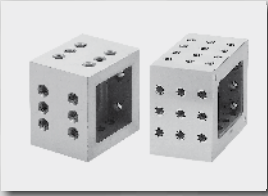




**FAST-CLAMPS**  
pag. 14. 4



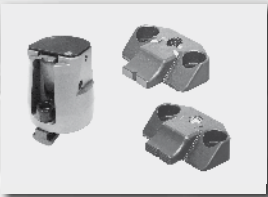
**Work locators**  
pag. 14. 36



**Risers + V blocks**  
pag. 14. 40



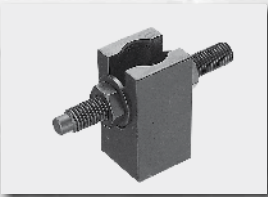
**Centering pin**  
pag. 14. 47



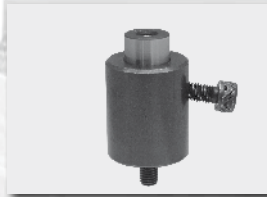
**Side Clamps**  
pag. 14. 48



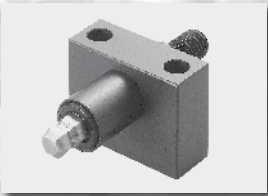
**Hook Clamps**  
pag. 14. 67



**Adjustable stops**  
pag. 14. 71



**Work supports**  
pag. 14. 75



**Remote control units**  
pag. 14. 82



**Contact bolts**  
pag. 14. 84

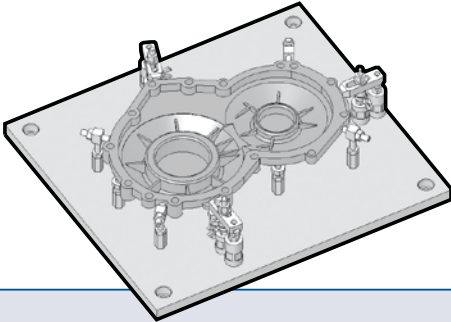


**Clamp screws**  
pag. 14. 86

# Fast Clamps

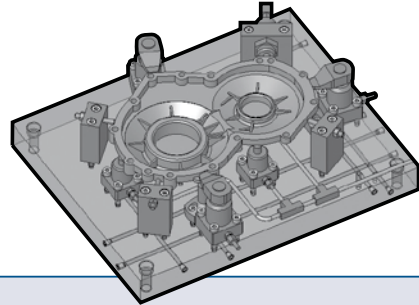
**Speedier In Setup  
Than Conventional  
Manual Clamping**

No tools needed



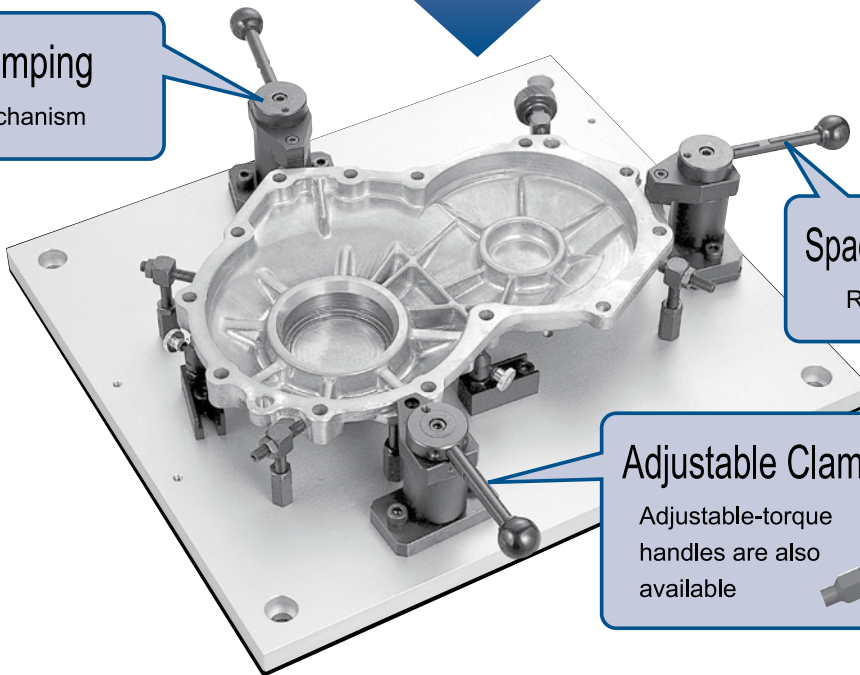
**More Economical  
Than Hydraulic  
Clamping**

Much lower fixture costs  
Maintenance free



**Positive Clamping**

Spiral cam mechanism

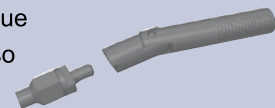


**Space-Saving Design**

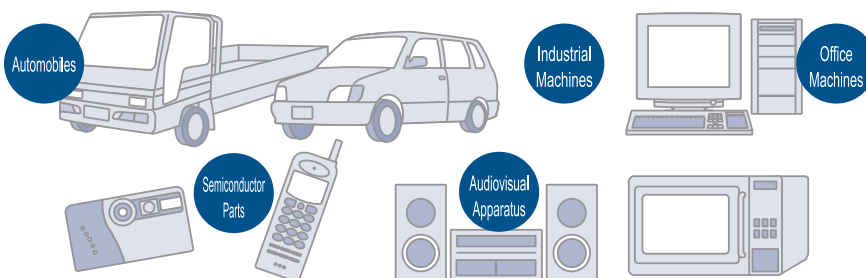
Removable handle

**Adjustable Clamping Force**

Adjustable-torque  
handles are also  
available

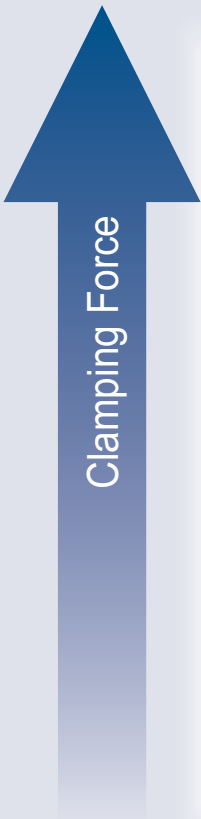


Fast Clamps serve for varied applications in machining  
and assembly jobs in different industries.



