

# tend PROXIMITY SWITCH

## พร็อกซีมิตี้สวิตช์

ISO 9002

### CYLINDRICAL SPIRAL TYPE PROXIMITY SWITCH

#### FEATURES

- Wide operating voltage range :  
3 wire 10-30V DC and 2 wire 90-250V AC.
- With operating indicator LED.
- May drive 200 mA loads directly.
- DC type with reverse-polarity proof.
- DC R5, R10, RL8, RL15, type with short circuit and over load proof.
- The lowest residual voltage.
- AC types are O-cross SCR output, operating stable.



#### TYPE

##### DC SWITCH TYPE

Type	NPN	TP-R2N	TP-R5N	TP-R10N
	PNP	TP-R2P	TP-R5P	TP-R10P
O.D.		M12	M18	M30
Detecting distance		2 mm	5 mm	10 mm

##### AC SWITCH TYPE

Type	TP-R2A	TP-R5A	TP-R10A
O.D.	M12	M18	M30
Detecting distance	2 mm	5 mm	10 mm

#### SPECIFICATIONS

##### DC SWITCHING TYPE

Item	Type	TP-R2 □	TP-R5 □	TP-R10 □
Input power		10-30 V DC		
Current consumption		10 mA max.		
Load current		10 mA at 12 V DC, 200 mA at 24 V DC		
Response frequency		800 Hz	500 Hz	300 Hz
Voltage output decrease		0.7 V max.		
Ambient temperature		-20 ~ +70°C		
Humidity		35 ~ 95% RH		
Standard detectable object		Iron 12 x 12 x 1t mm	Iron 18 x 18 x 1t mm	Iron 30 x 30 x 1t mm
Cable length		2 M		

##### AC SWITCHING TYPE

Item	Type	TP-R2A	TP-R5A	TP-R10A
Input power		90V - 250 V AC		
Current consumption		4 mA		
Load	2-Wire	10 ~ 10 mA		
Current	3-Wire	0 ~ 200 mA		
Response	2-Wire	15 Hz		
Frequency	3-Wire	25 Hz		
Voltage output decrease		4 V		
Ambient temperature		-20 ~ +70°C		
Humidity		35 ~ 95% RH		
Standard detectable object		Iron 12 x 12 x 1t mm	Iron 18 x 18 x 1t mm	Iron 30 x 30 x 1t mm
Cable length		2 M		

### ■ DC TYPE

Outside diameter		M12		M18		M30		
Type		Shielded	Non-shielded	Shielded	Non-shielded	Shielded	Non-shielded	
Detecting distance		2 mm	4 mm	5 mm	8 mm	10 mm	15 mm	
Type	NO	NPN	TP-R2N1	TP-RL4N1	TP-R5N1	TP-RL8N1	TP-R10N1	TP-RL15N1
		PNP	TP-R2P1	TP-RL4P1	TP-R5P1	TP-RL8P1	TP-R10P1	TP-RL15P1
	NC	NPN	TP-R2N2	TP-RL4N2	TP-R5N2	TP-RL8N2	TP-R10N2	TP-RL15N2
		PNP	TP-R2P2	TP-RL4P2	TP-R5P2	TP-RL8P2	TP-R10P2	TP-RL15P2
Standard detectable object (mm)		IRON 12 x 12 x 1t	IRON 18 x 18 x 1t	IRON 18 x 18 x 1t	IRON 30 x 30 x 1t	IRON 30 x 30 x 1t	IRON 54 x 54 x 1t	
Response frequency		1.5 kHz	400 Hz	600 Hz	200 Hz	400 Hz	100 Hz	

### ■ AC TYPE

Outside diameter		M18		M30	
Type		Shielded	Non-shielded	Shielded	Non-shielded
Detecting distance		5 mm	8 mm	10 mm	15 mm
Type SCR	NO	TP-R5A1	TP-RL8A1	TP-R10A1	TP-RL15A1
	NC	TP-R5A2	TP-RL8A2	TP-R10A2	TP-RL15A2
Standard detectable object (mm)		IRON 18 x 18 x 1t	IRON 30 x 30 x 1t	IRON 30 x 30 x 1t	IRON 54 x 54 x 1t
Response frequency		25 Hz			

# tend PROXIMITY SWITCH

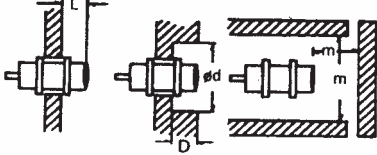
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ISO 9002

## ■ HINTS ON CORRECT USE

### ● Influence of surrounding metals

When mounting a proximity switch flush with a metallic panel, be sure to provide a minimum distance as shown in Table 1 below to prevent the switch from being affected by metal objects other than the object to be detected.



● Table 1 : Influence of Surrounding Metal (Unit : mm)

Item / Type	TP-R2 □(A)	TP-R5 □(A)	TP-R10 □(A)
L	0	0	0
d	12	18	30
D	0	0	0
m	8	20	40
n	18	27	45

### ● Mutual interference

Be sure to space the two switches at a distance greater than that shown in Table 2, to prevent mutual interference.



● Table 2 : Mutual Interference (Unit : mm)

Item / Type	TP-R2 □(A)	TP-R5 □(A)	TP-R10 □(A)
A	30	50	100
B	15	35	60

## ■ TP-R TP-RL DIMENSIONS (mm)



TP-R10A1, 2  
TP-RL15A1, 2

2,460.-  
2,560.-



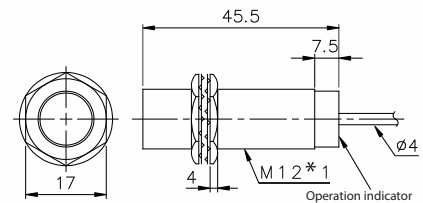
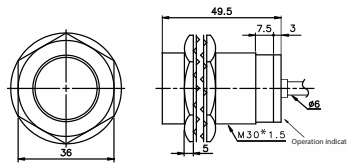
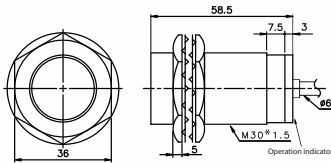
TP-R10N1, 2  
TP-R10P1, 2  
TP-RL15N1, 2  
TP-RL15P1, 2

1,975.-  
1,975.-  
2,100.-  
2,100.-



TP-R2N1, 2  
TP-R2P1, 2  
TP-RL4N1, 2  
TP-RL4P1, 2

1,000.-  
1,000.-  
1,000.-  
1,000.-

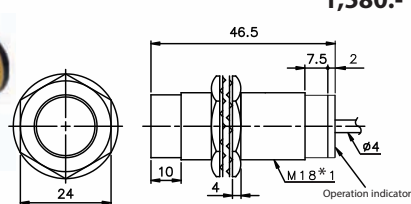
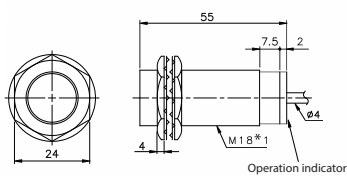


TP-R5A1, 2  
TP-RL8A1, 2

1,525.-  
1,770.-

TP-R5N1, 2  
TP-R5P1, 2  
TP-RL8N1, 2  
TP-RL8P1, 2

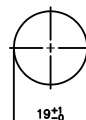
1,340.-  
1,340.-  
1,580.-  
1,580.-



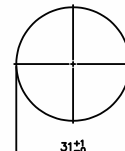
## ■ MOUNTING HOLES



TP-R2 □ A



TP-R5 □ A



TP-R10 □ A

# tend PROXIMITY SWITCH

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### ■ SQUARE TYPE PROXIMITY SWITCH



### ■ FEATURES

- Economic price.
- Wide operating voltage range : 3 wires 10 to 30 V DC and 2 wires 90 to 250 V AC.
- With operation indicator LED.
- May drive 150 mA loads directly.
- DC type with reverse-polarity proof.
- DC S5, S10, S20, type with short circuit and overload proof.
- The lowest residual voltage.
- AC type are O-cross SCR output, operating stable.

### ■ DC TYPE

Item		DC Type				AC Type			
Type	NO	NPN	TP-SN5N1	TP-S5N1	TP-S10N1	TP-S20N1	TP-S5A1	TP-S10A1	TP-S20A1
		PNP	TP-SN5P1	TP-S5P1	TP-S10P1	TP-S20P1	(SCR)	(SCR)	(SCR)
	NC	NPN	TP-SN5N2	TP-S5N2	TP-S10N2	TP-S20N2	TP-S5A1	TP-S10A2	TP-S520A2
		PNP	TP-SN5P2	TP-S5P2	TP-S10P2	TP-S20P2	(SCR)	(SCR)	(SCR)
Detecting distance			5 mm	7 mm	10 mm	20 mm	7 mm	10 mm	20 mm
Standard detectable object (mm)			IRON 18 x 18 x 1t	IRON 25 x 25 x 1t	IRON 30 x 30 x 1t	IRON 40 x 40 x 1t	IRON 25 x 25 x 1t	IRON 30 x 30 x 1t	IRON 40 x 40 x 1t
Response frequency			1 kHz	800 Hz	500 Hz	200 Hz	20 Hz		
Rated voltage			10 - 30 V DC				90 - 250 V AC		
Current sumption			15 mA max.				2 mA max.		
Load current			150 mA max.				3 - 200 mA		
Residual voltage			1.5 V max.				7 V max.		
Ambient temperature			Operating : -20 ~ 70°C						
The variation due to the variation of operating voltage			DC Type : ± 2.5% AC Type : ± 1%						
The variation due to the variation of ammbient temperature			From -20 ~ 70°C : ± 10%						
Enclosure rating			IP 67						
Cable length			2M						



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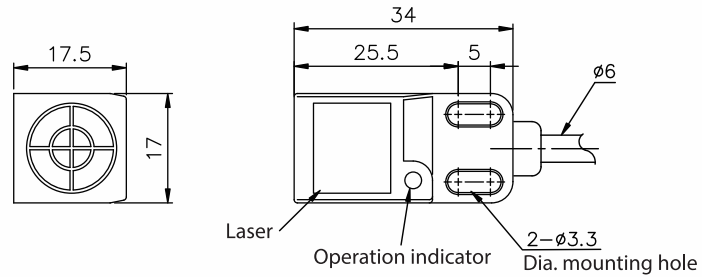
## TP-S DIMENSIONS (mm)

TP-SM5N1,2 (N1=NO, N2=NC)

640.-

TP-SM5P1,2 (P1=NO, P2=NC)

640.-



TP-S5N1,2 (N1=NO, N2=NC)

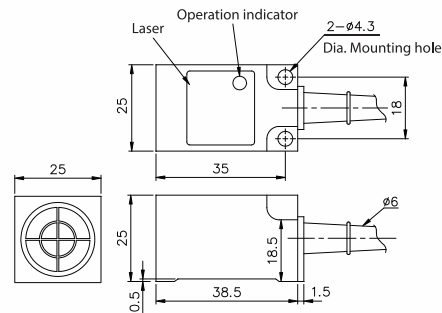
1,000.-

TP-S5P1,2 (P1=NO, P2=NC)

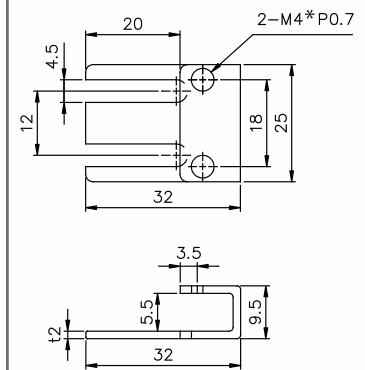
1,000.-

TP-S5A1,2 (A1=NO, A2=NC)

1,220.-



## Fix bracket (mm)



TP-S10N1,2 (N1=NO, N2=NC)

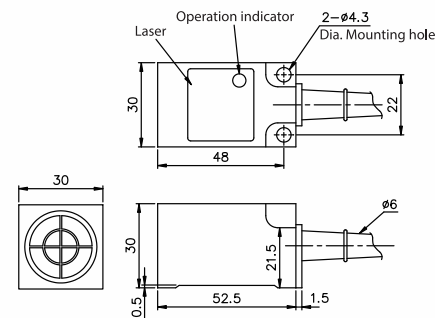
1,180.-

TP-S10P1,2 (P1=NO, P2=NC)

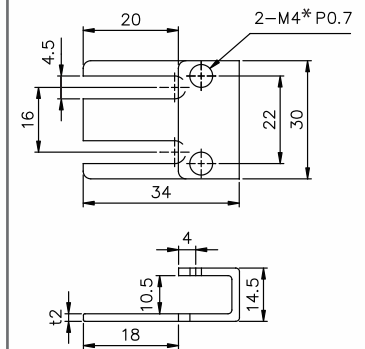
1,180.-

TP-S10A1,2 (A1=NO, A2=NC)

1,700.-



## Fix bracket (mm)



TP-S20N1,2 (N1=NO, N2=NC)

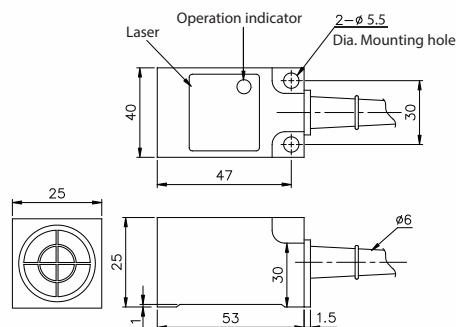
1,750.-

TP-S20P1,2 (P1=NO, P2=NC)

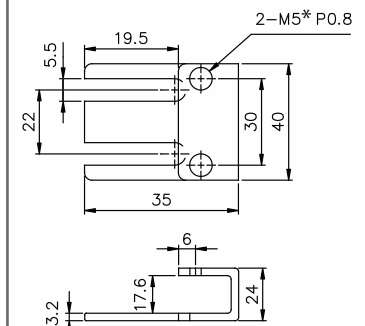
1,750.-

TP-S20A1,2 (A1=NO, A2=NC)

2,120.-



## Fix bracket (mm)



# tend MINI MICRO SWITCH

## มินิไมโครสวิตช์

### MODEL DESIGNATION

**TMV 10 2   - C**

①    ②    ③    ④

1. Rating  
10 10A  
16 16A  
21 21A
2. Actuator  
0 Push button type  
1 Long lever type  
2 Short lever type  
3 Long roller type  
4 Short roller type  
5 Extra lever type  
6 Crank lever type
3. Rating(contact)  
None 1C(com bottom terminal)  
S 1C(com side terminal)
4. Rating(Terminal)  
C #250 Terminal  
D #187 Terminal

### CONTACT CONFIGURATION



### TYPES

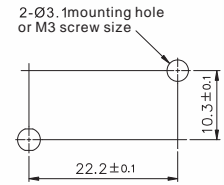
Actuator	COM terminal	Rating Contact	Rating terminal	10A	16A	21A
Push button type	Side Terminal	1C	#187 Terminal	TMV100-C/D	TMV160-C/D	TMV210-C/D
				TMV100S-C/D	TMV160S-C/D	TMV210S-C/D
Long lever type				TMV101-C/D	TMV161-C/D	TMV211-C/D
				TMV101S-C/D	TMV161S-C/D	TMV211S-C/D
Short lever type				TMV102-C/D	TMV162-C/D	TMV212-C/D
				TMV102S-C/D	TMV162S-C/D	TMV212S-C/D
Long roller type			#250 Terminal	TMV103C/D	TMV163C/D	TMV213C/D
				TMV103S-C/D	TMV163S-C/D	TMV213S-C/D
Short roller type				TMV104-C/D	TMV164-C/D	TMV214-C/D
				TMV104S-C/D	TMV164S-C/D	TMV214S-C/D
Extra lever type				TMV105-C/D	TMV165-C/D	TMV215-C/D
				TMV105S-C/D	TMV165S-C/D	TMV215S-C/D
Crank lever type	TMV106-C/D	TMV166-C/D	TMV216-C/D			
	TMV106S-C/D	TMV166S-C/D	TMV216S-C/D			

### TYPE AND SHAPE OF TERMINAL

Type of terminal	#187 Terminal	#250 Terminal
Bottom Terminal		
Side Terminal		
Terminal size		

### MOUNTING HOLES

Using M3 screw washer and spring washer as install. The twist force of 0.39~0.59N.m or 4~6kg.cm is recommended and applicable.



### SPECIFICATIONS RATINGS

Item	Rated voltage (V)	Noninductive load (A)		inductive load (A)		Inrush current (A)	
		Resistive load		Lamp load		Motor load	
		NC	NO	NC	NO	NC	NO
10A	250V AC	10	1.5	6	2	24 max	
	8 V DC	10	3	6	3		
	30V DC	6	3	6	3		
	125V DC	0.6	0.1	0.6	0.1		
	250V DC	0.3	0.005	0.3	0.05		
16A	250V AC	16	2	10	3	40 max	
	8 V DC	16	4	10	6		
	30V DC	10	4	10	4		
	125V DC	0.6	0.1	0.6	0.1		
	250V DC	0.3	0.05	0.3	0.05		
21A	250V AC	21	3	12	4	50 max	
	8 V DC	21	5	12	7		
	30V DC	14	5	12	5		
	125V DC	0.6	0.1	0.6	0.1		
	250V DC	0.3	0.05	0.3	0.05		

### CHARACTERISTICS

Item	Type	TMV 10	TMV16	TMV21
Operating speed		0.1 mm. ~ 1 m/s		
Operating frequency		Mechanically : 240 Operations/min electrically : 20 Operations/min		
Insulation resistance		100 MΩ min (at 500 V DC)		
Contact resistance		1,000 V AC, 50/60 Hz for 1 minute		
Detectric strength	Non-continuous terminals	15 mΩ max		
	Between non-continuous terminals	TMV 10 : 1500 V AC, 50/60 Hz for 1 minute TMV16/ TMV21 : 2000 V AC, 50/60 Hz for 1 minute		
Vibration	Malfunction	10-55 Hz, 1.5 mm double amplitude		
Shock	Mechanical durability	1,000 m/sec (approx. 100 G's)		
	Malfunction	200 m/sec (approx. 20 G's)	3,000 m/sec (approx. 30 G's)	
Service life	Mechanical	20,000,000 operations min.		
	Electrically	300,000 operations min. 100,000 operations min.		
Ambient temperature		General purpose type : -25 to +80 °C		
Ambient humidity		General purpose type : -85% RH max General purpose type : +5 to +35 °C		
Weight		Approx : 7.2 ~ 8 g		

TEND

BANDEX

TAKAMURA

TEEFLEX

KENION

NISSEI

ROSI

APEKS

LKEW

TAC

MARLOW

HARU

WIND

SPEED

COMMAX

ADVANTE

UNIVERSAL  
ADAPTER

ALION

EXOWELD

CONTROL  
MAX

JKN

SYLVIA

WANG

MACCON

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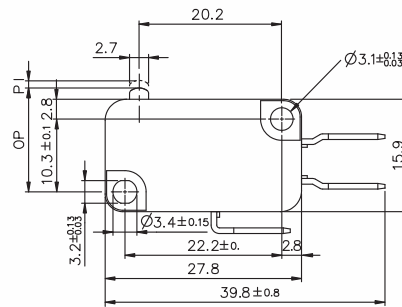
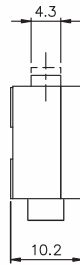
## มินิไมโครสวิตช์

