

Ultra-precision position Switches

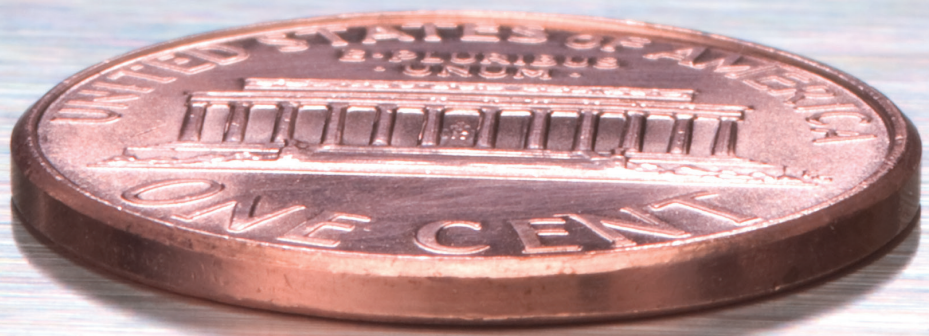
PT / CSM / STM

Ultra-Precision Position Switches
METROL® **Metrol**

NEW!!

The World's Smallest!!

M5 × 17mm,
Ultra-small size
PT-Touch Switch



www.metrol.co.jp/en

Ultra-small size PT-Touch Switch

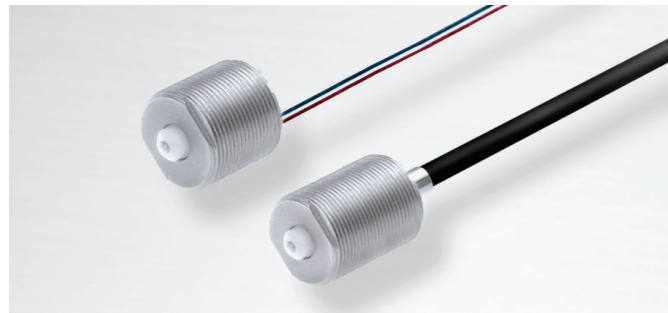


World's smallest class!!

- M5×17mm
- 1 micron/3 micron in repetitive accuracy
- Precision positioning switches can sustain 3 million operations.

P. 3

CS-Touch Switch CSM

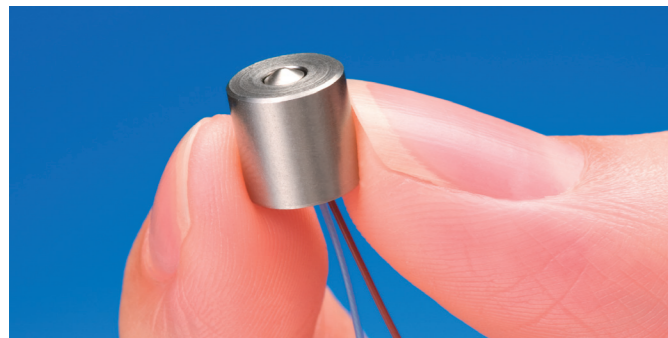


Best selling positioning switch

- M10×10mm
- This product has longer stroke length(1.5mm) than Stopper mini type STM

P. 7

Stopper Bolt with a Built-in Switch STM



Attachable to a robot fingertip! Switch for seating confirmation

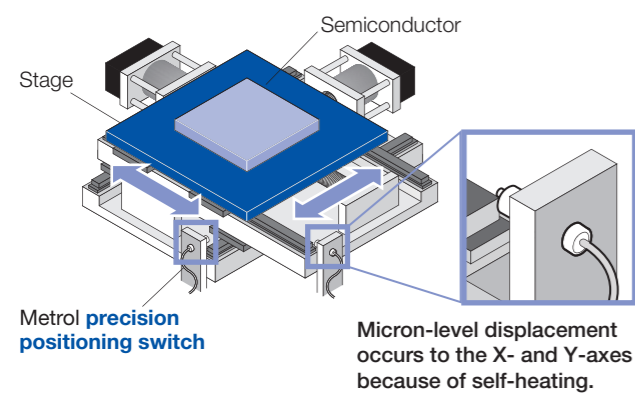
- φ8×8mm (the smallest) Mini-stopper with a built-in switch
- 300 kg Static load resistance

P. 11

Application examples of precision positioning switches

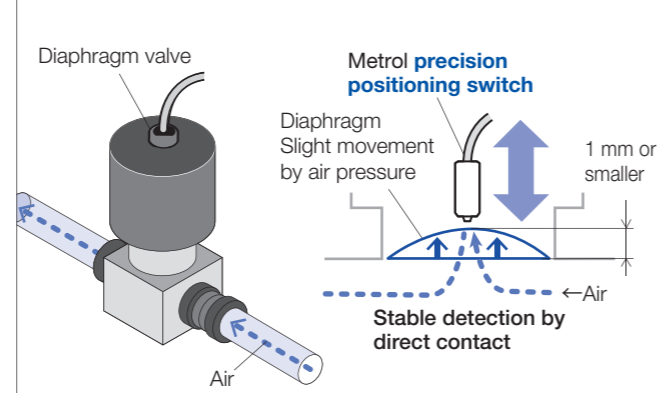
Detects the origin point of X-Y stage

Enables it to be used to compensate position drift and thermal displacement by detecting the origin point of the moving part in high accuracy.



Detects micro movement of diaphragms

Being a precision mechanical switch without any movement differential, it is able to detect micro movement of 1 mm or less.



Merits of Ultra-precision position switch

■ No movement differential

Minute displacement can be continuously detected.

■ No temperature drift

No signal point drift due to the voltage of the power supply or self-generation.

■ Can be used in harsh environment

Tightly sealed water-resistant structure switch corresponding to IP67.

■ Results in miniaturization of machine and equipment and in cost reduction.

■ Low current, low voltage switch that has a long life when used within the rated range.

