

FEATURES

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

SPECIFICATIONS

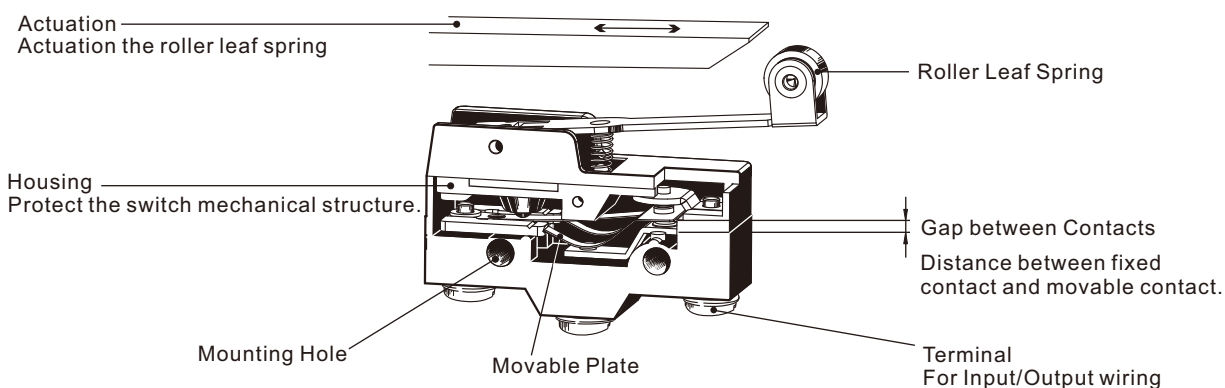
RATINGS

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	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 VDC	15	3	1.5		15	5	2.5			
14 VDC	15	3	1.5		10	5	2.5			
30 VDC	6	3	1.5		5	5	2.5			
125 VDC	0.4	0.4	0.4		0.05	0.05	0.05			
250 VDC	0.2	0.2	0.2		0.03	0.03	0.03			

CHARACTERISTICS

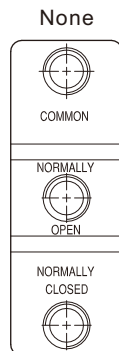
Operating speed	0.01mm to 1m/sec
Operating frequency	Mechanically:240 operations/min Electrically:20 operations/min
Contact resistance	15mΩ max.(initial)
Insulation resistance	100MΩ max.(at 500 VDC)
Dielectric strength	1,000 VAC,50/60Hz, for 1 minute be-tween non-continuos terminals; 2,000 VAC, 50/60HZ,for 1 minute be-tween current-carrying part and ground
Vibration	Mechanical durability: 10 to 55Hz, 1.5mm double amplitude
Shock	Mechanical durability:approx. 1,000m/sec ² (approx. 100G's) Malfunction durability:Approx 300m/sec ² (approx. 30G's)
Ambient temperature	General purpose type:-25° C to +80° C Sealed type:-15° C to +80° C
Humidity	General purpose type:85% RH max. Sealed type:95% RH max.
Service life	Mechanically:20,000,000 operations min. Electrically:500,000 operations min.
Weight	Approx. 22 to 58g
IP Rating	Normal Type IP00 Sealed Type: IP62

ILLUSTRATION

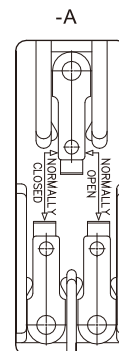


- TM Series offer Screw Type terminals, Solder Type terminal and Tab Type terminal to choose from.
- -A means it's the Solder type terminal, -C means it's the Tab type terminal and default is the Screw type terminal.