### OPERATION CHARACTERISTICS

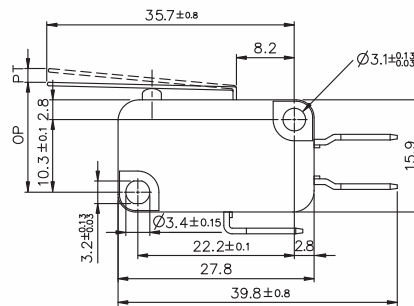
Type	TMV100	TMV101	TMV102	TMV103	TMV104	TMV105	TMV106
	TMV160	TMV161	TMV162	TMV163	TMV164	TMV165	TMV166
	TMV210	TMV211	TMV212	TMV213	TMV214	TMV215	TMV216
OF max	200 g	125 g	200 g	125 g	240 g	70 g	125 g
RF min	50 g	14 g	50 g	14 g	50 g	6 g	14 g
PT max	1.4 mm	4.0 mm	1.6 mm	4.0 mm	1.6 mm	9.0 mm	4.0 mm
OT min	0.8 mm	1.6 mm	0.8 mm	1.6 mm	0.8 mm	3.2 mm	1.6 mm
MD max	0.5 mm	1.5 mm	0.6 mm	1.5 mm	0.6 mm	2.8 mm	1.5 mm
OP	14.7 ± 0.5 mm	15.2 ± 1.2 mm	15.2 ± 0.5 mm	20.7 ± 1.2 mm	20.7 ± 0.6 mm	15.2 ± 2.5 mm	18.7 ± 1.2 mm

### DIMENSIONS

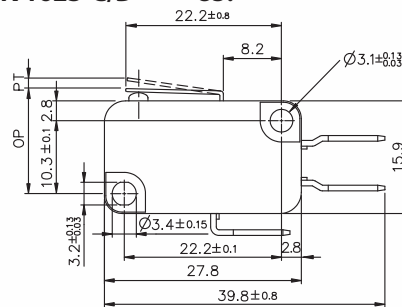
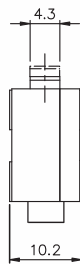
TMV100-C, TMV160-C TMV210-C	TMV100-C/D TMV100S-C/D	55.- 60.-	TMV160-C/D TMV160S-C/D	70.- 75.-	TMV210-C/D TMV210S-C/D	95.- 100.-
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TMV101-C, TMV161-C TMV211-C	TMV101-C/D TMV101S-C/D	60.- 65.-	TMV161-C/D TMV161S-C/D	70.- 85.-	TMV211-C/D TMV211S-C/D	100.- 105.-
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TMV102-C, TMV162-C TMV212-C	TMV102-C/D TMV102S-C/D	60.- 65.-	TMV162-C/D TMV162S-C/D	70.- 85.-	TMV212-C/D	100.-
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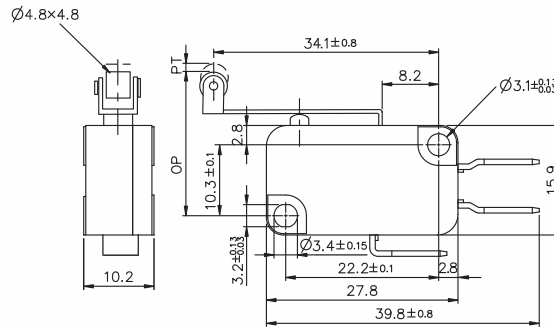
หมายเลข : TMVXXX-C/D Normal terminal C : # 250 Terminal  
TMVXXX-C/D Side terminal D : # 187 Terminal

\*ขอสงวนสิทธิ์ในการเปลี่ยนแปลงราคา

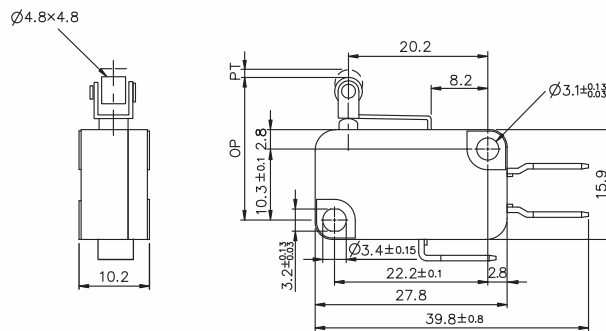
# tend MINI MICRO SWITCH มิโครสวิตช์

## DIMENSIONS

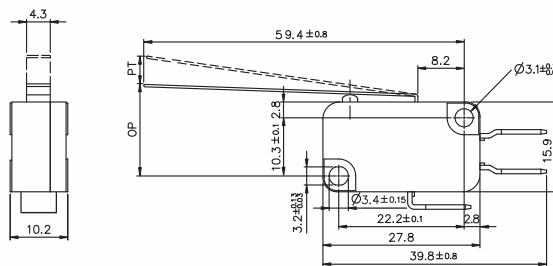
TMV103-C, TMV163-C TMV213-C	TMV103-C/D TMV103S-C/D	70.- 75.-	TMV163-C/D TMV163S-C/D	80.- 90.-	TMV213-C/D TMV213S-C/D	115.- 120.-
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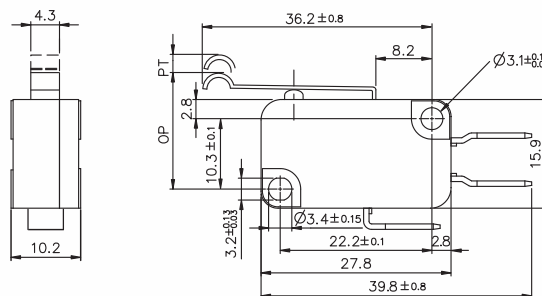
TMV104-C, TMV164-C TMV214-C	TMV104-C/D TMV104S-C/D	70.- 75.-	TMV164-C/D TMV164S-C/D	80.- 80.-	TMV214-C/D TMV214S-C/D	115.- 120.-
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TMV105-C, TMV165-C TMV215-C	TMV105-C/D TMV105S-C/D	65.- 75.-	TMV165-C/D TMV165S-C/D	75.- 90.-	TMV215-C/D TMV215S-C/D	105.- 115.-
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TMV106-C, TMV166-C TMV216-C	TMV106-C/D TMV106S-C/D	75.- 85.-	TMV166-C/D TMV166S-C/D	80.- 100.-	TMV216-C/D TMV216S-C/D	130.- 140.-
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หมายเหตุ : TMVXXX-C/D Normal terminal C : # 257 Terminal  
TMVXXX-C/D Side terminal D : # 187 Terminal

# tend MICRO SWITCH

## ไมโครสวิตช์

 ISO 9002    

### Best-selling basic switch boasting High precision and wide variety

#### ■ FEATURES

- Wide variety of actuators
- High precision
- High breaking capacity (15A)
- Wide operating speed range

#### ■ RATINGS

Rated voltage (V)	Non-inductive load (A)			Inductive load (A)				Inrush current (A)		
	Resistive load		Lamp load	Inductive load		Motor load				
	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	15	3	1.5	15	5	2.5	30 max.	15 max.		
250 VAC	15	2.5	1.25	15	3	1.5				
500 VAC	3	1.5	0.75	2.5	1.5	0.75				
8 VAC	15	3	1.5	15	5	2.5				
14 VAC	15	3	1.5	10	5	2.5				
30 VAC	6 (2)	3	1.5	5	5	2.5				
125 VAC	0.4	0.4	0.4	0.05	0.05	0.05				
250 VAC	0.2	0.2	0.2	0.03	0.03	0.03				

#### NOTES :

1. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 msec (DC)
2. Lamp load has an inrush current of 10 times the steady-state current. While motor load has an inrush current of 6 times the steady-state current.

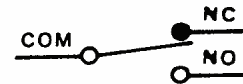
#### ■ CHARACTERISTICS

<b>Operating speed</b>	0.01 mm to 1 m/sec
<b>Operating frequency</b>	Mechanically : 240 Operations/min. Electrically : 20 operations/min.
<b>Contact resistance</b>	15 mΩ max. (initial)
<b>Insulation resistance</b>	100 MΩ min. (at 500 V DC)
<b>Dielectric strength</b>	1,000 VAC, 50/60 Hz for 1 minute between non-continuous terminals 2,000 VAC, 50/60 Hz for 1 minute between current carrying part and ground
<b>Vibration</b>	Mechanically durability : 10 to 55 Hz 1.5 mm double amplitude
<b>Shock</b>	Mechanically durability : Approx. 1,000 m/sec <sup>2</sup> (approx: 100 G's) Malfunction durability : Approx. 300 m/sec <sup>2</sup> (approx. 30G's)
<b>Ambient operating temperature</b>	General purpose type : -25° to +80°C Sealed type : -15° to 80°C
<b>Humidity</b>	General purpose type : 85% RH max Sealed type : 95% RH
<b>Service life</b>	Mechanically : 20,000,000 Operations min Electrically : 500,000 operations min.
<b>Weight</b>	Approx. 22 to 58g

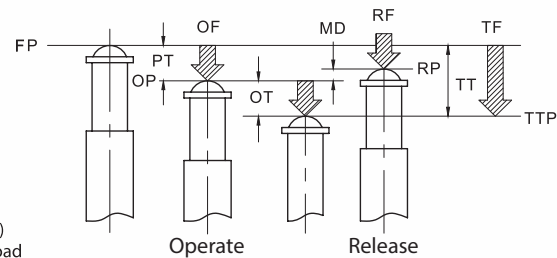
#### Z-15 SERIES :

- 15A 125, 250 or 480 VAC
- 1/2A 125 V DC, 1/4 250 V DC
- 1/8 HP 125 VAC, 1/4 HP 250 VAC

#### ■ CONTACT CONFIGURATION



#### ■ DEFINITIONS OF OPERATING CHARACTERISTICS



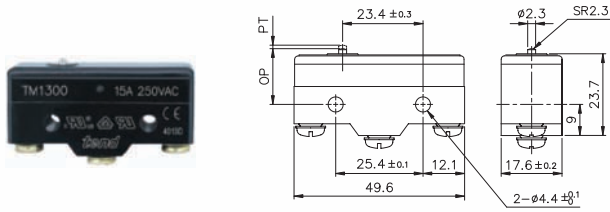
- OF** : Operating Force  
**RF** : Releasing Force  
**TF** : Total Force  
**FP** : Free Position  
**OP** : Operating Position  
**RP** : Releasing Position  
**TTP** : Total Travel Position  
**PT** : Pretravel  
**OT** : Overtravel  
**MD** : Movement Differential  
**TT** : Total Travel



**DIMENSIONS**

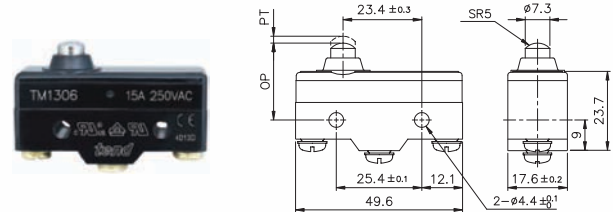
**TM 1300(Z-15G-B) 15A 250V AC**  
**TM 1300-2 20A 250V**

**155.-**  
**230.-**



**TM 1306(Z-15GD-B) 15A 250V AC**  
**TM 1306-2 20A 250V**

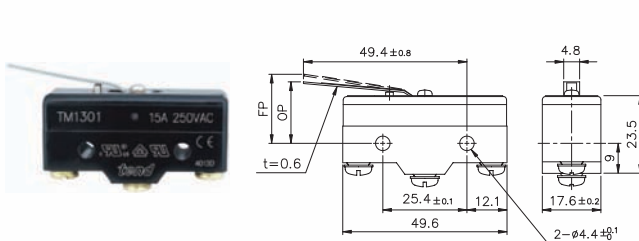
**165.-**  
**290.-**



**TM 1301(Z-15GL-B) 15A 250V AC**  
**TM 1301-2 20A 250V**

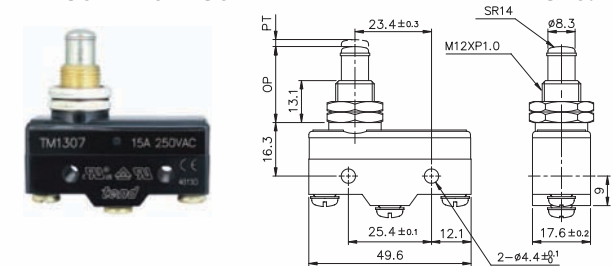
**160.-**  
**245.-**

Resistive Load    Lamp Load    Inductive Load    Motor Load



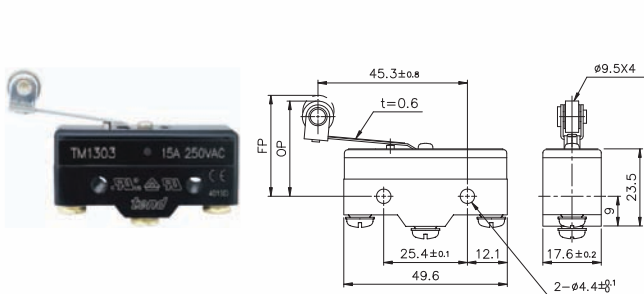
**TM 1307(Z-15GQ-B) 15A 250V AC**  
**TM 1307-2 20A 250V**

**205.-**  
**310.-**



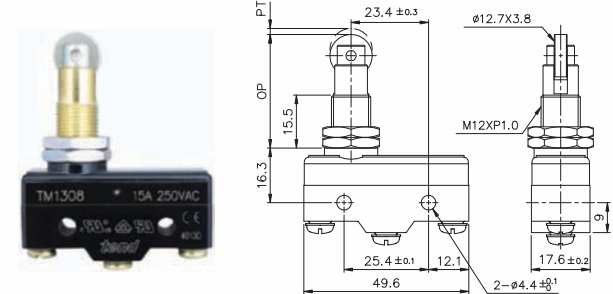
**TM 1303(Z-15GL2-B) 15A 250V AC**  
**TM 1303-2 20A 250V**

**175.-**  
**260.-**



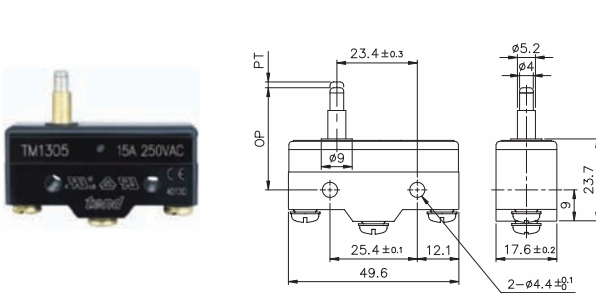
**TM 1308(Z-15GQ22-B) 15A 250V AC**  
**TM 1308-2 20A 250V**

**255.-**  
**370.-**



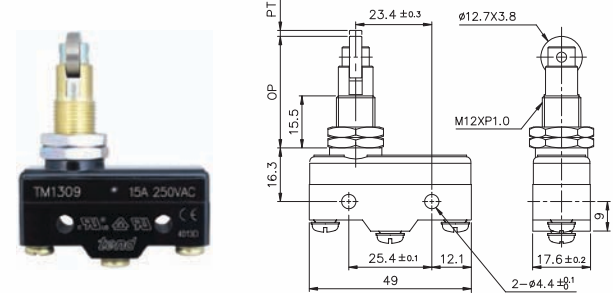
**TM 1305(Z-15GS-B) 15A 250V AC**  
**TM 1305-2 20A 250V**

**165.-**  
**290.-**



**TM 1309(Z-15GQ21-B) 15A 250V AC**  
**TM 1309-2 20A 250V**

**275.-**  
**385.-**



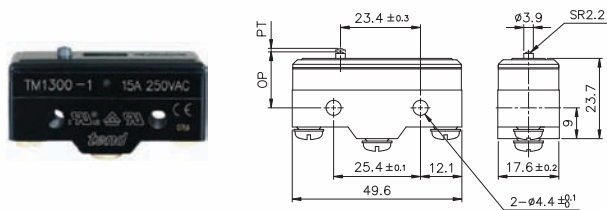
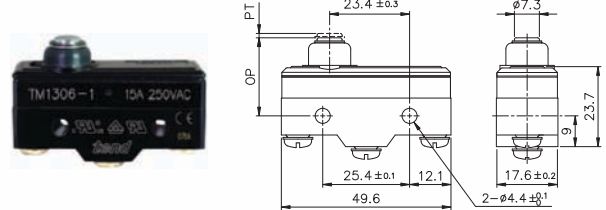
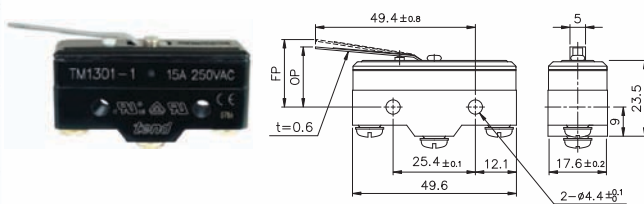
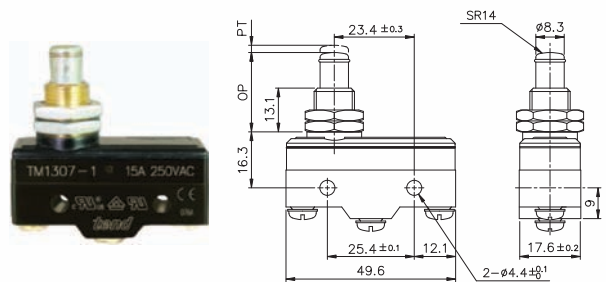
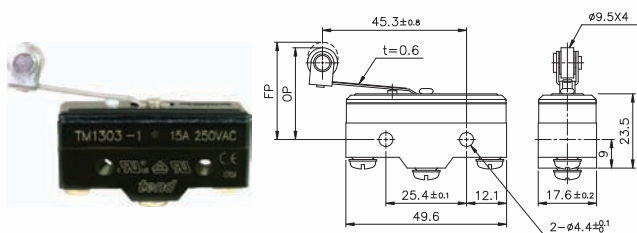
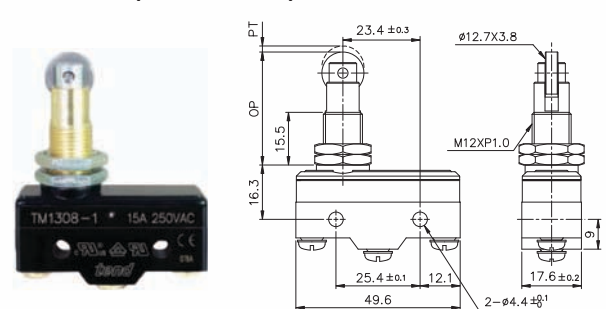
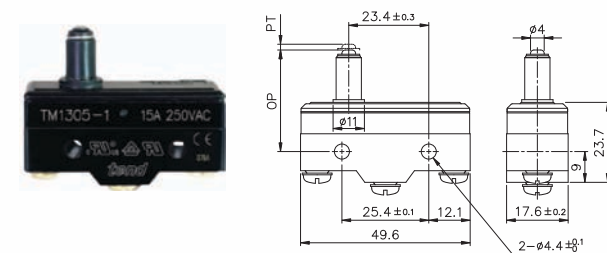
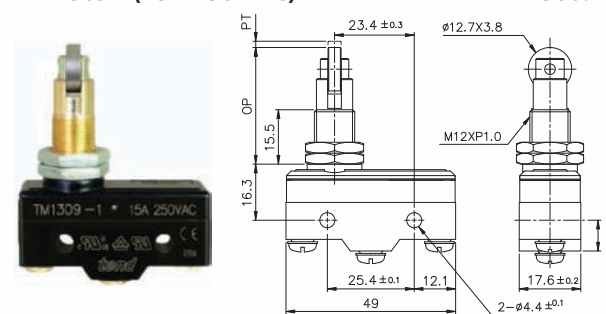
**OPERATION CHARACTERISTICS**