■ Easy positioning adjustment

Selection Guide

Selection by application

Existence detection
Position detection

PT series

→ P. 3

CSM series

→ P. 7

Seating check
Forward/backward
end check

STM series

→ P.11

Selection by repetitive accuracy

1μm / 3μm

PT series

→ P. 3

3μm

CSM series

→ P. 7

10μm

STM series

→ P.11

Selection by shape

M5×17mm
The World Smallest!

Stroke
1.5mm

PT series

→ P. 3

M10×10mm
Mini size

Stroke
1.5mm

CSM series

→ P. 7

φ8×8mm
Mini stopper with
a built-in switch

Stroke
0.3mm
0.5mm

STM series

→ P.11

PT

1-signal plunger type
Straight touch type (Plain bearing)

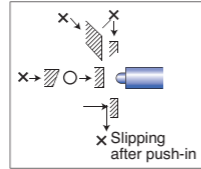
PAT.PEND.

NEW



- M5 / φ5 × 17mm slim switch
- 1 micron / 3 micron in repetitive accuracy

《Application》



Standard product name

Repeatability : 1μm type

unit:mm

Repeatability*1	Protective structure	Product name	Output mode	Pretravel	Contact force	Cable	Size	with LED
0.001mm (Both On↔Off)	IP40	PT5M1WB	B : Normally close	0 (*2)	0.5N	Core-wire cable	M5×0.5	PT5M1WB -L
		PT5S1WB					φ5	PT5S1WB -L
		PT5M1CB					M5×0.5	PT5M1CB -L
		PT5S1CB					φ5	PT5S1CB -L
	IP67	PTP5M1CB	0.8N	M5×0.5	PTP5M1CB -L			
		PTP5S1CB		φ5	PTP5S1CB -L			
	IP40	A : Normally open	PT5M1WA	0.3	0.5N	Core-wire cable	M5×0.5	PT5M1WA -L
			PT5S1WA				φ5	PT5S1WA -L

Repeatability : 3μm type

Repeatability*1	Protective structure	Product name	Output mode	Pretravel	Contact force	Cable	Size	with LED
0.003mm (Both On↔Off)	IP40	PT5M3WB	B : Normally close	0 (*2)	0.5N	Core-wire cable	M5×0.5	PT5M3WB -L
		PT5S3WB					φ5	PT5S3WB -L
		PT5M3CB					M5×0.5	PT5M3CB -L
		PT5S3CB					φ5	PT5S3CB -L
	IP67	PTP5M3CB	0.8N	M5×0.5	PTP5M3CB -L			
		PTP5S3CB		φ5	PTP5S3CB -L			
	IP40	A : Normally open	PT5M3WA	0.3	0.5N	Core-wire cable	M5×0.5	PT5M3WA -L
			PT5S3WA				φ5	PT5S3WA -L

*1 At operating speed 50~200mm/min (Operating speed slower than 10mm/min is not recommended.) -L : LED indicator (120mm from the switch)

*2 Adjust the installed location of the switch by the signal switching point.

Common specification

unit:mm

Switch structure	Dry contact	Cable	Core-wire cable : 0.5m (×2) Oil-resistant φ0.6 Tensile strength 15N Cabtyre cable : 2m Oil resistant φ2.8/2 cores, Tensile strength 30N
Movement differential	0	Operating temperature range	0°C~80°C (Ice-free)
Contact life time	3 million (No bungle caused by vibration and use under contact rating)	Temperature drift	0
Stroke	1.5	Oscillation	10~55Hz total amplitude 1.5 for X,Y,Z each direction
Contacting part material	SUS HRC45	Impact	300m/s ² for X,Y,Z each direction
Case material	SUS303	Contact rating	DC5V~DC24V Steady current: 10mA or less (rush current: 20mA or less)
<p>◎The following options are available.</p> <ul style="list-style-type: none"> • Transistor output • Reverse connect protection. • Level conversion. • Output current is increased to 100mA. 		Standard accessory	Two fixing nuts for threaded type
<ul style="list-style-type: none"> • Shape of contacting part • LED indicator • Cable 			

PT

1-signal plunger type
Straight touch type (Plain bearing)

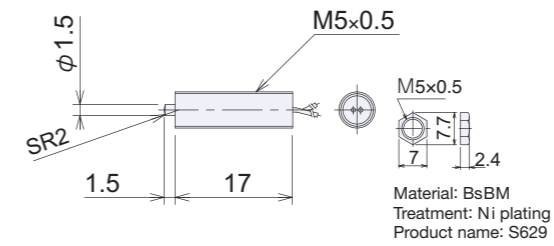
Contact type position switch series
www.metrol.co.jp/en

Ultra-small size high accuracy PT-Touch Switch

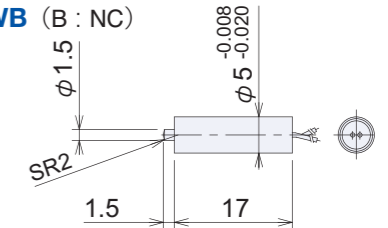
Outer dimension

Output mode B : Normally close

Core-wire cable
PT5M1WB (B : NC)
PT5M3WB (B : NC)

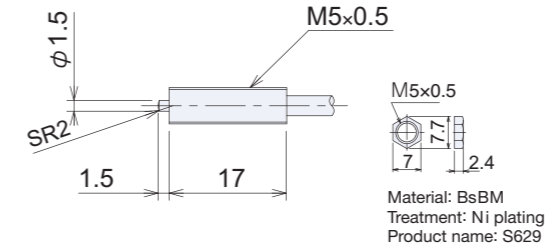


PT5S1WB (B : NC)
PT5S3WB (B : NC)

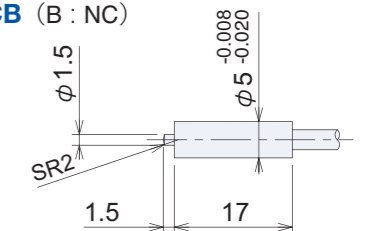


Cabtyre cable

PT5M1CB (B : NC)
PT5M3CB (B : NC)

