

CS-Touch Switch

High-precision positioning switch series
www.metrol.co.jp/en

CS / CSJ / CSS / CSK / CSP

1-signal plunger type

Straight touch type (Metal bearing)



Features

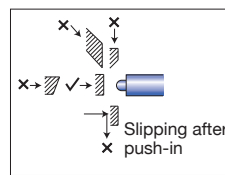
■ **Slim design allows side by side installation, wide range of variations.**

From M5 / Long stroke / Water-resistant

■ **High performance at reasonable price**

5 micron in repetitive accuracy

《Application》



Standard specification

unit:mm

	Product name	Output mode	Stroke	Size	Contacting part	Protective structure	with LED
Cylinder type (Threaded / Non-threaded)	CSJ055A	A : NO	2.8	M5×0.5	φ2 plunger, SR1.5 SUS, Hardened HRC50	IP65	CSJ055A-L
	CSJS50A			φ5			CSJS50A-L
	CS065A	A : NO		M6×0.5			CS065A-L
	CSS60 A / B	A : NO		φ6			CSS60A / B -L
	CS067 A / B	B : NC		M6×0.75			CS067A / B -L
	CSS80A	A : NO		φ8	φ3.5 plunger, SR3 SUS, Hardened HRC50		CSS80A-L
	CS087A			M8×0.75			CS087A-L
Long stroke	CSK087 A / B	A : NO	5	M8×0.75	Sφ2 SUS, Hardened HRC50	IP67	CSK087A / B -L
Waterproof	CSP087 A / B-A	B : NC	2.8				CSP087A / B -AL

-A : Contacting part ϕ 2 ball, SUS, Hardened HRC50

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

Common specification

unit:mm

Switch structure	Dry contact
Output mode	A : Normally open / B : Normally close
Pretravel	0.3
Repeatability	Both On→Off, Off→On/ 0.005 (range) (At operating speed 50-200mm/min) *
Movement differential	0
Contact life time	10million (If no specified bungle caused by vibration and used under voltage and current rating)
Contact force	1N
Case material	SUS HRC50
Standard accessory	Two fixing nuts for threaded type

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

Cable (Refer to P7-5)	Standard length 3m Oil resistant ϕ 2.8 / 2 cores, Tensile strength 30N, minimum bending R7
Operating temperature range	0°C-80°C (Ice-free)
Temperature drift	0 (because of no amplifier)
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 (Refer to P14-3)	DC5V-DC24V Steady current: 10 mA or less (rush current: 20 mA or less) When using the switch with LED, limit the current below 10mA.

◎The following options are available.

- Transistor output (Refer to P7-3)
 - Reverse connect protection.
 - Level conversion.
 - Output current is increased to 100mA.
- Shape of contacting part
- Protective cover
- LED indicator
- Contact force
- Cable direction
- Heat-resistance (P6-4)