# Added Product Items Offer A Wider Range Of Applications

Stronger Clamping Force  
Clamping-Height Adjustment  
**Greater Performance**



**NEW**

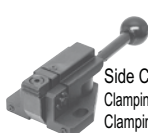
**Pull Clamps Heavy**

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



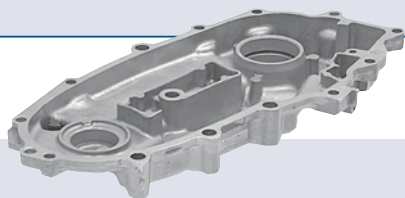
Push Clamps, Standard  
Clamping Range: up to 2.5mm  
Clamping Force: up to 4,000N



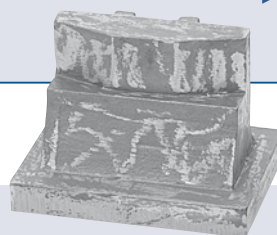
Pull Clamps, Standard  
Clamping Range: up to 2mm  
Clamping Force: up to 2,500N



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



**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.



With Handle

Without Handle

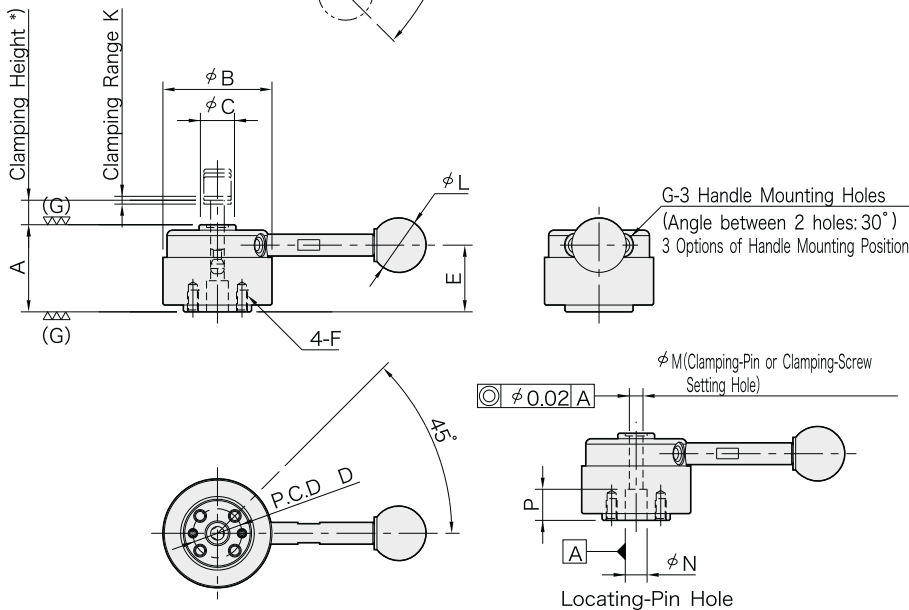
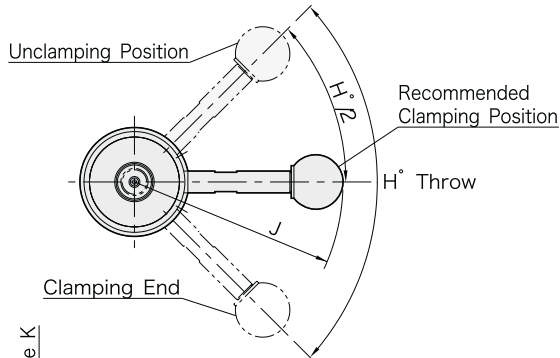
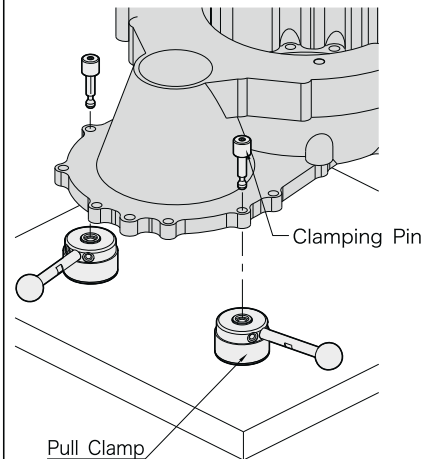
Note) Clamping Pins or Screws must be ordered separately.

[Body & Cam]  
 Material: SCM440 steel  
 Finish : Black oxide  
 Heat Treat: Quenched  
 and tempered

[Handle]  
 Material: S45C steel  
 Finish : Black oxide

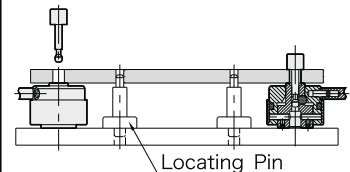
[Ball Knob]  
 Material: ABS resin  
 Color : Black

### How To Use

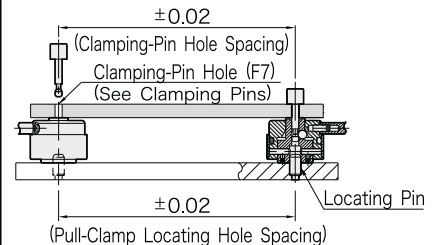


### How To Locate Workpiece

#### 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.



### Technical Information

Allowable Loads in Machining of Workpiece Bottom  
 Ensure that a force more than indicated below is not applied to the workpiece bottom.

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

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

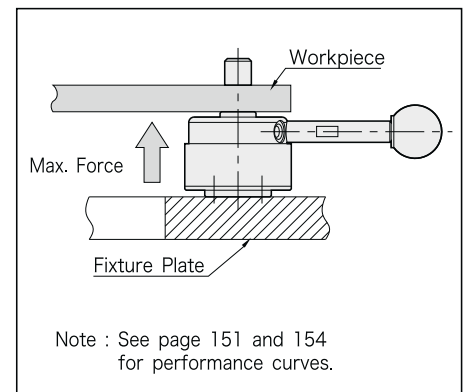
#### Without Handle

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.



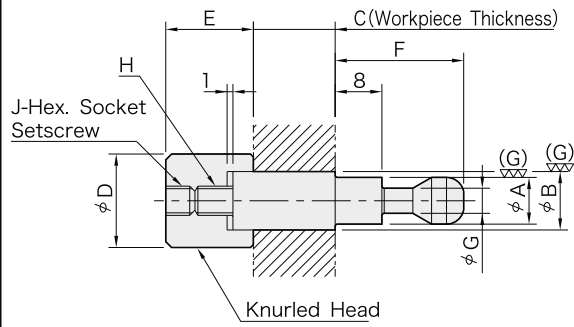
# QLPD-X

# CLAMPING PINS(Standard)



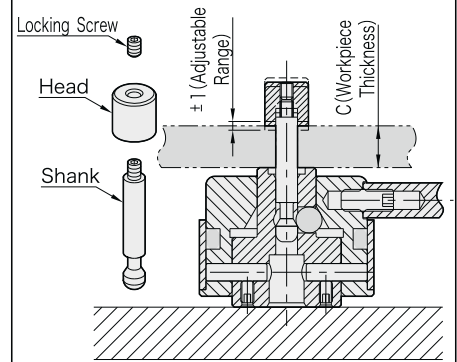
[Shank]  
 Material:SCM435 steel  
 Finish :Precision ground  
 Heat Treated(shank end)

[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



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

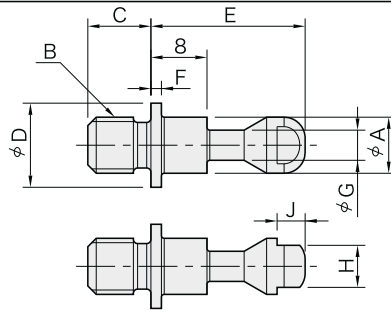
• Custom Clamping Pins(different B dimensions) are available on request.

