

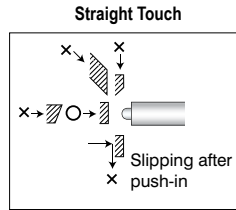


Precision Limit Switches

Precision Touch Limit Switches

Features

- Slim design (from M5) allows side-by-side installation
- Long-stroke and water-resistant models available
- 5 micron (μm) repeat accuracy
- Stainless steel housing
- Metal bearing
- Straight-touch and straight needle touch available



O indicates correct target approach and orientation.
X indicates approach and orientation that should be avoided.



CSJ055A-L



CS067A-CL

Precision Touch Limit Switches Selection Chart

Part Number	Price	Drawing Link	Actuator/ Head Type*	Barrel Type	Barrel Diameter/ Thread*	Stroke	Switching Output	Contact Force	Connection Type
Straight Touch									
CSJ055A	\$6boh:	PDF	Ø 2mm plunger, SR 1.5 mm	Threaded	M5×0.5	2.8mm	(1) N.O.	1N	Cable, 3m [9.8ft]
CSJ055A-L	\$1n7?:	PDF	Ø 2mm plunger, SR 1.5mm			2.8mm	(1) N.O.	1N	
CSJS50A	\$6bog:	PDF	Ø 2mm plunger SR 1.5mm	Smooth	Ø 5mm	2.8mm	(1) N.O.	1N	
CSJS50A-L	\$.1n7.:	PDF	Ø 2mm plunger, SR 1.5mm			2.8mm	(1) N.O.	1N	
CS065A-L	\$1n80:	PDF	Ø 2mm plunger, SR 1.5mm	Threaded	M6×0.5	2.8mm	(1) N.O.	1N	
CSS60A-L	\$1n81:	PDF	Ø 2mm plunger, SR 1.5mm	Smooth	Ø 6mm	2.8mm	(1) N.O.	1N	
CSS60B-L	\$1n82:	PDF	Ø 2mm plunger, SR 1.5mm			2.8mm	(1) N.C.	1N	
CS067A	\$.6boj:	PDF	Ø 2mm plunger, SR 1.5mm	Threaded	M6×0.75	2.8mm	(1) N.O.	1N	
CS067A-B	\$.6boi:	PDF	Ø 2mm plunger, Ø 4mm flat			2.8mm	(1) N.O.	1N	
CS067A-L	\$1n83:	PDF	Ø 2mm plunger, SR 1.5mm			2.8mm	(1) N.O.	1N	
CS067B	\$6bok:	PDF	Ø 2mm plunger, SR 1.5mm			2.8mm	(1) N.C.	1N	
CS067B-L	\$1n85:	PDF	Ø 2mm plunger, SR 1.5mm			2.8mm	(1) N.C.	1N	
CS067A-BL	\$1n84:	PDF	Ø 2mm plunger, Ø 4mm flat			2.8mm	(1) N.O.	1N	
CSS80A-L	\$1n86:	PDF	Ø 3.5mm plunger, SR 3mm	Smooth	Ø 8mm	2.8mm	(1) N.O.	1N	
CS087A-L	\$1n87:	PDF	Ø 3.5mm plunger, SR 3mm	Threaded	M8×0.75	2.8mm	(1) N.O.	1N	
CSK087A	\$.6bof:	PDF	Ø 3.5mm plunger, SR 3mm			5mm	(1) N.O.	1N	
CSK087A-L	\$1n88:	PDF	Ø3.5mm plunger, SR 3mm			5mm	(1) N.O.	1N	
CSK087B-L	\$1n89:	PDF	Ø 3.5mm plunger, SR 5mm			5mm	(1) N.C.	1N	
CSP087A-AL	\$1n8a:	PDF	Ø 5.5mm plunger, 2mm round			2.8mm	(1) N.O.	1N	
CSP087B-AL	\$1n8b:	PDF	Ø 5.5mm plunger, 2mm round			2.8mm	(1) N.C.	1N	
Straight Needle Contact Touch									
CSJ055A-CL	\$2bvo:	PDF	needle plunger, 1.5mm flat	Threaded	M5×0.5	2.8mm	(1) N.O.	1N	Cable, 3m [9.8ft]
CS065A-CL	\$2bvp:	PDF	needle plunger, 1.5mm flat		M6×0.5	2.8mm	(1) N.O.	1N	
CS067A-CL	\$2bvq:	PDF	needle plunger, 1.5mm flat		M6×0.75	2.8mm	(1) N.O.	1N	
Spring Plunger									
SP080A-L	\$6box:	PDF	Ø 2.5mm plunger SR 1.25mm	Threaded	M8×1.25 mm	3mm	(1) N.O.	8N	Cable 2m [6.56ft]

* Ø = diameter, SR = surface radius

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



Precision Limit Switches

Precision Touch Limit Switches Specifications						
Type	Straight Touch Switches					
Series	CS	CSJ	CSS	CSK	CSP	SP
Environmental						
Degree of Protection	IP65				IP67	IP40
Temperature Range	Operating: 0 to 80°C [32 to176°F] (Ice-free)					
Mechanical Ratings						
Enclosure Material	Stainless Steel					
Pretravel	0.3 mm					2.2 mm
Torque (for nuts on threaded barrels, set screws on smooth barrels)	4 N•m	2 N•m	N/A	N/A	7 N•m	L1 10N•m L2 5•Nm
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction					
Shock	300 m/s² for X, Y, Z each direction					
Repeat Accuracy	5 micron (µm) *					Both On-Off, Off-On 0.01mm (range)
Recommended Minimum Operating Speed	50mm (1.96 in)/minute					
Electrical Ratings						
Contact Life	10 million operations					3 million (spring)
Contact Voltage	5–24VDC					
Steady Current Rating	10mA or less					
Max In-rush Current Rating	20mA without LED indicator, 10mA with LED indicator					
Connection Type	Cable: 3m (2m for SP series) Oil resistant Ø2.8/ 2 cores, Tensile strength 30N, minimum bending R7					
Indicating	-L models: LED indicator (mounted in cable 120mm from the switch)					

* At operating speed 50-200 mm/minute. Operating speed slower than 10 mm/min is not recommended.

Circuit Diagrams

Without LED	With LED (-L models)
<p>Normally open (N.O.)</p>	<p>Normally open (N.O.)</p>
<p>Normally closed (N.C.)</p>	<p>Normally closed (N.C.)</p>

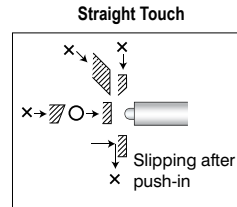


Precision Limit Switches

Precision Straight Touch Limit Switches

Features

- Ultra-small design (M5 or Ø5)
- 3 micron (µm) repeat accuracy
- No movement differential
- Dustproof / water-resistant (IP67) models available
- Stainless steel housing
- Metal bearing



O indicates correct target approach and orientation.

X indicates approach and orientation that should be avoided.