Type	TM 1300	TM 1301	TM 1303	TM 1305	TM 1306	TM 1307	TM 1308	TM 1309
OF max	350 g	300 g	300 g	350 g	350 g	350 g	350 g	350 g
RF min	114 g	50 g	50 g	114 g	114 g	114 g	114 g	114 g
PT max	0.4 mm	4 mm	4 mm	0.4 mm	0.4 mm	0.4 mm	0.4 mm	0.4 mm
OT min	0.13 mm	1.6 mm	1.6 mm	1.6 mm	1.6 mm	5.5 mm	3.58 mm	3.58 mm
MD max	0.05 mm	1.3 mm	1.3 mm	0.05 mm	0.05 mm	0.05 mm	0.05 mm	0.05 mm
FP max		20.6 mm	31.8 mm					
OP	15.9 ± 0.4 mm	17.4 ± 0.8 mm	28.6 ± 0.8 mm	28.2 ± 0.5 mm	21.5 ± 0.5 mm	21.8 ± 0.8 mm	33.4 ± 1.2 mm	33.4 ± 1.2 mm



**tend****MICRO SWITCH**

ไมโครสวิตช์ ชนิดกันน้ำ, กันน้ำมัน, กันฝุ่น ISO 9002

**■ DIMENSIONS****TM 1300-1(15A 250V AC)****225.-****TM 1306-1(15A 250V AC)****255.-****TM 1301-1(15A 250V AC)****240.-****TM 1307-1(15A 250V AC)****295.-****TM 1303-1(15A 250V AC)****255.-****TM 1308-1(15A 250V AC)****360.-****TM 1305-1(15A 250V AC)****255.-****TM 1309-1(15A 250V AC)****360.-****■ OPERATION CHARACTERISTIC**

Type	TM1300-1	TM1301-1	TM1303-1	TM1305-1	TM1306-1	TM1307-1	TM1308-1	TM1309-1
OF max	500 g	400 g	400 g	500 g	500 g	500 g	500 g	500 g
RF min	114 g	50 g	50 g	114 g	114 g	114 g	114 g	114 g
PT max	0.4 mm	4 mm	4 mm	0.4 mm	0.4 mm	0.4 mm	0.4 mm	0.4 mm
OT min	0.13 mm	1.6 mm	1.6 mm	1.6 mm	1.6 mm	5.5 mm	3.58 mm	3.58 mm
MD max	0.05 mm	1.3 mm	1.3 mm	0.05 mm	0.05 mm	0.05 mm	0.05 mm	0.05 mm
FP max		20.6 mm	31.8 mm					
OP	15.9 ± 0.4 mm	17.4 ± 0.8 mm	28.6 ± 0.8 mm	28.2 ± 0.5 mm	21.5 ± 0.5 mm	21.8 ± 0.8 mm	33.4 ± 1.2 mm	33.4 ± 1.2 mm

\*ขอสงวนสิทธิ์ในการเปลี่ยนแปลงราคา

# tend MICRO SWITCH

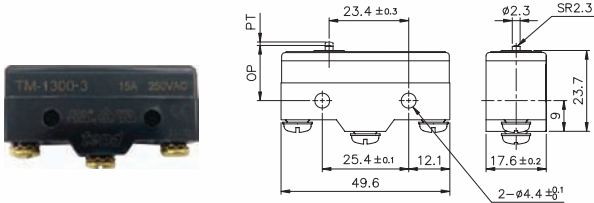
ไมโครสวิตช์ ชนิดก้านน้ำ, ก้านน้ำมัน, ก้านฝุ่น ISO 9002



## DIMENSIONS

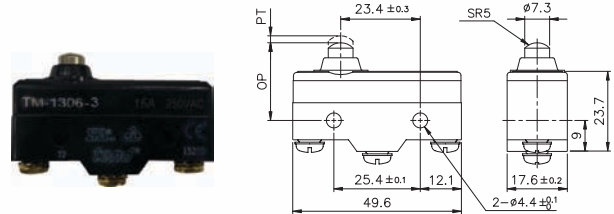
TM 1300-3(20A 250V AC)  
TM 1303-12

275.-  
275.-



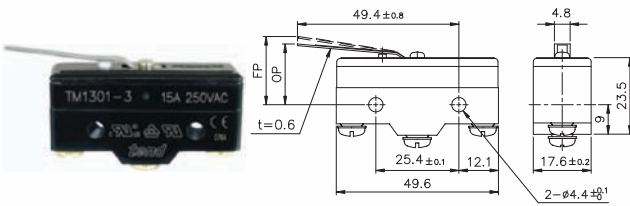
TM 1306-3(20A 250V AC)

305.-



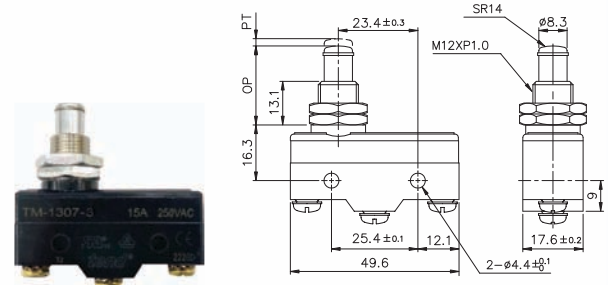
TM 1301-3(20A 250V AC)

335.-



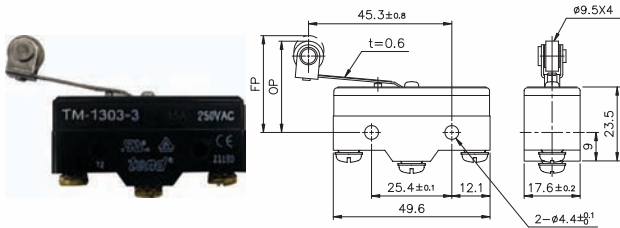
TM 1307-3(20A 250V AC)

335.-



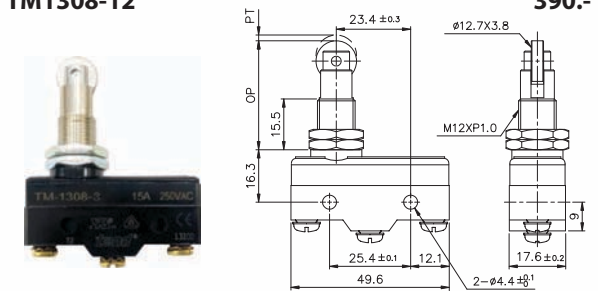
TM 1303-3(20A 250V AC)  
TM 1303-12

295.-



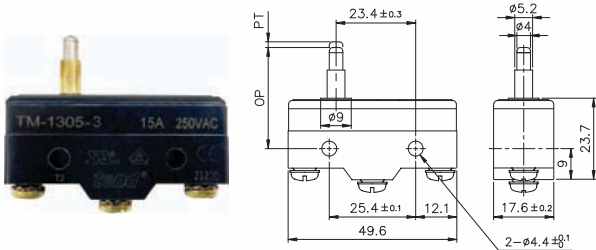
TM 1308-3(20A 250V AC)  
TM1308-12

390.-  
390.-



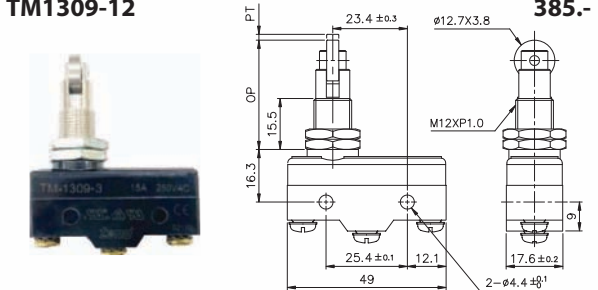
TM 1305-3(20A 250V AC)

305.-



TM 1309-3(20A 250V AC)  
TM1309-12

385.-  
385.-

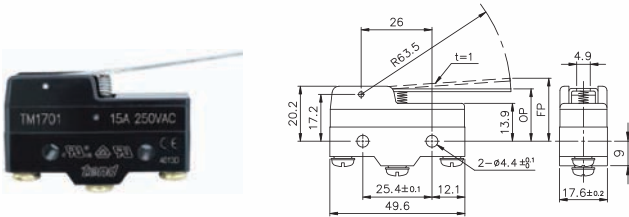
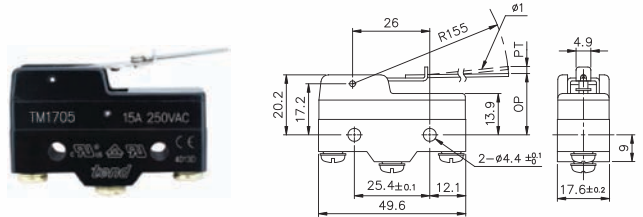
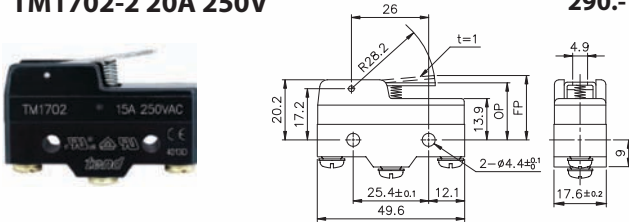
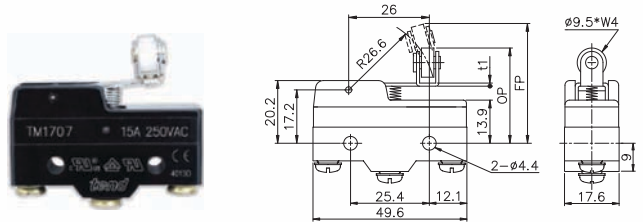
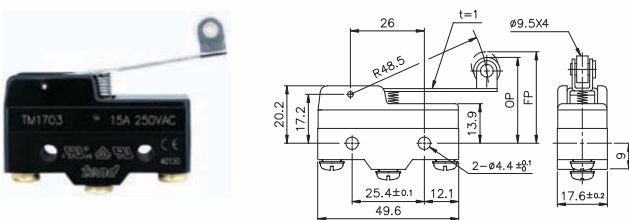
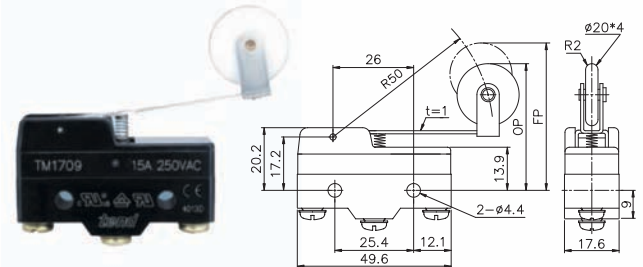
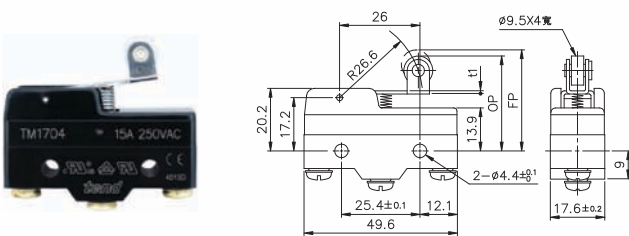
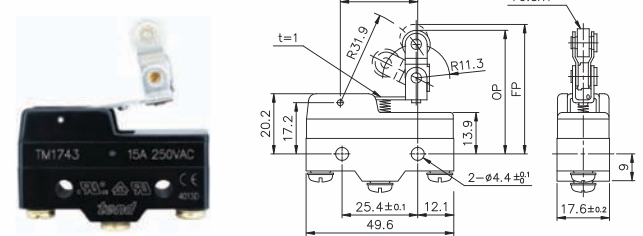


## OPERATION CHARACTERISTIC

Type	TM1300-3	TM1301-3	TM1303-3	TM1305-3	TM1306-3	TM1307-3	TM1308-3	TM1309-3
OF max	850 g	450 g	450 g	800 g	800 g	800 g	800 g	800 g
RF min	200 g	50 g	50 g	200 g	200 g	200 g	200 g	200 g
PT max	0.7 mm	4 mm	4 mm	0.7 mm	0.7 mm	0.7 mm	0.7 mm	0.7 mm
OT min	0.13 mm	1.6 mm	1.6 mm	1.6 mm	1.6 mm	5.5 mm	3.58 mm	3.58 mm
MD max	0.2 mm	1.3 mm	1.3 mm	0.2 mm	0.2 mm	0.2 mm	0.2 mm	0.2 mm
FP max		20.6 mm	31.8 mm					
OP	15.9 ± 0.4 mm	17.4 ± 0.8 mm	28.6 ± 0.8 mm	28.2 ± 0.5 mm	21.5 ± 0.5 mm	21.8 ± 0.8 mm	33.4 ± 1.2 mm	33.4 ± 1.2 mm

# tend MICRO SWITCH

## ไมโครสวิตช์

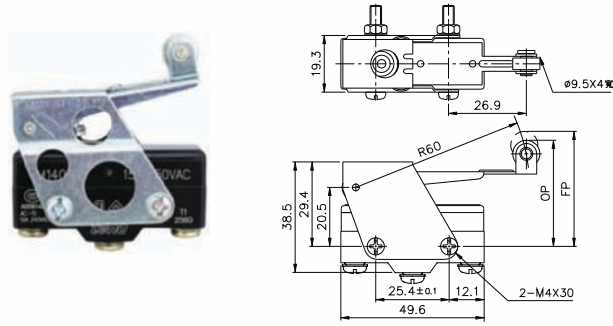
 ISO 9002    
**TM1701(15A 250V AC)**  
**TM1701-2 20A 250V**
**180.-**  
**290.-**

**TM1705(15A 250V AC)**  
**TM1705-2 20A 250V**
**250.-**  
**360.-**

**TM1702(15A 250V AC)**  
**TM1702-2 20A 250V**
**180.-**  
**290.-**

**TM1707(15A 250V AC)**
**300.-**

**TM1703(15A 250V AC)**  
**TM1703-2 20A 250V**
**190.-**  
**295.-**

**TM1709(15A 250V AC)**
**350.-**

**TM1704(15A 250V AC)**  
**TM1704-2 20A 250V**
**190.-**  
**295.-**

**TM1743(15A 250 VAC)**  
**TM1743-2 20A 250V**
**240.-**  
**380.-**


### ■ OPERATION CHARACTERISTICS

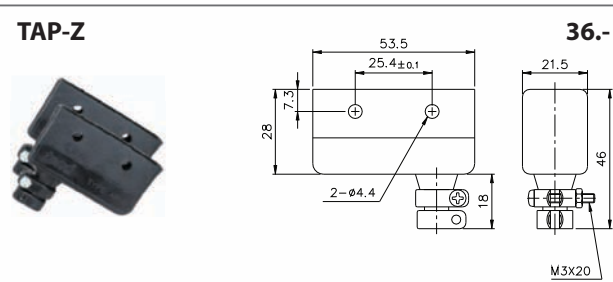
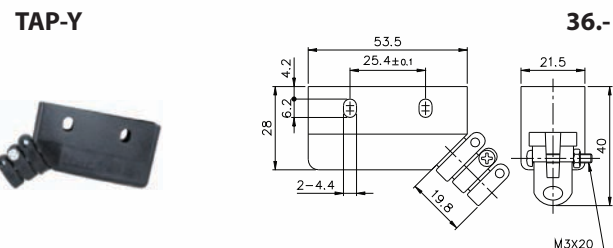
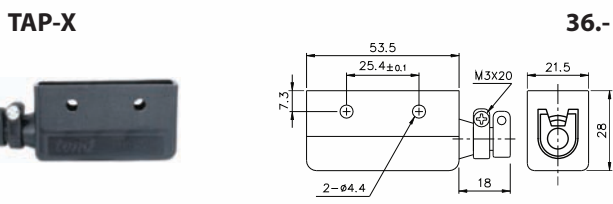
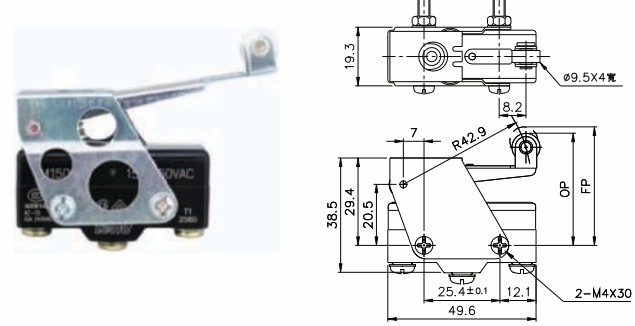
Type	TM1701	TM1702	TM1703	TM1704	TM1705	TM1707	TM1709	TM1743
OF max	70 g	100 g	160 g	160 g	10 g	170 g	100 g	160 g
RF min	14 g	28 g	22 g	42 g	3 g	42 g	21 g	42 g
PT max	10 mm	5 mm	7.1 mm	2.7 mm	20 mm	2.7 mm	7.3 mm	2.7 mm
OT min	5.6 mm	2 mm	4 mm	2.4 mm	5.6 mm	2.4 mm	4 mm	2.4 mm
MD max	1.27 mm	1 mm	1.02 mm	0.5 mm	3 mm	0.5 mm	1.6 mm	0.5 mm
FP max	28.2 mm	24.8 mm	36.5 mm	32.5 mm		33.3mm	47.5 mm	43.6 mm
OP	19 ± 0.8 mm	19 ± 0.8 mm	30.2 ± 0.8 mm	30.2 ± 0.4 mm	19 ± 0.8 mm	31 ± 0.4 mm	41.2 ± 0.8 mm	43.1 ± 0.8 mm

\*ขอสงวนสิทธิ์ในการเปลี่ยนแปลงราคา

TM1401(15A 250 VAC) 240.-  
 TM1401-2 20A 250V 355.-  
 TM1401-1(15A 250VAC) ก้านน้ำ 340.-  
 TM1401-3(20A 250VAC) ก้านน้ำ 410.-



TM1501(15A 250 VAC) 240.-  
 TM1501-2 20A 250V 355.-  
 TM1501-1(15A 250VAC) ก้านน้ำ 340.-  
 TM1501-3(20A 250VAC) ก้านน้ำ 410.-



**OPERATION CHARACTERISTICS**

Type	TM1401	TM1501
OF max	500 g	600 g
RF min	170 g	300 g
PT max	5 mm	3 mm
OT min	12.7 mm	6 mm
MD max	2.2 mm	2 mm
FP max	44.5 ± 1.6 mm	41 ± 1.6 mm
OP	40.4 ± 1.6 mm	40.4 ± 1.6 mm

TEND

BANDEX

TAKAMURA

TEEFLEX

KENION

NISSEI

ROSI

APEKS

LKEW

TAC

MARLOW

HARU

WIND SPEED

COMMAX

ADVANTE

UNIVERSAL ADAPTER

ALION

EXOWELD

CONTROL MAX

JKN

SYLVIA

WANG

MACCON

# tend MICRO SWITCH

ไมโครสวิตช์ ชนิดกันน้ำ, กันน้ำมัน, กันฝุ่น ISO 9002



## OPERATION CHARACTERISTICS

- Surrounding joints are sealed by epoxy, and waterproof, oiltight rubber boot.
- Dust-preventive, waterproof and oiltight.