C+R Automations- GmbH

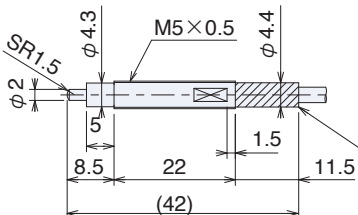
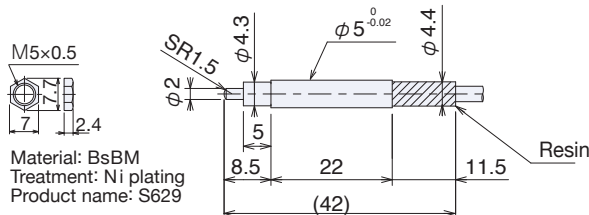
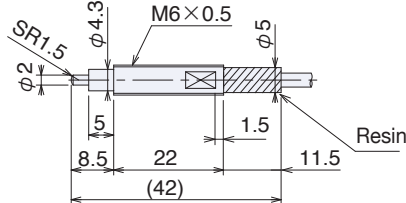
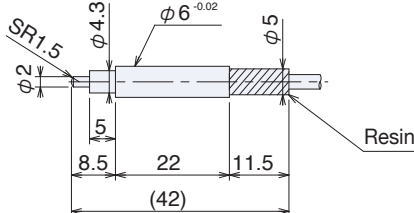
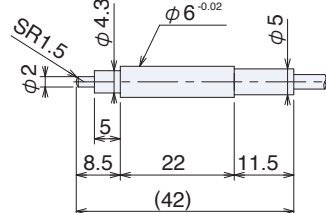
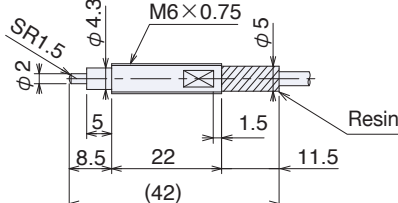
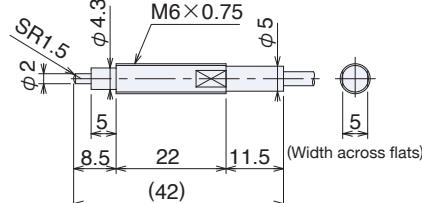
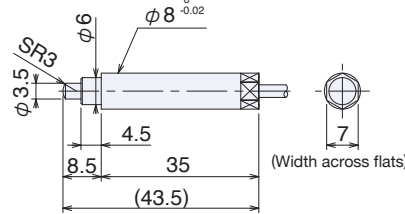
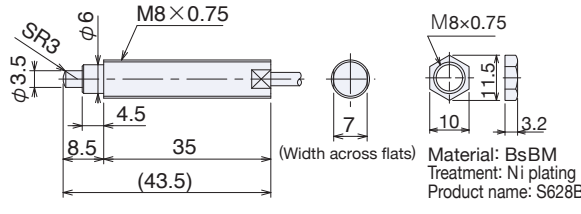
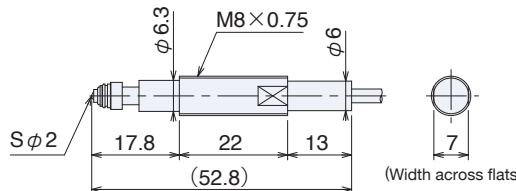
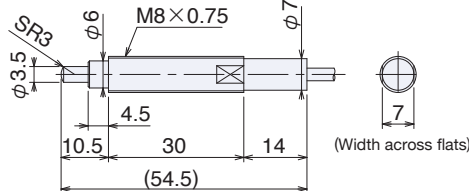
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www.crautomation.de

Änderungen vorbehalten

Outer dimension

M5 / $\phi 5$	<div data-bbox="252 257 474 288" data-label="Caption"> <p>CSJ055A (A : NO)</p> </div>  <div data-bbox="909 253 1134 284" data-label="Caption"> <p>CSJS50A (A : NO)</p> </div> 
M6 / $\phi 6$	<div data-bbox="252 571 458 602" data-label="Caption"> <p>CS065A (A : NO)</p> </div>  <div data-bbox="252 848 461 880" data-label="Caption"> <p>CSS60A (A : NO)</p> </div>  <div data-bbox="975 844 1185 875" data-label="Caption"> <p>CSS60B (B : NC)</p> </div>  <div data-bbox="252 1158 458 1189" data-label="Caption"> <p>CS067A (A : NO)</p> </div>  <div data-bbox="975 1153 1182 1184" data-label="Caption"> <p>CS067B (B : NC)</p> </div> 
M8 / $\phi 8$	<div data-bbox="252 1460 461 1491" data-label="Caption"> <p>CSS80A (A : NO)</p> </div>  <div data-bbox="868 1460 1077 1491" data-label="Caption"> <p>CS087A (A : NO)</p> </div>  <div data-bbox="252 1747 539 1778" data-label="Caption"> <p>Waterproof type (IP67)</p> </div> <div data-bbox="252 1796 504 1827" data-label="Caption"> <p>CSP087A-A (A : NO)</p> </div> <div data-bbox="252 1827 504 1859" data-label="Caption"> <p>CSP087B-A (B : NC)</p> </div>  <div data-bbox="868 1751 1241 1783" data-label="Caption"> <p>Long stroke type (Stroke 5mm)</p> </div> <div data-bbox="868 1796 1096 1827" data-label="Caption"> <p>CSK087A (A : NO)</p> </div> <div data-bbox="868 1827 1096 1859" data-label="Caption"> <p>CSK087B (B : NC)</p> </div> 