Precision Straight Touch Limit Switches Selection Chart

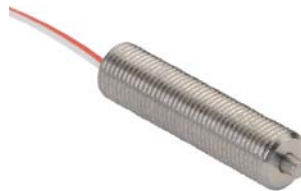
Part Number	Price	Drawing Link	Actuator/Head Type*	Barrel	Barrel Diameter/Thread*	Stroke	Switching Output	Contact Force	Connection Type
PT5M1WA	\$6bov:	PDF	Ø 1.5mm plunger, SR 2mm	Threaded	M5×0.5	1.5mm	(1) N.O.	0.5N	Core wire, 0.5m [1.6ft]
PT5M3WA	\$1n8h:	PDF	Ø 1.5mm plunger, SR 2mm			1.5mm	(1) N.O.	0.5N	
PT5M3WB	\$1n8e:	PDF	Ø 1.5mm plunger, SR 2mm			1.5mm	(1) N.C.	0.5N	
PT5M3CB	\$:6bot:	PDF	Ø1.5mm plunger, SR 2mm			1.5mm	(1) N.C.	0.5N	Cable, 2m [6.5ft]
PT5M3CB-L	\$:1n8f:	PDF	Ø 1.5mm plunger, SR 2mm			1.5mm	(1) N.C.	0.5N	
PT5S3CB-L	\$1n8g:	PDF	Ø 1.5mm plunger, SR 2mm	Smooth	Ø 5 mm	1.5mm	(1) N.C.	0.5N	
PTP5M3CB-B	\$06bou:	PDF	Ø 1.5mm plunger, Ø 3mm flat	Threaded	M5×0.5	1.5mm	(1) N.C.	0.8N	
PTP5M3CB-L	\$-1n8i:	PDF	Ø 11.5mm plunger, SR 2mm	Threaded		1.5mm	(1) N.C.	0.8N	
PTP5S3CB-L	\$-1n8j:	PDF	Ø 1.5mm plunger, SR 2mm	Smooth	Ø 5 mm	1.5mm	(1) N.C.	0.8N	

* Ø = diameter, SR = surface radius

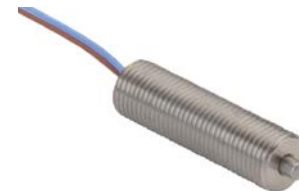
-L: LED indicator (mounted in cable 120mm from the switch)



PT5M1WA



PT5M3WA



PT5M3WB



PT5M3CB



PTP5M3CB-L



PTP5S3CB-L



PTP5M3CB-B



PTP5M3CB-L



PTP5S3CB-L



Precision Limit Switches

Precision Straight Touch Limit Switches Specifications		
Series	PT5x3xx	PTP5x3CB
Environmental		
Degree of Protection	IP40	IP67
Temperature Range	Operating: 0 to 80°C [32 to 176°F] (Ice-free)	
Mechanical Ratings		
Enclosure Material	303 Stainless Steel	
Pretravel	0* (PT5M3WA and PT5M1WA about 0.3 mm)	
Torque (for nuts on threaded barrels, set screws on smooth barrels)	1 N·m	
Vibration	10–55 Hz total amplitude 1.5 for X, Y, Z each direction	
Shock	300 m/s² for X, Y, Z each direction	
Electrical Ratings		
Contact Life	3 million operations	
Repeat Accuracy	Both On–Off, Off–On: 0.003 mm**	
Recommended Minimum Operating Speed	50 mm/minute	
Contact Voltage	5–24 VDC	
Steady Current Rating	10mA or less	
Max In-rush Current Rating	20mA without LED indicator, 10mA with LED indicator	
Connection Type	PTxxxWx: Core-wire cable, 0.5m (×2) Oil resistant Ø 0.6 Tensile strength 15N. PTxxxCB: Cable, 2m Oil-resistant Ø2.8/2 cores Tensile strength 30N, Minimum bending R7.	
Indicating	-L models: LED indicator (mounted in cable 120mm from the switch)	

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

** At operating speed 50-200 mm/minute. Operating speed slower than 10 mm/min is not recommended.

Circuit Diagrams

Without LED	With LED (-L models)
<p>Normally open (N.O.)</p>	
<p>Normally closed (N.C.)</p>	<p>Normally closed (N.C.)</p>



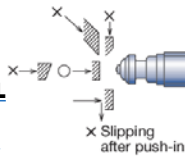
Precision Limit Switches

High Precision Touch Limit Switches

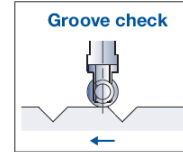
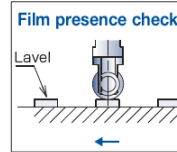
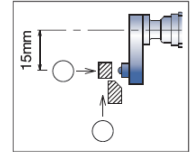
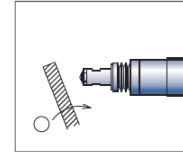
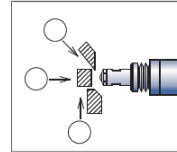
Features

- 0.5 micron (μm) repeat accuracy
- No movement differential
- No temperature drift
- Dustproof / water-resistant (IP67)
- LED indicator
- Stainless steel housing

P085DB-AL
P10DB-A
P10DA-AL
P10DB-AL
P10DLB-AL



O indicates correct target approach and orientation.
 X indicates approach and orientation that should be avoided.



P10DHA-TML
P10DHB-TML
P10DHLTB-TML

High Precision Touch Limit Switches Selection Chart

Part Number	Price	Drawing Link	Actuator/Head Type*	Barrel Type	Barrel Diameter/Thread	Stroke	Switching Output	Contact Force	Connection Type
Straight Touch									
P085DB-AL	\$01n8k:	PDF	Ø 5.5mm plunger, 2mm round	Threaded	M8×0.5	3mm	(1) N.C.	1N	Cable 3m [9.8ft]
P10DB-A	\$06bos:	PDF	Ø8.5mm plunger, 2mm round	Threaded	M10×0.5	3mm	(1) N.C.	1N	
P10DB-AL	\$-01n8l:	PDF	Ø 8.5mm plunger, 2mm round	Threaded	M10×0.5	3mm	(1) N.C.	1N	
P10DA-AL	\$01n8n:	PDF	Ø 8.5mm plunger, 2mm round	Threaded	M10×0.5	3mm	(1) N.O.	1N	
P10DLB-AL	\$045hz:	PDF	Ø 8.5mm plunger, 2mm round	Threaded	M10×0.5	10mm	(1) N.C.	1N	
Straight Touch With Ball Bearing									
P10DHA-TML	\$;045h]:	PDF	Ø 2.5mm plunger, 8mm roller	Threaded	M14×0.5	3mm	(1) N.O.	1N	Cable 3m [9.8ft]
P10DHB-TML	\$;045h[:	PDF	Ø 2.5mm plunger, 8mm roller	Threaded	M14×0.5	3mm	(1) N.C.	1N	
P10DHLTB-TML	\$045h_:	PDF	Ø 2.5mm plunger, 8mm roller	Threaded	M14×0.5	10mm	(1) N.C.	1N	

* Ø = diameter, SR = surface radius

-xL: LED indicator (mounted in cable 120mm from the switch)