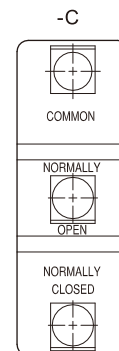
Screw type



Solder type



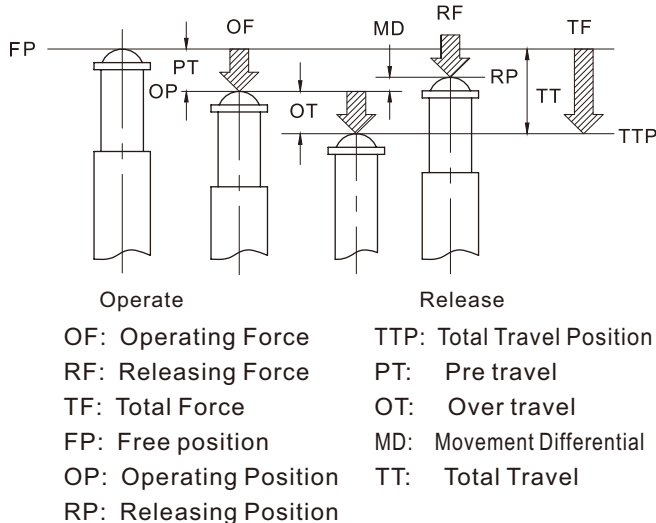
Tab type



CONTACT CONFIGURATION



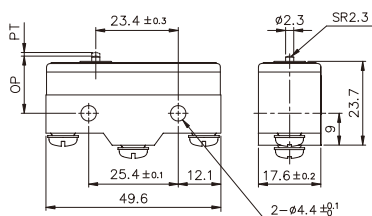
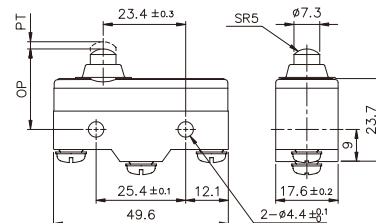
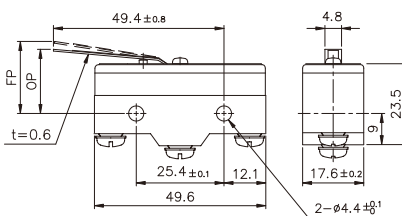
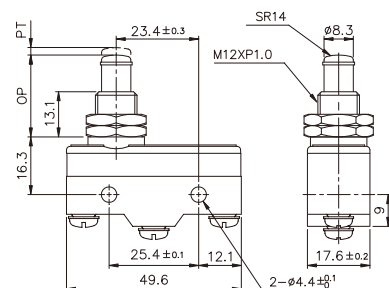
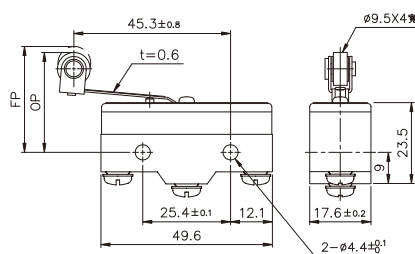
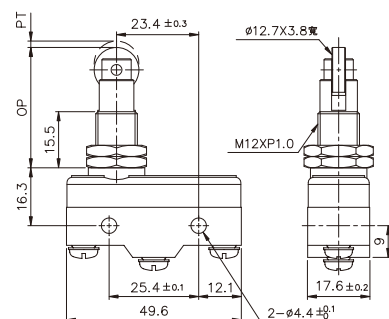
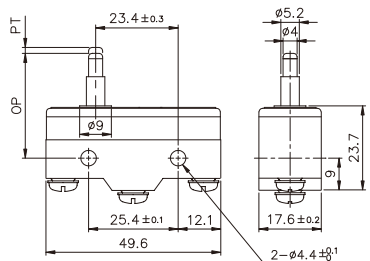
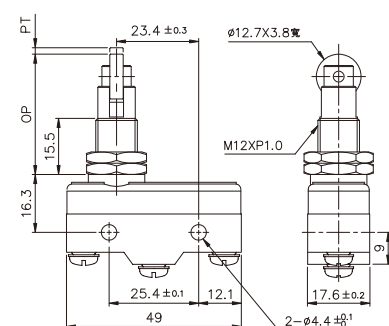
DEFINITIONS OF OPERATING CHARACTERISTICS:



OPERATION CHARACTERISTICS

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

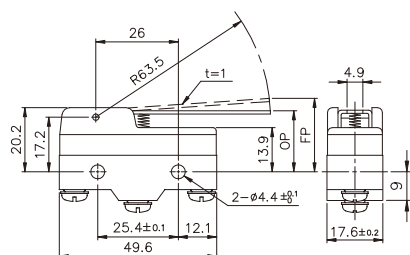
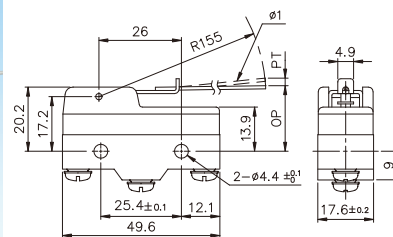
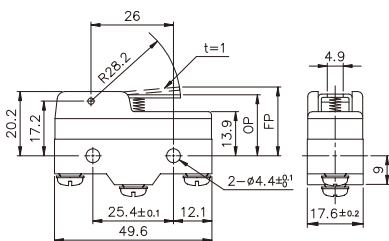
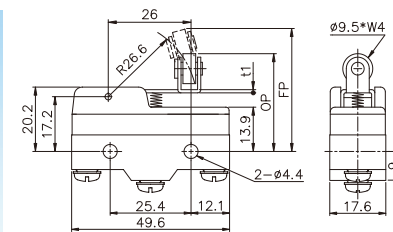
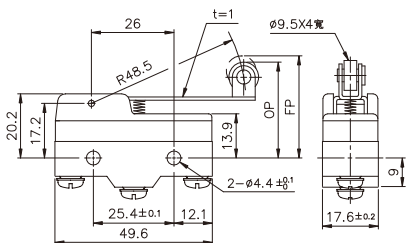
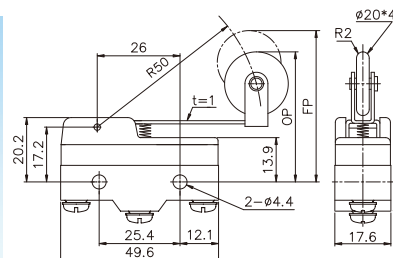
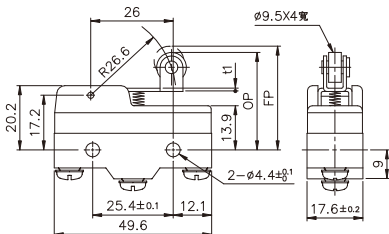
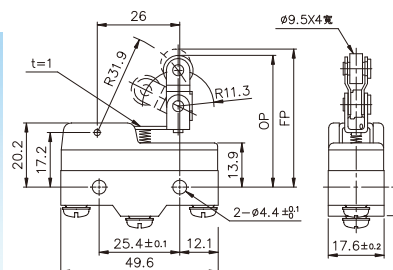
DIMENSIONS

TM-1300

TM-1306

TM-1301

TM-1307

TM-1303

TM-1308

TM-1305

TM-1309


OPERATION CHARACTERISTICS

Type	TM-1701	TM-1702	TM-1703	TM-1704	TM-1705	TM-1707	TM-1709	TM-1743
OF Max.	70g	160g	100g	160g	10g	170g	100g	160g
RF Min.	14g	28g	22g	42g	3g	42g	21g	42g
PT Max.	10mm	5mm	7.1mm	2.7mm	20mm	2.7mm	7.3mm	2.7mm
OT Min.	5.6mm	2mm	4mm	2.4mm	5.6mm	2.4mm	4mm	2.4mm
MD Max.	1.27mm	1mm	1.02mm	0.5mm	4mm	0.5mm	1.6mm	0.5mm
FP Max.	28.2mm	24.8mm	36.5mm	32.5mm		33.3mm	47.5mm	43.6mm
OP	19±0.8mm	19±0.4mm	30.2±0.8mm	30.2±0.4mm	19±0.8mm	31±0.4mm	41.2±0.8mm	41.3±0.8mm

DIMENSIONS

TM-1701

TM-1705

TM-1702

TM-1707

TM-1703

TM-1709

TM-1704

TM-1743


FEATURES

- Wide variety of actuators
- High breaking capacity(20A)
- High precision
- Wide operating speed range

