

FAST CLAMPS



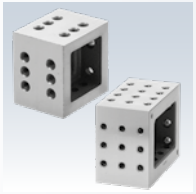
FAST CLAMPS

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Work locators

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Risers + V blocks

Accessories

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Centering pin

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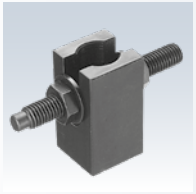
Side Clamps

Page 14.48



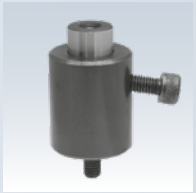
Hook Clamps

Page 14.65



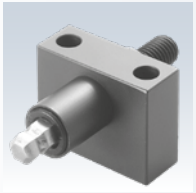
Adjustable stops

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Work supports

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Remote control units

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Contact bolts

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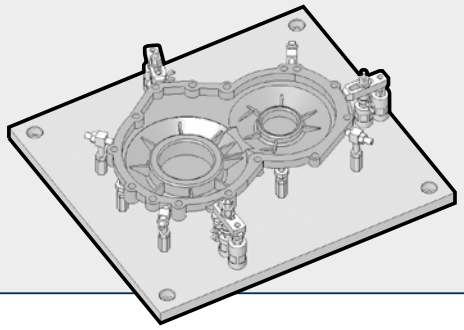
Clamp screws

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Fast Clamps

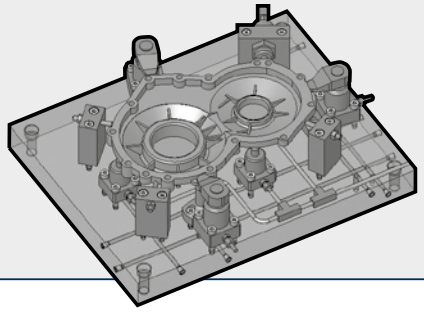
Speedier In Setup Than Conventional Manual Clamping

No tools needed



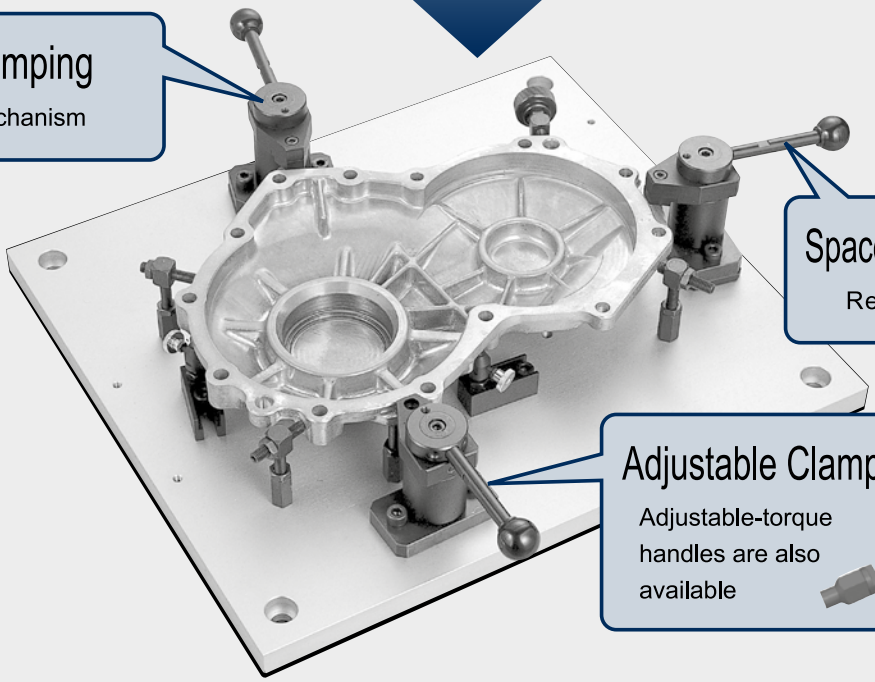
More Economical Than Hydraulic Clamping

Much lower fixture costs
Maintenance free



Positive Clamping

Spiral cam mechanism

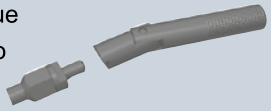


Space-Saving Design

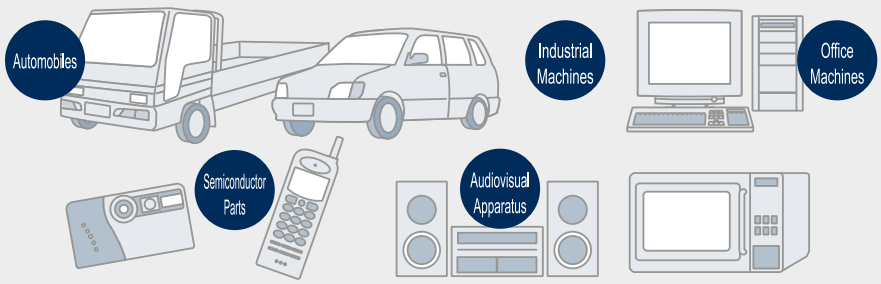
Removable handle

Adjustable Clamping Force

Adjustable-torque handles are also available



Fast Clamps serve for varied applications in machining and assembly jobs in different industries.



Added Product Items Offer A Wider Range Of Applications

Stronger Clamping Force Clamping-Height Adjustment

Greater Performance

Clamping Force



NEW

Pull Clamps Heavy

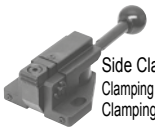
Clamping Range:up to 2.5mm
Clamping Force:up to 8,000N

Swing Clamps Heavy

Clamping Range:up to 1.6mm
Clamping Force:up to 6,000N

NEW





Side Clamps, Standard
Clamping Range:2mm
Clamping Force:up to 4,000N



Push Clamps, Standard
Clamping Range:up to 2.5mm
Clamping Force:up to 4,000N

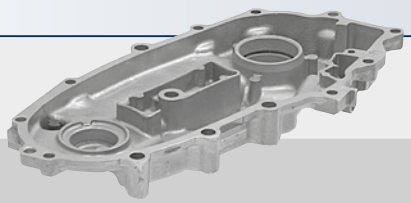


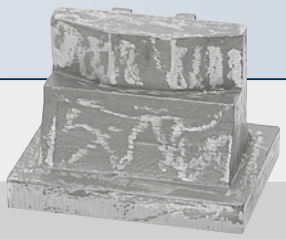
Pull Clamps, Standard
Clamping Range:up to 2mm
Clamping Force:up to 2,500N



Swing Clamps, Standard
Clamping Range:up to 1.8mm
Clamping Force:up to 1,200N

Clamping-Height Adjustment





Die-Cast Parts

Cast-Iron Parts

This extended line of Fast Clamps allows clamping parts made from materials ranging from non-ferrous metals like aluminum, zinc, etc. to cast iron and steel.

Setting a clamping force is important when clamping a part that can easily get strained.

To compensate for variations between castings, a long clamping height range is needed. Clamping force is also an important factor for castings that receive a comparatively heavy load when being machined.

QLPD PULL CLAMPS(Standard)



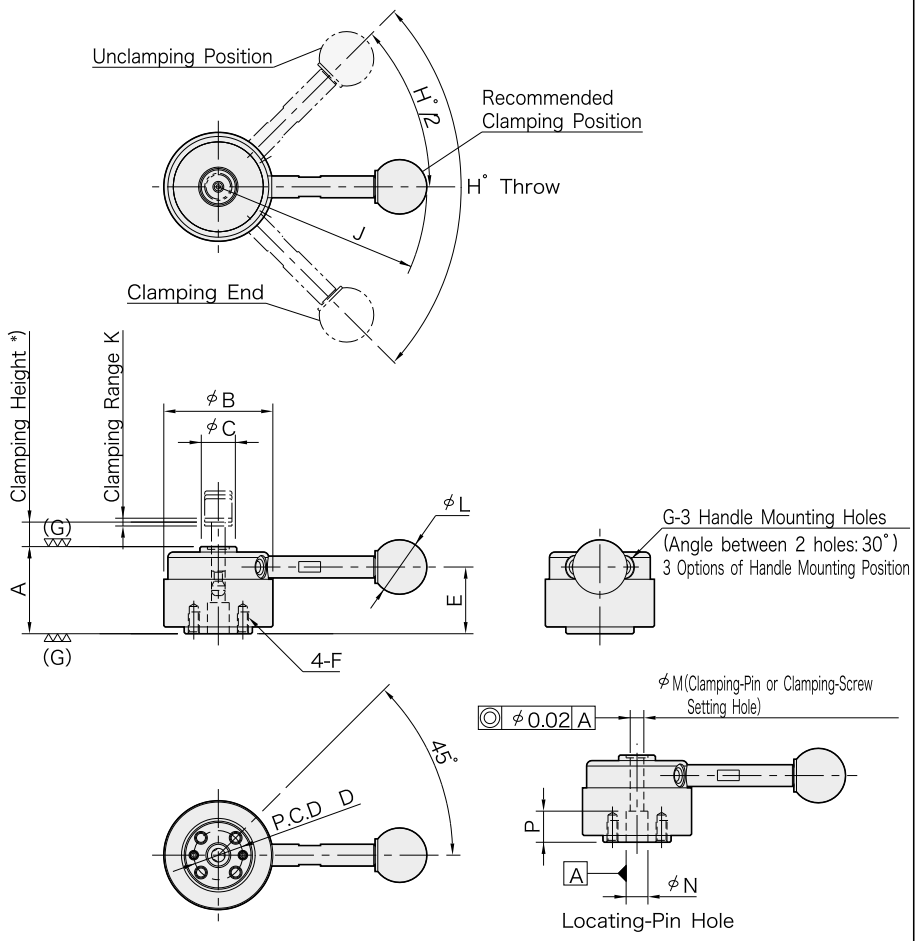
With Handle　　Without Handle

Note) Clamping Pins or Screws must be ordered separately.

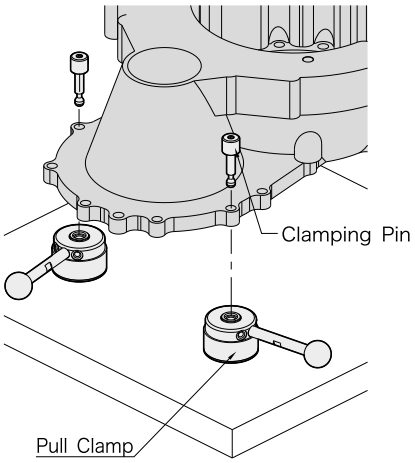
Body & CAM	
Material	SCM440 steel
Finish	Black oxide
Heat Treat	Quenced and tempered

Handle	
Material	S45C steel
Finish	Black oxide

Ball Knob	
Material	ABS resin
Color	Black

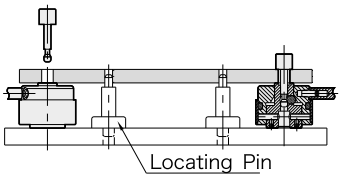


How To Use

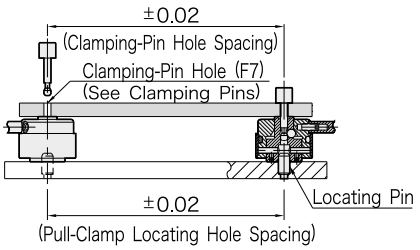


How To Locate Workpiece

1. Basic Method



2. Method for clamping and locating a workpiece at a time
Give an accuracy shown below to the hole spacing to generate a locating accuracy of ±0.08.



Series	A (±0.01)	B	C	D (P.C.D)	E	F	G	H	K	M (F7)
QLPD150	32	40	13.5	18	24.5	M4x0.7 8 deep	M5x0.8	90°	1.5	5
QLPD200	40	50	18	25	30.7	M6x1 9 deep	M6x1	110°	2	8

Series	N (G6)	P	Clamping Force (N)	Clamping Mechanism	Recommended Workpiece Thickness Tolerance **)
QLPD150	8	10	900	Spiral Cam Cam Angle:4°	±0.3
QLPD200	12	13	2500		±0.5

With Handle

Part Number	J	L	Allowable Operating Load (N) ***)	Weight (g)
51991101	76.5	20	150	245
51991102	111.5	25	200	470

Without Handle

Part Number	Weight (g)
51991103	220
51991104	420

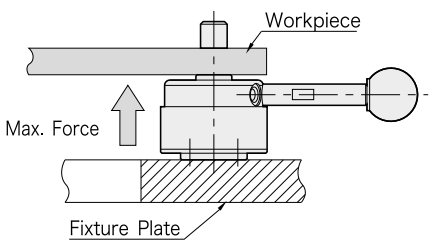
*) Grip length of Clamping Pin(workpiece thickness)
**) Maintaining these recommended tolerances allows minimizing the variation of handle position in the clamping mode in clamping with the use of the Clamping Pin.
***) Allowable load to operate the handle.

Technical Infomation

Allowable Loads in Machining of Workpiece Bottom

Ensure that a force more than indicated below is not applied to the workpiece bottom.

Series	Allowable Force To Workpiece Bottom (Per Clamp)
QLPD150	max.2000N
QLPD200	max.5500N

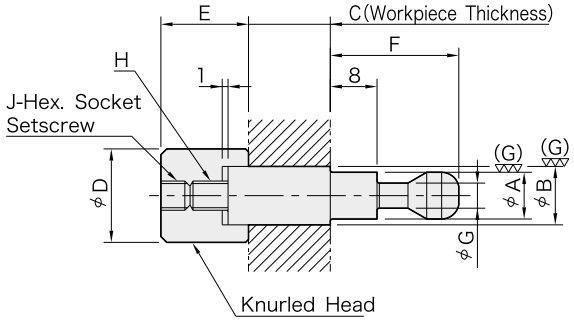


QLPD-X CLAMPING PINS(Standard)



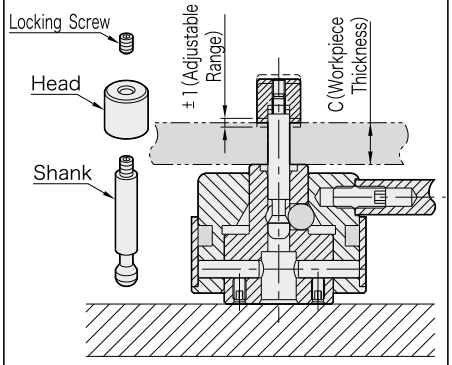
Shank	
Material	SCM435 steel
Finish	Precision ground
Heat	Treated (shank end)

Head	
Material	SCM45C steel
Finish	Black oxide
Heat Treat	Quenched and tempered



C dimension is adjustable by +/-1mm to fit actual workpiece thickness.

How To Use



Part Number	A (f7)	B (f7)	C *) (By 0.1mm)	D	E	F	G	H	J	Pull Clamps	Weight (g)
51991105 -(C Dim. in mm)	5	5	3≦C≦50	10	10	17	3	M3x0.5	M3x0.5-4L	QLPD150 Series	min. 8 to max.16
51991106 -(C Dim. in mm)		6									min. 8 to max.19
51991107 -(C Dim. in mm)	8	8	4≦C≦80	16	15	22	4.3	M5x0.8	M5x0.8-5L	QLPD200 Series	min.30 to max.60
51991108 -(C Dim. in mm)		10									min.31 to max.77

*) For ordering, specify workpiece thickness.

Ordering Example

QLPD150-5x5-10.5

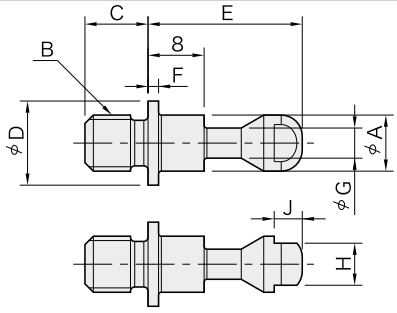
Shank Size C Dim.

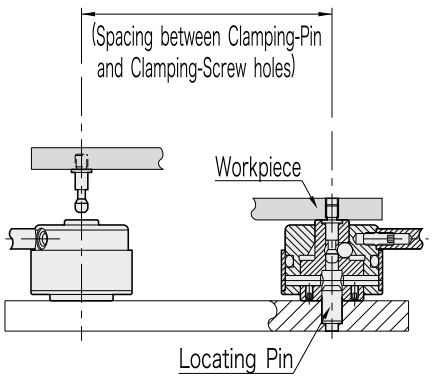
· Custom Clamping Pins(different B dimensions) are available on request.

QLPD-M CLAMPING SCREWS(Standard)



Material	SCM440 steel
Finish	Black oxide
Heat Treat	Quenched and tempered





Part Number	A	B	C	D	E	F	G	H	J	Pull Clamps	Weight (g)
51991109	5	M 5x0.8	6	8	17	1.2	3	4	2.5	QLPD150 Series	3
51991110		M 6x1	7								4
51991111	8	M 8x1.25	9	12	22	1.5	4.3	6	4	QLPD200 Series	10
51991112		M10x1.5	11								13

Recommended Spacing Tolerance in Use of Clamping Screws

Custom Clamping Screws (different screw thread sizes) are available on request.

QLPDH PULL CLAMPS(Heavy)

NEW

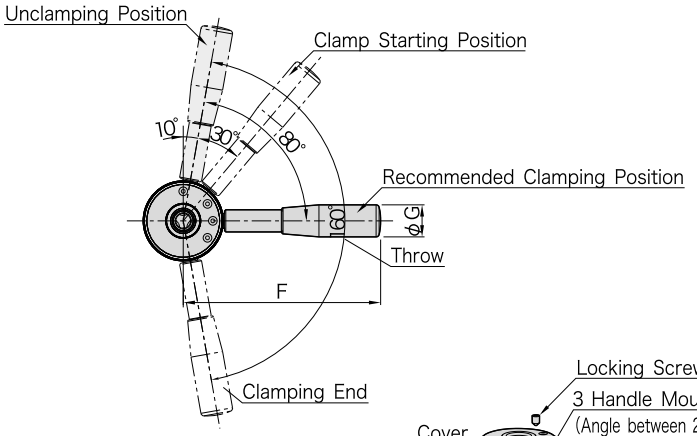


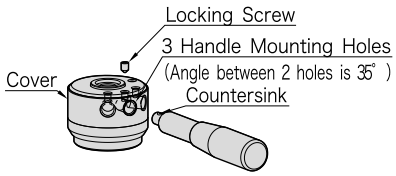
Body & Clamp ring	
Material	SCM440 steel
Finish	Black oxide
Heat Treat	Quenced and tempered

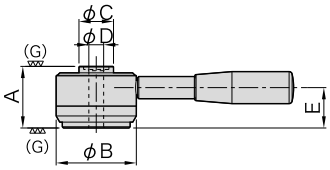
Handle Shank	
Material	S45C steel
Finish	Black oxide
Heat Treat	Quenced and tempered

Handle	
Material	Plastic
Color	Black

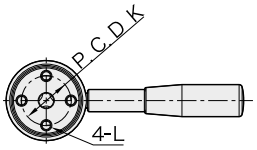
Note) Clamping Pins or Screws must be ordered separately.

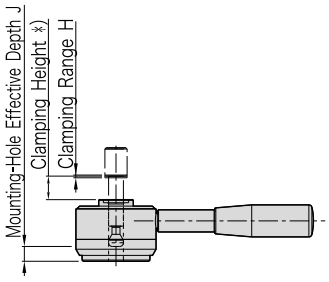




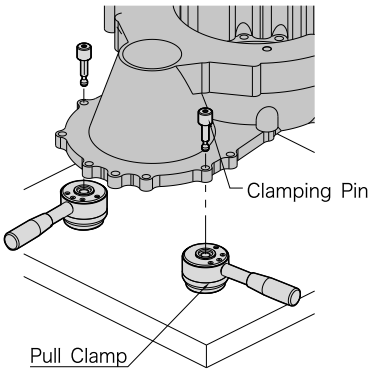


The handle can be removed by loosening the locking screw.
To keep the handle mounted permanently,make sure that the locking screw is fully tightened.
3 options of handle mounting position.



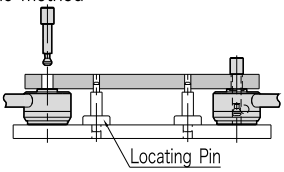


How To Use

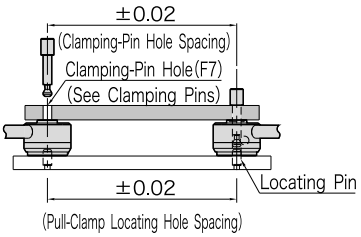


How To Locate Workpiece

1. Basic method

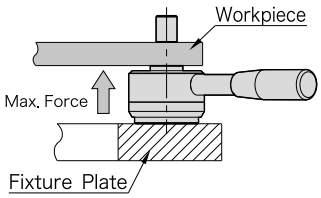


2. Method for clamping and locating a workpiece at a time.
Give an accuracy shown below to the hole spacing to generate a locating accuracy of ±0.08.

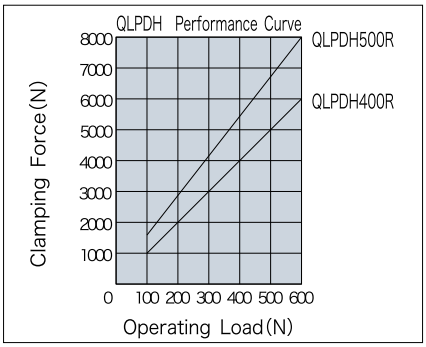


Technical Information

Allowable Loads in Machining of Workpiece Bottom



Part Number	Allowable Force To Workpiece Bottom (Per Clamp)
51991501	max. 8000N
51991502	max.14000N



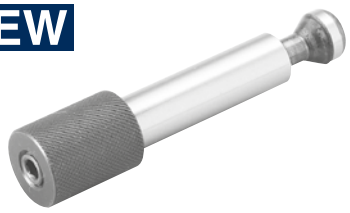
Part number	Series	A (±0.01)	B	C	D (F7)	E	F	G	H	J	K (P.C.D)
51991501	QLPDH 400 R	50	65	28	12	36	160	26	2	10	40
51991502	QLPDH 500 R	63	80	34	16	45	180	28	2.5	12	50

Part number	Series	L	Allowable Operating Load (N) **	Clamping Force (N)	Clamping Mechanism	Recommended Workpiece Thickness Tolerance ***	Weight (kg)
51991501	QLPDH 400 R	M 8x1.25 14 deep	600	6,000	Spiral Cam Cam Angle : 4°	±0.5	1.2
51991502	QLPDH 500 R	M10x1.5 18 deep		8,000		±0.8	2.2

*) Grip length of Clamping Pin (workpiece thickness)
**) Allowable load to operate the handle
***) Maintaining these recommended tolerances allows minimizing the variation of handle position in the clamping mode in clamping with the use of the Clamping Pin.

QLPDH-X CLAMPING PINS (Heavy)

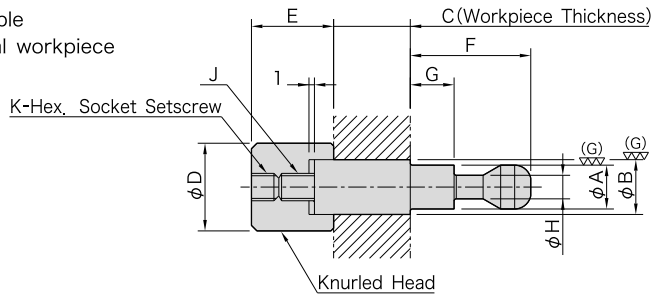
NEW



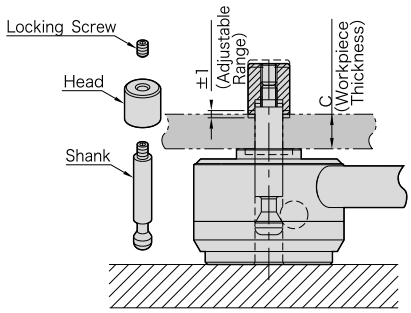
Shank	
Material	SCM435 steel
Finish	Precision ground

Head	
Material	S45C steel
Finish	Black oxide
Heat Treat	Quenched and tempered

C dimension is adjustable by ± 1mm to fit actual workpiece thickness.



How To Use



Ordering Example

QLPDH400-12-20.5
Part Number C Dim.

·Custom Clamping Pins (different B dimensions) are available on request.

Part Number	A (f7)	B (f7)	C *) (By 0.1mm)	D	E	F	G	H	J	K	Pull Clamps	Weight (g)
51991503-(C Dim. In mm)	12	12	0<C≦100	18	23	38	21.5	6.5	M 8x1.25	M 8x1.25- 8L	QLPDH400R	70 to 160
51991504-(C Dim. In mm)		16		24								175 to 265
51991505-(C Dim. In mm)	16	16	0<C≦120	24	29	48	28	9.5	M10x1.5	M10x1.5 -10L	QLPDH500R	160 to 350
51991506-(C Dim. In mm)		20		30								325 to 515

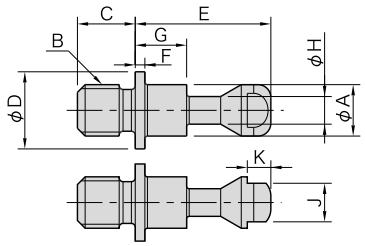
*) For ordering, specify workpiece thickness.

QLPDH-M CLAMPING SCREWS (Heavy)

NEW

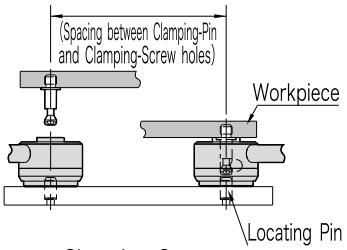


Material	SCM 435
Finish	Black oxide
Heat Treat	Quenched and tempered



Part Number	A	B	C	D	E	F	G	H	J	K	Pull Clamps	Weight (g)
51991507	12	M12x1.75	13	20	38	2	21.5	6.5	10	4	QLPDH400R	40
51991508		M16x2	17									55
51991509	16	M16x2	17	25	48	2.5	28	9.5	13	5	QLPDH500R	90
51991510		M20x2.5	21									110

Recommended Spacing Tolerance in Use of Clamping Screws



Custom Clamping Screws (different screw thread sizes) are available on request.

QLSW SWING CLAMPS(Standard)



With Handle　　Without Handle

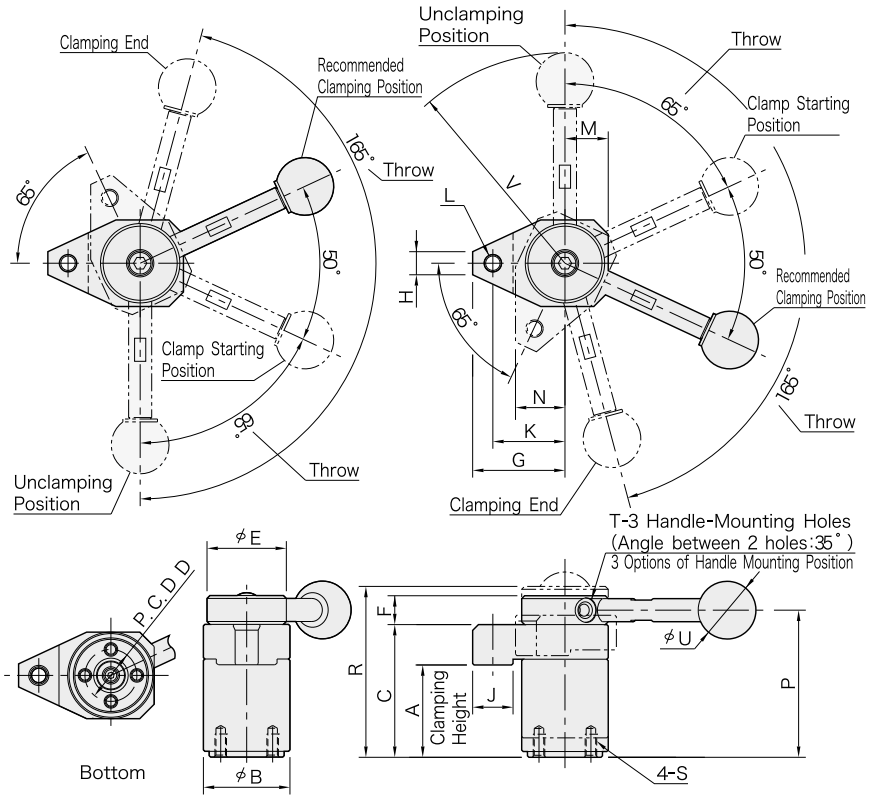
Body & Shaft	
Material	SCM440 steel
Finish	Quenched and tempered

Clamp arm & Adaptor Head	
Material	S45C steel
Finish	Quenched and tempered

Handle	
Material	S45C steel
Finish	Black oxide

Ball Knob	
Material	ABS resin
Finish	Black

Counterclockwise Clamping　　Clockwise Clamping



Size/Type	Clamping Direction	A	B	C	D (P.C.D)	E	F	G	H	J	K	L
QLSW150R	Clockwise	32 *)	30	46	18	30	10	32	8	14	25	M6x1
QLSW150L	Counterclockwise											
QLSW200R	Clockwise	45 **)	40	63	25	38	13	40	12	16	32	M8x1.25
QLSW200L	Counterclockwise											

*) Actual clamping height : 31.4 to 32.6 (clamping range :1.2)
**) Actual clamping height : 44.1 to 45.9 (clamping range :1.8)

Size/Type	M	N	P	R	S	T	Clamping Force(N)	Clamping Mechanism
QLSW150R	15	17	51	57.5	M4x0.7 8 deep	M5x0.8	800	Spiral Cam Cam Angle:4°
QLSW150L								
QLSW200R	20	22.5	69.5	78.1	M6x1 12 deep	M6x1	1200	
QLSW200L								

With Handle

Part Number	U	V	Allowable Operating Load (N) ***)	Weight (g)
51991115	20	73	150	320
51991117				
51991116	25	107	200	710
51991118				

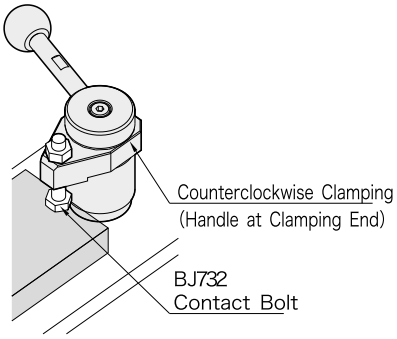
***) Allowable load to operate the handle

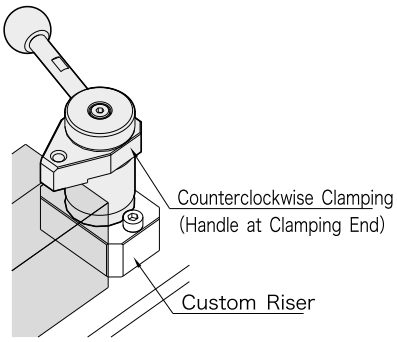
Without Handle

Part Number	Weight (g)
51991119	295
51991121	
51991120	660
51991122	

Note : The handle must be ordered separately.

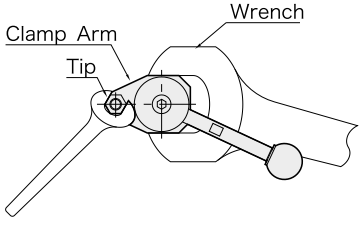
How To Use





Tip Installation

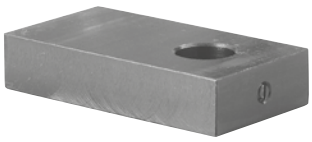
When installing a tip on the clamp arm, lock the clamp arm using a wrench to prevent the clamp from receiving any torque.



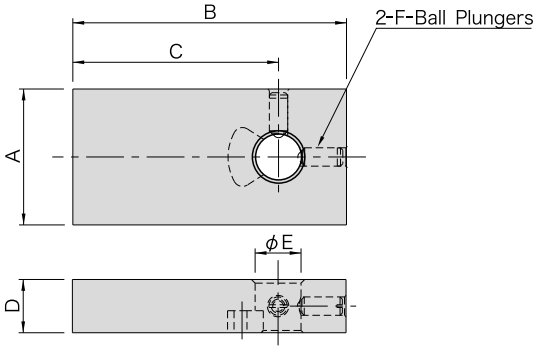
QLSW-SH

MACHINABLE CLAMP ARMS FOR STANDARD SWING CLAMPS

NEW

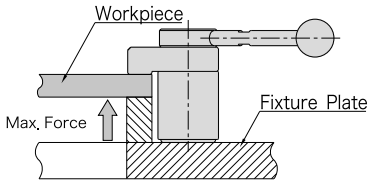


Material: S45C steel
Finish : Black oxide



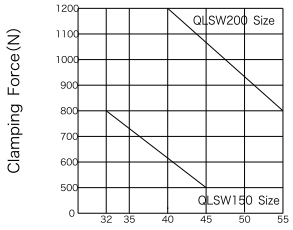
Technical Infomation

Allowable Loads in Machining of Workpiece Bottom

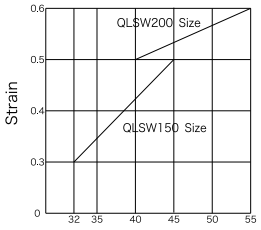


Series	Allowable Force To Workpiece Bottom(Per Clamp)
QLSW150	max.2100N
QLSW200	max.2700N

Clamp Arm Length Vs. Clamping Force



Clamp Arm Length Vs. Strain During Clamping

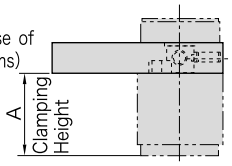


Notes :
- Clamp arm length denotes C dimensions below.
- Clamping force and strain during clamping denote values gained when the max. allowable load is applied to the handle.

How To Use

- Use for clamp arm customization
- Machine to your clamping requirements

(Clamping Height in Use of Machinable Clamp Arms)



Part Number	A	B	C	D	E (F8)	F	Allowable Weight of Clamping Tip*) (g)	Swing Clamps	Weight (g)
51991513	30	60	45	12	10	M4	100	QLSW150Series	150
51991514	40	75	55	16	16	M5		QLSW200Series	330

*) A clamping tip to mount on the end of the clamp arm must not weigh over 100g.

Part Number	A
51991513	34**)
51991514	47***)

**) Actual clamping height:33.4 to 34.6 (clamping range:1.2)
***) Actual clamping height:46.1 to 47.9 (clamping range:1.8)

QLSWH SWING CLAMPS(Heavy)

NEW



Body/Cam/Handle	
Material	SCM440 steel
Finish	Black oxide
Heat Treat	Quenced and tempered

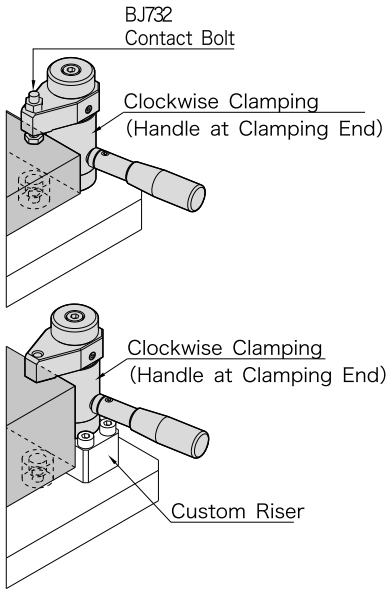
Spindle	
Material	SCM435 steel
Finish	Black oxide
Heat Treat	Quenced and tempered

Arm/Covering/Handle	
Material	S45C steel
Finish	Black oxide
Heat Treat	Quenced and tempered

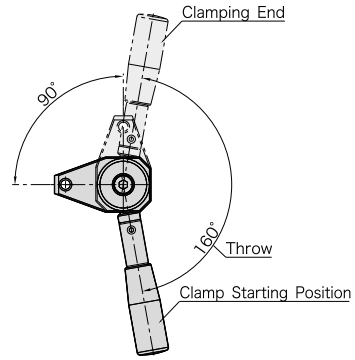
Adjustment knob	
Material	S45C steel
Finish	Black oxide

Handle	
Material	Plastic
Color	Black

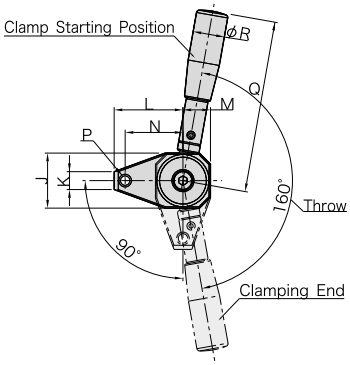
How To Use

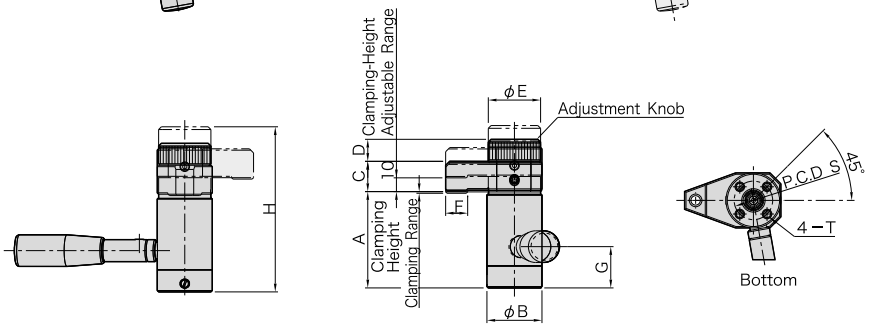


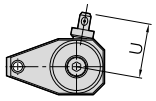
Counterclockwise Clamping



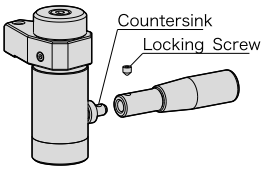
Clockwise Clamping







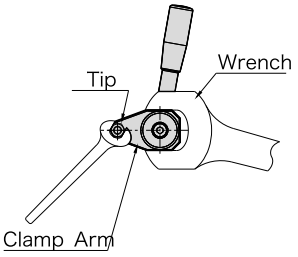
When Handle Is Removed



The handle can be removed by loosening the locking screw.
To keep the handle mounted permanently, make sure that the locking screw is fully tightened.
3 options of handle mounting position.

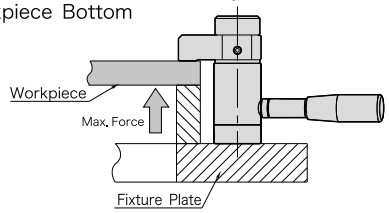
Tip Installation

When installing a tip on the clamp arm, lock the clamp arm using a wrench to prevent the clamp from receiving any torque.



Technical Information

Allowable Loads in Machining of Workpiece Bottom

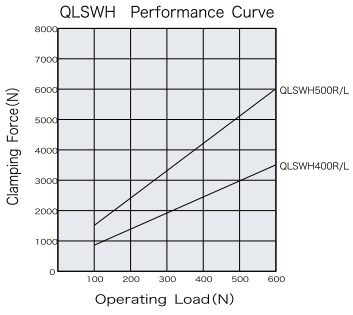


Series	Allowable Force To Workpiece Bottom(Per Clamp)
QLSWH400	max. 8000N
QLSWH500	max.14000N

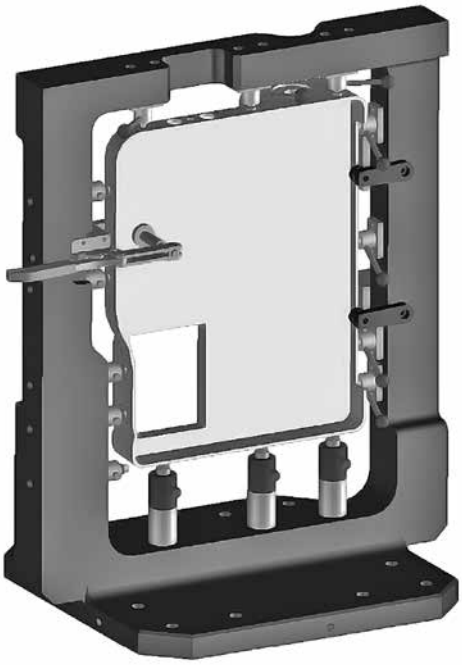
Part Number	Clamping Direction	Clamping Range	Clamping Height	B	C	D	E	F	G	H	J	K	L	M
51991515	Clockwise	1.2	70 to 80	40	22	16	38	16	30	120	40	13	50	20
51991516	Counter-clockwise													
51991517	Clockwise	1.6	80 to 90	50	25	20	48	24	38	137	50	18	60	25
51991518	Counter-clockwise													

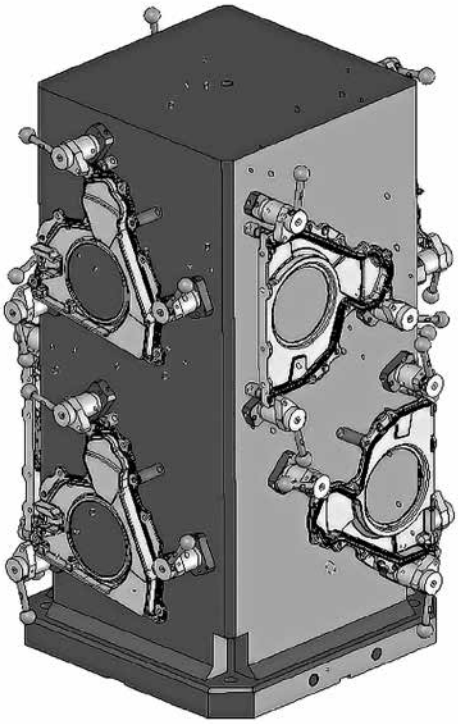
Part Number	N	P	Q	R	S (P.C.D)	T	U	Allowable Oerating Load(N)*)	Clamping Force (N)	Clamping Mechanism	Weight (kg)
51991515	42	M 8x1.25	125	23	28	M6x1 12 deep	39	600	3,500	Spiral Cam Cam Angle 2°	1.1
51991516											
51991517	48	M12x1.75	160	28	35	M8x1.25 16 deep	47	600	6,000		2
51991518											

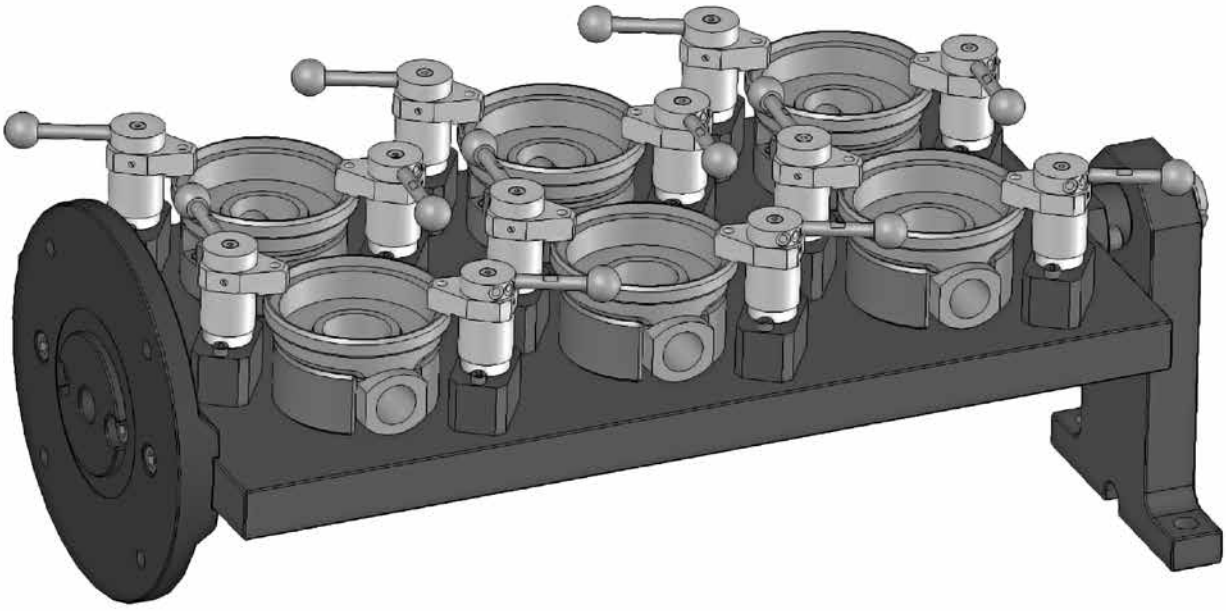
*) Allowable load to operate the handle



APPLICATION EXAMPLES







Information on Your Making Custom Clamp Arms for Standard Size of Swing Clamps

Recommeded Dimensions

Series	A (F8)	B	E	F	G	H	J	K	L(Max.) *)	M	N
QLSW150	10	12	5	32	M4x0.7	11	1.5	30	45	15	C5
QLSW200	16	16	6	42	M5x0.8	15	2	40	55	20	C8

*) See page 138 clamping force vs. clamp-arm length

Clamp Arm Installation/Removal Instructions

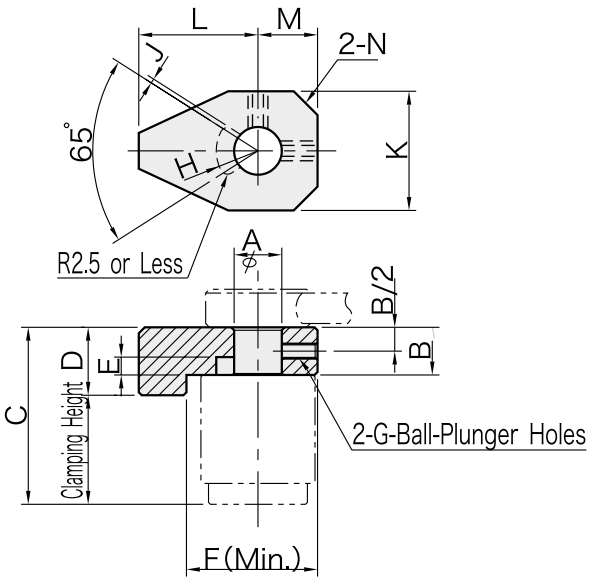
To install a clamp arm,

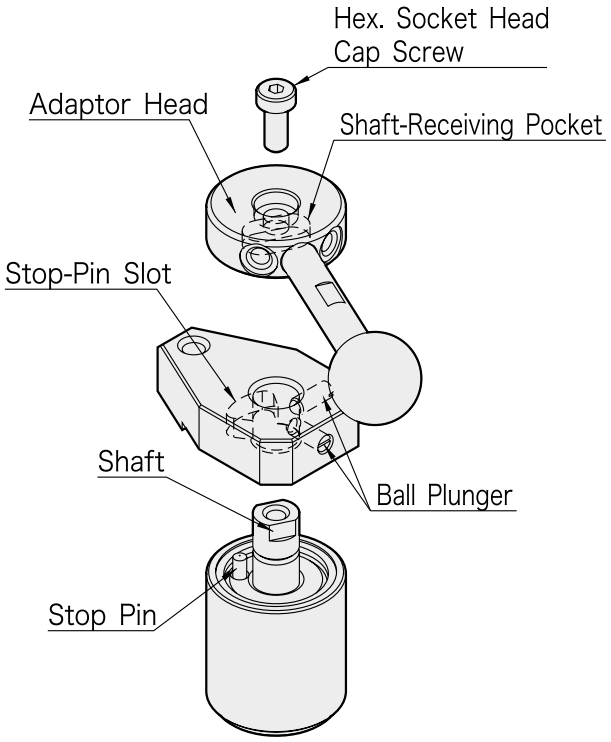
1. Fit it onto the shaft getting the stop pin received in the stop-pin slot provided on the clamp-arm bottom.
2. Place the adaptor head onto the shaft getting the shaft fitted into the shaft-receiving pocket in the adaptor head, and then lock the adaptor head using a hex. socket head cap screw.
3. Tighten the ball plungers inside the clamp arm.

To remove the clamp arm, follow the above steps back.