P085DB-AL



P10DB-A



P10DB-AL



P10DA-AL



P10DLB-AL



P10DHA-TML



P10DHB-TML



P10DHLTB-TML



Precision Limit Switches

High Precision Touch Limit Switches

High Precision Touch Limit Switches Specifications				
Series	P08	P10	P10DH	P10DHL
Environmental				
Degree of Protection	IP67			
Temperature Range	Operating: 0 to 80°C [32 to 176°F] (Ice-free)			
Mechanical Ratings				
Enclosure Material	303 Stainless Steel			
Pretravel	0*	P10DA / P10DHA: 0.2 mm P10DB / P10DHB: 0*		0*
Torque (for nuts on threaded barrels, set screws on smooth barrels)	4 N•m (2.95 lb•ft)	8 N•m (5.90 lb•ft)	10 N•m (7.38 lb•ft)	
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction			
Shock	300 m/s² for X, Y, Z each direction			
Repeat Accuracy	Both On–Off, Off–On: 0.0005 mm (range)**			
Recommended Minimum Operating Speed	50mm/minute			
Electrical Ratings				
Contact Life	3 million operations			
Contact Voltage	5–24VDC			
Steady Current Rating	10mA or less			
Max In-rush Current Rating	20mA without LED indicator, 10mA with LED indicator			
Connection Type	Cable: 3m Oil resistant Ø5/2 cores (P08: Ø4/2 cores), tensile strength 30N, minimum bending R7, 20AWG			
Indicating	-AL: LED indicator (mounted in cable 120mm from the switch)			

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

** At operating speed 50-200 mm/minute. Operating speed slower than 10 mm/min is not recommended.

Circuit Diagrams

Without LED	With LED (-AL models)
<p>Normally open (N.O.)</p>	<p>Normally open (N.O.)</p> <p>LED Normally Off</p>
<p>Normally closed (N.C.)</p>	<p>Normally closed (N.C.)</p> <p>LED Normally On</p>



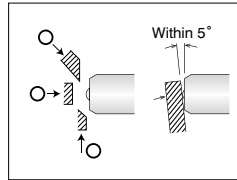
Precision Limit Switches

Ball Plunger Limit Switches

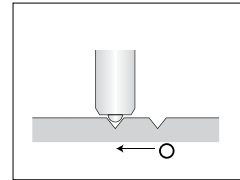
Features

- Indexing positioning ball plunger combined with touch switch for confirmation signal
- Dual function reduces number of components required
- 10 micron (μm) repeat accuracy
- Angled/Sliding Touch
- Higher contact force ideal for indexing

Angled/Sliding Touch



Indexing Touch



O indicates correct target approach and orientation.

Ball Plunger Limit Switches Selection Chart

Part Number	Price	Drawing Link	Actuator/Head Type*	Barrel Type	Barrel Diameter/Thread*	Stroke	Switching Output	Contact Force	Connection Type
Indexing/Angled/Sliding Touch									
<u>BP060A-F</u>	\$6boe:	<u>PDF</u>	Ø 3mm ball plunger	Threaded	Ø M6×1.0	0.8mm	(1) N.O.	1N	Cable 2m [6.5 ft]
<u>BP060A-L</u>	\$1n8p:	<u>PDF</u>	Ø 3mm ball plunger			0.8mm	(1) N.O.	8-13N	
<u>BP060A-LF</u>	\$1n8q:	<u>PDF</u>	Ø 3mm ball plunger			0.8mm	(1) N.O.	1N	
<u>BP080A-L</u>	\$2bvs:	<u>PDF</u>	Ø 4mm ball plunger		Ø M8×1.25	1.0mm	(1) N.O.	10-16N	
<u>BP080A-LF</u>	\$2bvt:	<u>PDF</u>	Ø 4mm ball plunger			1.0mm	(1) N.O.	1N	
<u>BP100A-L</u>	\$-2bvi:	<u>PDF</u>	Ø 5mm ball plunger		Ø M10×1.5	1.2mm	(1) N.O.	15-20N	
<u>BP100A-LF</u>	\$-2bvj:	<u>PDF</u>	Ø 5mm ball plunger			1.2mm	(1) N.O.	1N	
<u>BP4SWA</u>	\$1n8s:	<u>PDF</u>	Ø 3mm ball plunger	Smooth	Ø 4mm	0.8mm	(1) N.O.	1N	Core wire 0.5m [1.64 ft]
<u>BP5MWA</u>	\$;1n8t:	<u>PDF</u>	Ø 3mm ball plunger	Threaded	M5×0.5	1mm	(1) N.O.	1N	

* Ø = diameter



[BP060A-F](#)



[BP060A-L](#)



[BP080A-L](#)



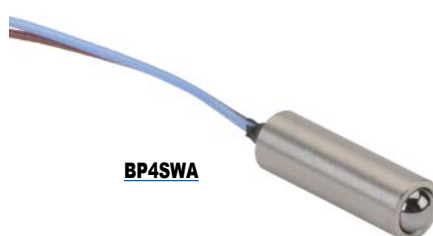
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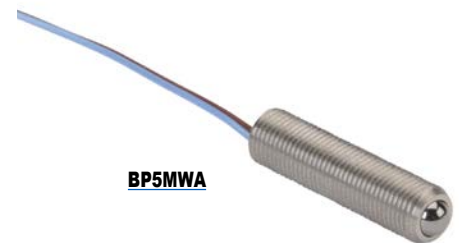
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[BP100A-LF](#)



[BP4SWA](#)



[BP5MWA](#)



Precision Limit Switches

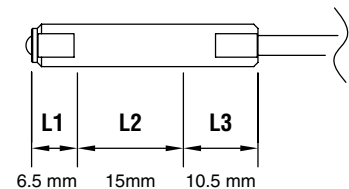
Ball Plunger Limit Switches Specifications					
Series	BP060A	BP080A	BP100A	BP4SWA	BP5MWA
Environmental					
Degree of Protection	IP40				
Temperature Range	Operating: 0 to 80°C [32 to 176°F] (Ice-free)				
Mechanical Ratings					
Enclosure Material	303 Stainless Steel				
Pretravel	0.3 mm				
Torque (for nuts on threaded barrels, set screws on smooth barrels)	See Torque Limit Figure			NA	1 N•m
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction				
Shock	300 m/s² for X, Y, Z each direction				
Repeat Accuracy	Both On–Off, Off–On: 0.01 mm (range)(axial direction)*				
Recommended Minimum Operating Speed	50mm/minute				
Electrical Ratings					
Contact Life	3 million operations			1 million operations	
Contact Voltage	5–24VDC				
Steady Current Rating	10mA or less				
Max In-rush Current Rating	10mA (limit current to protect LED indicator)			20mA	
Connection Type	Cable: 2m Oil resistant Ø2.8/2 cores, Tensile strength 30N, minimum bending R7.			Core wire cable: 0.5m (×2), Oil resistant, Ø0.66, Tensile strength 15N	
Indicating	-L and -LF models: LED indicator (mounted in cable 120mm from the switch)			N/A	

* At operating speed 50-200 mm/minute. Operating speed slower than 10 mm/min is not recommended.