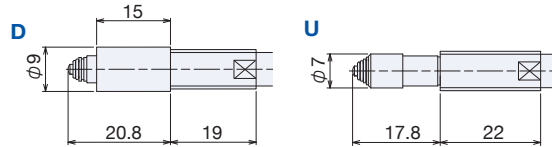
Options

Product name	Shape of contacting part	Protective cover	LED indicator	Contact force	Cable direction
$\phi 2$ plunger CSJ055A CSJS50A CS065A CSS60 A / B CS067 A / B	Blank: $\phi 2$ plunger SR1.5 A: $\phi 2$ flat B: $\phi 4$ flat C: Needle DP: Plastic	Blank: Not required	Blank: No LED L: 120mm from the switch LD *: Attached to the switch *Available only when perpendicular cable direction R is selected.	Blank: 1N S: 0.3N G: 0.5N H: 1.5N (The rubber scraper is not provided for "S". IP40) (Normally close type not acceptable for S and G)	Blank: Straight R: 90° (Normally close type not acceptable for R)
$\phi 3.5$ plunger CSS80A CS087A CSK087 A / B	Blank: $\phi 3.5$ plunger SR3 B: $\phi 3.5$ flat			Blank: 1N S: 0.3N G: 0.5N H: 1.5N (The rubber scraper is not provided for S,G. IP40) (Normally close type not acceptable for S and G)	Blank: Straight R: 90°
Water resistant type CSP087 A / B	A(Standard): S $\phi 2$ ball SUS, Hardened steel B: $\phi 3$ flat	Blank: No protective D: Downward U: Upward	Blank: No LED L: 120mm from the switch	Blank: 1N	Blank: Straight

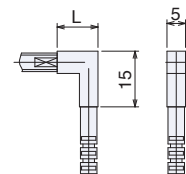
Transistor output
TNA Added to standard product name TNB TPA TPB (Refer to P7-3)

- ▶ e.g.) CSJ055A-ALSR
- ▶ Transistor output e.g.) CSJ055ATNA

Only for CSP



R: 90° (Not available for CSP)

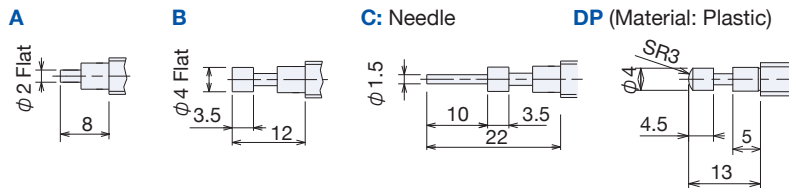


CSJ055A / CSJS50A
CS065A / CSS60A / CS067A
 $\phi 2$ plunger : (L) 9.5

CSS80A / CS087A / CSK087 A / B
 $\phi 3.5$ plunger : (L) 11

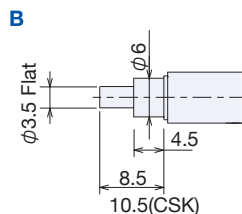
$\phi 2$ plunger

CSJ055A
CSJS50A
CS065A
CSS60 A / B
CS067 A / B



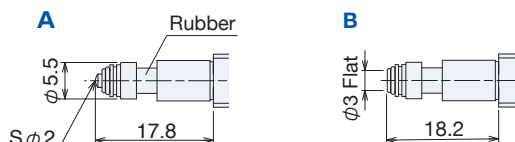
$\phi 3.5$ plunger

CSS80A
CS087A
CSK087 A / B

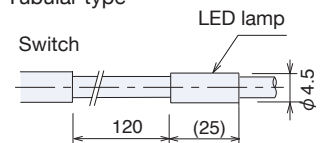


Waterproof type (IP67)