Type	TM 1701-1	TM 1702-1	TM 1703-1	TM 1704-1	TM1705-1	TM 1743-1
OF max	100 g	190 g	130 g	190 g	40 g	190 g
RF min	14 g	28 g	21 g	42 g	3 g	50 g
PT max	10 mm	5 mm	7.1 mm	2.7 mm	20 mm	2.7 mm
OT min	5.6 mm	2 mm	4 mm	2.4 mm	5.6 mm	2.4 mm
MD max	2 mm	1 mm	1.6 mm	0.8 mm	4 mm	0.8 mm
FP max	28.2 mm	25 mm	36.5 mm	32.9 mm		43.6 mm
OP	19 ± 0.8 mm	19 ± 0.8 mm	30.2 ± 0.8 mm	30.2 ± 0.4 mm	19 ± 0.8 mm	41.3 ± 0.8 mm

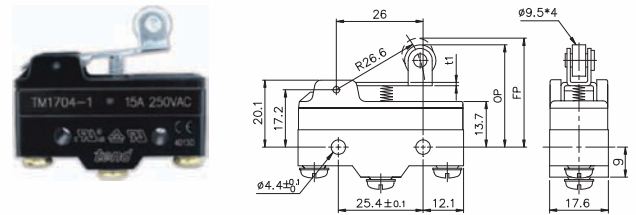
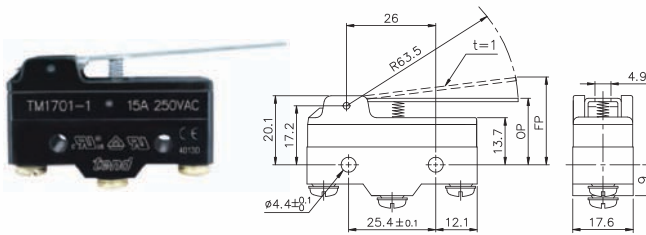
## DIMENSIONS

TM1701-1(15A 250V AC)

255.-

TM1704-1(15A 250V AC)

280.-

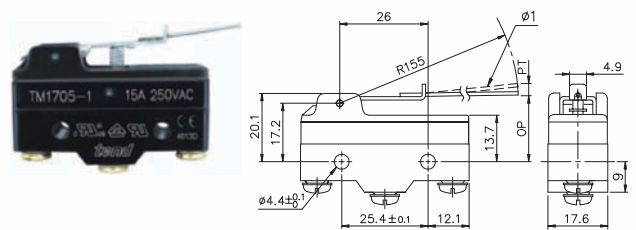
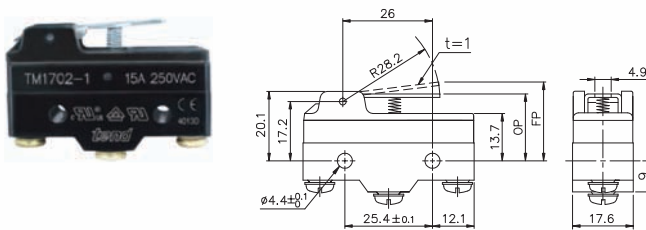


TM1702-1(15A 250V AC)

255.-

TM1705-1(15A 250V AC)

325.-

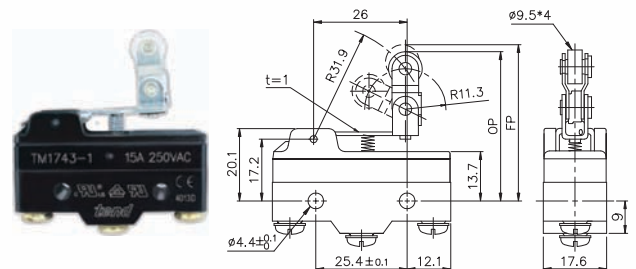
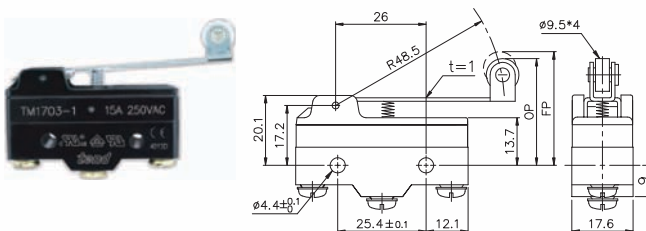


TM1703-1(15A 250V AC)

280.-

TM1743-1(15A 250V AC)

350.-





# tend MICRO SWITCH

ไมโครสวิตช์ ชนิดกันน้ำ, กันน้ำมัน, กันฝุ่น

ISO 9002



TEND

BANDEX

TAKAMURA

TEEFLEX

KENION

NISSEI

ROSI

APEKS

LKEW

TAC

MARLOW

HARU

WIND SPEED

COMMAX

ADVANTE

UNIVERSAL ADAPTER

ALION

EXOWELD

CONTROL MAX

JKN

SYLVIA

WANG

MACCON

## OPERATION CHARACTERISTICS

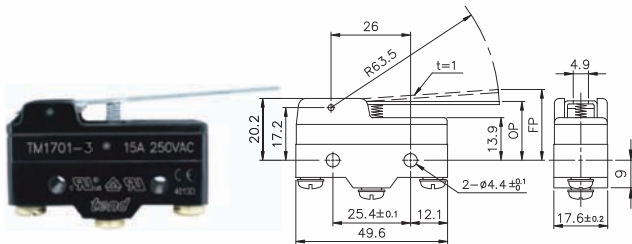
- Surrounding joints are sealed by epoxy, and waterproof, oiltight rubber boot.
- Dust-preventive, waterproof and oiltight.

Type	TM 1701-3	TM 1702-3	TM 1703-3	TM 1704-3	TM 1707-3	TM 1709-3	TM 1743-3
OF max	110 g	210 g	150 g	220 g	220 g	150 g	200 g
RF min	14 g	28 g	22 g	42 g	42 g	21 g	42 g
PT max	10 mm	5 mm	7.1 mm	2.7 mm	2.7 mm	7.3 mm	2.7 mm
OT min	5.6 mm	2 mm	4 mm	2.4 mm	2.4 mm	4 mm	2.4 mm
MD max	1.27 mm	1 mm	1.02 mm	0.5 mm	0.5 mm	1.6 mm	0.5 mm
FP max	28.2 mm	24.8 mm	36.5 mm	32.5 mm	32.5 mm	47.5 mm	43.6 mm
OP	19 ± 0.8 mm	19 ± 0.8 mm	30.2 ± 0.8 mm	30.2 ± 0.8 mm	30.2 ± 0.8 mm	41.2 ± 0.8 mm	41.3 ± 0.8 mm

## DIMENSIONS

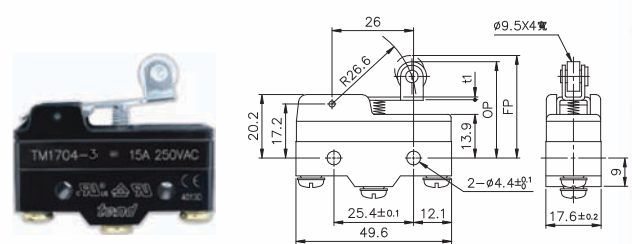
TM1701-3(20A 250V AC)

305.-



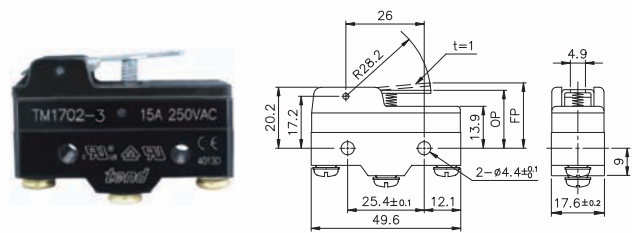
TM1704-3(20A 250V AC)  
TM1704-12

305.-  
305.-



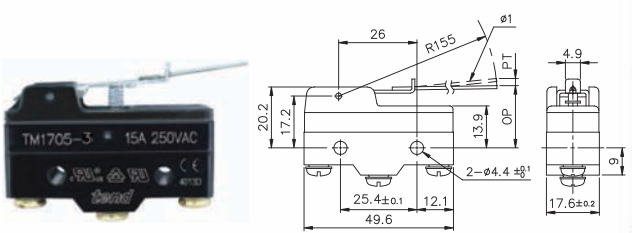
TM1702-3(20A 250V AC)

305.-



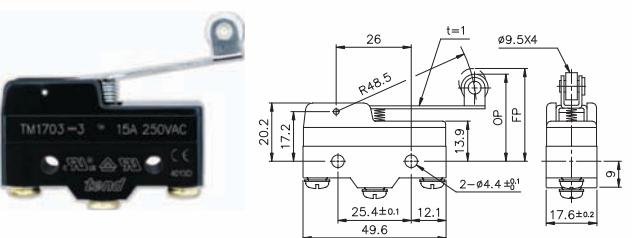
TM1705-3(20A 250V AC)  
TM1705-12

385.-  
-



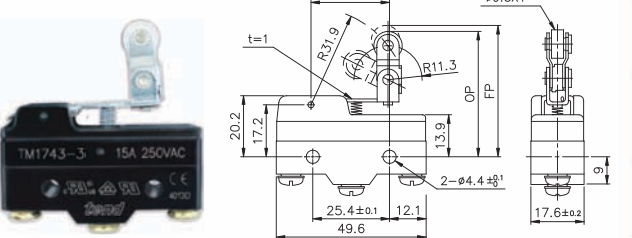
TM1703-3(20A 250V AC)  
TM1743-12

305.-  
305.-



TM1743-3(20A 250V AC)  
TM1743-12

400.-  
400.-





# tend MICRO SWITCH (TWO CIRCUIT DOUBLE-BREAK)

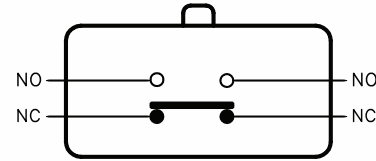
ไมโครสวิตช์

ISO 9002

## RATINGS

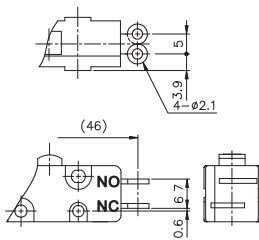
Rated voltage (V)	Non-inductive load (A)				Inductive load (A)				Inrush current (A)	
	Resistive load		Lamp load		Inductive load		Motor load		NC	NO
	NC	NO	NC	NO	NC	NO	NC	NO		
125 V AC	10	3	1.5			4	2	30 max.	15 max.	
250 V AC	10	2	1	10	3	1.5				
8 V DC	10	6	3	10	6					
14 V DC	10	6	3	10	6					
30 V DC	6	4	3	6.0	4					
125 V DC	0.8	0.2	0.2	0.8	0.2					
250 V DC	0.4	0.1	0.1	0.4	0.1					

## CONTACT CONFIGURATION

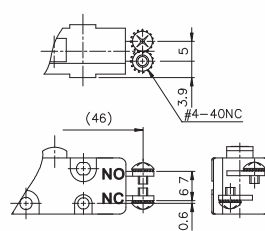


## TERMINAL TYPE

### TW-101A Solder Type



### TW-101B Screw Type

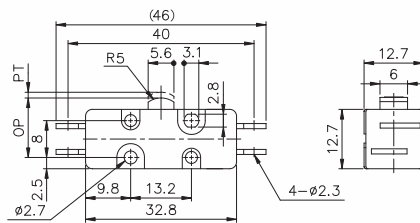


## OPERATION CHARACTERISTICS

Type	TW-101 A/B	TW-102 A/B	TW-104 A/B
OF max	400 g	200 g	240 g
RF min	114 g	60 g	70 g
PT max	1.6 mm	3.5 mm	3 mm
OT min	0.25 mm	1.8 mm	1.2 mm
MD max	0.65 mm	1.6 mm	2 mm
OP	11.7 ± 0.4 mm	14.6 ± 0.8 mm	25.3 ± 0.8 mm

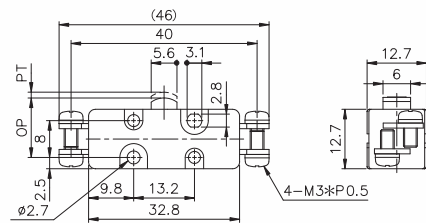
### TW-101A

130.-



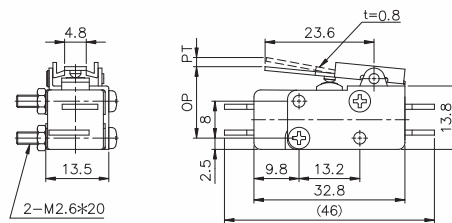
### TW-101B

145.-



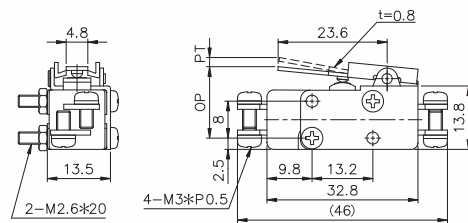
### TW-1012A

160.-



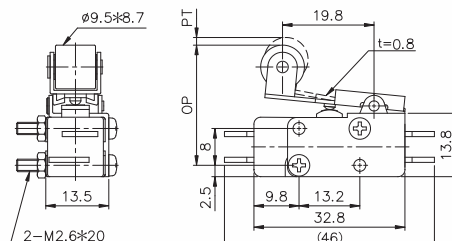
### TW-1012B

180.-



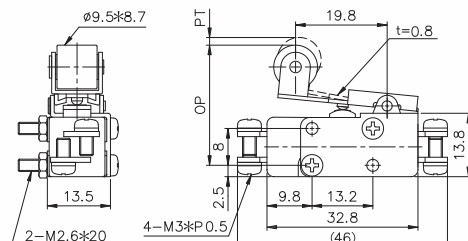
### TW-1014A

190.-



### TW-1014B

210.-



### FEATURES

- Similar to TEND TM series micro switch
- Put a magnet in the contact block to prevent fire.
- The safety switch for DC usage.

### SPECIFICATIONS RATINGS

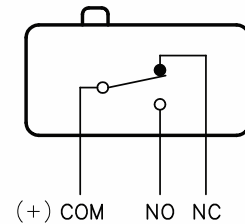
Rated voltage (V)	Non-inductive load (A)				Inductive load (A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
8 V DC	15	3	1.5	15	15	5	2.5	
14 V DC	15	3	1.5	15	10	5	2.5	
30 V DC	15	3	1.5	10	10	5	2.5	
125 V DC	10	3	1.5	7.5	6	5	2.5	
250 V DC	3	3	1.5	2	2	2	1.5	

NOTES : 1. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 msec. Max. (DC)  
2. Lamp load has an inrush current of 10 times the steady-state current, while motor load has an inrush current of 6 times the steady-state current.

### CHARACTERISTICS

Operating speed	0.1 mm to 1 m/s
Operating frequency	Mechanically : 240 Operations/min. Electrically : 20 operations/min.
Contact resistance	15 mΩ max. (initial)
Insulation resistance	100 MΩ max. (at 500 V DC)
Dielectric strength	1,500 V AC, 50/60 Hz for 1 minute
Vibration	10 to 55 Hz 1.5 mm double amplitude
Shock	Mechanically : Approx. 1,000 m/sec <sup>2</sup> (approx. 100 G's) Electrically : Approx. 300 m/sec <sup>2</sup> (approx. 30 G's)
Ambient ermperture	-25° ~ +85°C
Ambient humidity	Below 85% RH
Service life	Mechanically : 1,000,000 Operations/min Electrically : 100,000 operations/min.
Weight	Approx. 27 g ~ 36 g

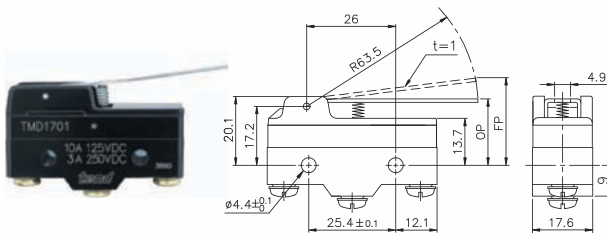
### CONTACT CONFIGURATION



### DIMENSIONS

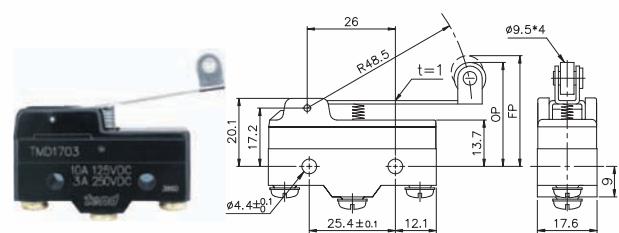
#### TMD1701

565.-



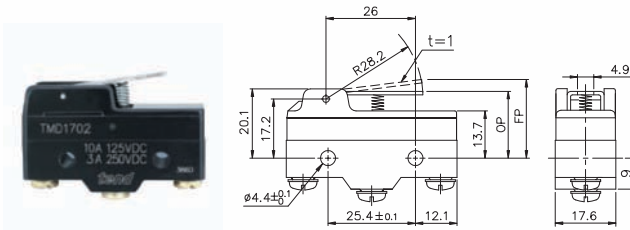
#### TMD1703

565.-



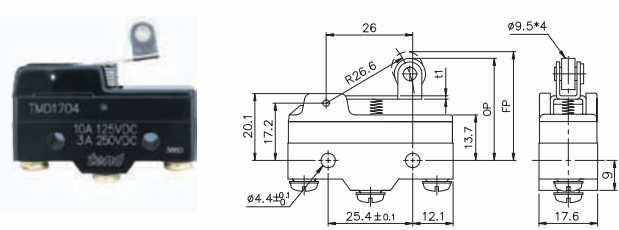
#### TMD1702

565.-



#### TMD1704

565.-

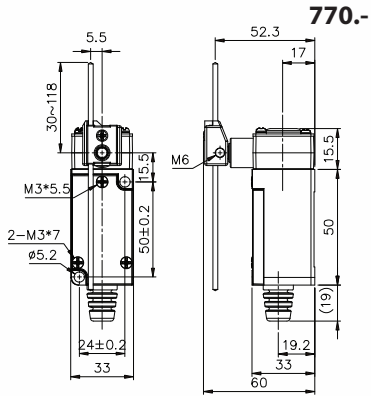


### OPERATION CHARACTERISTICS

Type	TMD1701	TMD1702	TMD1703	TMD1704
OF max	110gf (1.08N)	250gf (2.45N)	145gf (1.42N)	220gf (2.16N)
RF min	14gf (0.14N)	32gf (0.31N)	21gf (0.21N)	35gf (0.34N)
OT min	4.8 mm	2.1 mm	4 mm	2.4 mm
MD max	3.9 mm	1.7 mm	3 mm	1.7 mm
FP max	34.6 mm	25.5 mm	40.5 mm	37.1 mm
OP	19.8 ± 0.8 mm	20.7 ± 0.8 mm	32.2 ± 0.8 mm	32.2 ± 0.8 mm