SPECIFICATIONS

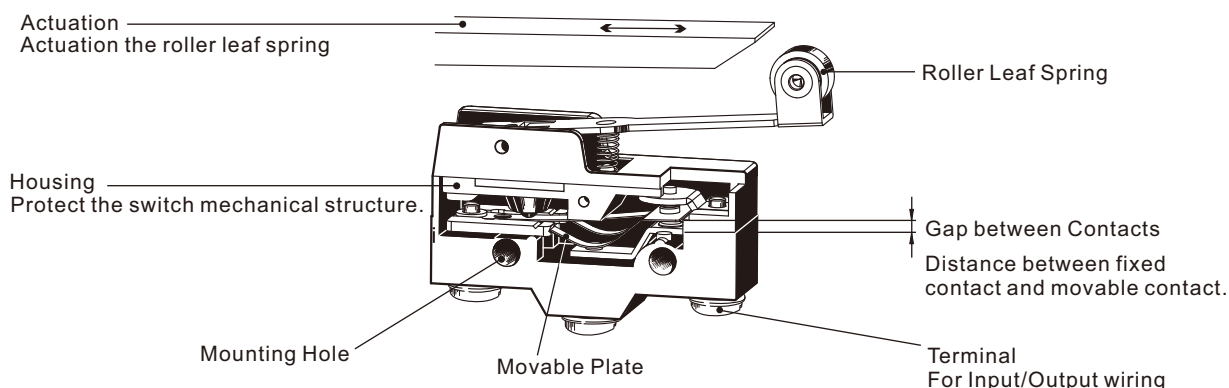
RATINGS

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	NC	NO
125 VAC	20		7.5		20		12.5		30 max.	15 max.
250 VAC	20		7.5		20		8.3			
500 VAC	5		2		3		2			
8 VDC	20	3	1.5		20		12.5			
14 VDC	20	3	1.5		15		12.5			
30 VDC	6	3	1.5		5		5			
125 VDC	0.4	0.4	0.4		0.05		0.05			
250 VDC	0.2	0.2	0.2		0.03		0.03			

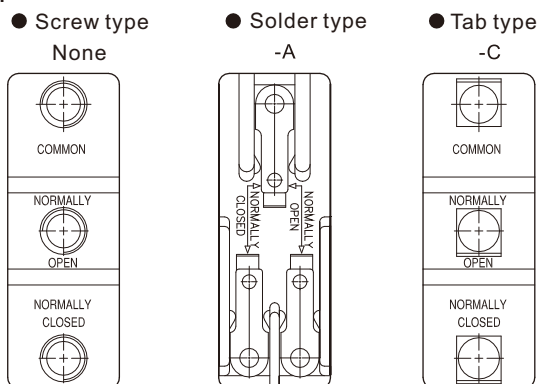
CHARACTERISTICS

Operating speed	0.01mm to 1m/sec
Operating frequency	Mechanically:240 operations/min Electrically:20 operations/min
Contact resistance	15mΩ max.(initial)
Insulation resistance	100MΩ max.(at 500 VDC)
Dielectric strength	1,000 VAC,50/60Hz, for 1 minute be-tween non-continuos terminals; 2,000 VAC, 50/60HZ,for 1 minute be-tween current-carrying part and ground
Vibration	Mechanical durability: 10 to 55Hz, 1.5mm double amplitude
Shock	Mechanical durability:approx. 1,000m/sec ² (approx. 100G's) Malfunction durability:Approx 300m/sec ² (approx. 30G's)
Ambient temperature	General purpose type:-25 C to +80 C Sealed type:-15 C to +80 C
Humidity	General purpose type:85% RH max. Sealed type:95% RH max.
Service life	Mechanically:1,000,000 operations min. Electrically:500,000 operations min.
Weight	Approx. 22 to 58g
IP Rating	Normal Type IP00 Sealed Type: IP62

ILLUSTRATION



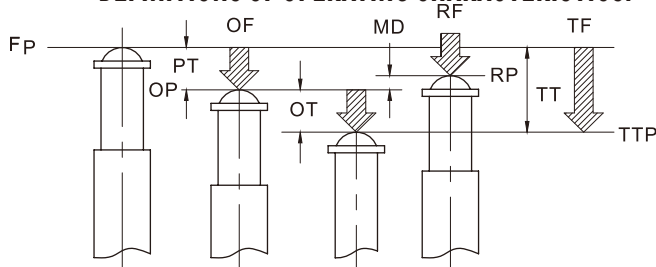
- TM Series offer Screw Type terminals, Solder Type terminal and Tab Type terminal to choose from.
- -A means it's the Solder type terminal, -C means it's the Tab type terminal and default is the Screw type terminal.



CONTACT CONFIGURATION



DEFINITIONS OF OPERATING CHARACTERISTICS:



Operate

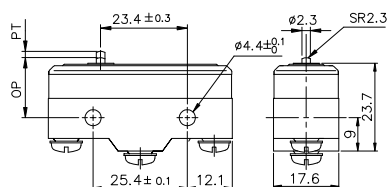
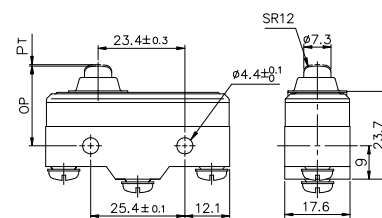
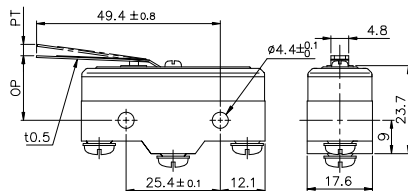
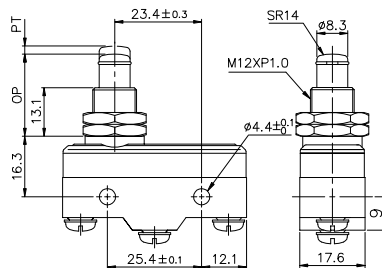
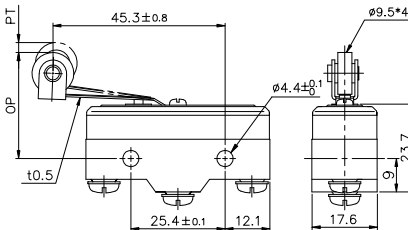
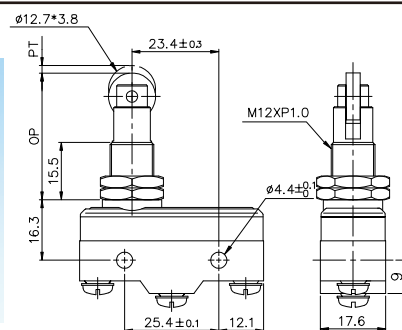
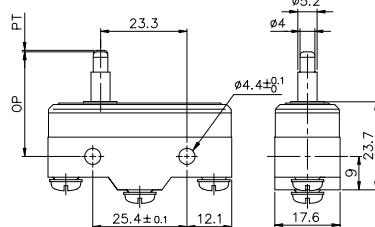
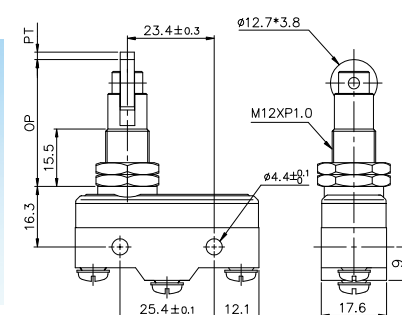
Release