Circuit Diagrams

Without LED	With LED
<p>Normally open (N.O.)</p>	<p>Normally open (N.O.)</p> <p>LED Normally Off</p>

Torque Limits



Tightening Torque for Case Screws and Nuts						
Applicable Models	L1		L2		L3	
	Length	Tightening Torque	Length	Tightening Torque	Length	Tightening Torque
BP060A	6.5mm	2.5 N•m [1.84 lb•ft]	15mm	5 N•m [3.68 lb•ft]	10.5mm	2.5 N•m [1.84 lb•ft]
BP080A	8mm	5 N•m [3.68 lb•ft]	21.5mm	10 N•m [7.37 lb•ft]	5.5mm	5 N•m [3.68 lb•ft]
BP100A	6.5mm	15 N•m [11.06 lb•ft]	22.5mm	25 N•m [18.44 lb•ft]	9mm	15 N•m [11.06 lb•ft]

Caution: Use the lower torque (i.e. torque corresponding to L1 and L3) while tightening the bolt between lengths L1 and L2 or L2 and L3 in the picture. Please make sure to use a locknut if the bolt is likely to shift in position due to the vibrational impacts.



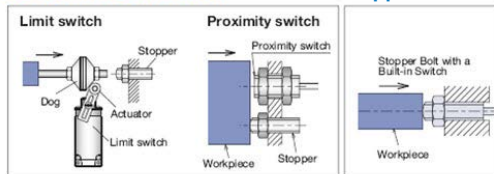
Precision Limit Switches

Stopper Bolt Precision Limit Switches

Overview

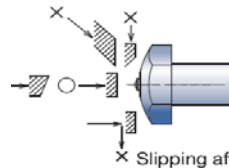
Stopper bolt precision limit switches incorporate a mechanical stop along with the limit switch function, eliminating the need for a separate mechanical stop in many situations. They can also absorb the high-impact forces required to stop a load.

Stopper Bolt Limit Switches can reduce parts count
conventional switches stopper bolt switch



Features

- 2 tasks with one device
- Housing a high-accuracy built-in switch in a stopper bolt
- Provides higher contact force ideal for indexing/positioning
- 10 micron (μm) repeat accuracy
- No movement differential
- Stainless steel housing



O indicates correct target approach and orientation.

X indicates approach and orientation that should be avoided.

Stopper Bolt Precision Limit Switches Selection Chart									
Part Number	Price	Drawing Link	Actuator/Head Type*	Barrel Type	Barrel Diameter/Thread	Stroke	Switching Output	Contact Force	Connection Type
STP100UA-L	\$,2bv,:	PDF	Ø 5.5mm plunger with upward cover Ø 5mm	Threaded	M10×1.5	0.7mm	(1) N.O.	4N	Cable 2m [6.56 ft]
STP100DA-L	\$2bx0:	PDF	Ø 5.5mm plunger with downward cover Ø 5mm	Threaded	M10×1.5	0.7mm	(1) N.O.	4N	
STS060PA	\$6boy:	PDF	Ø 1.5mm plunger, 3.4mm flat	Threaded	M6×1.0	0.7mm	(1) N.O.	2N	
STS060PA-L	\$45h#:	PDF	Ø 1.5mm plunger, 3.4mm flat	Threaded	M6×1.0	0.7mm	(1) N.O.	2N	
STS080PA-L	\$2bx1:	PDF	Ø 1.5mm plunger, 4.5mm flat	Threaded	M8×1.25	0.7mm	(1) N.O.	2N	
STS100PA-L	\$2bx2:	PDF	Ø 1.5mm plunger, 4.5mm flat	Threaded	M10×1.5	0.7mm	(1) N.O.	2N	
STE060PA-L	\$,45h!:	PDF	Ø 1.5mm plunger, 3.4mm flat with hex	Threaded	M6×1.0	0.7mm	(1) N.O.	2N	
STE080PA-L	\$2bx3:	PDF	Ø 1.5mm plunger, 4.5mm flat with hex	Threaded	M8×1.25	0.7mm	(1) N.O.	2N	
STE100PA-L	\$2bx4:	PDF	Ø 1.5mm plunger, 4.5mm flat with hex	Threaded	M10×1.5	0.7mm	(1) N.O.	2N	

* Ø = diameter

STP Series (Stopper With Protective Cover)



[STP100UA-L](#)

STS Series (Straight Stopper Bolt)



[STS060PA-L](#)

STE Series (Hexagonal Stopper Bolt)



[STE060PA-L](#)



[STP100DA-L](#)



[STS080PA-L](#)



[STE080PA-L](#)



[STS060PA](#)



[STS100PA-L](#)



[STE100PA-L](#)



Precision Limit Switches

Stopper Bolt Precision Limit Switches Specifications

Series	STP	STS	STE
Environmental			
Degree of Protection	IP67**	IP65**	
Temperature Range	Operating: 0 to 80°C [32 to 176°F] (Ice-free)		
Mechanical Ratings			
Enclosure Material	Stainless steel		
Torque (for nuts on threaded barrels, set screws on smooth barrels)	See Torque Limit Figure		
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction		
Shock	300 m/s² for X, Y, Z each direction		
Repeat Accuracy	Both On-Off, Off-On/ 0.01 (range) (At operating speed 50-200mm/min) *2		
Recommended Minimum Operating Speed	50mm (1.96in)/minute		
Withstand Load	5000N		
Electrical Ratings			
Contact Life	10 million (No bungle caused by vibration and use under contact rating)		
Impact resistance	0.4J		
Contact Voltage	5–24VDC		
Steady Current Rating	10mA or less		
Max In-rush Current Rating	20mA without LED indicator, 10mA with LED indicator		
Connection Type	Standard length 2m [6.56 ft] oil resistant 2.8 / 2 cores, 26AWG Tensile strength 30N, minimum bending R7		
Indicating	-L models: LED indicator (mounted in cable 120mm from the switch)		

* At operating speed 50-200 mm/minute. Operating speed slower than 10 mm/min is not recommended.

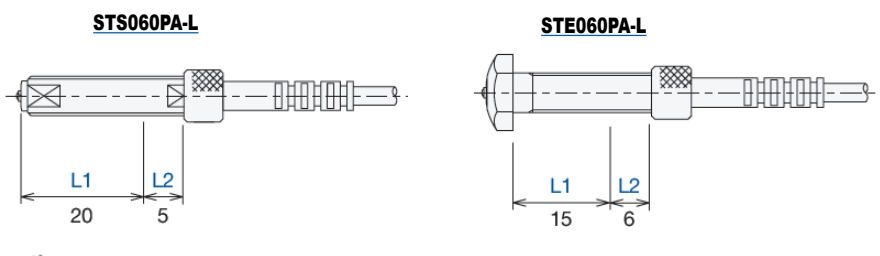
** At normal temperature (0–80°C [32–176°F]).

Circuit Diagram

Without LED	With LED (-L models)
<p>Normally open (N.O.)</p>	<p>Normally open (N.O.)</p>

Torque Limits

Applicable models	Tightening torque
STS060PA-L	L1: 5 N•m [3.68 lb•ft] L2: 2.5 N•m [1.84 lb•ft]
STE060PA-L	
STS060PA	
STS080PA-L	10 N•m [7.38 lb•ft]
STE080PA-L	10 N•m [7.38 lb•ft]
STS100PA-L	25 N•m [18.44 lb•ft]
STE100PA-L	25 N•m [18.44 lb•ft]
STP100UA-L	25 N•m [18.44 lb•ft]
STP100DA-L	25 N•m [18.44 lb•ft]





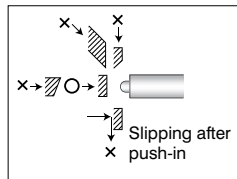
Precision Limit Switches

Low Contact Force Limit Switches: CSFN / CS / CSJ

Features

- 0.1N and 0.5N contact force
- 5 micron (µm) and 10 micron (µm) repeat accuracy
- Stainless steel housing
- Metal bearing
- Straight-touch and straight needle touch available

Low Contact Force Straight Touch

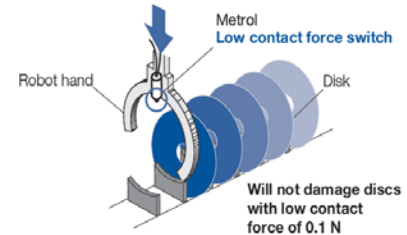


O indicates correct target approach and orientation.