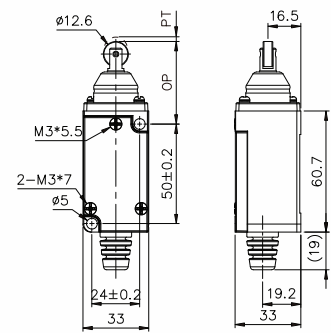


**TZ-1107**

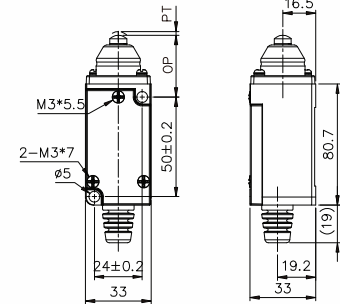


**770.-**

**TZ-1112**

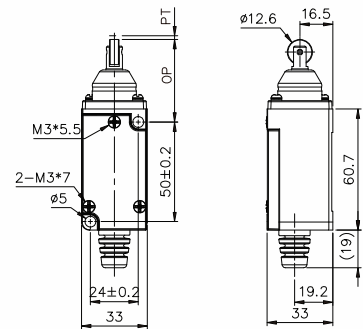


**TZ-1111**

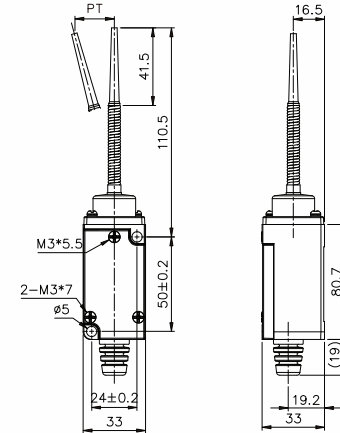


**750.-**

**TZ-1122**

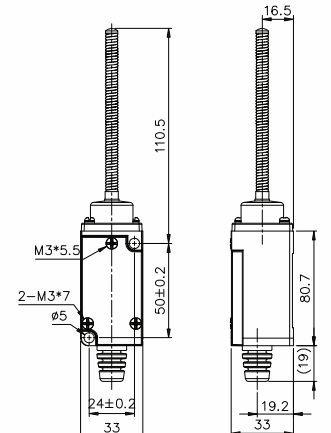


**TZ-1166**



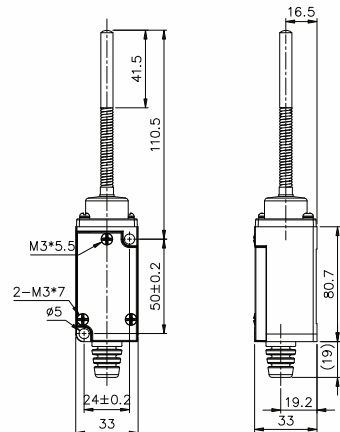
**750.-**

**TZ-1167**



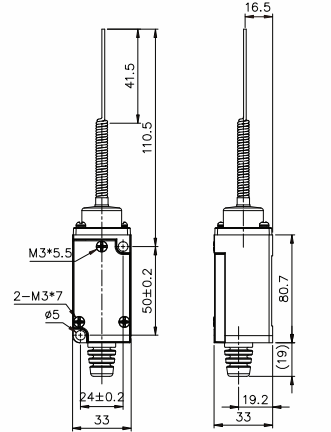
**750.-**

**TZ-1168**



**820.-**

**TZ-1169**



**750.-**

TEND
BANDEX
TAKAMURA
TEEFLEX
KENION
NISSEI
ROSI
APEKS
LKEW
TAC
MARLOW
HARU
WIND SPEED
COMMAX
ADVANTE
UNIVERSAL ADAPTER
ALION
EXOWELD
CONTROL MAX
JKN
SYLVIA
WANG
MACCON

**tend****COMPACT LIMIT SWITCH**

คอมแพคลิมิทสวิตช์ ชนิดก้านน้ำ, ก้านน้ำมัน, ก้านฟลูม

**SPECIFICATIONS RATINGS**

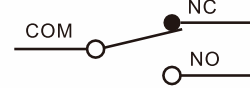
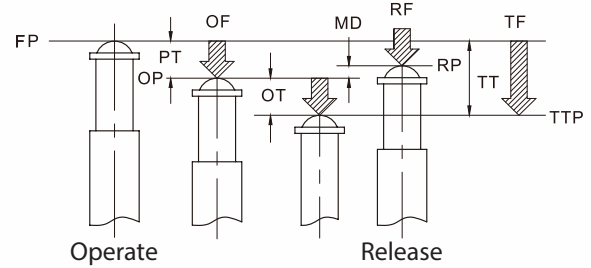
Rated voltage (V)	Non-inductive load(A)		Inductive load(A)				Inrush current (A)	
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125V AC	5	1.5	3	2	1	10 max.	10 max.	
250V AC	5	1.5	3	1	0.5			
8V DC	5	-	1.5	-	-			
14V DC	5	-	1.5	-	-			
30V DC	5	-	1.5	-	-			
125V DC	0.5	-	0.05	-	-			
250V DC	0.25	-	0.03	-	-			

**OPERATING CHARACTERISTICS**

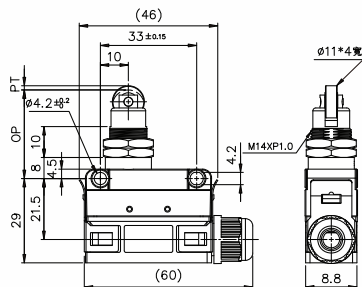
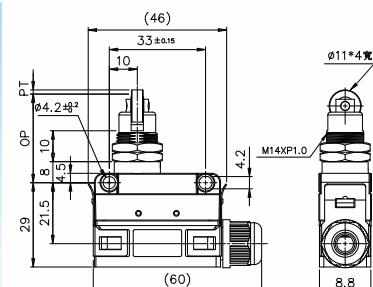
Type	TZ-2311	TZ-2312
OF max	1200g	1200g
RF min	500g	500g
PT max	1.5mm	1.5mm
OT min	3mm	3mm
MD max	(0.1mm)	(0.1mm)
OP	0.8±0.8	31.4±0.8

**CHARACTERISTICS**

Operating speed	0.01 mm to 1 m/sec (Plunger Type)
Operating frequency	Mechanically : 240 operations/min Electrically : 20 operations/min
Contact resistance	15 mΩ (max.) (initial)
Insulation resistance	100 MΩ min. (at 500VDC)
Dielectric strength	1,000 V AC, 50/60 Hz, for 1 minute between non-continuous terminals; 1,500 V AC, 50/60 Hz, for 1 minute between current-carrying metal part and ground.
Vibration	(*10 ~ 20 Hz): 1.5 mm double amplitude Malfunction durability: 10 ~ 55 Hz
Shock	Mechanical durability : 1,000m/sec <sup>2</sup> (approx.100G'S) Malfunction durability: 300m/sec <sup>2</sup> (approx.30G'S)
Ambient temperature	-10 °C ~ +80 °C (Not freezing)
Humidity	Max. 95% RH
Service life	Mechanically : 10,000,000 operations min. Electrically : 500,000 operations min.
Weight	Approx. 22 to 58g
Degree of protection	IEC : IP65

**CONTACT CONFIGURATION****DEFINITIONS OF OPERATING CHARACTERISTICS**

**OF** : Operating Force      **TTP** : Total Travel Position  
**RF** : Releasing Force      **PT** : Pretravel  
**TF** : Total Force          **OT** : Overtravel  
**FP** : Free Position        **MD** : Movement Differential  
**OP** : Operating Position   **TT** : Total Travel  
**RP** : Releasing Position

**APPEARANCE AND DIMENSIONS****TZ-2311****550.-****TZ-2312****550.-**



### SPECIFICATIONS

- DPDS Limit switch for multiple applications.
- Rugged aluminum alloy diecast housing.
- High mechanical strength
- Oil resistance, waterproof and dust proof structure

### RATINGS

Retard voltage (V)	Non-inductive load (A)				Inductive load (A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 V AC	5 (0.1)	1.5	0.7	3	2.5	1.3		
250 V AC	3	1	0.5	2	1.5	0.8		
8 V DC	5 (0.1)	2		5	4	3		
14 V DC	5 (0.1)	2		4	4	3		
30 V DC	4 (0.1)	2		3	3	3		
125 V DC	0.4	0.05		0.4		0.05		
250 V DC	0.2	0.03		0.2		0.03		

### CHARACTERISTICS

Rating	5A 125 V AC, 3A 250 V AC
Operating speed	1 mm ~1 m/s
Operating frequency	Mechanically: 120 operations/min. Electrically: 30 operations/min.
Contact resistance	15 mΩ max. (initial)
Insulation resistance	100 MΩ min. (at 500 V DC)
Dielectric strength	1,000 V AC, 50/60 Hz for 1 minute between noncontinuous terminals 1,500 V AC, 50/60 Hz for 1 minute between current carrying and non-current carrying parts and between each terminal and ground
Vibration	10 ~ 55 Hz 1.5 mm double amplitude
Shock	Mechanically Approx : 1,000 m/s <sup>2</sup> (Approx:100G's) Electrically : Approx : 500 m/s <sup>2</sup> (approx. 50G's)
Ambient temperature	-10° ~ +70°C
Humidity	Below 95% RH
Service life	Mechanically : 1,000 operations/ min Electrically : 20 operations/min.
Degree of protection	IEC: IP67
Weight	Approx. 360 g (cable length 3 m) Approx. 540 g (cable length 5 m)

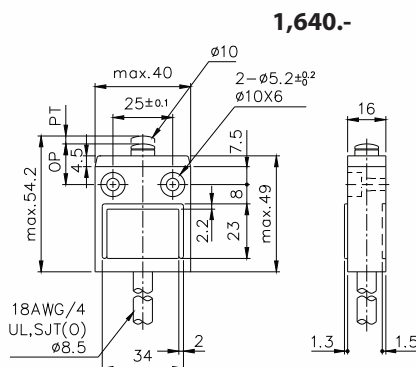
### OPERATING CHARACTERISTICS

Type	TZ-3101	TZ-3102	TZ-3103	TZ-3104	TZ-3110
OF max	1200 gf (11.77N)	1200 gf (11.77N)	1200 gf (11.77N)	580 gf (5.69N)	1200 gf (11.77N)
RF min	450 gf (4.41N)	450 gf (4.41N)	450 gf (4.41N)	150 gf (1.47N)	450 gf (4.41N)
PT max	1.8 mm	1.8 mm	1.8 mm	25°	1.8 mm
OT min	3 mm	3 mm	3 mm	40°	3 mm
MD max	0.2 mm	0.2 mm	0.2 mm	3°	0.2 mm
OP	15.7 ± 1 mm	28.5 ± 1 mm	28.5 ± 1 mm	-	28.5 ± 1 mm

Type	TZ-3111	TZ-3112	TZ-3113	TZ-3169
OF max	1800 gf (17.65N)	1800 gf (17.65N)	1800 gf (17.65N)	150 gf (1.47N)
RF min	450 gf (4.41N)	450 gf (4.41N)	450 gf (4.41N)	-
PT max	1.8 mm	1.8 mm	1.8 mm	15°
OT min	3 mm	3 mm	3 mm	-
MD max	0.2 mm	0.2 mm	0.2 mm	-
OP	24.9 ± 1 mm	34.3 ± 1 mm	34.3 ± 1 mm	-

### DIMENSIONS

#### TZ-3101





# tend

## COMPACT PREWIRED LIMIT SWITCH

คอมแพค พร็วไรด์ ลิมิตสวิตช์ ชนิดกันน้ำ, กันน้ำมัน, กันฝุ่น

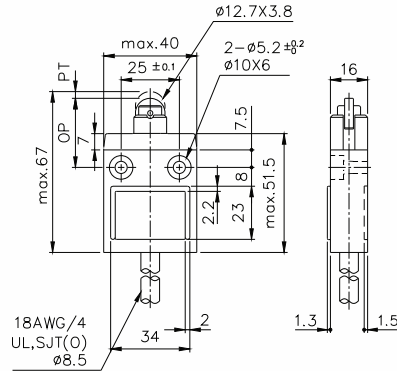


A009142

### DIMENSIONS

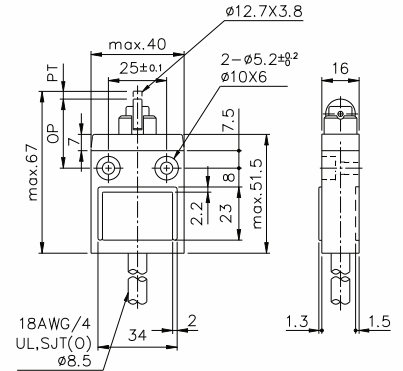
TZ-3102

1,640.-



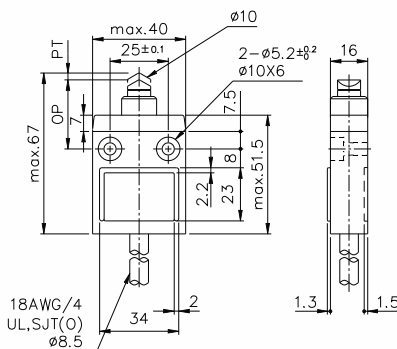
TZ-3103

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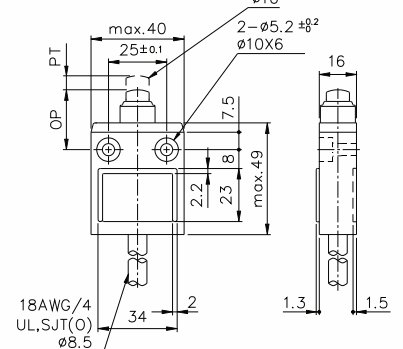
TZ-3110

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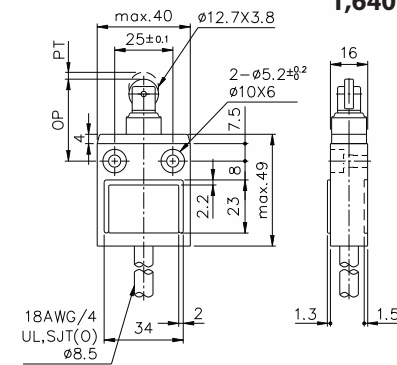
TZ-3111

1,640.-



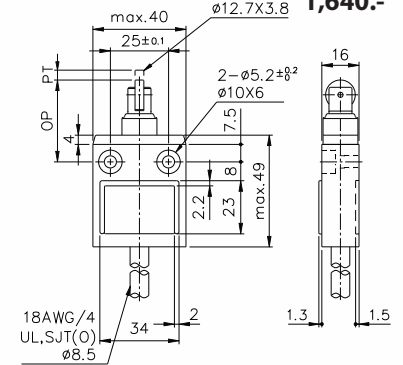
TZ-3112

1,640.-



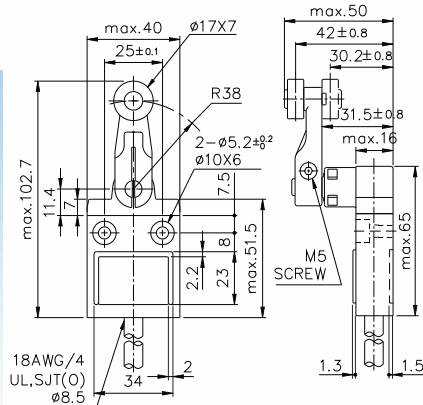
TZ-3113

1,640.-



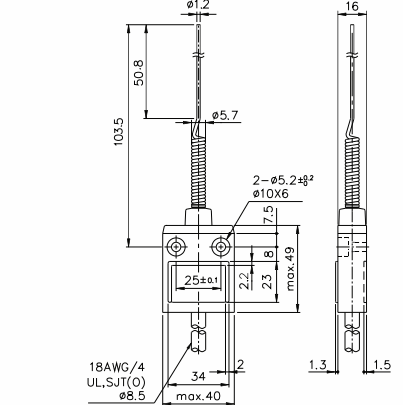
TZ-3104

1,640.-



TZ-3169

1,640.-



\*ขอสงวนสิทธิ์ในการเปลี่ยนแปลงราคา

# tend COMPACT PREWIRED LIMIT SWITCH

คอมแพค พร็วไรด์ ลิมิตสวิตช์ ชนิดกันน้ำ, กันน้ำมัน, กันฝุ่น



TEND

BANDEX

TAKAMURA

TEEFLEX

KENION

NISSEI

ROSI

APEKS

LKEW

TAC

MARLOW

HARU

WIND SPEED

COMMAX

ADVANTE

UNIVERSAL ADAPTER

ALION

EXOWELD

CONTROL MAX

JKN

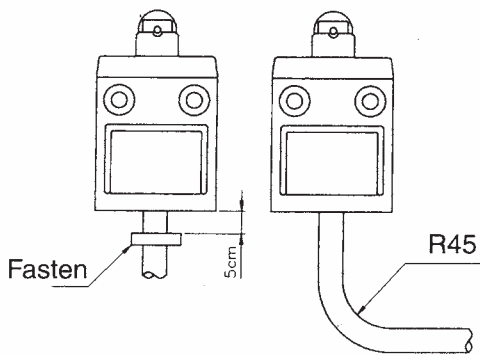
SYLVIA

WANG

MACCON

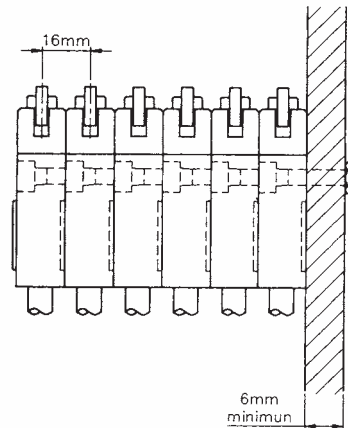
## FASTENING OF THE SWITCH CABLE

The switch bodies are filled with resin for sealing purposes. To avoid stressing the cable and switch body, fasten the cable at 5 cm or farther away from the switch body. Should the wire be bent. The bending radius shall be at least 45 mm.



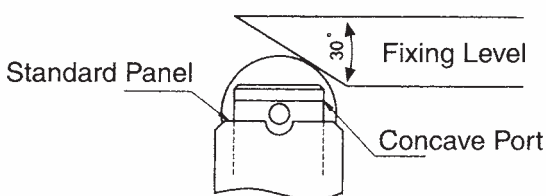
## SWITCH BANK MOUNTING

A maximum of six switches may be mounted together as a switch bank. During the installation, the convex part of the switch back. The mounting panel shall be 6 mm or thicker.



## INSTALLATION

The service life and accuracy of switches will be effected by the shape of actuator operation frequency & over travel. So the angular of the fixing level should be about 30° the surface finish of the fixing level should be over, the hardness is from HV400~500. When installing, the position of the concave part should be above the standard panel.

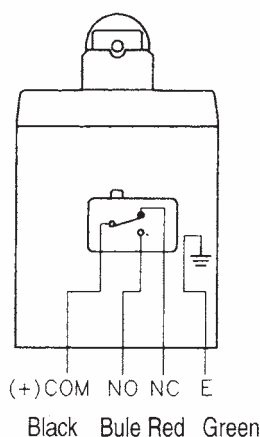


## MOUNTING

Recommended tightening torque according to the following form.

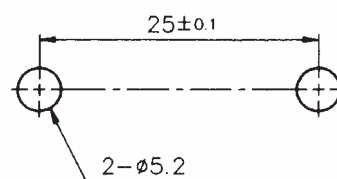
Model	Screw type	Torque
1	M5 fastening screws	4.9~5.88 N.m (50 ~ 60 kgf.cm)
2	M3.5 installing screws	0.78~0.88 N.m (8 ~ 9 kgf.cm)

## CONTACT TYPES



## MOUNTING HOLES

Mount the switch body to a rigid mounting panel using two M5 screws



# tend LIMIT SWITCH

## ลิมิตสวิตช์ IP67



Wide Selection of Two-circuit Double-break Limit Switches

### ■ FEATURES

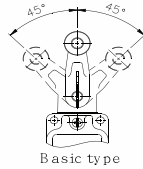
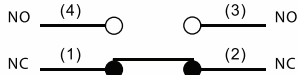
- Rigid diecast switch housing
- Set position indicator plate for easy maintenance
- High mechanical strength
- Oiltight, waterproof and dust proof construction

### ■ SPECIFICATIONS RATING

Rated voltage (V)	Non-inductive load(A)				Inductive load(A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 V AC	10	10	3	1.5	10	5	2.0	
250 V AC	5	5	2	1	5	3	1.0	
480 V AC	3	3	1.5	0.8	3	1.5	0.8	
600 V AC	1	1	1	0.5	1.5	1	0.5	
8 V AC		10		6		3		10
14 V DC		10		6		3		10
30 V DC		6		4		3		6
125 V DC		0.8		0.2		0.2		0.8
250 V DC		0.4		0.1		0.1		0.4

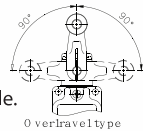
NOTES: 1. Inductive load has a power factor = 0.4; time constant = 7 msec.  
2. Lamp load has an inrush current of 10 times the steady-state current while motor load has an inrush current of 6 times the steady-state current.

