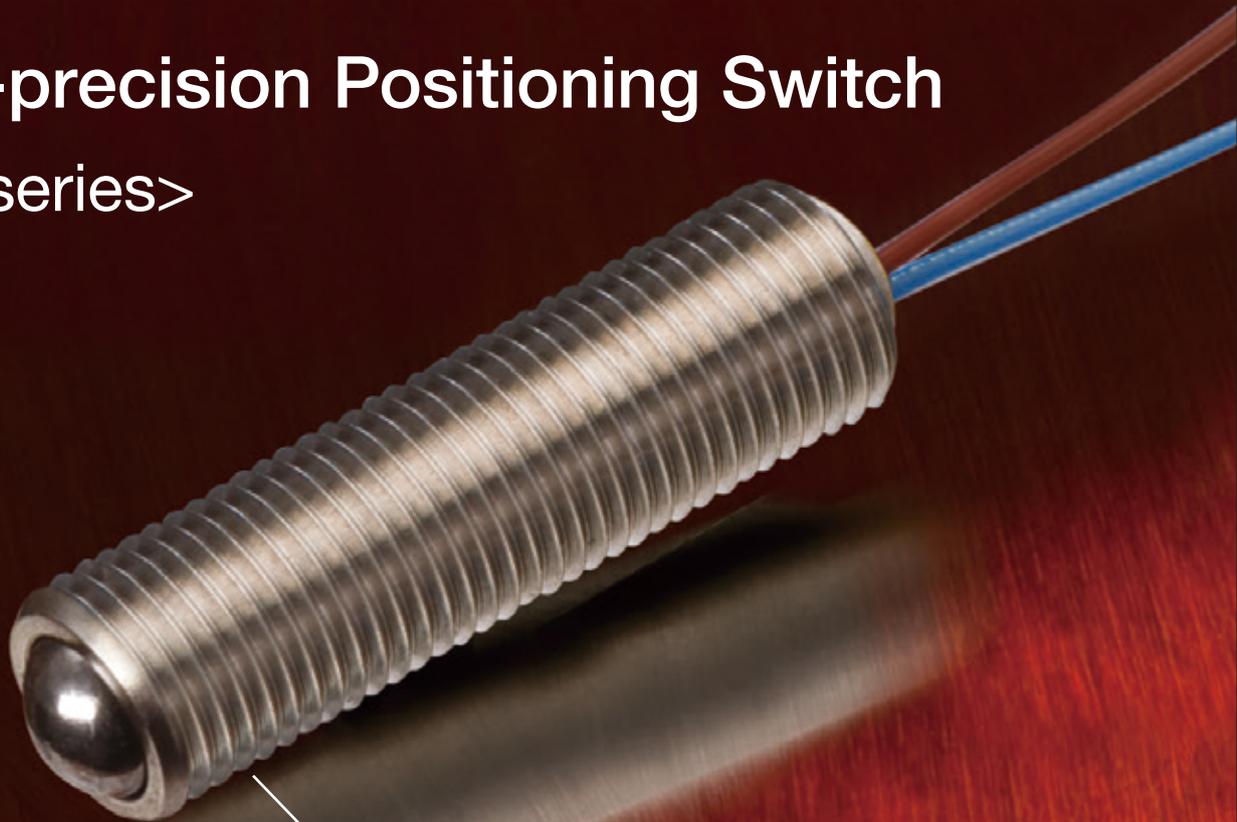


To engineers involved in vacuum environment and
semiconductor manufacturing

10⁻⁵Pa

High vacuum class resistance

High-precision Positioning Switch
<GN series>



NEW

Ball plunger type
made of a low outgassing material



10⁻⁵Pa High vacuum resistance

Positioning in vacuum environments

Low outgassing material is used for the body of the switch

High-precision Positioning Switch can be used in 10⁻⁵PA high-vacuum environments.

Used for "positioning" in vacuum deposition, sputtering and thin film processing equipment.

M5 Ultra-compact size

Space saving of equipment

M5×17mm Ultra-compact size (PT series)

Ultra-compact size enables space savings and downsizing machines in semiconductor manufacturing equipment and vacuum chambers.