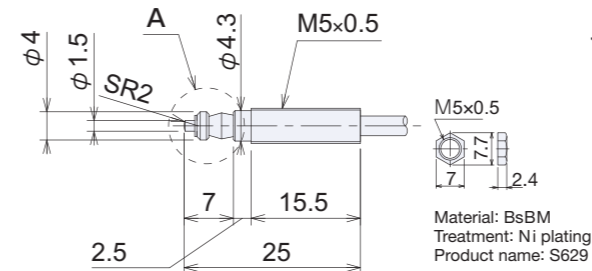


PT5S1CB (B : NC)
PT5S3CB (B : NC)

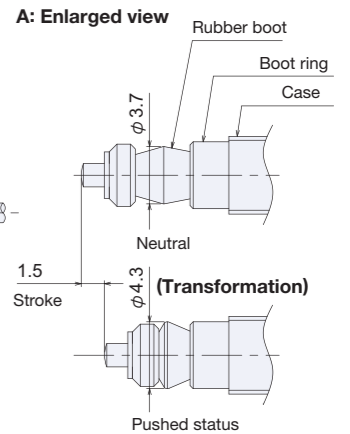
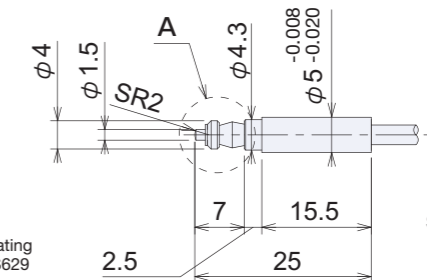


Water-resistant type (IP67) *3

PTP5M1CB (B : NC)
PTP5M3CB (B : NC)



PTP5S1CB (B : NC)
PTP5S3CB (B : NC)

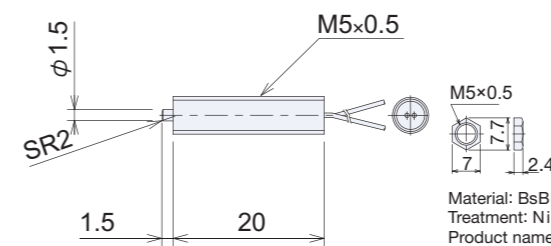


*3 Not suitable for use in harsh environment such as where there are scattering of coolants, etc. The use of High-accuracy MT Touch Switch P085DB / P08SB is recommended for such harsh environment. Refer to catalog AB8 (P3-4)

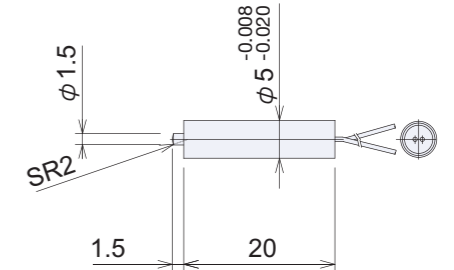
Output mode A : Normally open

Core-wire cable

PT5M1WA (A : NO)
PT5M3WA (A : NO)



PT5S1WA (A : NO)
PT5S3WA (A : NO)



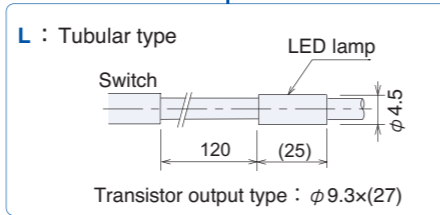
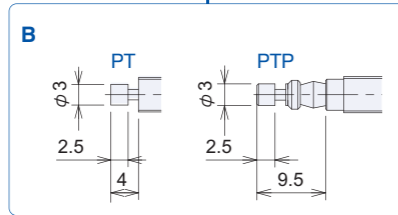
(-L) Refer to next page for LED indicator

Ultra-small size high accuracy PT-Touch Switch

Options

Output mode B: NC

Product name	Transistor output	Shape of contacting part	LED indicator	Cable
Core-wire cable PT5M1WB PT5S1WB PT5M3WB PT5S3WB Cabtyre PT5M1CB PT5S1CB PT5M3CB PT5S3CB PTP5M1CB PTP5S1CB PTP5M3CB PTP5S3CB	Only applicable for cabtyre cables TNA TNB TPA TPB	Blank: ϕ 1.5 plunger SR2 B: ϕ 3 flat SUS, Hardened	Blank: No LED L: 120mm from the switch	Blank: Standard (Core-wire cable 0.5m) (Cabtyre 2m) Only applicable for cabtyre cables, not usable when transistor output is selected. : Connector CN-2H

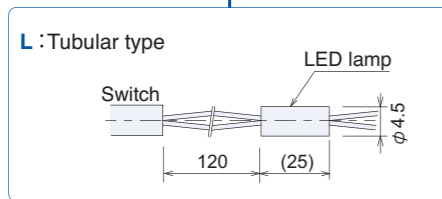


▶ e.g.) PT5M1WB-BL
▶ Transistor output
e.g.) PT5M1CBTNA-L

Output mode A: NO

Product name	LED indicator
PT5M1WA PT5S1WA PT5M3WA PT5S3WA	Blank: No LED L: 120mm from the switch

▶ e.g.) PT5M1WA-L



Connector (Only applicable for cabtyre cables, not usable when transistor output is selected.)

Mark	Product name	Cable	Protective structure	Dimension	Pullout strength
CH	CN-2H	2-cores ϕ 2.8	IP65	*Only applicable for cabtyre cables, not usable when transistor output is selected. The switch side is able to go through M6 nuts.	1.5N

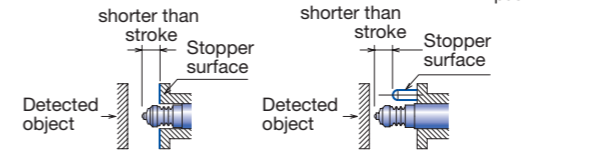
e.g.) PT5M1CB-1-CH-2
(High accuracy PT-Touch Switch PT5M1CB / Switch side cable 1m / Connector CN-2H / Machine side cable 2m)

Ultra-small size high accuracy PT-Touch Switch

How to use

Make contact with detected objects at right angle (within deflection angle $\pm 3^\circ$)
Do not press the plunger to the stroke end. It may cause malfunction due to the impact.