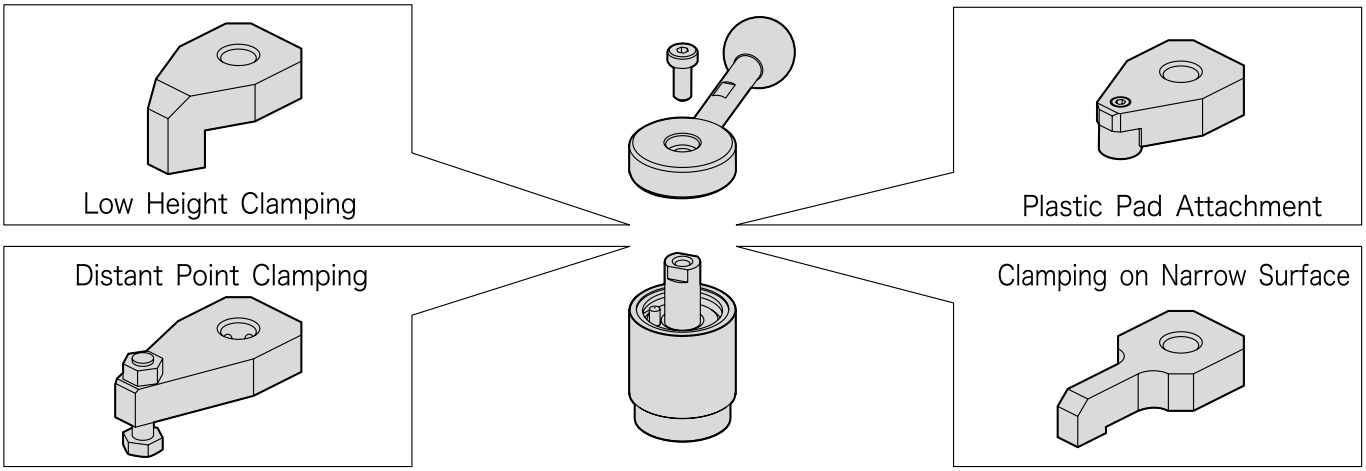
How To Determine D Dimensions

Series	C	D
QLSW150	46	46 - Clamping Height
QLSW200	63	63 - Clamping Height





Clamp Arm Customization Examples



Information on Your Making Custom Clamp Arms for Heavy Size of Swing Clamps

Recommended Dimensions

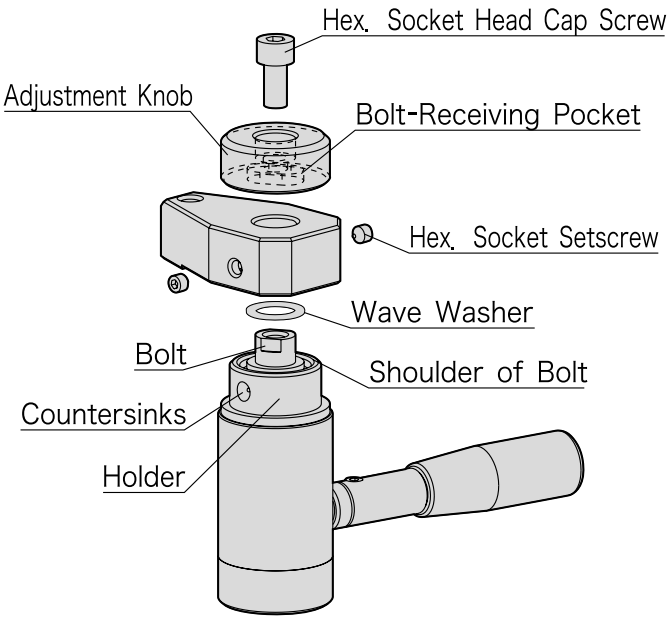
Series	A (F8)	B	C	D	E (±0.1)	F	G	H	L (Max.)
QLSWH400	32	15	21	13	5	M6x1	20	40	50
QLSWH500	41	19	24	15	6	M8x1.25	25	50	60

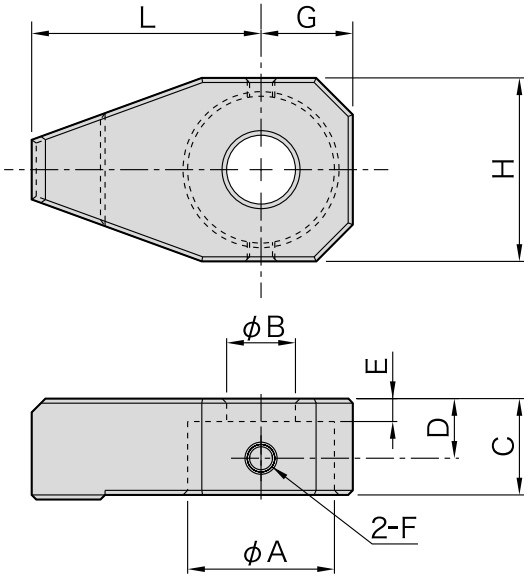
Clamp Arm Installation/Removal Instructions

To install a clamp arm,

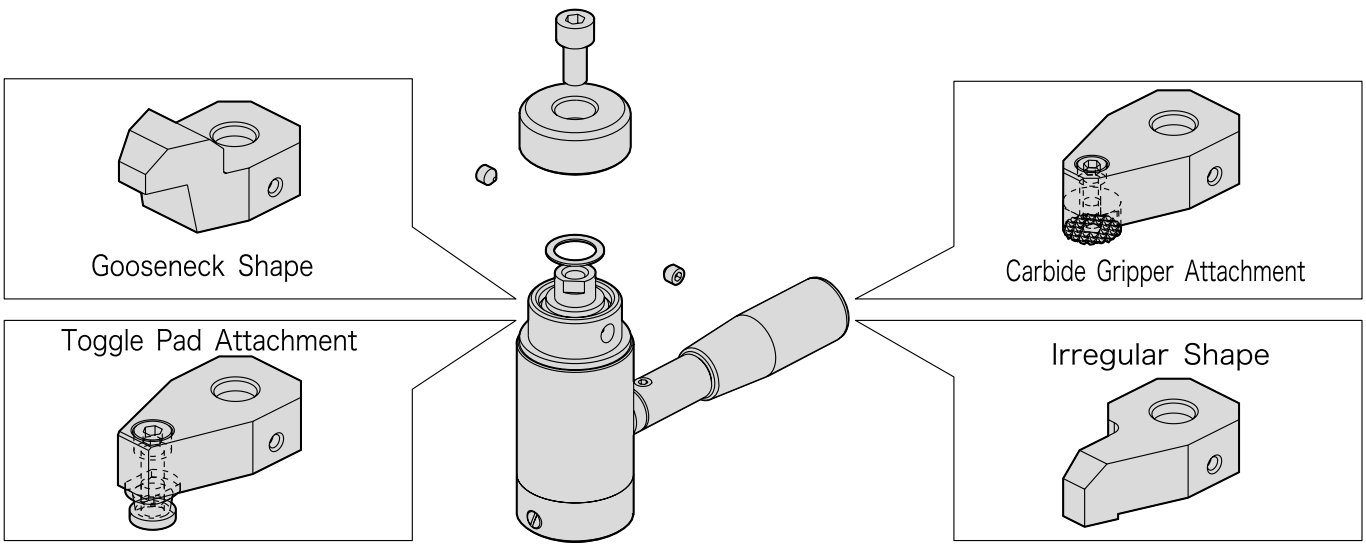
1. Place the wave washer on the shoulder of the bolt and then fit the clamp arm onto the bolt.
2. Place the adjustment knob onto the bolt getting the bolt fitted into the bolt-receiving pocket in the adjustment knob, and then lock the adjustment knob using a hex. socket head cap screw.
3. Align the countersinks on the side of the holder with the setscrew holes on the side of the clamp arm, and then lock them using the hex. socket setscrews.

To remove the clamp arm, follow the above steps back.





Clamp Arm Customization Examples



QLSWC SWING CLAMPS (Mini)

NEW

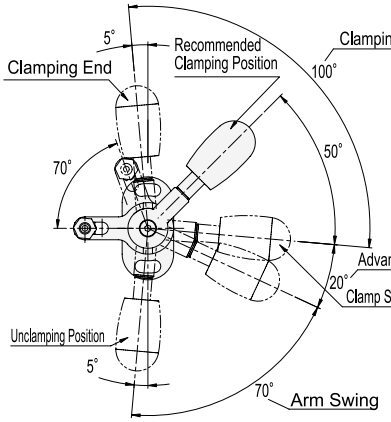


Body / Handle / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

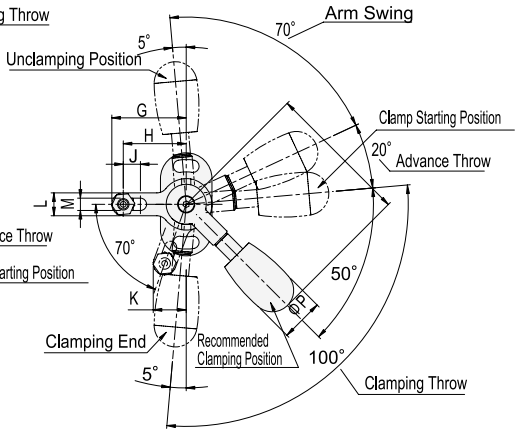
Arm / Cam Shaft	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered

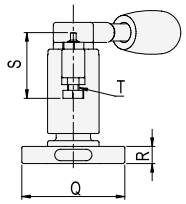
Knob	
Material	Phenolic plastic
Color	Black

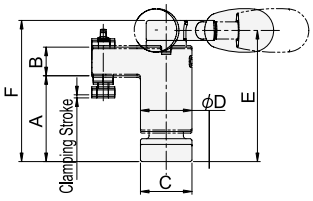
Counterclockwise Clamping



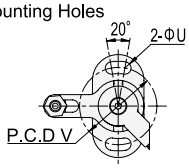
Clockwise Clamping



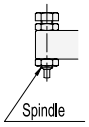




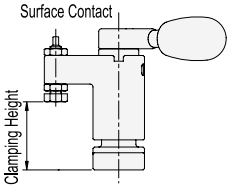
Mounting Holes

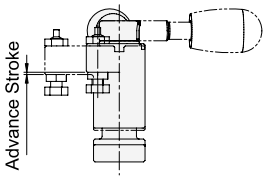


Rough Surface Contact



Finished Surface Contact





Part Number	Clamping Direction	Clamping Height *)				Clamping Stroke	Advance Stroke
		Finished Surface Contact		Rough Surface Contact			
		Min.	Max.	Min.	Max.		
51991822	Clockwise	22.8	24.8	22.4	24.4	1	0.8
51991823	Counterclockwise	(22.3-23.3)	(24.3-25.3)	(21.9-22.9)	(23.9-24.9)		
51991824	Clockwise	31.3	33.3	32.2	33.3	1.4	1.1
51991825	Counterclockwise	(30.6-32)	(32.6-34)	(31.5-32.9)	(33.5-34.9)		

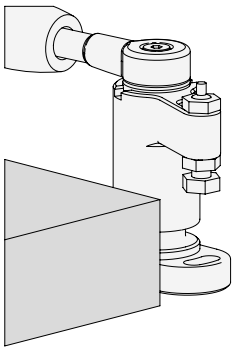
*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
51991822	30	10	18	18	45.8	49	26	22	6	11.5	8	4.3	50	15	36
51991823															
51991824	40	14	23	23	61.3	66	35	30	8	15.3	10	5.3	63	20	45
51991825															

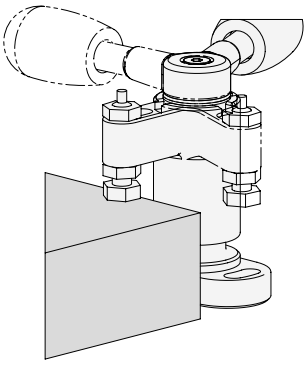
Part Number	R	S	T	U	V	W	Allowable Operating Load (N) **)	Clamping Force (N)	Clamping Mechanism	Weight (g)
51991822	6	22.8	M4×0.7	4.3	27	8	100	1,100	Spiral Cam Cam Angle:5°	112
51991823										
51991824	8	28.5	M5×0.8	5.3	34	10	150	1,800		250
51991825										

**) Allowable load to operate the handle

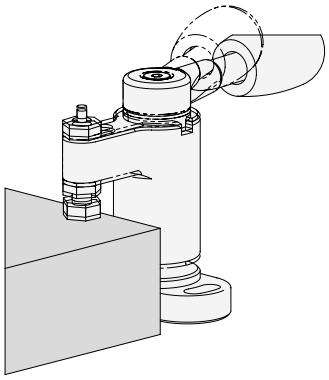
How To Operate



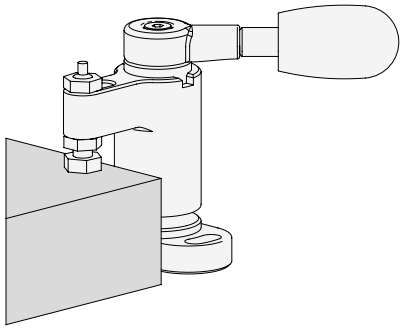
1. Unclamped
Load a workpiece.



2. Arm Swing
Turn the handle to set the arm in position.

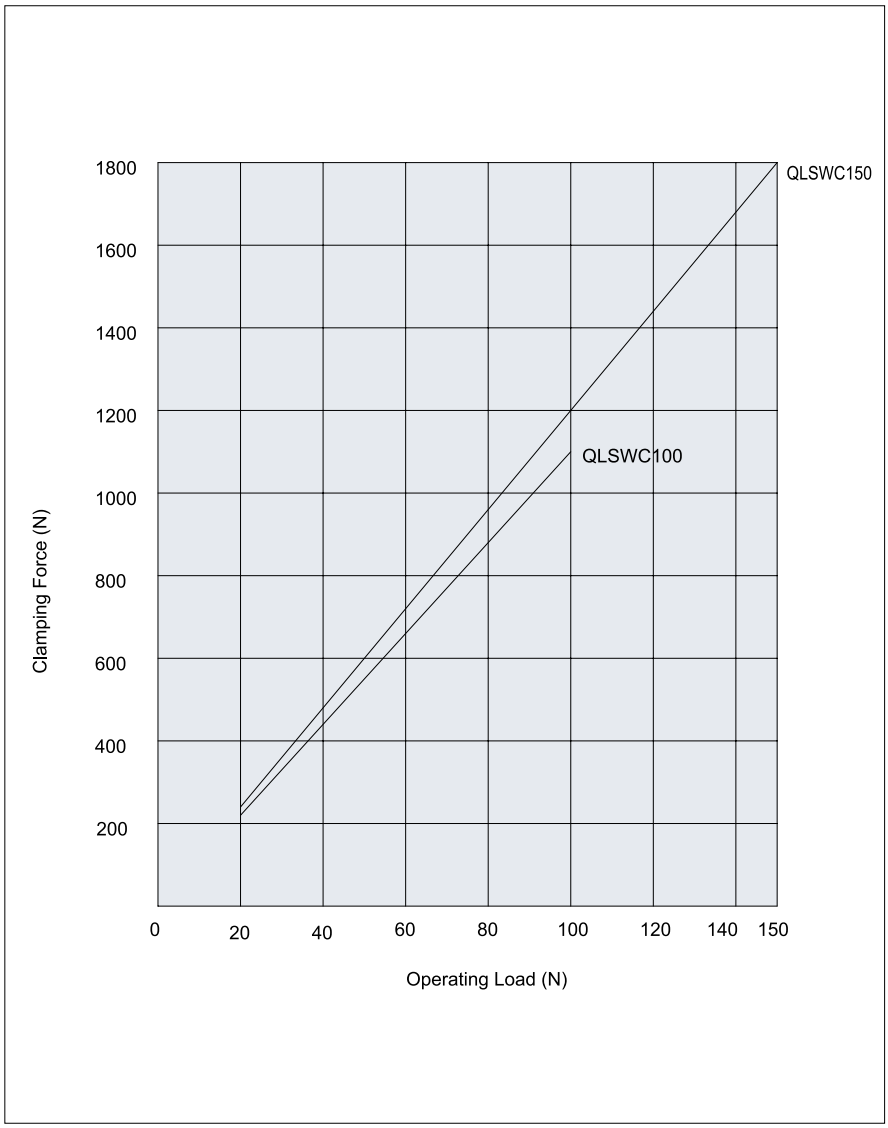


3. Clamping Setup
Continue turning the handle to set the spindle close to the workpiece.



4. Clamping
Turn the handle to the recommended clamping position.

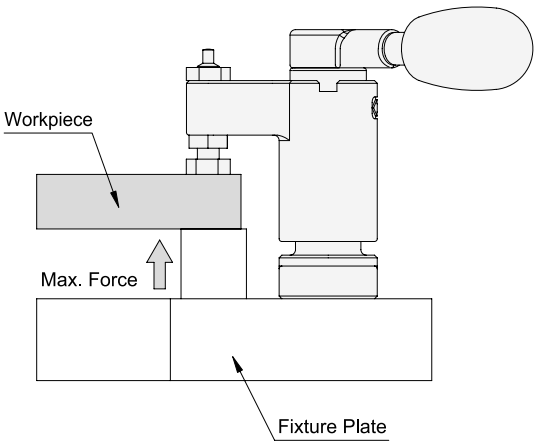
Performance Curve



Technical Information

Allowable Loads in Machining of Workpiece Bottom

Ensure that any force more than stated below is not applied.

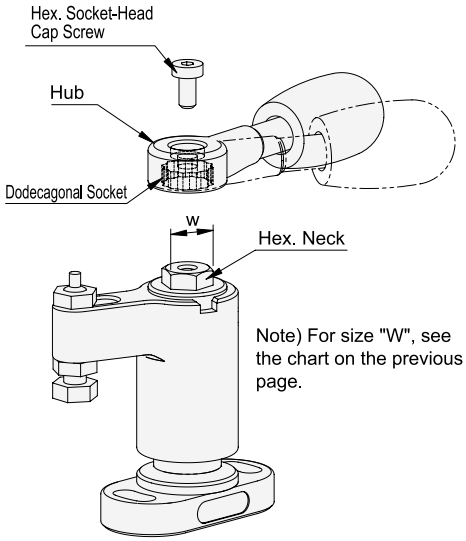


Series	Allowable Force to Workpiece Bottom (per Clamp)
QLSWC100	max.2,300N
QLSWC150	max.3,600N

How To Operate

How To Change Handle Position

The dodecagonal socket in the hub of the handle allows changing the handle operating angle by 30°.

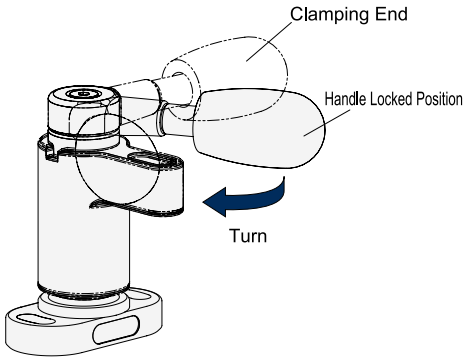


Note) For size "W", see the chart on the previous page.

How To Release Locked Handle

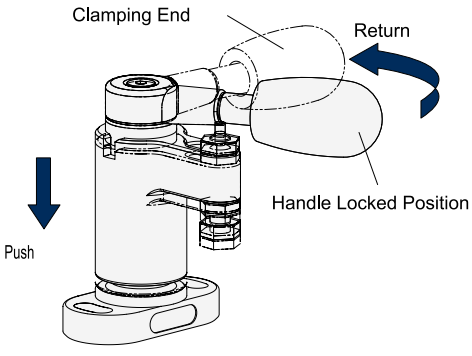
When turned beyond the clamping end, the handle will be locked with a click. The locked handle can be released by following the instructions below.

When the spindle is not installed,



Turn the handle beyond the locked position until another click is made.

When the spindle is installed,



Lower the arm at the handle locked position and then return the handle keeping the arm lowered.

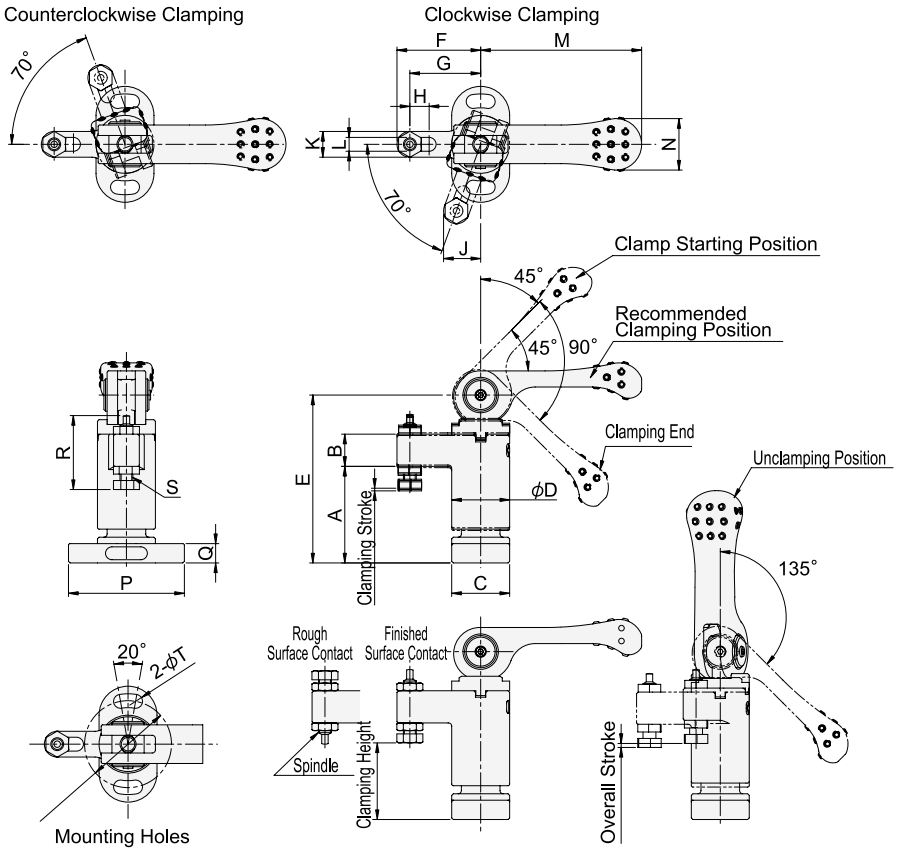
QLSWC SWING CLAMPS (Mini) WITH CAM HANDLE

NEW



Body / Washer / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

Arm / Cam Shaft / Handle	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered



Part Number	Clamping Direction	Clamping Height *)				Clamping Stroke	Overall Stroke
		Finished Surface Contact		Rough Surface Contact			
		Min.	Max.	Min.	Max.		
51991826	Clockwise	22.8	24.8	22.4	24.4	0.8	1.2
51991827	Counterclockwise	(22.4-23.2)	(24.4-25.2)	(22-22.8)	(24-24.8)		
51991828	Clockwise	31.3	33.3	32.2	34.2	1	1.5
51991829	Counterclockwise	(30.8-31.8)	(32.8-33.8)	(31.7-32.7)	(33.7-34.7)		

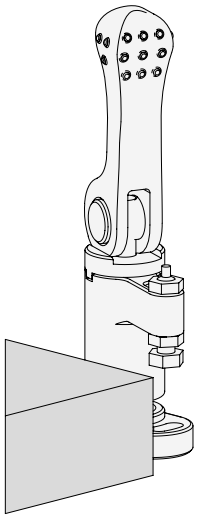
*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
51991826	30	10	18	18	52	26	22	6	11.5	8	4.3	50	15	36	6
51991827															
51991828	40	14	23	23	68	35	30	8	15.3	10	5.3	63	20	45	8
51991829															

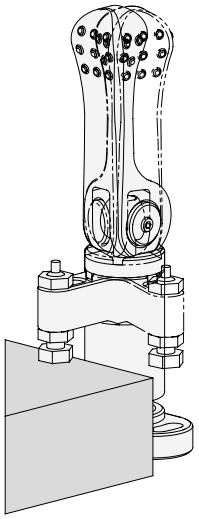
Part Number	R	S	T	U	Cam Handles Part Number	Allowable Operating Load (N) **)	Clamping Force (N)	Clamping Mechanism	Weight (g)
51991826	22.8	M4×0.7	4.3	27	QLCA-05	100	800	Spiral Cam Cam Angle:4°	134
51991827									
51991828	28.5	M5×0.8	5.3	34	QLCA-06	150	1,500		272
51991829									

**) Allowable load to operate the handle

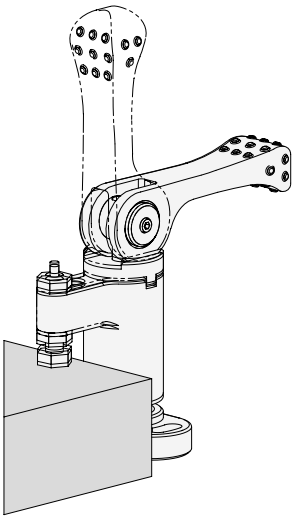
How To Operate



1. Unclamped
Load a workpiece.

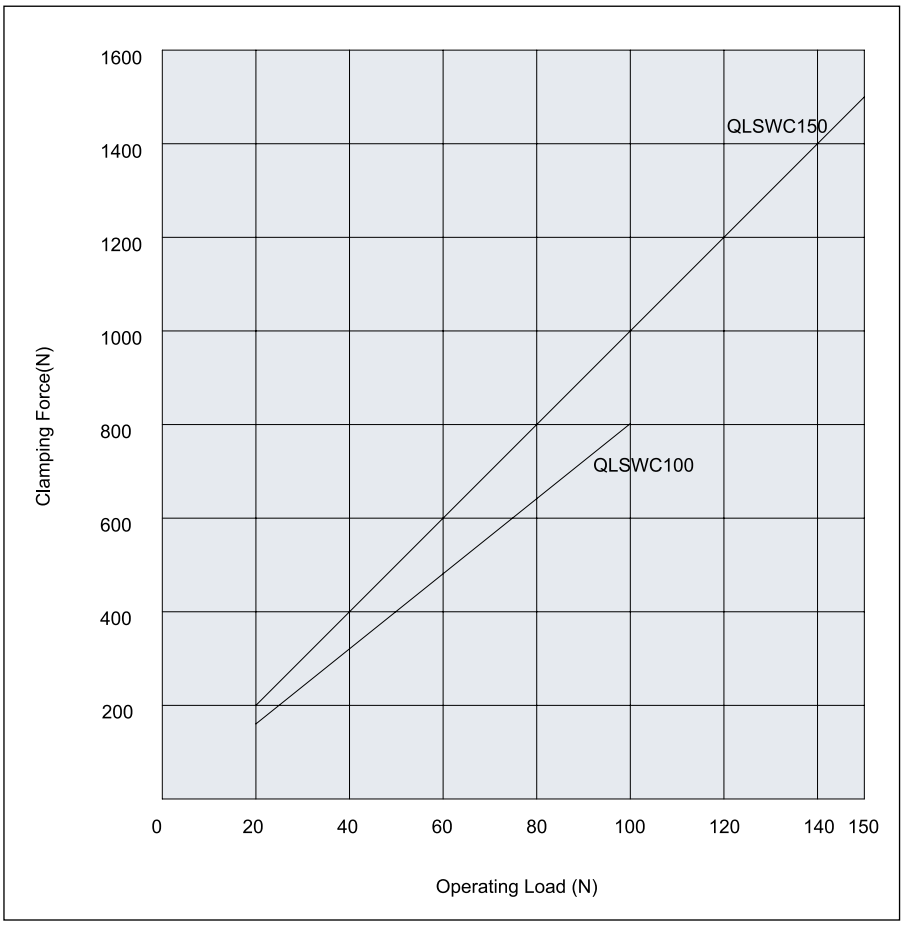


2. Arm Swing
Turn the handle to set the arm in position.



3. Clamping
Set the handle down to clamp the workpiece.

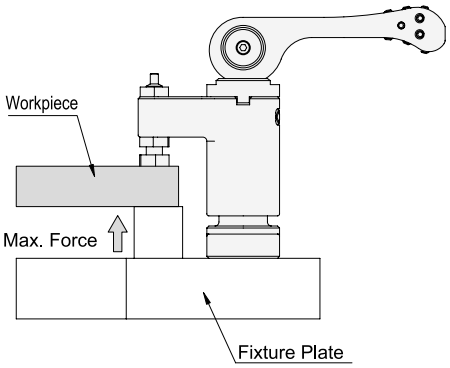
Performance Curve



Technical Information

Allowable Loads in Machining of Workpiece Bottom

Ensure that any force more than stated below is not applied.



Series	Allowable Force to Workpiece Bottom (per Clamp)
QLSWC100	max.2,300N
QLSWC150	max.3,600N

QLSWC SWING CLAMPS (Mini) FOR TORQUE CONTROL

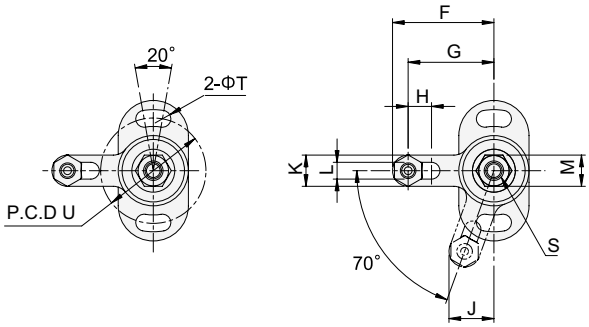
NEW

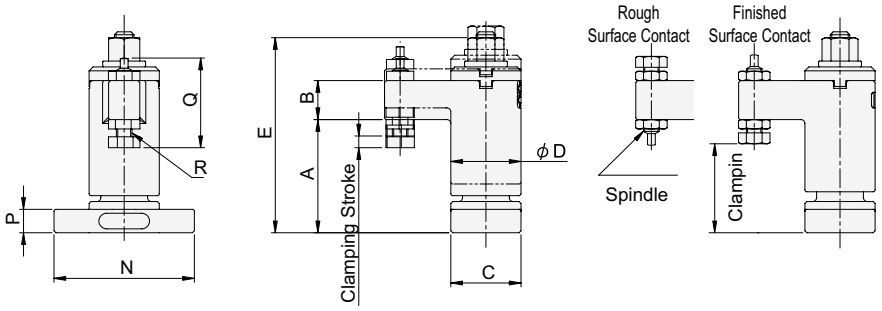


Body / Washer / Flange Nut / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

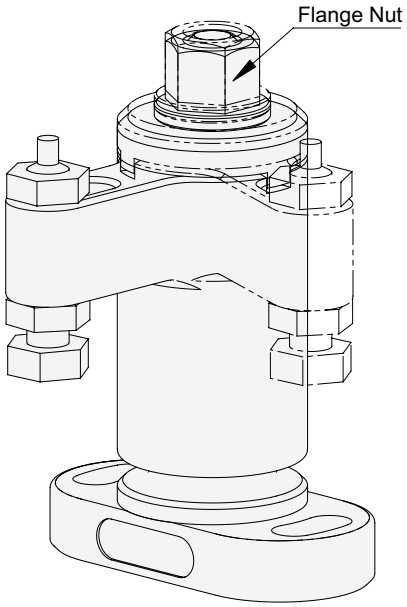
Arm	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered

- Designed for clamping-force control with a torque wrench
- Screw clamping mechanism allows for longer clamping stroke and greater clamping force.





How To Operate



Turning the flange nut allows the arm to swing into position for clamping.

Warning

Do not use a power tool(impact wrench etc.) to turn the flange nut, for damage prevention.

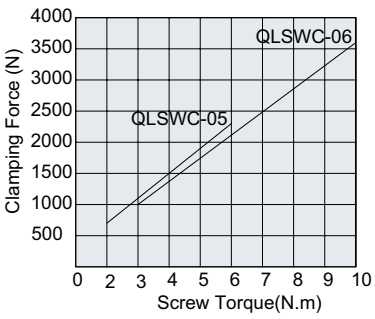
Part Number	Clamping Height *)				Clamping Stroke	A	B	C	D	E
	Finished Surface Contact		Rough Surface Contact							
	Min.	Max.	Min.	Max.						
51991830	22.8 (22.8-25.8)	24.8 (24.8-27.8)	22.4 (22.4-25.4)	24.4 (24.4-27.4)	3	29	10	18	18	52.5
51991831	31.3 (31.3-35.3)	33.3 (33.3-37.3)	32.2 (32.2-36.2)	34.2 (34.2-38.2)	4	39	14	23	23	69.5

*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

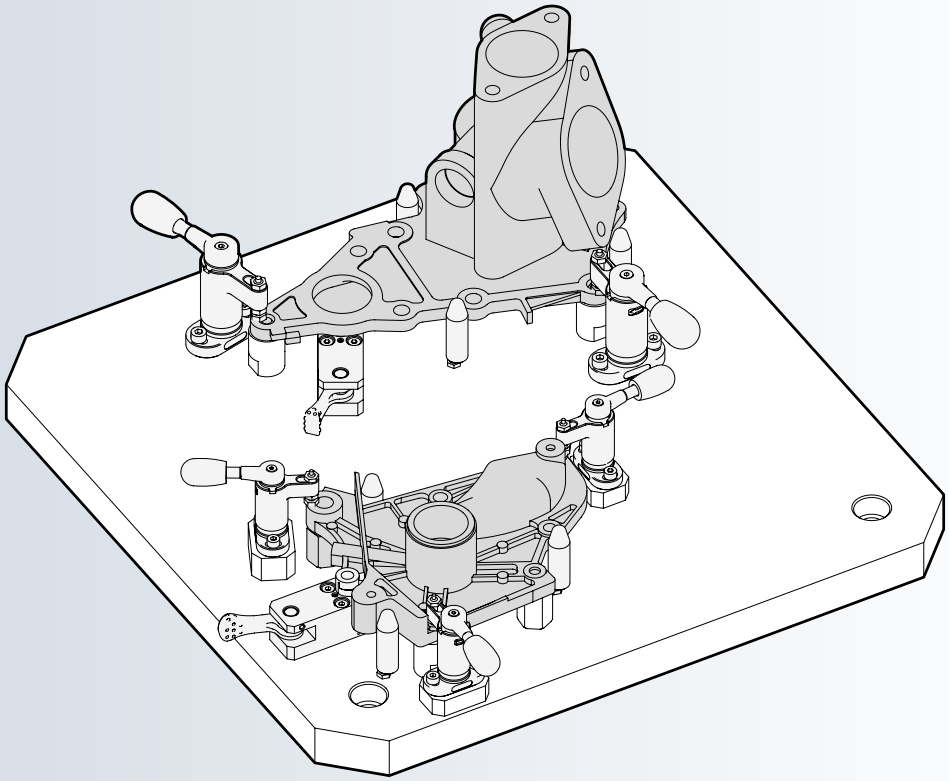
Part Number	F	G	H	J	K	L	M	N	P	Q
51991830	26	22	6	11.5	8	4.3	8	36	6	22.8
51991831	35	30	8	15.3	10	5.3	10	45	8	28.5

Part Number	R	S	T	U	Clamping Force(N)	Allowable Screw Torque (N.m)	Weight (g)
51991830	M4×0.7	M5×0.8	4.3	27	2,300	6	94
51991831	M5×0.8	M6×1	5.3	34	3,600	10	210

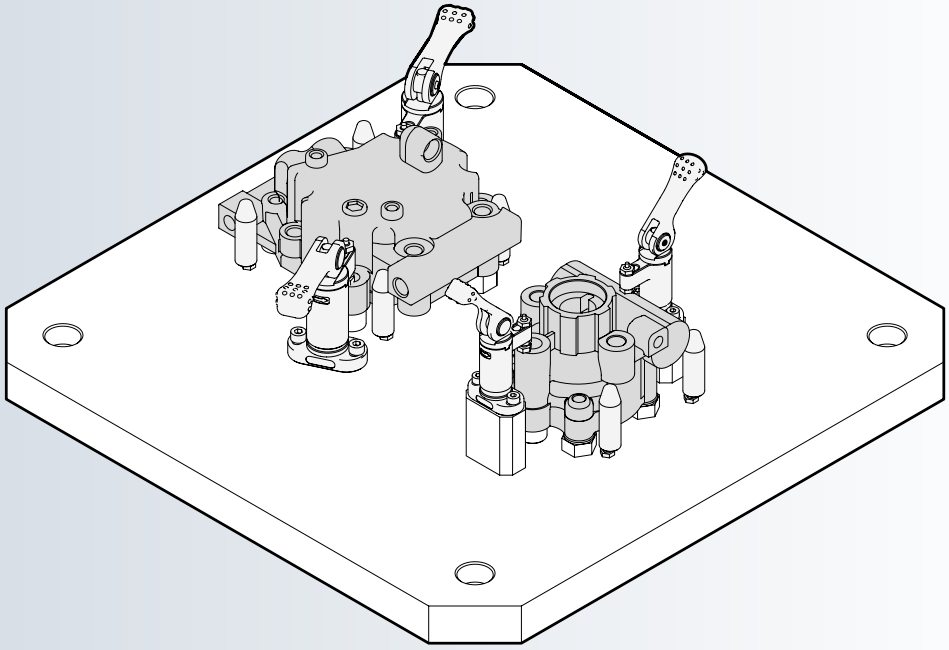
Performance Curve



Fixturing with Swing Clamps(Mini)



Fixturing with Swing Clamps(Mini) with Cam Handle



QLRE RETRACTABLE CLAMPS (Mini) WITH CAM HANDLE

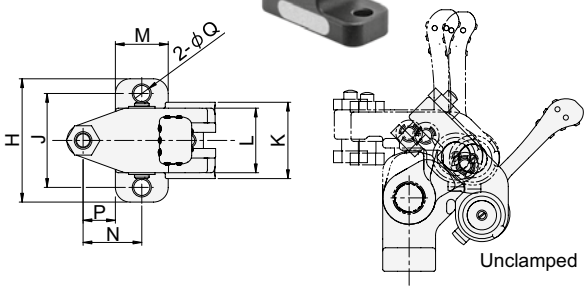
NEW

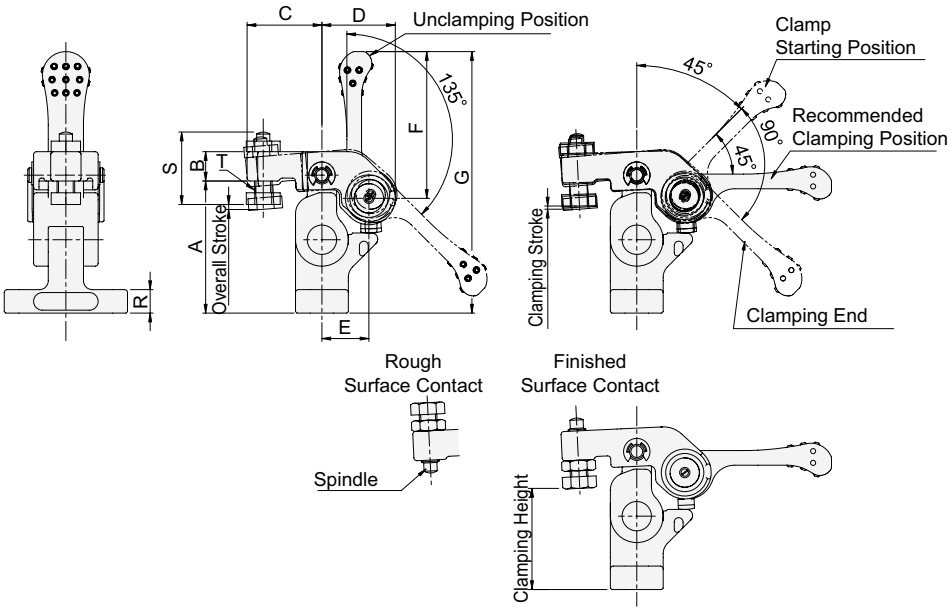


Body / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

Arm / Joint	
Material	SCM435 steel
Finish	Black oxide
Heat treat	Quenched and tempered

Cam Handle	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered





Part Number	Clamping Height *)				Clamping Stroke	Overall Stroke
	Finished Surface Contact		Rough Surface Contact			
	Min.	Max.	Min.	Max.		
51991832	32 (31.5-32.5)	40 (39.5-40.5)	35 (34.5-35.5)	43 (42.5-43.5)	1	1.5
51991833	37 (36.4-37.6)	48 (47.4-48.6)	42 (41.4-42.6)	53 (52.4-53.6)	1.2	1.8

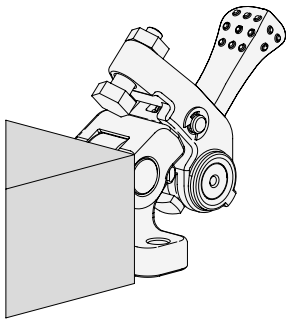
*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
51991832	45	10	25.5	25	16	50	89	42	32	26	22	18	20	11	5.5
51991833	55	12	32	31	20	63	109	52	40	32	28	22	25	14	6.6

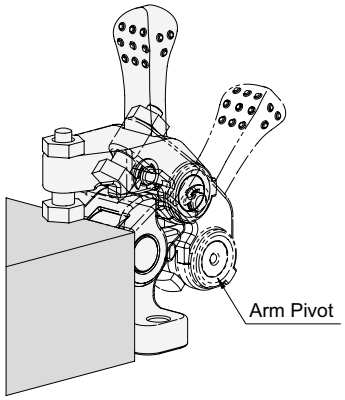
Part Number	R	S	T	Cam Handles Part Number	Allowable Operating Load (N) **)	Clamping Force(N)	Clamping Mechanism	Weight (g)
51991832	8	24	M6×1	QLCA-05	100	700	Spiral Cam Cam Angle:4°	244
51991833	10	30.5	M8×1.25	QLCA-06	150	1,100		468

**) Allowable load to operate the handle

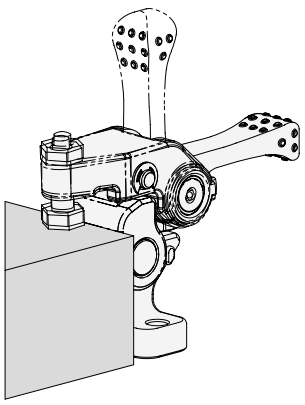
How To Operate



1. Unclamped
Load a workpiece.



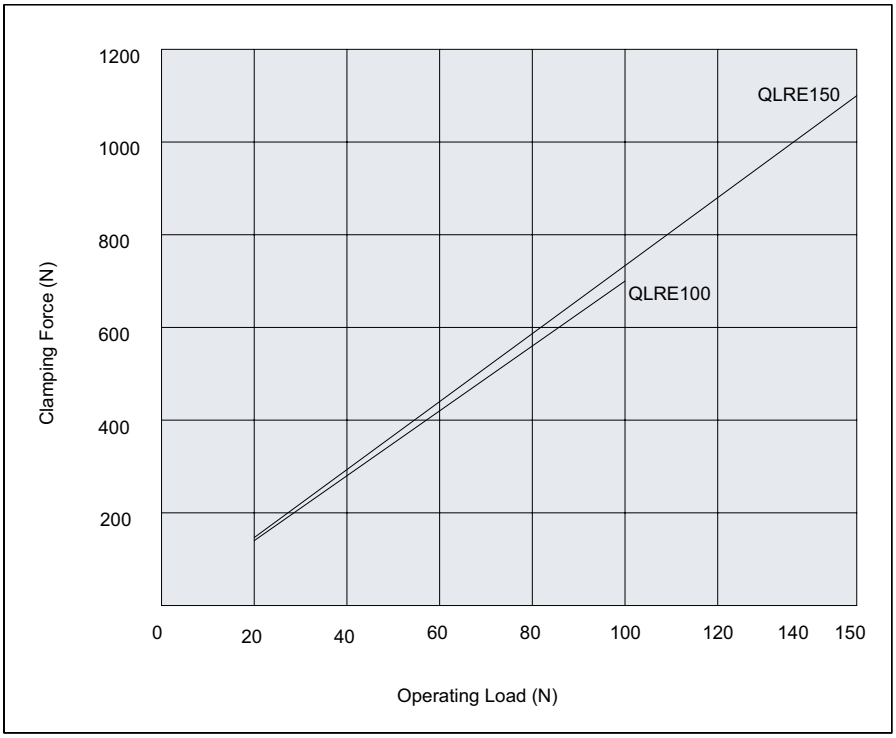
2. Clamping Setup
Set the arm in clamping position holding it at the arm pivot.



3. Clamping
Set the handle down to clamp the workpiece.

For unclamping, follow the above steps back.

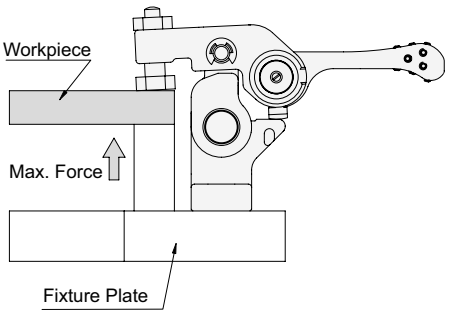
Performance Curve



Technical Information

Allowable Loads in Machining of Workpiece Bottom

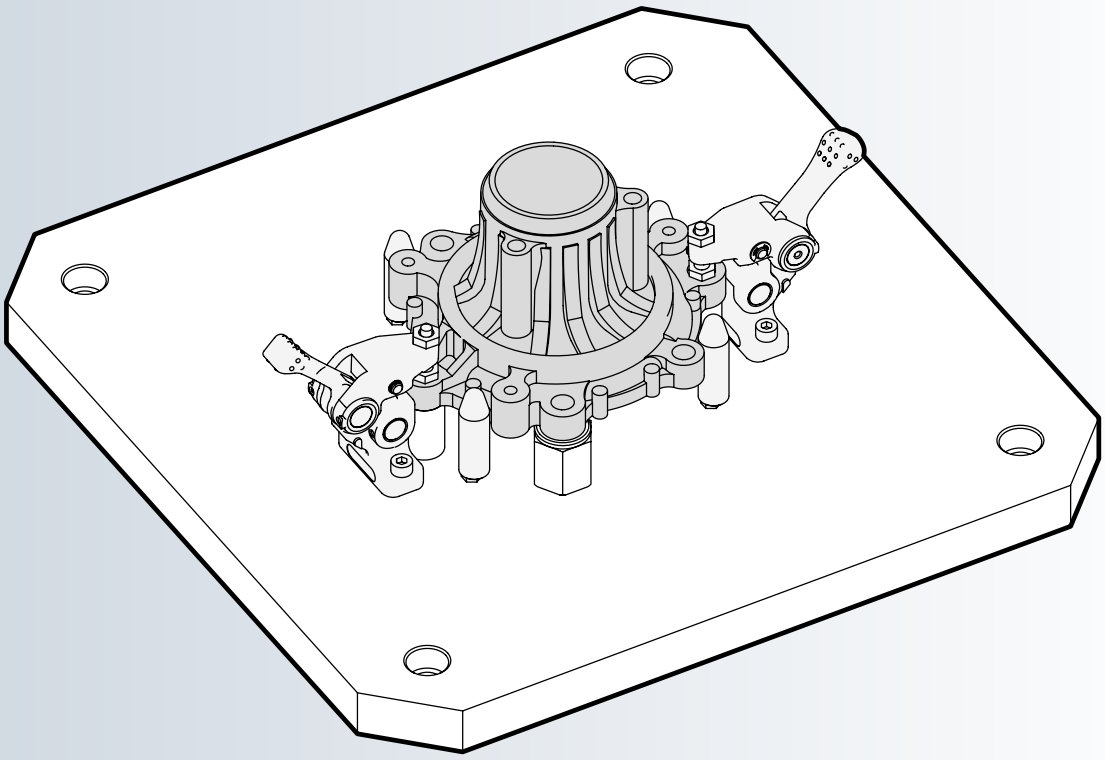
Ensure that any force more than stated below is not applied.



Part Number	Allowable Force to Workpiece Bottom (per Clamp)
51991832	max.5,000N
51991833	max.6,000N

APPLICATION EXAMPLES

Fixturing with Retractable Clamps (Mini) with Cam Handle



QLRE RETRACTABLE CLAMPS (Mini) WITH ADJUSTABLE HANDLE

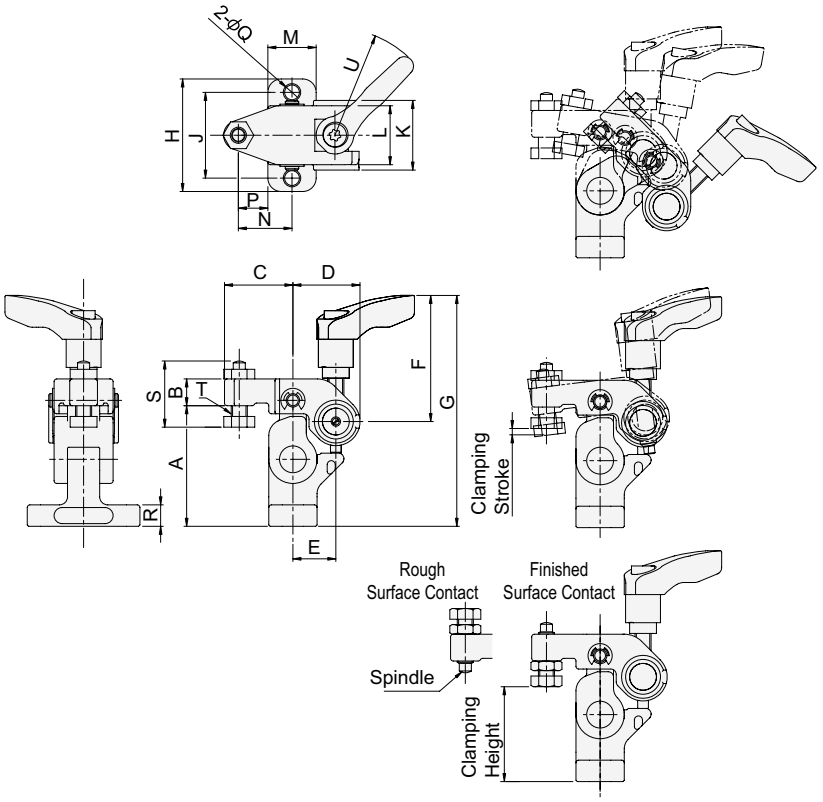
NEW



Body / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

Arm / Joint	
Material	SCM435 steel
Finish	Black oxide
Heat treat	Quenched and tempered

- Screw clamping mechanism allows for longer clamping stroke and greater clamping force.