- OF: Operating Force
- RF: Releasing Force
- TF: Total Force
- FP: Free position
- OP: Operating Position
- RP: Releasing Position
- TTP: Total Travel Position
- PT: Pre travel
- OT: Over travel
- MD: Movement Differential
- TT: Total Travel

OPERATION CHARACTERISTICS

Type	TM-1300-2	TM-1301-2	TM-1303-2	TM-1305-2	TM-1306-2	TM-1307-2	TM-1308-2	TM-1309-2
OF Max.	650g	350g	350g	650g	650g	650g	650g	650g
RF Min.	200g	50g	50g	200g	200g	200g	200g	200g
PT Max.	0.7mm	4mm	4mm	0.7mm	0.7mm	0.7mm	0.7mm	0.7mm
OT Min.	0.13mm	1.6mm	1.6mm	1.6mm	1.6mm	5.5mm	3.58mm	3.58mm
MD Max.	0.2mm	1.3mm	1.3mm	0.05mm	0.2mm	0.2mm	0.2mm	0.2mm
FP Max.		20.6mm	31.8mm					
OP	15.9±0.4mm	17.4±0.8mm	28.6±0.8mm	28.2±0.5mm	21.5±0.5mm	21.8±0.8mm	33.4±1.2mm	33.4±1.2mm

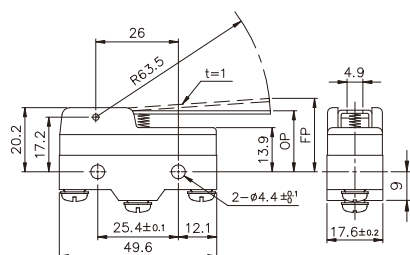
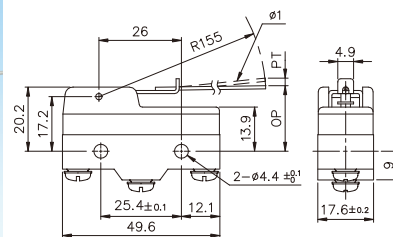
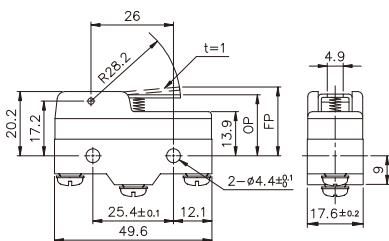
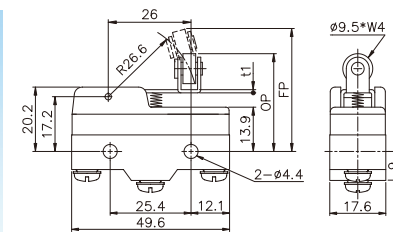
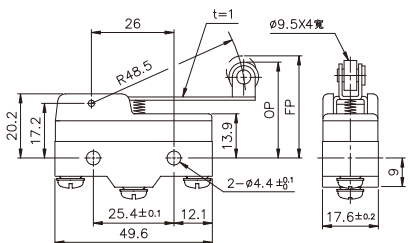
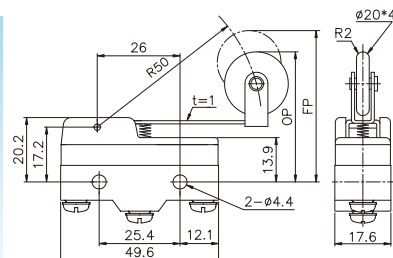
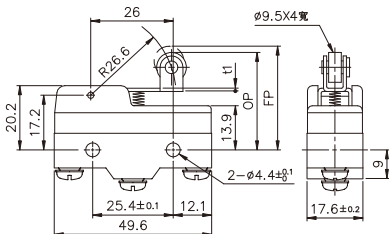
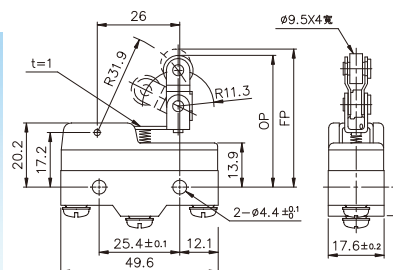
DIMENSIONS

TM-1300-2

TM-1306-2

TM-1301-2

TM-1307-2

TM-1303-2

TM-1308-2

TM-1305-2

TM-1309-2


OPERATION CHARACTERISTICS

Type	TM-1701-2	TM-1702-2	TM-1703-2	TM-1704-2	TM-1705-2	TM-1707-2	TM-1709-2	TM-1743-2
OF Max.	80g	160g	120g	180g	20g	170g	70g	180g
RF Min.	14g	42g	22g	42g	5g	42g	34g	42g
PT Max.	10mm	6.5mm	7.1mm	2.7mm	20mm	2.7mm	6.3mm	2.7mm
OT Min.	5.6mm	1.2mm	4mm	2.4mm	5.6mm	2.4mm	6mm	2.4mm
MD Max.	1.27mm	1.2mm	1.02mm	0.5mm	3.5mm	0.5mm	0.74mm	0.5mm
FP Max.	28.2mm		36.5mm	32.5mm		34mm	47.5mm	43.6mm
OP	19±0.8mm	19±0.8mm	30.2±0.8mm	30.2±0.4mm	19±0.4mm	31±0.4mm	41.2±0.8mm	41.3±0.8mm

DIMENSIONS

TM-1701-2

TM-1705-2

TM-1702-2

TM-1707-2

TM-1703-2

TM-1709-2

TM-1704-2

TM-1743-2


tend MICRO SWITCH(SEALED TYPE)

TM

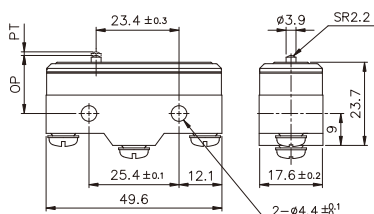
Surrounding joints are sealed by epoxy, and waterproof, oiltight rubber boot.
Dust-preventive, waterproof and oiltight.