If there is a possibility to press the plunger to the stroke end, install a stopper separately to prevent the malfunction.



Tightening torque for case screws and nuts

	Screw / Nut	Tightening torque
PT-Touch Switch	M5x0.5	1N · m

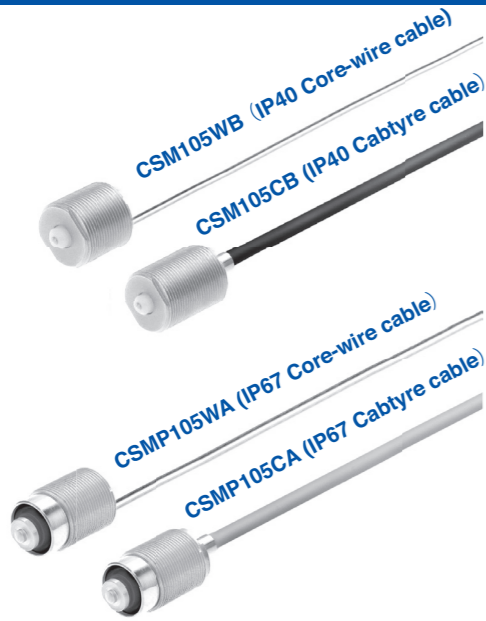
Circuit diagram

No LED	with LED
Normally close 	Normally close LED Normally On
Normally open 	Normally open LED Normally Off

Electrical specification / circuit diagram.

When using the switches with LED option, limit the current to below 10mA. Refer to catalog AB8 "Confirmation of switch operation" on P7-3.

PAT.



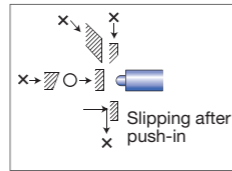
Very short mini type switch

Suitable for machines required to be small and for narrow installation space.

This product has longer stroke length (1.5mm) than Stopper mini type switch STM (Refer to P11).

No stopper function.

Application



Standard product name

Output mode	Pretravel	Standard product	Cable	Protective structure	Size	with LED unit:mm
A : Normally open	0.3	CSM105WA	Core-wire cable	IP65	M10×0.5	CSM105WA -L
		CSMP105WA		IP67		CSMP105WA -L
		CSM105CA	Cabtyre cable	IP65		CSM105CA -L
		CSMP105CA		IP67		CSMP105CA -L
B : Normally close	0 (*1)	CSM105WB	Core-wire cable	IP40	M10×0.5	CSM105WB -L
		CSMP105WB		IP67		CSMP105WB -L
		CSM105CB	Cabtyre cable	IP40		CSM105CB -L
		CSMP105CB		IP67		CSMP105CB -L

*1 Adjust the installed location of the switch by the signal switching point.

©When stopper function is required, choose Stopper mini type switch STM (Refer to P11).

-L: LED indicator (120mm from the switch)

Common specification

		unit:mm	
Switch structure	Dry contact	Cable	Core-wire cable: 0.5m (×2) Oil-resistant φ0.6 Tensile strength 15N Cabtyre cable: 2m Oil resistant φ2.8 / 2 cores, Tensile strength 30N φ5 30mm protective rubber tube (Detachable)
Output mode	A : Normally open / B : Normally close	Operating temperature range	0°C~80°C (Ice-free)*3
Stroke	1.5	Temperature drift	0
Repeatability	Both On→Off, Off→On/ 0.003 (At operating speed 50~200mm/min)*2	Oscillation	10~55Hz total amplitude 1.5 for X,Y,Z each direction
Movement differential	0	Impact	300m/s ² for X,Y,Z each direction
Contact life time	10million (If no specified bungle caused by vibration and used under voltage and current rating)	Contact rating	DC5V~DC24V Steady current : 10 mA or less (rush current: 20 mA or less)
Contact force	1N	Standard accessory	One fixing nut and a spanner for threaded type
Case material	SUS303		
Contacting part material	SUS HRc50		

*2 Operating speed slower than 10mm/min is not recommended.

*3 The sealed waterproof structure causes delay in return, when used under temperature (below 5°C).

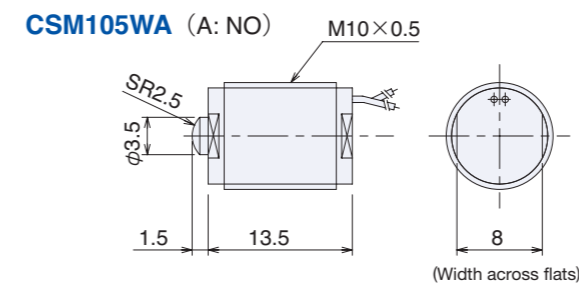
The following options are available.

- Transistor output
 - Reverse connect protection.
 - Level conversion.
 - Output current is increased to 100mA.
- LED indicator
- Cable

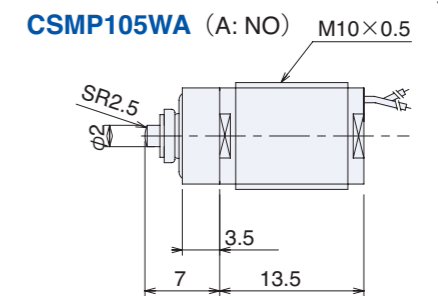
Outer dimension

Output mode A : Normally open

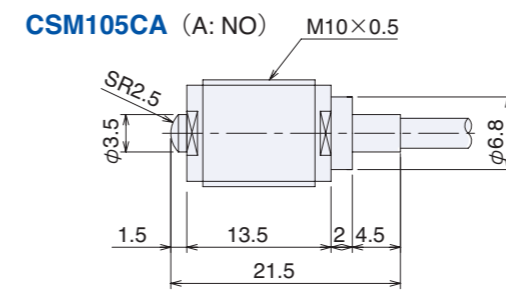
Core-wire cable (IP65)