# QLPD-M

# CLAMPING SCREWS(Standard)

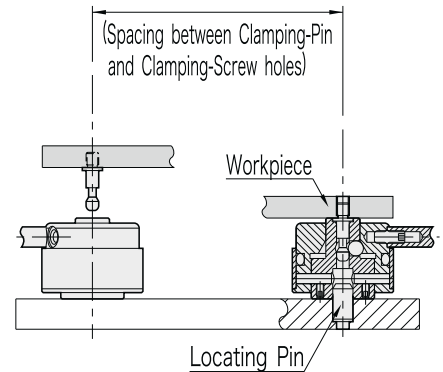


Material:SCM435 steel  
 Finish :Black oxide  
 Heat Treat:Quenched  
 and tempered



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

Recommended Spacing Tolerance in Use of Clamping Screws



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

**NEW**

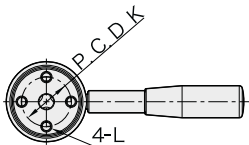
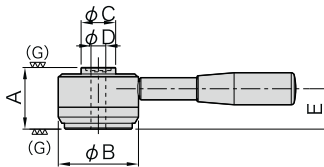
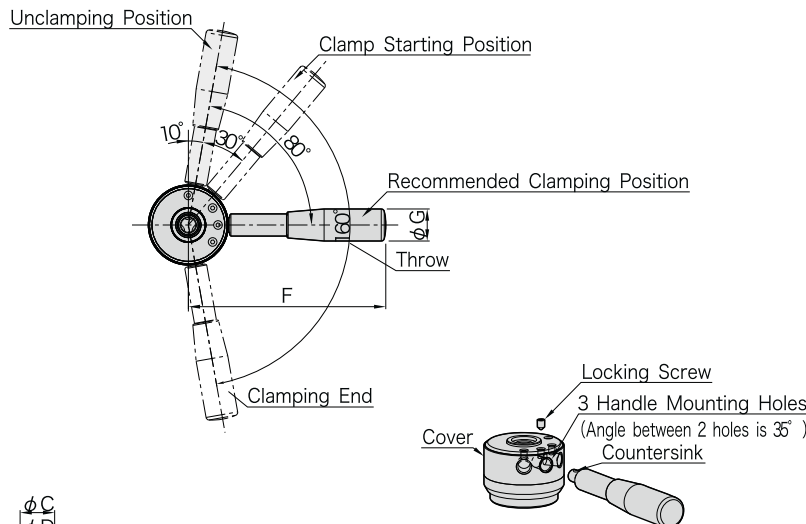


[Body & Clamp Ring]  
Material:SCM440 steel  
Finish :Black oxide  
Heat Treat:Quenched and tempered

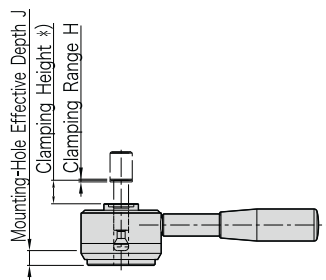
[Handle Shank]  
Material:S45C steel  
Finish :Black oxide  
Heat Treat:Quenched and tempered

[Handle]  
Material:Plastic  
Color :Black

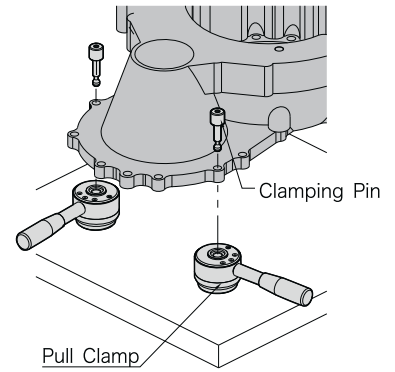
Note) Clamping Pins or Screws must be ordered separately.



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.

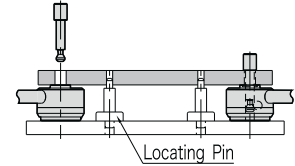


## How To Use

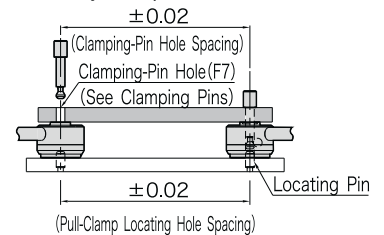


## How To Locate Workpiece

### 1. Basic method

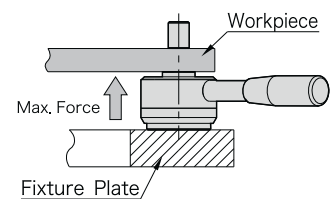


2. Method for clamping and locating a workpiece at a time.  
Give an accuracy shown below to the hole spacing to generate a locating accuracy of  $\pm 0.08$ .

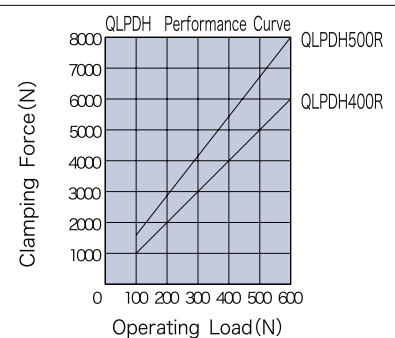


## Technical Information

### Allowable Loads in Machining of Workpiece Bottom



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



Part number	Series	A ( $\pm 0.01$ )	B	C	D (F7)	E	F	G	H	J	K (P, C, D)
<b>51991501</b>	QLPDH 400 R	50	65	28	12	36	160	26	2	10	40
<b>51991502</b>	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)
<b>51991501</b>	QLPDH 400 R	M 8x1.25 14 deep	600	6,000	Spiral Cam	$\pm 0.5$	1.2
<b>51991502</b>	QLPDH 500 R	M10x1.5 18 deep		8,000	Cam Angle : 4°	$\pm 0.8$	2.2

\*) Grip length of Clamping Pin (workpiece thickness)

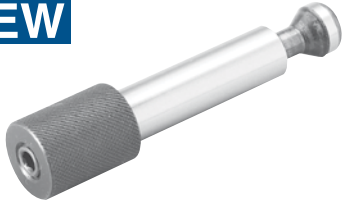
\*\*\*) Allowable load to operate the handle

\*\*\*) 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)

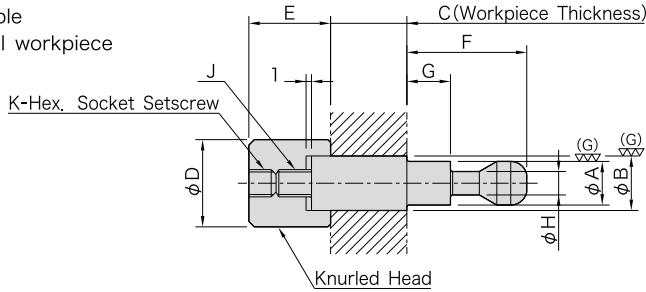
**NEW**



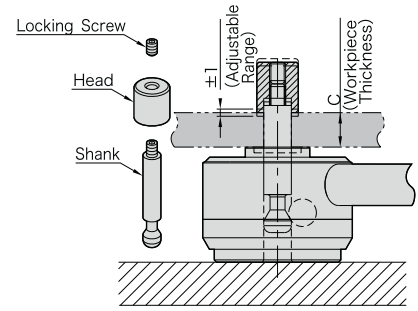
[Shank]  
Material:SCM435 steel  
Finish :Precision ground, heat treated (shank end)

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

C dimension is adjustable by  $\pm 1$ mm 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)
<b>51991503</b> -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
<b>51991504</b> -C Dim. In mm)	12	16		24	23	38	21.5	6.5	M 8x1.25	M 8x1.25- 8L	QLPDH400R	175 to 265
<b>51991505</b> -C Dim. In mm)	16	16	0 < C ≤ 120	24	29	48	28	9.5	M10x1.5	M10x1.5 -10L	QLPDH500R	160 to 350
<b>51991506</b> -C Dim. In mm)	16	20		30	29	48	28	9.5	M10x1.5	M10x1.5 -10L	QLPDH500R	325 to 515

\*)For ordering, specify workpiece thickness.