OPERATION CHARACTERISTICS

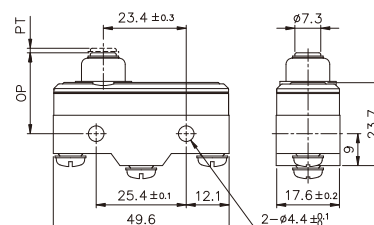
Type	TM-1300-1	TM-1301-1	TM-1303-1	TM-1305-1	TM-1306-1	TM-1307-1	TM-1308-1	TM-1309-1
OF Max.	500g	400g	400g	500g	500g	500g	500g	500g
RF Min.	114g	50g	50g	114g	114g	114g	114g	114g
PT Max.	0.4mm	4mm	4mm	0.4mm	0.4mm	0.4mm	0.4mm	0.4mm
OT Min.	0.13mm	1.6mm	1.6mm	1.6mm	1.6mm	5.5mm	3.58mm	3.58mm
MD Max.	0.05mm	1.3mm	1.3mm	0.05mm	0.05mm	0.05mm	0.05mm	0.05mm
FP Max.		20.6mm	31.8mm					
OP	15.9±0.4mm	17.4±0.8mm	28.6±0.8mm	28.2±0.5mm	21.5±0.5mm	21.8±0.8mm	33.4±1.2mm	33.4±1.2mm

DIMENSIONS

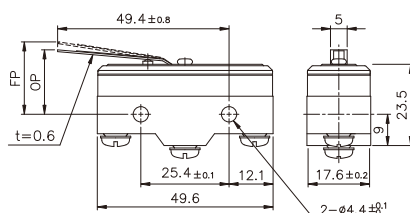
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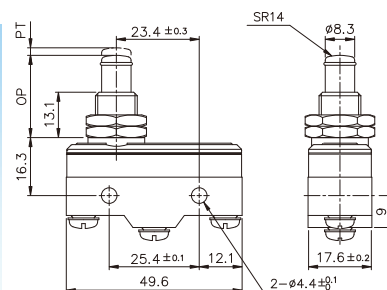
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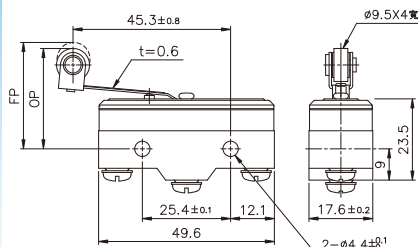
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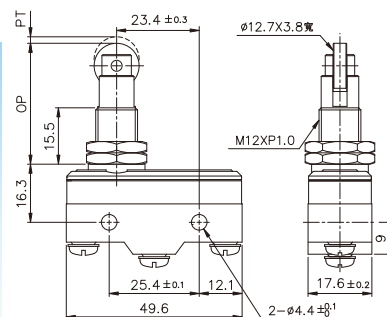
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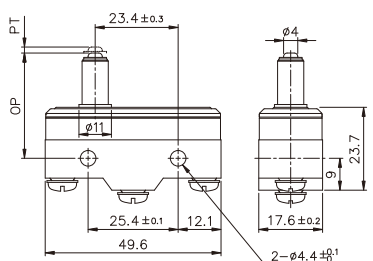
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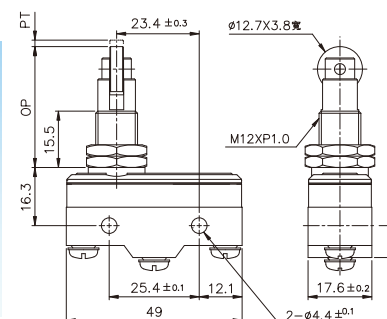
TM-1308-1



TM-1305-1



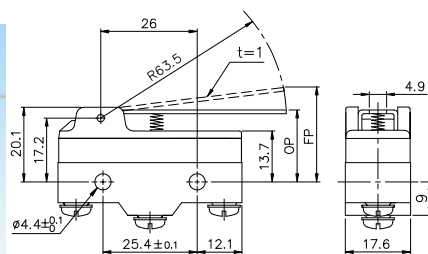
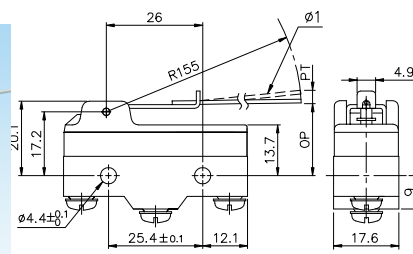
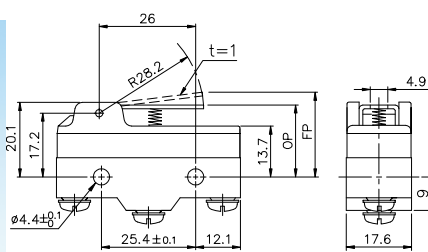
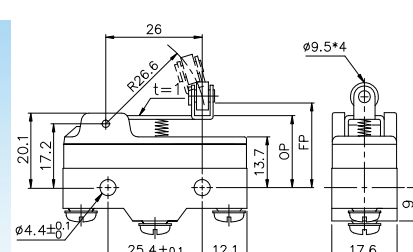
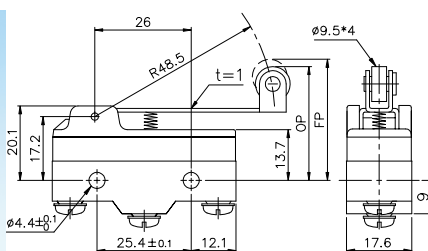
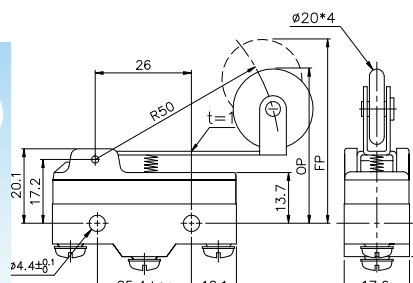
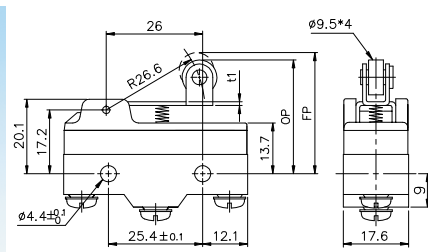
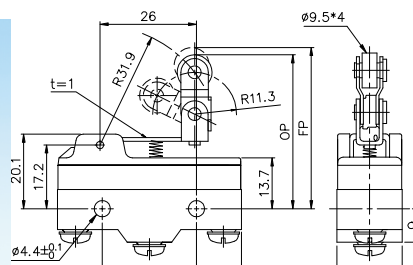
TM-1309-1