Part Number	Clamping Height *)				Clamping Stroke	A	B	C	D	E
	Finished Surface Contact		Rough Surface Contact							
	Min.	Max.	Min.	Max.						
51991834	32 (32-29.5)	40 (40-37.5)	35 (35-32.5)	43 (43-40.5)	2.5	45	10	25.5	25	16
51991835	37 (37-33.5)	48 (48-44.5)	42 (42-38.5)	53 (53-49.5)	3.5	55	12	32	31	20

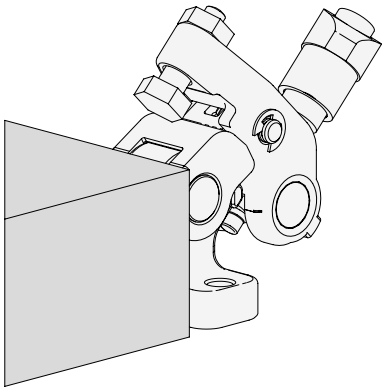
*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

Part Number	F	G	H	J	K	L	M	N	P	Q
51991834	47	86	42	32	26	22	18	20	11	5.5
51991835	63	109	52	40	32	28	22	25	14	6.6

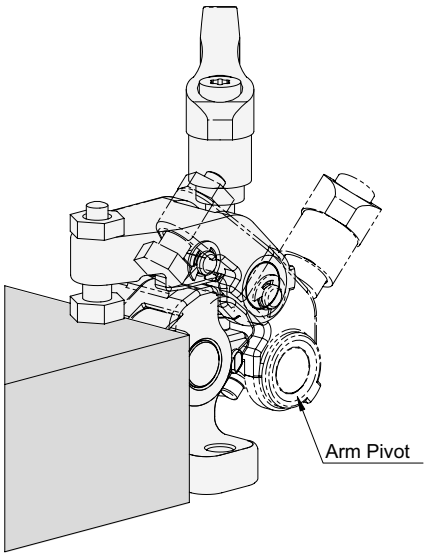
Part Number	R	S	T	U	Adjustable Handles	Allowable Operating Load (N) **)	Clamping Force(N)	Clamping Mechanism	Weight (g)
51991834	8	24	M6×1	40	FKF6-BR	170	2,400	Screw	242
51991835	10	30.5	M8×1.25	65	FKF8-BR	210	4,200		490

**) Allowable load to operate the handle

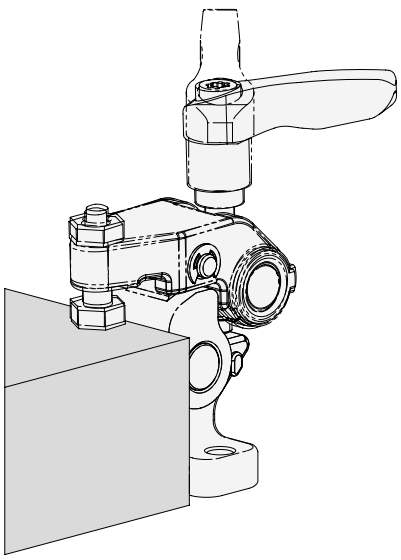
How To Operate



1. Unclamped
Load a workpiece.



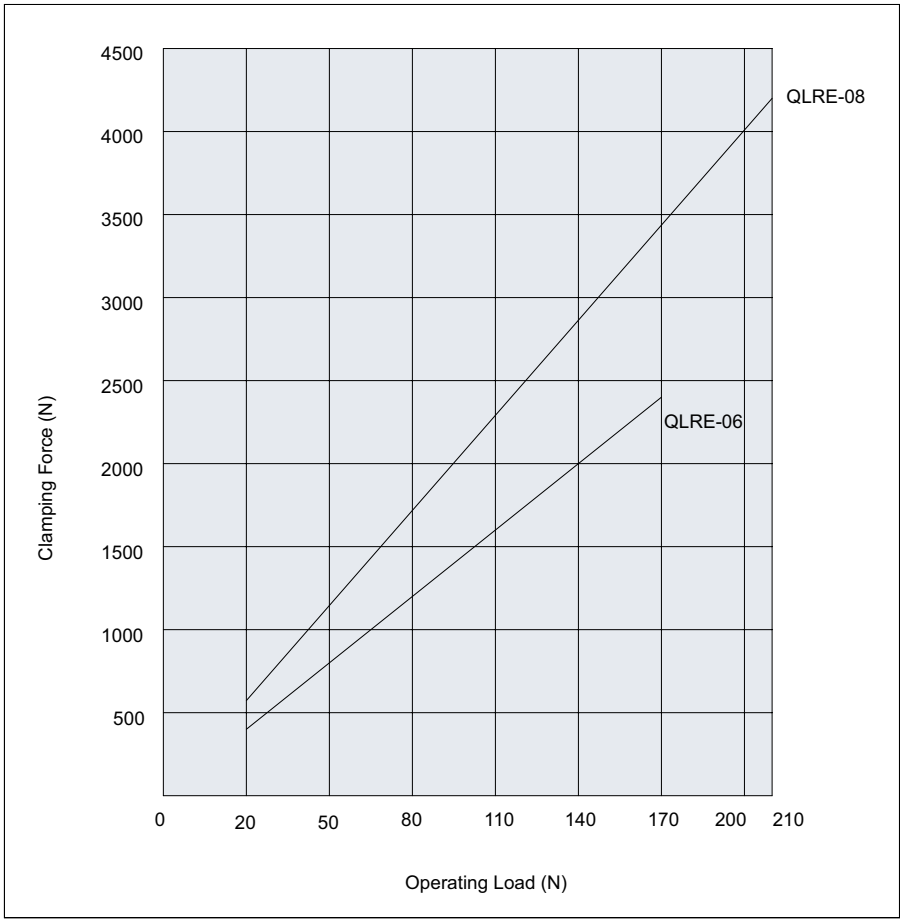
2. Clamping Setup
Set the arm in clamping position holding it at the arm pivot.



3. Clamping
Set the handle down to clamp the workpiece.

For unclamping, follow the above steps back.

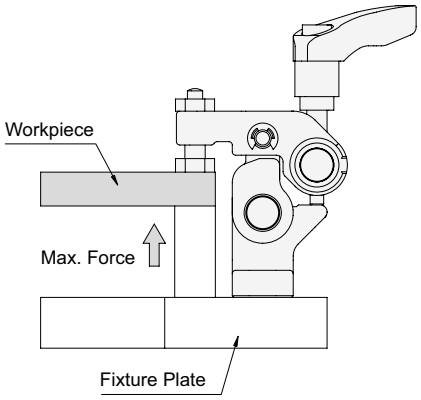
Performance Curve



Technical Information

Allowable Loads in Machining of Workpiece Bottom

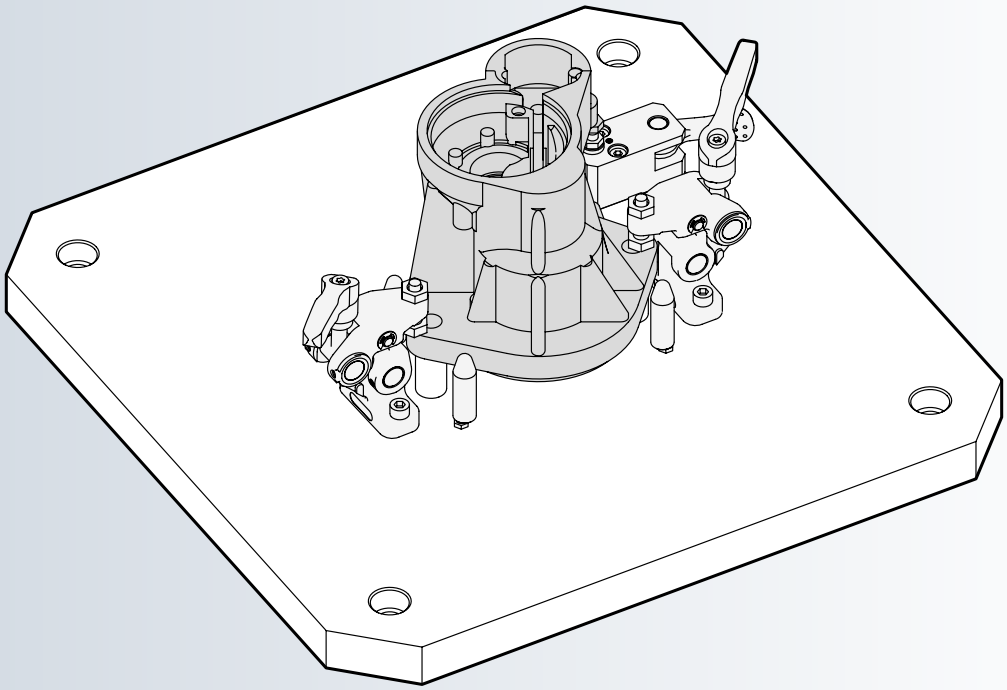
Ensure that any force more than stated below is not applied.



Part Number	Allowable Force to Workpiece Bottom (per Clamp)
QLRE-06	max.5,000N
QLRE-08	max.6,000N

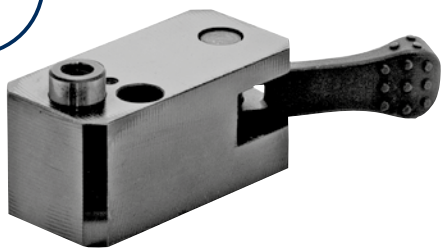
APPLICATION EXAMPLES

Fixturing with Retractable Clamps (Mini) with Adjustable Handle



BJ352 WORK SUPPORT WITH CAM HANDLE

NEW



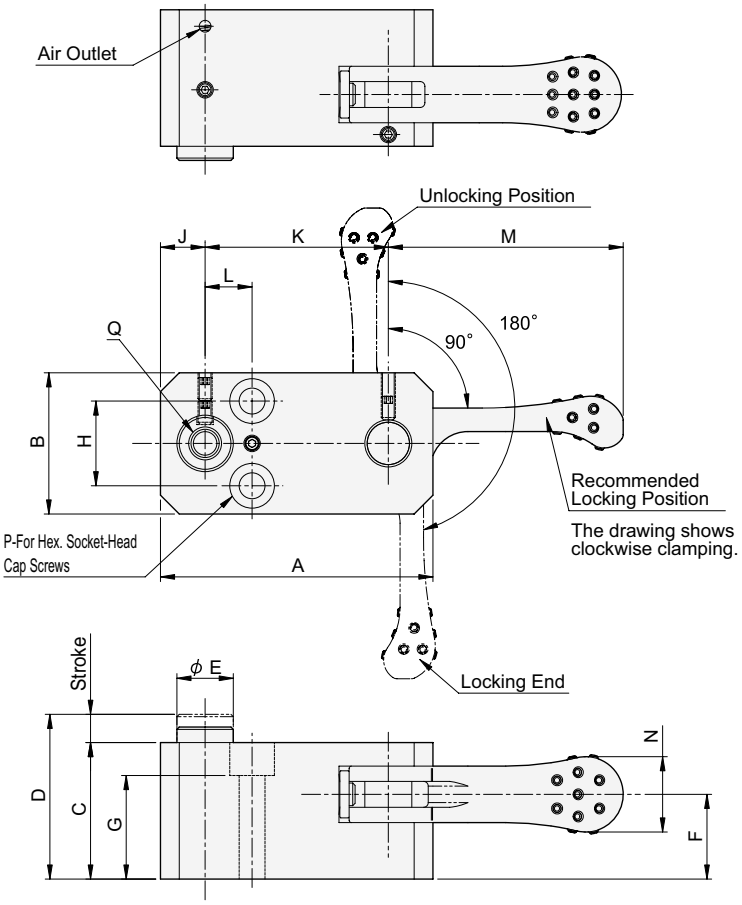
Body	
Material	S45C steel
Finish	Black oxide

Piston	
Material	SK4 steel
Finish	Black oxide
Heat treat	Quenched and tempered

Locking Pin	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

Handle	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered

* The clamping direction can easily be changed.

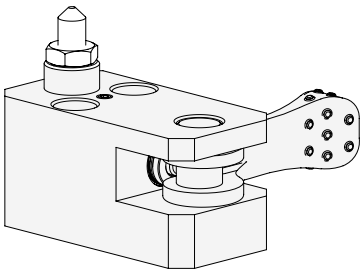


Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N
51991836	52	25	24	29	10	14	19	15	8	36	8	40	14
51991837	58	30	29	35	12	18	22	18	9.5	39	10	50	16
51991838	75	38	37	45	16	23	25	24	12	51	12	63	19
51991839	85	45	42	52	19	26	30	28	14.5	56	15	80	24

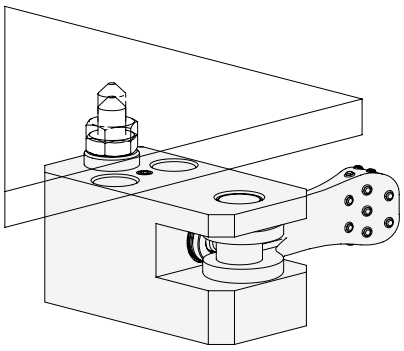
Part Number	P	Q	Cam Handles Part Number	Allowable Operating Load (N) *)	Support Capacity (N)	Piston Spring Force (N)	Locking Mechanism	Weight (g)
51991836	M4	M5×0.8 8 deep	QLCA-04	80	500	0-6	Spiral Cam Cam Angle:4°	213
51991837	M5	M6×1 10 deep	QLCA-05	100	700	0-6		335
51991838	M6	M8×1.25 15 deep	QLCA-06	150	900	0-7		738
51991839	M8	M10×1.5 15deep	QLCA-08	200	1,200	1-11		1,110

*) Allowable load to operate the handle

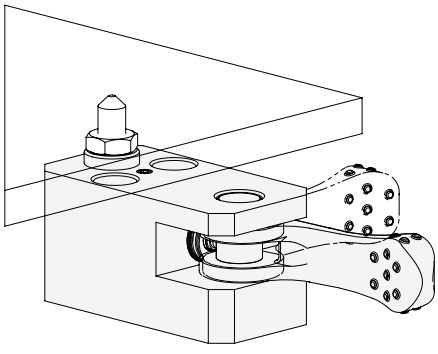
How To Operate



1. Unlocked
No workpiece loaded



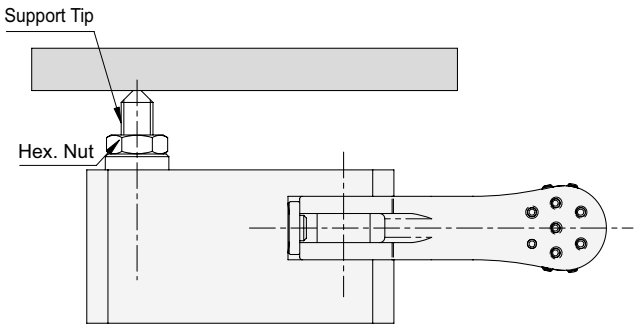
2. Workpiece Loading
Load a workpiece, and the piston lowers.



3. Clamping
Turn the handle to lock the piston.

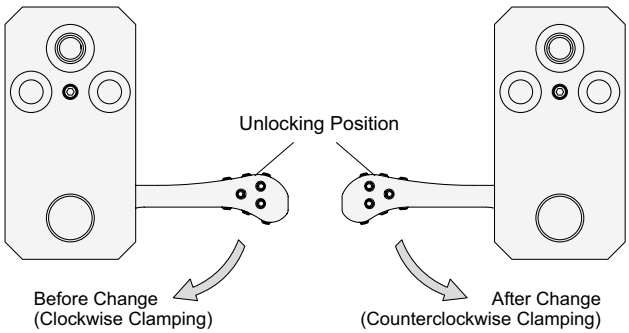
Adjusting Handle Locking Position

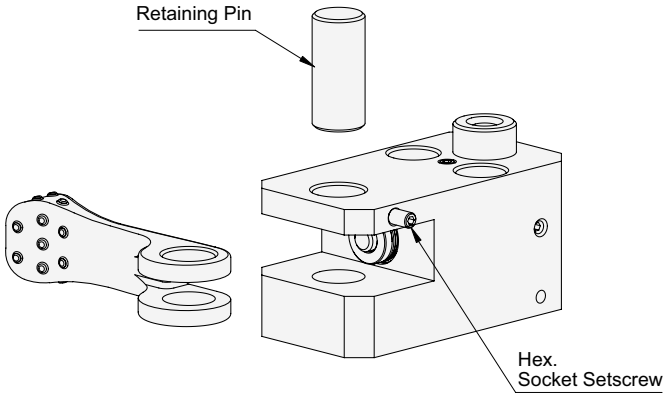
Ensure before use that the handle comes to the recommended position when the piston is locked, by adjusting the height of a support tip.



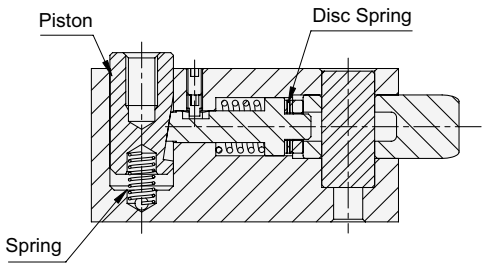
Changing Clamping Direction

Loosen the hex. socket setscrew to remove the retaining pin. Turn the handle upside down and put it in position again.





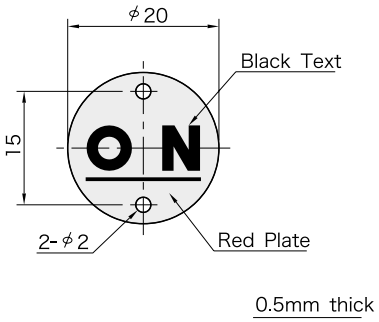
The built-in disc spring prevents loosened locking.



QLST MARKER PLATES

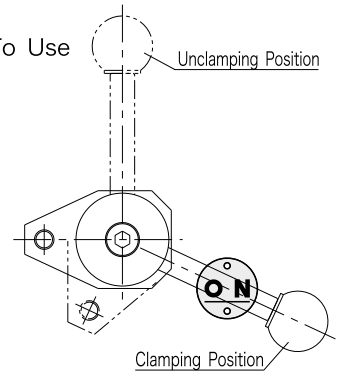


Material: Aluminum



Pressure sensitive adhesive on the backside.
Two 2mm-dia. holes allow for riveting.

How To Use



Use to mark the handle position in the clamping mode.

Part Number
51991147

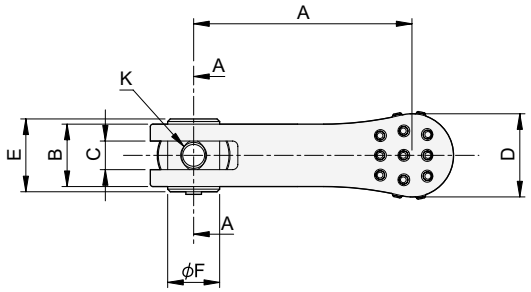
QLCA CAM HANDLES

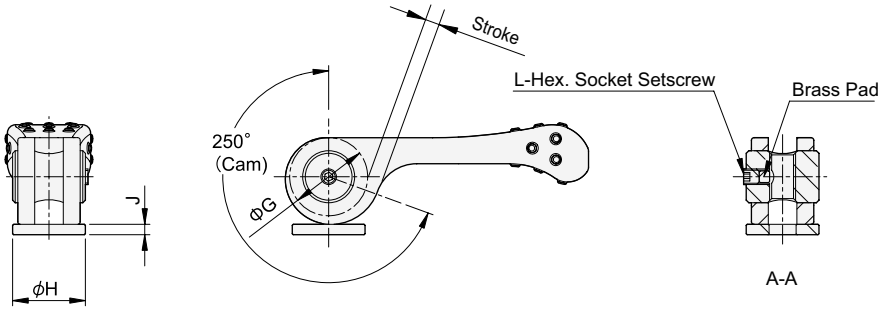
NEW

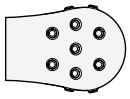


Lever	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered

Ring Nut / Washer	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

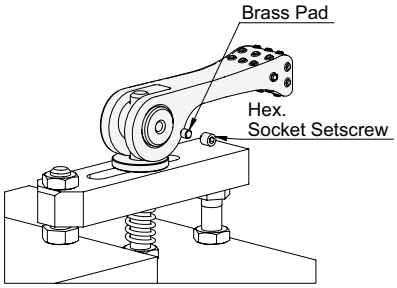






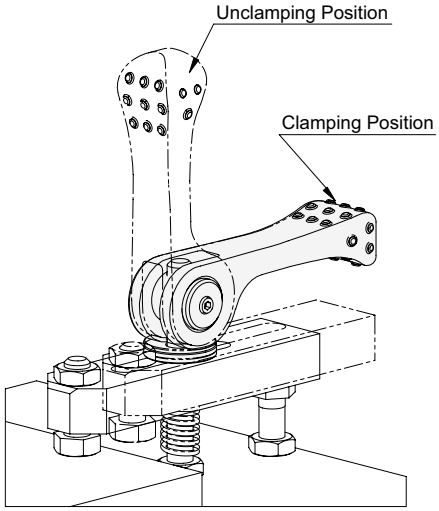
Bottom

Installing the cam handle



Use a brass pad and a hex. socket setscrew included.

Application Example



Part Number	A	B	C	D	E	F	G	H	J
51991858	40	10	4.5	14	12	8	12	12	2
51991859	50	12	5.5	16	14	10	15	14	2
51991860	63	14	6.5	19	16	12	18	16	3
51991861	80	18	9	24	20	15	22	20	3

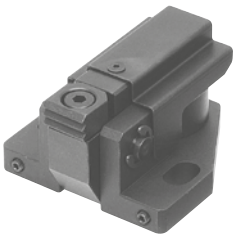
Part Number	K	L	Stroke	Allowable Operating Load (N) *)	Clamping Force(N)	Clamping Mechanism	Weight (g)
51991858	M4×0.7	M3×0.5−3L	1.8	80	900	Spiral Cam Cam Angle:4°	26
51991859	M5×0.8	M3×0.5−3L	2.3	100	1,300		46
51991860	M6×1	M4×0.7−4L	2.7	150	2,600		80
51991861	M8×1.25	M4×0.7−4L	3.3	200	4,000		154

*) Allowable load to operate the handle

QLSC SIDE CLAMPS(Standard)



With Handle



Without Handle

Base	
Material	S45C steel
Finish	Quenched and tempered

Jaws	
Material	SKH51 steel
Finish	Quenched and tempered

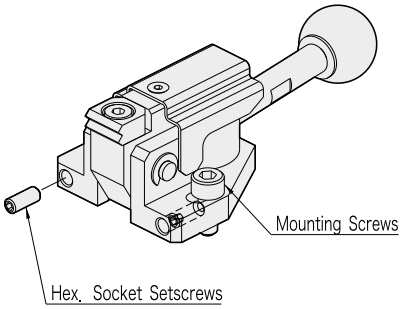
Cam	
Material	SK4 steel
Finish	Quenched and tempered

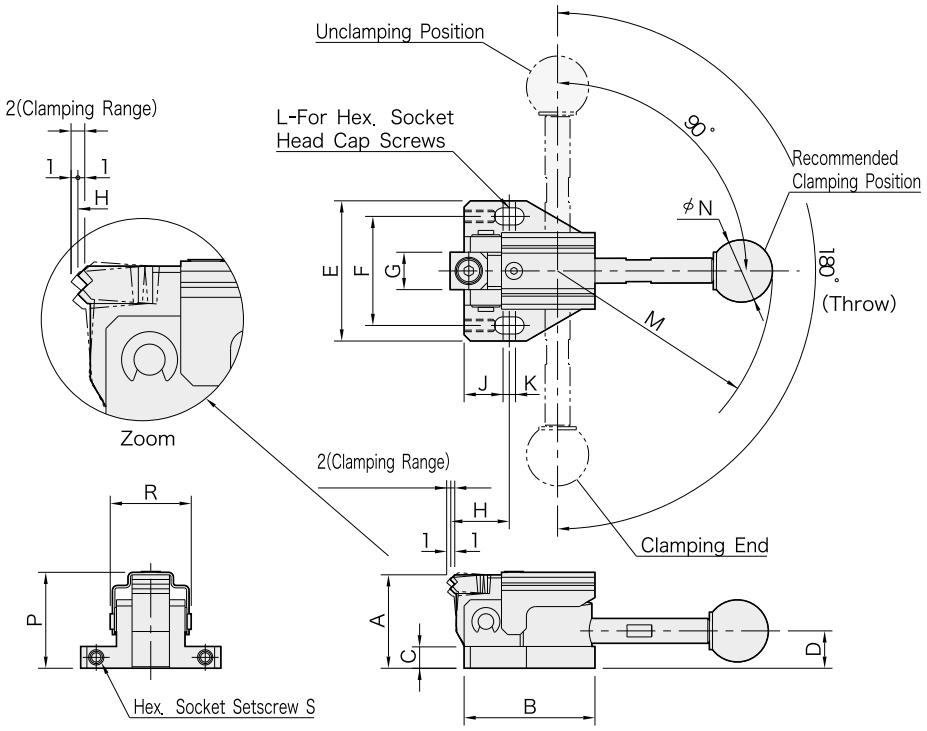
Handle	
Material	S45C steel
Finish	Black oxide

Ball Knob	
Material	ABS resin
Finish	Black

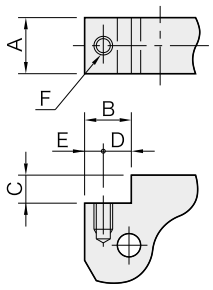
How To Use

The long mounting holes allow adjusting the clamping range. Tightening the hex. socket setscrews in the base front allows preventing the clamp from sliding back in the clamping mode.



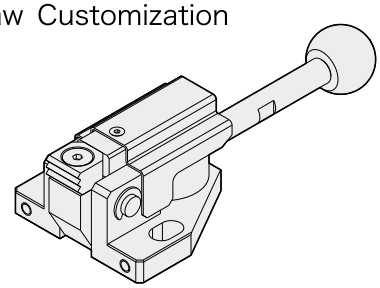


Dimensions of Jaw Base



Size	A	B	C	D	E	F
QLSC150	12	10	6	6	4	M4x0.7 7 deep
QLSC200	16	14.5	10	8	6.5	M6x1 9 deep

Jaw Customization



Size	A	B	C	D	E	F	G	H	J	K	L	P
QLSC150	30	42	7	12	45	35	12	19	12.5	4	M5	31
QLSC200	40	62	10	16	65	50	16	28	18.5	5	M8	41

Size	R	S	Clamping Force(N)	Clamping Mechanism
QLSC150	26	M4x0.7-10L	3000	Spiral Cam Cam Angle:4°
QLSC200	38	M4x0.7-15L	4000	

With Handle

Part Number	M	N	Allowable Operating Load (N) ⁎)	Weight (g)
51991125	69	20	150	210
51991126	104	25	200	580

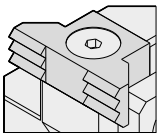
Without Handle

Part Number	Weight (g)
51991127	185
51991128	530

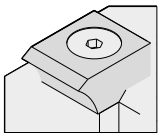
Note : The handle must be ordered separately.

⁎) Allowable load to operate the handle

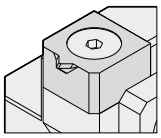
Wide Serrated Jaw



Edged Jaw



Pointed Jaw



QLPU PUSH CLAMPS(Standard)



With Handle



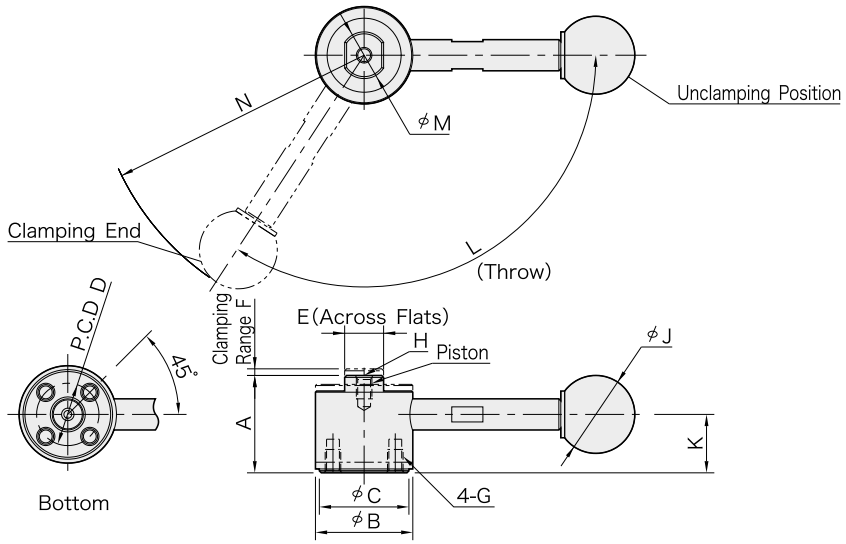
Without Handle

Cam	
Material	SK4 steel
Finish	Quenched and tempered

Piston	
Material	S45C steel
Finish	Quenched and tempered

Handle	
Material	S45C steel
Finish	Black oxide

Ball Knob	
Material	ABS resin
Finish	Black



Series	A	B	C	D (P.C.D)	E	F	G	H	K	L	M	Clamping Force(N)	Clamping Mechanism
QLPU150	25	25	23	16	10	1.7	M4x0.7 6 deep	M4x0.7 6 deep	15	123°	12	3000	Spiral Cam
QLPU200	32	32	30	20	13	2.5	M6x1 9 deep	M6x1 9 deep	19.5	135°	15	4000	Cam Angle:4°

With Handle

Part Number	J	N	Allowable Operating Load (N) *)	Weight (g)
51991129	20	69.5	150	180
51991130	25	103	200	370

*) Allowable load to operate the handle

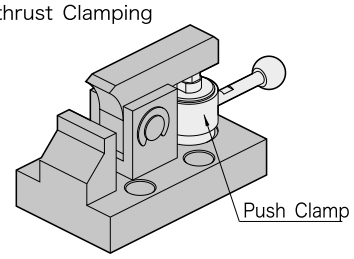
Without Handle

Part Number	Weight (g)
51991131	150
51991132	310

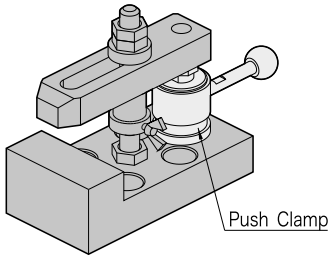
Note: The handle must be ordered separately.

Application Examples

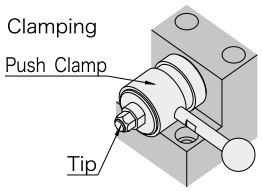
Downthrust Clamping



Downward Clamping



Sideways Clamping



When installing a tip on the piston, lock the piston using a wrench to prevent the clamp from receiving any torque.

Note : See page 151 and 154 for performance curves.

QLSL STANDARD HANDLES

QLSL
Screw-In Handles



Handle	
Material	S45C steel
Finish	Black oxide

Ball Knob	
Material	ABS resin
Finish	Black

QLSL-RL
Plug-In Handles



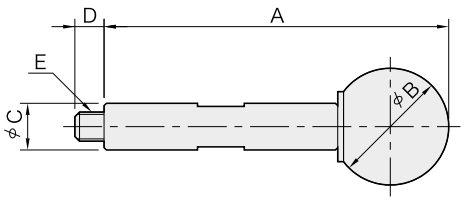
Handle	
Material	S45C steel
Finish	Black oxide

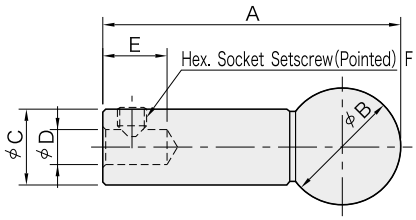
Ball Knob	
Material	ABS resin
Finish	Black

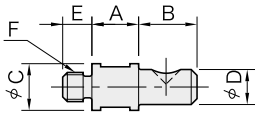
QLSL-RA
Plug-In Handles
adaptors



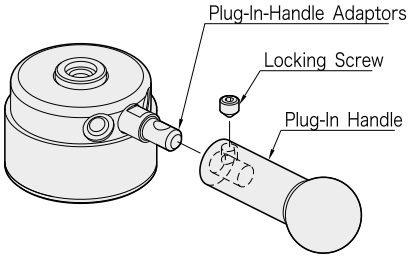
Material	SCM440 steel
Finish	Quenched and tempered



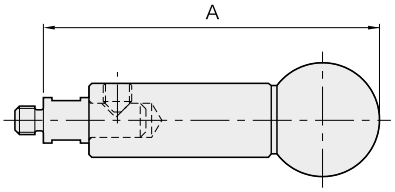




How To Use



Secure the Plug-In Handle to the Adaptor using the locking screw if necessary.



Plug-In Handle Coupled with the Adaptor

Size	A
QLSL150	59
QLSL200	89

QLSL (Screw-in Handles)

Part Number	A	B	C	D	E	Weight (g)
51991135	59	20	8	5	M5x0.8	30
51991136	89	25	10	6	M6x1	60

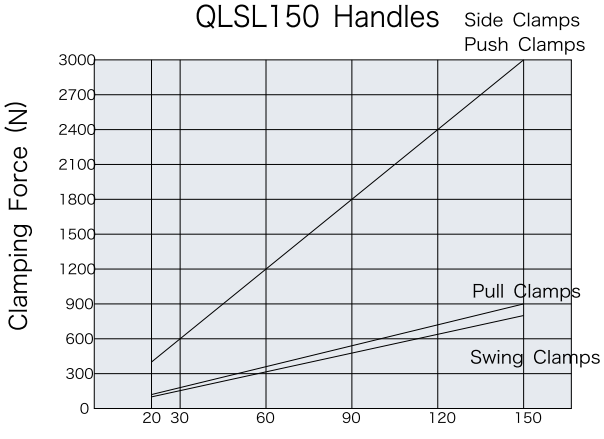
QLSL-RL(Plug-In Handles)

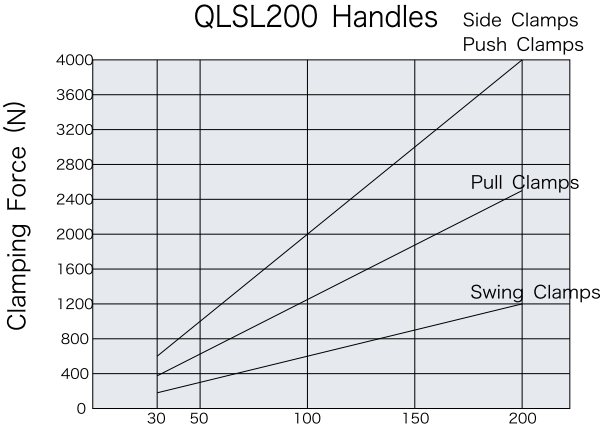
Part Number	A	B	C	D	E	F	Weight (g)
51991137	51	20	13	6	11	M5x0.8-5L	45
51991138	79	25	15	8	13	M6x1 -6L	90

QLSL-RA(Plug-In-Handle Adaptors)

Part Number	A	B	C	D	E	F	Weight (g)
51991139	8	10	8	6	5	M5x0.8	7
51991140	10	12	10	8	6	M6x1	14

Performance Curves





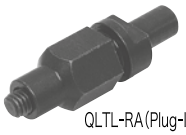
QLTL ADJUSTABLE-TORQUE HANDLES



QLTL(Screw-In Handles)



QLTL-RL(Plug-In Handles)



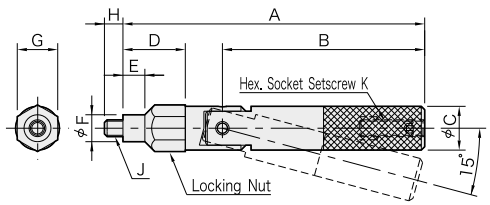
QLTL-RA(Plug-In-Handle Adaptors)

Stem	
Material	SCM440 steel
Finish	Quenched and tempered

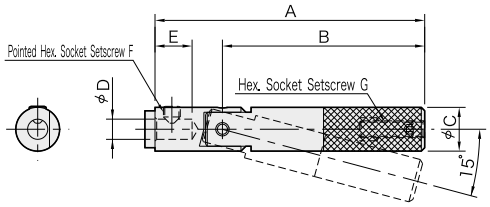
Lockin nut	
Material	S45C steel
Finish	Black oxide

Handle	
Material	S45C steel
Finish	Quenched and tempered

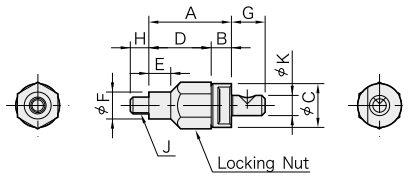
QLTL(Screw-In Handles)



QLTL-RL(Plug-In Handles)

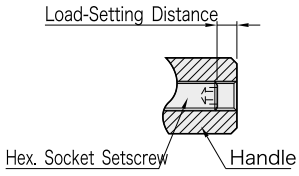


QLTL-RA(Plug-In-Handle Adaptors)



How To Use

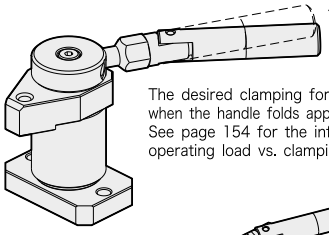
Turning the setscrew inside the handle allows adjusting the torque to set a desired clamping force.



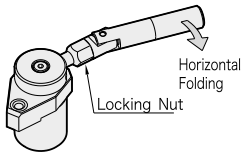
[Operating-Load Setting Range]

QLTL120/QLTL120-RL : 30N to 120N
QLTL160/QLTL160-RL : 50N to 160N

Note : Ensure that the operating load is not set below the lower limit to prevent the handle from returning to the unclamping position due to shock load generated during the transfer of machine pallets.



The desired clamping force is reached when the handle folds approximately 15° See page 154 for the information on operating load vs. clamping force.



Note : Ensure that the handle is set to fold horizontally.

QLTL(Screw-In Handles)

Part Number	A	B	C	D	E	F	G	H	J	K	Weight (g)
51991141	89.5	60	13	18.5	6.5	8	12	5.5	M5x0.8	M5x0.8-16L	90
51991142	119	84	15	23	8	10	14	6.5	M6x1	M6x1 -20L	140

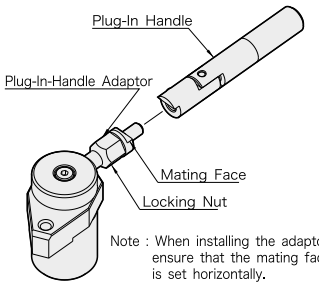
QLTL−RL(Plug-In Handles)

Part Number	A	B	C	D	E	F	G	Weight (g)
51991143	80	60	13	6	11	M5x0.8-5L	M5x0.8-16L	70
51991144	107	84	15	8	13	M6x1 -6L	M6x1 -20L	130

QLTL−RA(Plug-In-Handle Adaptors)

Part Number	A	B	C	D	E	F	G	H	J	K	Weight (g)
51991145	24.5	6	13	18.5	6.5	8	10	5.5	M5x0.8	6	20
51991146	30	7	15	23	8	10	12	6.5	M6x1	8	40

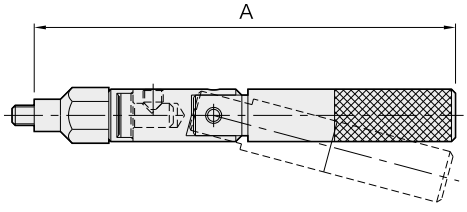
Plug-In Handle Installation

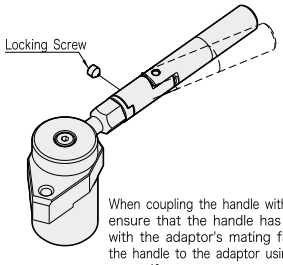


Note : When installing the adaptor, ensure that the mating face is set horizontally.

Plug-In Handle Coupled with the Adaptor

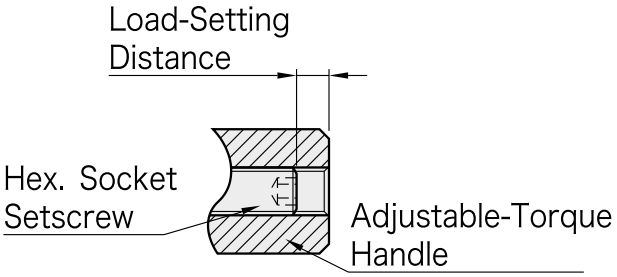
Part Number	A
51991143 **51991145**	104.5
51991144 **51991146**	137

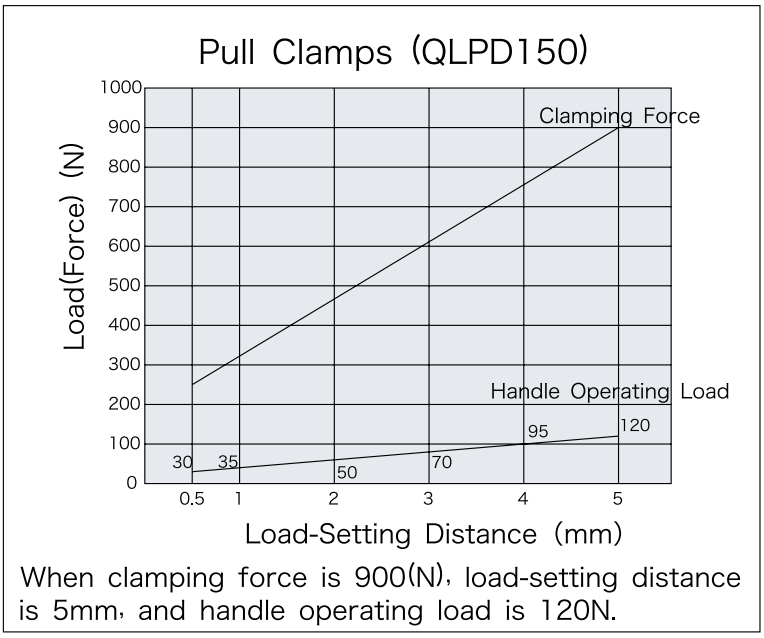




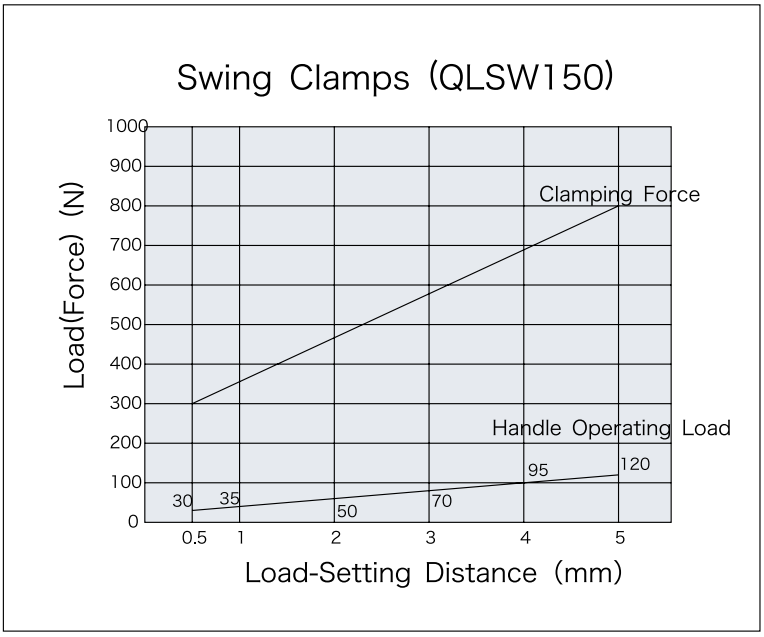
When coupling the handle with the adaptor, ensure that the handle has full contact with the adaptor's mating face. Secure the handle to the adaptor using the locking screw if necessary.

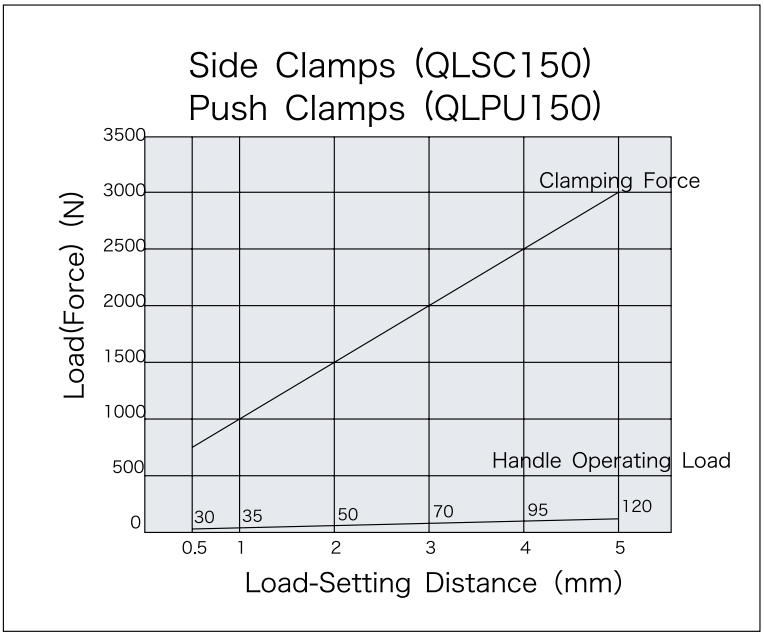
Performance Curves





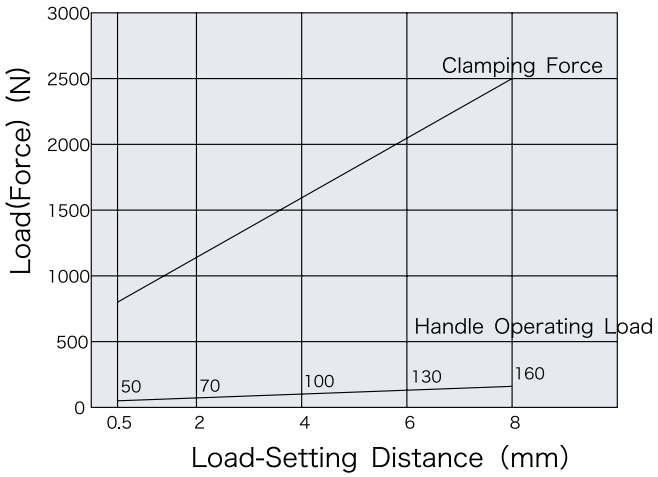
When clamping force is 900(N), load-setting distance is 5mm, and handle operating load is 120N.



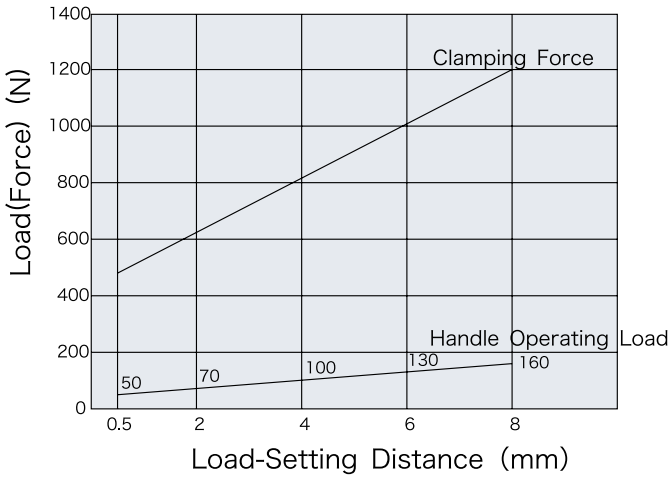


Note : The above performance curves apply when clamps are degreased.