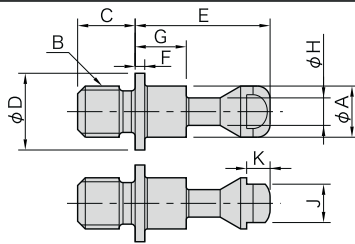
# QLPDH-M

# CLAMPING SCREWS (Heavy)

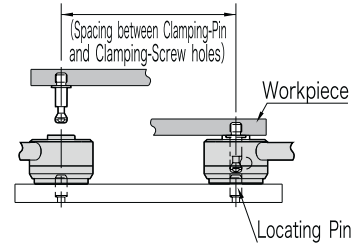
**NEW**



Material:SCM435  
Finish :Black oxide  
Heat Treat:Quenched and tempered



### Recommended Spacing Tolerance in Use of Clamping Screws



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

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



With Handle

Without Handle

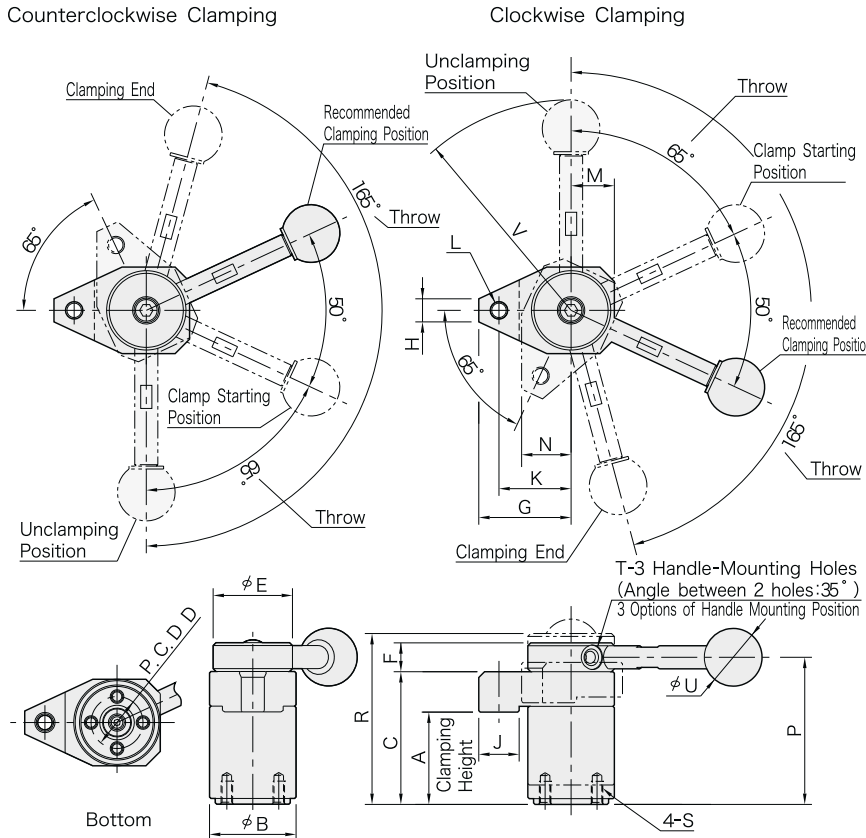
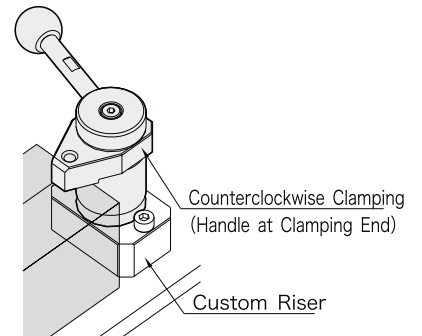
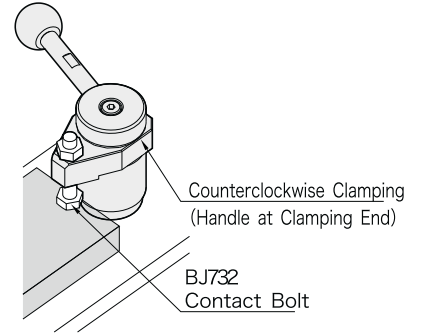
[Body & Shaft]  
 Material: SCM440 steel  
 Finish : Black oxide  
 Heat Treat: Quenched and tempered

[Clamp Arm & Adaptor Head]  
 Material: S45C steel  
 Finish : Black oxide  
 Heat Treat: Quenched and tempered

[Handle]  
 Material: S45C steel  
 Finish : Black oxide

[Ball Knob]  
 Material: ABS resin  
 Color : Black

### How To Use



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

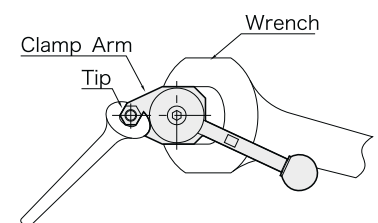
### Without Handle

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

Note : The handle must be ordered separately.

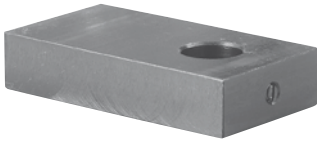
### Tip Installation

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

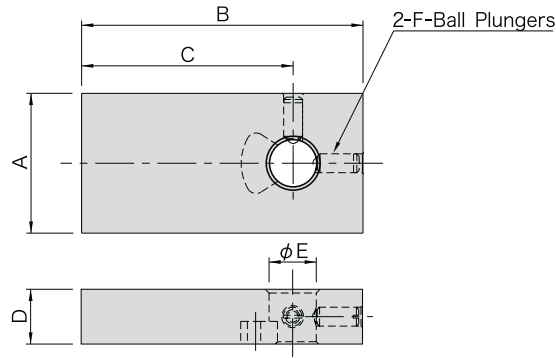




**NEW**

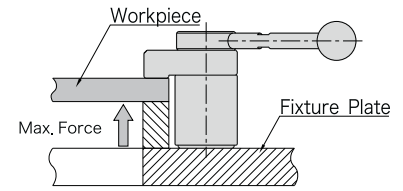


Material: S45C steel  
Finish : Black oxide



### Technical Information

#### Allowable Loads in Machining of Workpiece Bottom

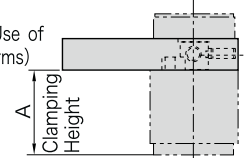


Series	Allowable Force To Workpiece Bottom (Per Clamp)
<b>QLSW150</b>	max.2100N
<b>QLSW200</b>	max.2700N

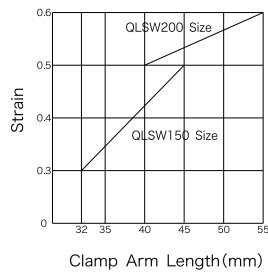
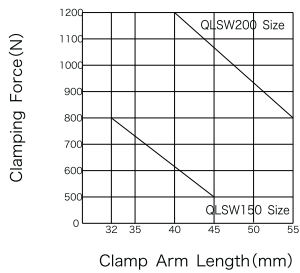
### How To Use

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

(Clamping Height in Use of Machinable Clamp Arms)



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.