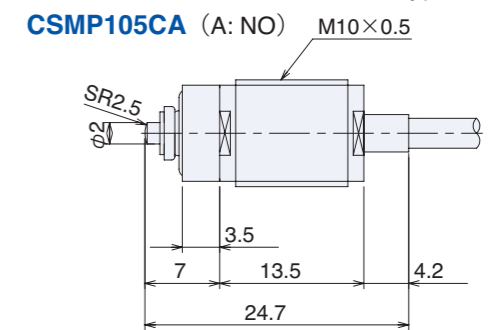
Core-wire cable Water-resistant type (IP67)



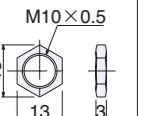
Cabtyre cable (IP65)



Cabtyre cable Water-resistant type (IP67)



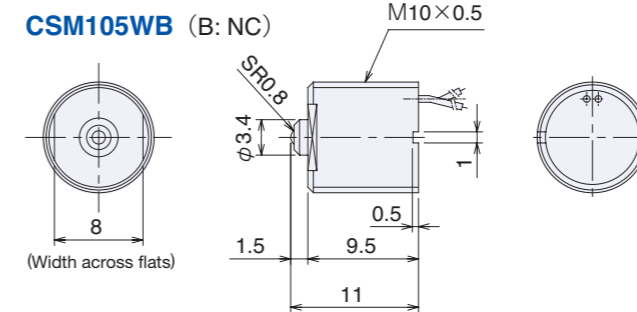
(-L) Refer to next page for LED indicator



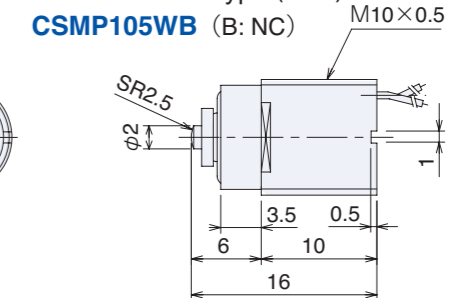
Material: BsBM
Treatment: Ni plating
Product name: S623

Output mode B : Normally close

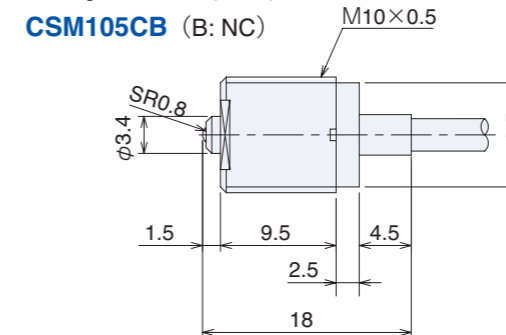
Core-wire cable (IP40)



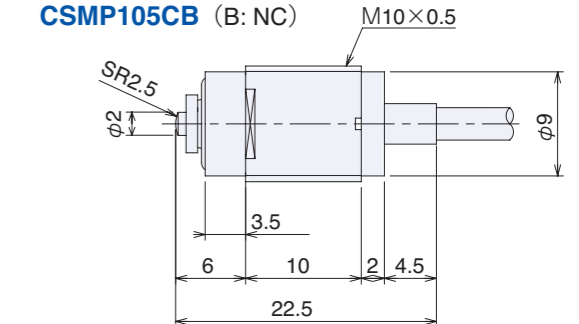
Core-wire cable Water-resistant type (IP67)



Cabtyre cable (IP40)



Cabtyre cable Water-resistant type (IP67)



(-L) Refer to next page for LED indicator

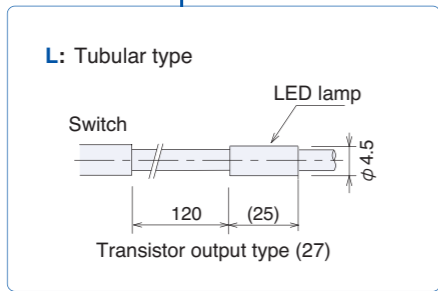
Options

<p>Standard product</p> <p>Core-wire cable CSM105WA CSMP105WA CSM105WB CSMP105WB</p> <p>Cabtyre cable CSM105CA CSMP105CA CSM105CB CSMP105CB</p>	<p>LED indicator</p> <p>Blank: No LED L: 120mm from the switch</p>	<p>Cable</p> <p>Blank: Standard (Core-wire cable 0.5m) (Cabtyre cable 2m)</p> <p>Only for cabtyre cable option: (Not selectable when transistor output is selected.) Connector CN-2H</p>
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Transistor output

Only for cabtyre cable

TNA	Added to standard product name
TNB	
TPA	
TPB	



- ▶ e.g.) CSM105WA-L
- ▶ Transistor output e.g.) CSM105CBTNA

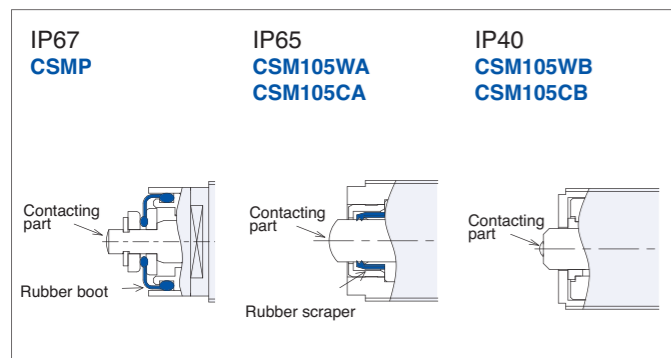
Connector (Only applicable for cabtyre cables, not usable when transistor output is selected.)