X indicates approach and orientation that should be avoided.

CSFN105A-H6X must be mounted downward

Detects presence of HDD discs



Low Contact Force Limit Switches Selection Chart

Part Number	Price	Drawing Link	Actuator/ Head Type*	Barrel Type	Barrel Diameter/Thread*	Stroke	Switching Output	Contact Force	Connection Type
Low Contact Force, Metal Bearing, Downward Mounting Only									
<u>CSFN105A-H6X</u>	\$45hy:	PDF	Ø 2mm plunger [0.079 in] SR 1.5 mm [0.059 in]	Threaded	M10x0.5	2mm [0.079in]	NPN, N.O.	0.1N	3m [9.8 ft] cable
Low Contact Force, Straight Touch, Metal Bearing									
<u>CS067A-LG</u>	\$45hy:	PDF	Ø 2mm plunger [0.079 in] SR 1.5 mm [0.059 in]	Threaded	M6x0.75	2.8mm [0.110in]	(1) N.O.	0.5N	3m [9.8 ft] cable
Low Contact Force, Straight Touch, Needle Contact									
<u>CSJ055A-CG</u>	\$45ht:	PDF	needle plunger Ø 1.5mm flat [0.059 in]	Threaded	M5x0.5	2.8mm [0.110in]	(1) N.O.	0.5N	3m [9.8 ft] cable

Ø = diameter, SR = surface radius

* Must be mounted in a downward direction



CSFN105A-H6X



CS067A-LG



CSJ055A-CG



Precision Limit Switches

Low Contact Force Limit Switches Specifications

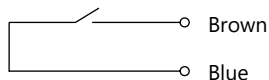
Series	CSFN Metal Bearing	CS Custom Metal Bearing	CSJ Custom Needle Contact
Environmental			
Degree of Protection	IP40	IP65	
Temperature Range	Operating: 0 to 60°C [32 to 140°F] (Ice-free)		Operating: 0 to 80°C [32 to 176°F] (Ice-free)
Mechanical Ratings			
Enclosure Material	Stainless Steel (mounting nuts are Ni-plated brass)		
Pretravel	0.4 mm [0.016 in]	0.3 mm [0.012 in]	
Torque (for nuts on threaded barrels, set screws on smooth barrels)	4 N•m [2.95 lb•ft]	2 N•m [1.48 lb•ft]	N/A
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction		
Shock	300 m/s² for X, Y, Z each direction		
Repeat Accuracy	0.01 mm (10 micron [μm]) *	0.005 mm (5 micron [μm]) *	
Recommended Minimum Operating Speed	50mm (1.96in)/minute		
Electrical Ratings			
Contact Life	10 million operations		
Contact Voltage	12–24VDC	5–24VDC	
Steady Current Rating	10mA or less		
Max In-rush Current Rating	10mA (limit current to protect LED indicator)		
Connection Type	Cable: 3m PVC (polyvinyl chloride) oil resistant Ø4/3 cores, 30AWG Tensile strength 30N, minimum bending R7	Cable: 3m PVC (polyvinyl chloride) oil resistant Ø2.8/2 cores, 26AWG Tensile strength 30N minimum bending R7	
Indicating	-L: LED indicator (mounted in cable 120mm from the switch)		

* At operating speed 50-200 mm/minute. Operating speed slower than 10 mm (0.393 in)/min is not recommended.

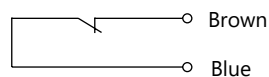
Circuit Diagrams

Without LED

Normally open (N.O.)

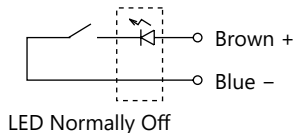


Normally closed (N.C.)

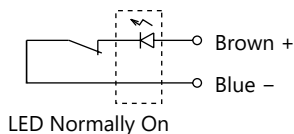


With LED

Normally open (N.O.)

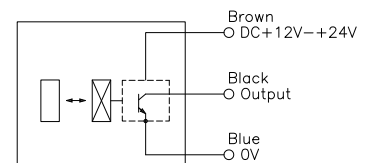


Normally closed (N.C.)



CSFN105A-H6X

Normally open (N.O.)
(NPN Open Collector)





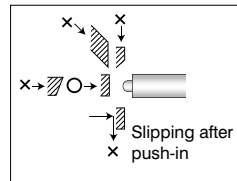
Precision Limit Switches

90-Degree Straight Touch Limit Switches

Features

- Slim design
- 90-degree cable orientation
- Long-stroke models available
- 5 micron (μm) repeat accuracy
- Stainless steel housing
- Metal bearing

90-Degree Straight Touch



O indicates correct target approach and orientation.
X indicates approach and orientation that should be avoided.

90-Degree Straight Touch Limit Switches Selection Chart

Part Number	Price	Drawing Link	Actuator/ Head Type*	Barrel Type	Barrel Diameter/Thread*	Stroke	Switching Output	Contact Force	Connection Type
CSS60A-LR	\$-6bol:	PDF	Ø 2mm plunger [0.079in] SR 1.5mm [0.059in]	Smooth	Ø 6mm	2.8mm [0.110in]	(1) N.O.	1N	Cable 3m [9.84ft]
CS065A-LR	\$45ho:	PDF		Threaded	M6x0.5		(1) N.O.		
CS067A-BLR	\$45he:	PDF	Ø 2mm plunger [0.079in] Ø 4.5mm flat [0.1.77in]		M6x0.75		(1) N.O.		
CS067A-LR	\$.45hf:	PDF	Ø 2mm plunger [0.079in] SR 1.5mm [0.059in]				(1) N.O.		
CS067B-LR	\$45hg:	PDF	M8x0.75		(1) N.C.				
CS087A-LR	\$45hh:	PDF			Ø 3.5mm plunger [0.138in] SR 3 mm [0.118in]		(1) N.O.		
CSJ055A-LR	\$-45hi:	PDF	Ø 2mm plunger [0.079in] SR 1.5 mm [0.059in]	M5x0.5	(1) N.O.				
CSJS50A-LR	\$45hp:	PDF	Smooth	Ø 5mm	(1) N.O.				
CSK087A-LR	\$45hq:	PDF	Ø 3.5mm plunger [0.138in] SR 3 mm [0.118in]	Threaded	M8x0.75	5mm [0.197in]	(1) N.O.		
CSK087B-LR	\$45hs:	PDF					(1) N.C.		