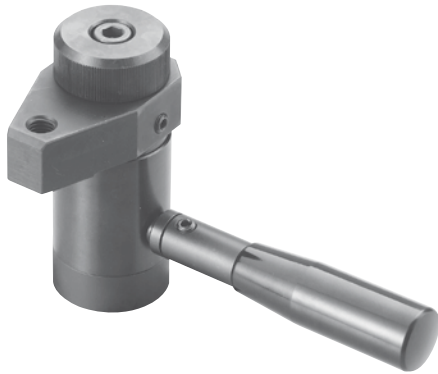
Part Number	A	B	C	D	E (F8)	F	Allowable Weight of Clamping Tip*) (g)	Swing Clamps	Weight (g)
<b>51991513</b>	30	60	45	12	10	M4	100	QLSW150Series	150
<b>51991514</b>	40	75	55	16	16	M5		QLSW200Series	330

Part Number	A
<b>51991113</b>	34**)
<b>51991114</b>	47***)

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

\*\*\*) Actual clamping height:46.1 to 47.9 (clamping range:1.8)

**NEW**



[Body/Cam/Handle]  
Material: SCM440 steel  
Finish : Black oxide  
Heat Treat: Quenched and tempered

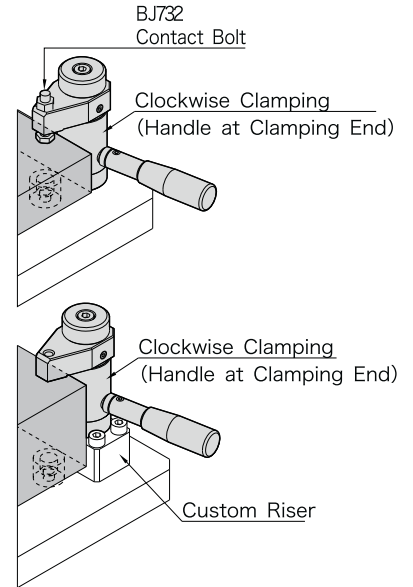
[Bolt]  
Material: SCM435 steel  
Finish : Black oxide  
Heat Treat: Quenched and tempered

[Clamp Arm/Holder/Handle Shank]  
Material: S45C steel  
Finish : Black oxide  
Heat Treat: Quenched and tempered

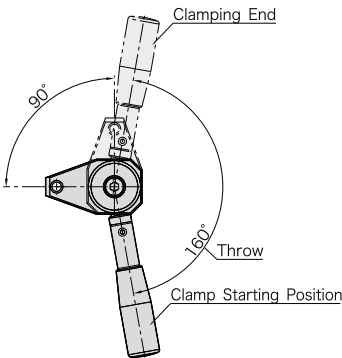
[Adjustment Knob]  
Material: S45C steel  
Finish : Black oxide

[Handle]  
Material: Plastic  
Color : Black

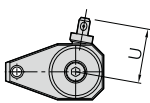
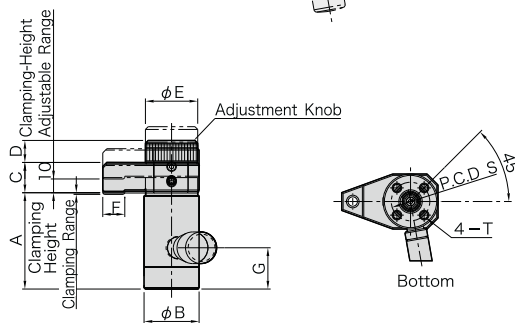
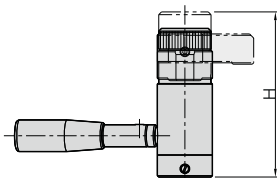
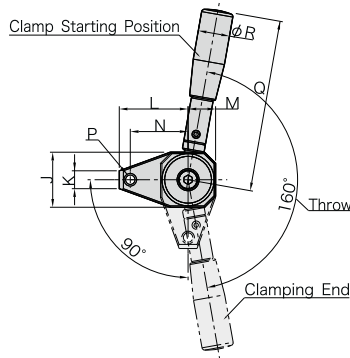
### How To Use



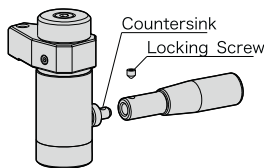
Counterclockwise Clamping



Clockwise Clamping



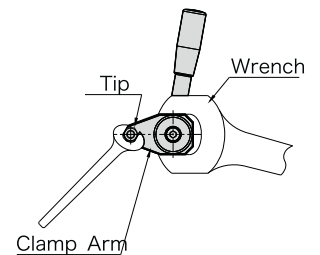
When Handle Is Removed



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.

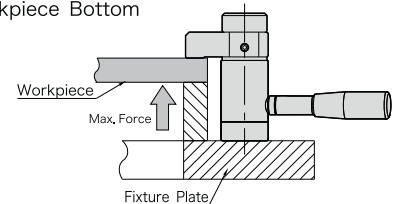
### Tip Installation

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

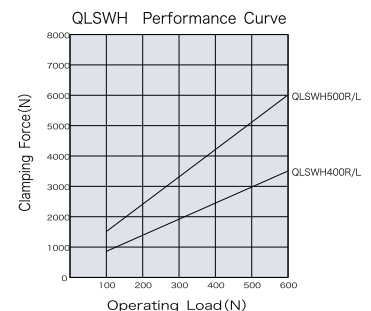
Allowable Loads in Machining of Workpiece Bottom