Mark	Product name	Cable	Protective Structure	Dimension	Pullout Strength
CH	CN-2H	2cores	φ2.8	IP65	1.5N

**Only applicable for cabtyre cables, not usable when transistor output is selected.*

e.g.) CSM105CA-1-CH-2
(CS-Touch Switch CSM105CA / Switch side cable 1m / Connector CN-2H / Machine side cable 2m)

Protective structure



Explanatory notes for options

For metal cuttings and coolant

The products in this series are not suitable for operating in a harsh machining environment (even IP67 type) where coolant contains metal cuttings.

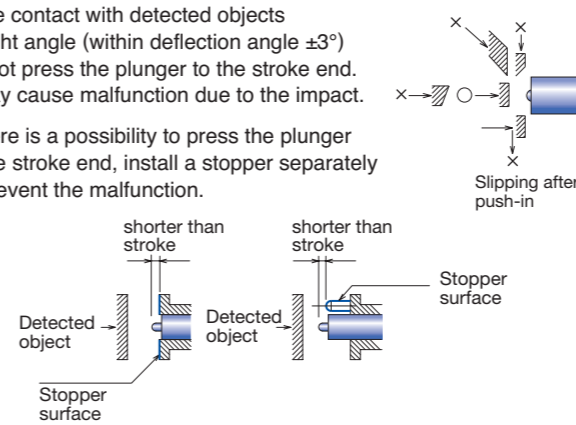
Tightening torque for case screws and nuts

	Screw / Nut	Tightening torque	Applicable models
CS-Touch Switch	M10x0.5	8N · m	CSM

How to use

Make contact with detected objects at right angle (within deflection angle $\pm 3^\circ$)
Do not press the plunger to the stroke end. It may cause malfunction due to the impact.

If there is a possibility to press the plunger to the stroke end, install a stopper separately to prevent the malfunction.



Circuit diagram

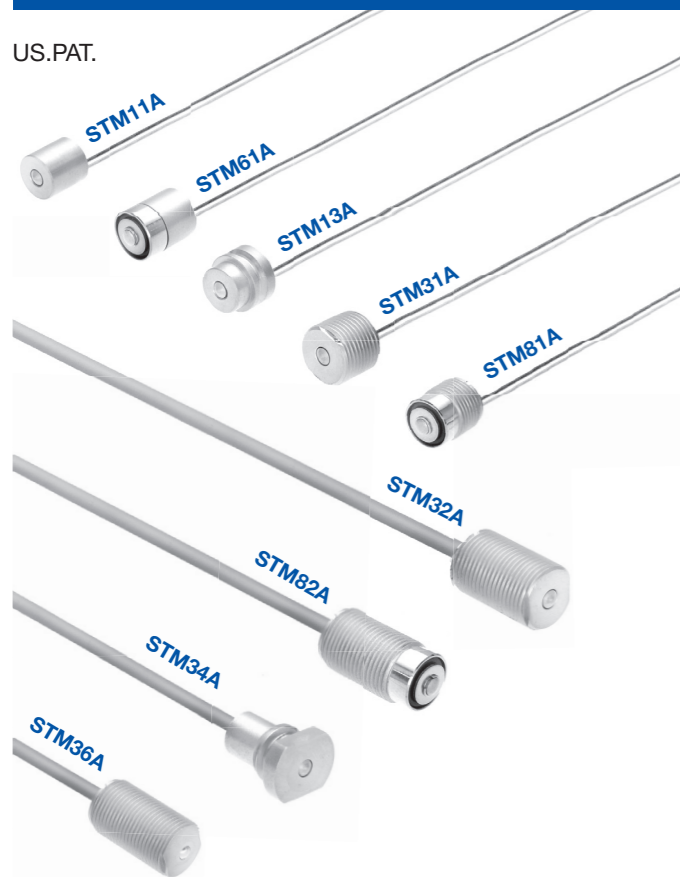
(Old wire color)

No LED	with LED
<p>Normally open (NO)</p> <p>○ Brown (Red)</p> <p>○ Blue (White)</p>	<p>Normally open (NO)</p> <p>○ Brown (Red)+</p> <p>○ Blue (White)-</p> <p>LED Normally Off</p>
<p>Normally close (NC)</p> <p>○ Brown (Red)</p> <p>○ Blue (White)</p>	<p>Normally close (NC)</p> <p>○ Brown (Red)+</p> <p>○ Blue (White)-</p> <p>LED Normally On</p>

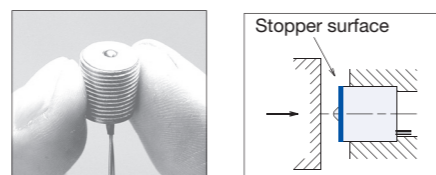
Electrical specification / circuit diagram.

When using the switches with LED option, limit the current to below 10mA. Refer to catalog AB8 "Confirmation of switch operation" on P7-3.

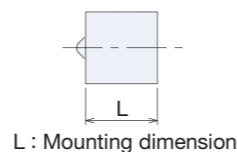
US.PAT.



- $\phi 8 \times 8$ (the smallest) Mini-stopper with a built-in switch
- Mini switch with a hardened stopper surface
- Best suited to demanding application and equipment for installation space.
- There are straight touch type and angled touch type.



- Friction-less plate spring is applied to this product
- Protective structure IP67 (Water-resistant type)
As for water-resistant type, the stopper surface is stored in the rubber boot.
- High dimensional accuracy for mounting simple setting at replacement.