* Ø = diameter, SR = surface radius



[CSS60A-LR](#)



[CS065A-LR](#)



[CS067A-BLR](#)



[CS067A-LR](#)



[CS067B-LR](#)



[CS087A-LR](#)



[CSJ055A-LR](#)



[CSJS50A-LR](#)



[CSK087A-LR](#)



[CSK087B-LR](#)



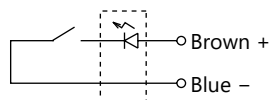
Precision Limit Switches

90-Degree Straight Touch Limit Switches Specifications				
Series	CS	CSS	CSJ	CSK
Environmental				
Degree of Protection	IP65			
Temperature Range	Operating: 0 to 80°C [32 to 176°F] (Ice-free)			
Mechanical Ratings				
Enclosure Material	Stainless Steel			
Pretravel	0.3 mm			
Torque (for nuts on threaded barrels, set screws on smooth barrels)	4 N•m [2.95 lb•ft]	N/A	2 N•m [1.48 lb•ft]	7 N•m [5.16 lb•ft]
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction			
Shock	300 m/s² for X, Y, Z each direction			
Repeat Accuracy	5 micron (µm) *			
Recommended Minimum Operating Speed	50mm (1.96in)/minute			
Electrical Ratings				
Contact Life	10 million operations			
Contact Voltage	5–24VDC			
Steady Current Rating	10mA or less			
Max In-rush Current Rating	10mA (limit current to protect LED indicator)			
Connection Type	Cable: 3m [9.84 ft], oil resistant, Ø2.8/2 cores, tensile strength 30N [6.74 lbf], minimum bending R7, 2-26AWG			
Indicating	-L: LED indicator (mounted in cable 120mm from the switch)			

* At operating speed 50-200 mm/minute. Operating speed slower than 10 mm/min is not recommended.

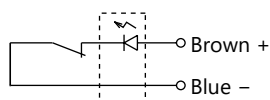
Circuit Diagrams

Normally open (N.O.)



LED Normally Off

Normally closed (N.C.)



LED Normally On



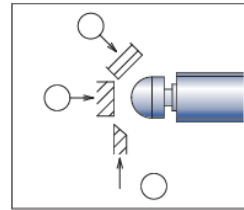
Precision Limit Switches

Sliding Angled Offset Touch Limit Switches

Features

- Metal and plastic hemisphere actuators
- 5 micron (μm) repeat accuracy
- Stainless steel housing

Sliding Angled Offset Touch



O indicates correct target approach and orientation.

Sliding Angled Offset Touch Limit Switches Selection Chart

Part Number	Price	Drawing Link	Actuator/ Head Type*	Barrel Type	Barrel Diameter/Thread*	Stroke	Switching Output	Contact Force	Connection Type
CSHP085A-L	\$01n8c:	PDF	Ø 4.7mm plunger SR 3mm	Threaded	M8×0.5	2.8mm [0.110in]	(1) N.O.	1N	Cable 2m [6.56 ft]
CSHP085B-L	\$01n8d:	PDF	Ø 4.7mm plunger SR 3mm	Threaded	M8×0.5		(1) N.C.	1N	
CSH121A-A	\$6boo:	PDF	Ø 10mm hemisphere SR 5mm	Threaded	M12x1		(1) N.O.	1.5N	
CSH121A-AL	\$-45hj:	PDF	Ø 10mm hemisphere SR 5mm	Threaded	M12x1		(1) N.O.	1.5N	
CSH121B-AL	\$45hk:	PDF	Ø 10mm hemisphere SR 5mm	Threaded	M12x1		(1) N.C.	1.5N	
CSH121A-APL	\$-45hl:	PDF	Ø 10mm hemisphere SR 5mm plastic	Threaded	M12x1		(1) N.O.	1.5N	
CSH121B-APL	\$45hn:	PDF	Ø 10mm hemisphere SR 5mm plastic	Threaded	M12x1		(1) N.C.	1.5N	

* Ø = diameter, SR = surface radius



[CSHP085B-L](#)



[CSH121A-A](#)



[CSH121A-AL](#)



[CSH121B-AL](#)



[CSH121A-APL](#)



[CSH121B-APL](#)



Precision Limit Switches

Sliding Angled Offset Touch Limit Switches Specifications

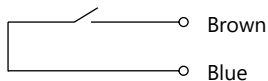
Series	CSHP	CSH
Environmental		
Degree of Protection	IP67	IP65
Temperature Range	Operating: 0 to 80°C [32 to 176°F] (Ice-free)	
Mechanical Ratings		
Enclosure Material	Stainless Steel	
Pretravel	0.3 mm	
Torque (for nuts on threaded barrels, set screws on smooth barrels)	4 N•m [2.95 lb•ft]	12 N•m [8.85 lb•ft]
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction	
Shock	300 m/s² for X, Y, Z each direction	
Repeat Accuracy	0.005mm (5 micron [μm]) *	
Recommended Minimum Operating Speed	50mm [1.96in]/minute	
Electrical Ratings		
Contact Life	10 million operations	
Contact Voltage	5–24VDC	
Steady Current Rating	10mA or less	
Max In-rush Current Rating	10mA (limit current to protect LED indicator)	
Connection Type	Cable: 2m [6.56ft] , oil resistant Ø2.8/2 cores, Tensile strength 30N [6.74 lbf], minimum bending R7, 2-26AWG	
Indicating	-L: LED indicator (mounted in cable 120mm from the switch)	

* At operating speed 50-200 mm/minute. Operating speed slower than 10mm/min is not recommended.

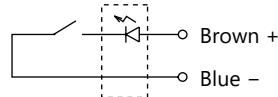
Circuit Diagrams

Without LED	With LED
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Normally open (N.O.)

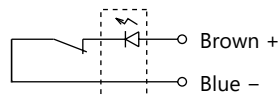


Normally open (N.O.)



LED Normally Off

Normally closed (N.C.)



LED Normally On



Precision Limit Switches

Precision Mini Straight Touch Limit Switches Specifications		
Type	Precision Angled	Precision Mini
Series	CSM	CSMP
Environmental		
Degree of Protection	IP65	IP67
Temperature Range	Operating: 0 to 80°C [32 to 176°F] (Ice-free)	
Mechanical Ratings		
Enclosure Material	303 Stainless Steel	
Pretravel	0.3 mm	
Torque (for nuts on threaded barrels, set screws on smooth barrels)	8 N•m [5.901 lb•ft]	
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction	
Shock	300 m/s² for X, Y, Z each direction	
Repeat Accuracy	Both On–Off, Off–On: 0.003 mm*	
Recommended Minimum Operating Speed	50mm [1.96in]/minute	
Electrical Ratings		
Contact Life	10 million operations	
Contact Voltage	5–24VDC	
Steady Current Rating	10mA or less	
Max In-rush Current Rating	10mA (limit current to protect LED indicator)	
Connection Type	Core wire cable, 0.5 m (x2), oil resistant, Ø 0.6, tensile strength 15N, Cable: 2m, oil resistant Ø2.8/2 cores, tensile strength 30N [6.74 lbf], 2-26AWG	
Indicating	-L: LED indicator (mounted in cable 120mm from the switch)	

* At operating speed 50-200 mm/minute. Operating speed slower than 10mm/min is not recommended.