CSP087 A / B

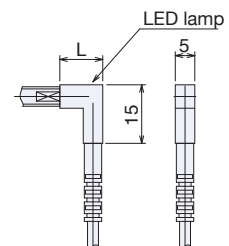


L: Tubular type



Transistor output type : $\phi 9.3 \times (32)$

LD **R:** Integrated with sensor *
(Not available for CSP)



CSJ055A / CSJS50A
CS065A / CSS60A / CS067A
 $\phi 2$ plunger : (L) 9.5

CSS80A / CS087A / CSK087 A / B
 $\phi 3.5$ plunger : (L) 11

*Available only when perpendicular cable direction R is selected.

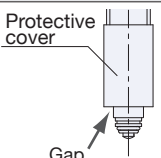
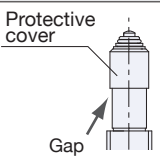
Options

Shape of contacting part

Product name	Mark: Shape	Shape of detected objects
ϕ 2 plunger CSJ055A CSJS50A CS065A CSS60 A/B CS067 A/B	Blank: ϕ 2 plunger SR1.5 A: ϕ 2 flat B: ϕ 4 flat C: Needle DP: ϕ 3.5, SR3	Flat Convex, ball (Cutters, drills) The bottom of the deep hole, Small detected surface Flat
ϕ 3.5 plunger CSS80A CS087A CSK087 A/B	Blank: ϕ 3.5 plunger SR3 B: ϕ 3.5 flat	Flat Convex, ball (Cutters, drills)

Protective covers (CSP only)

Choose the suitable cover according to switch mounting direction so that the metal cuttings and coolant can't enter from the gaps. (Refer to P14-5)

D: Mostly for downward installation	U: Mostly for upward installation
	

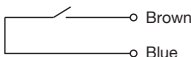
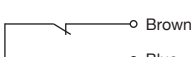
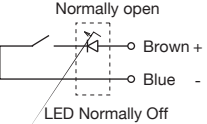
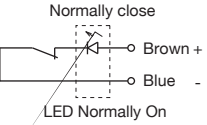
Note when installing on brackets, etc. :

When the diameter is large or a D shaped protection boot or special contact is used, pass the switch from the front side of the installation hole (remove the relay connector before installation).

Tightening torque for case screws and nuts

	Screw / Nut	Tightening torque	Applicable models
CS-Touch Switch	M5x0.5	2N · m	CSJ055
	M6x0.5	4N · m	CS065
	M6x0.75	4N · m	CS067
	M8x0.75	7N · m	CSP087

Circuit diagram

without LED	with LED
<p>Normally open</p>  <p>Normally close</p> 	<p>Normally open</p>  <p>Normally close</p> 

Electrical specification / circuit diagram. (Refer to P7-2)

When using the switches with LED option, limit the current below 10mA. (Refer to P14-3 "Confirmation of switch operation")

Product name	Mark: Shape	Shape of detected objects
Waterproof (IP67) CSP087 A/B	A: S ϕ 2 ball carbide B: ϕ 3 flat	Flat Convex, ball (Cutters, drills)

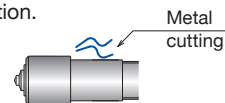
Contact force (Not available for CSP)

Mark: Shape	Operating condition
S: 0.3N	No chattering caused by vibration or impact
G: 0.5N	(No rubber boot is provided for "S", IP40)
H: 1.5N	Intense vibration or impact

Refer to P6-2 for low contact force type (0.1N)

For metal cuttings and coolant (CSP only)

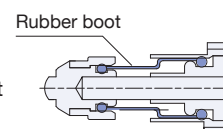
- Protective cover is strongly recommended to avoid damage from cuttings and coolant when the switch is used in machining environment.
- In addition, an extra cover is recommended to avoid direct hit by high-pressure coolant or heavy cuttings.
- For horizontal mounting, an extra cover prevents coolant or cuttings from entering inside and getting piled up on the body.
- Fabricate and place an extra cover to avoid metal chips adhering to the rubber boots during the grinding operation.