Standard product name

Shape	Standard product name	Protective structure	Contact force	Size	Stroke	with LED	
Short type	Non-threaded type	STM11A	IP44	0.8N	$\phi 8 \times 8$	0.5	STM11A-L
		STM61A	IP67	1N	$\phi 9 \times 11.5$	0.3	STM61A-L
	Non-threaded type with flange	STM13A	IP44	0.8N	$\phi 10 \times 8$	0.5	STM13A-L
		STM63A	IP67	1N	$\phi 11 \times 11.5$	0.3	STM63A-L
	Threaded type	STM31A	IP44	0.8N	M10 \times 8	0.5	STM31A-L
		STM81A	IP67	1N	M10 \times 11.5	0.3	STM81A-L
	Threaded type with flange	STM33A	IP44	0.8N	$\phi 13 \times 8$	0.5	STM33A-L
		STM83A	IP67	1N	$\phi 13 \times 11.5$	0.3	STM83A-L
	Non-threaded/ threaded with a contacting ball type	STMB11A	IP44	0.8N	$\phi 8 \times 11$	0.5	STMB11A-L
		STM35A			M10 \times 11		STM35A-L
Long type	Non-threaded type	STM12A	IP44	0.8N	$\phi 8 \times 15$	0.5	STM12A-L
		STM62A	IP67	1N	$\phi 9 \times 18.5$	0.3	STM62A-L
	Non-threaded type with flange	STM14A	IP44	0.8N	$\phi 10 \times 15$	0.5	STM14A-L
		STM64A	IP67	1N	$\phi 11 \times 18.5$	0.3	STM64A-L
	Threaded type	STM32A	IP44	0.8N	M10 \times 15	0.5	STM32A-L
		STM82A	IP67	1N	M10 \times 18.5	0.3	STM82A-L
	Threaded type with flange	STM34A	IP44	0.8N	$\phi 13 \times 15$	0.5	STM34A-L
		STM84A	IP67	1N	$\phi 13 \times 18.5$	0.3	STM84A-L
	Non-threaded/ threaded with a contacting ball type	STMB12A	IP44	0.8N	$\phi 8 \times 18$	0.5	STMB12A-L
		STM36A			M10 \times 18		STM36A-L

©When stopper property is not required, CS-Touch Switch CSM with 1.5mm stroke is recommended. Refer to P7

-L : LED indicator (120mm from the switch)

unit:mm

Common specification

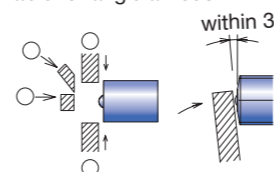
Switch structure	Dry contact
Output mode	A : Normally open
Signal point	Middle of the stroke
Repeatability	Both On→Off, Off→On/ 0.01 (At operating speed 50~200mm/min) *1
Movement differential	0
Contact life time	10 million (No bungle caused by vibration and use under contact rating)
Withstand load	3000N 1500N : In the case the contacting surface of the detected object is smaller than $\phi 6$ and the selected switch is IP44 (STM11~STM36)
Impact resistance	0.2J
Case and stopper surface material	SUS HRC45

*1 Operating speed slower than 10mm/min is not recommended.

How to use

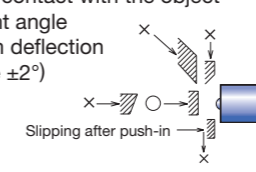
Contacting ball type

Suitable for angular touch



Other types

Make contact with the object at right angle (within deflection angle $\pm 2^\circ$)



The angle required to turn on the switch when the object can not make contact with the switch end.

Do not press the plunger beyond the stopper. It may cause malfunction due to the impact. (The contact surface of the objects should be more than 3.5mm in diameter for drip-proof type)

Tightening torque for case screws and nuts

Stopper Bolt with a Built-in Switch	Screw / Nut	Tightening torque	Applicable models
	M10	10N · m	STM

Explanatory diagram

Drip-proof type (IP44)

Water-resistant type (IP67)

⚠ The products in this series are not suitable for operating in a harsh machining environment (even IP67 type) where coolant contains metal cuttings.

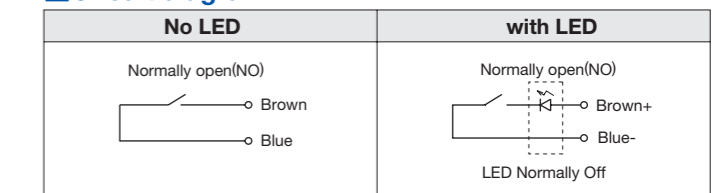
Contacting part material	SUS HRC50~
Cable	Short type: Core-wire cable 0.5m(x2) Oil-resistant $\phi 0.6$ Tensile strength 15N Long type: Cabtyre cable 2m Oil-resistant $\phi 2.8 / 2$ cores, Tensile strength 30N
Operating temperature range	0°C~80°C (Ice-free)*2
Temperature drift	0
Oscillation	10~55Hz total amplitude 1.5 for X,Y,Z each direction
Impact	300m/s ² for X,Y,Z each direction
Contact rating	DC5V~DC24V Steady current : 10 mA or less (rush current: 20 mA or less)
Standard accessory	Refer to the drawing

*2 The sealed waterproof structure causes delay in return, when used under temperature (below 5°C).

The following options are available.

- Transistor output
 - Reverse connect protection.
 - Level conversion.
 - Output current is increased to 100mA.
- LED indicator
- Cable direction
- Cable
- Heat-resistance

Circuit diagram



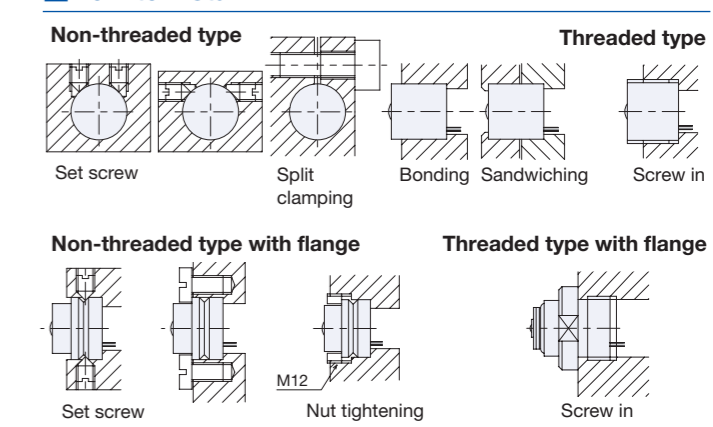
Electrical specification / circuit diagram.

When using the switches with LED option, limit the current to below 10mA.