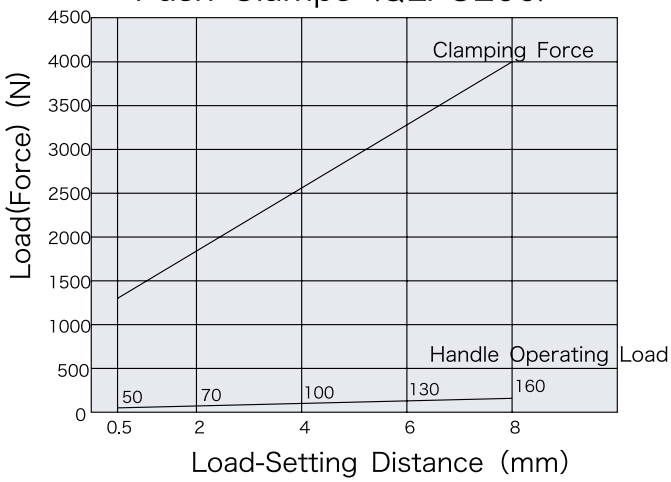
Pull Clamps (QLPD200)



Swing Clamps (QLSW200)



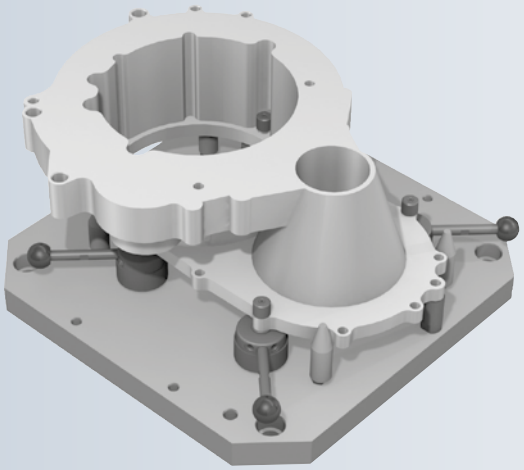
Side Clamps (QLSC200)
Push Clamps (QLPU200)

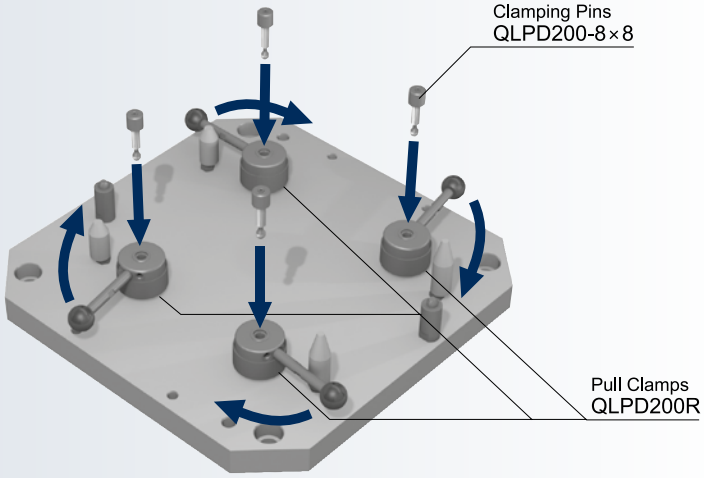


Note : The above performance curves apply when clamps are degreased.

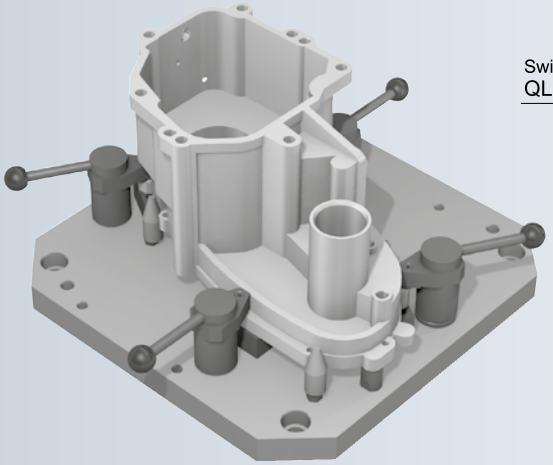
APPLICATION EXAMPLES

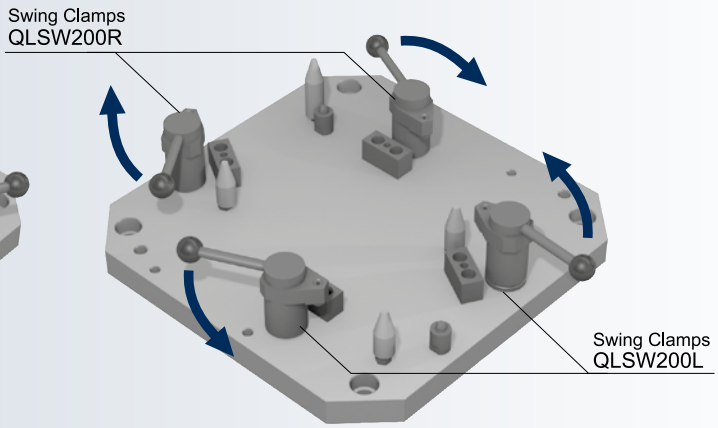
Pull Clamps



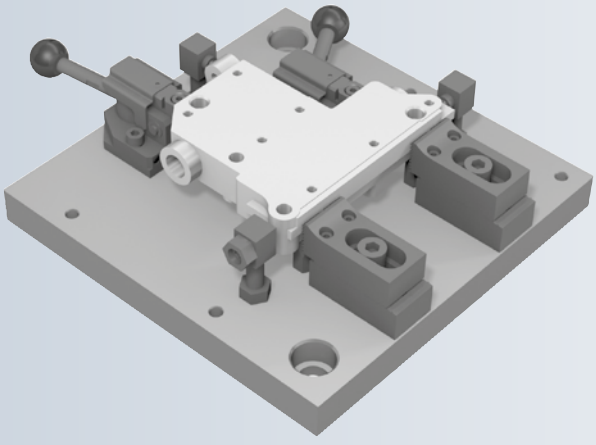


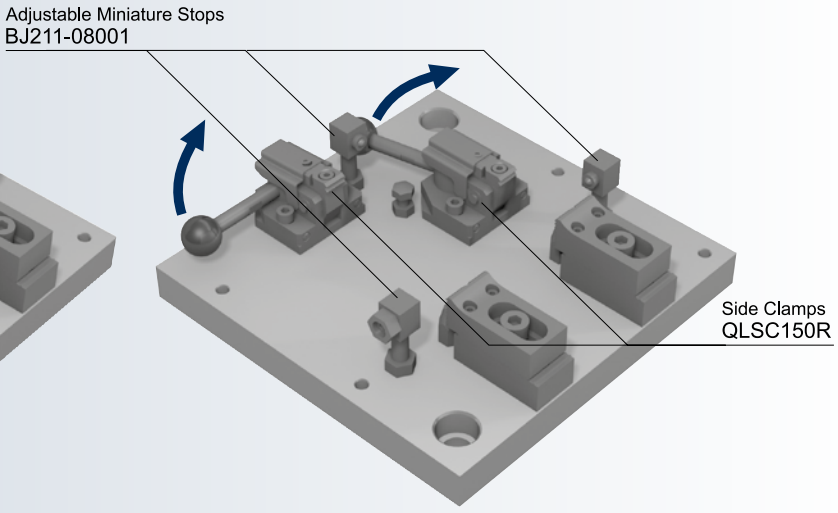
Swing Clamps





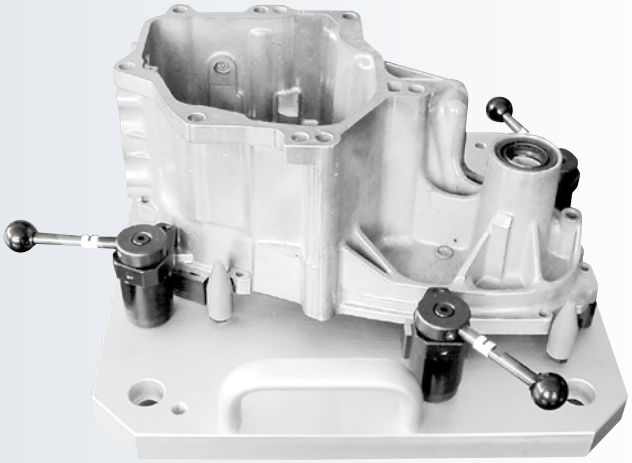
Side Clamps

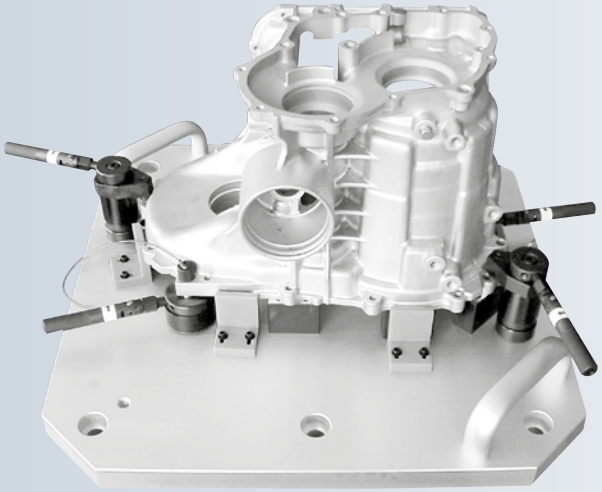




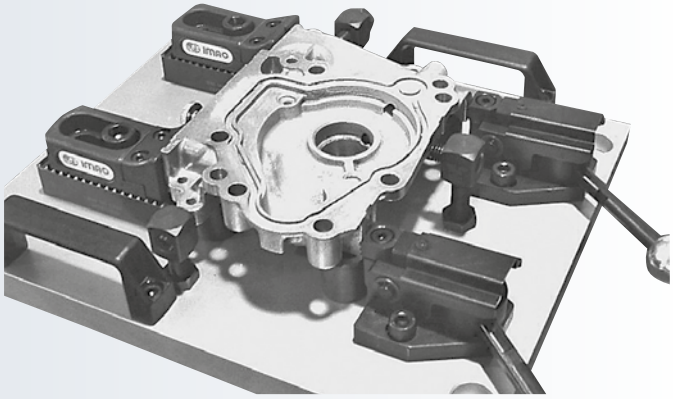
APPLICATION EXAMPLES

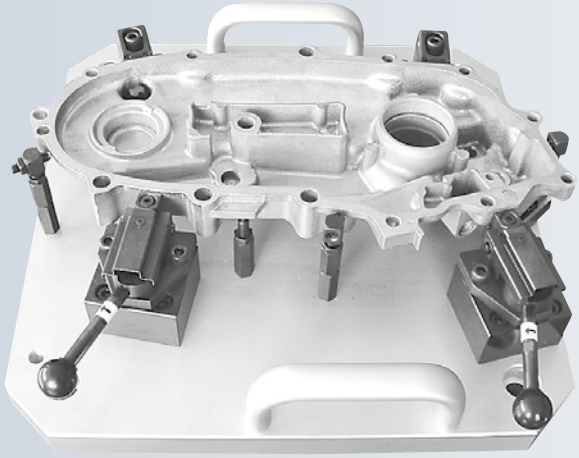
Actual Applications of Swing Clamps





Actual Applications of Side Clamps





CP710 SPRING-LOADED WORK LOCATORS

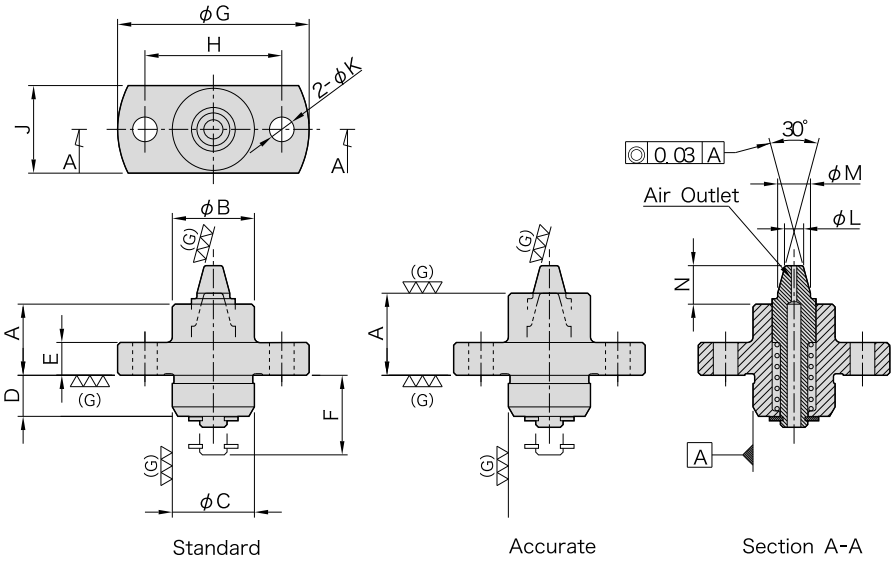
NEW



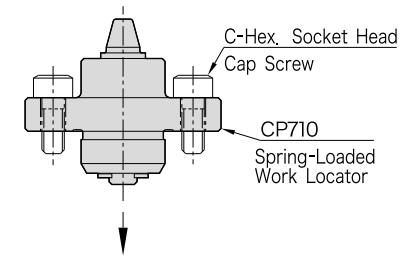
Standard Accurate

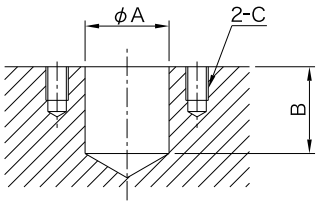
Body	
Material	S45C steel
Finitura	Black oxide
Heat Treat	Quenched and tempered

Locating Pin	
Material	SK4 steel
Heat Treat	Quenched and tempered



Mounting Hole Dimensions





Series	A (H7)	B	C
51991521 **51991522**	15 (H7-effective depth: 8)	16	M4x0.7
51991525 **51991526**			
51991523 **51991524**	20 (H7-effective depth: 10)	21	M4x0.7
51991527 **51991528**			

Standard

Part Number	A	B	C (g6)	D	E	F	G	H	J	K	L	M
51991521	13	15	15	7.5	6	15	35	25	16	4.5	3.5	6
51991522											4.5	7
51991523	18	20	20	10	8	20	40	30	22	4.5	5.5	9
51991524											7.5	11

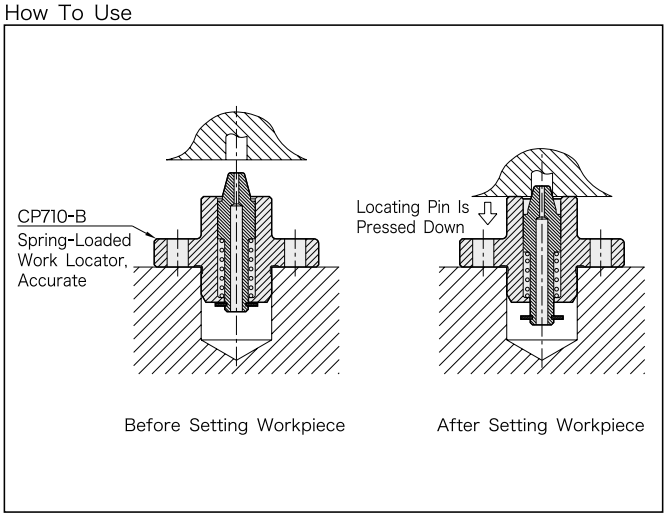
Part Number	N	Locating Hole Dia. ⁎)	Support Capacity (N)	Weight (g)
51991521	7.4	ϕ3.8 to ϕ 5.2	6.4 to 19.3	45
51991522		ϕ4.8 to ϕ 6.2		45
51991523	9.3	ϕ5.8 to ϕ 8.2	5.5 to 20.5	95
51991524		ϕ7.8 to ϕ10.2		95

Accurate

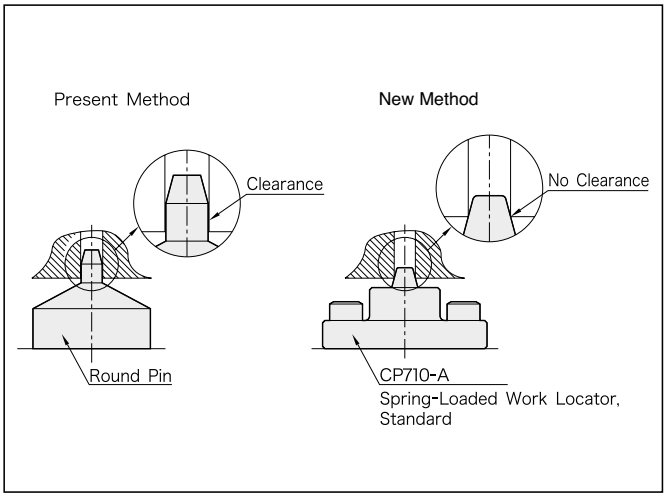
Part Number	A (±0.01)	B	C (g6)	D	E	F	G	H	J	K	L	M
51991525	15	15	15	7.5	6	15	35	25	16	4.5	3.5	6
51991526											4.5	7
51991527	20	20	20	10	8	20	40	30	22	4.5	5.5	9
51991528											7.5	11

Part Number	N	Locating Hole Dia. ⁎)	Support Capacity (N)	Weight (g)
51991525	5.4	ϕ3.8 to ϕ 5.2	6.4 to 19.3	50
51991526		ϕ4.8 to ϕ 6.2		50
51991527	7.3	ϕ5.8 to ϕ 8.2	5.5 to 20.5	100
51991528		ϕ7.8 to ϕ10.2		100

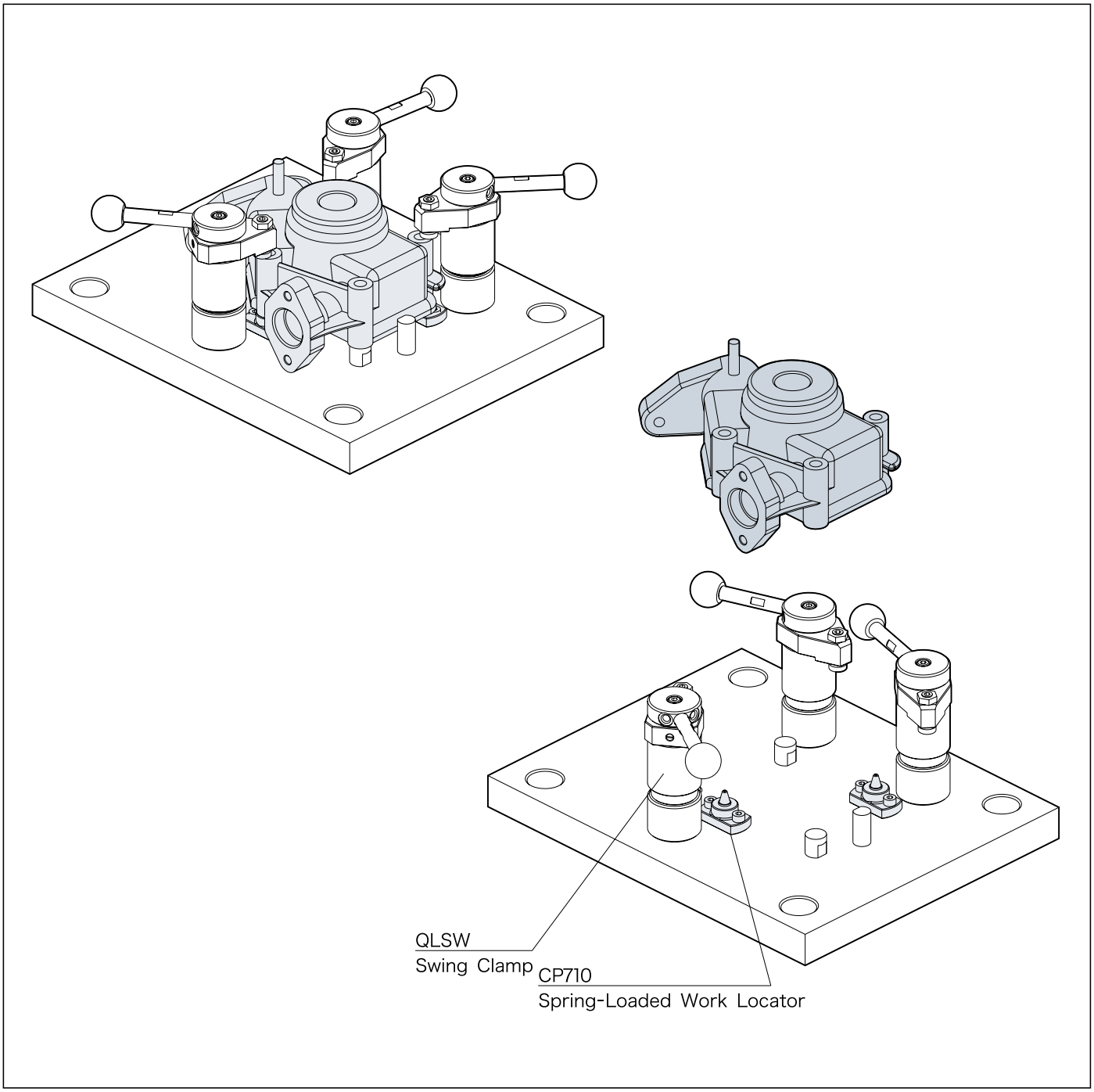
⁎)Within these diameter limits, locating holes can be chamfered up to 1mm x 1mm.



When the workpiece is set, the tapered pin is pressed down to locate it. The accurate style allows vertically as well as horizontally positioning the workpiece with accuracy.



Use of tapered pin allows secure locating with no clearance between the locating hole and the tapered pin.



Note: In clamping, hold down the workpiece by hand to avoid lift that can be generated by spring force.

CP700 WORK LOCATORS

NEW

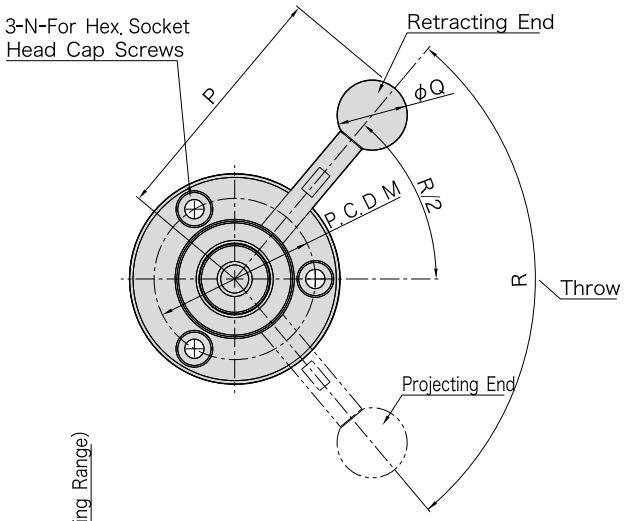


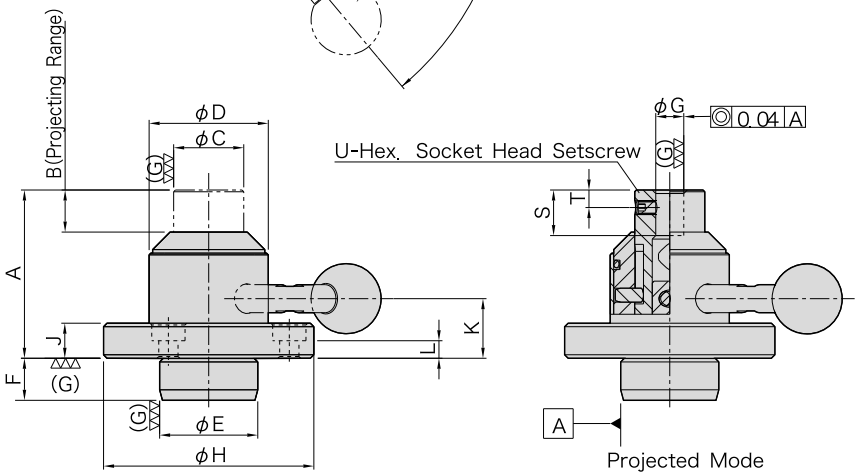
Body	
Material	S45C steel
Finish	Black oxide
Heat Treat	Quenched and tempered

Piston	
Material	SCM440 steel
Finish	Black oxide
Heat Treat	Quenched and tempered

Handle	
Material	SC45 steel
Finish	Black oxide

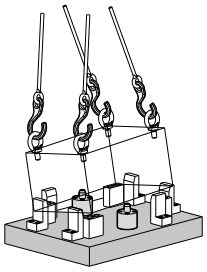
Ball Knob	
Material	ABS resin
Color	Black



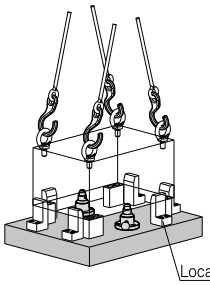


How To Use

Present Method



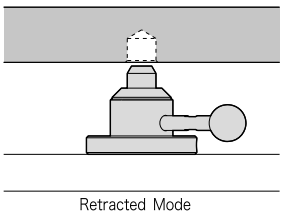
Galling and damage caused



Our Method

No galling caused

The locating pin gets projected only after the workpiece is set on supports. This allows loading and unloading the workpiece smoothly, with no galling. Get the locating pin projected to locate the workpiece after it is roughly positioned with the help of locating guides.



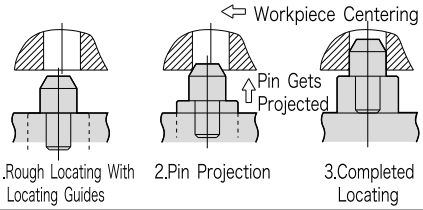
Retracted Mode

Projected Mode

Part Number	A	B	C	D	E (g6)	F	G (G7)	H	J	K	L	M (P.C.D)	N	P
51991529	48	12	20	34	28	12	8	60	10	17	5	46	M5	71
51991530	61	15	30	48	42	14	12	80	13	23	7	63	M6	94

Part Number	Q	R	S	T	U	Allowable Operating Load (N)*)	Max. Workpiece Weight (kg)**)	Weight (kg)
51991529	20	100	13	5	M4x0.7-5L	150	250	0.42
51991530	25	90	15	8	M6x1 -8L	200	300	1.04

*) Allowable load to operate the handle
**)Max. weight that allows the locating pin to project and provide workpiece centering



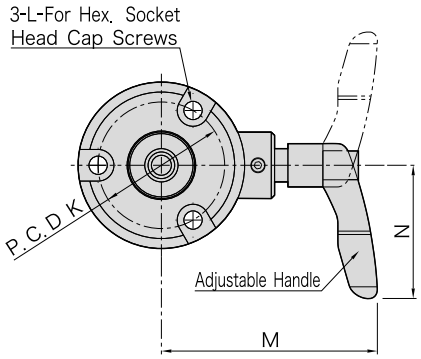
CP701 EXTENDABLE WORK LOCATORS

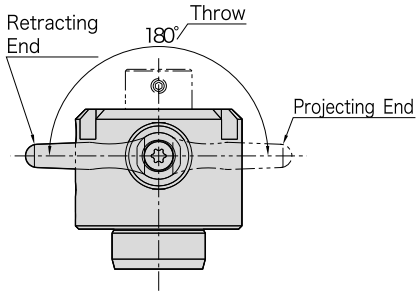
NEW



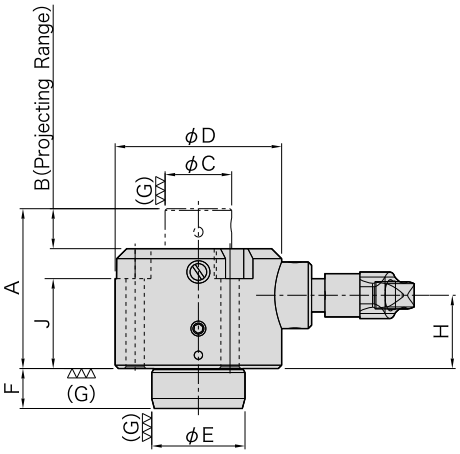
Body	
Material	S45C steel
Finish	Black oxide
Heat Treat	Quenched and tempered

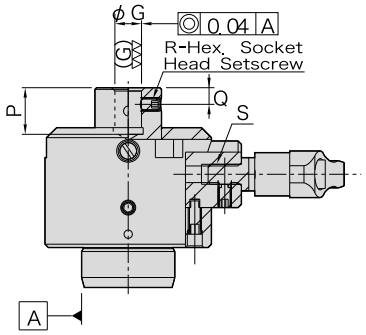
Pistone	
Material	SC45 steel
Finish	Black oxide





The handle position can be changed freely, clockwise or counterclockwise.

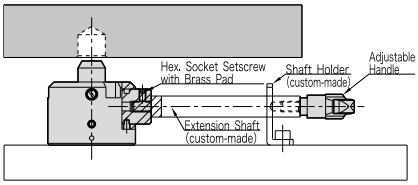




Projected Mode

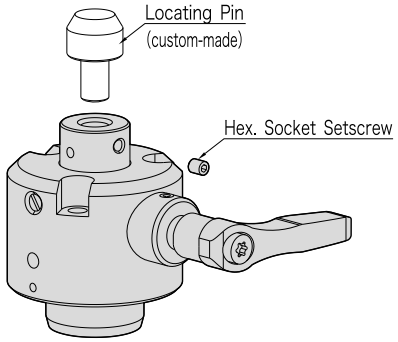
How To Use

Extended Application



With an extension shaft and a shaft holder prepared separately, the handle control can be easily done even when small space is available under the workpiece.

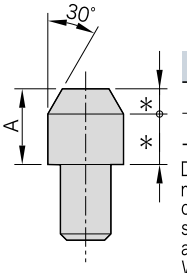
Locating-Pin Mounting



Projected Mode

A locating pin can easily be mounted by using a hex. socket setscrew when the piston is fully projected (locating pins must be prepared separately).

Locating-Pin Head Dimensions



A
12 or less
15 or less

Determine the dimensions marked with an asterisk considering a clearance set between the workpiece and the locating guides. When the taper angle is determined to be smaller than 30° (recommended), set the clearance smaller.

Part Number	A	B	C	D	E (g6)	F	G (G7)	H	J	K (P, C, D)	L	M	N	P
51991533	48	12	20	50	28	12	8	22	27	38	M5	65	40	14
51991534	61	15	30	65	42	14	12	26	31	52	M6	87.5	65	16

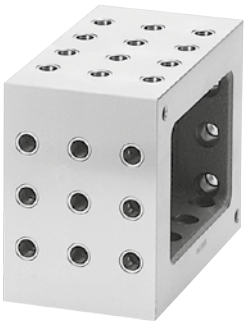
Part Number	Q	R	S	Adjustable Handles	Allowable Operating Load(N)*	Max. Workpiece Weight(kg)**	Weight (kg)
51991533	5	M4x0.7-5L	M6x1 12 deep	FKR6X10-BR	170	250	0.59
51991534	6	M5x0.8-8L	M8x1.25 17 deep	FKR8X15-BR	210	300	1.31

*) Allowable load to operate the handle
**) Max. weight that allows the locating pin to project and provide workpiece centering

Features

- Can support heavy workpieces made from steel or cast iron
- No tools needed
- Different locating pins can be mounted depending on workpiece's locating holes.
- The piston stays locked when it is fully projected or retracted until the handle is operated again.

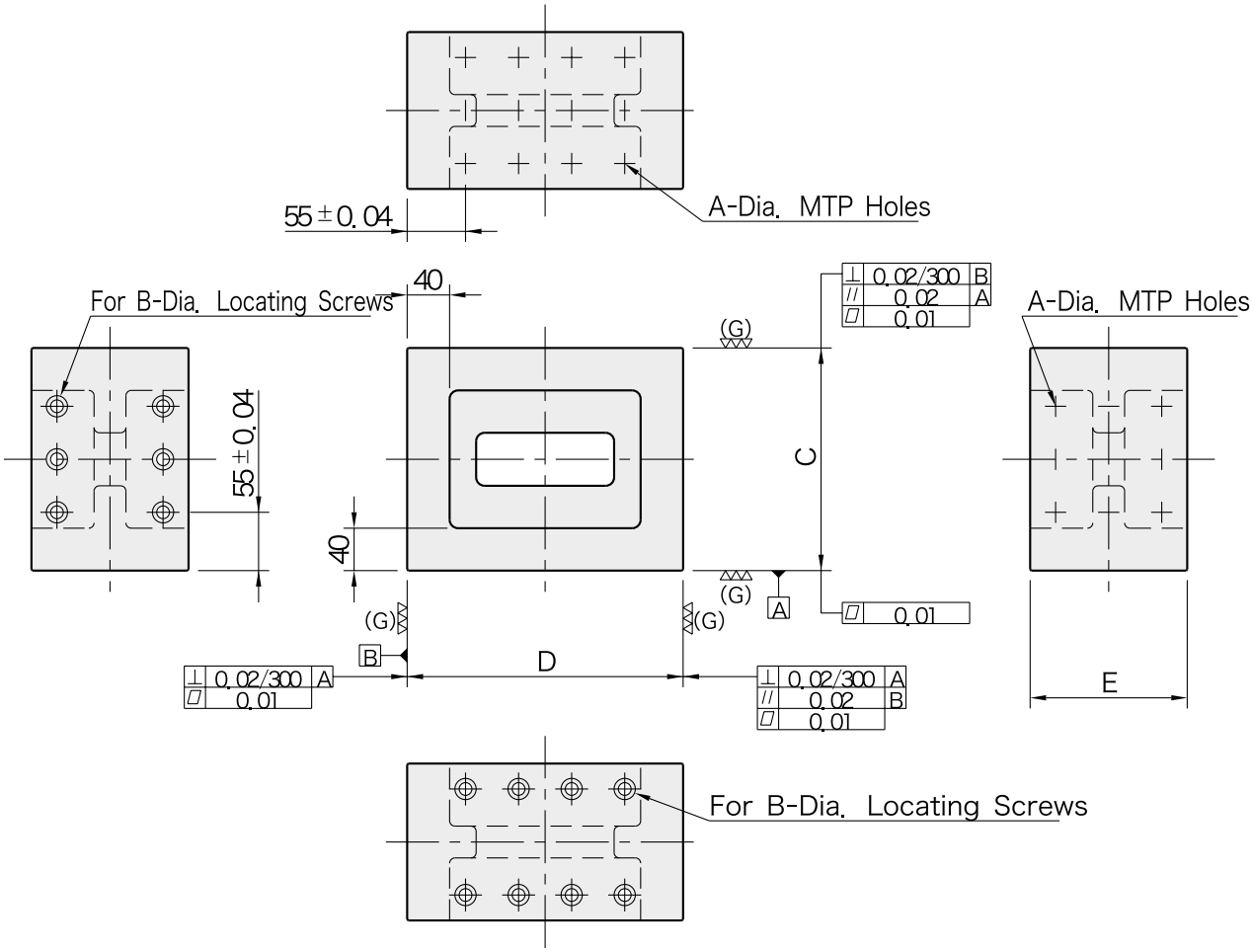
BJ090 RISER BLOCKS



[Body]
Material:FC300 cast iron
Annealed
Precision ground

[Alignment Bushing]
Material:SUJ2 steel
Heat treated

[Threaded Insert]
Material:S45C steel
Heat treated



Part Number	A		B	C	D	E	No. of MTP Holes	No. of Mounting Holes	Proper Locating Screws Cod.	Weight (kg)
	(F7)	(Thread)	(F7)	(±0.02)	(±0.02)					
51991535	12	M12x1.75	12	160	210	148	15	10	**51991863**	26
51991536				210	260		21	14		37
51991537	16	M16x2	16	160	210	148	15	10	**51991865**	25
51991538				210	260		21	14		36

·MTP-hole protection plugs and eye bolts are included.
·Locate on a tooling plate or block using Locating Screws.
·MTP holes spacing : 50 ± 0.02mm

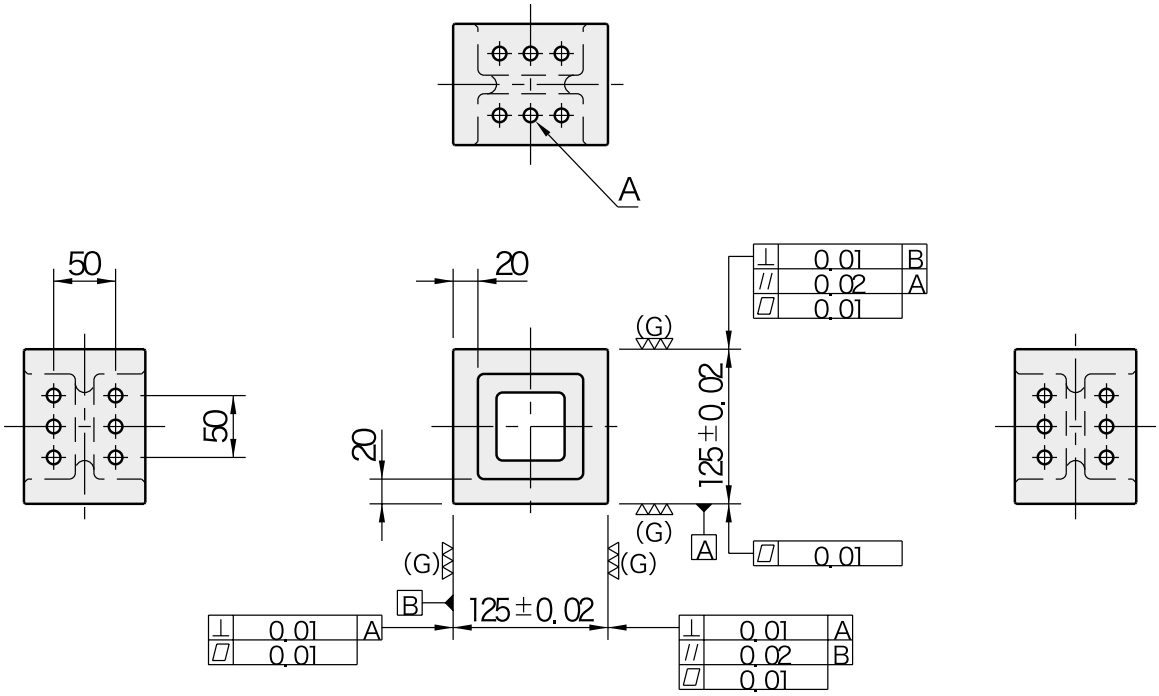
BJ091 COMPACT RISER BLOCKS

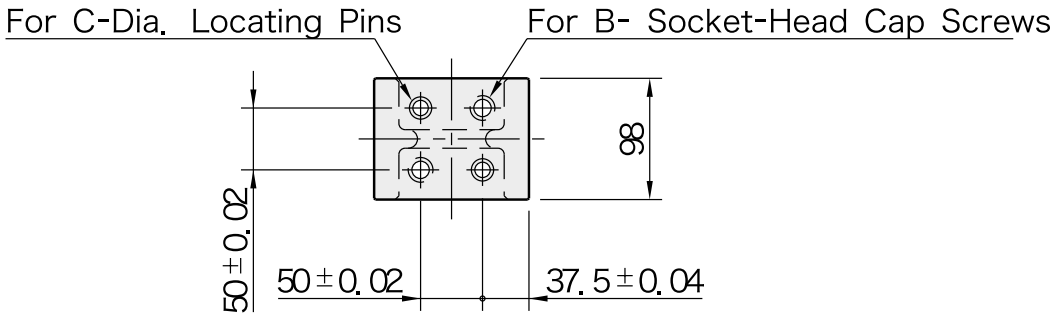


[Body]
Material:FC300 cast iron
Annealed
Precision ground

[Alignment Bushing]
Material:SUJ2 steel
Heat treated

[Threaded Insert]
Material:S45C steel
Heat treated

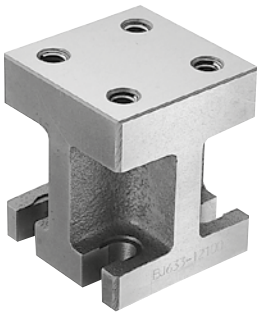




Part Number	A	B	C (F7)	Weight (kg)
51991539	M12x1.75	M12	12	6.3
51991540	M16x2	M16	16	6.2

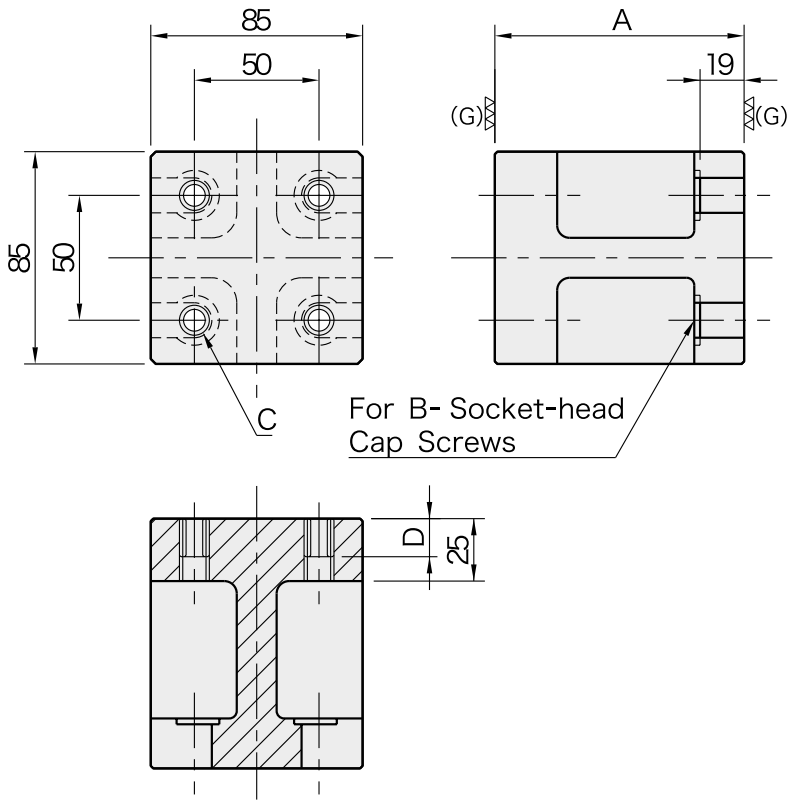
·Locate on a tooling plate or block using a round pin and a diamond pin.

BJ633 H RISERS



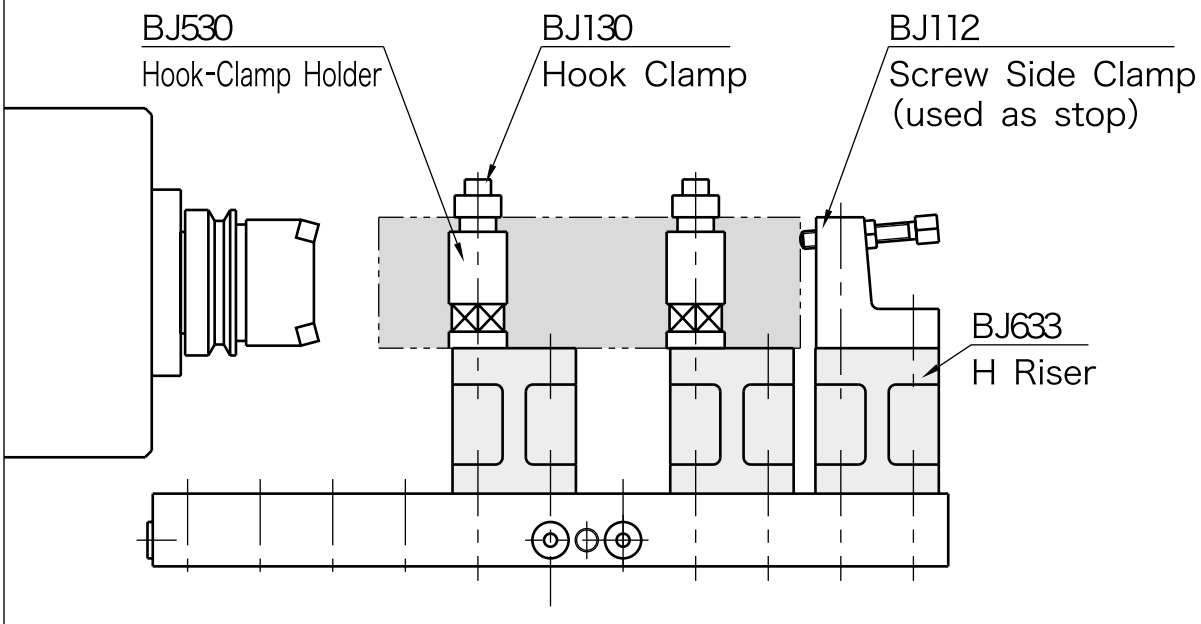
【Body】
- ■Material : FC300 cast iron
- ■Annealed
- ■Precision ground

【Threaded Insert】
- ■Material : S45C steel
- ■Heat treated



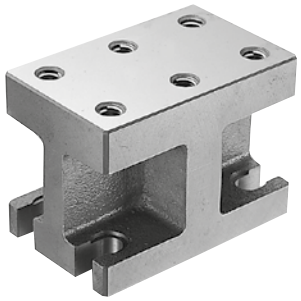
Part Number	A (±0.01)	B	C	D	Weight (kg)
51991543	100	M16	M16×2	16	3.2
51991544	125				3.8

■How To Use



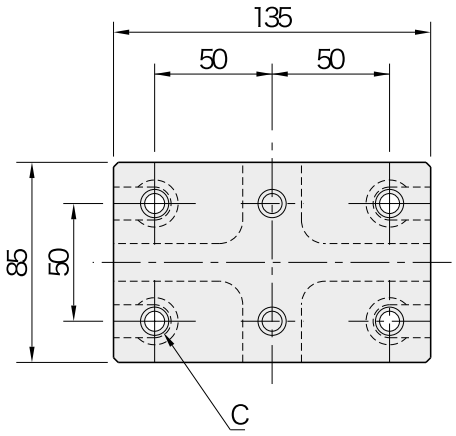
Use to raise a workpiece or components, parallel to a tooling plate.