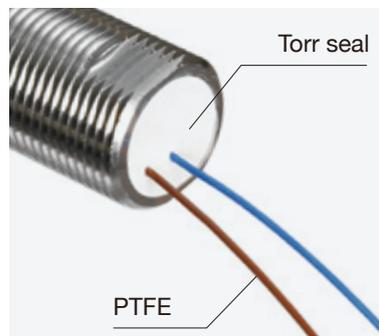
Point Using low outgassing materials and adhesive.

Grease, inbricants or oiles are not used



<Heat-resistant materials>

Using "PEEK" and zirconia, heat-resistant seramics.



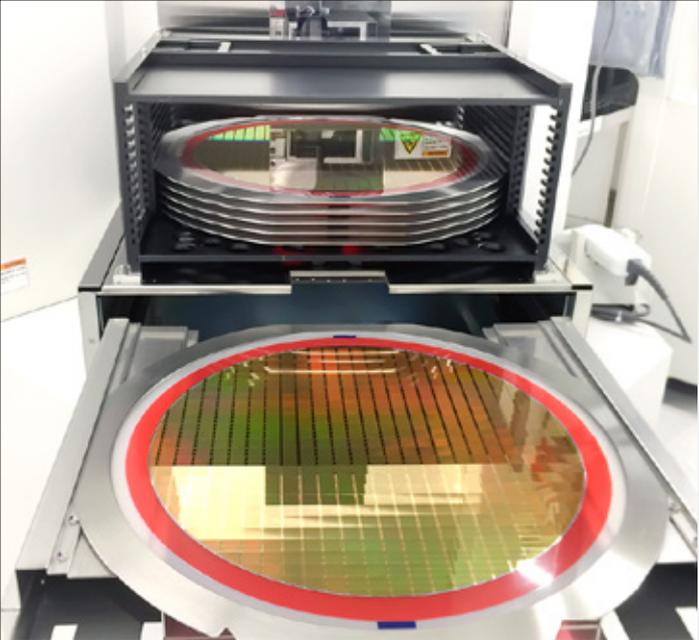
<Cable/Adhesive>

Using "PTFE" for cable and "Torr Seal" for adhesive.



<Assembly environment>

Parts for assembly are cleaned in a cleanroom and latex gloves (powder free) are use when assembling.

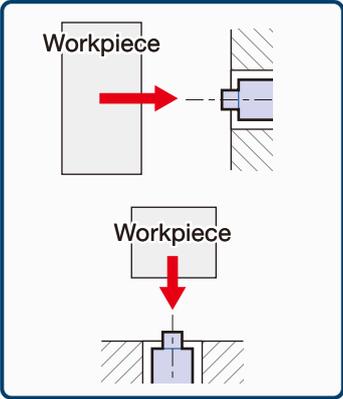
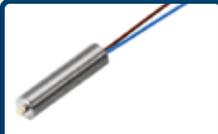
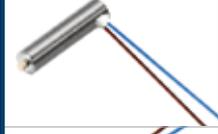
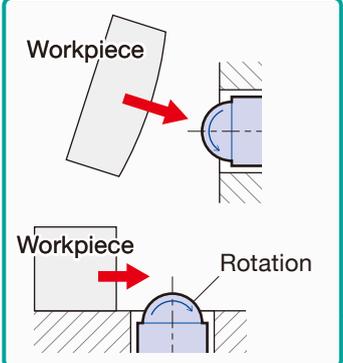


Case studies

Used by major semiconductor production system manufacturers and leading panel production users.