Installing instruction

- When using under the specified static load resistance, the stopper surface of the product can be used as a stopper.
- When the expected load is larger than the specification, embed the switch in a sturdy stopper (to be prepared by the customer) for use.

How to install



Outer dimension Straight touch type Short type (Core-wire cable)

Stopper Bolt with a Built-in Switch

	Drip-proof type (IP44)	Water-resistant type (IP67)
Non-threaded type	<p>STM11A (A: NO)</p>	<p>STM61A (A: NO)</p>
Non-threaded type with flange	<p>STM13A (A: NO)</p>	<p>STM63A (A: NO)</p>
Threaded type	<p>STM31A (A: NO)</p> <p>Accessory : Spanner x 1, nut x 1 Sideways cable direction is not available</p>	<p>STM81A (A: NO)</p> <p>Material : BsBM Treatment : Ni plating Product name : S623B</p> <p>Accessory : Nut x 1 Sideways cable direction is not available</p>
Threaded type with flange	<p>STM33A (A: NO)</p> <p>Sideways cable direction is not available</p>	<p>STM83A (A: NO)</p> <p>Sideways cable direction is not available</p>

Outer dimension Angled touch type (Contacting ball)

	Short type (Cable: Core-wire cable)	Long type (Cable: Cabtyre)
Non-threaded type	<p>STMB11A (A: NO)</p>	<p>STMB12A (A: NO)</p>
Threaded type	<p>STM35A (A: NO)</p> <p>Accessory : Spanner x 1, nut x 1</p>	<p>STM36A (A: NO)</p> <p>Accessory : Spanner x 1, nut x 2, toothed washer</p>

Outer dimension Straight touch type Long type (Cabtyre cable)

Stopper Bolt with a Built-in Switch

	Drip-proof type (IP44)	Water-resistant type (IP67)
Non-threaded type	<p>STM12A (A: NO)</p>	<p>STM62A (A: NO)</p>
Non-threaded type with flange	<p>STM14A (A: NO)</p>	<p>STM64A (A: NO)</p>
Threaded type	<p>STM32A (A: NO)</p> <p>Accessory : Spannerx1, nutx2, toothed washer</p>	<p>STM82A (A: NO)</p> <p>Accessory : Nutx2, toothed washer</p>
Threaded type with flange	<p>STM34A (A: NO)</p> <p>Sideways cable direction is not available</p>	<p>STM84A (A: NO)</p> <p>Sideways cable direction is not available</p>

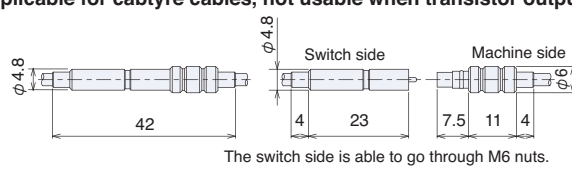
(-L) Refer to below for LED indicator

Options

Product name	LED indicator	Cable direction	Cable
STM series	<p>Blank: No LED</p> <p>L: 120mm from the switch</p>	<p>Blank: Straight</p> <p>R: Sideways (90°)</p> <p>Short type (Core-wire cable)</p> <p>Long type (Cabtyre)</p> <p>(The Sideways cable direction is not available for threaded type with flange and short, threaded type.)</p>	<p>Blank: Standard</p> <p>Short type 0.5m</p> <p>Cabtyre 2m</p> <p>Option</p> <p>Only for long type</p> <p>: Connector CN-2H</p> <p>(Refer to next page)</p>
Transistor output	<p>L: Tubular type</p> <p>LED lamp</p> <p>Switch</p> <p>120 (25)</p> <p>Transistor output : φ9.3x(27)</p>	<p>Blank: Short type (Core-wire cable)</p> <p>R: Short type</p> <p>Long type</p> <p>Standard dimension -2mm</p> <p>For threaded type, pay extra attention to damage on the cable during installation.</p>	
Only for long type	<p>TNA Added to standard product name</p> <p>TNB</p> <p>TPA</p> <p>TPB</p> <p>Refer to AB8 (P2-4)</p> <p>▶ e.g.) STM11A-LR</p> <p>▶ Transistor output e.g.) STM12ATNA</p>		

Stopper Bolt with a Built-in Switch

■ **Connector** (Only applicable for cabtyre cables, not usable when transistor output is selected.)

Mark	Product name	Cable	Protective Structure	Dimension	Pullout strength
CH	CN-2H	2cores φ2.8	IP65	<p>※Only applicable for cabtyre cables, not usable when transistor output is selected.</p> 	1.5N

e.g.) STM12A-1-CH-2

(Stopper Mini with a Built-in Switch **STM12A** / Switch side cable 1m / Connector **CN-2H** / Machine side cable 2m)

Common warnings and precautions

■ Electrical

- Use under the specified contact rating.
- I/F units with a built-in contact point protection circuit are effective for adverse condition environments where overcurrent may flow. Such environments may involve, regardless of the presence of contact points, inductive loads with coils (such inductive loads mainly mean relay coils, motors, solenoids, many of which require a current of 30mA or more when driven and generate counter-electromotive force when switched OFF). Refer to catalog AB8 (P2-2)
- Since operating errors may occur due to induction when high-voltage lines or power lines are wired within the same conduit or duct as switch wires, wire them in separate ducts.
- When using the switch with LED, keep the current below 10mA.
- Chattering may occur when opening and closing the circuit with dry contacts regardless of whether the switch has a snap action mechanism. Take the first signal as a judgment signal.

■ Cable related option entry

- 1) Refer to catalog AB8 catalog (P7-7) for water-resistance.
- 2) When extending cable length, use cabtyre cable having a cross-section area of at least 0.2mm².

■ Tightening torque for case screws and nuts

Screw / Nut	Tightening torque	Applicable models
M5×0.5	1N · m	PT5M / PTP5M
M10×0.5	8N · m	CSM
M10×0.75	10N · m	STM

Help desk

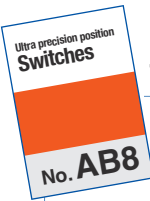
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