Circuit Diagrams

Without LED	With LED
<p>Normally open (N.O.)</p> <p>○ Brown</p> <p>○ Blue</p>	<p>Normally open (N.O.)</p> <p>○ Brown +</p> <p>○ Blue -</p> <p>LED Normally Off</p>



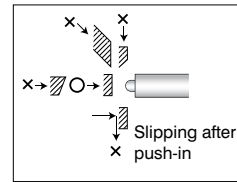
Precision Limit Switches

High-Vacuum Resistance Limit Switches

Features

- Can be used in 10⁻⁵ PA high-vacuum environments
- Switch body made using low outgassing material and adhesive

High Vacuum Resistance



O indicates correct target approach and orientation.

X indicates approach and orientation that should be avoided.

High-Vacuum Resistance Limit Switches Selection Chart

Part Number	Price	Actuator/Head Type*	Barrel Type	Barrel Diameter/Thread	Stroke	Output Mode	Repeatability	Contact Force	Connection Type	Drawing Link
<u>GN-BP5MA</u>	\$04vzc:	Angled touch ball plunger SR 3mm	Threaded	M5x0.5	1.0mm [0.039in]	(1) N.O.	0.01mm [0.00039in]	1N	Cable direction: straight Polytetrafluoroethylene (PTFE) 0.5m [1.6ft] core wire, 27 AWG	PDF
<u>GN-BP5MA-R</u>	\$04vzd:	Angled touch ball plunger SR 3mm	Threaded	M5x0.5	1.0mm [0.039in]	(1) N.O.	0.01mm [0.00039 n]	1N	Cable direction: 90° Polytetrafluoroethylene (PTFE) 0.5m [1.6ft] core wire, 27 AWG	PDF
<u>GN-PT5M3A</u>	\$-045i0:	Straight touch Ø 1.5mm plunger SR 2mm	Threaded	M5x0.5	1.5mm [0.059in]	(1) N.O.	0.003mm [0.00012in]	0.5N	Cable direction: straight Polytetrafluoroethylene (PTFE) 0.5m [1.6ft] core wire, 27 AWG	PDF
<u>GN-PT5M3B</u>	\$-045i1:	Straight touch Ø 1.5mm plunger SR 2mm	Threaded	M5x0.5	1.5mm [0.059in]	(1) N.C.	0.003mm [0.00012in]	0.5N	Cable direction: straight Polytetrafluoroethylene (PTFE) 0.5m [1.6ft] core wire, 27 AWG	PDF
<u>GN-BP161B</u>	\$;004vze:	Angled touch Ø 2mm plunger SR 4mm	Threaded	M16x1	2.9mm [0.114in]	(1) N.C.	0.01mm [0.00039in]	1.5N	Cable direction: straight Polytetrafluoroethylene (PTFE) 0.5m [1.6ft] core wire, 27 AWG	PDF
<u>GN-CSK141B</u>	\$;004vz9:	Straight touch Ø 12mm plunger SR 4mm	Threaded	M14x1	5mm [0.197mm]	(1) N.C.	0.01mm [0.00039in]	0.8N	Cable direction: straight Polytetrafluoroethylene (PTFE) 0.5m [1.6ft] core wire, 27 AWG	PDF

* Ø = diameter, SR = surface radius



GN-BP5MA



GN-BP5MA-R



GN-PT5M3A



GN-PT5M3B



GN-BP161B



GN-CSK141B



Precision Limit Switches

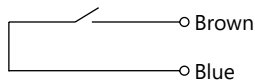
High-Vacuum Resistance Limit Switches Specifications	
Series	GN
Environmental	
Compatible Vacuum	10 ⁻⁵ PA
Degree of Protection	IP40
Temperature Range	120°C [248°F] (allowable baking temperature)
Mechanical Ratings	
Enclosure Material	304 Stainless Steel
Pretravel	0mm [0in]: (GN-PT5M3B, GN-CSK141B) * 0.2 mm [0.0079 in]: (GN-BP161B) 0.3 mm [0.0118 in]: (GN-BP5MA, GN-BP5MA-R, GN-PT5M3A)
Torque (for nuts on threaded barrels, set screws on smooth barrels)	1 N•m [0.73 lb•ft] GN-PT5M3A, GN-PT5M3B, GN-BP5MA 10 N•m [7.37 lb•ft] GN-CSK141B 12 N•m [8.85 lb•ft] GN-BP161B
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction
Shock	300 m/s ² for X, Y, Z each direction
Electrical Ratings	
Contact Life	3 million operations
Repeat Accuracy**	Both On-Off, Off-On: See Selection Table
Recommended Minimum Operating Speed	50mm [1.96in] / minute
Contact Voltage	5-24 VDC
Steady Current Rating	10mA or less
Max In-rush Current Rating	20mA
Connection Type	0.5 m [19.69 in] Polytetrafluoroethylene (PTFE) core wire, 27AWG
Indicating	N/A

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

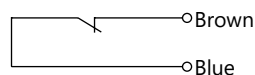
** At operating speed 50-200 mm/minute. Operating speed slower than 10 mm/min is not recommended.

Circuit Diagrams

Normally open (N.O.)



Normally closed (N.C.)





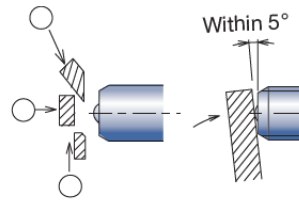
Precision Limit Switches

High Temperature: HT Series Limit Switches

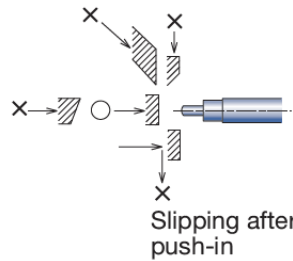
Features

- Plunger and ball plunger models
- Constructed using heat resistant parts and adhesives
- Heat resistant cable
- Operating temperature upper limit of 200°C [392°F]

High Temperature HT Series



O indicates correct target approach and orientation.
X indicates approach and orientation that should be avoided.



High Temperature Limit Switches Selection Chart									
Part Number	Price	Actuator/Head Type*	Barrel Type	Barrel Diameter/Thread	Stroke	Switching Output	Contact Force	Connection Type	Drawing Link
Straight/Precision Touch									
HT-CS067A	\$04vza:	Ø2mm plunger, SR 1.5mm	Threaded	M6×0.75	2.8mm	(1) N.O.	1N	Cable 2m [6.56ft]	PDF
Indexing/Angled/Sliding Touch/Ball Plunger									
HT-BP060A	\$04vzb:	Ø 3mm ball plunger	Threaded	M6×1.0	0.8mm	(1) N.O.	6-13N	Cable 2m [6.56ft]	PDF
Heat Resistant Stopper Bolt									
STS060A-HT2	\$045h?:	1.5mm plunger 3.4mm flat	Threaded	M6×1.0	0.7mm	(1) N.O.	1N	Cable 2m [6.56ft]	PDF
STM82A-HT2	\$,045h,:	Ø 3mm plunger with boot	Threaded	M10×0.75	0.3mm	(1) N.O.	1N	Cable 2m [6.56ft]	PDF

* Ø = diameter, SR = surface radius



[HT-CS067A](#)



[HT-BP060A](#)



[STS060A-HT2](#)