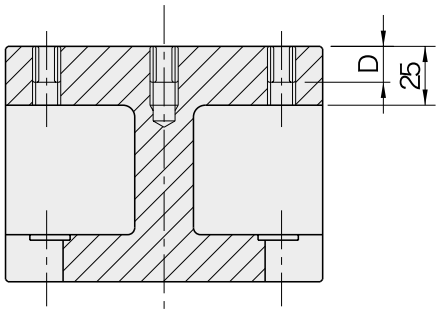
BJ634 H RISERS



【Body】
- ■Material : FC300 cast iron
- ■Annealed
- ■Precision ground

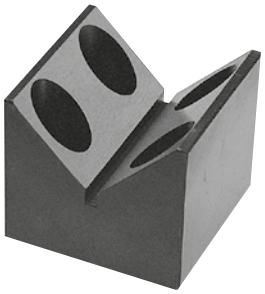
【Threaded Insert】
- ■Material : S45C steel
- ■Heat treated





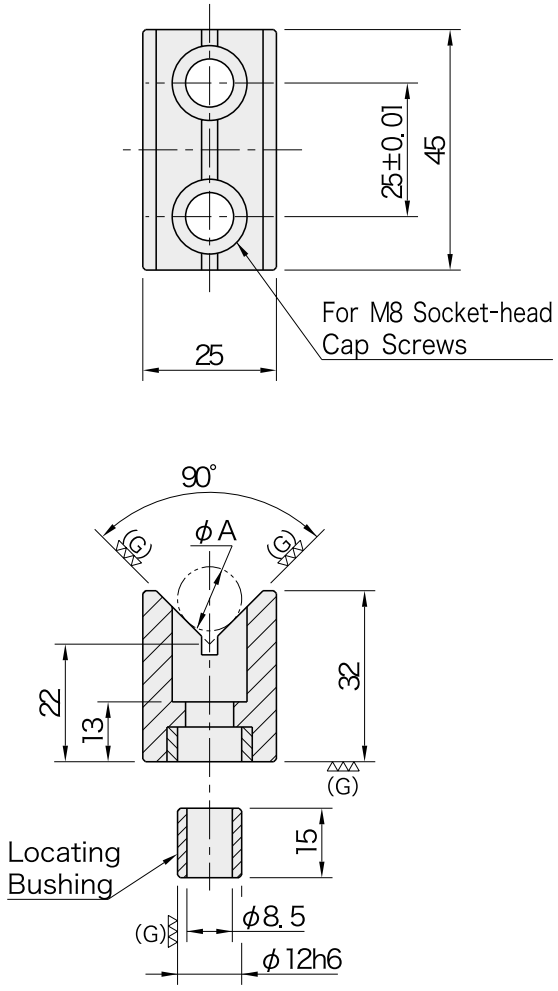
Part Number	A (±0.01)	B	C	D	Weight (kg)
51991547	100	M16	M16×2	16	5.1
51991548	125				5.8

BJ440(Mini) V BLOCKS

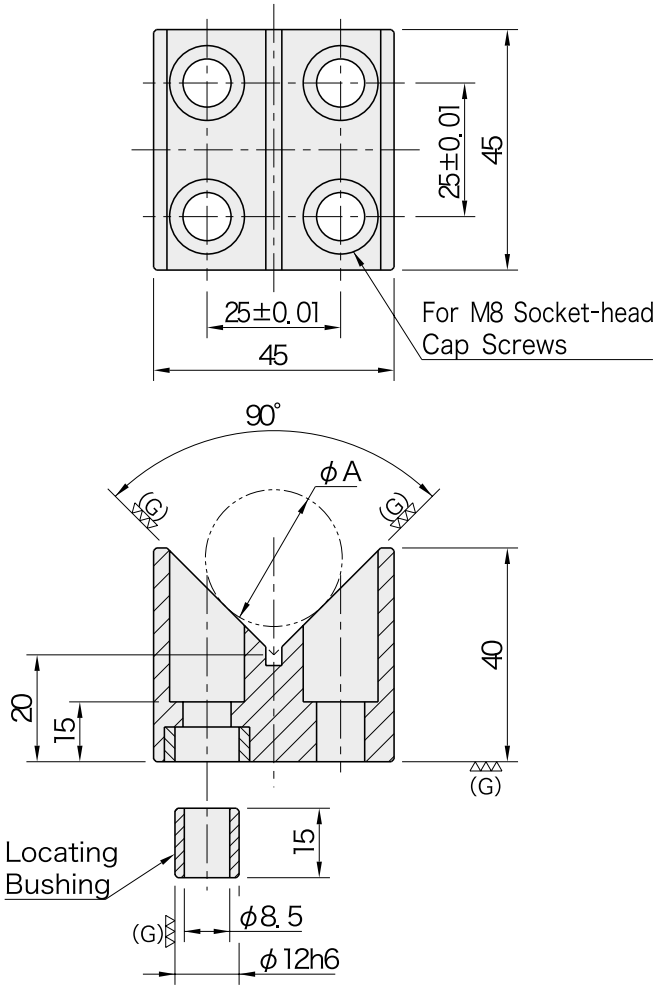


■Material : S45C steel
■Heat treated
■Black oxide finish
■Precision ground

BJ440-08032



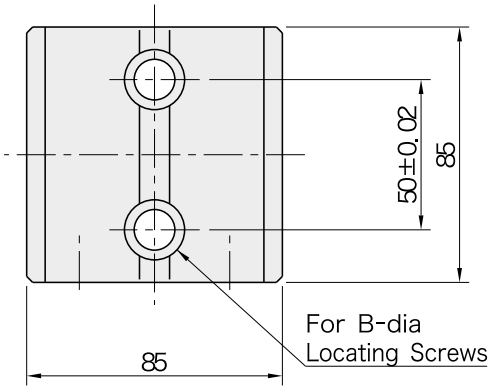
BJ440-08040



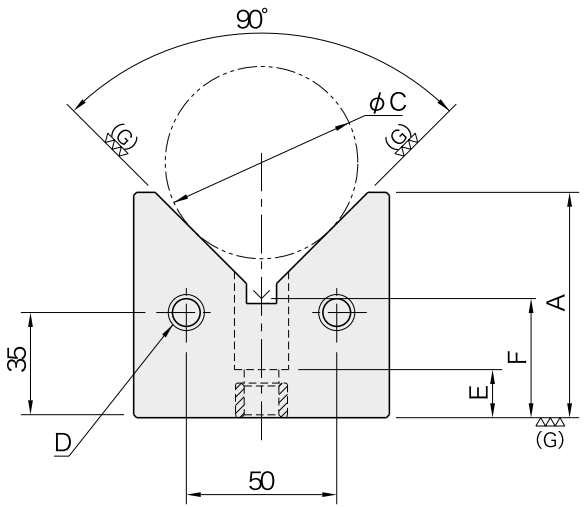
Part Number	A		Weight (g)
	min.	max.	
51991549	10	25	200
51991550	15	50	370

BJ440 V BLOCKS





■Material : S45C steel
■Heat treated
■Black oxide finish
■Precision ground



Part Number	A	B (F7)	C		D	E	F
			Min.	Max.			
51991551	63	12	15	80	M12×1.75 30 deep	22	34.72
51991552	75			100			39.65
51991553	63	16	35	80	M16×2 35 deep	25	34.72
51991554	75		15	100			39.65

Part Number	Proper Locating Screws Cod.	Weight (kg)
51991551	**51991862**	2.9
51991552		3.3
51991553	**51991864**	2.9
51991554		3.3

BJ770 METAL PROTECTION PLUGS



51991556



51991555

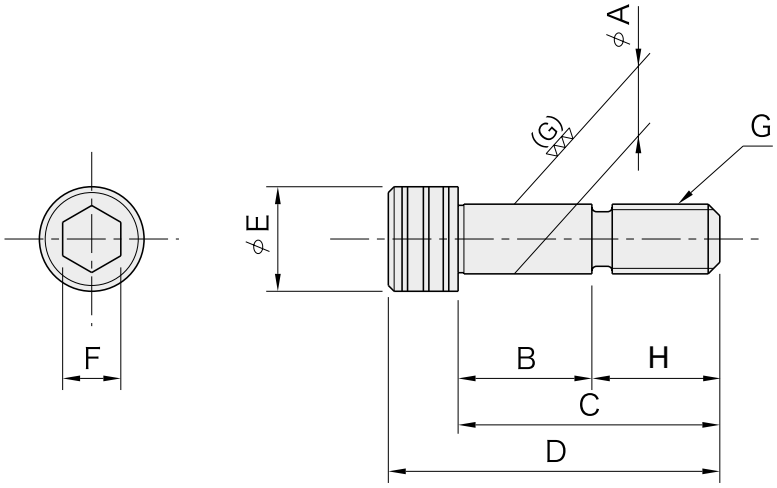
Part Number	Thread	Weight (g)
51991555	M12	15
51991556	M16	20
57290020	D16/M12	18

·Replacement protection plugs.
·Use to keep chips and dirt out of unused MTP holes.

BJ701 HIGH PRECISION LOCATING SCREW



Material:SCM435 steel
Heat treated
Black oxide finish
Precision ground

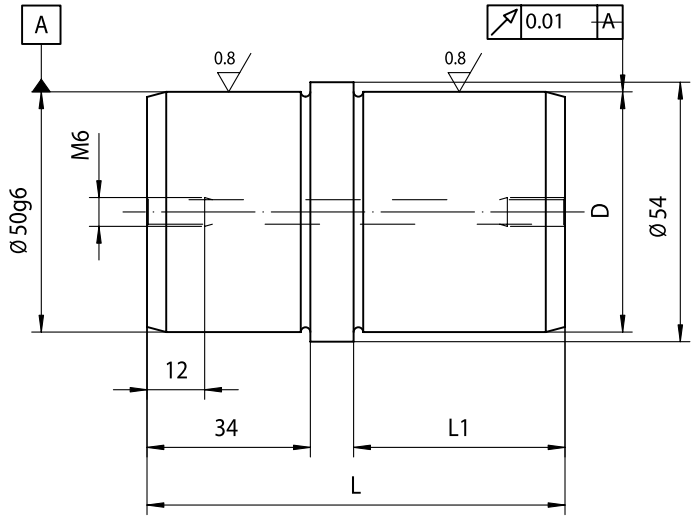


Part Number	A*	B	C	D	E	F	G	H	Weight (g)
51 99 18 66	12	23	45	57	18	10	M12x1,75	22	52
51 99 18 62		33	55	67					59
51 99 18 63		43	65	77					68
51 99 18 65	16	30	55	71	24	14	M16x2	25	120
51 99 18 64		40	65	81					134

* - 0,005
- 0,013

CENTERING PIN

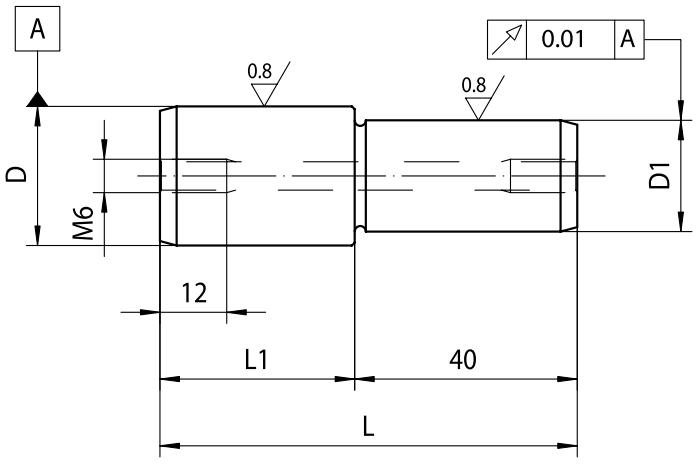




Part Number	D_{g6}	L	L1	Weight (Kg)
57001051	25	77	34	0.81
57001052	40	87	44	1.12
57001053	50	87	44	1.36

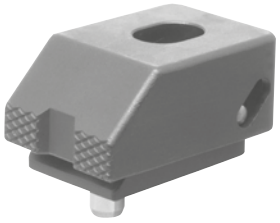
CENTERING PIN FOR ALIGNING HOLE



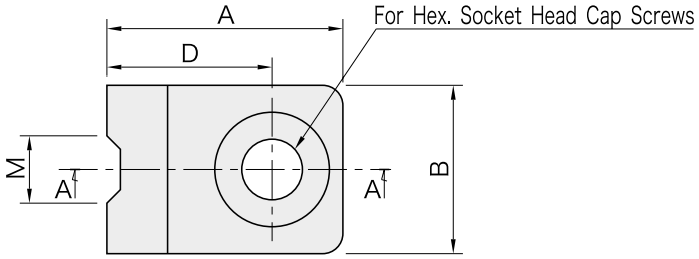


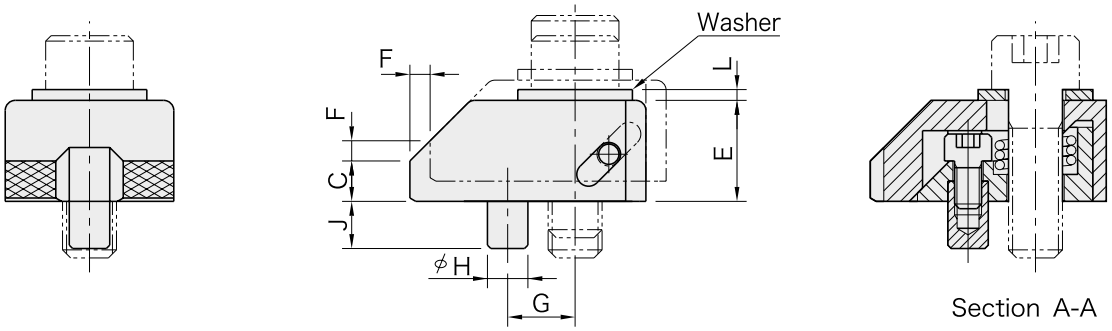
Part Number	D_{g6}	$D1_{g6}$	L	L1	Weight (Kg)
57001061	25	20	75	35	0.23
57001062	30	20	85	45	0.34
57001063	30	35	85	45	0.40

CP106 TOE CLAMPS



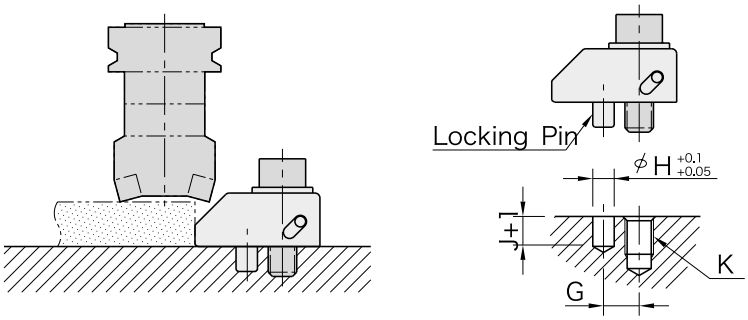
Material:S45C steel
Finish :Black oxide
Heat Treated





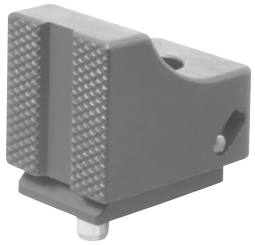
Part Number	A	B	C	D	E	F	G	H (h7)	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991557	35	25	6	24.5	15	3	10	6	7	M 8	1.6	10	7,000	25	100
51991558	43	30	8	29	19	4	12	6	7	M10	2	11	8,500	50	185
51991559	54	35	9	37	23	5	16	8	10	M12	2.3	12	20,000	90	320
51991560	65	40	10	45	25	6	20	10	10	M16	3.2	14	40,000	200	520

How To Use and Install

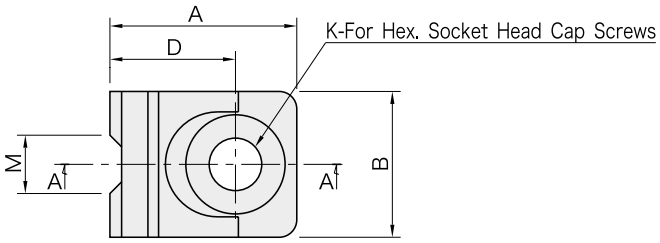


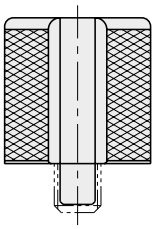
·Drill a cap-screw hole and a locking-pin hole as specified.
·One flat washer is included.

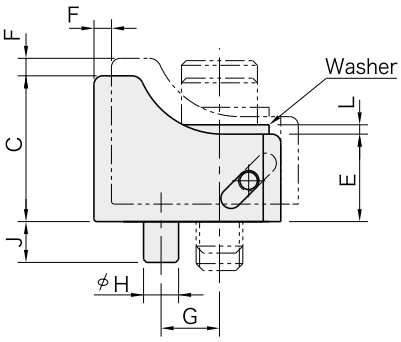
CP107 SIDE CLAMPS

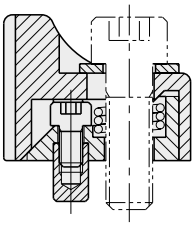


Material: S45C steel
Finish : Black oxide
Heat Treated





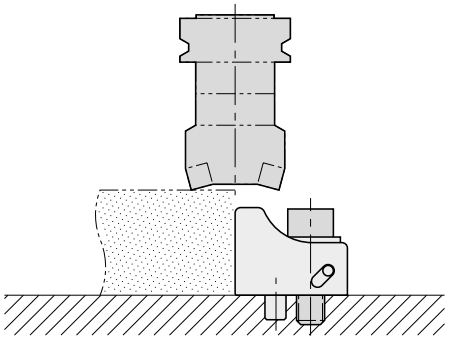


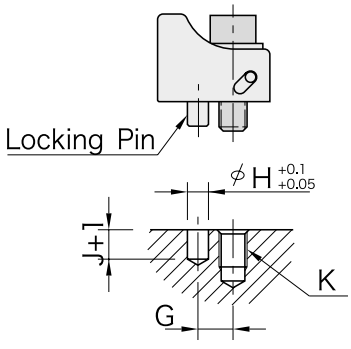


Section A-A

Part Number	A	B	C	D	E	F	G	H (h7)	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991561	32	25	25	21.5	15	3	10	6	7	M 8	1.6	10	7,000	25	115
51991562	40	30	32	26	19	4	12	6	7	M10	2	11	8,500	50	225
51991563	50	35	38	33	23	5	16	8	10	M12	2.3	12	20,000	90	390
51991564	60	40	45	40	25	6	20	10	10	M16	3.2	14	40,000	200	640

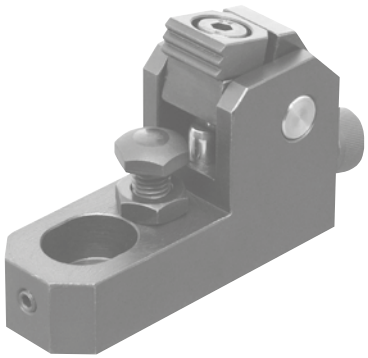
How To Use and Install





- Drill a cap-screw hole and a locking-pin hole as specified.
- One flat washer is included.

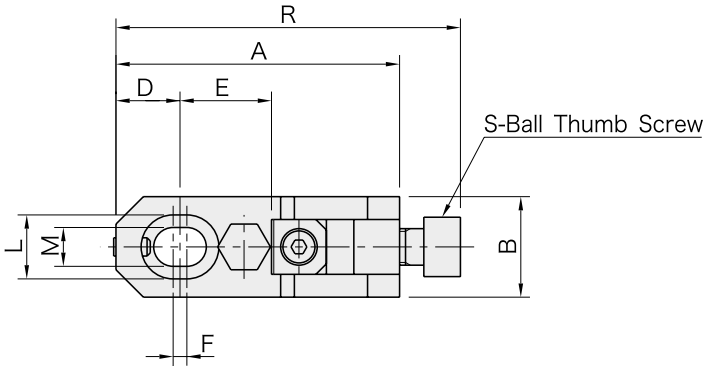
CP100 SIDE CLAMPS

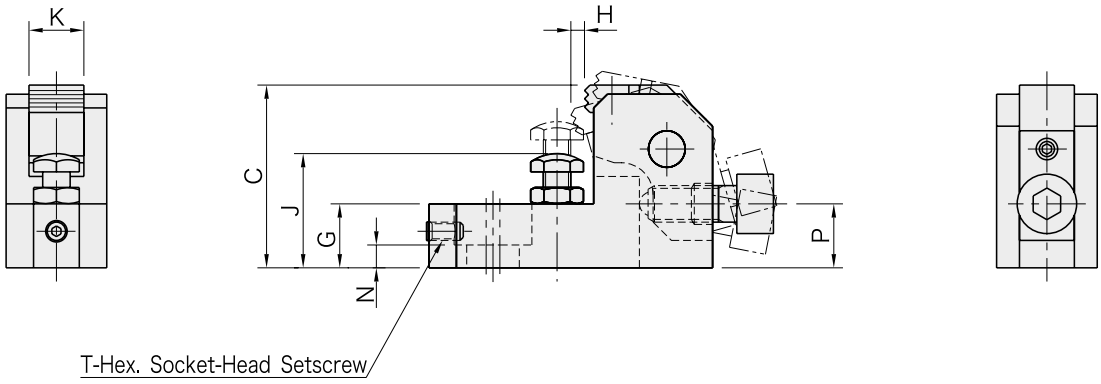


[Body]
Material: S45C steel
Finish : Black oxide
Heat Treated

[Arm]
Material: S45C steel
Finish : Black oxide

[Jaw]
Material: SKH51 steel
Finish : Black oxide
Heat Treated





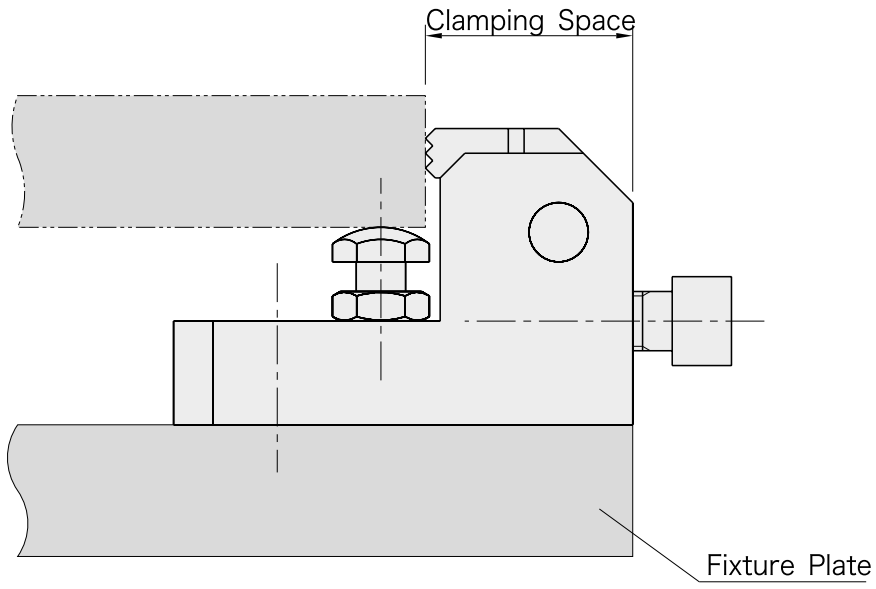
Part Number	A	B	C	D	E	F	G	H	J	K	L	M
51991565	62	22	40	14	20	3	14	3	25 to 32	12	14	8.5
51991566	78	25	50	18	25	4	18	3.7	32 to 40	16	17.5	11
51991567	93	32	60	21	30	5	21	4.5	40 to 48	20	20	13
51991568	124	38	80	28	40	6	27	6	48 to 63	25	26	17

Part Number	N	P	R	S	T	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (kg)
51991565	5	14	75.5	M 8x1.25-20L	M4x0.7-8L	6,000	15	0.23
51991566	7	17.5	95	M10x1.5-25L	M5x0.8-10L	10,000	30	0.41
51991567	8	21	113	M12x1.75-30L	M6x1-12L	17,000	65	0.75
51991568	10	28	151	M16x2-40L	M8x1.25-16L	25,000	130	1.57

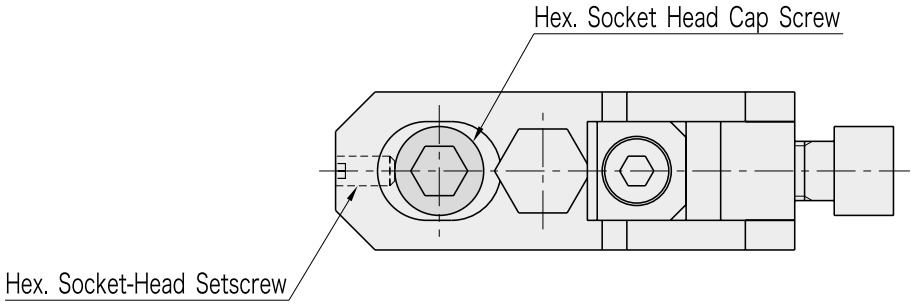
Spare jaws

Cod.	
51992035	See page 14.95
51992038	
51992042	
51992044	

How To Use and Install

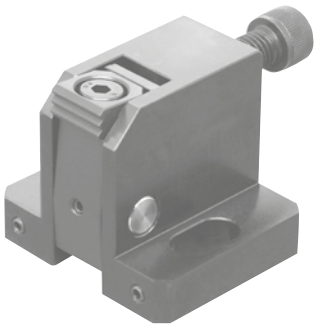


Smaller clamping space allows clamping a larger workpiece.

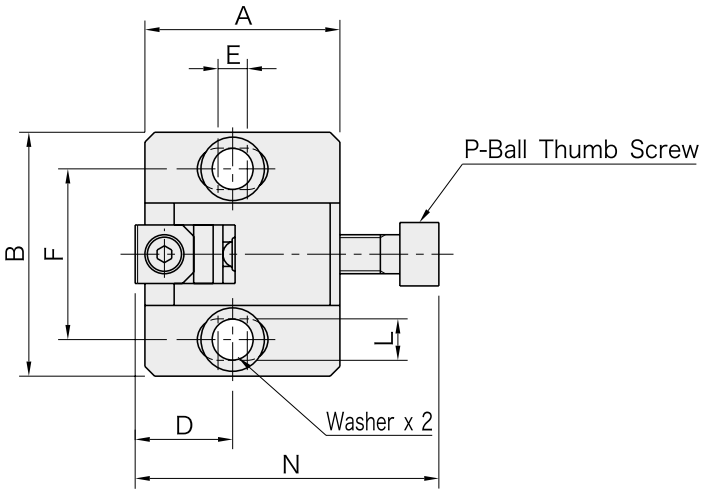


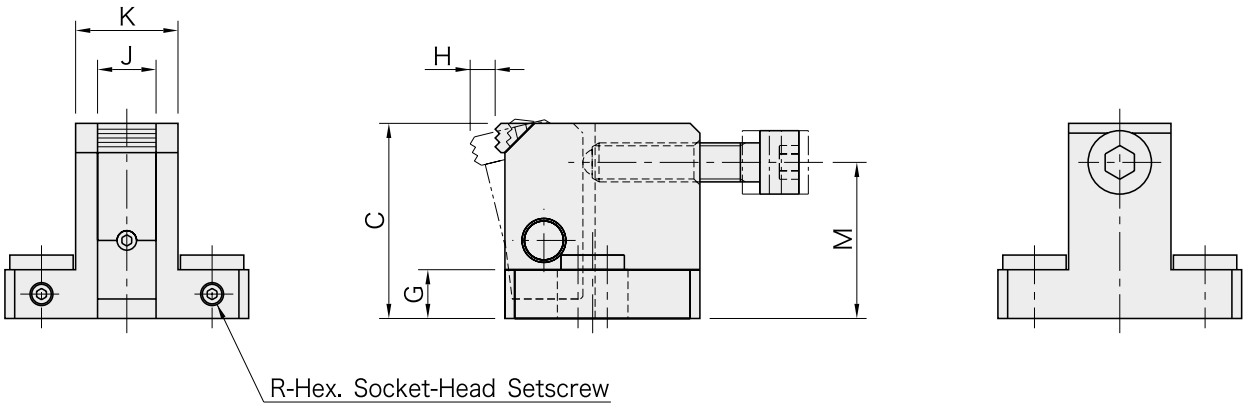
The hex. socket-head setscrew works to prevent the clamp from sliding back if screwed in until it contacts the cap screw.

CP101 SIDE CLAMPS



[Body]
Material: S45C steel
Finish : Black oxide
[Arm]
Material: S45C steel
Finish : Black oxide
Heat Treated
[Jaw]
Material: SKH51 steel
Finish : Black oxide
Heat Treated





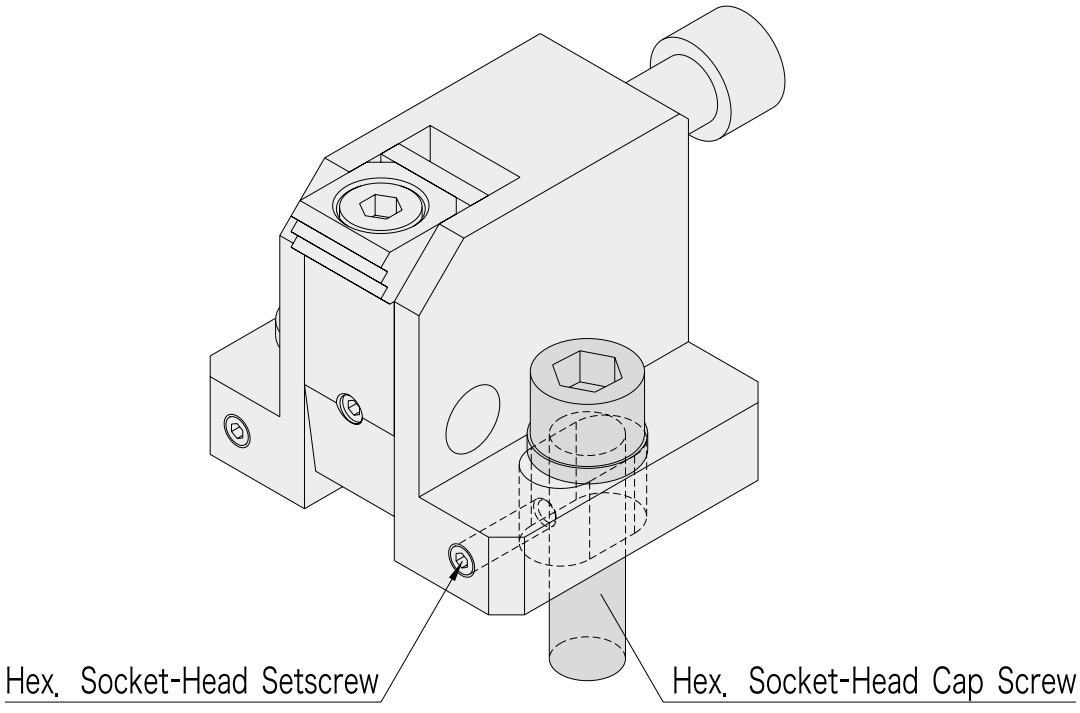
Part Number	A	B	C	D	E	F	G	H	J	K	L
51991569	40	50	40	20	6	35	10	5.3	12	21	8.5
51991570	50	65	50	25	8	45	12	7.1	16	27	11
51991571	60	70	60	30	10	50	15	8	20	31	13
51991572	80	90	80	40	15	65	20	10.2	25	39	17

Part Number	M	N	P	R	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (kg)
51991569	32	62.5	M 8x1.25-35L	M4x0.7-10L	11,000	25	0.33
51991570	40	74	M10x1.5-40L	M4x0.7-12L	18,000	50	0.66
51991571	48	91	M12x1.75-50L	M5x0.8-15L	25,000	90	1.06
51991572	64	115	M16x2-60L	M6x1-20L	46,000	200	2.38

Spare jaws

Cod.	
51992035	See page 14.95
51992038	
51992042	
51992044	

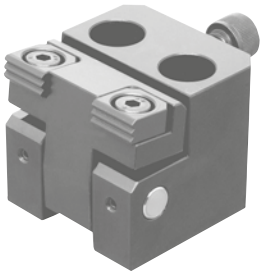
How To Install



The hex. socket-head setscrew works to prevent the clamp from sliding back if screwedin until it contacts the cap screw.

·Two flat washers are included.

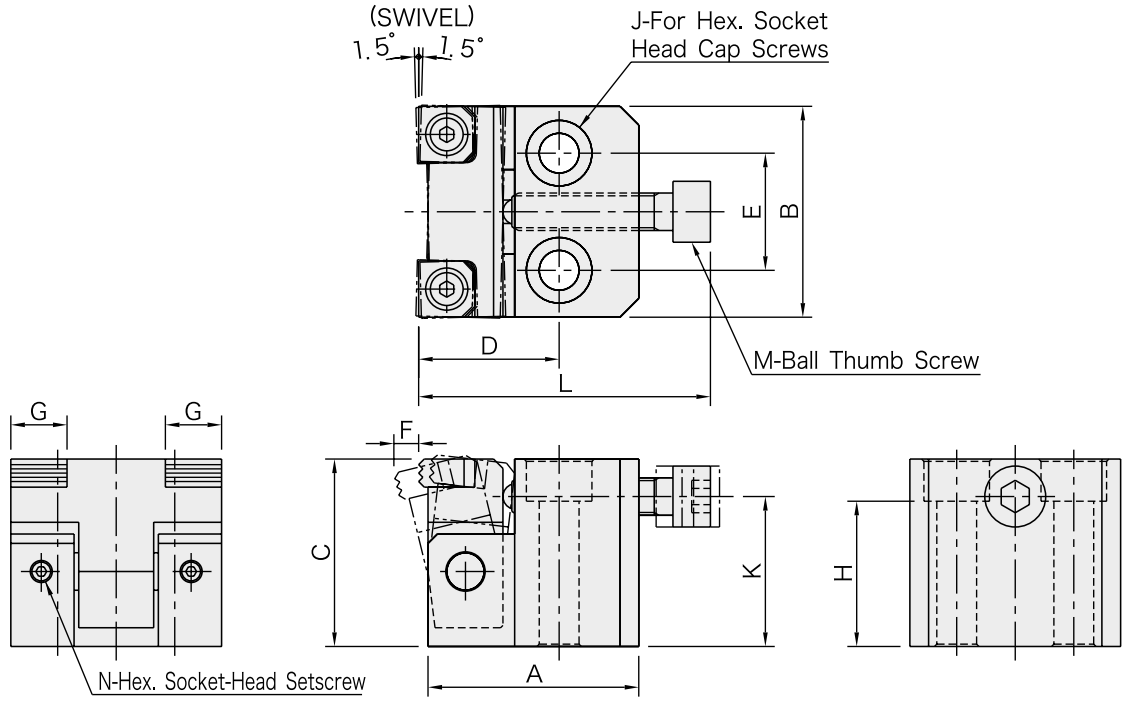
CP102 WIDE-JAW SIDE CLAMPS



[Body]
Material: S45C steel
Finish : Black oxide

[Arm]
Material: S45C steel
Finish : Black oxide
Heat Treated

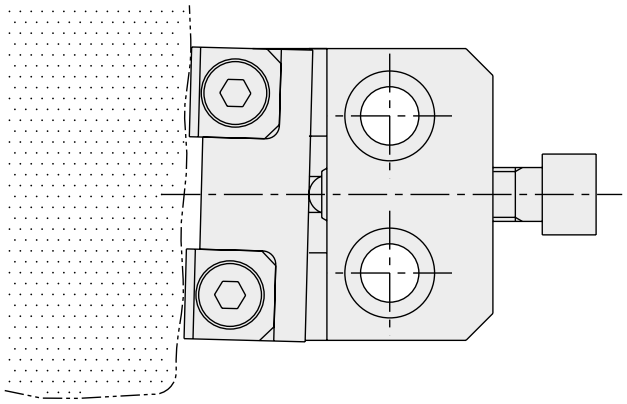
[Jaw]
Material: SKH51 steel
Finish : Black oxide
Heat Treated



Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N
51991573	45	45	40	30	25	5.3	12	31	M 8	32	62.5	M 8x1.25-35L	M4x0.7-4L
51991574	55	55	50	40	30	7.1	16	39	M10	40	74	M10x1.5 -40L	M4x0.7-4L
51991575	65	65	60	45	35	8	20	47	M12	48	91	M12x1.75-50L	M5x0.8-5L

Part Number	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (kg)
51991573	11,000	25	0.55
51991574	18,000	50	1
51991575	25,000	90	1.69

How To Use

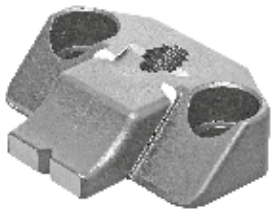


The jaw swivels to fit an unmachined surface of the workpiece.

CP104 TOE CLAMPS



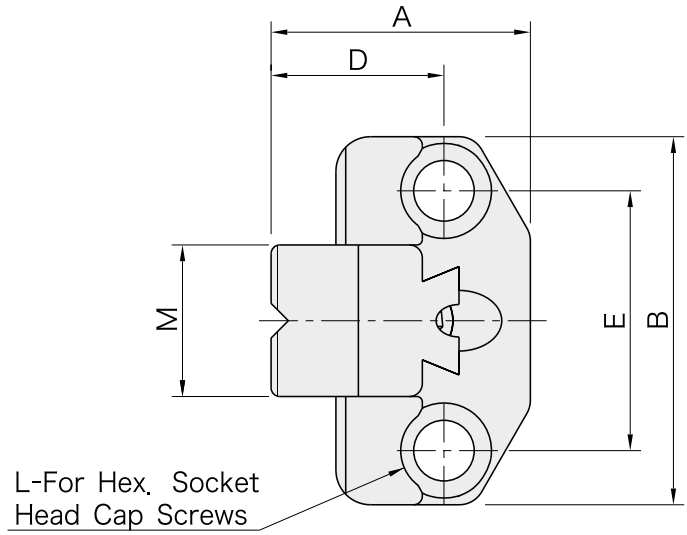
Serrated

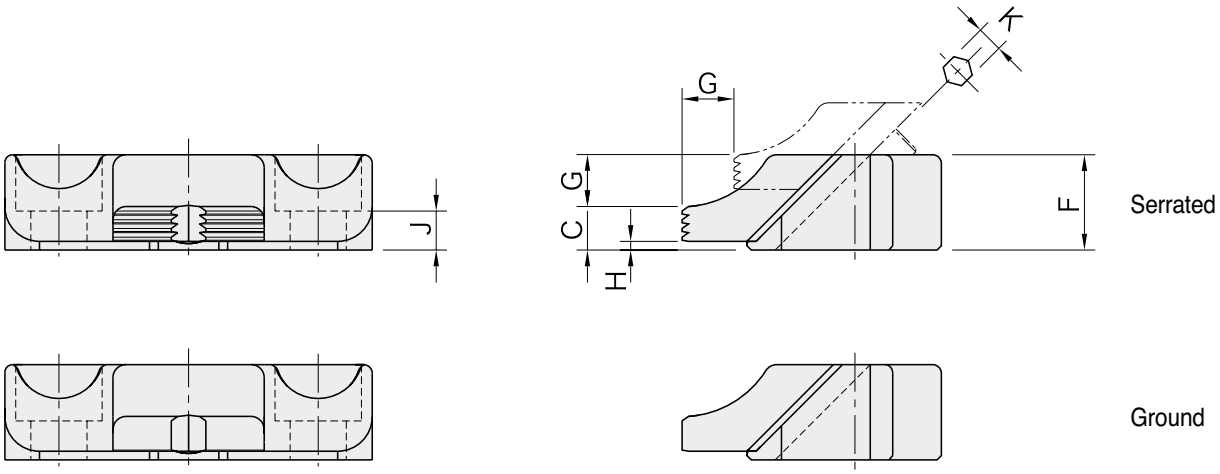


Ground

[Body]
Material: SCM440 steel
Finish : Black oxide
Heat Treated

[Jaw]
Material: SCM440 steel
Finish : Black oxide
Heat treated on edge

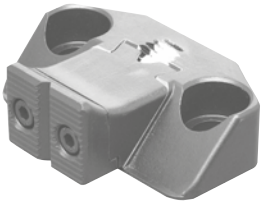




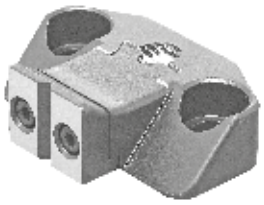
Serrated Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991576	39.5	65	7.5	25	45	16	7	1.5	7	4	M 8	25	4,000	8	160
51991578	60	85	10	40	60	22	12	2	9	6	M12	35	9,000	26	450
51991580	77	100	14	50	70	30	14	2	13	8	M16	40	17,000	60	900

Ground Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991577	39.5	65	7.5	25	45	16	7	1.5	7	4	M 8	25	4,000	8	160
51991579	60	85	10	40	60	22	12	2	9	6	M12	35	9,000	26	450
51991581	77	100	14	50	70	30	14	2	13	8	M16	40	17,000	60	900

CP105 SIDE CLAMPS



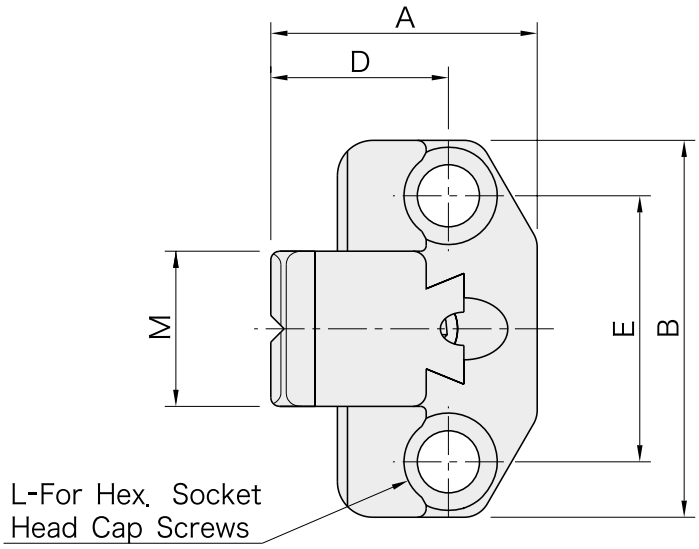
Serrated

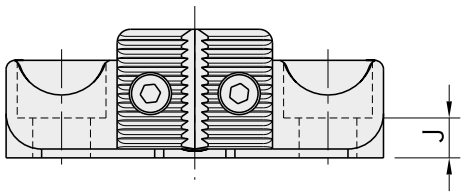


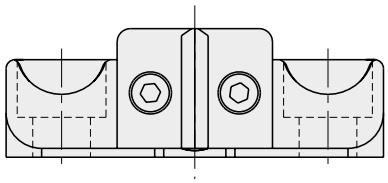
Ground

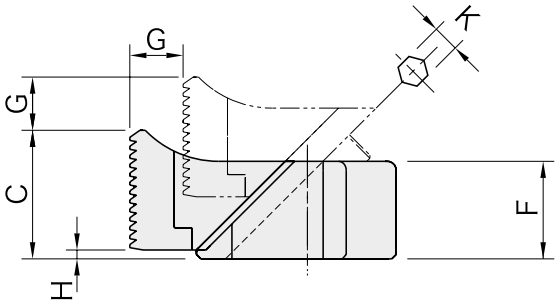
[Body & Jaw Carrier]
Material: SCM440 steel
Finish : Black oxide
Heat treated

[Jaw]
Material: SCM440 steel
Finish : Black oxide
Heat treated on edge

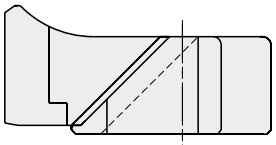








Serrated



Ground

Serrated Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991582	39.5	65	19.5	25	45	16	7	1.5	7	4	M 8	25	4.000	8	180
51991584	60	85	29	40	60	22	12	2	9	6	M12	35	9.000	26	500
51991586	77	100	38	50	70	30	14	2	13	8	M16	40	17.000	60	1.010

Ground Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991583	39.5	65	19.5	25	45	16	7	1.5	7	4	M 8	25	4.000	8	180
51991585	60	85	29	40	60	22	12	2	9	6	M12	35	9.000	26	500
51991587	77	100	38	50	70	30	14	2	13	8	M16	40	17.000	60	1.010

BJ101 ADJUSTABLE TOE CLAMPS



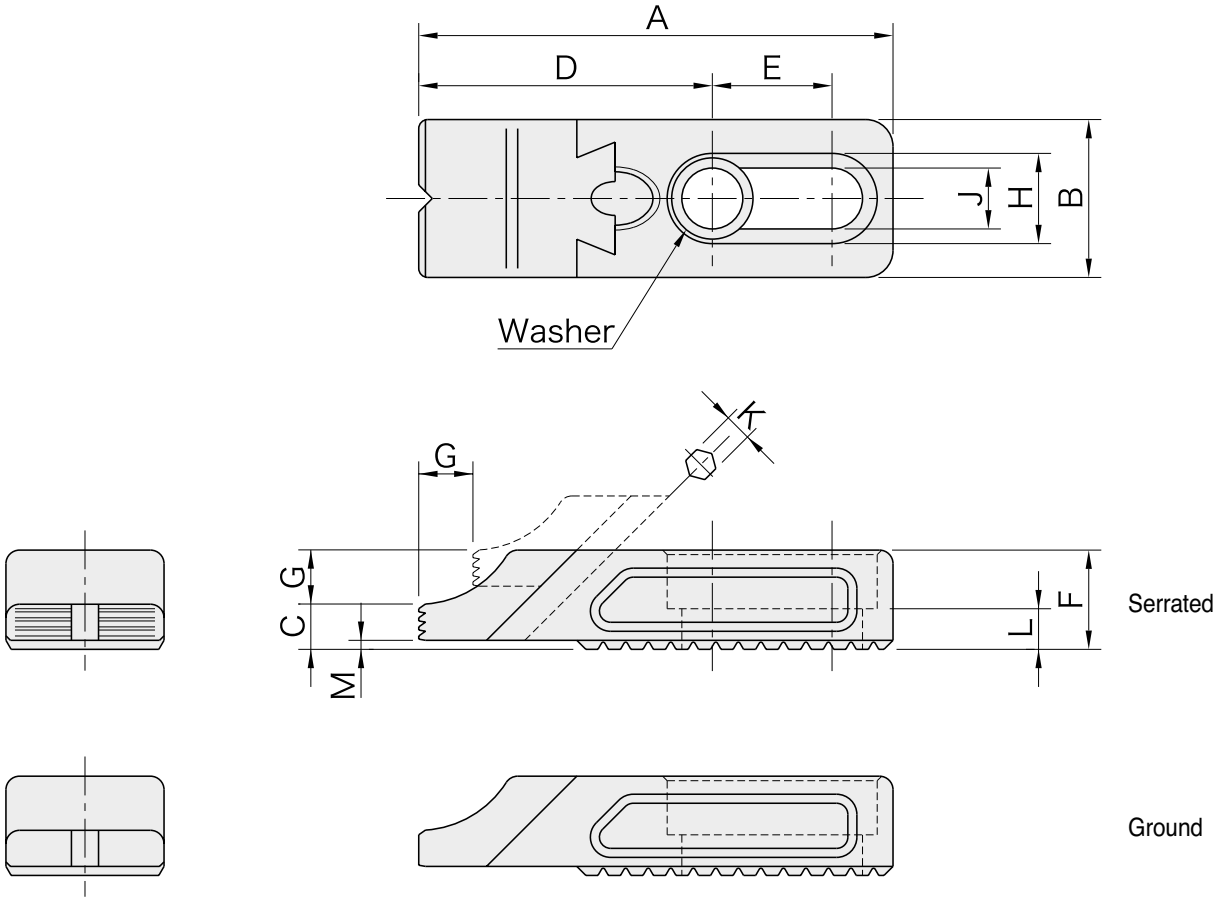
Serrated



Ground

[Body]
Material:FCM440 steel
Heat treated
Black oxide finish

[Sliding Nose]
Material:SCM440 steel
Heat treated (on edge)
Black oxide finish
Precision ground or serrated



Serrated Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Weight (g)
51991588	72	25	7.5	45.5	16.5	16	7	14	8.5	4	7	1.5	150
51991590	105	35	10	65	26.5	22	12	20	13	6	9	2	400
51991592	137	40	14	89.5	30	30	14	26	17	8	13	2	830

Ground Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Weight (g)
51991589	72	25	7.5	45.5	16.5	16	7	14	8.5	4	7	1.5	150
51991591	105	35	10	65	26.5	22	12	20	13	6	9	2	400
51991593	137	40	14	89.5	30	30	14	26	17	8	13	2	830

Part Number	When Used Singularly		When Used with Slide Stop		Weight (g)
	Clamping Force (N)	Allowable Screw Torque (N•m)	Clamping Force (N)	Allowable Screw Torque (N•m)	
51991588	3,600	6,5	4,000	8	150
51991589					
51991590	7,400	19	10,400	26	400
51991591					
51991592	11,700	32	24,000	60	830
51991593					

BJ102 ADJUSTABLE SIDE CLAMPS



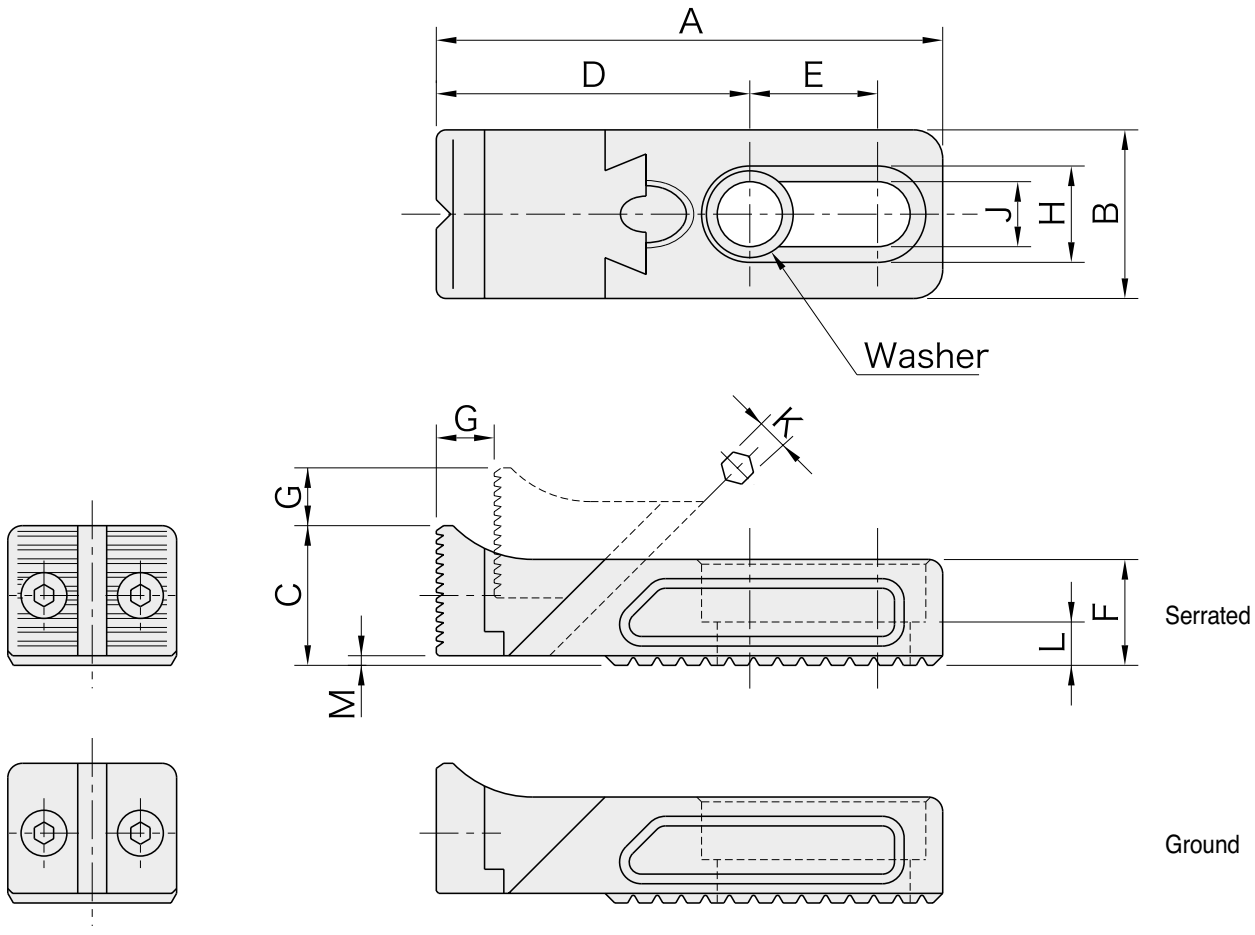
Serrated



Ground

[Body & Jaw Carrier]
Material:FCM440 steel
Heat treated
Black oxide finish

[Jaw]
Material:SCM440 steel
Heat treated
Black oxide finish
Precision ground or serrated



Serrated Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Weight (g)
51991594	72	25	19.5	45.5	16.5	16	7	14	8.5	4	7	1.5	160
51991596	105	35	29	65	26.5	22	12	20	13	6	9	2	440
51991598	137	40	38	89.5	30	30	14	26	17	8	13	2	920

Ground Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Weight (g)
51991595	72	25	19.5	45.5	16.5	16	7	14	8.5	4	7	1.5	160
51991597	105	35	29	65	26.5	22	12	20	13	6	9	2	440
51991599	137	40	38	89.5	30	30	14	26	17	8	13	2	920

Part Number	Clamping Force (N) *)	Allowable Screw Torque (N•m) *)	Weight (g)
51991594	3,600	6,5	160
51991595			
51991596	7,400	19	440
51991597			
51991598	11,700	32	920
51991599			

Note *) The stated values are effective when used singularly (not mounted on a serrated adaptor).