Protective structure

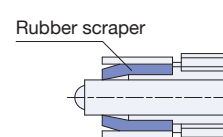
CSP type (IP67)

A rubber boot is applied to the plunger. As it has no rotation stopper, please do not twist the rubber boot by rotating the shaft.



Product other than CSP (IP65)

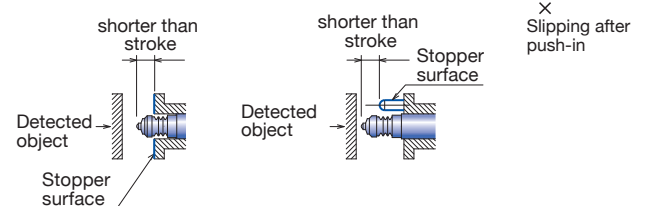
Rubber scraper is applied to the plunger. When the lip of the scraper is damaged by cuttings, the water resistance becomes impaired.



How to use

Make contact with detected objects at right angle (within deflection angle $\pm 3^\circ$)

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



CS-Touch Switch

CSHP

High-precision positioning switch series

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1 signal plunger type (Linear bushing bearing)

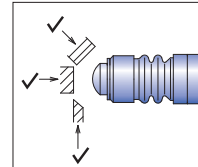
Sliding and angled touch, Waterproof type



Features

- A linear bushing bearing makes it optimum for slide and deflection angle contacts.
- IP67 protective structure, can be used in harsh environment.

《Application》



Standard specification

unit: mm

Product name	Output mode	Contacting part	With LED
CSHP085A	A : NO	φ4.7 plunger SR3 SUS, Hardened HRC45-50	CSHP085A-L
CSHP085B	B : NC		CSHP085B-L

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

Common specification

unit: mm

Switch structure	Dry contact
Output mode	A : Normally open / B : Normally close
Pretravel	0.3
Stroke	2.8 (axial direction)
Repeatability	Both On→Off, Off→On/ 0.005 (axial direction) (At operating speed 50-200mm/min)*
Movement differential	0
Contact life time	10 million (If no specified bungle caused by vibration and used under voltage and current rating)
Protective structure	IP67
Contact force	1N (axial direction)
Plunger shaft	No rotation stopper
Case material	SUS303

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

Cable (refer to P7-5)	Standard length 2m Oil resistant φ2.8/2 cores, Tensile strength 30N, Minimum bending R7
Operating temperature range	0°C-80°C (ice-free)
Temperature drift	0 (because of no amplifier)
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 (Refer to P14-3)	DC5V-DC24V Steady current: 10 mA or less (rush current: 20 mA or less) When using the switches with LED option, limit the current below 10mA.
Standard accessory	Two fixing nuts

◎The following options are available.

・Transistor output (Refer to P7-3)

- ・Reverse connect protection
- ・Level conversion
- ・Output current is increased to 100mA.

・LED indicator

Circuit diagram

without LED	with LED
<p>Normally open (NO)</p> <p>Normally closed (NC)</p>	<p>Normally open (NO)</p> <p>LED Normally Off</p> <p>Normally closed (NC)</p> <p>LED Normally On</p>

Electrical specification / circuit diagram. (Refer to P7-2)

When using the switches with LED option, limit the current below 10mA.
(Refer to P14-3 "Confirmation of switch operation")

How to use

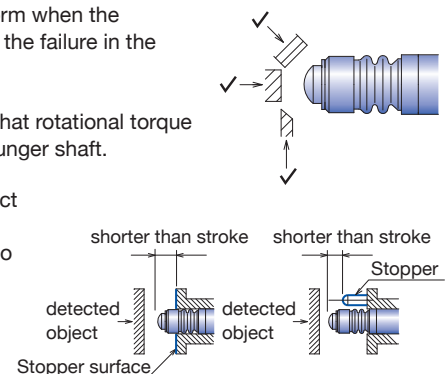
Suitable for sliding and angled objects.