- Stage positioning within vacuum chambers
- Workpiece positioning within vacuum deposition devices
- Positioning within thin film manufacturing equipment
- Semiconductor wafer positioning
- Vacuum compatible positioning stages
- Verifying mask seating with substrate holders

Selection guide

How to use	Output mode	Stroke	Cable direction	Product name	
Straight touch type  <p>Ideal for contacting workpieces from the straight direction such as positioning and seating of substrates and stages.</p>	A : NO	1.5mm	Straight	GN-PT5M3A	    
			90°	GN-PT5M3A-R	
	B : NC	1.5mm	Straight	GN-PT5M3B	
			90°	GN-PT5M3B-R	
		5.0mm	Straight	GN-CSK141B	
	Angled touch type  <p>Ideal for sliding or warped workpieces like large LCD panels.</p>	A : NO	0.8mm	Straight	
90°				GN-BP5MA-R	
B : NC		2.9mm	Straight	GN-BP161B	

GN series

10-5Pa high-vacuum resistance

Standard specification

unit : mm

How to use	Product name	Output mode	Repeatability*1	Stroke	Pretravel	Pretravel	Cable direction
Straight touch type	GN-PT5M3A	A : NO	0.003	1.5	about 0.3	0.5N	Straight
	GN-PT5M3A-R						90°(-R)
	GN-PT5M3B	B : NC			0*2		Straight
	GN-PT5M3B-R						90°(-R)
	GN-CSK141B				0.01		5.0
Angled touch type	GN-BP5MA	A : NO	0.01	0.8	about 0.3	1.0N	Straight
	GN-BP5MA-R						90°(-R)
	GN-BP161B	B : NC		2.9	about 0.2		1.5N

*1 Both On→Off, Off→On/ 0.003 (range)(At operating speed 50-200mm/min) *2 Adjust the installed location of the switch by the signal switching point.

Common specification

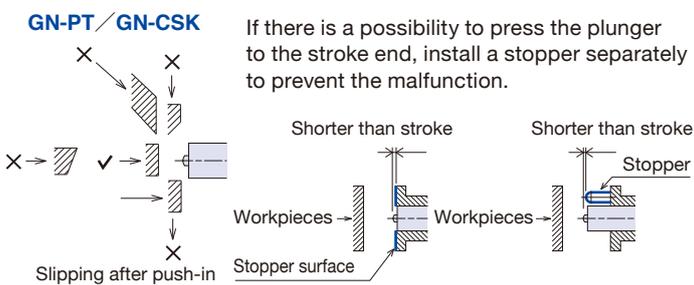
Switch structure	Dry contact
Compatible vacuum	10 ⁻⁵ Pa
Allowable baking temperature	120°C
Movement differential	0
Contact life time	3 million (If no specified bungle caused by vibration and used under voltage and current rating.)
Protective structure	IP40

Cable	PTFE Core-wire cable0.5m AWG30 〈AT01B030〉 made by Junkosha Inc.
Oscillation	10 - 55Hz total amplitude 1.5 for X, Y, Z each direction
Impact	300m/s ² X,Y,Z each direction
Contact rating	DC5V-DC24V Steady current : 10 mA or less(rush current: 20 mA or less)
Standard accessory	Two fixing nuts

How to use

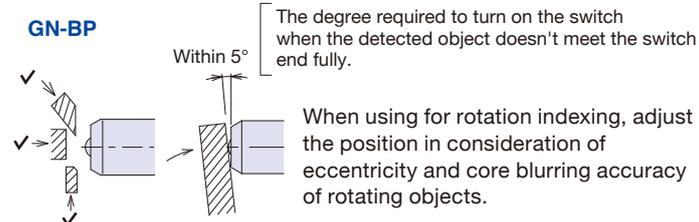
Straight touch type

Make contact with detected objects at right angle
(within deflection angle ±3°)

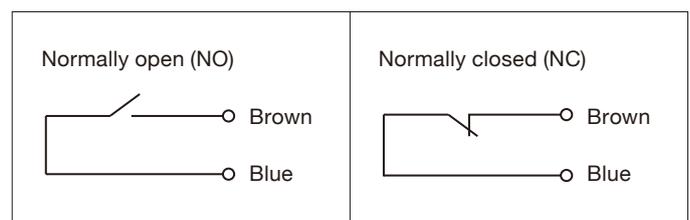


Angled touch type

Suitable for angled touch



Circuit diagram



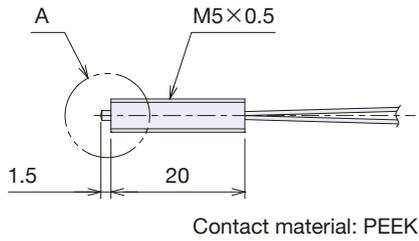
Options

Product name	Cable
GN-PT5M3 GN-PT5M3A-R GN-PT5M3B GN-PT5M3B-R GN-CSK141B GN-BP5MA GN-BP5MA-R GN-BP161B	Blank: Standard(0.5m) 1 : 1m 3 : 3m 5 : 5m ▶ e.g.) GN-PT5M3A-R-3