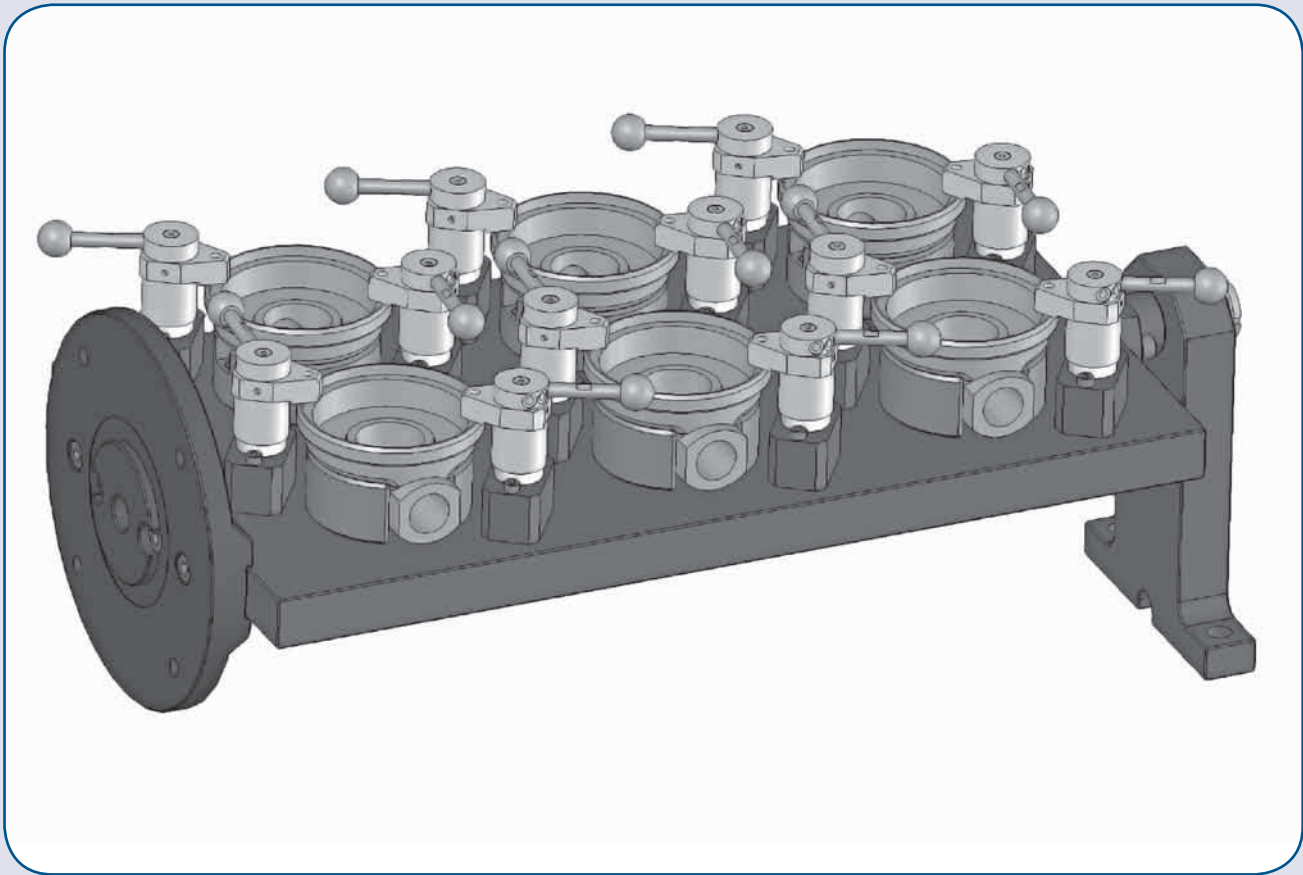
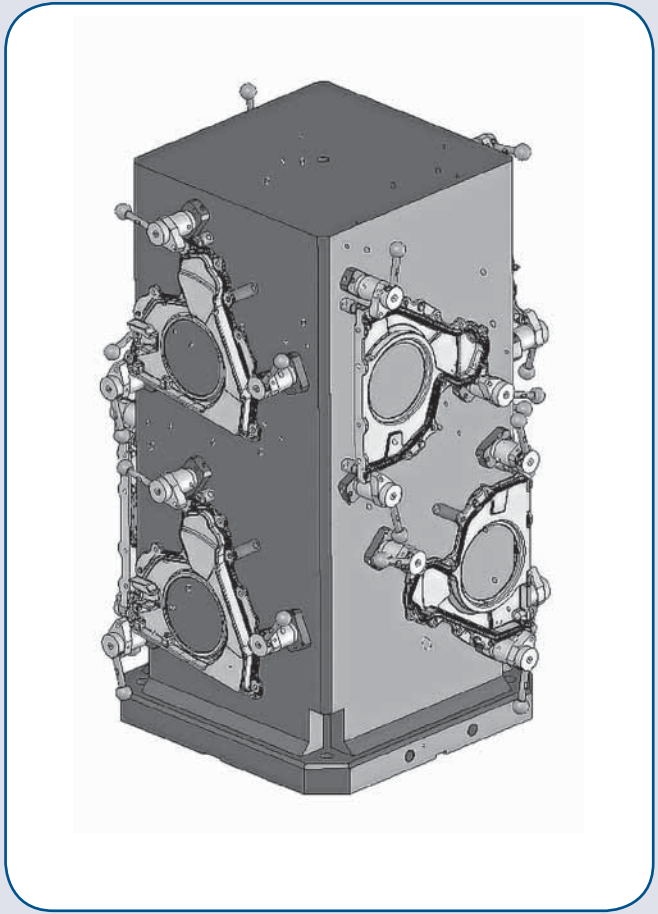
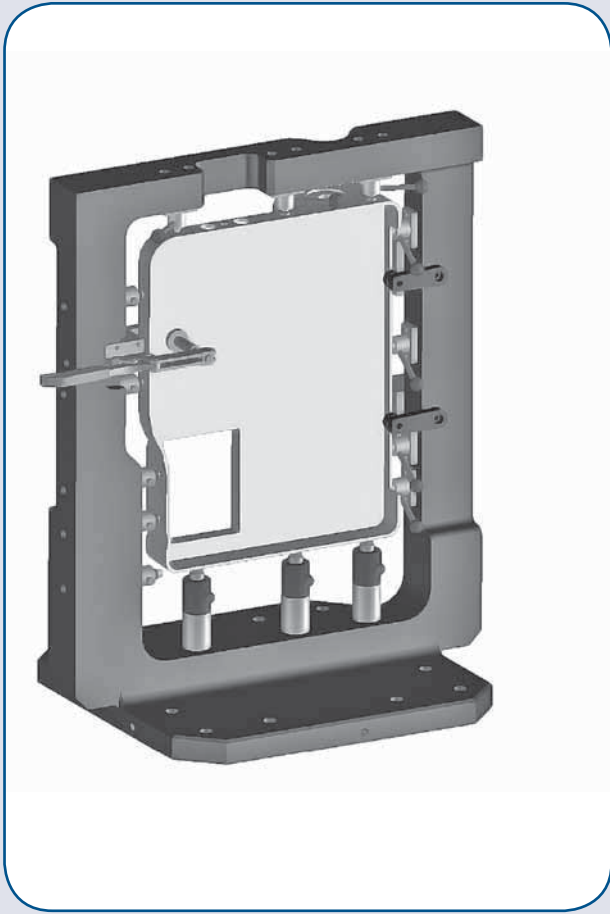
Series	Allowable Force To Workpiece Bottom(Per Clamp)
<b>QLSWH400</b>	max. 8000N
<b>QLSWH500</b>	max.14000N

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

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



\*) Allowable load to operate the handle



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

## Recommended Dimensions

Series	A (F8)	B	E	F	G	H	J	K	L (Max. *)	M	N
<b>QLSW150</b>	10	12	5	32	M4x0.7	11	1.5	30	45	15	C5
<b>QLSW200</b>	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