### ■ CONTACT CONFIGURATION



### ■ OVERTRAVEL TYPE

The Overtravel Type is a limit switch which is provided with a greater OT to facilitate dog setting. Since this type is identical to the Basic Type in dimensions, both types are interchangeable. The Overtravel Type is Classified into two versions -2 series and -2N series.



#### J2 SERIES

The head of -2 series switch can be installed in any of the four directions.

- 90° Operation on only one side - impossible
- 90° Operation on either side - possible

#### J2N SERIES

The head of -2N series switch can be installed only in two directions. Forward and backward.

- 90° Operation on only one side - possible
- 90° Operation on either side - possible



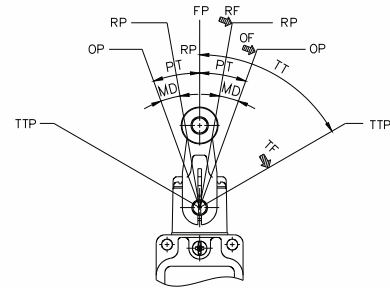
Loosen the cam holder with a coin or screw driver

Reverse the cam

Reverse the position of the cam and reinstall

### ■ CHARACTERISTICS

Operating speed	1 mm to 2 m/sec (TZ-5104)
Operating frequency	Mechanically: 120 operations/min Electrically: 30 operations/min
Contact resistance	15 mΩ max. (initial)
Insulation resistance	100 MΩ max. (at 500 V DC)
Dielectric strength	1,000 V AC, 50/60 Hz for 1 minute between noncontinuous terminals. 2,200 V AC, 50/60 Hz for 1 minute between each terminal and non-current carrying metal part and between each terminal and ground
Temperature rise	50 degrees max.
Vibration	Malfunction durability: 10 to 55 Hz. 1.5 mm double amplitude
Shock	Mechanical durability: approx 1,000 m/sec <sup>2</sup> (approx: 100 G's) Malfunction durability: approx 300 m/sec <sup>2</sup> (approx: 30G's)
Ambient temperature	Operating: -10° ~ +80°C
Humidity	95% RH max
Service life	Mechanical: 15,000,000 operations min. Electrically: 500,000 operations min.
Weight	Approx. 275 g (with Type TZ-5104)
Degree of protection	IEC: IP 67



OF: Operating Force

RF: Releasing Force

TF: Total Force

FP: Free Position

OP: Operating Position

RP: Releasing Position

TTP: Total Travel Position

PT: Pretravel

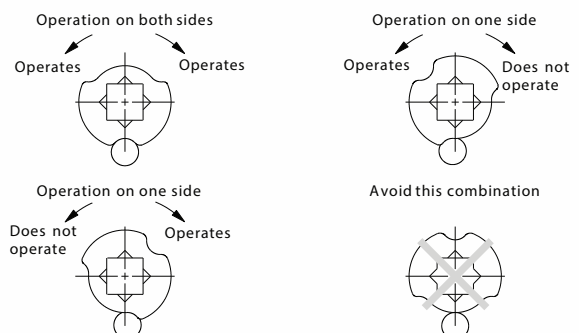
OT: Overtravel

MD: Movement Differential

TT: Total Travel

90° operation on one side is possible by simply changing the direction of the cam.

Relationship of cam to operation as observed from the rear of switch



### OPERATING CHARACTERISTICS

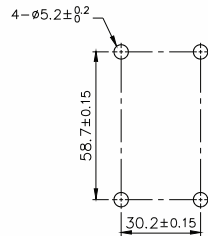
Operating characteristics	Type	TZ-5101	TZ-5102	TZ-5104	TZ-5105	TZ-5107	TZ-5108
OF max.		2,720 g	2,720 g	1,360 g	1,200 g	142 g	1,360 g
RF min.		910 g	910 g	227 g	-	28°	227 g
PT max.		1.7 mm	1.7 mm	20°	55°	20°	20°
OT min.		6.4 mm	5.6 mm	30°	35°	30°	30°
MD max.		1 mm	1 mm	12°	-	12°	12°
TTP max.		29.5 mm	39.5 mm	-	-	-	-
OP		OP : 34 ± 0.8 mm	44 ± 0.8 mm	-	OP: 90 ± 10°	-	-

### OPERATING CHARACTERISTICS

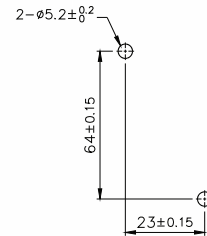
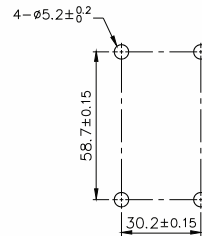
Type	TZ-5104-2 / TZ-5108-2	TZ-5104-2N / TZ-5108-2N	TZ-5106 / TZ-5169	TZ-5107-2	TZ-5107-2N
OF max.	1000 g	980 g	150 g	290 g	290 g
RF min.	100g	120 g	-	25g	25g
PT max.	20°	20°	28 mm	20°	20°
OT min.	55°	70°	-	55°	70°
MD max.	12°	10°	-	12°	10°

### MOUNTING HOLES

Basic type and -2 SERIES

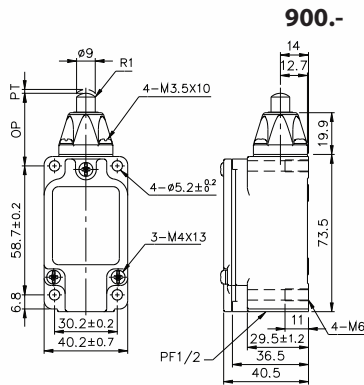


-2N SERIES



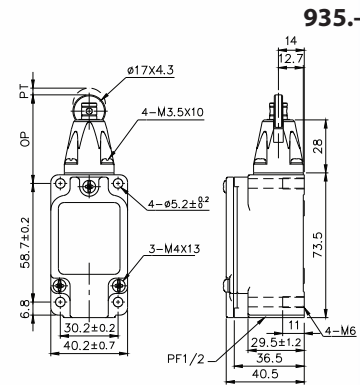
### DIMENSIONS

#### TZ-5101



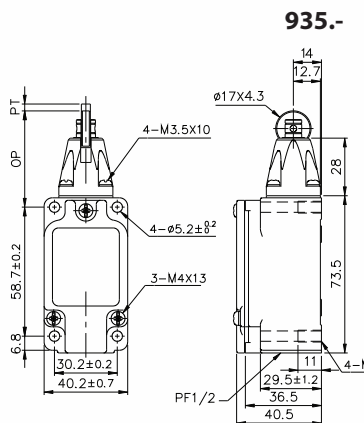
#### 900.-

#### TZ-5102



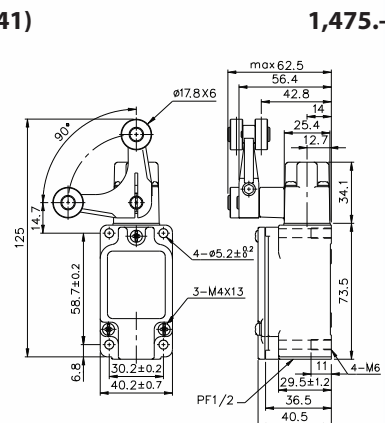
#### 935.-

#### TZ-5103(HL-5000)



#### 935.-

#### TZ-5105(WLCA32-41)



#### 1,475.-



# tend

## LIMIT SWITCH

### ลิมิตสวิตช์ IP67



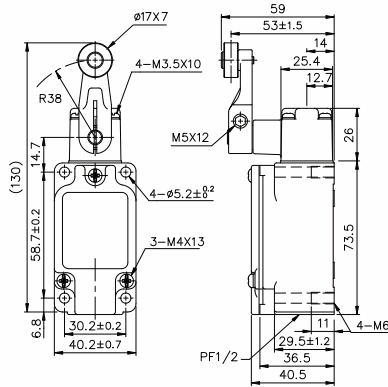
#### DIMENSIONS

**TZ-5104 (WLCA2)**

**945.-**

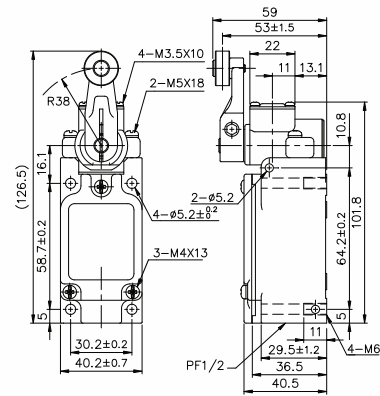
**TZ-5104-2 (WLCA2-2)**

**1,065.-**



**TZ-5104-2N (WLCA2-2N)**

**1,105.-**

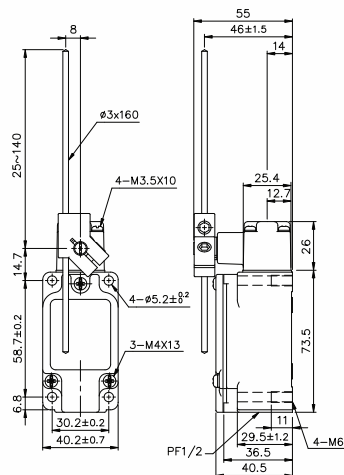


**TZ-5107 (WLCL)**

**1,020.-**

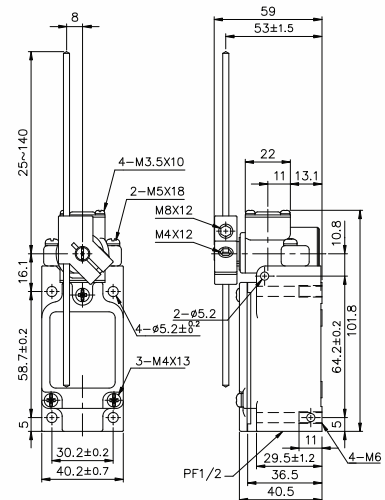
**TZ-5107-2 (WLCL-2)**

**1,100.-**



**TZ-5107-2N (WLCL-2N)**

**1,180.-**

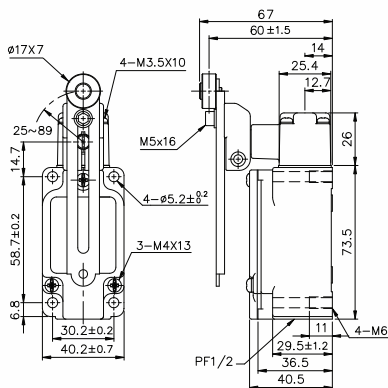


**TZ-5108 (WLCA12)**

**1,090.-**

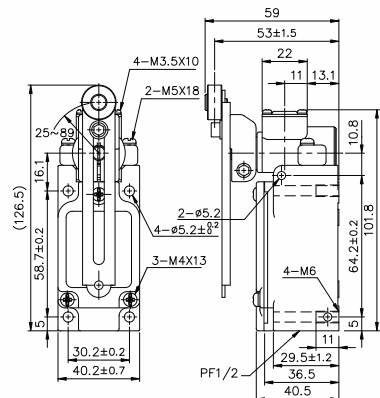
**TZ-5108-2 (WLCA12-2)**

**1,175.-**



**TZ-5108-2N (WLCA-2N)**

**1,235.-**





# tend LIMIT SWITCH

## ลิมิตสวิตช์ IP67



TEND

BANDEX

TAKAMURA

TEEFLEX

KENION

NISSEI

ROSI

APEKS

LKEW

TAC

MARLOW

HARU

WIND SPEED

COMMAX

ADVANTE

UNIVERSAL ADAPTER

ALION

EXOWELD

CONTROL MAX

JKN

SYLVIA

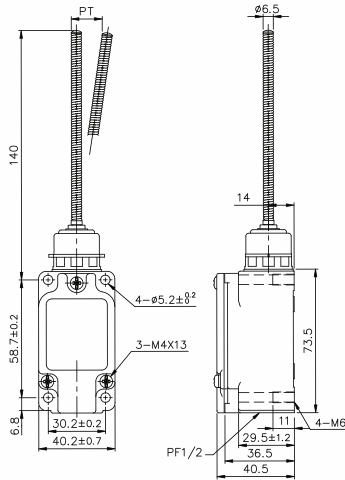
WANG

MACCON

■ DIMENSIONS (Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions)

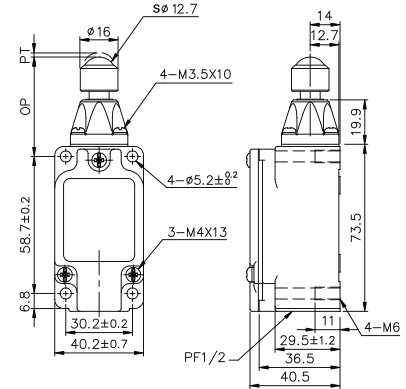
**TZ-5106(WLNJ)**

955.-



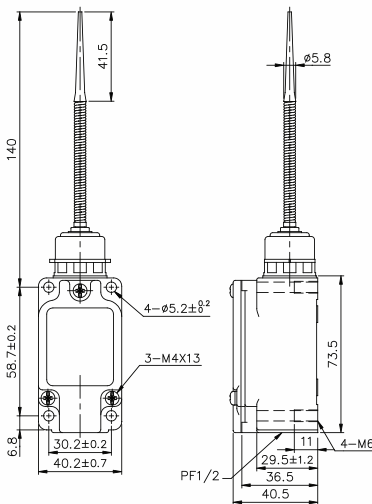
**TZ-5109(WLD3)**

1,100.-



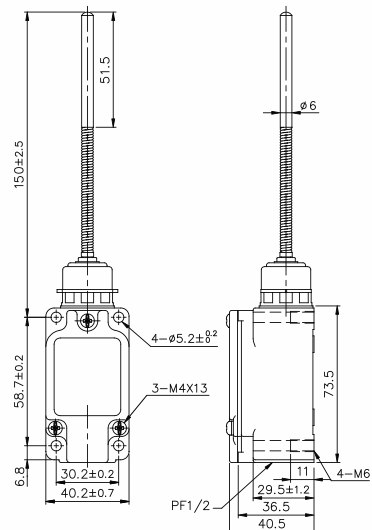
**TZ-5166**

955.-



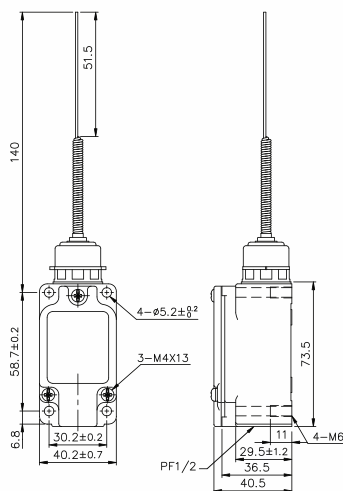
**TZ-5168**

1,010.-



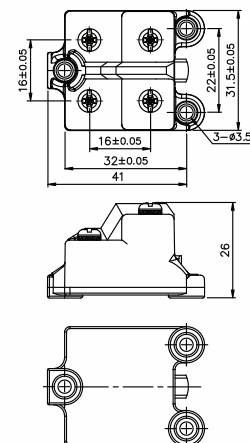
**TZ-5169**

955.-



**TZ-501**

335.-



**tend****ENCLOSED LIMIT SWITCH**

เอ็นโคลสลิมีตสวิตช์ IP65



A009142

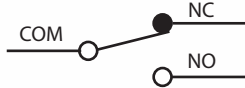
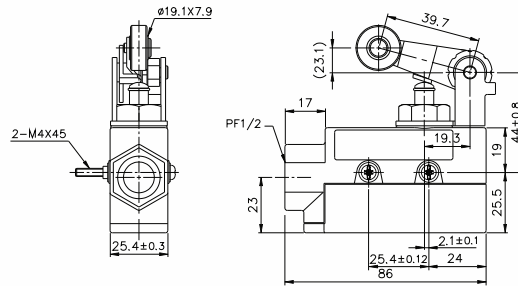
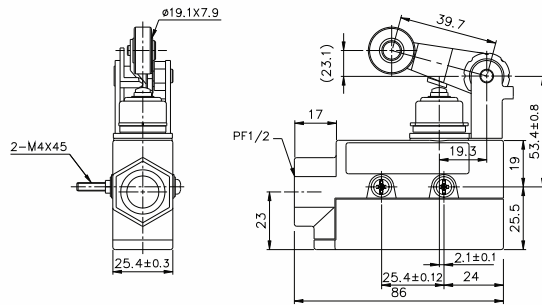
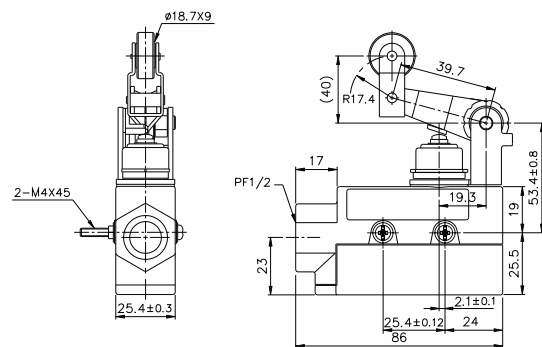
Long Service Life and Large Breaking Capacity

**E-99688****FEATURES**

- Models TZ-6 incorporate Model TM Micro Switches with rugged diecast cases.
- Available with various types of built-in switches (including split contact type, maintained operation type, magnetic blowout type) and various actuators.
- Degree of Protection : IEC IP65**

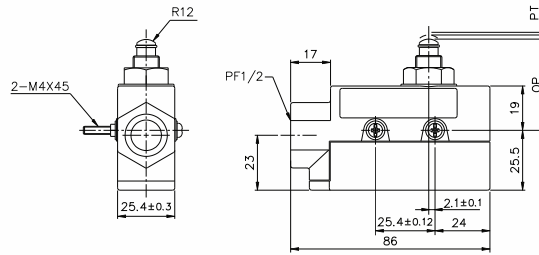
**SPECIFICATIONS**

- RATINGS
- CHARACTERISTICS THE SAME AS MICRO SWITCH SEE P (A)1

**CONTACT CONFIGURATION****DIMENSIONS****TZ-6004 (ZE-QA2-2)****735.-****TZ-6104 (ZE-NA2-2)****805.-****TZ-6143 (ZE-NA2-2)****980.-**

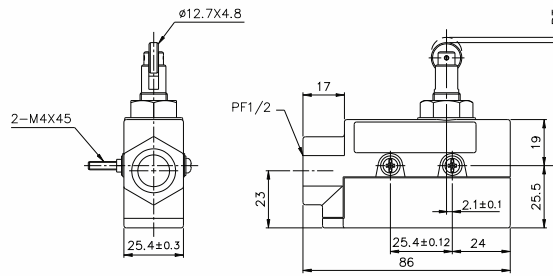
**TZ-6001 (ZE-Q-2)**

**620.-**



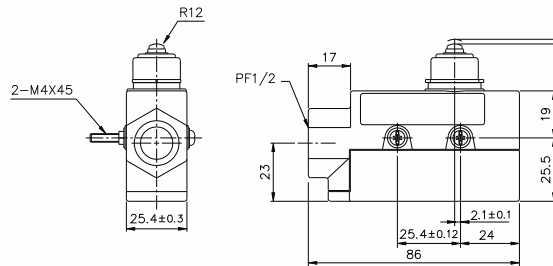
**TZ-6002 (ZE-QA22-2)**

**690.-**



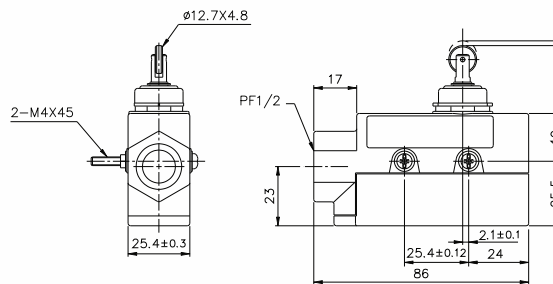
**TZ-6101 (ZE-N-2)**

**680.-**



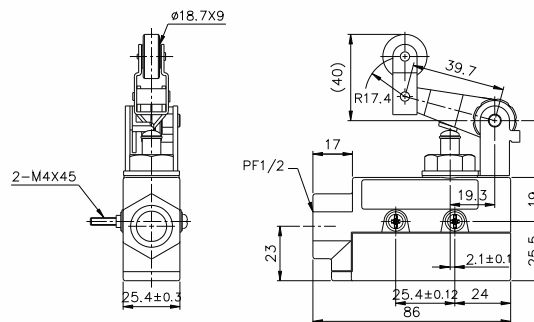
**TZ-6102 (ZE-NA22-2)**

**930.-**



**TZ-6043 (ZE-QA77-2)**

**950.-**



# tend LIMIT SWITCH

## ลิมิตสวิตช์



### FEATURES

- High precision and long life (10,000,000 mechanical operations)
- Sealed with gasket diaphragm to provide high sealing property without use of any adhesive or pin.