Action is limited between the tip end and the edge of the internal bearing.

The end face may deform when the detector is hit, causing the failure in the return.

When sliding, be sure that rotational torque is not applied to the plunger shaft.

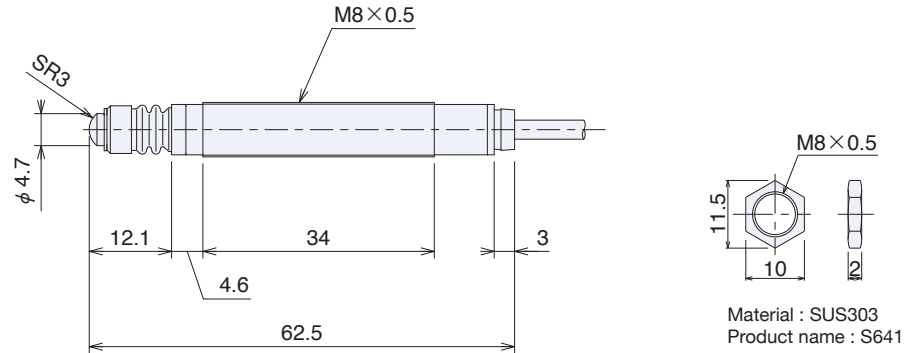
Do not press the contact to the stroke end.
If there is a possibility to press it to the stroke end, install a stopper separately to prevent malfunction.



Outer dimension

CSHP085A (A : NO)

CSHP085B (B : NC)



Options

Product name	LED indicator
CSHP085A CSHP085B	Blank : No LED L : 120mm from the switch
Transistor output	L : Tubular type
TNA Added to standard product name TNB TPA TPB (Refer to P7-3)	<p>LED lamp</p> <p>Switch</p> <p>120 (25)</p> <p>Transistor output type : $\phi 9.3 \times (32)$</p>

► e.g.) **CSHP085A-L**

► Transistor output e.g.) **CSHP085ATNA**

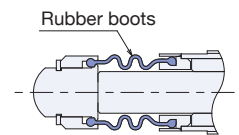
Tightening torque for case screws and nuts

	Screw/Nut	Tightening torque	Applicable model
CS-Touch Switch	M8×0.5	4N·m	CSHP

Protective structure

Rubber boots are used.

As it has no rotation stopper, please do not twist the rubber boot by rotating the shaft.



CS-Touch Switch

High-precision positioning switch series

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CSH

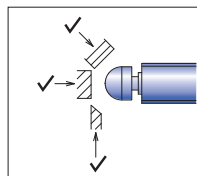
1-signal plunger type (Linear bushing bearing)

Sliding and angled touch type

Features

- A linear bushing bearing makes it optimum for slide and deflection angle contacts.

《Application》



Standard specification

Product name	Output mode	with LED
CSH121A-A	A : NO	CSH121A-AL
CSH121B-A	B : NC	CSH121B-AL

-A: S ϕ 10 hemisphere SUS, Hardened HRC 45-50

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

Common specification

Switch structure	Dry contact
Output mode	A : Normally open / B : Normally close
Pretravel	0.3
Stroke	2.8 (axial direction)
Repeatability	Both On→Off, Off→On/ 0.005 (axial direction) (At operating speed 50-200mm/min)* ¹
Movement differential	0
Contact life time	10million (If no specified bungle caused by vibration and used under voltage and current rating)
Protective structure	IP65
Contact force	1.5N (axial direction)
Plunger shaft	No rotation stopper
Case material	SUS 303

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

unit:mm

Cable (Refer to P7-5)	Standard length 2m Oil resistant ϕ 4 / 2 cores, Tensile strength 30N, minimum bending R7
Operating temperature range	0°C-80°C (Ice-free)
Temperature drift	0 (because of no amplifier)
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 (Refer to P14-3)	DC5V-DC24V Steady current: 10 mA or less (rush current: 20 mA or less) When using the switch with LED, limit the current below 10mA.
Standard accessory	Two fixing nuts

◎The following options are available.