■ OPERATION CHARACTERISTICS

Type	TM-1701-1	TM-1702-1	TM-1703-1	TM-1704-1	TM-1705-1	TM-1707-1	TM-1709-1	TM-1743-1
OF Max.	100g	190g	130g	190g	40g	200g	130g	190g
RF Min.	14g	28g	21g	42g	3g	42g	21g	50g
PT Max.	10mm	5mm	7.1mm	2.7mm	20mm	2.7mm	7.3mm	2.7mm
OT Min.	5.6mm	2mm	4mm	2.4mm	5.6mm	2.4mm	4mm	2.4mm
MD Max.	2mm	1mm	1.6mm	0.8mm	4mm	0.5mm	1.6mm	0.8mm
FP Max.	28.2mm	25mm	36.5mm	32.9mm		33.3mm	47.5mm	43.6mm
OP	19±0.8mm	19±0.8mm	30.2±0.8mm	30.2±0.4mm	19±0.8mm	31±0.4mm	41.2±0.8mm	41.3±0.8mm

■ DIMENSIONS

TM-1701-1

TM-1705-1

TM-1702-1

TM-1707-1

TM-1703-1

TM-1709-1

TM-1704-1

TM-1743-1


tend MICRO SWITCH FOR DIRECT CURRENT TM

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

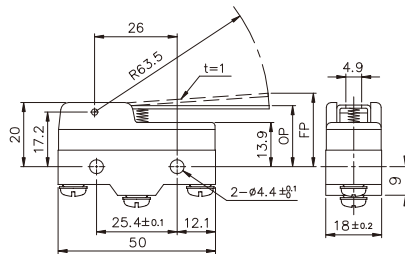
RATINGS

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

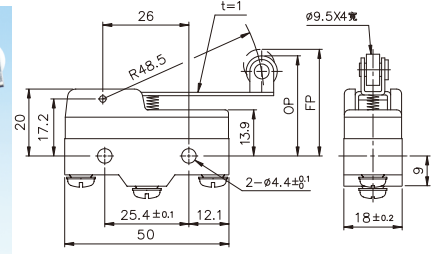
Notes: 1. Inductive load has a power factor of 0.4min(AC) and a time constant of 7 msec. Max.(DC)
 2. Lamp load has an inrush current of 10 times the steady-state current, while motor load has an inrush current of 6 times the steady-state current.

DIMENSIONS

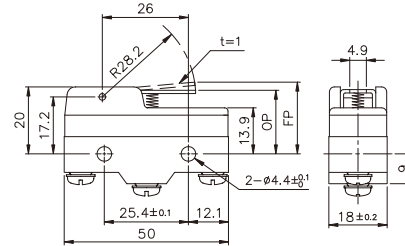
TMD-1701



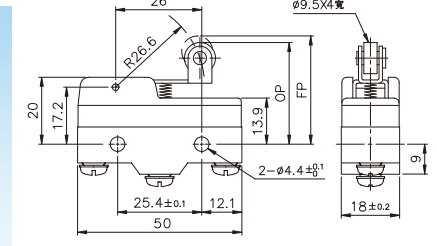
TMD-1703



TMD-1702



TMD-1704



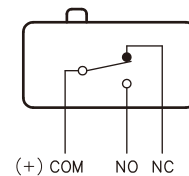
OPERATION CHARACTERISTICS

Type	TMD-1701	TMD-1702	TMD-1703	TMD-1704
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.	4.8mm	2.1mm	4mm	2.4mm
MD Max.	3.9mm	1.7mm	3mm	1.7mm
FP Max.	34.6mm	25.5mm	40.5mm	37.1mm
OP	19.8±0.8mm	19.8±0.4mm	32.2±0.8mm	32.2±0.8mm

CHARACTERISTICS

Operating speed	0.1mm to 1m/s
Operating frequency	Mechanically: 240 operations/min Electrically: 20 operations/min
Contact resistance	15mΩ max.(initial)
Insulation resistance	100MΩ max.(at 500 VDC)
Dielectric strength	1,500 VAC, 50/60Hz, for 1 minute
Vibration	10 to 55Hz, 1.5mm double amplitude
Shock	Mechanical : approx. 1,000m/s ² (approx. 100G's) Electrically 300m/s ² (approx. 30G's)
Ambient temperature	-25~+80°C
Ambient Humidity	Below 85% RH
Service life	Mechanically: 1,000,000 operations min. Electrically: 100,000 operations min.
Weight	Approx. 27 to 36g
IP Rating	Normal Type IP00 Sealed Type: IP62