[STM82A-HT2](#)



Precision Limit Switches

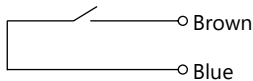
High Temperature Limit Switches Specifications				
Part Number	HT-CS067A	HT-BP060A	STS060A-HT2	STM82A-HT2
Environmental				
Degree of Protection	IP65**	IP40**	IP40**	IP65**
Temperature Range	Operating: 0 to 200°C [32 to 392°F] (Ice-free)			
Mechanical Ratings				
Enclosure Material	Stainless Steel			
Pretravel	0.3 mm (0.012 in)	0.5 mm [0.020 in] from end face	0.3 mm [0.012 in] from stopping face	Middle of stroke
Vibration	10–55 Hz total amplitude 1.5 for X, Y, Z each direction			
Shock	300 m/s² for X, Y, Z each direction			
Electrical Ratings				
Contact Life	3 million operations			
Repeat Accuracy	0.01 mm [0.00039 in] * **			
Recommended Minimum Operating Speed	50mm [1.96in]/minute			
Contact Voltage	5-24 VDC			
Steady Current Rating	10mA or less			
Max In-rush Current Rating	20mA			
Connection Type	Cable: 2m [6.56ft] heat-resistant Ø 2.8 2 cores, 24AWG		Cable: 2m [6.56ft] heat-resistant Ø 2.8 2 cores, 26AWG	
Indicating	N/A			

* At operating speed 50-200 mm [1.97-7.87 in]/minute. Operating speed slower than 10mm [0.39in]/min is not recommended.

** At normal temperature (0 to 80°C [32 to 176°F]).

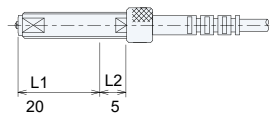
Circuit Diagrams

Normally open (N.O.)

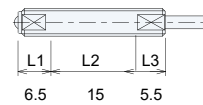


Torque Limits

Stopper Bolt



Ball Plunger



Tightening Torque for Case Screws and Nuts						
Applicable Models	L1		L2		L3	
	Length	Tightening Torque	Length	Tightening Torque	Length	Tightening Torque
HT-CS067A	6.5mm	4 N•m [2.95 lb•ft]	—	—	—	—
HT-BP060A	6.5mm	2.5 N•m [1.84 lb•ft]	15 mm	5 N•m [3.68 lb•ft]	5.5mm	5 N•m [3.68 lb•ft]
STS060A-HT2	20mm	5 N•m [3.68 lb•ft]	5mm	5 N•m [3.68 lb•ft]	—	—
STM82A-HT2	6.5mm	10 N•m [7.376 lb•ft]	—	—	—	—

Caution: Use the lower torque (i.e. torque corresponding to L1 and L3) while tightening the bolt between lengths L1 and L2 or L2 and L3 in the picture. Please make sure to use a locknut if the bolt is likely to shift in position due to the vibrational impacts.



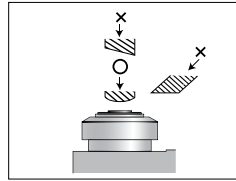
Precision Limit Switches

High Precision Touch and Tool Setter Limit Switches

Features

- Tool setter for blade positioning, wear detection, breakage, etc.
- 0.5 micron (μm) repeat accuracy
- No movement differential
- No temperature drift
- Dustproof / water-resistant (IP67)
- LED indicator

Tool Setter



O indicates correct target approach and orientation.

X indicates approach and orientation that should be avoided.

High Precision Touch and Tool Setter Limit Switches Selection Chart

Part Number	Price	Drawing Link	Actuator/Head Type*	Mounting Direction	Mounting Hole	Stroke	Switching Output	Contact Force	Connection Type
<u>P11DDB-DLD</u>	\$06bop:	<u>PDF</u>	Ø 16mm plunger, Ø5mm flat	downward	(2) Ø 4.6	3mm	(1) N.C.	1.5N	Cable 3m [9.8ft]
<u>P11DDB-DULD</u>	\$01n8o:	<u>PDF</u>	Ø 16mm plunger, Ø 5mm flat	upward	(2) Ø 4.6	3mm	(1) N.C.	1.5N	Cable 3m [9.8ft]
<u>P11DMB-DULD</u>	\$06boq:	<u>PDF</u>	Ø 16mm plunger, Ø 5mm flat	upward	(2) M4	3mm	(1) N.C.	1.5N	Cable 3m [9.8ft]
<u>P11EDB-DULD</u>	\$02bvk:	<u>PDF</u>	Ø 16mm plunger, Ø 5mm flat	upward	(2) Ø 4.6	5mm	(1) N.C.	1.5N	Cable 3m [9.8ft]
<u>P21EDBP-22-28</u>	\$-02bvl:	<u>PDF</u>	Ø 18.5mm plunger, Ø 10mm flat	upward	(2) Ø 4.6	5mm	(1) N.C.	1.5N	Cable 5m [16.4ft]

* Ø = diameter

-xxLD: LED indicator (attached to sensor)

[P21EDBP-22-28](#) includes M5 air inlet



[P11DDB-DLD](#)



[P11DDB-DULD](#)



[P11DMB-DULD](#)



[P11EDB-DULD](#)



[P21EDBP-22-28](#)



Precision Limit Switches

High Precision Touch and Tool Setter Limit Switches Specifications

Series	P11	P21
Environmental		
Degree of Protection	IP67	
Temperature Range	Operating: 0 to 80°C [32 to 176°F] (Ice-free)	
Mechanical Ratings		
Enclosure Material	Aluminum	
Pretravel	0*	1st signal 0*, 2nd signal 2.5 mm (0.098 in)
Torque (for nuts on threaded barrels, set screws on smooth barrels)	N/A	
Vibration	10–55Hz total amplitude 1.5 for X, Y, Z each direction	
Shock	300 m/s² for X, Y, Z each direction	
Repeat Accuracy	Both On–Off, Off–On: 0.0005 mm (range)**	
Recommended Minimum Operating Speed	50mm [1.96in]/minute	
Electrical Ratings		
Contact Life	3 million operations	
Contact Voltage	5–24VDC	
Steady Current Rating	10mA or less	
Max In-rush Current Rating	10mA (limit current to protect LED indicator)	
Connection Type	Cable: 3m (9.84 ft) oil resistant Ø5/2 cores (P08: Ø4/2 cores) Tensile strength 30N, minimum bending R7, 30AWG	Cable: 5m (16.40ft) oil resistant Ø3.7/4 cores (P08: Ø4/2 cores), Tensile strength 30N, minimum bending R7, 30AWG
Indicating	-L: LED indicator (mounted in cable 120mm from the switch)	

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

** At operating speed 50-200 mm/minute. Operating speed slower than 10 mm/min is not recommended.

Circuit Diagrams

P21 Wiring

Without LED	With LED
<p>Normally closed (N.C.)</p> <p>Brown Blue</p>	<p>Normally closed (N.C.)</p> <p>Brown + Blue -</p> <p>LED Normally On</p>

With LED
<p>2-signal type (P21)</p> <p>First Signal</p> <p>Normally closed (N.C.)</p> <p>Orange + Black -</p> <p>Second Signal</p> <p>Normally closed (N.C.)</p> <p>Yellow Green</p>