### SPECIFICATIONS RATINGS

Rated voltage (V)	Non-inductive load(A)				Inductive load(A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 V AC	10	3	1.5	10	5	2.5		
250 V AC	10	2.5	1.25	10	3	1.5		
480 V AC	3	1.5	0.75	2.5	1.5	0.75		
8 V AC	10	3	1.5	6	6	5		
14 V DC	10	3	1.5	6	6	5		
30 V DC	8	3	1.5	6	5	2.5		
125 V DC	0.5	0.4		0.05		0.05		
250 V DC	0.25	0.2		0.03		0.03		

- NOTES : 1. Inductive load : power factor = 0.4;  
time constant = 7 msec.
2. Lamp load has an inrush current of 10 times the steady-state current, while motor load has an inrush current of 6 times the steady-state current.

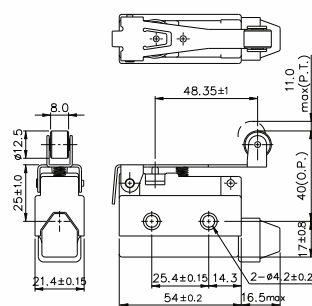
### OPERATING CHARACTERISTICS

Type	TZ-7100	TZ-7110	TZ-7310	TZ-7311	TZ-7312	TZ-7120	TZ-7140	TZ-7121	TZ-7141	TZ-7124	TZ-7144	TZ-7166
OF max	600 g	600 g	600 g	600 g	600 g	150 g	220 g	180 g	240 g	200 g	280 g	120 g
RF min	100 g	100 g	100 g	100 g	100 g	40 g	60 g	50 g	80 g	60 g	100 g	
PT max	2.0 mm	2.0 mm	2.0 mm	2.0 mm	2.0 mm	13.5 mm	8.5 mm	11.0 mm	6.5 mm	11.0 mm	6.5 mm	25 mm
OT min	0.8 mm	5.0 mm	6.0 mm	6.0 mm	6.0 mm	4.0 mm	2.5 mm	3.0 mm	2.0 mm	3.0 mm	2.0 mm	11 mm
MD max	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	3.2 mm	2.0 mm	2.4 mm	1.5 mm	2.4 mm	1.5 mm	
OP	30.8±0.8mm	44±1.2mm	21.8±1.2 mm	33.3±1.2 mm	25±1 mm	25±1 mm	40±1 mm	40±1 mm	50±1.2 mm	50±1.2 mm		
FP max						35 mm	32 mm		46 mm		56 mm	

### DIMENSIONS

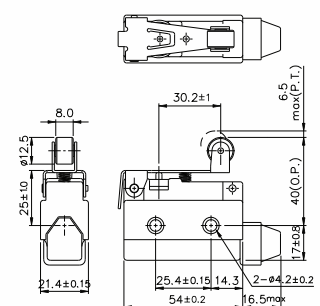
#### TZ-7121 (D4MC-2000)

315.-



#### TZ-7141 (D4MC-2020)

315.-

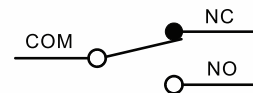


### CHARACTERISTICS

10A 250V AC

Operating speed	0.01 mm to 50 cm/sec (at pin plunger)
Operating frequency	120 operations/min.
Contact resistance	25 mΩ max. (initial)
Insulation resistance	100 MΩ max. (at 500 V DC)
Dielectric strength	1,000 V AC, 50/60 Hz for 1 minute between noncontinuous terminals 2,000 V AC, 50/60 Hz for 1 minute between current carrying and non-current carrying parts and between each terminal and ground
Vibration	Mechanical durability : 10 to 55 Hz 1.5 mm double amplitude
Shock	Mechanical durability : 1,000 m/sec <sup>2</sup> (approx. 100 G's) Malfunction durability : 300 m/sec <sup>2</sup> (approx. 30 G's)
Ambient emperature	Operating : -10° to +80°C
Humidity	95% RH max (at +20° to +35°C)
Service life	Mechanically : 10,000,000 operations min (at rated OT Value) Electrically : 500,000 operations min.
Weight	Approx. 60 g
Degree of protection	IEC : IP65

### CONTACT CONFIGURATION



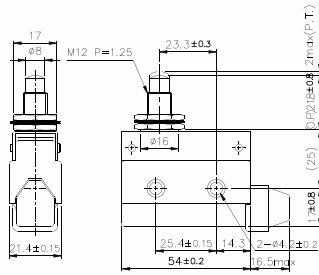
# tend LIMIT SWITCH

## ลิมิตสวิตช์



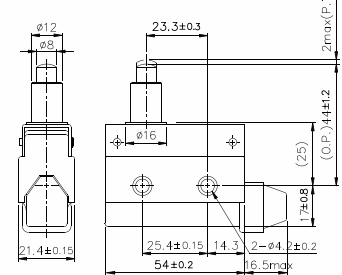
**TZ-7310(D4MC)-5000**

**390.-**



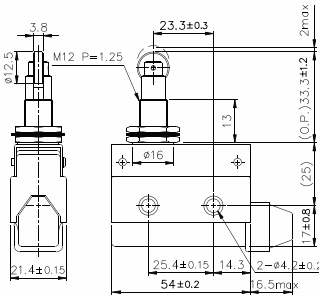
**TZ-7110**

**375.-**



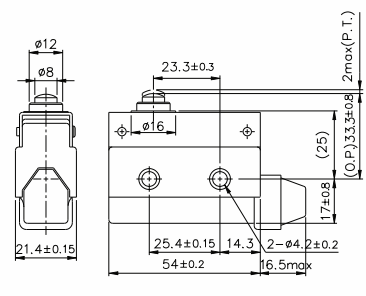
**TZ-7311(D4MC)-5020**

**385.-**



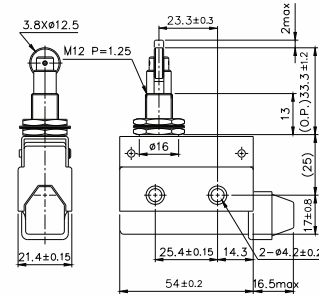
**TZ-7100**

**365.-**



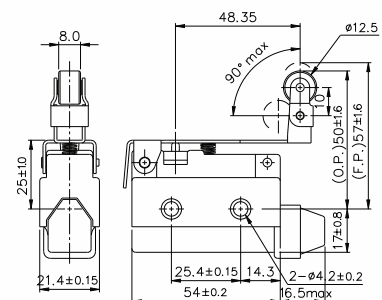
**TZ-7312(D4MC)-5040**

**385.-**



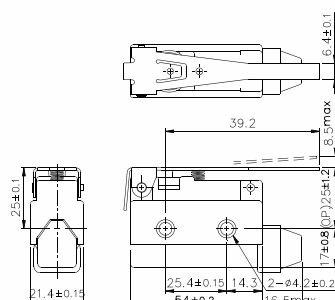
**TZ-7124**

**355.-**



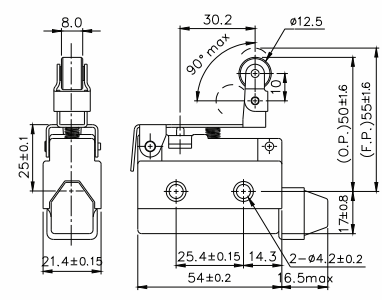
**TZ-7120(D4MC)-1000**

**295.-**



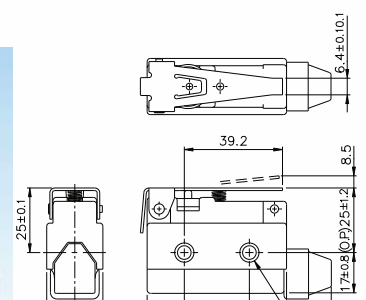
**TZ-7144(D4MC)-3030**

**352.-**



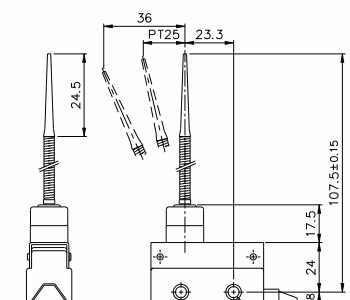
**TZ-7140(D4MC)-1020**

**295.-**



**TZ-7166(D4MC)-5000**

**470.-**



TEND

BANDEX

TAKAMURA

TEEFLEX

KENION

NISSEI

ROSI

APEKS

LKEW

TAC

MARLOW

HARU

WIND SPEED

COMMAX

ADVANTE

UNIVERSAL ADAPTER

ALION

EXOWELD

CONTROL MAX

JKN

SYLVIA

WANG

MACCON



# tend

## LIMIT SWITCH

### ลิมิตสวิตช์ IP65



#### FEATURES

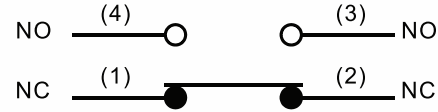
- Built-in basic switch with double spring mechanism
- Long life (10,000,000 mechanical operations)
- Highly rigid construction (Head and cover snugly fit in box)
- Dustproof and drip-proof construction
- Smooth operation with greater OT
- Easy-to-wire conduit opening design

#### SPECIFICATIONS RATINGS

Rated voltage (V)	Non-inductive load(A)				Inductive load(A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 V AC	5	5	1.5	0.7	3	3	2	1
250 V AC	5	5	1	0.5	3	3	1.5	0.8
8 V AC	5	5	3	3	5	4	3	3
14 V DC	5	5	3	3	4	4	3	3
30 V DC	5	5	3	3	4	4	3	3
125 V DC	0.4	0.4						
250 V DC	0.2	0.2						
Inrush current	NC: 24A max. NO: 12A max.							

- NOTES : 1. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 msec. Max. (DC)  
2. Lamp load has an inrush current of 10 times the steady-state current, while motor load has an inrush current of 6 times the steady-state current.

#### CONTACT CONFIGURATION



#### CHARACTERISTICS

Operating speed	0.5 mm to 50 cm/sec
Operating frequency	Mechanically: 120 operations/min Electrically: 30 operations/min
Contact resistance	15 mΩ max. (initial)
Insulation resistance	100 MΩ min. (at 500 V DC)
Dielectric strength	1,000 V AC, 50/60 Hz for 1 minute between noncontinuous terminals 1,500 V AC, 50/60 Hz for 1 minute between current carrying and non-current carrying parts and between each terminal and ground
Vibration	10 to 55 Hz 1.5 mm double amplitude
Shock	Mechanically durability: 1,000 m/S <sup>2</sup> (approx. 100G'S) malfunction: 500 m/S <sup>2</sup> (approx. 50G'S)
Ambient ermperture	Operating : -5 to +65°C
Humidity	95% RH max
Service life	Mechanically : 10,000,000 operations min. Electrically : 500,000 operations min.
Weight	Approx. 130 g to 190 g
Degree of protection	IEC : IP65

#### OPERATING CHARACTERISTICS

Type	TZ-8104	TZ-8108	TZ-8107	TZ-8111	TZ-8112 TZ-8122	TZ-8166, TZ-8167 TZ-8168, TZ-8169
Operating characteristics						
OF max	750 g	750 g	750 g	900 g	900 g	150 g
RF min	100 g	100 g	100 g	150 g	150 g	-
PT max	2.0°	2.0°	2.0°	1.5 mm	1.5 mm	30 mm
OT min	50°	50°	50°	4 mm	4 mm	-
MD max	12°	12°	12°	1 mm	1 mm	-
OP	-	-	-	26 ±0.8 mm	37 ±0.8 mm	-

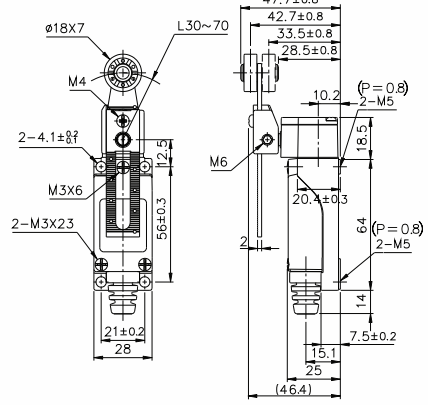
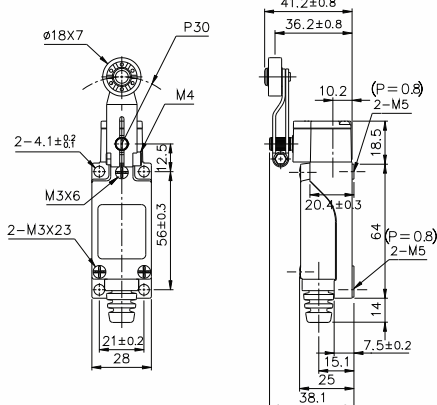
#### DIMENSIONS (Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.)

TZ-8104(HL-5000)

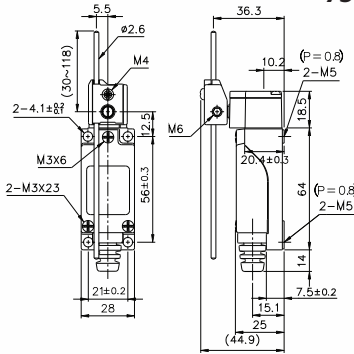
715.-

TZ-8108(HL-5030)

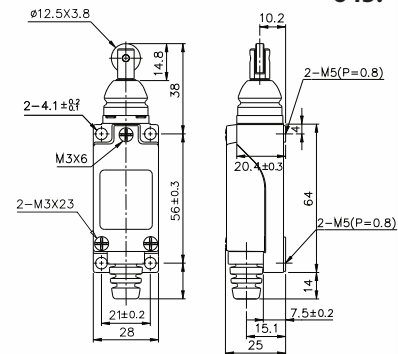
785.-



**TZ-8107 (HL-5050)**

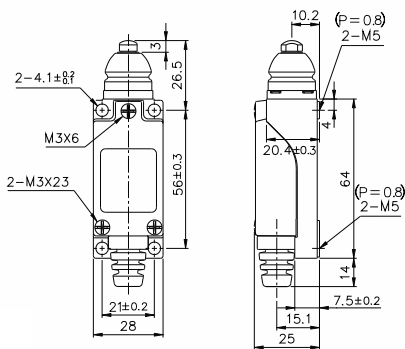


**730.- TZ-8112 (HL-5200)**



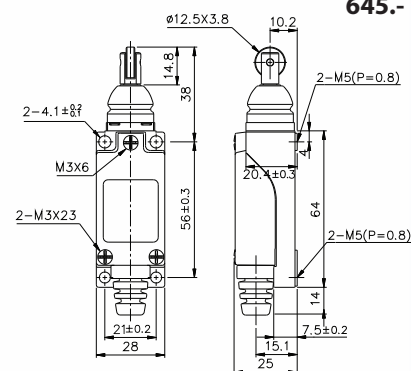
**645.-**

**TZ-8111 (HL-5100)**



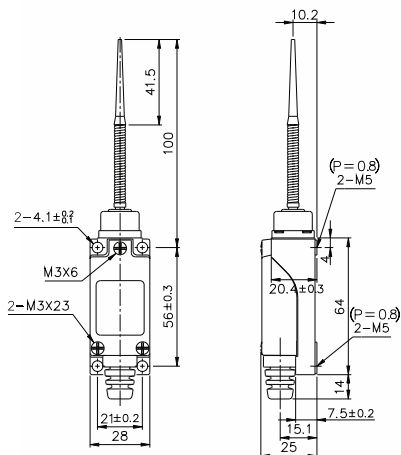
**635.-**

**TZ-8122**



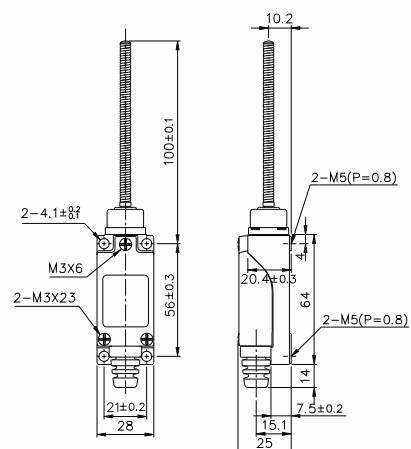
**645.-**

**TZ-8166 (HL-5300)**



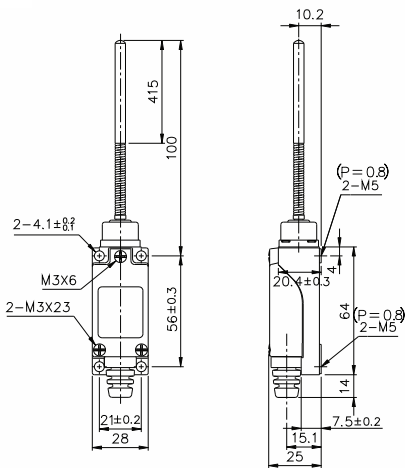
**715.-**

**TZ-8167**



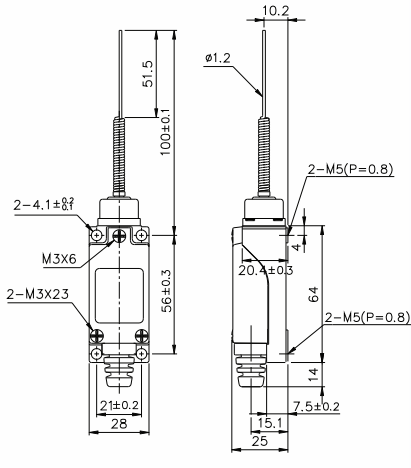
**715.-**

**TZ-8168**



**730.-**

**TZ-8169**



**715.-**

# tend LIMIT SWITCH

## ลิมิตสวิตช์ IP65



### Economical, Miniature Limit Switch Boasting Rigid Construction

TZ-92 Series are DIN EN0047

#### FEATURES

- Built-in basic switch with double spring mechanism
- Long life (10,000,000 mechanical operations)
- Material : Glass reinforced plastic.
- Dust proof and drip-proof construction
- Smooth operation with greater OT
- Easy-to-wire conduit opening design

#### SPECIFICATIONS RATINGS

Rated voltage (V)	Non-inductive load (A)				Inductive load (A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 V AC	5	5	1.5	0.7	3	3	2	1
250 V AC	5	5	1	0.5	3	3	1.5	0.8
8 V DC	5	5	3	3	5	4	3	3
14 V DC	5	5	3	3	4	4	3	3
30 V DC	5	5	3	3	4	4	3	3
125 V DC	0.4	0.4						
250 V DC	0.2	0.2						
Inrush current	NC: 24A max. NO: 12A max							

NOTES : 1. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 msec. Max. (DC)  
2. Lamp load has an inrush current of 10 times the steady-state current, while motor load has an inrush current of 6 times the steady-state current.