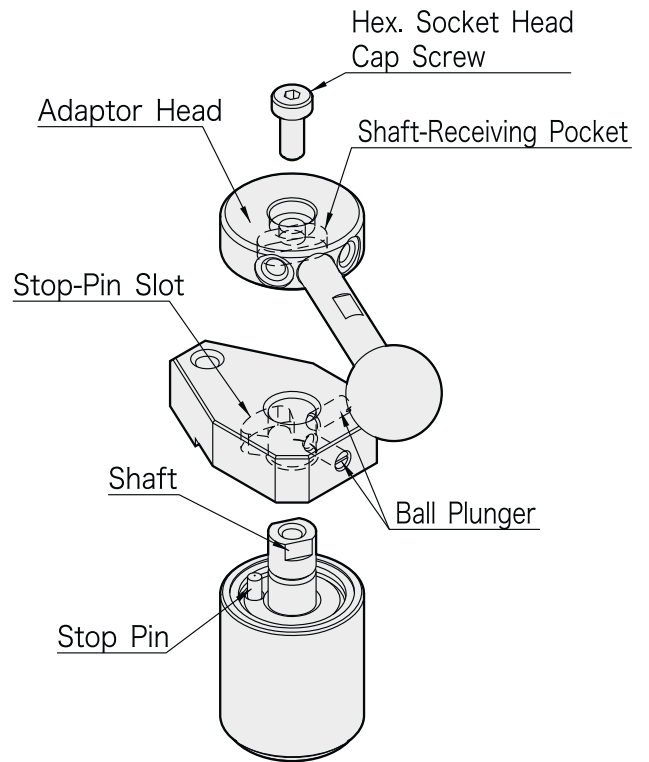
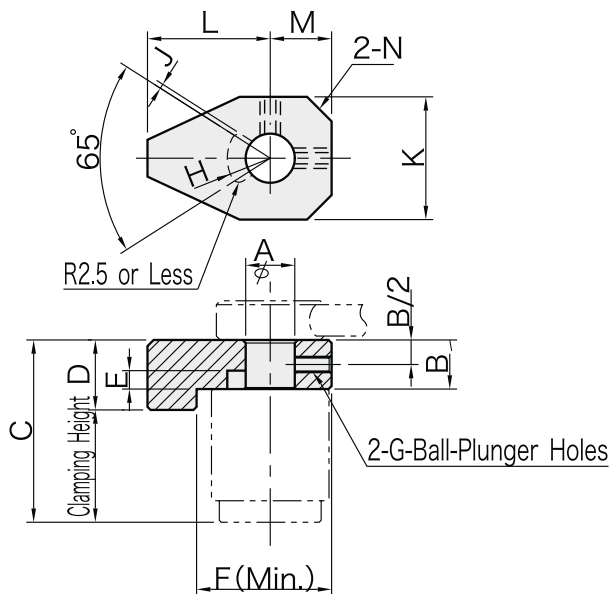
To install a clamp arm,

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.

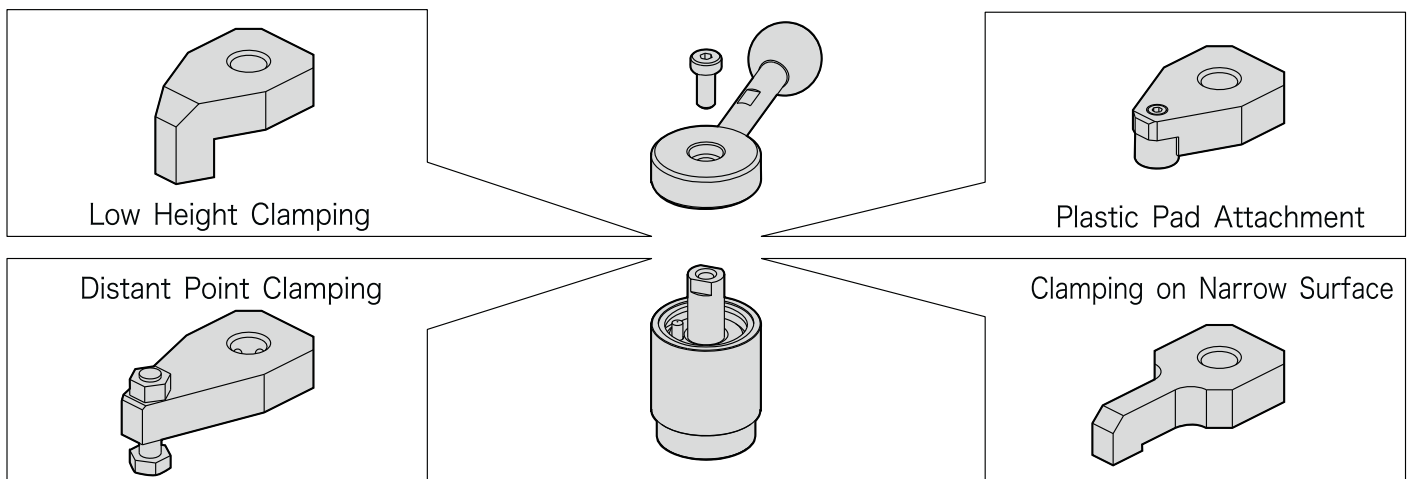
To remove the clamp arm, follow the above steps back.

### How To Determine D Dimensions

Series	C	D
<b>QLSW150</b>	46	46 - Clamping Height
<b>QLSW200</b>	63	63 - Clamping Height



### Clamp Arm Customization Examples



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

## Recommended Dimensions

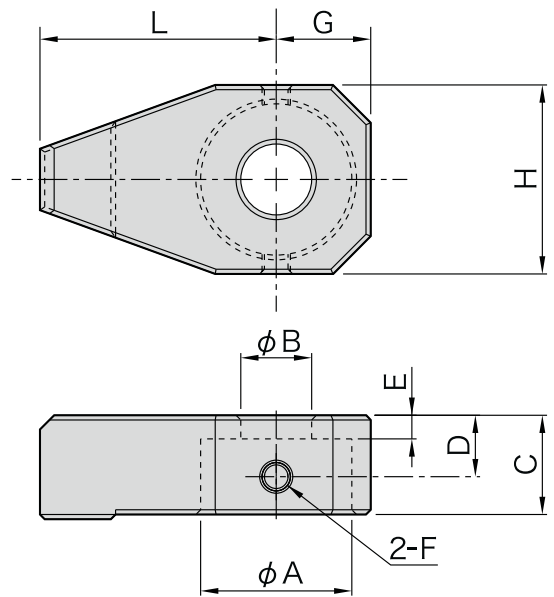
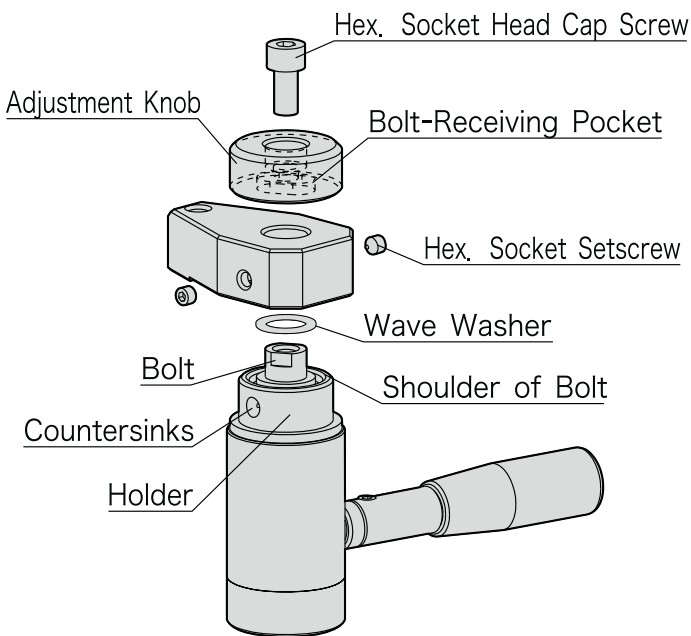
Series	A (F8)	B	C	D	E ( $\pm 0.1$ )	F	G	H	L (Max.)
<b>QLSWH400</b>	32	15	21	13	5	M6x1	20	40	50
<b>QLSWH500</b>	41	19	24	15	6	M8x1.25	25	50	60