- Transistor output (Refer to P7-3)
- Shape of contacting part
- LED indicator
- Contact force
- Cable

Circuit diagram

without LED	with LED
<p>Normally open (NO)</p> <p>Normally close (NC)</p>	<p>Normally open (NO)</p> <p>Normally close (NC)</p>

Electrical specification / circuit diagram. (Refer to P7-2)

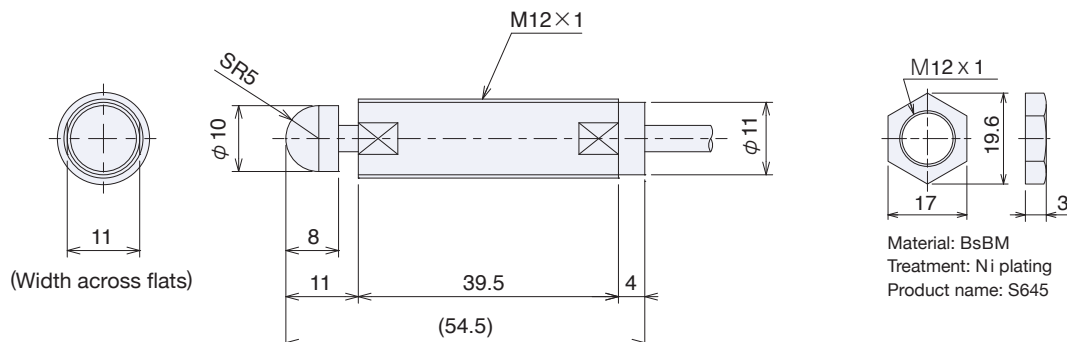
When using the switches with LED option, limit the current below 10mA. (Refer to P14-3 "Confirmation of switch operation")

Outer dimension

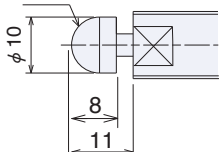
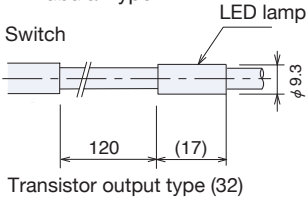
(-A) S ϕ 10 hemisphere SUS, Hardened HRC 45-50

CSH121A-A (A : NO)

CSH121B-A (B : NC)



Options

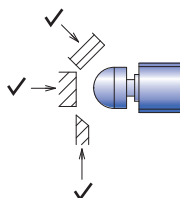
Product name	Shape of contacting part	LED indicator	Contact force
CSH121A CSH121B	A(Standard): S ϕ 10 hemisphere SUS, Hardened HRC45-50 AP: S ϕ 10 hemisphere plastic	Blank: No LED L: 120mm from the switch	Blank: 1.5N J: 0.8N (The rubber scraper is not provided for "J", IP40)
Transistor output TNA Added to TNB standard TPA product TPB name (Refet to P7-3)	A : Herdened SUS HRC45-50 AP : Plastic 	L: Tubular type 	

- e.g.) CSH121A-AL
- Transistor output
e.g.) CSH121BTNA-A

How to use

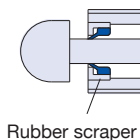
Suitable for sliding and angled objects.
Action is limited between the tip end and the edge of the internal bearing.
The end face may deform when the detector is hit, causing the failure in the return.

When sliding, be sure that rotational torque is not applied to the plunger shaft.



Protective structure

Rubber scraper is applied to the plunger.
When the lip of the scraper is damaged by cuttings, the water resistance becomes impaired.



Shape of contacting part

Mark: Shape	Operating condition
A: S ϕ 10 hemisphere	Flat (sliding, rotating objects)
AP: S ϕ 10 hemisphere plastic	

Contact force

Mark: Shape	Operating condition
J: 0.8N	The rubber scraper is not provided for "J". (IP40)

Tightening torque for case screws and nuts

	Screw / Nut	Tightening torque	Applicable model
CS-Touch Switch	M12x1	12N · m	CSH