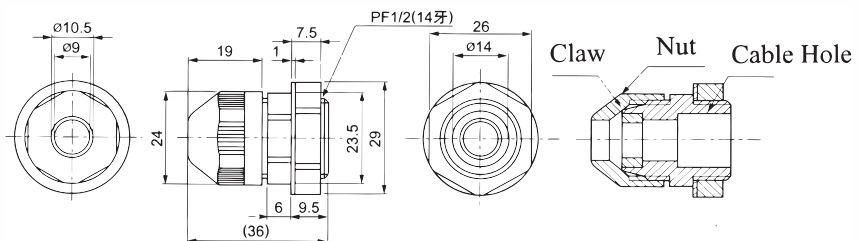
#### OPERATING CHARACTERISTICS

Type	TZ-9104	TZ-9108	TZ-9107	TZ-9111	TZ-9112 TZ-9122	TZ-9124	TZ-9166, TZ-9167 TZ-9169
	TZ-9204	TZ-9208	TZ-9207	TZ-9211	TZ-9212 TZ-9222	TZ-9244	TZ-9266, TZ-9267 TZ-9269
OF max	500 g	450 g	450 g	700 g	700 g	450 g	150 g
RF min	50 g	40 g	40 g	150 g	150 g	80 g	-
PT max	18 ~ 28	18 ~ 28	2 mm	2 mm	2 mm	4 mm	30 mm
OT min	30	30	30	4 mm	4 mm	4 mm	-
MD max	14	14	14	0.8 mm	0.8 mm	1.6 mm	-
OP	-	-	-	18 ± 0.5 mm	28.2 ± 0.8 mm	37 ± 0.8 mm	-

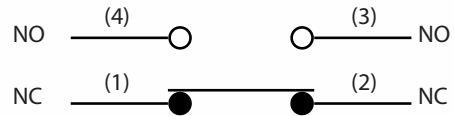
### HPF-12 (TG-16) SERIES

CABLE GLAND Diameter of Cable  $\varnothing 6 \sim 10$  mm

80.-



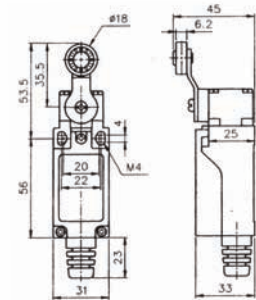
#### CONTACT CONFIGURATION



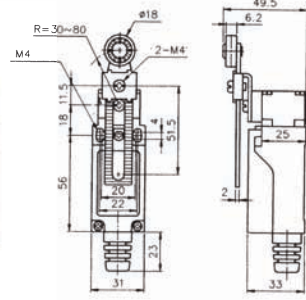
#### CHARACTERISTICS

Operating speed	5 mm to 50 cm/s
Operating frequency	120 operations/min.
Contact resistance	25 mΩ max. (initial)
Insulation resistance	100 MΩ max. (at 500 V DC)
Dielectric strength	1,000 V AC, 50/60 Hz for 1 minute between non-continuous terminals 1,500 V AC, 50/60 Hz for 1 minute between current carrying and non-current carrying parts and between each terminal and ground
Vibration	10 to 55 Hz 1.5 mm double amplitude
Shock	Approx. :300 m/s <sup>2</sup> (approx. 30G's)
Ambient temperature	Operating : -5° to +60°C
Humidity	95% RH max
Service life	Mechanically : 10,000,000 operations min Electrically : 500,000 operations min.
Weight	Approx. 130 to 190 g
Degree of protection	IEC : IP65

TZ-9104

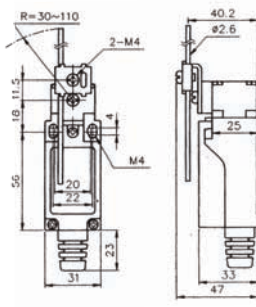


565.- TZ-9108

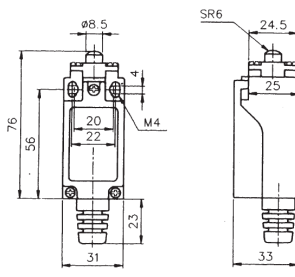


635.-

TZ-9107

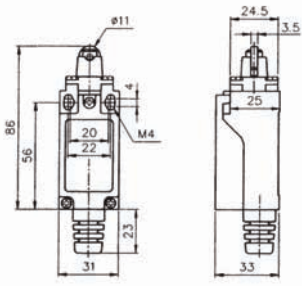


600.- TZ-9111

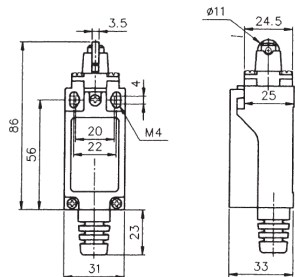


500.-

TZ-9112

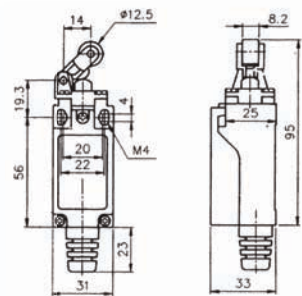


540.- TZ-9122

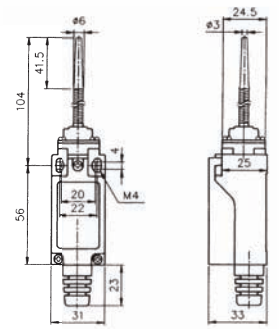


540.-

TZ-9124

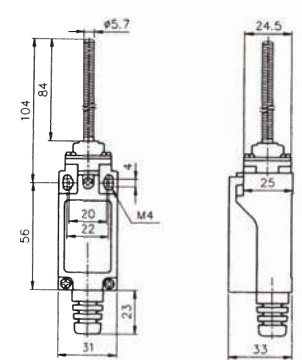


600.- TZ-9166

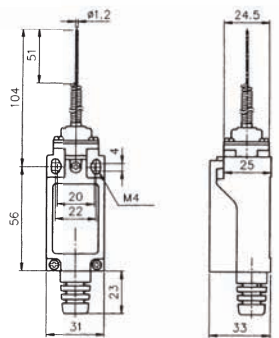


565.-

TZ-9167



565.- TZ-9169



565.-



TEND

BANDEX

TAKAMURA

TEEFLEX

KENION

NISSEI

ROSI

APEKS

LKEW

TAC

MARLOW

HARU

WIND  
SPEED

COMMAX

ADVANTE

UNIVERSAL  
ADAPTER

ALION

EXOWELD

CONTROL  
MAX

JKN

SYLVIA

WANG

MACCON

# tend LIMIT SWITCH

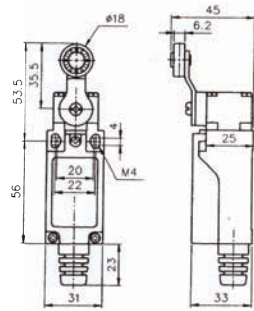
## ลิมิตสวิตช์ IP65

### TZ-9



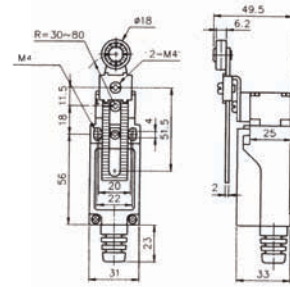
**TZ-9204**

**565.-**



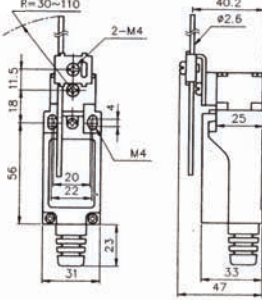
**TZ-9208**

**635.-**



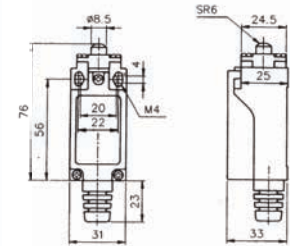
**TZ-9207**

**600.-**



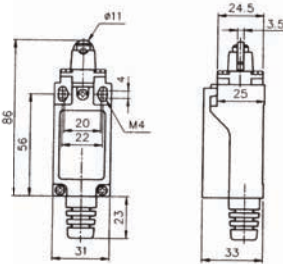
**TZ-9211**

**560.-**



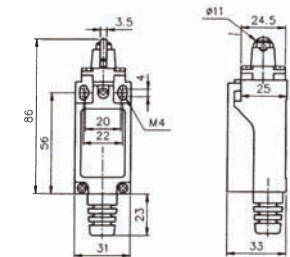
**TZ-9212**

**540.-**



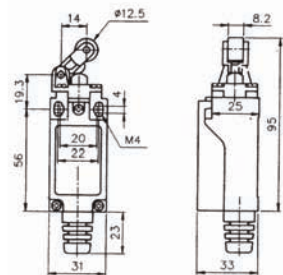
**TZ-9222**

**540.-**



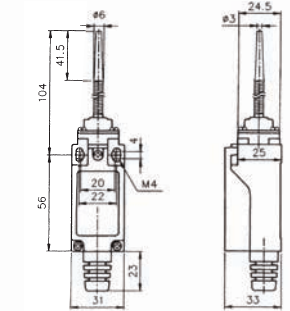
**TZ-9224**

**600.-**



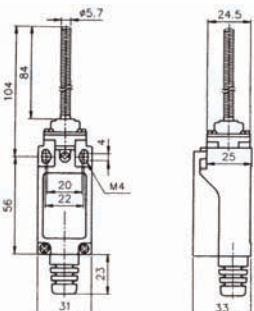
**TZ-9266**

**565.-**



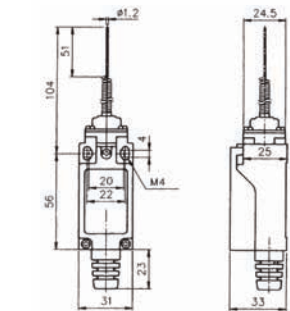
**TZ-9267**

**565.-**



**TZ-9269**

**565.-**



\*ขอสงวนสิทธิ์ในการเปลี่ยนแปลงราคา



#### MODEL DESIGNATIONS

**TSW - A**

①      ②

Designation	Signal	Description
1.Type	TSW	Elevator Switch
	TSW2	Decelerate Switch
2.Contact blocks	A	1a
	B	1b

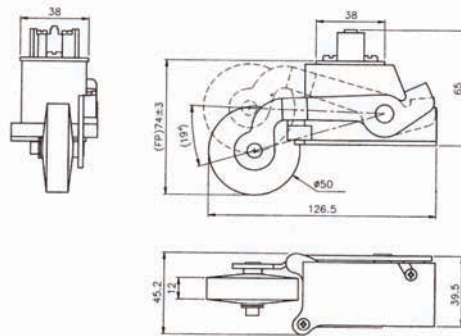
#### CHARACTERISTICS

Characteristics	Type	TSW	TSW2
Contact resistance		50 mΩ max.	
Insulation resistance		100 MΩ min. (at 500 V DC)	
Dielectric strength		2000 V AC, 50/60 Hz 1 minute	
Ambient temperature		-10°C ~ 80°C	
Ambient humidity		45% ~ 80% RH	
Operation force		1 Kgf max	300 gr. max
Weight		Approx. 250 gr	Approx. 350 gr
Pretravel		8 mm max	45° ± 5°
Overtravel		25 mm max	23° ± 5°
Free position		74 ± 3 mm.	

#### DIMENSIONS

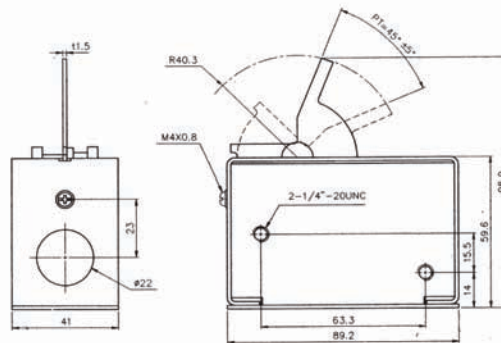
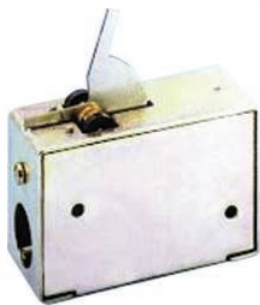
TSW-A (KS-E002A)

1,000.-



TSW2-3 (KS-E002B)

1,000.-



**tend****SAFETY KEY INTERLOCK SWITCH**

เซฟตี้คีย์อินเตอร์ล๊อคสวิตช์



### MODEL DESIGNATIONS

**TZ93 B PG 01**

① ② ③ ④

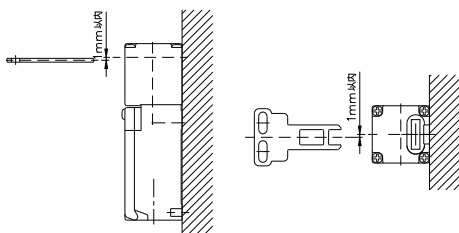
Designation	Signal	Description
1.Type	TZ-93	Safety Switch
2.Type of contact blocks fitted	B	2b (2NC)
	C	1a1b (No-Nc)
3.Conduit entries	PG	PG13.5 x P1.5
	PT	PT1/2 x 14UNC
4.Actuating keys	None	None
	01	Horizontal
	02	Vertical
	03	Adjustable

### SPECIFICATIONS RATINGS

Rated voltage (V)	Non-inductive load (A)				Inductive load (A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125VAC	10	3	1.5	10	5	2.5		
250VAC	10	2	1	10	3	1.5		
400VAC	10	1.5	0.8	3	1.5	0.8		
8VDC	10	6	3	10		6		
14VDC	10	6	3	10		6		
30VDC	6	4	3	6		4		
125VDC	0.8	0.2	0.2	0.8		0.2		
250VDC	0.4	0.1	0.1	0.4		0.1		

### USE ATTENTION AFFAIR

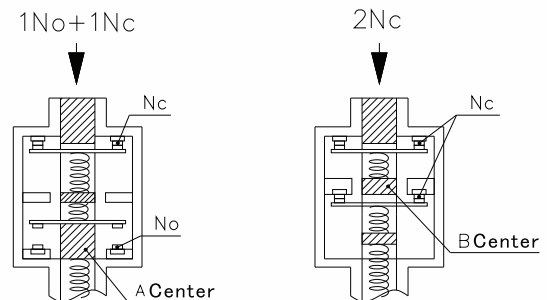
To prevent the wear and the space should be within 1 mm between the key and middle of the insert hole



### CHARACTERISTICS

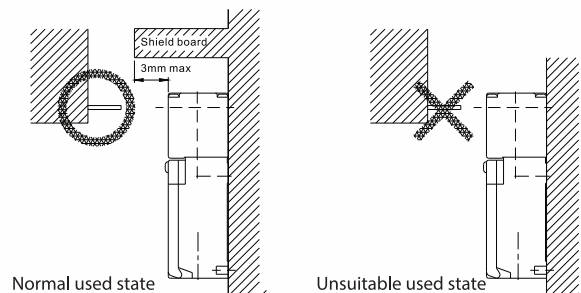
Rating	3A 240 VAC (A300)
Operating speed	0.1 mm ~ 0.5 m/s
Operating frequency	30 times/ minute
Contact resistance	25 mΩ max. (initial)
Insulation resistance	100 MΩ min. (at 500 V DC)
Rated insulation voltage (ui)	400 V
Dielectric strength	AC2500 V/Umip 4 KV
Vibration	10 ~ 50 Hz 0.65 mm double amplitude
Shock	Mechanically Approx : 1,000 m/s <sup>2</sup> (Approx: 100 G's) Electrically: Approx : 300 m/s <sup>2</sup> (approx. 30G's)
Ambient temperature	-30° ~ +70°C
Ambient humidity	Below 95% RH
Service life	Mechanically : 10,000,000 operations/ min Electrically : 150,000 operations/min.
Degree of protection	IP65 (EN60947-5-1)
Shor-circuit protective device	10A Fuse
Weight	Approx. 76 g

### REQUIRED TO HAVE POSITIVE MACHINE



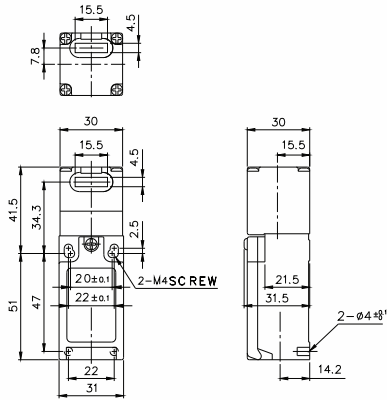
When the contact block get fire, press on the middle of the key structure, the Nc strict leaving structure can push the contact block a way cut off the movement.

When in use, there should put a plate on the top to prevent the key overinsert. To prevent nonmovement, the space between the plate and the switch should be under 3 mm.



### ■ DIMENSIONS (ใช้คอนโทรลปิด-เปิดไฟฟ้าตู้คอนโทรล)

TZ-93BPG  
TZ-93BPT  
TZ-93CPG  
TZ-93CPT



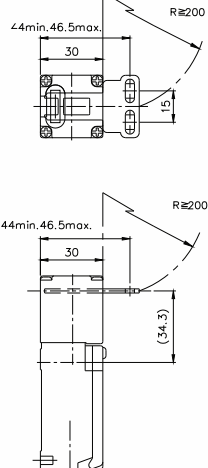
### ■ OPERATING CHARACTERISTICS

Key plug in force	max.	14.71N (1,500 gf)
Key pull out force	max.	29.42N (3,000 gf)
Pretravel		6 ± 3 mm
Total travel		(28 mm)
Force required to have positive	min.	58.84N (6,000 gf)
Positive opening travel	min.	10 mm

### ■ DIMENSIONS OF OPERATING

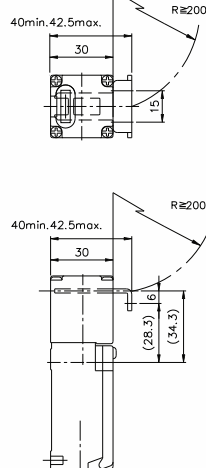
TZ-93BPG01 } 2B (2NC)  
TZ-93BPT01 } 2B (2NC)  
TZ-93CPG01 } 1A1B  
TZ-93CPT01 } (1NO+1NC)

1,160.-



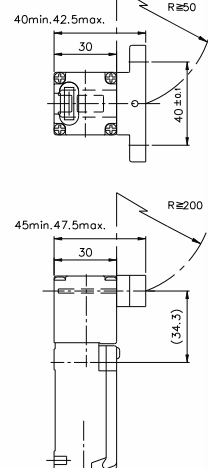
TZ-93BPG02 } 2B (2NC)  
TZ-93BPT02 } 2B (2NC)  
TZ-93CPG02 } 1A1B  
TZ-93CPT02 } (1NO+1NC)

1,160.-



TZ-93BPG03 } 2B (2NC)  
TZ-93BPT03 } 2B (2NC)  
TZ-93CPG03 } 1A1B  
TZ-93CPT03 } (1NO+1NC)

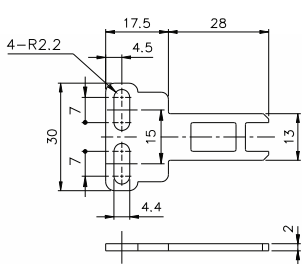
1,160.-



### ■ TYPE OF KEYS AND DIMENSIONS

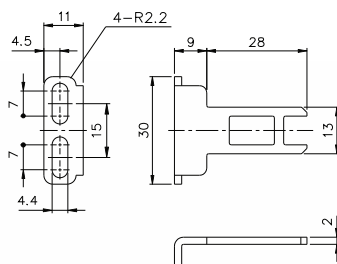
TZ93-K1

80.-



TZ93-K2

80.-



TZ93-K3

145.-