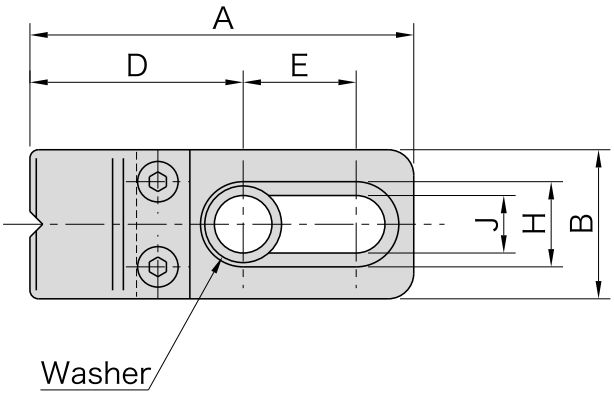
BJ201 ADJUSTABLE TOE STOPS

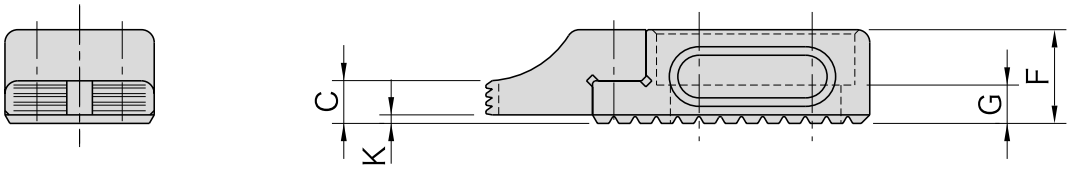


Serrated

【Body】
- ■Material : FCM440 steel
- ■Black oxide finish

【Jaw】
- ■Material : SCM440 steel
- ■Heat treated
- ■Black oxide finish
- ■Precision serrated





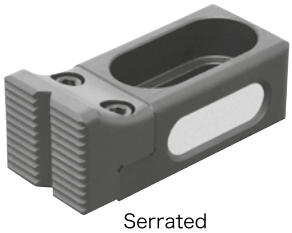
Serrated

Part Number	A	B	C	D	E	F	G	H	J	K	Weight (g)
51991600	60	25	7.5	33.5	16.5	16	7	14	8.5	1.5	120
51991601	90	35	10	50	26.5	22	9	20	13	2	330
51991602	115	40	14	67.5	30	30	13	26	17	2	660

Note *) The stated values are effective when used singularly (not mounted on a serrated adaptor).

・Stop that mounts on a BJ500, Rack Block to prevent backslide.

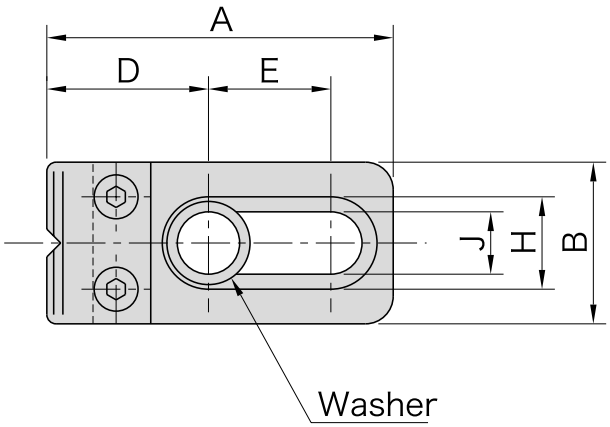
BJ202 ADJUSTABLE SIDE STOPS

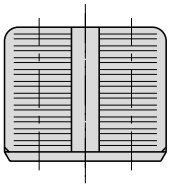


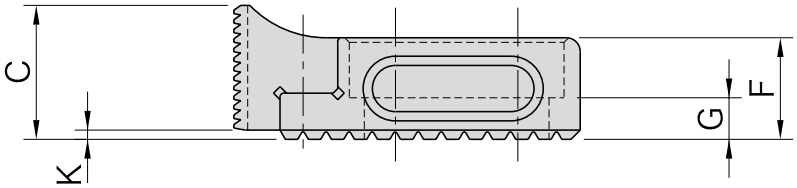
Serrated

【Body】
- ■Material : FCM440 steel
- ■Black oxide finish

【Jaw】
- ■Material : SCM440 steel
- ■Heat treated
- ■Black oxide finish
- ■Precision serrated







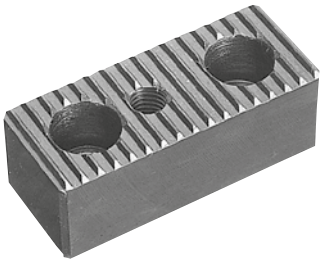
Serrated

Part Number	A	B	C	D	E	F	G	H	J	K	Weight (g)
51991603	50	25	19.5	23.5	16.5	16	7	14	8.5	1.5	100
51991604	75	35	29	35	26.5	22	9	20	13	2	310
51991605	95	40	38	47.5	30	30	13	26	17	2	625

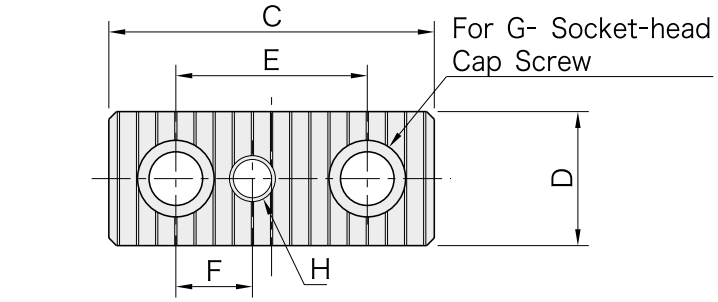
Note *) The stated values are effective when used singularly (not mounted on a serrated adaptor).

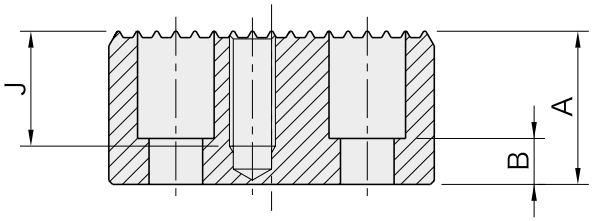
・Stop that mounts on a BJ500, Rack Block to prevent backslide.

BJ500 RACK BLOCKS



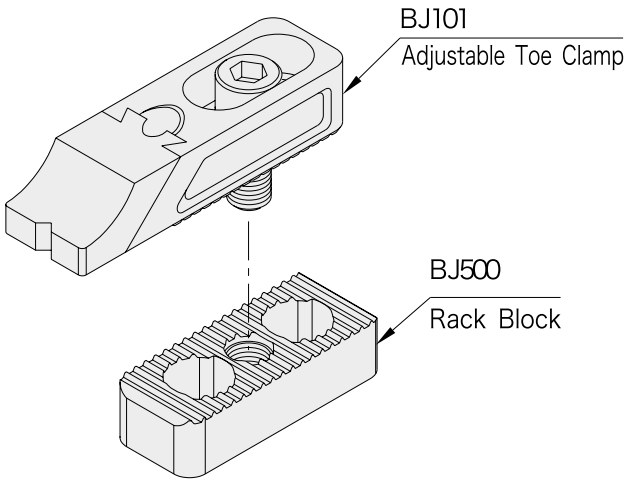
■Material : S45C steel
■Black oxide finish





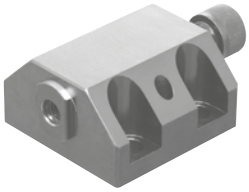
Part Number	A	B	C	D	E	F	G	H	J	Weight (kg)
51991606	16	7	50	25	25	12.5	M 8	M 8×1.25	Through	0.13
51991607	20	9								0.17
51991608	25	13							20	0.21
51991609	32	20								0.27
51991610	40	28								0.33
51991611	50	38								0.42
51991612	20	5	85	35	50	20	M12	M12×1.75	Through	0.34
51991613	25	10								0.45
51991614	32	12								0.57
51991615	40								30	0.71
51991616	50								35	0.9
51991617	25	6	90	40	50	25	M16	M16×2	Through	0.46
51991618	32	13								0.62
51991619	40	15							30	0.78
51991620	50								35	0.98
51991621	63									1.24

■How To Use



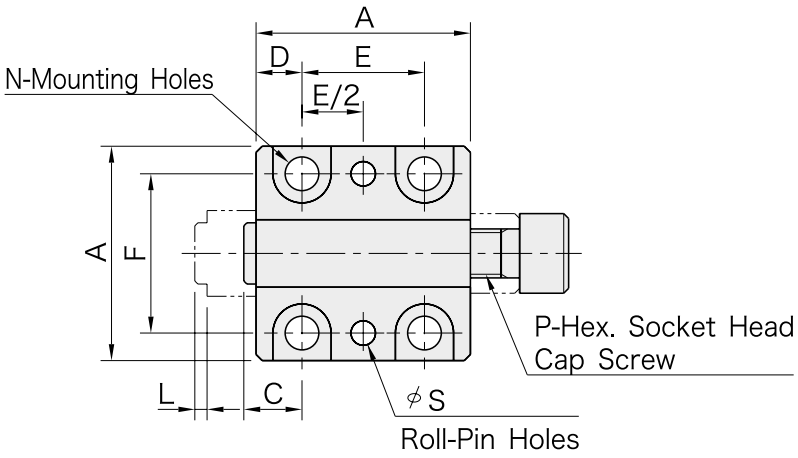
Serrated riser that prevents BJ101/BJ102 clamps and BJ201/BJ202 stops from slipping backward.

CP110 BLOCK PUSH CLAMPS

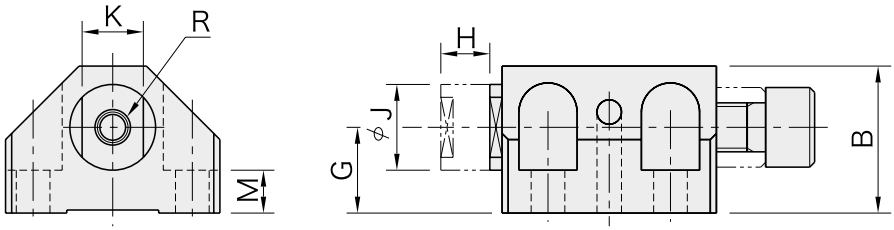


CP110
(Cap Screw Style)

[Body]
Material: S45C steel
Finish : Black oxide
[Piston]
Material: S45C steel
Finish : Black oxide
Heat Treated
[Knurled Knob]
Material: S45C steel
Finish : Black oxide



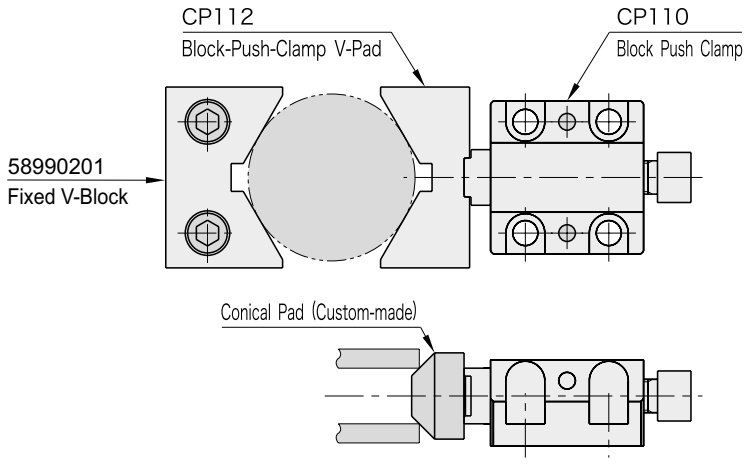
CP110
(Cap Screw Style)



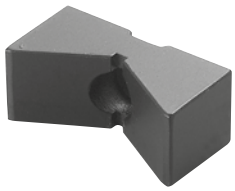
Part Number	A	B	C	D	E	F	G	H	J	K (-0.1 -0.3)	L	M	N	P	R	S	T	U
51991622	35	24	9.5	7.5	20	26	14	8	14	10	2	7	M 5	M 8x1.25	M 5x0.8 8 Prof.	4	24	14
51991623	45	29	12	10	25	35	16	10	18	12	2	8	M 6	M10x1.5	M 6x1 10 Prof.	4	24	14
51991624	55	31	15	12.5	30	40	18	12	20	14	2.5	8	M 8	M12x1.75	M 8x1.25 12 Prof.	6	30	17
51991625	70	37	18	15	40	50	20	16	25	19	3	8	M10	M16x2	M10x1.5 15 Prof.	8	36	20

Cap Screw Style			
Part Number	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991622	6 200	10	160
51991623	11 000	22	340
51991624	20 000	48	540
51991625	37 000	121	1 050

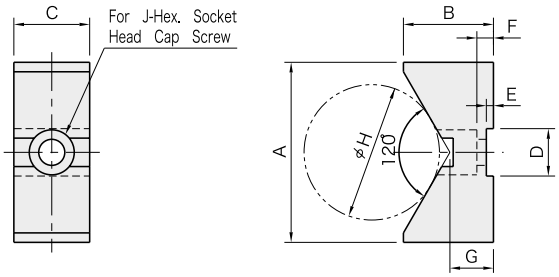
How To Use



CP112 MOVABLE BLOCK PUSH CLAMP V-PADS



Material: S45C steel
Finish : Black oxide
Heat treated

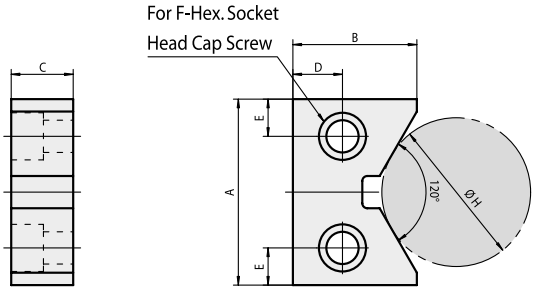


Part Number	A	B	C	D (+0.1 0)	E	F	G	H min.	H max	J	Weight (g)
51991630	38	19	16	10	1.5	3.5	9.2	15	60	M 5	65
51991631	50	24	19	12	1.5	4.5	11	20	80	M 6	125
51991632	65	32	22	14	2	5.5	15	25	100	M 8	250
51991633	75	38	25	19	2.5	7.5	18.7	30	120	M10	390

CP112 F FIXED V-BLOCK PUSH CLAMP

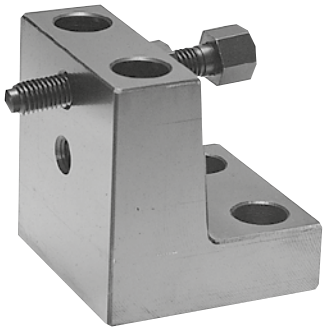


Material: S45C steel
Finish : Black oxide
Heat treated



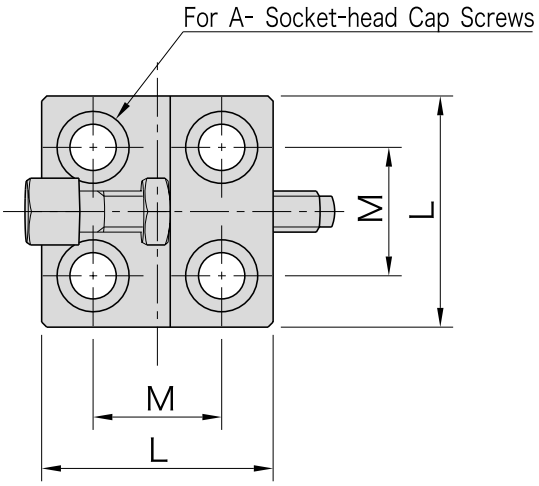
Part Number	A	B	C	D	E	F	H min	H max	Weight (Kg)
58990201	38	25	16	8	8	M6	15	60	0.09
58990202	50	35	19	10	10	M8	20	80	0.19
58990203	65	40	22	12	12	M10	25	100	0.30
58990204	75	50	25	20	15	M12	30	120	0.52

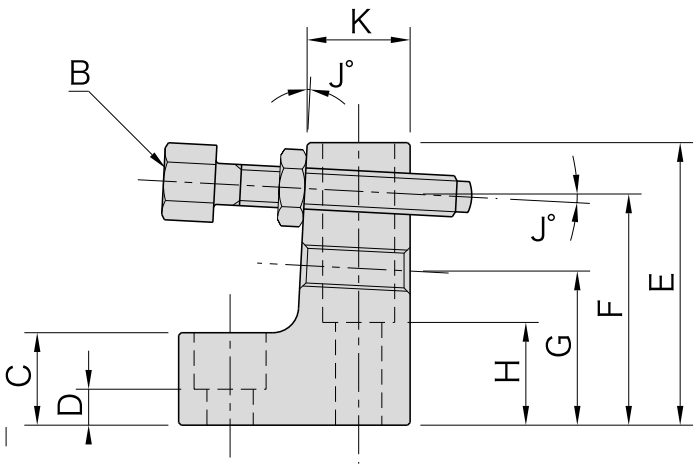
BJ112 REVERSE SCREW SIDE CLAMPS



【Body】
■Material : S45C steel
■Black oxide finish

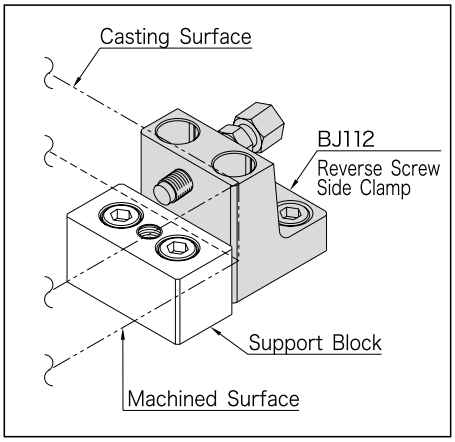
【Screw】
■Material : SCM435 steel
■Heat treated
■Black oxide finish

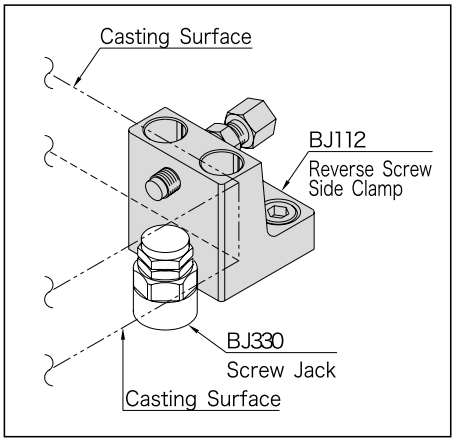


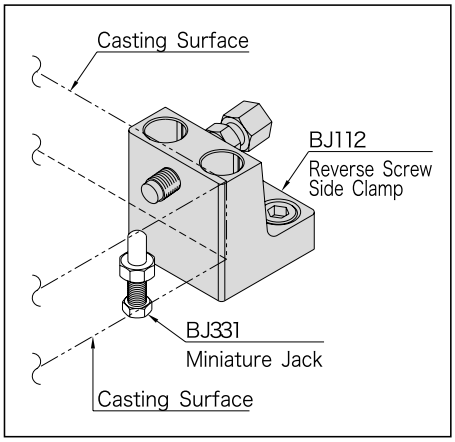


Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Weight (kg)
51991634	M 8	M 8×1.25-50L	18	7	55	45	30	20	3	20	45	25	0.45
51991636	M16	M16×2 -80L	27	10	90	75	50	33	5	33	85	50	2.3

■Application Examples



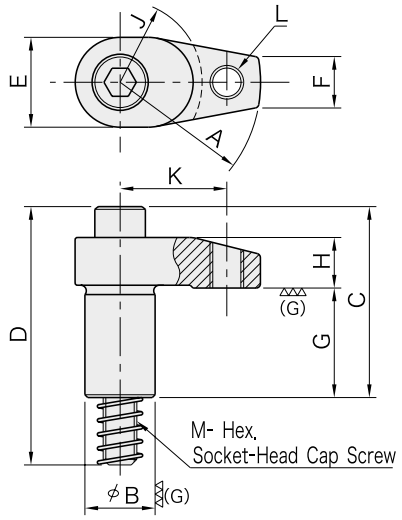




BJ130 HOOK CLAMPS

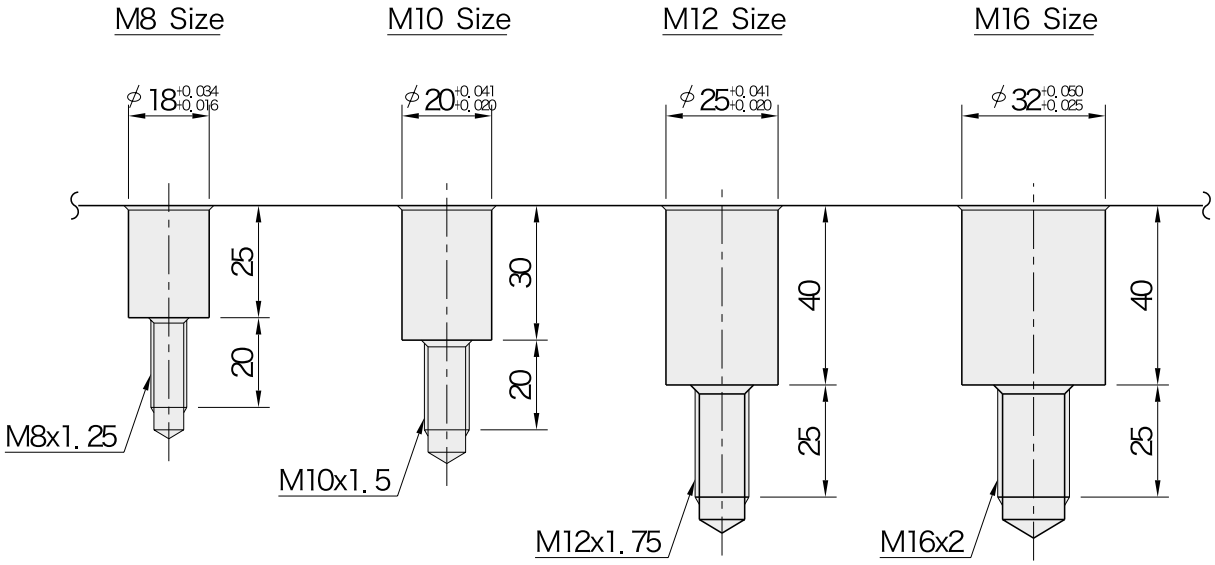


Material:SCM435 steel
Heat treated
Black oxide finish
Precision ground



·Use with a BJ530 Hook-Clamp Holder.

How To Use
(Reference)



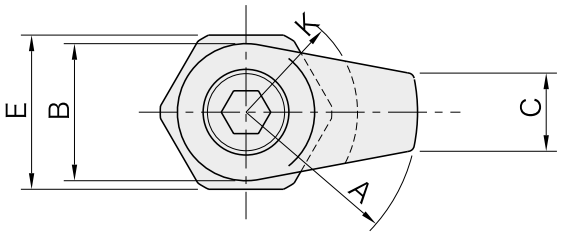
Hook Clamps can be plugged directly into custom blocks with receiving holes as specified above.

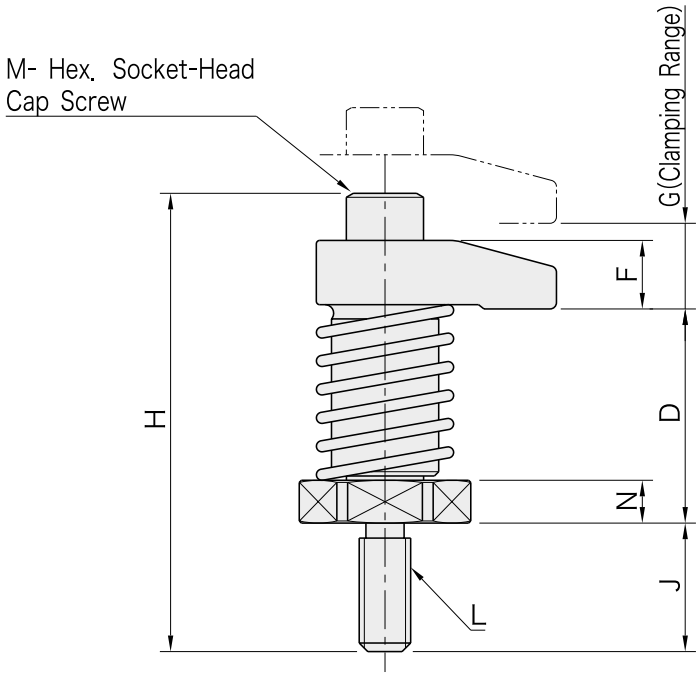
Part Number	A	B (h7)	C	D	E	F	G	H	J	K	L	M	Allowable Screw Torque (N·m)	Weight (Kg)
51991637	20	18	37	58	22	10	23	12	15	–	–	M8x1.25 - 50L	38	90
51991638	25												33	95
51991639	30								20				30	105
51991640	30	20	54	75	24	12	30	15	20	–	–	M10x1.5 - 65L	38	200
51991641	40								25				32	210
51991642	40	25	66	92	32	18	39	16	25	–	–	M12x1.75 - 80L	60	280
51991643	50		68					18					50	310
51991644	60												46	350
51991645	40	25	66	92	32	18	39	16	25	31	M12x1.75	M12x1.75 - 80L	60	280
51991646	50		68					18		38			50	310
51991647	60									46			46	350
51991648	40	32	75	101	36	22	39	21	25	–	–	M16x2 - 85L	170	420
51991649	50												150	470
51991650	60												130	530
51991651	50	32	75	101	36	22	39	21	25	38	M12x1.75	M16x2 - 85L	150	470
51991652	60									46			130	530

BJ131 HOOK CLAMPS WITH SPRING



Material:SCM435 steel
Heat treated
Black oxide finish
Precision ground





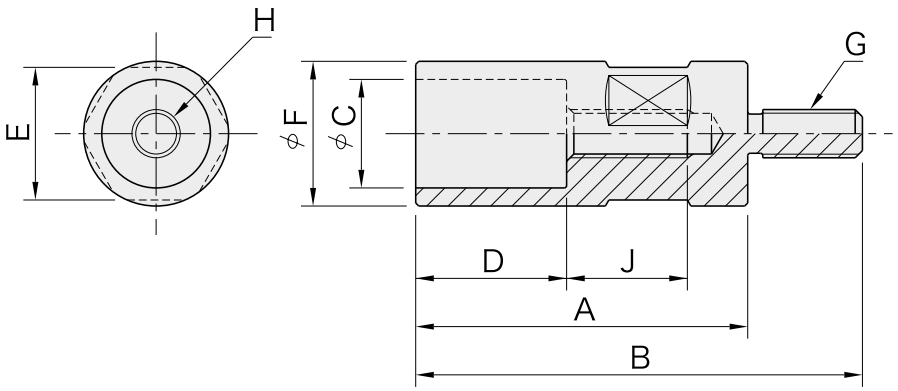
Part Number	A	B	C	D	E	F	G	H	J	K	L
51991655	30	22	10	35	22	12	10	68	19	20	M 8x1.25
51991659	40	32	18	50	36	16	15	107	30	25	M12x1.75
51991660	50					18		109			
51991661	60										
51991665	40	36	22	50	36	21	15	116	30	25	M16x2
51991666	50										
51991667	60										

Part Number	M	N	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991655	M 8x1.25-30L	6	6,700	20	135
51991659	M12x1.75-45L	10	13,500	45	450
51991660			12,600		480
51991661			11,700		520
51991665	M16x2 -55L	10	13,400	60	630
51991666			12,400		680
51991667			12,000		740

BJ530 HOOK CLAMP HOLDERS



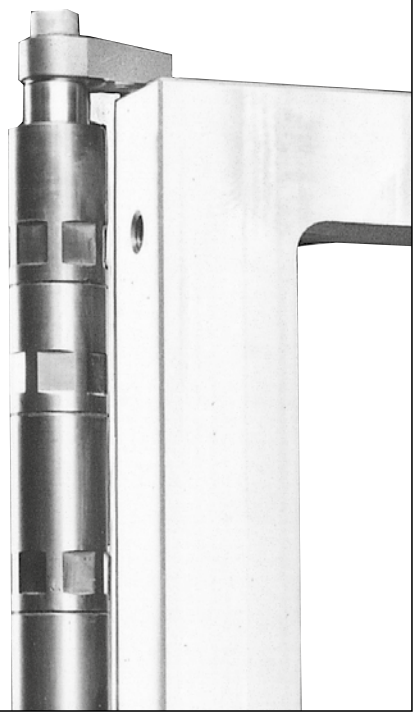
Material:S45C steel
Black oxide finish



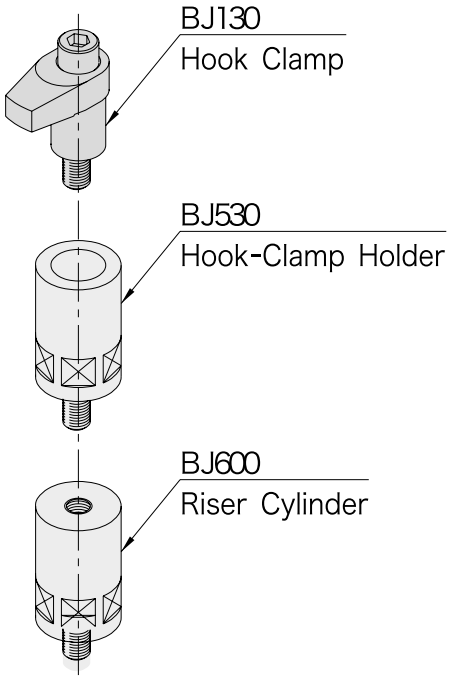
Part Number	A	B	C (F7)	D	E	F	G	H	J	Allowable Screw Torque (N·m) *)	Weight (g)
51991671	55	74	18	25	22	24	M 8x1.25	M 8x1.25	20	30	140
51991672	63	93	20	30	30	32	M12x1.75	M10x1.5	21	40	400
51991673	80	110							23		500
51991674	80	110	25	40	36	40	M12x1.75	M12x1.75	25	50	1,080
51991675	100	130									1,280
51991676	80	110	32	40	46	50	M16x2	M16x2	25	80	1,690
51991677	100	130									2,000

*) The above screw torque values are effective for istallation of Hook Clamps.

How To Use



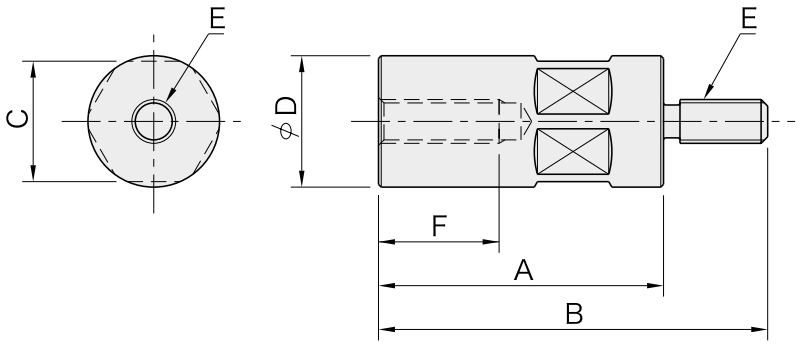
Holder that is specifically designed to receive a BJ130 Hook Clamp.



BJ600 RISER CYLINDERS



Material: SCM435 steel(Mini)
S45C steel(Standard&heavy)
Heat treated(Mini)
Black oxide finish



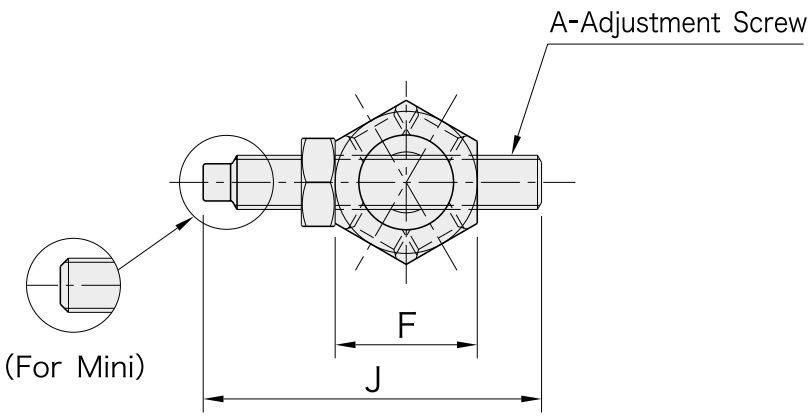
Part Number	A	B	C	D	E	F	Weight (g)
51991678	32	51	22	24	M 8x1.25	20	105
51991679	40	59					135
51991680	50	69					170
51991681	65	84					220
51991684	50	80	36	40	M12x1.75	35	480
51991685	65	95					640
51991686	80	110					780
51991687	100	130					980
51991688	125	155					1,230
51991691	50	80	46	50	M16x2	35	770
51991692	65	95					1,000
51991693	80	110					1,230
51991694	100	130					1,540
51991695	125	155					1,920

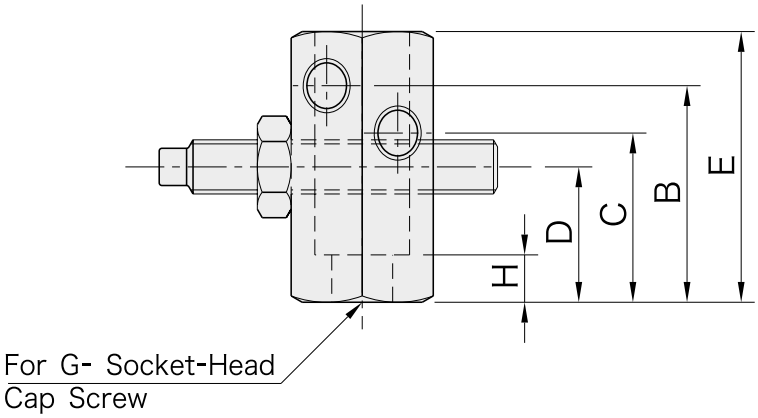
BJ210 ADJUSTABLE STOPS



[Body]
Material:S45C steel
Black oxide finish

[Adjustment Screw]
Material:Steel
Heat treated
Black oxide finish





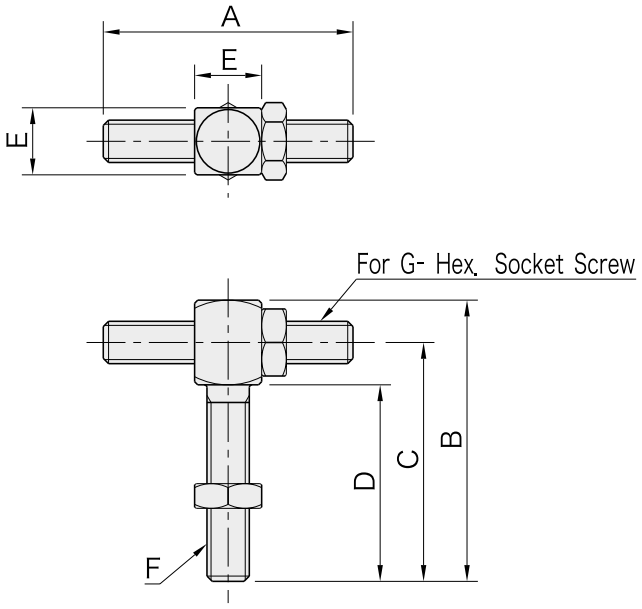
Part Number	A	B	C	D	E	F	G	H	J	Weight (g)
51991698	M 8x1.25	32	25	20	40	21	M 8	7	50	95
51991699	M12x1.75	50	40	32	60	36	M12	12	100	500
51991700	M16x2	63	50	40	80	46	M16	14	100	1,200

·Side stop that offers three options of screw height.
·Can also be used as auxiliary clamps.

BJ211 ADJUSTABLE MINIATURE STOPS

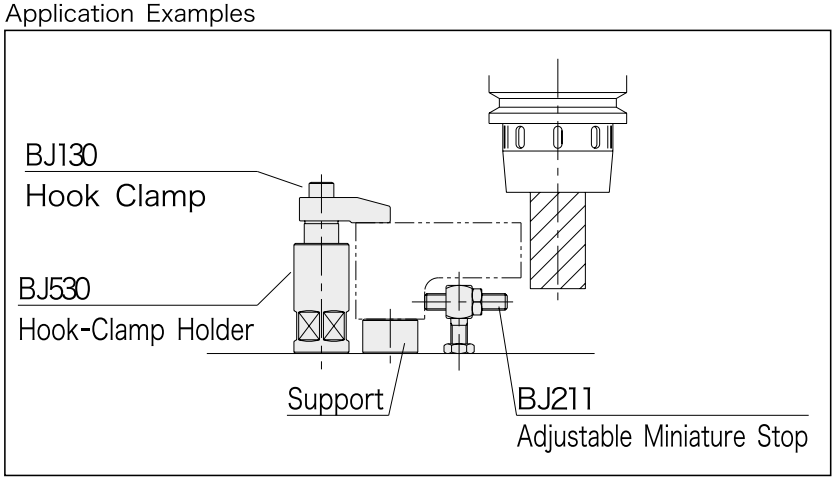


Material:S45C steel
Heat treated
Black oxide finish

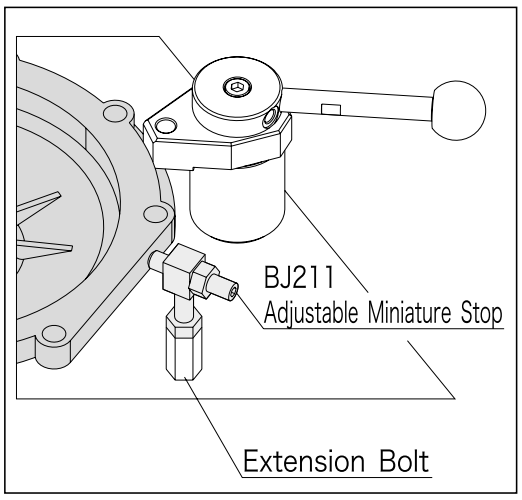


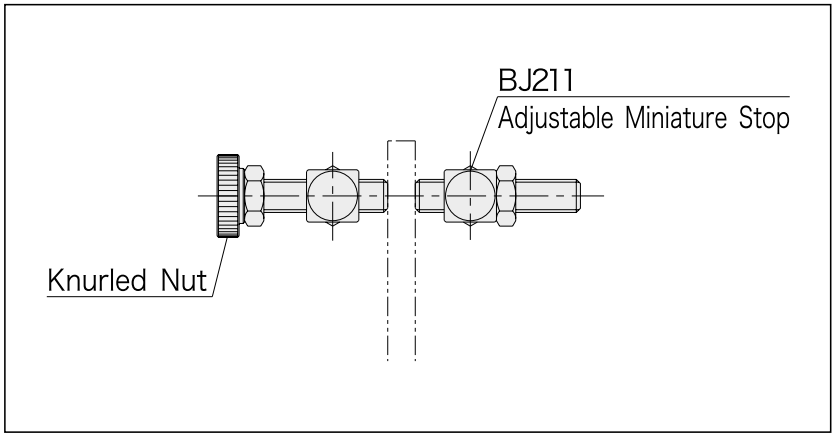
Part Number	A	B	C	D	E	F	G	Weight (g)
51991213	40	56	48	40	13	M 8x1.25	M 8x1.25	60
51991214	50	70	60	50	17	M10x1.5	M10x1.5	120
51991215	60	84	72	60	19	M12x1.75	M12x1.75	190
51991216	80	112	96	80	24	M16x2	M16x2	410

Application Examples



Miniature size allows use in small space.



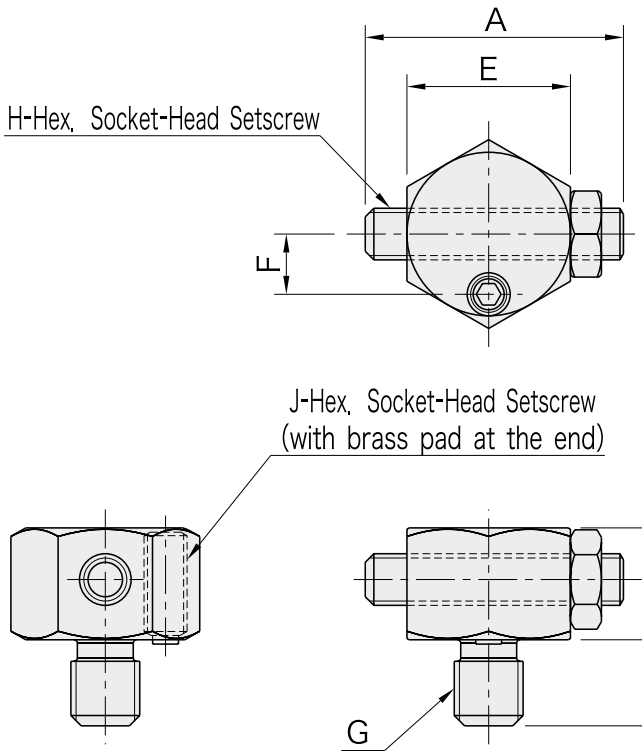


Can be used as auxiliary clamps.

BJ214 SCREW STOP BUTTONS

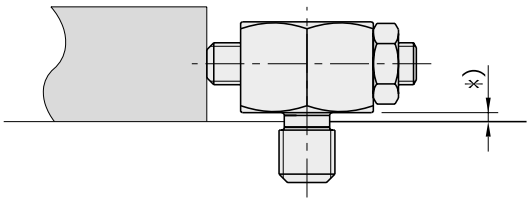


Material: S45C steel
Finish : Black oxide
Heat treated

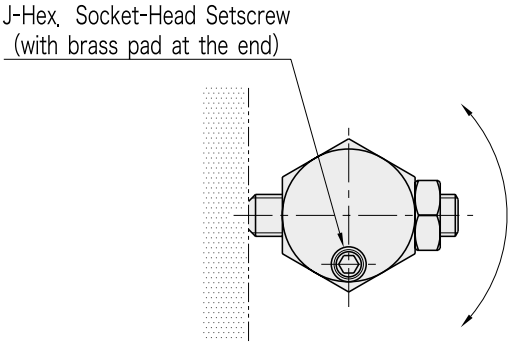


Part Number	A	B	C	D	E	F	G	H	J	Weight (g)
51991701	30	13	7	10	19	7	M 8x1.25	M 6x1	M5x0.8-12L	40
51991702	40	16.5	8.5	12	22	8	M10x1.5	M 8x1.25	M5x0.8-12L	75
51991703	50	21	11	15	24	9	M12x1.75	M10x1.5	M6x1 -20L	120
51991704	60	23	12	20	30	12	M16x2	M12x1.75	M6x1 -20L	210

How To Use



*) Minimize this clearance when installing.



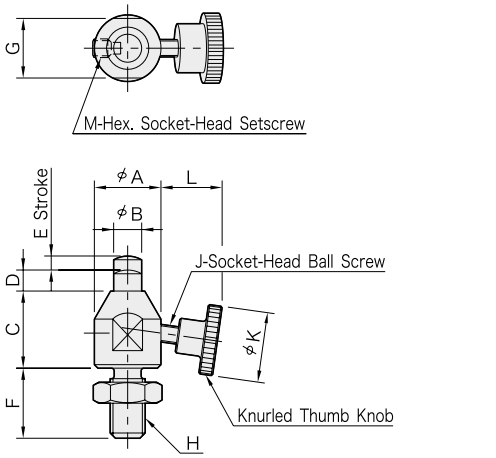
Installation Information
1. Screw in the body completely.
2. Screw back the body and set the adjustment screw.
3. Tighten up the hex. socket-head setscrew to lock the body.

·Use to stop a low-profile workpiece.

BJ360 COMPACT WORK SUPPORTS

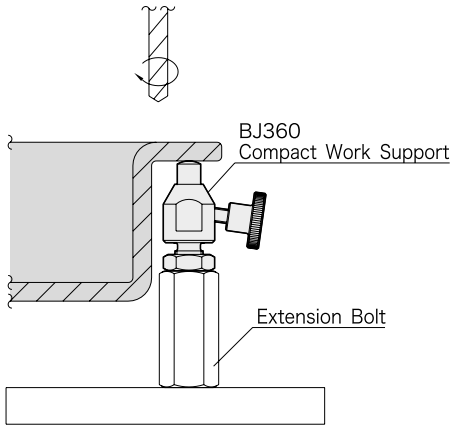


[Body]
Material: S45C steel
Finish : Black oxide
[Piston]
Material: SK4 steel
Finish : Black oxide
Heat treated



Note) The socket-head ball screw is glued to the knurled thumb knob.

How To Use



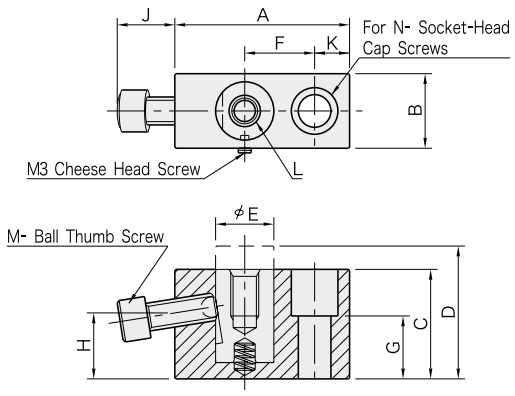
Part Number	A	B	C	D	E	F	G	H	J	K
51991148	15	6	18	5	3	16	13	M 8x1.25	M4x0.7-16L	16
51991149	19	8	22	6	4	20	17	M10x1.5	M5x0.8-20L	20
51991150	22	10	25			24	19	M12x1.75	M6x1 -25L	24

Part Number	L	M	Piston Spring Force (N)	Support Capacity (N)	Weight (g)
51991148	13.2	M4x0.7-6L	1.5 to 3.0	200	36
51991149	16.3		1.8 to 3.0	300	72
51991150	22.3			400	150

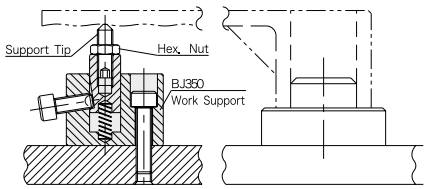
BJ350 WORK SUPPORTS



[Body]
Material:S45C steel
Black oxide finish
[Piston]
Material:SK4 steel
Heat treated
Black oxide finish



Application Example



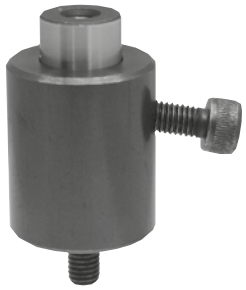
Ideal for preventing the workpiece from chattering and deflecting.

- The positive locking mechanism offers high support capacities.
- The above support capacity values are reached when the ball thumb screw is fully tightened.

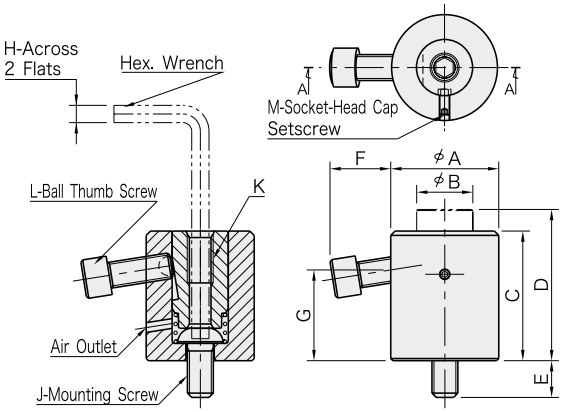
Part Number	A	B	C	D	E	F	G	H	J	K
51991152	38	19	29	35	12	15	15	17.6	13	8
51991153	50	22	37	47	16	20	20	21.1	16	10
51991154	65	25	42	52	19	25	20	24.6	18.5	15
51991155	75	32	47	57	25	30	27	28.3	25	15

Part Number	L	M	N	Support Capacity (N)	Piston Spring Force (N)	Weight (g)
51991152	M 6x1 10 deep	M 6x1 -16L	M 6	4,000	0 to 6	150
51991153	M 8x1.25 15 deep	M 8x1.25 -20L	M 8	6,000	0 to 7	285
51991154	M10x1.5 15 deep	M10x1.5 -25L	M10	7,500	1 to 11	480
51991155	M12x1.75 20 deep	M12x1.75 -30L	M12	9,000	1 to 11	800

BJ351 WORK SUPPORT CYLINDERS



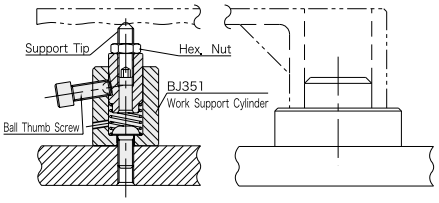
[Body]
Material:S45C steel
Black oxide finish
[Piston]
Material:SK4 steel
Heat treated
Black oxide finish



Section A-A

To install, insert a hex. wrench through the piston into the mounting screw.