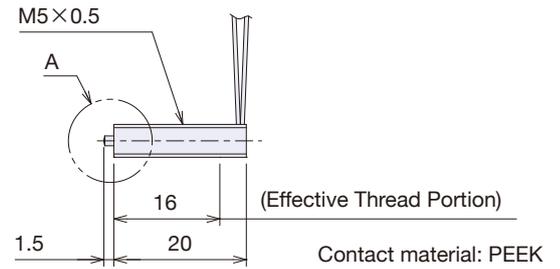
Straight touch type

unit : mm

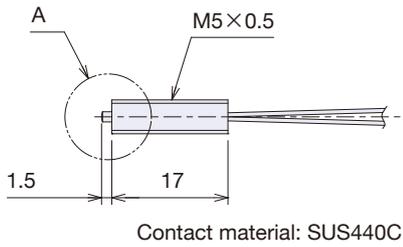
GN-PT5M3A (A: NO)



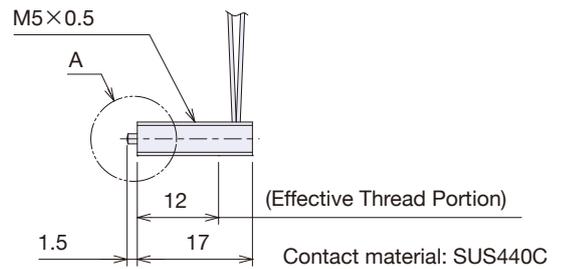
GN-PT5M3A-R (A: NO)



GN-PT5M3B (B: NC)

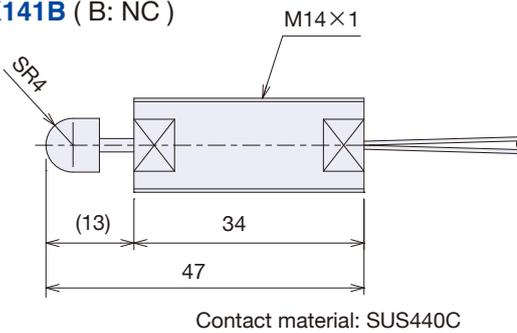


GN-PT5M3B-R (B: NC)

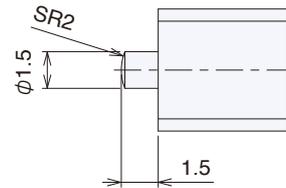


GN-CSK141B (B: NC)

NEW



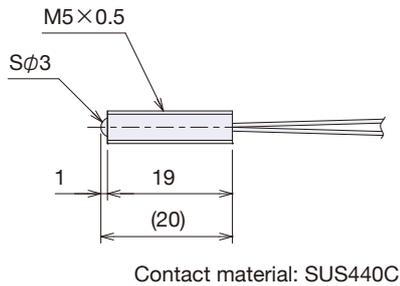
Details of part A



Angled touch type

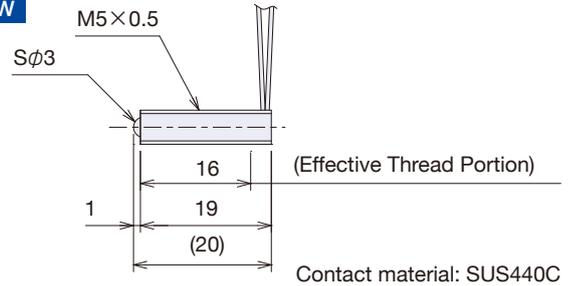
GN-BP5MA (A: NO)