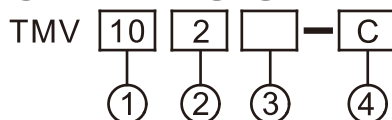
CONTACT CONFIGURATION



FEATURES

- High precision
- Wide variety of actuators
- Wide operating speed range

MODEL DESIGNATION



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

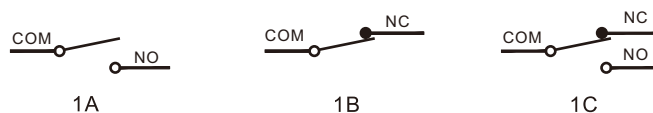
TYPES

Actuator	COM terminal	Rating contact	Rating Terminal	10A	16A	21A
Push button type	Side Terminal	1C	#187 Terminal	TMV100-C/D TMV100S-C/D	TMV160-C/D TMV160S-C/D	TMV210-C/D TMV210S-C/D
Long lever type				TMV101-C/D TMV101S-C/D	TMV161-C/D TMV161S-C/D	TMV211-C/D TMV211S-C/D
Short lever type				TMV102-C/D TMV102S-C/D	TMV162-C/D TMV162S-C/D	TMV212-C/D TMV212S-C/D
Long roller type				TMV103-C/D TMV103S-C/D	TMV163-C/D TMV163S-C/D	TMV213-C/D TMV213S-C/D
Short roller type				TMV104-C/D TMV104S-C/D	TMV164-C/D TMV164S-C/D	TMV214-C/D TMV214S-C/D
Extra lever type				TMV105-C/D TMV105S-C/D	TMV165-C/D TMV165S-C/D	TMV215-C/D TMV215S-C/D
Crank lever type	Bottom Terminal		#250 Terminal	TMV106-C/D TMV106S-C/D	TMV166-C/D TMV166S-C/D	TMV216-C/D TMV216S-C/D

TYPE AND SHAPE OF TERMINAL

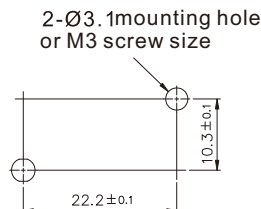
Type of terminal	#187 Terminal	#250 Terminal
Bottom Terminal		
Side Terminal		
Terminal size		

CONTACT CONFIGURATION



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 Type	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
10A	250 VAC	10		1.5		6		2		24 max.
	8 VDC	10		3		6		3		
	30 VDC	6		3		6		3		
	125 VDC	0.6		0.1		0.6		0.1		
	250 VDC	0.3		0.05		0.3		0.05		
16A	250 VAC	16		2		10		3		40 max.
	8 VDC	16		4		10		6		
	30 VDC	10		4		10		4		
	125 VDC	0.6		0.1		0.6		0.1		
	250 VDC	0.3		0.05		0.3		0.05		
21A	250 VAC	21		3		12		4		50 max.
	8 VDC	21		5		12		7		
	30 VDC	14		5		12		5		
	125 VDC	0.6		0.1		0.6		0.1		
	250 VDC	0.3		0.05		0.3		0.05		

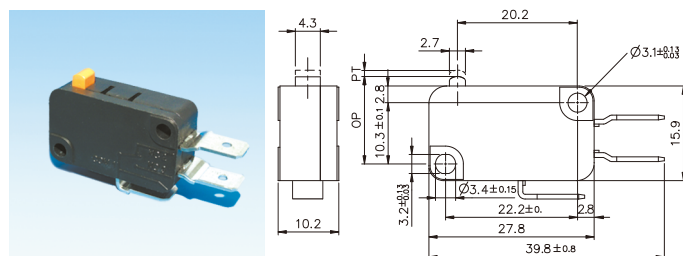
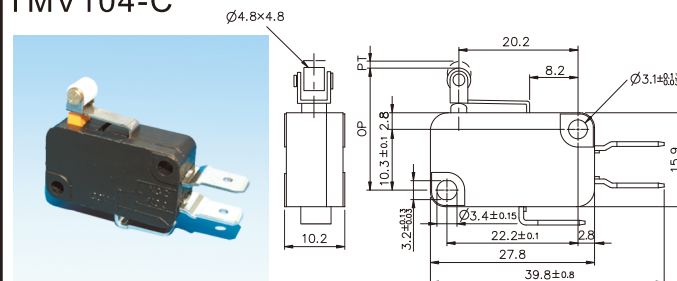
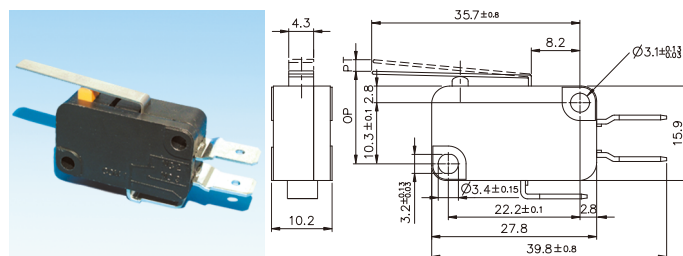
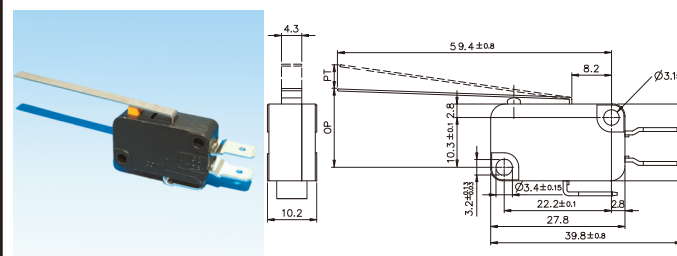
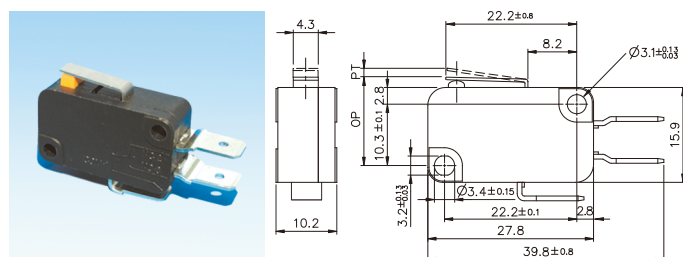
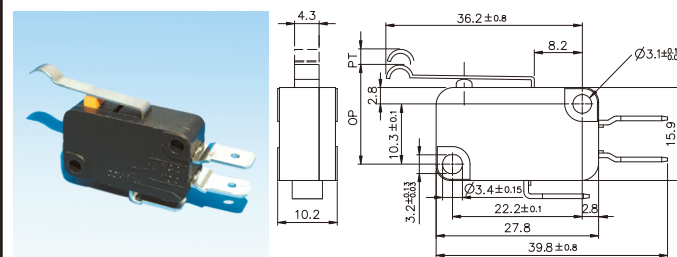
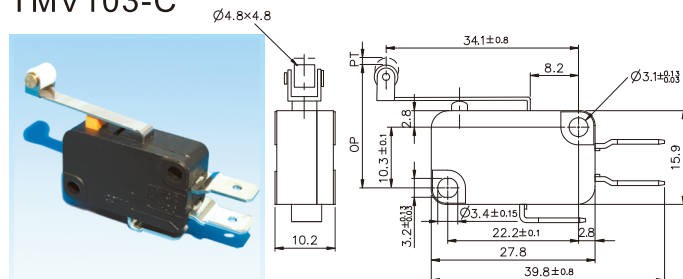
CHARACTERISTICS