Application Example



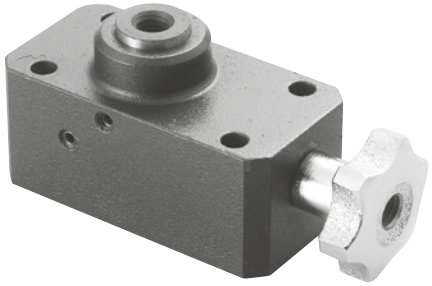
Ideal for preventing the workpiece from chattering and deflecting.

- The positive locking mechanism offers high support capacities.
- The above support capacity values are reached when the ball thumb screw is fully tightened.

Part Number	A	B	C	D	E	F	G	H	J	K
51991156	28	14	33	39	10	13.1	22.2	4	M 6x1	M 6x1 12 deep
51991157	35	19	42	52	14	17.2	27.5	5	M 8x1.25	M 8x1.25 16 deep
51991158	42	22	50	-	14	23.8	34	6	M 10x1.5	M 10x1.5 20 deep
51991159	50	26	60	70	16	28.1	42.1	8	M 12x1.75	M 12x1.75 24 deep
51991160	60	33	70	80	22	26.6	47.4	10	M 16x2	M 16x2 32 deep

Part Number	L	M	Support capacity (N)	Piston Spring Force (N)	Weight (g)
51991156	M 6x1 -16L	M4x0.7 - 8L	4.000	10 ~ 22	150
51991157	M 8x1.25 -20L	M4x0.7 - 8L	6.000	10 ~ 27	300
51991158	M 10x1.5 -25L	-	7.500	14 ~ 28	540
51991159	M 12x1.75 -30L	M5x0.8 - 12L	9.000	15 ~ 30	865
51991160	M 16x2 -30L	M5x0.8 - 12L	9.000	15 ~ 35	1390

CP300 EXTENDABLE WORK SUPPORTS



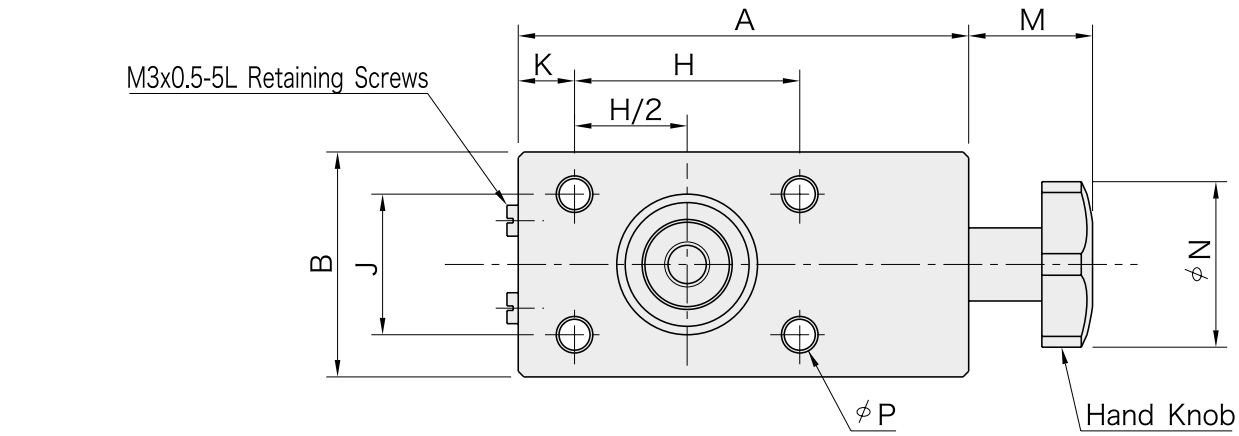
[Body]
Material: S45C steel
Finish : Black oxide

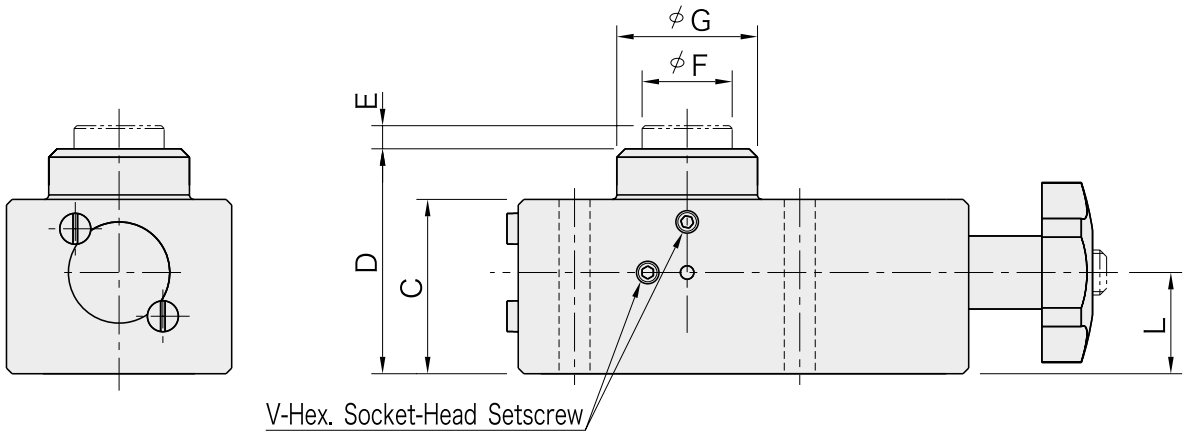
[Piston & Locking Pin]
Material: SK4 steel
Finish : Black oxide
Heat Treated

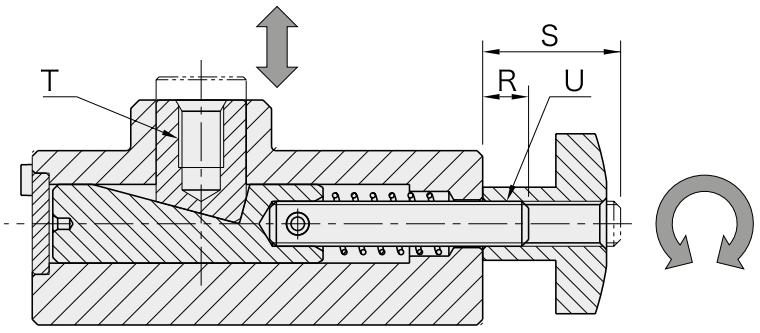
[Spindle]
Material: S45C steel
Finish : Black oxide
Heat Treated

[Piston Plug]
Material: S45C steel
Finish : Black oxide

[Knob]
Material: FC200 cast iron
Finish : Chrome plated







Turning the hand knob clockwise lets the locking pin move upward and turning it counterclockwise lets the locking pin move downward.

Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
51991709	80	40	31	40	4	16	25	40	25	10	18	22	32	5.5	8	23.5
51991710	95	50	39	50	5	20	32	50	30	10	23	25	40	6.5	9	28
51991711	115	60	47	60	6	24	38	60	40	15	28	32	50	9	12	35.5

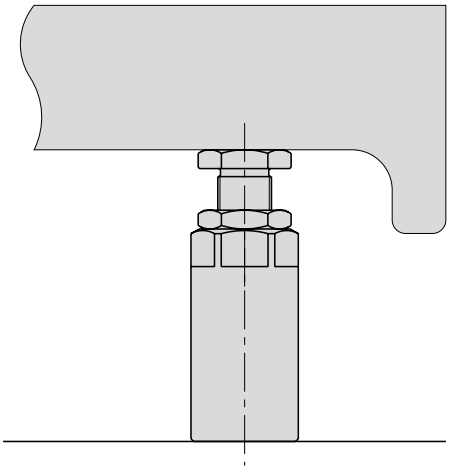
Part Number	T	U	V	Support Capacity(N)	Allowable Screw Torque (N·m)	Weight (kg)
51991709	M 8x1.25 12 deep	M 8x1.25	M4x0.7-10L	700	1	0.82
51991710	M10x1.5 15 deep	M10x1.5	M4x0.7-10L	800	1.5	1.52
51991711	M12x1.75 18 deep	M12x1.75	M5x0.8-16L	900	2	2.67

Note : The stated values of both "Support Capacity" and "Allowable Screw Torque" are based on the manual operation of the hand knob.

How To Use

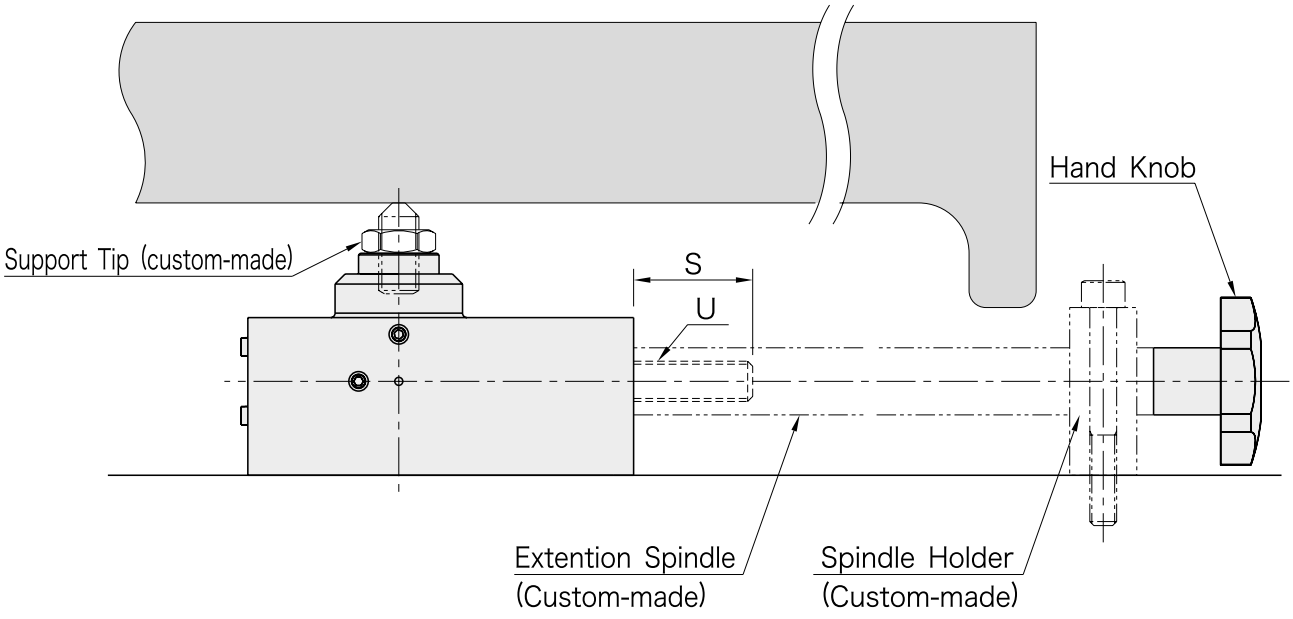
Conventional Method

Cumbersome height adjustment with a wrench
Limited positioning area



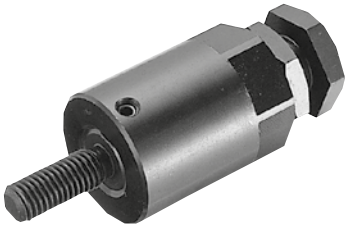
Extendable Work Support Method

Easy height adjustment with a hand knob
Flexible positioning

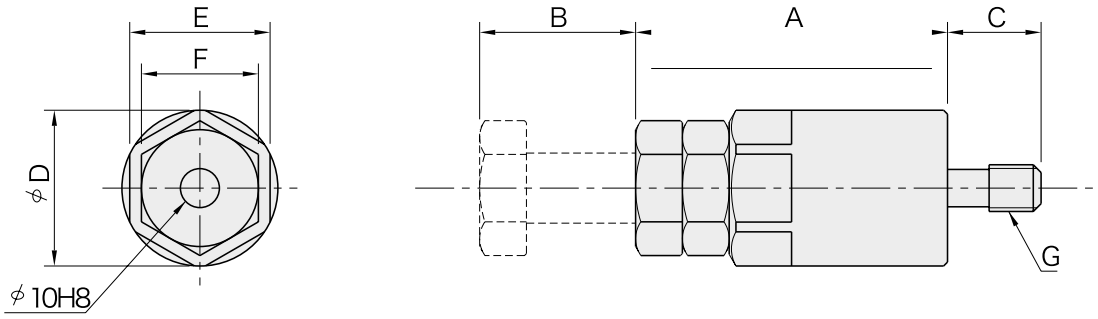


·Connecting an extention spindle allows adjusting the part height with ease.
·Provide a tapped hole for the extention spindle for connection, as specified in chart above.

BJ330 SCREW JACKS



[Body]
Material:S45C steel
Black oxide finish
[Bolt]
Material:SCM435 steel
Heat treated
Black oxide finish

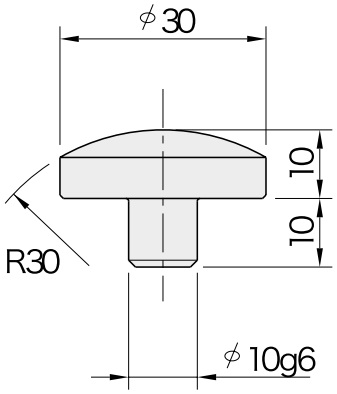


Part Number	A	B	C	D	E	F	G	Load Capacity (N)	Weight (g)
51991712	40	10	30	40	36	30	M12x1.75	31,800	350
51991713	50	20							420
51991714	70	40							570
51991718	50	20	30	40	36	30	M16x2	31,800	430
51991719	70	40							580

BJ733 SCREW-JACK TIP

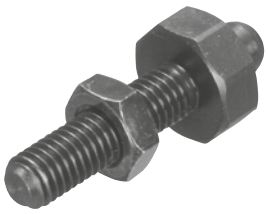


Material:S45C steel
Heat treated
Black oxide finish

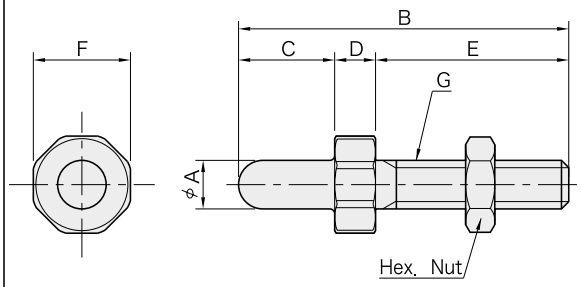


Part Number	Weight (g)
51991722	50

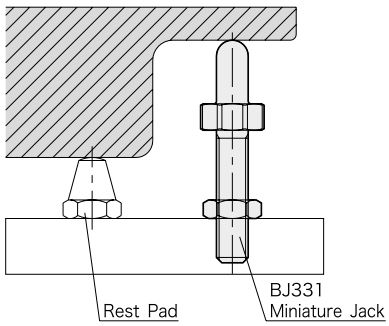
BJ331 MINIATURE JACKS



Material:S45C steel
Heat treated
Black oxide finish
Hardness:RC33 - 39



How To Use

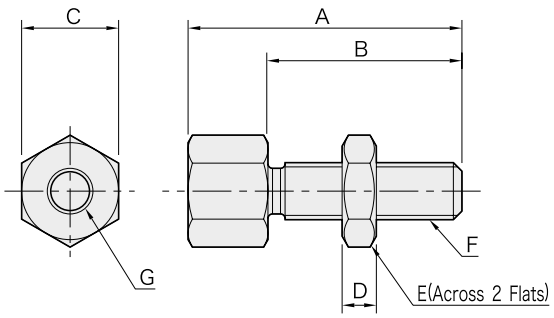


Part Number	A	B	C	D	E	F	G	Weight (g)
51991161	6	37	6	6	25	13	M 6x1	11
51991162		43	12					13
51991163	8	45	8	7	30	17	M 8x1.25	40
51991164		53	16					45
51991165	10	58	10	8	40	19	M10x1.5	60
51991166		68	20					65
51991167	12	72	12	10	50	24	M12x1.75	110
51991168		84	24					120
51991169	16	89	16	13	60	30	M16x2	240
51991170		105	32					265

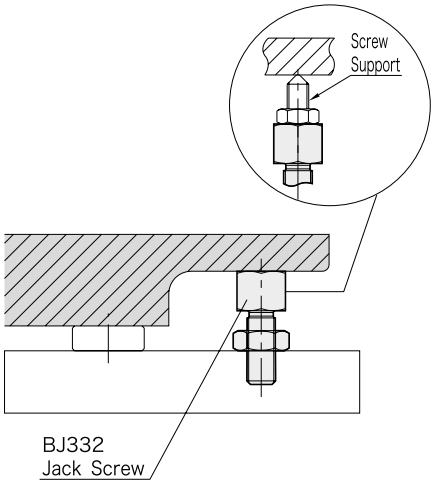
BJ332 JACK SCREWS



Material: S45C steel
Finish : Black oxide



How To Use

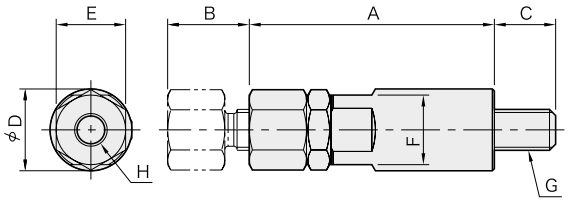


Part Number	A	B	C	D	E	F	G	Weight (g)
51991173	30	20	13	5	13	M 8x1.25	M 6x1 6 deep	20
51991174	40	30						25
51991175	38	24	17	6	17	M10x1.5	M 8x1.25 8 deep	45
51991176	48	34						50
51991177	51	33	22	7	22	M12x1.75	M10x1.5 10 deep	95
51991178	66	48						110
51991179	62	40	27	10	27	M16x2	M12x1.75 12 deep	185
51991180	77	55						210

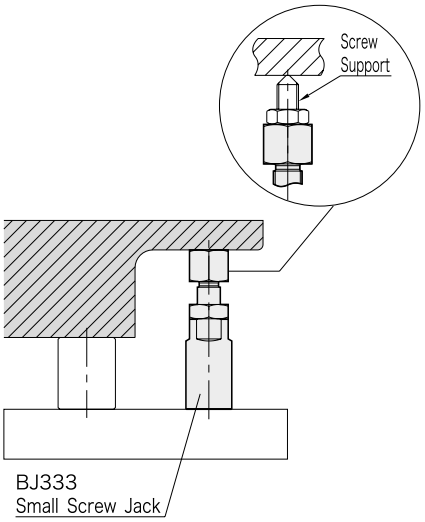
BJ333 SMALL SCREW JACKS



Material: S45C steel
Finish : Black oxide



How To Use

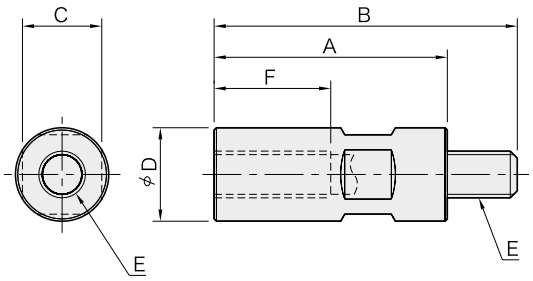


Part Number	A	B	C	D	E	F	G	H	Weight (g)
51991181	40	10	12	16	13	13	M 8 x1.25	M 6x1 6 deep	55
51991182	50	20							70
51991183	50	10	14	20	17	17	M10x1.5	M 8x1.25 8 deep	110
51991184	60	20							135
51991185	65	15	19	24	22	22	M12x1.75	M10x1.5 10 deep	220
51991186	80	30							275
51991187	80	15	24	32	27	27	M16x2	M12x1.75 12 deep	460
51991188	95	30							555

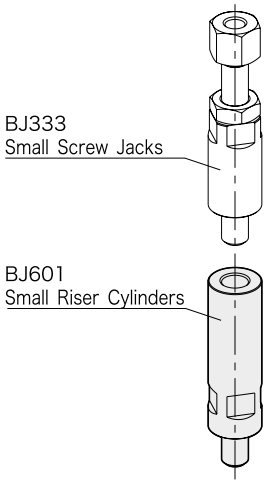
BJ601 SMALL RISER CYLINDERS



Material: S45C steel
Finish : Black oxide



How To Use



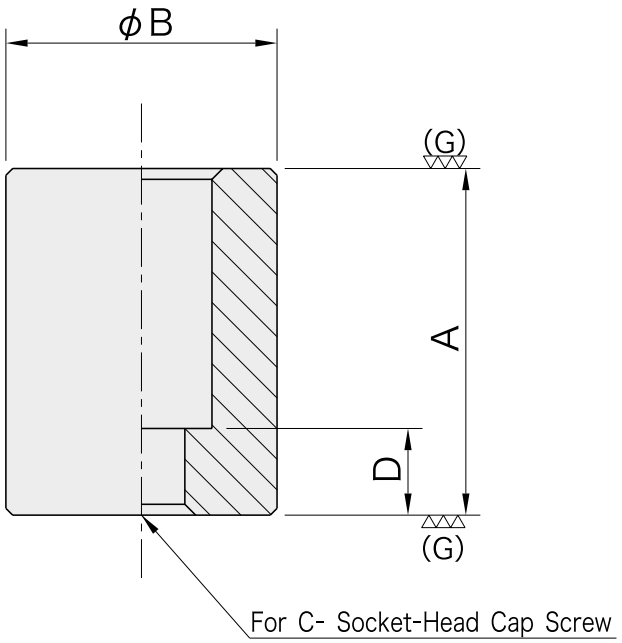
Part Number	A	B	C	D	E	F	Weight (g)
51991189	32	44	13	16	M 8X1.25	18	45
51991190	40	52				20	55
51991191	50	62					70
51991192	65	77					90
51991193	80	92					115
51991194	100	112					145
51991195	40	54	17	20	M10X1.5	23	85
51991196	50	64				25	105
51991197	65	79					145
51991198	80	94					180
51991199	100	114					230

Part Number	A	B	C	D	E	F	Weight (g)
51991201	50	69	22	24	M12X1.75	30	160
51991202	65	84					200
51991203	80	99					255
51991204	100	119					325
51991205	125	144					415
51991206	160	179					540
51991207	50	74	27	32	M16X2	32	280
51991208	65	89				40	350
51991209	80	104					430
51991210	100	124					560
51991211	125	149					715
51991212	160	184					935

BJ300 SUPPORT CYLINDERS

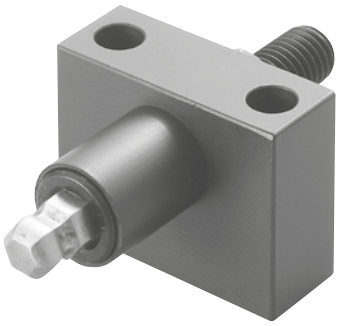


Material:S45C steel
Heat treated
Black oxide finish
Precision ground
Hardness:RC39 - 45

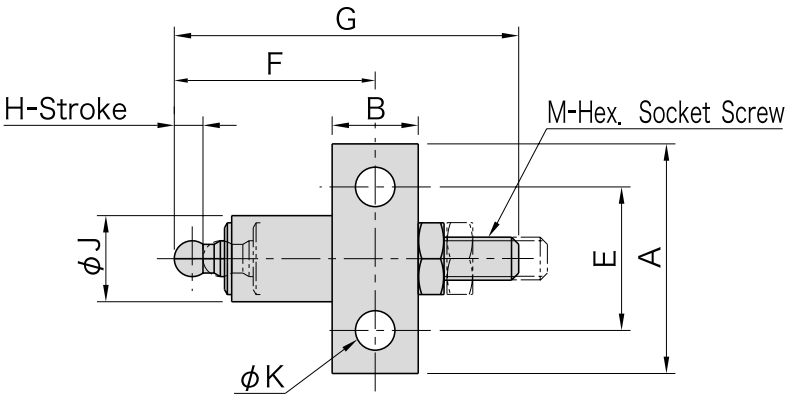


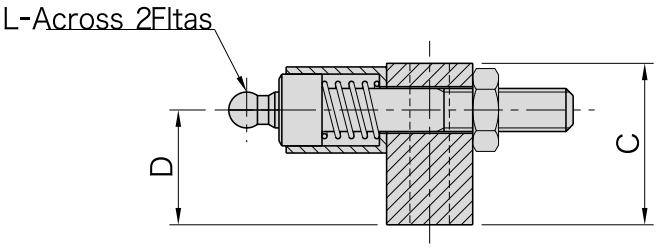
Part Number	A (±0.01)	B	C	D	Weight (g)
51991723	16	25	M 8	7	47
51991724	20				58
51991725	25				71
51991726	32				89
51991727	40				110
51991728	50				136
51991729	20	32	M10	9	97
51991730	25				120
51991731	32				151
51991732	40				186
51991733	50				229
51991734	63				287
51991735	20	40	M12	7	160
51991736	25			12	200
51991737	32				260
51991738	40				330
51991739	50				420
51991740	63				530
51991741	80			22	660
51991742	100				840
51991744	25	50	M16	8	350
51991745	32			15	390
51991746	40				500
51991747	50				630
51991748	63				810
51991749	80			35	1,000
51991750	100				1,260
51991751	125				1,600

BJ650 REMOTE-CONTROL UNITS



Material: S45C steel
Finish : Black oxide





Short

Part Number	A	B	C	D	E	F	G	H	J	K
51991752	32	12	22	16	20	30	48	4	12	5.5
51991753	32	12	27	19.2	20	34	57	4	15	5.5
51991754	44	16	32	22.2	30	45	76	5	18	9
51991755	44	16	36	25.2	30	50	86	5	20	9

Part Number	L	M	Work Supports BJ 350	Weight (g)	Recommended Distance between Work Supprt and Remote-Control Unit A
51991752	5	M 6x1 -35L	**51991152**	75	66
51991753	6	M 8x1.25-40L	**51991153**	100	81
51991754	8	M10x1.5 -55L	**51991154**	210	103
51991755	10	M12x1.75-60L	**51991155**	250	121

Tall

Part Number	A	B	C	D	E	F	G	H	J	K
51991756	32	12	26	20	20	30	48	4	12	5.5
51991757	32	12	33	25.2	20	34	57	4	15	5.5
51991759	44	16	49	38.2	30	50	86	5	20	9
51991760	44	16	54	43.7	30	50	86	5	20	9

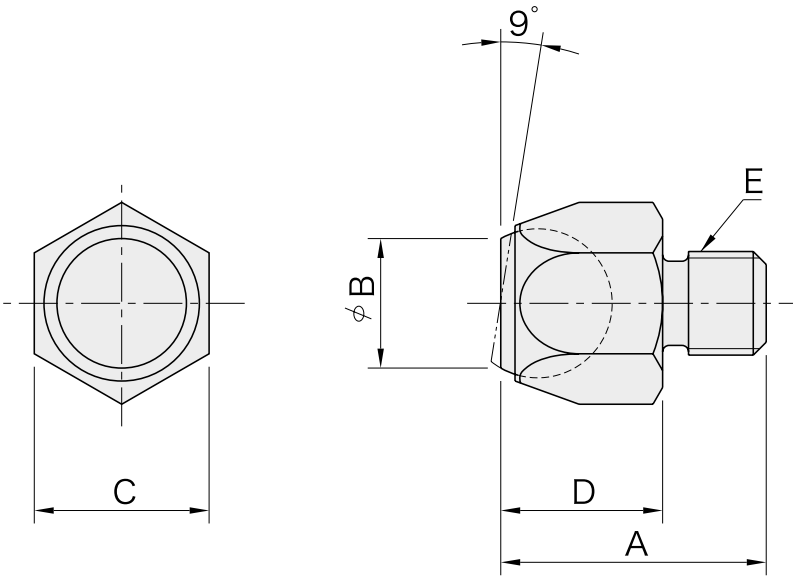
Part Number	L	M	Work Supports BJ 351	Weight (g)	A:Recommended Distance between Work Supprt and Remote-Control Unit
51991756	5	M 6x1 -35L	**51991156**	85	52
51991757	6	M 8x1.25-40L	**51991157**	115	62
51991759	10	M12x1.75-60L	**51991159**	310	92
51991760	10	M12x1.75-60L	**51991160**	335	95

BJ730 SWIVEL CONTACT BOLTS



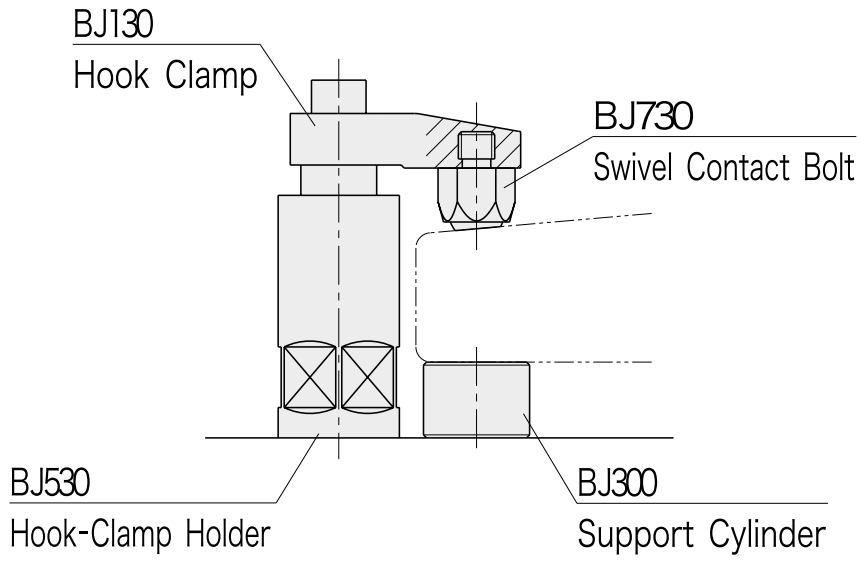
[Body]
Material:S45C steel
Heat treated (M6&M8 sizes)
Black oxide finish

[Ball]
Material:SUJ2
Heat treated



Part Number	A	B	C	D	E	Load Capacity (N)	Weight (g)
51991770	16	7.4	10	9	M 6x1	13,700	12
51991771	21	10.5	13	12	M 8x1.25	25,600	15
51991772	27	12.7	17	16	M10x1.5	40,000	45
51991773	32	15	22	20	M12x1.75	59,400	50
51991774	41	20	27	25	M16x2	96,400	115

Application Example

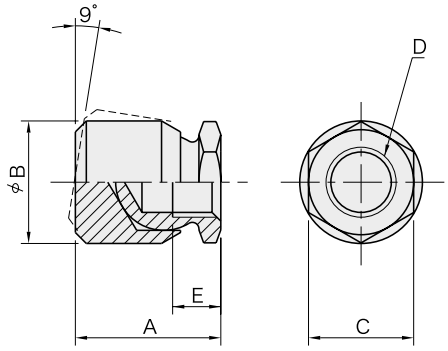


·Use to clamp from above and/or below a workpiece.
·Ball swivel is not limited.

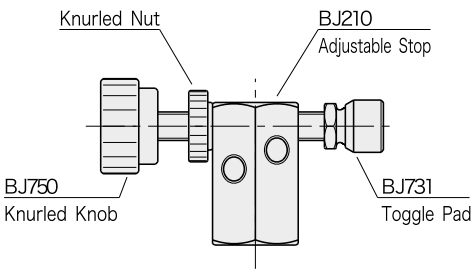
BJ731 TOGGLE PADS



Material:S45C steel
Heat treated (contact surface)
Black oxide finish



Application Example



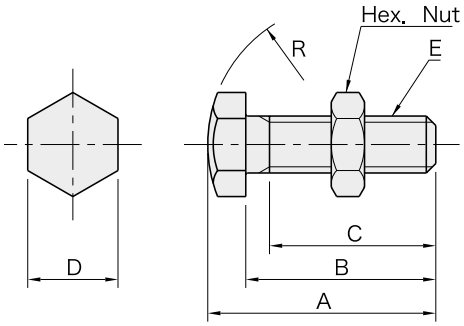
Use to distribute clamping pressure to irregular workpiece surfaces.

Part Number	A	B	C	D	E	Load Capacity (N)		Weight (g)
						Static	Repeated	
51991775	17	15	13	M 8x1.25	6	8,000	5,300	18
51991776	25	22	19	M12x1.75	8	15,900	10,600	60
51991777	33	28	24	M16x2	10	26,700	17,800	130

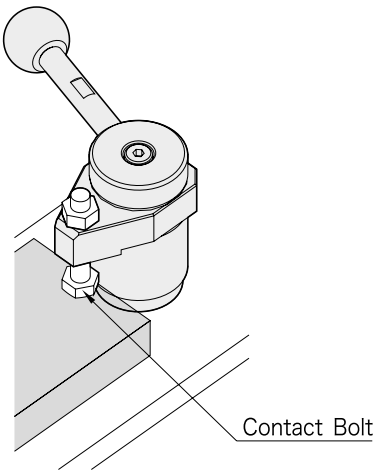
BJ732 CONTACT BOLTS



Material:SCM435 steel
Heat treated
Black oxide finish
Heat treated on edge



Application Example

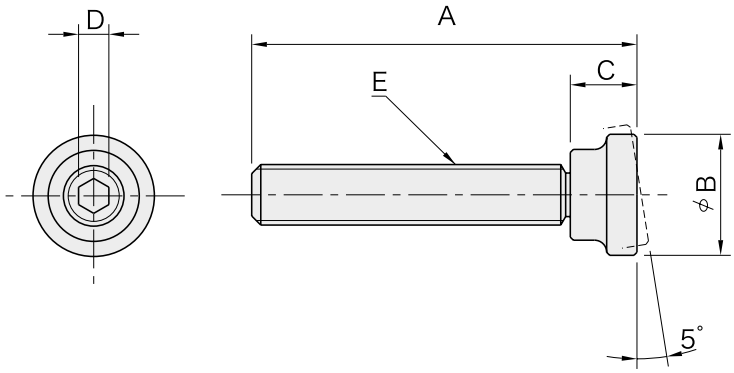


Part Number	A	B	C	D	E	R	Weight (g)
51991235	30	25	22	10	M 6x1	R15	7
51991236	40	35	32				9
51991237	50	45	42				11
51991238	36	30	27	13	M 8x1.25	R17.5	16
51991239	46	40	37				19
51991240	56	50	47				22
51991241	48	40	37	17	M10x1.5	R20	33
51991242	58	50	47				38
51991243	68	60	57				42
51991244	50	40	35	19	M12x1.75	R30	60
51991245	70	60	55				65
51991246	80	70	65				70
51991247	55	45	40	24	M16x2	R35	110
51991248	75	65	60				125
51991249	85	75	70				135

BJ746 SOCKET TOGGLE SCREWS



Material:S45C steel
Heat treated
Black oxide finish

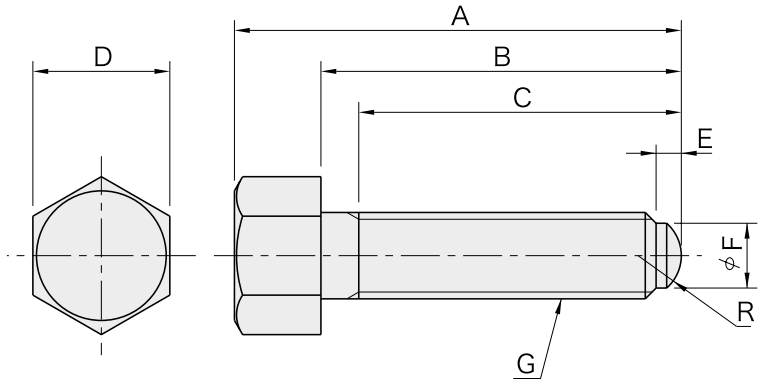


Part Number	A	B	C	D	E	Weight (g)
51991780	43	16	9	4	M 8x1.25	28
51991781	63					37
51991782	83					46
51991783	64	20	11	5	M10x1.5	50
51991784	84					60
51991785	104					70
51991786	65	25	13	6	M12x1.75	75
51991787	85					95
51991788	105					110
51991789	130					130
51991790	85	32	15	8	M16x2	170
51991791	105					190
51991792	130					230
51991793	155					265

BJ748 CLAMP SCREWS



Material:SCM435 steel
Heat treated
Black oxide finish
Hardness:RC33 - 39

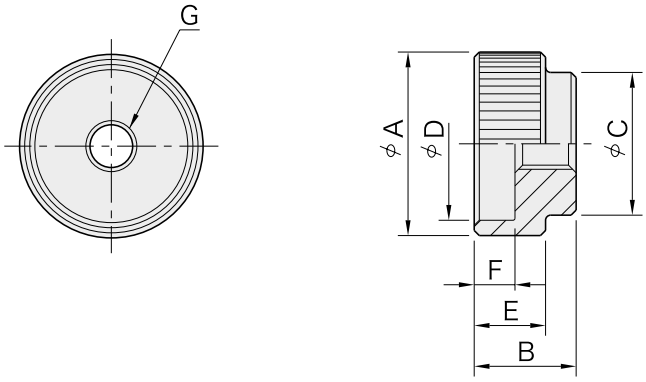


Part Number	A	B	C	D	E	F	G	R	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991800	50	40	37	13	3	5.5	M 8x1.25	R 6	53,000	84	21
51991801	60	50	47								24
51991802	70	60	57								26
51991803	52	40	37	17	3.5	7.5	M10x1.5	R 8	89,000	178	38
51991804	62	50	47								42
51991805	72	60	57								46
51991806	75	60	55	19	5	9	M12x1.75	R 9	100,000	240	70
51991807	95	80	75								80
51991808	115	100	95								95
51991809	140	125	120								115
51991810	100	80	75	24	6	12	M16x2	R12	130,000	417	165
51991811	120	100	95								185
51991812	145	125	120								215

BJ750 KNURLED KNOBS

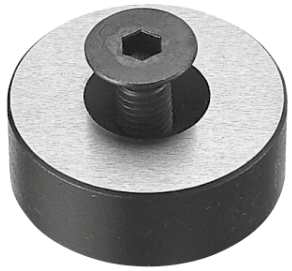


Material:S45C steel
Finish :Black oxide

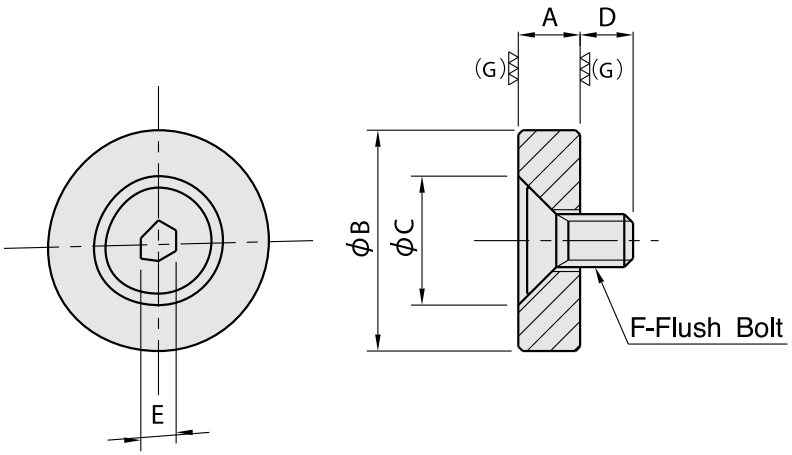


Part Number	A	B	C	D	E	F	G	Weight (g)
51991819	30	17	20	24	12	7	M 8x1.25	50
51991820	36	20	28	30	14	8	M10x1.5	90
51991821	40	24	32	34	16	10	M12x1.75	125

BJ763 FLAT FEET

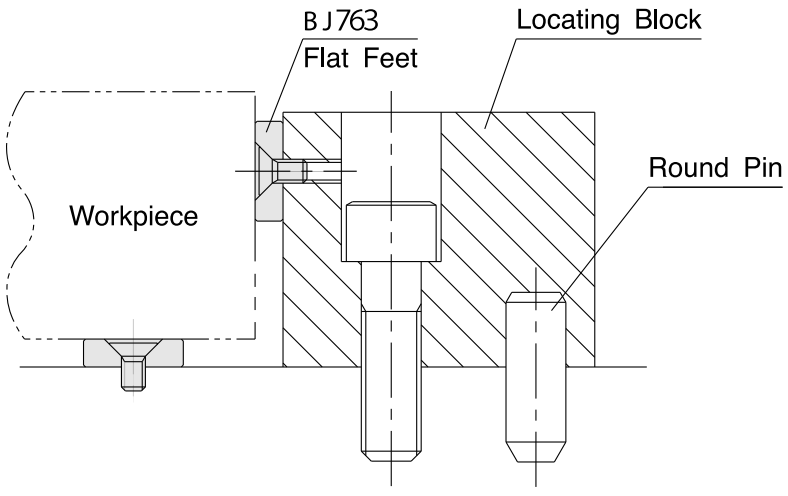


- Material：S45C steel
- Heat treated
- Black oxide finish
- Precision ground
- Hardness：RC39 to 45



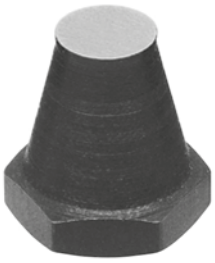
Code	A ($^{+0.01}_{0}$)	ϕB	ϕC	D	E	F	Weight (g)
51 99 18 67	5	25	14	7.7	4	M6× 1	20
51 99 18 68		30					30
51 99 18 69		35					40
51 99 18 70	10	25		10.7			40
51 99 18 71		30					60
51 99 18 72		35					80
51 99 18 73	10	30	19.4	11.3	5	M8× 1.25	60
51 99 18 74		35					80
51 99 18 75		40					100
51 99 18 76	15	30					90
51 99 18 77		35					115
51 99 18 78		40					150

Application Example

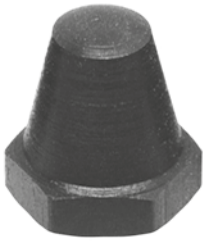


Precision locator that keeps workpieces machined surfaces out of damage.
The accuracy of a locating block with Flat Feet installed can easily be compensated by regrinding the feet.