NEW



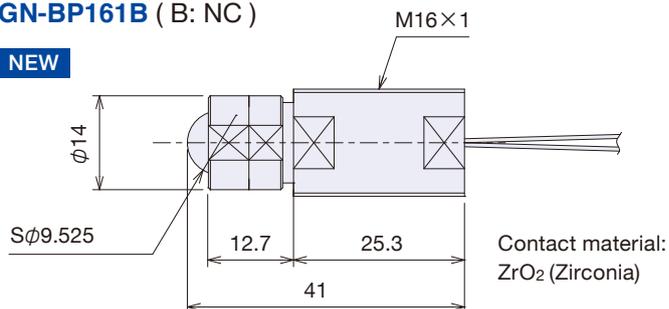
GN-BP5MA-R (A: NO)

NEW



GN-BP161B (B: NC)

NEW



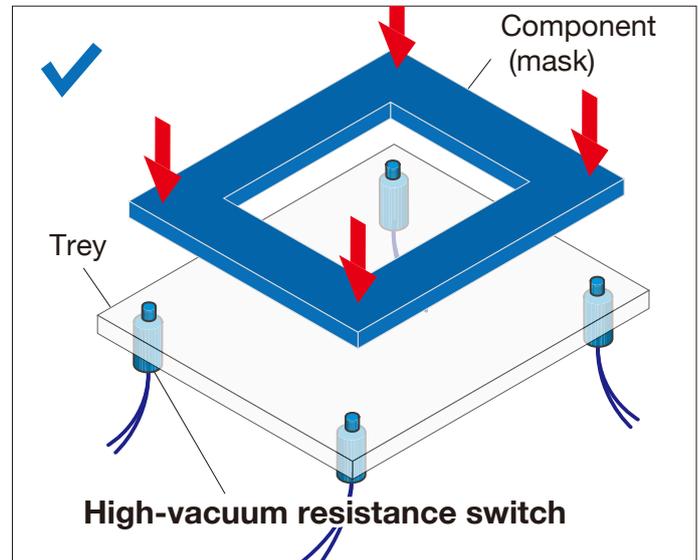
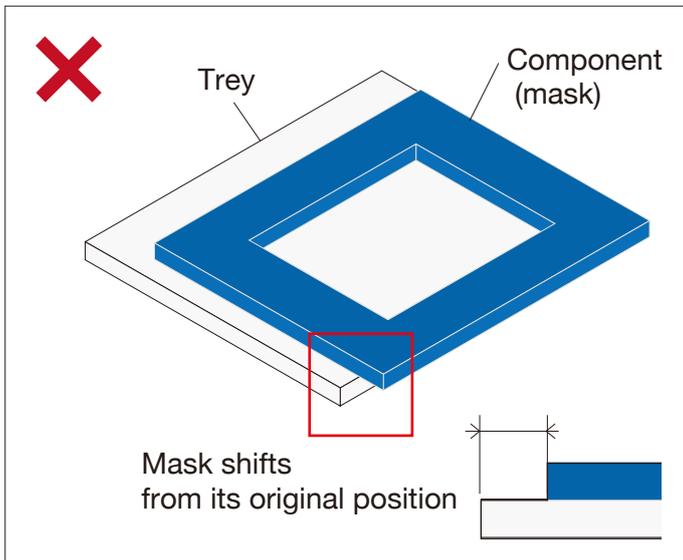
Tightening torque for case screws and nuts

Product name	Screw / Nut	Tightning torque
GN-PT5M3A / B	M5×0.5	1N · m
GN-CSK141B	M14×1	10N · m
GN-BP5MA	M5×0.5	1N · m
GN-BP161B	M16×1	12N · m

Improvement Examples with vacuum environments

Verifying mask seating

Positioning of mask in vacuum deposition system is required.



Problems

- × General sensor cannot be installed in the chamber, resulting in defective processing due to the displacement of the mask.

Results

- ✓ Detects proper seating of mask by installing High-vacuum resistance switch directly into the tray.

Help Desk

For engineers who have trouble with precision positioning in vacuum environments.

We accept any questions regarding product usage or requests to customize products. Please feel free to contact us.

We can provide our best support if details about application, usage environment and what kind of workpieces will be detected can be provided.

touchsensor@metrol.co.jp

The specifications and descriptions are subjected to change without notice due to improvements in products.