Item \ Type		TMV 10	TMV 16	TMV 21
Operating speed		0.1mm to 1m/s (push button type)		
Operating frequency		Mechanically:240 operations/min Electrically:20 operations/min		
Insulation resistance		100MΩ max.(at 500 VDC)		
Contact resistance		15mΩ max.(initial)		
Dielectric strength	non-continous terminals	1,000 VAC,50/60Hz, for 1 minute		
	between non-continous terminals	TMV10:1,500 VAC,50/60Hz, for 1 minute TMV16/TMV21:2,000 VAC,50/60Hz, for 1 minute		
Vibration	Malfunction	10 to 55Hz, 1.5mm double amplitude		
Shock	Mechanical durability	1,000m/sec ² (approx. 100G's)		
	Malfunction	200m/sec ² (approx. 20G's)	300m/sec ² (approx. 30G's)	
Service life	Mechanically	20,000,000 operations min		
	Electrically	300,000 operations min	100,000 operations min	
Ambient temperature		General purpose type:-25 to +65°C		
Ambient humidity		General purpose type:85%RH max		
Weight		Approx:7.2~8g		
IP Rating		Normal Type IP00 Sealed Type: IP62		

■ OPERATION CHARACTERISTICS

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

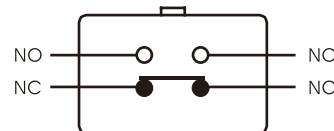
■ DIMENSIONS

TMV100-C

TMV104-C

TMV101-C

TMV105-C

TMV102-C

TMV106-C

TMV103-C


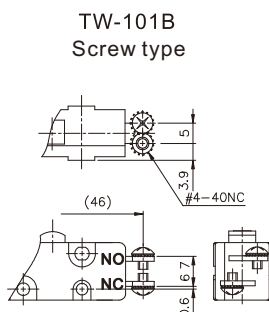
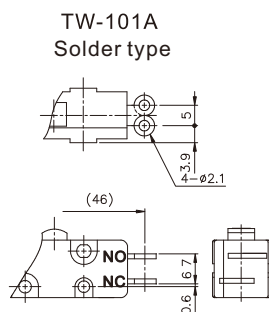
RATINGS

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	10		3	1.5			4	2	30 Max.	15 Max.
250 VAC	10		2	1	10		3	1.5		
8 VDC	10		6	3	10		6			
14 VDC	10		6	3	10		6			
30 VDC	6		4	3	6.0		4			
125 VDC	0.8		0.2	0.2	0.8		0.2			
250 VDC	0.4		0.1	0.1	0.4		0.1			

CONTACT CONFIGURATION



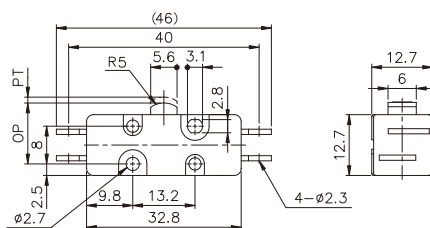
TYPE OF TERMINAL



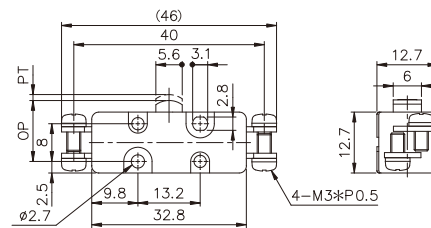
OPERATION CHARACTERISTIC

Type	TW-101 $\frac{A}{B}$	TW-1012 $\frac{A}{B}$	TW-1014 $\frac{A}{B}$
OF Max.	400g	200g	240g
RF Min.	114g	60g	70g
PT Max.	1.6mm	3.5mm	3mm
OT Min.	0.25mm	1.8mm	1.2mm
MD Max.	0.65mm	1.6mm	2mm
OP	11.7 ±0.4mm	14.6±0.8mm	25.3±0.8mm

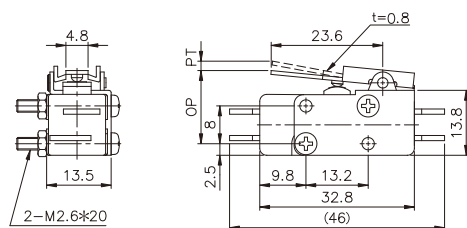
TW-101A



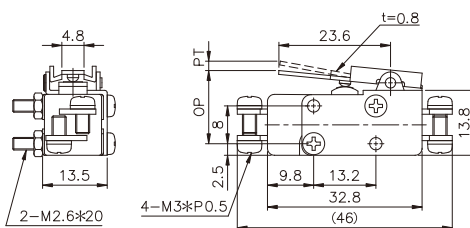
TW-101B



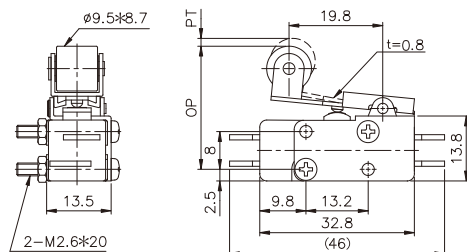
TW-1012A



TW-1012B



TW-1014A



TW-1014B