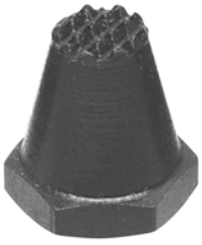
BJ810 REST PADS



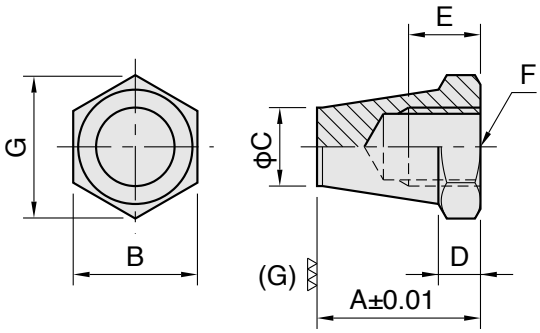
(Ground)



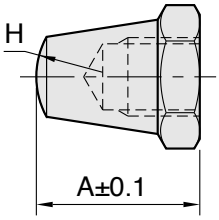
(Round)



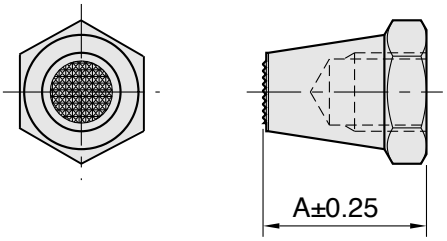
(Serrated)



(Ground)



(Round)



(Serrated)

Material&finish

Steel (S15C)
Carburized-hardened
Black oxide finish

Ground code	Round code	Serrated code	A	B	C	D	E	F	G	H	Weight (g)
51 99 18 79	51 99 18 80	51 99 18 81	12.5	11	6	3	4	M 6x1	12.7	5	5
51 99 18 82	51 99 18 83	51 99 18 84	25				7				8
51 99 18 85	51 99 18 86	51 99 18 87	15	13	8	4	6	M 8x1.25	15	8.5	9
51 99 18 88	51 99 18 89	51 99 18 90	30				9				18
51 99 18 91	51 99 18 92	51 99 18 93	20	17	10	5	9	M10x1.5	19.6	9	17
51 99 18 94	51 99 18 95	51 99 18 96	40				13				35
51 99 18 97	51 99 18 98	51 99 18 99	25	19	12	6	11	M12x1.75	21.9	12.8	25
51 99 19 00	51 99 19 01	51 99 19 02	50				16				62

BJ811 SCREW REST BUTTONS



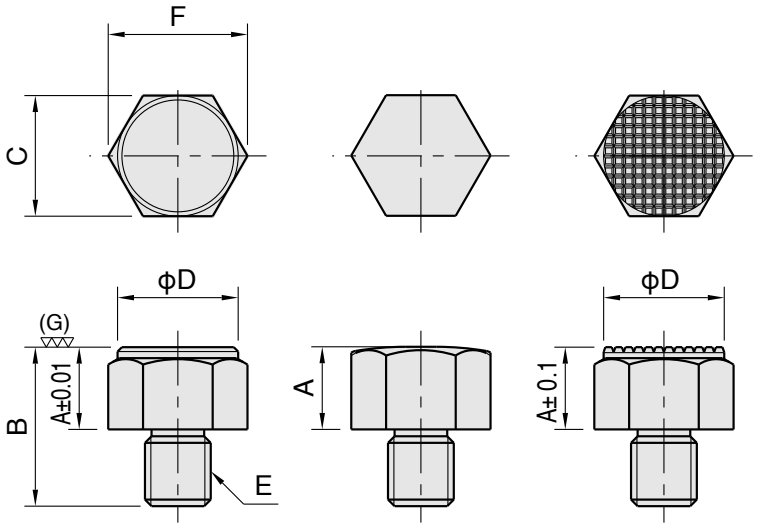
(Ground)



(Round)



(Serrated)



(Ground) (Round) (Serrated)

Material&finish

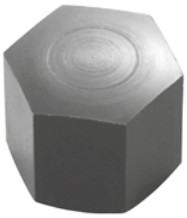
Steel (SUM22L)
Carburized - hardened
Black oxide finish

Ground code	Round code	Serrated code	A	B	C	D	E	F	Weight (g)
51 99 19 03	**51 99 19 04**	**51 99 19 05**	10	20	17	17	M 8x1.25	19.4	24
51 99 19 06	**51 99 19 07**	**51 99 19 08**		24	22	22	M12x1.75	25.2	40
51 99 19 09	**51 99 19 10**	**51 99 19 11**	15	29					56

BJ812 REST BUTTONS



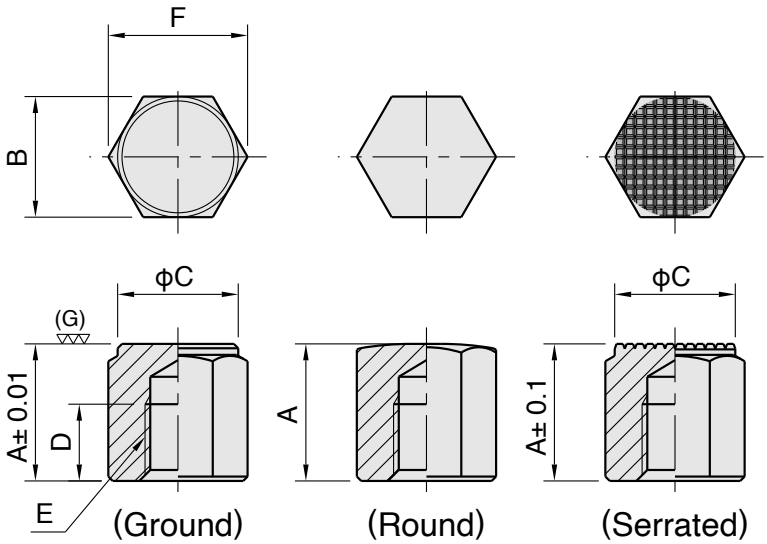
(Ground)



(Round)



(Serrated)



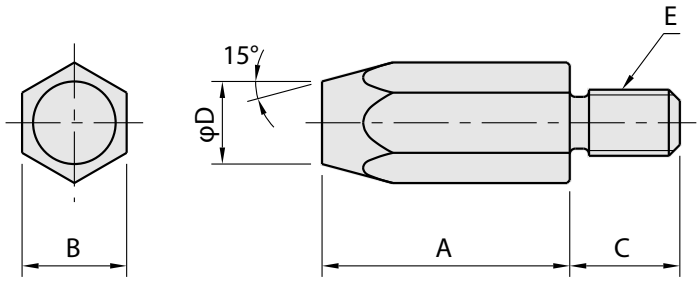
Material&finish

Steel(SUM22L)
Carburized-hardened
Black oxide finish

Ground code	Round code	Serrated code	A	B	C	D	E	F	Weight (g)
51 99 19 12	51 99 19 13	51 99 19 14	15	17	17	6	M 8x1.25	19.4	23
51 99 19 15	51 99 19 16	51 99 19 17	25			16			40
51 99 19 18	51 99 19 19	51 99 19 20	20	22	22	10	M12x1.75	25.2	52
51 99 19 21	51 99 19 22	51 99 19 23	25			15			65
51 99 19 24	51 99 19 25	51 99 19 26	30			20			77
51 99 19 27	51 99 19 28	51 99 19 29	40			25			105
51 99 19 30	51 99 19 31	51 99 19 32	50						135

BJ760 SCREW REST PADS





Material&finish

Steel (S45C)
Quenched and tempered
Black oxide finish
Heat treated to Rc33-39

Part Number	A	B	C	D	E	weight (g)
51 99 19 42	10	10	11	8	M 6x1	6
51 99 19 43	20			6		13
51 99 19 44	15	13	13	10	M 8x1.25	18
51 99 19 45	30			9		33
51 99 19 46	20	17	16	13	M10x1.5	44
51 99 19 47	40					80
51 99 19 48	25	19	20	15	M12x1.75	70
51 99 19 49	50					120

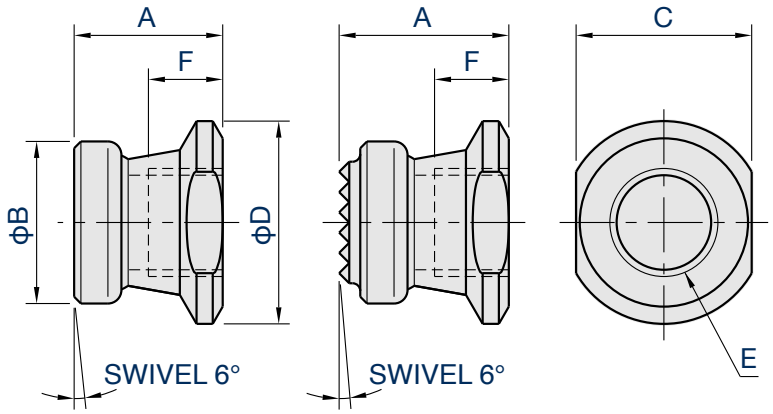
BJ735 TOGGLE PADS



(Plain)



(Serrated)



(Plain) (Serrated)

Type	Body	Pad	Insert Tip
Plain	Steel (SCM440) Black oxide finish	Steel (SCM440) Quenched and tempered Black oxide finish Heat treated to Rc36-40	-
Serrated			Carbide Black oxide finish

code	A	B	C	D	E	F	Load Capacity (N)	Weight (g)
51 99 19 50	15.5	14	12	14.3	M 6×1	5.5	5,000	9
51 99 19 51	13							
51 99 19 52	19.5	16	14	16	M 8×1.25	7	10,000	13
51 99 19 53	17							
51 99 19 54	21.5	18	16	19.1	M10×1.5	8	13,000	21
51 99 19 55	18							
51 99 19 56	25.5	21	22	25.4	M12×1.75	9.5	24,000	34
51 99 19 57	22							
51 99 19 58	28	24	22	25.4	M16×2	11	38,000	50
51 99 19 59	25							
51 99 19 60	33	28	30	31.5	M20×2.5	13.5	57,000	82
51 99 19 61	29							

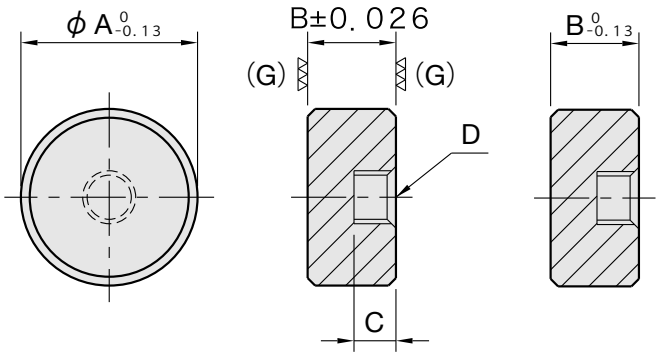
SRP / DRP REST PADS



(Steel)



(Plastic)

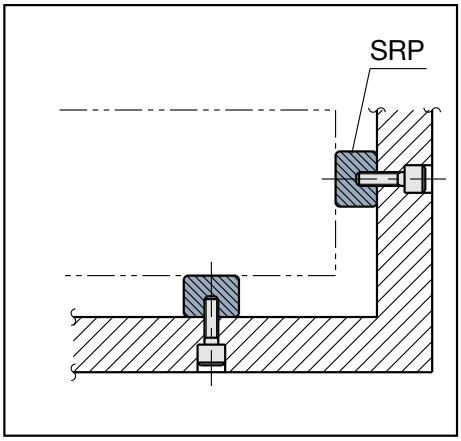


(Steel) (Plastic)

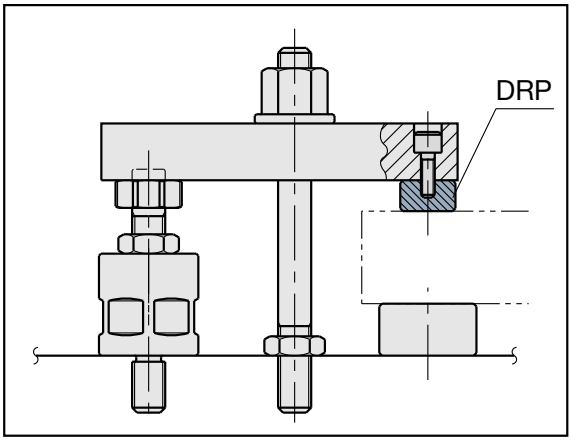
Type	Material & Finish
Steel	Steel (SNCM220) Carburized-hardened Black oxide finish Heat treated to Rc60
Plastic	Polyacetal plastic White

Steel		Plastic		A	B	C	D
Part Number	Weight (g)	Part Number	Weight (g)				
51 99 19 62	5	**51 99 19 68**	1	10	10	5	M5×0.8
51 99 19 63	8	**51 99 19 69**	2	12	10	5	M5×0.8
51 99 19 64	10	**51 99 19 70**	2	12	12	6.4	M5×0.8
51 99 19 65	15	**51 99 19 71**	3	16	10	5	M6×1
51 99 19 66	23	**51 99 19 72**	4	20	10	5	M6×1
51 99 19 67	37	**51 99 19 73**	7	25	10	5	M6×1

Application Examples

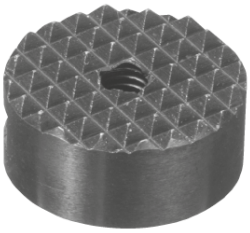


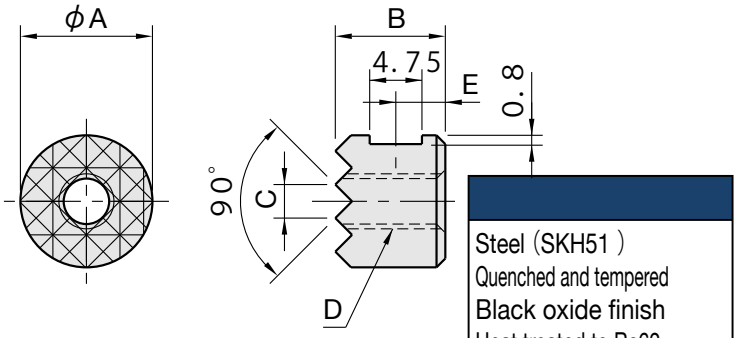
• Workpiece positioning



• Protecting a soft or precision ground workpiece.

HS ROUND GRIPPERS, Tapped

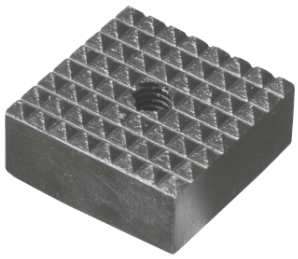


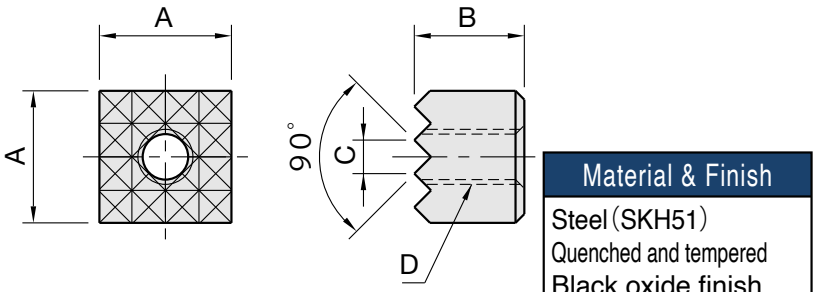


Steel (SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

Part Number	A $(^{0}_{-0.13})$	B $(^{0}_{-0.13})$	C	D	E	Weight (g)
51 99 19 74	10	10	2.3	M5×0.8	4.5	5
51 99 19 75		12			6	6
51 99 19 76	12	10	3	M5×0.8	4.5	8
51 99 19 77		12			6	9
51 99 19 78	16	10	3	M6×1	4.5	14
51 99 19 79		12			6	15
51 99 19 80	20	10	3	M6×1	4.5	23
51 99 19 81		12			6	25
51 99 19 82	25	10	3	M6×1	4.5	37
51 99 19 83		12			6	40

HS SQUARE GRIPPERS, Tapped



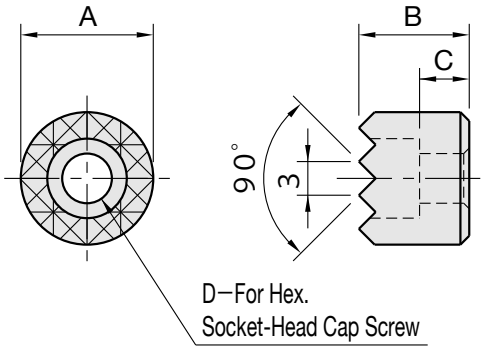


Material & Finish
Steel (SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

Part Number	A $(^{0}_{-0.13})$	B $(^{0}_{-0.13})$	C	D	Weight (g)
51 99 19 84	10	10	2.3	M5×0.8	7
51 99 19 85		12			7.5
51 99 19 86	12	10	3	M5×0.8	10
51 99 19 87		12			11
51 99 19 88	16	10	3	M6×1	17
51 99 19 89	20	10	3	M5×0.8	30
51 99 19 90		12			33.5
51 99 19 91	25	10	3	M6×1	47
51 99 19 92		12			53

HS-C ROUND GRIPPERS, C'Bored

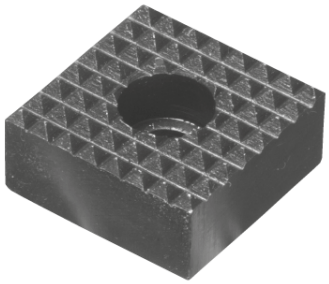


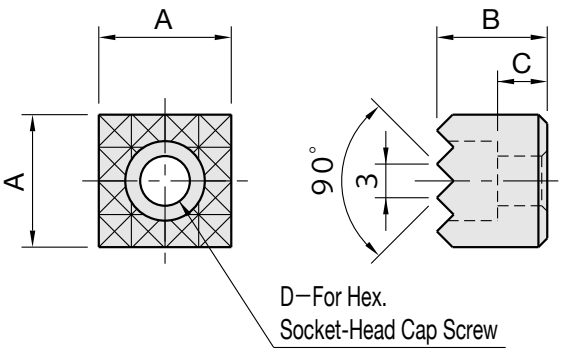


Steel (SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

Part Number	A ($^{0}_{-0.13}$)	B ($^{0}_{-0.13}$)	C	D	Weight (g)
51 99 19 93	12	10	4.5	M4	6
51 99 19 94		12	6.5		8
51 99 19 95	16	10	4.5	M4	12
51 99 19 96		12	6.5		15
51 99 19 97	20	10	3.5	M5	19
51 99 19 98		12	5.5		23
51 99 19 99	25	10	2.5	M6	30
51 99 20 00		12	4.5		38

HS-C SQUARE GRIPPERS, C'Bored



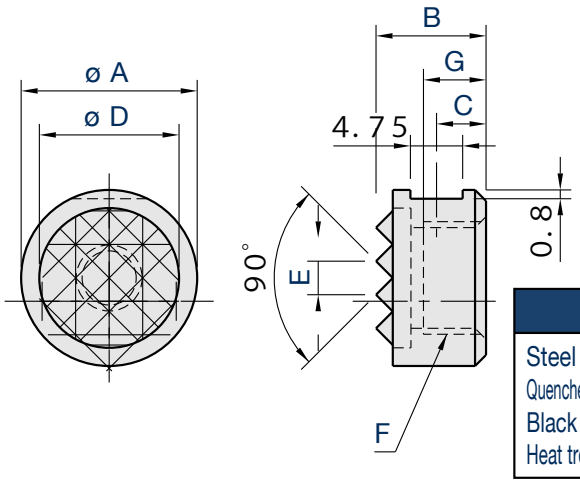


Steel (SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

Part Number	A ($^{0}_{-0.13}$)	B ($^{0}_{-0.13}$)	C	D	Weight (g)
51 99 20 01	12	10	4.5	M4	8
51 99 20 02		12	6.5		10
51 99 20 03	16	10	4.5	M4	16
51 99 20 04	20	10	3.5	M5	25
51 99 20 05		12	5.5		31
51 99 20 06	25	10	2.5	M6	40
51 99 20 07		12	4.5		49

CT ROUND GRIPPERS

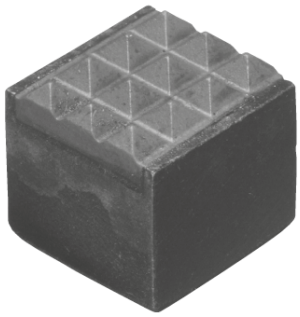


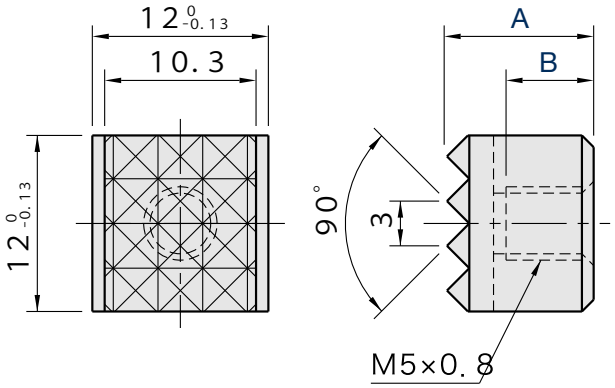


Body	Tip
Steel (SCM440) Quenched and tempered Black oxide finish Heat treated to Rc32	Carbide Black oxide finish

code	A ($^{0}_{-0.13}$)	B ($^{0}_{-0.13}$)	C	D	E	F	G (Effective Thread Length)	Weight (g)
51 99 20 08	10	10	4.5	7.9	2.3	M5×0.8	6.5	5
51 99 20 09		12	6				8.5	6
51 99 20 10	12	10	4.5	9.5	3	M5×0.8	6.5	8
51 99 20 11		12	6				8.5	9
51 99 20 12	16	10	4.5	12.7	3	M6×1	6.5	14
51 99 20 13		12	6				8.5	17
51 99 20 14	20	10	4.5	15.9	3	M6×1	6.5	23
51 99 20 15		12	6				8.5	28
51 99 20 16	25	10	4.5	19.1	3	M6×1	6.5	35
51 99 20 17		12	6				8.5	43

CT SQUARE GRIPPERS



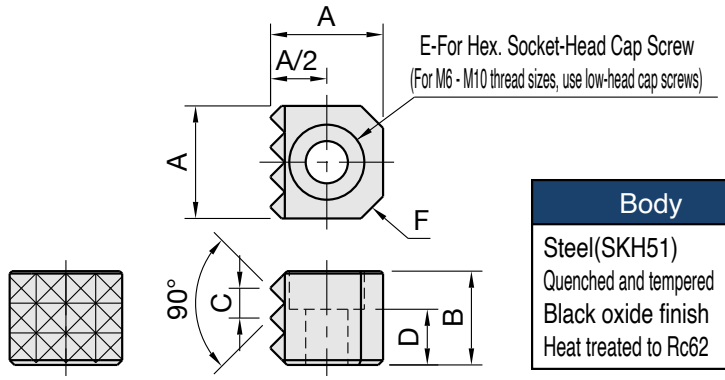


code	A ($^{0}_{-0.13}$)	B (Effective Thread Length)	Weight (g)
51 99 20 18	10	6.5	10
51 99 20 19	12	8.5	13

Body	Tip
Steel (SCM440) Quenched and tempered Black oxide finish Heat treated to Rc32	Carbide Black oxide finish

HSE EDGE GRIPPERS, Diamond Serration

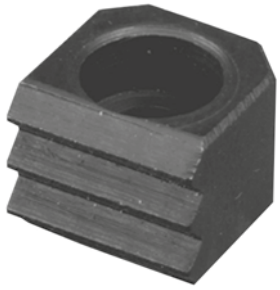


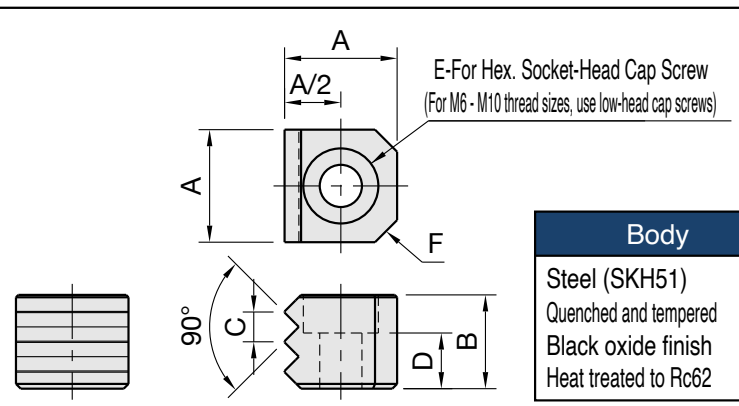


Body
Steel(SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

code	A (0 -0.13)	B (0 -0.13)	C	D	E	F	Weight (g)
51 99 20 20	10	6	2.3	2.8	M 3	1.6	4
51 99 20 21		10		6.8			6
51 99 20 22	12	6	3	1.9	M 4	2.3	4
51 99 20 23		10		5.9			8
51 99 20 24		12		7.9			10
51 99 20 25	16	6	3	1.8	M 6	3.2	8
51 99 20 26		10		5.8			14
51 99 20 27		12		7.8			17
51 99 20 28	20	6	3	0.9	M 8	3.2	10
51 99 20 29		10		4.9			20
51 99 20 30		12		6.9			25
51 99 20 31	25	10	3	3.4	M10	3.2	31
51 99 20 32		12		5.4			39

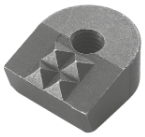
HSE-SS EDGE GRIPPERS, Straight Serration



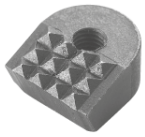


Body
Steel (SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

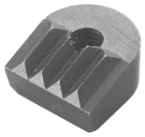
code	A (0 -0.13)	B (0 -0.13)	C	D	E	F	Weight (g)
51 99 20 33	10	6	2.3	2.8	M 3	1.6	4
51 99 20 34		10		6.8			6
51 99 20 35	12	6	3	1.9	M 4	2.3	5
51 99 20 36		10		5.9			8
51 99 20 37		12		7.9			10
51 99 20 38	16	6	3	1.8	M 6	3.2	8
51 99 20 39		10		5.8			14
51 99 20 40		12		7.8			18
51 99 20 41	20	6	3	0.9	M 8	3.2	10
51 99 20 42		10		4.9			20
51 99 20 43		12		6.9			25
51 99 20 44	25	10	3	3.4	M10	3.2	31
51 99 20 45		12		5.4			40



51 99 20 46



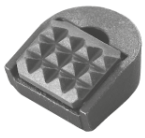
51 99 20 47



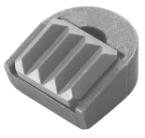
51 99 20 48



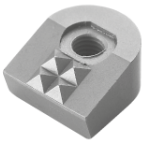
51 99 20 49



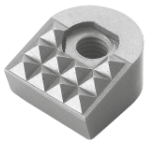
51 99 20 50



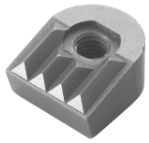
51 99 20 51



51 99 20 52

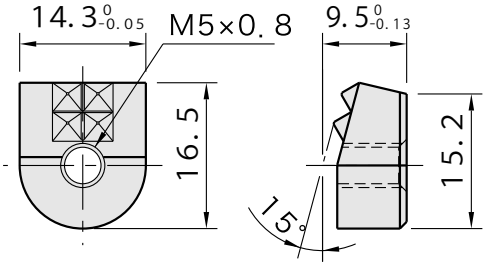


51 99 20 53

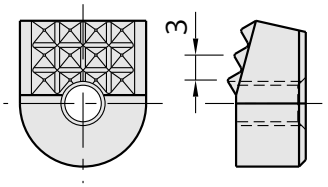


51 99 20 54

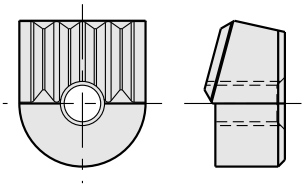
51 99 20 46 51 99 20 47 51 99 20 48	Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc62	
51 99 20 49 51 99 20 50 51 99 20 51	Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc62	Carbide Black oxide finish
51 99 20 52 51 99 20 53 51 99 20 54	Carbide Black oxide finish	



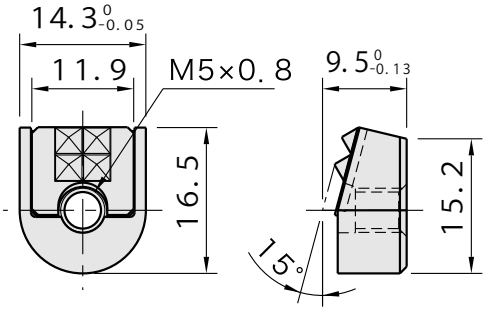
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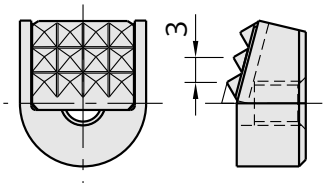
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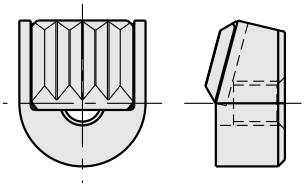
51 99 20 48



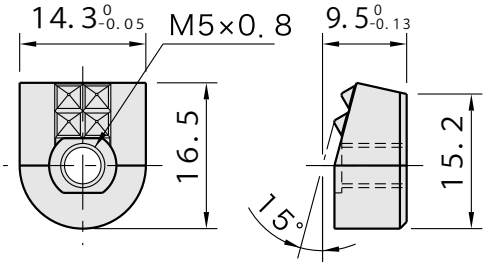
51 99 20 49



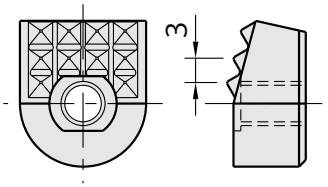
51 99 20 50



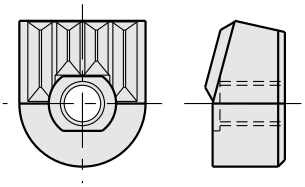
51 99 20 51



51 99 20 52



51 99 20 53



51 99 20 54

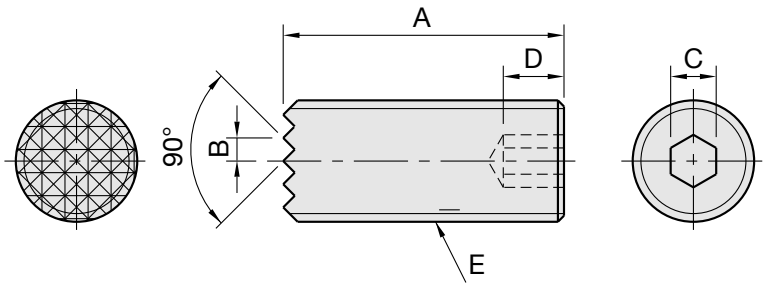
Part Number	Weight (g)
51 99 20 46	11
51 99 20 47	12
51 99 20 48	

Part Number	Weight (g)
51 99 20 49	12
51 99 20 50	13
51 99 20 51	

Part Number	Weight (g)
51 99 20 52	20
51 99 20 53	
51 99 20 54	

HS SOCKET SCREW GRIPPERS



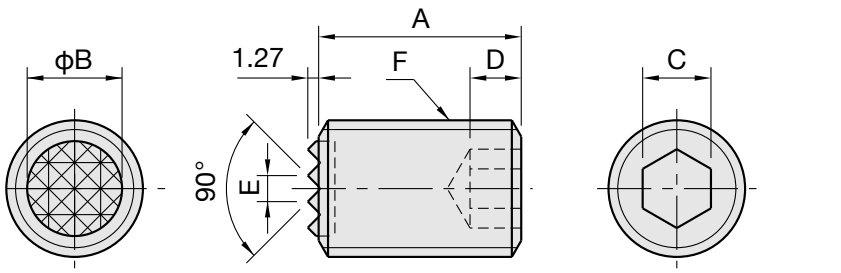


code	A	B	C	D	E	Weight (g)
51 99 20 55	25	2.3	3	4	M10×1.5	13
51 99 20 56	40					21
51 99 20 57	25	3	5	6	M12×1.75	16
51 99 20 58	40					29
51 99 20 59	25	3	6	8	M16×2	34
51 99 20 60	40					53
51 99 20 61	25	3	8	10	M20×2.5	54
51 99 20 62	40					82

Material & Finish
Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc58

PG TIPPED SOCKET SCREW GRIPPERS



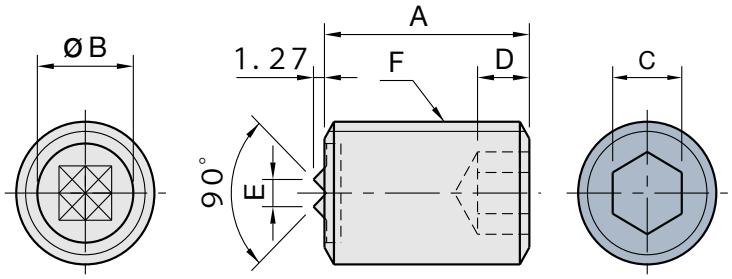


Body	Tip
Steel (SCM440) Quenched and tempered Black oxide finish	Carbide Black oxide finish

code	A	B	C	D	E	F	Weight (g)
51 99 20 63	25	6.4	5	4	2.3	M10×1.5	15
51 99 20 64	50						30
51 99 20 65	25	7.9	6	5	2.3	M12×1.75	21
51 99 20 66	50						43
51 99 20 67	25	11.1	8	6	3	M16×2	37
51 99 20 68	50						77
51 99 20 69	25	12.7	10	8	3	M20×2.5	57
51 99 20 70	50						119

PG TIPPED SOCKET SCREW GRIPPERS



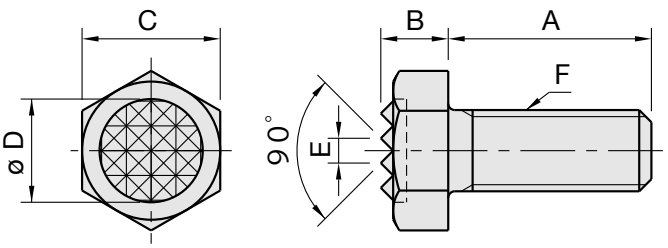


code	A	B	C	D	E	F	Weight (g)
51 99 20 71	25	7.9	6	5	3	M12×1.75	21
51 99 20 72	50						43
51 99 20 73	25	11.1	8	6	3	M16×2	37
51 99 20 74	50						77
51 99 20 75	25	12.7	10	8	3	M20×2.5	57
51 99 20 76	50						119

Steel (SCM440) Quenched and tempered Black oxide finish	Carbide Black oxide finish

CT HEX-HEAD SCREW GRIPPERS





code	A	B	C	D	E	F	Weight (g)
51 99 20 77	12	5	10	7.9	2.3	M 6×1	6
51 99 20 78	25						8
51 99 20 79	12	6.4	13	9.5	3	M 8×1.25	10
51 99 20 80	25						15
51 99 20 81	35						17
51 99 20 82	25	8.3	17	12.7	3	M10×1.25	20
51 99 20 83	12	8.3	17	12.7	3	M10×1.5	25
51 99 20 84	25						27
51 99 20 85	40						36
51 99 20 86	25	8.7	19	15.9	3	M12×1.75	42
51 99 20 87	40						55
51 99 20 88	35	11	24	19.1	3	M16×2	88
51 99 20 89	50						127
51 99 20 90	40	13.5	30	25.4	2.3	M20×2.5	133
51 99 20 91	60						231

Steel (SCM440) Quenched and tempered Black oxide finish Heat treated to Rc32	Carbide Black oxide finish

BUH HEX-HEAD SWIVEL GRIPPER SCREW



51 99 20 92 - 20 97
(Serrated, Steel Ball)



51 99 20 98 - 21 11
(Serrated, Steel Tip)



51 99 21 12 - 21 17
(Plain, Steel Ball)



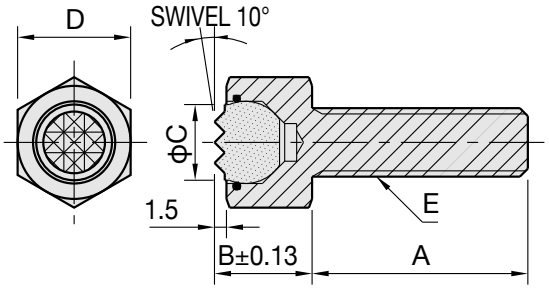
51 99 21 18 - 21 31
(Plain, Steel Tip)



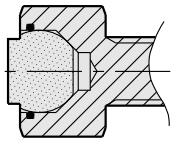
51 99 21 32 - 21 37
(Plain, Plastic Ball)



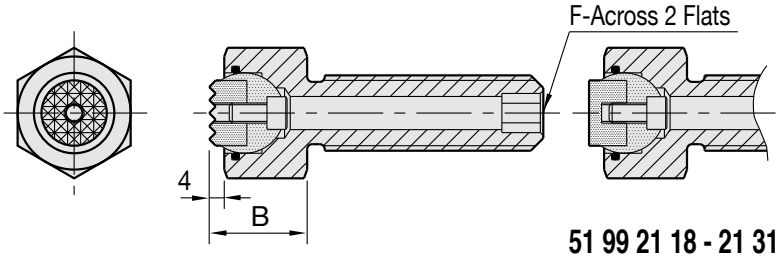
51 99 21 38 - 21 51
(Plain, Plastic Tip)



51 99 20 92 - 20 97
(Serrated, Steel Ball)



51 99 21 12 - 21 17
(Plain, Steel Ball)
51 99 21 32 - 21 37
(Plain, Plastic Ball)



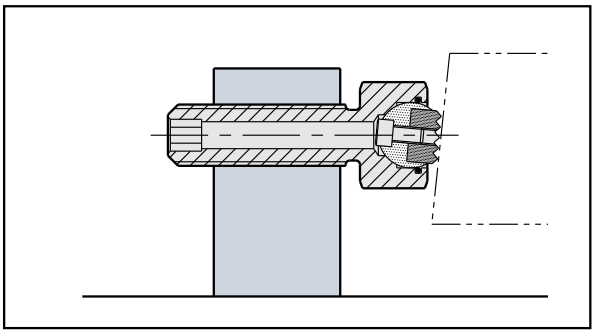
51 99 20 98 - 21 11
(Serrated, Steel Tip)

51 99 21 18 - 21 31
(Plain, Steel Tip)
51 99 21 38 - 21 51
(Plain, Plastic Tip)

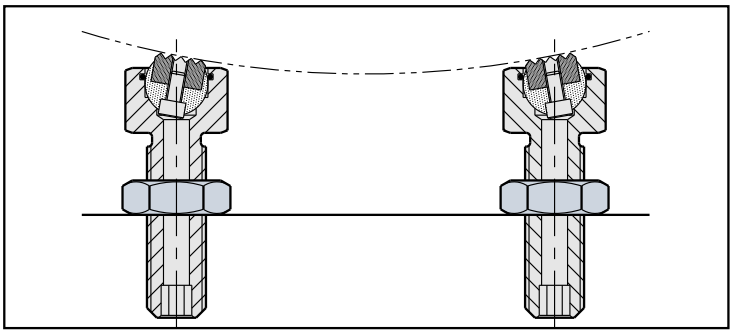
code	Body	Ball	Tip
51 99 20 92 - 20 97 **51 99 21 12 - 21 17**	Steel(SCM440) Quenched and tempered Black oxide finish	Steel(SKH51) Quenched and tempered Black oxide finish Heat treated to Rc60	
51 99 21 32 - 21 37		Polyacetal plastic White	
51 99 20 98 - 21 11		Stainless steel (SUS440)	Steel(SKH51) Quenched and tempered Black oxide finish Heat treated to Rc62
51 99 21 18 - 21 31			Steel (SNCM220) Carburized-hardened Black oxide finish Heat treated to Rc60
51 99 21 38 - 21 51			Polyacetal plastic White

Serrated (Steel)		Plain (Steel)		Plain (Plastic)		A	B	C	D	E	F	Load Capacity (N)
code	Weight (g)	code	Weight (g)	code	Weight (g)							
51 99 20 92	7	**51 99 21 12**	7	**51 99 21 32**	6	12	9.5	6	10	M 6x1	-	5,300
51 99 20 93	8	**51 99 21 13**	8	**51 99 21 33**	7	25						
51 99 20 94	10	**51 99 21 14**	10	**51 99 21 34**	9	40						
51 99 20 95	12	**51 99 21 15**	12	**51 99 21 35**	11	12	13	8.5	13	M 8x1.25	-	10,900
51 99 20 96	18	**51 99 21 16**	18	**51 99 21 36**	16	25						
51 99 20 97	22	**51 99 21 17**	22	**51 99 21 37**	21	40						
51 99 20 98	26	**51 99 21 18**	26	**51 99 21 38**	22	15	17	10	17	M10x1.5	3	18,400
51 99 20 99	33	**51 99 21 19**	33	**51 99 21 39**	29	30						
51 99 21 00	43	**51 99 21 20**	43	**51 99 21 40**	39	50						
51 99 21 01	55	**51 99 21 21**	55	**51 99 21 41**	49	20	19	12	19	M12x1.75	5	24,500
51 99 21 02	65	**51 99 21 22**	65	**51 99 21 42**	59	40						
51 99 21 03	75	**51 99 21 23**	75	**51 99 21 43**	69	60						
51 99 21 04	87	**51 99 21 24**	87	**51 99 21 44**	75	25	23	16	24	M16x2	6	43,600
51 99 21 05	117	**51 99 21 25**	117	**51 99 21 45**	105	50						
51 99 21 06	152	**51 99 21 26**	152	**51 99 21 46**	140	80						
51 99 21 07	153	**51 99 21 27**	154	**51 99 21 47**	134	30	24	20	30	M20x2.5	8	57,700
51 99 21 08	205	**51 99 21 28**	206	**51 99 21 48**	186	60						
51 99 21 09	276	**51 99 21 29**	277	**51 99 21 49**	257	100						
51 99 21 10	287	**51 99 21 30**	289	**51 99 21 50**	257	40	30	25	36	M24x3	10	85,600
51 99 21 11	432	**51 99 21 31**	434	**51 99 21 51**	402	100						

Application Example



• Ideal for workpiece positioning and positive holding.



• Can also be used as screw jacks.

How To Install Tip

• Push the ball out of the body and then secure the tip to the ball using the included hex. socket-head cap screw.

TBU SWIVEL GRIPPER SCREWS



51 99 21 52 - 21 57
(Serrated, Steel Ball)



51 99 21 58 - 21 62
(Serrated, Steel Tip)



51 99 21 63 - 21 68
(Plain, Steel Ball)



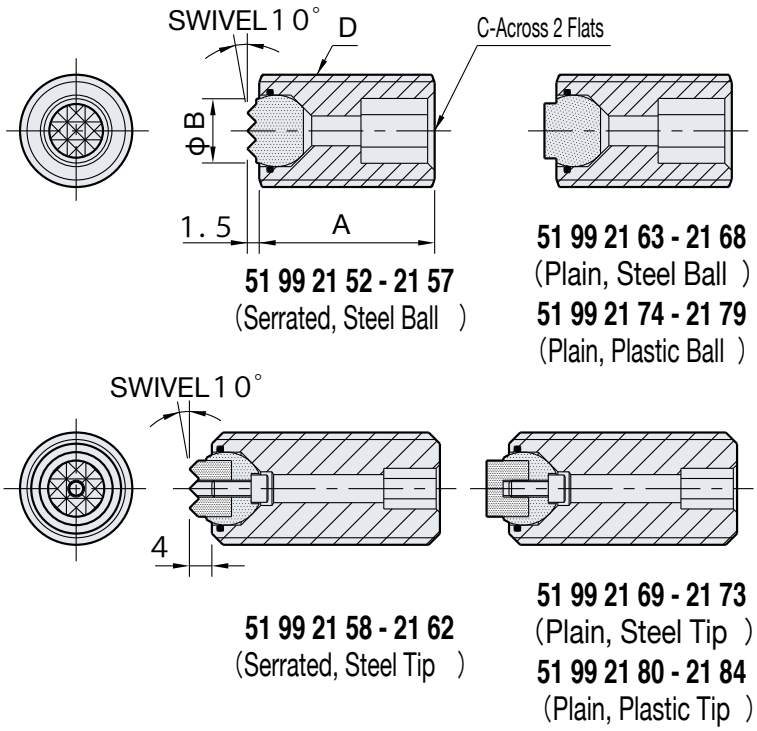
51 99 21 69 - 21 73
(Plain, Steel Tip)



51 99 21 74 - 21 79
(Plain, Plastic Ball)



51 99 21 80 - 21 84
(Plain, Plastic Tip)



51 99 21 52 - 21 57
(Serrated, Steel Ball)

51 99 21 63 - 21 68
(Plain, Steel Ball)
51 99 21 74 - 21 79
(Plain, Plastic Ball)

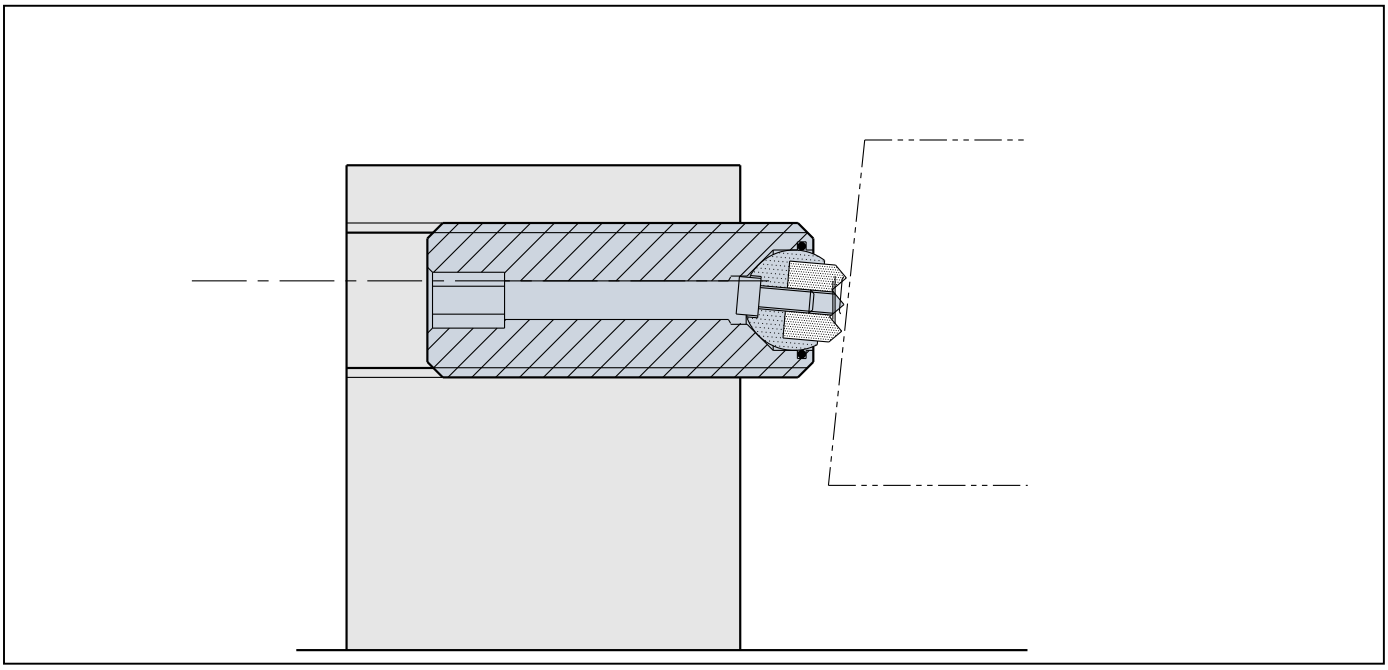
51 99 21 58 - 21 62
(Serrated, Steel Tip)

51 99 21 69 - 21 73
(Plain, Steel Tip)
51 99 21 80 - 21 84
(Plain, Plastic Tip)

code	Body	Ball	Tip
51 99 21 52 - 21 57 51 99 21 63 - 21 68	Steel (SCM440) Quenched and tempered Black oxide finish Heat treated to Rc45	Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc60	
51 99 21 74 - 21 79		Polyacetal plastic White	
51 99 21 58 - 21 62		Stainless steel (SUS440)	Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc62
51 99 21 69 - 21 73			Steel (SNCM220) Carburized-hardened Black oxide finish Heat treated to Rc60
51 99 21 80 - 21 84			Polyacetal plastic White

Serrated (Steel)		Plain (Steel)		Plain (Plastic)		A	B	C	D	Load Capacity (N)
code	Weight (g)	code	Weight (g)	code	Weight (g)					
51 99 21 52	13	51 99 21 63	13	51 99 21 74	12	25	6	6	M12×1.75	5,300
51 99 21 53	19	51 99 21 64	19	51 99 21 75	18	35				
51 99 21 54	28	51 99 21 65	28	51 99 21 76	27	50				
51 99 21 55	26	51 99 21 66	26	51 99 21 77	25	25	8.5	8	M16×2	10,900
51 99 21 56	39	51 99 21 67	39	51 99 21 78	38	35				
51 99 21 57	58	51 99 21 68	58	51 99 21 79	57	50				
51 99 21 58	57	51 99 21 69	57	51 99 21 80	53	30	10	10	M20×2.5	18,400
51 99 21 59	90	51 99 21 70	90	51 99 21 81	86	50				
51 99 21 60	123	51 99 21 71	123	51 99 21 82	119	70		8		
51 99 21 61	113	51 99 21 72	113	51 99 21 83	107	40	12	10	M24×3	24,500
51 99 21 62	210	51 99 21 73	210	51 99 21 84	204	80				

Application Example TBU

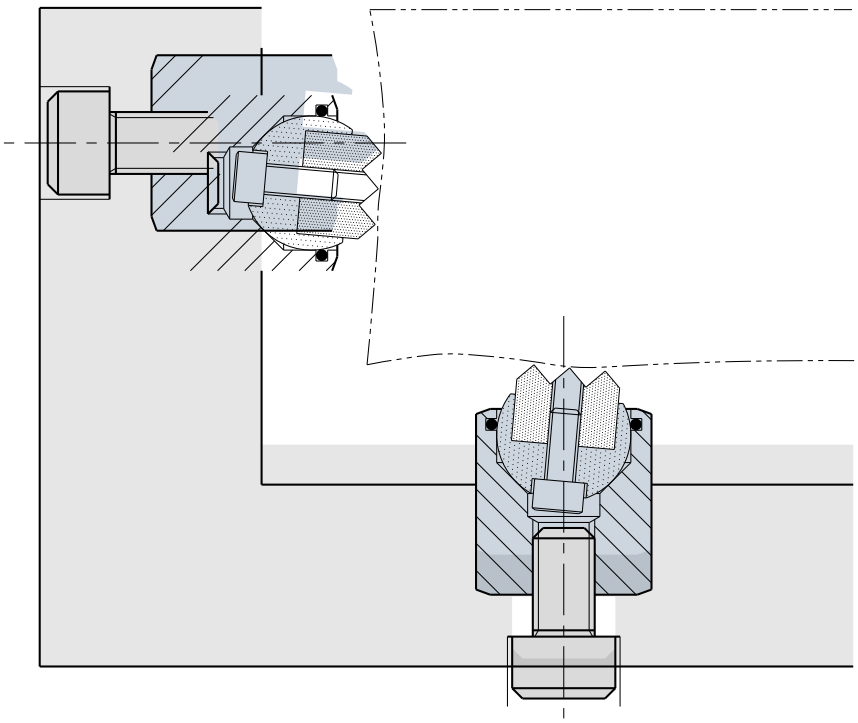


• Ideal for workpiece positioning and positive holding.

How To Install Tip

• Push the ball out of the body and then secure the tip to the ball using the included hex. socket-head cap screw.

Application Example BBU



• Grippers for better workpiece positioning methods.

How To Install Tip

• Push the ball out of the body and then secure the tip to the ball using the included hex. socket-head cap screw.

BBU SWIVEL PAD GRIPPERS



51 99 21 85 - 21 88
(Serrated, Steel Ball)



51 99 21 89 - 21 93
(Serrated, Steel Tip)



51 99 21 94 - 21 97
(Plain, Steel Ball)



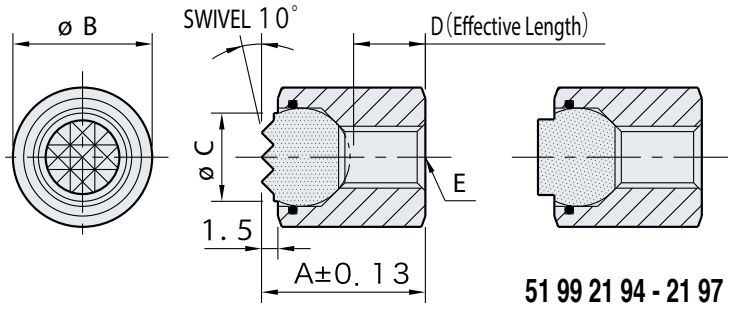
51 99 21 98 - 22 02
(Plain, Steel Tip)



51 99 22 03 - 22 06
(Plain, Plastic Ball)

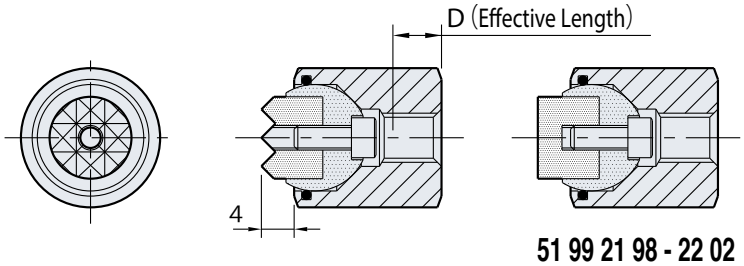


51 99 22 07 - 22 11
(Plain, Plastic Tip)



51 99 21 85 - 21 88
(Serrated, Steel Ball)

51 99 21 94 - 21 97
(Plain, Steel Ball)
51 99 22 03 - 22 06
(Plain, Plastic Ball)



51 99 21 89 - 21 93
(Serrated, Steel Tip)

51 99 21 98 - 22 02
(Plain, Steel Tip)
51 99 22 07 - 22 11
(Plain, Plastic Tip)

code			
51 99 21 85 - 21 88 **51 99 21 94 - 21 97**	Steel (SCM440) Quenched and tempered Black oxide finish	Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc60	
51 99 22 03 - 22 06		Polyacetal plastic White	
51 99 21 89 - 21 93		Stainless steel (SUS440)	Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc62
51 99 21 98 - 22 02			Steel (SNCM220) Carburized-hardened Black oxide finish Heat treated to Rc60
51 99 22 07 - 22 11			Polyacetal plastic White

Serrated (Steel)		Plain (Steel)		Plain (Plastic)		A	B	C	D	E	Load Capacity (N)
Part Number	Weight (g)	Part Number	Weight (g)	Part Number	Weight (g)						
51 99 21 85	6	**51 99 21 94**	6	**51 99 22 03**	5	12	10	6	3.5	M 4×0.7	5300
51 99 21 86	13	**51 99 21 95**	13	**51 99 22 04**	12	25			9		
51 99 21 87	12	**51 99 21 96**	12	**51 99 22 05**	11	16	13	8.5	6.5	M 5×0.8	10900
51 99 21 88	21	**51 99 21 97**	21	**51 99 22 06**	20	25			9		
51 99 21 89	31	**51 99 21 98**	31	**51 99 22 07**	27	22	17	10	7.5	M 6×1	18400
51 99 21 90	43	**51 99 21 99**	43	**51 99 22 08**	37	24	19	12	8.5	M 8×1.25	24500
51 99 21 91	72	**51 99 22 00**	73	**51 99 22 09**	61	28	24	16	9	M10×1.5	43600
51 99 21 92	128	**51 99 22 01**	129	**51 99 22 10**	109	30	30	20	8.5	M12×1.75	57700
51 99 21 93	235	**51 99 22 02**	237	**51 99 22 11**	205	36	36	25	12	M12×1.75	85600

NOTES