### Clamp Arm Installation/Removal Instructions

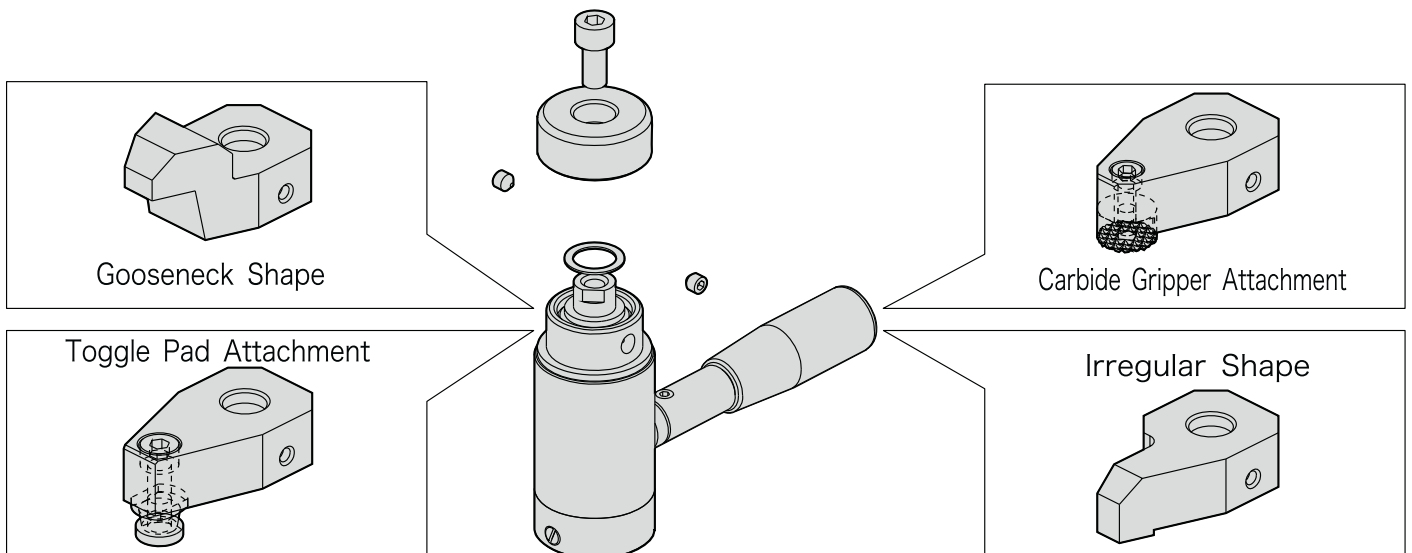
To install a clamp arm,

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.



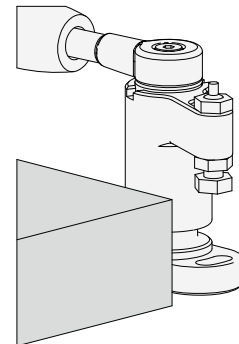
### Clamp Arm Customization Examples



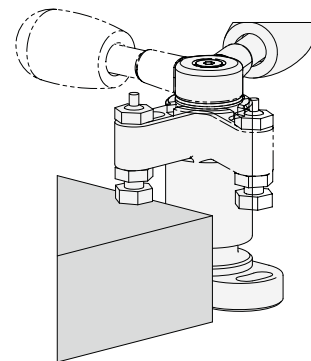


Body / Handle / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered
Arm / Cam Shaft	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered
Knob	
Material	Phenolic plastic
Color	Black

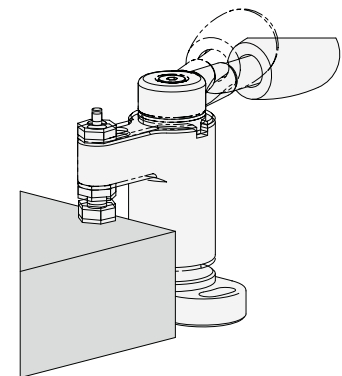
## How To Operate



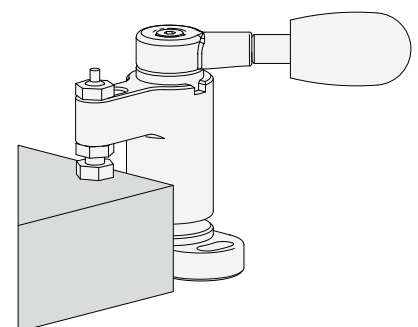
1. Unclamped  
Load a workpiece.



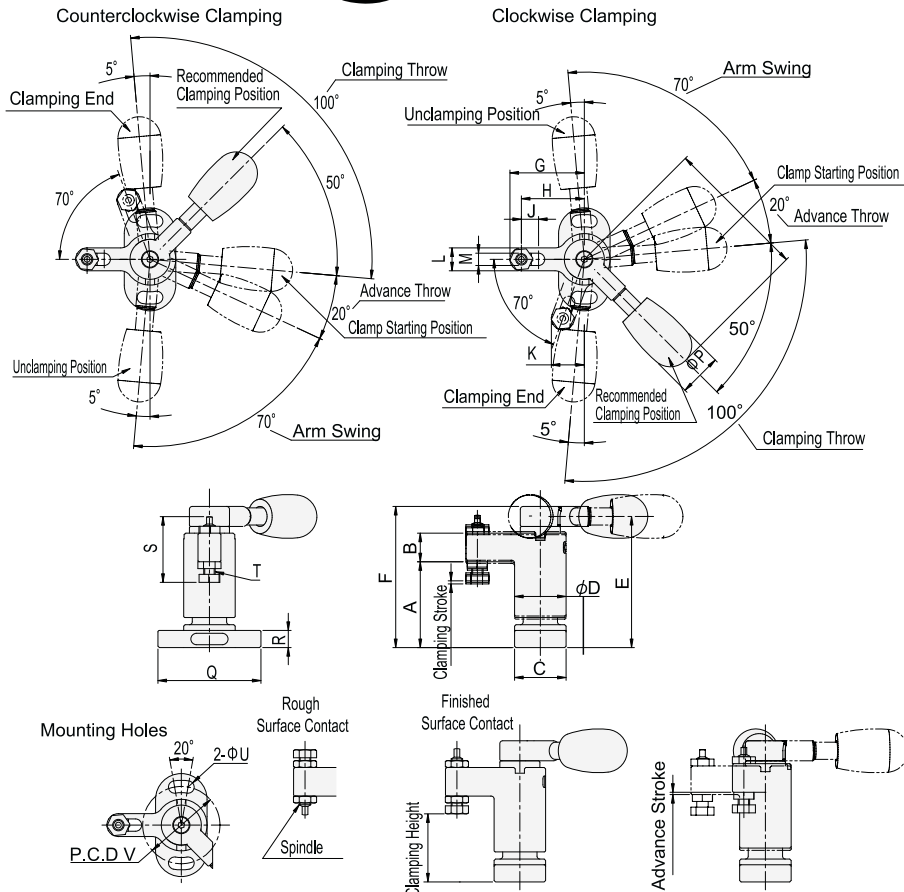
2. Arm Swing  
Turn the handle to set the arm in position.



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.



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)	1	0.8
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)	1.4	1.1

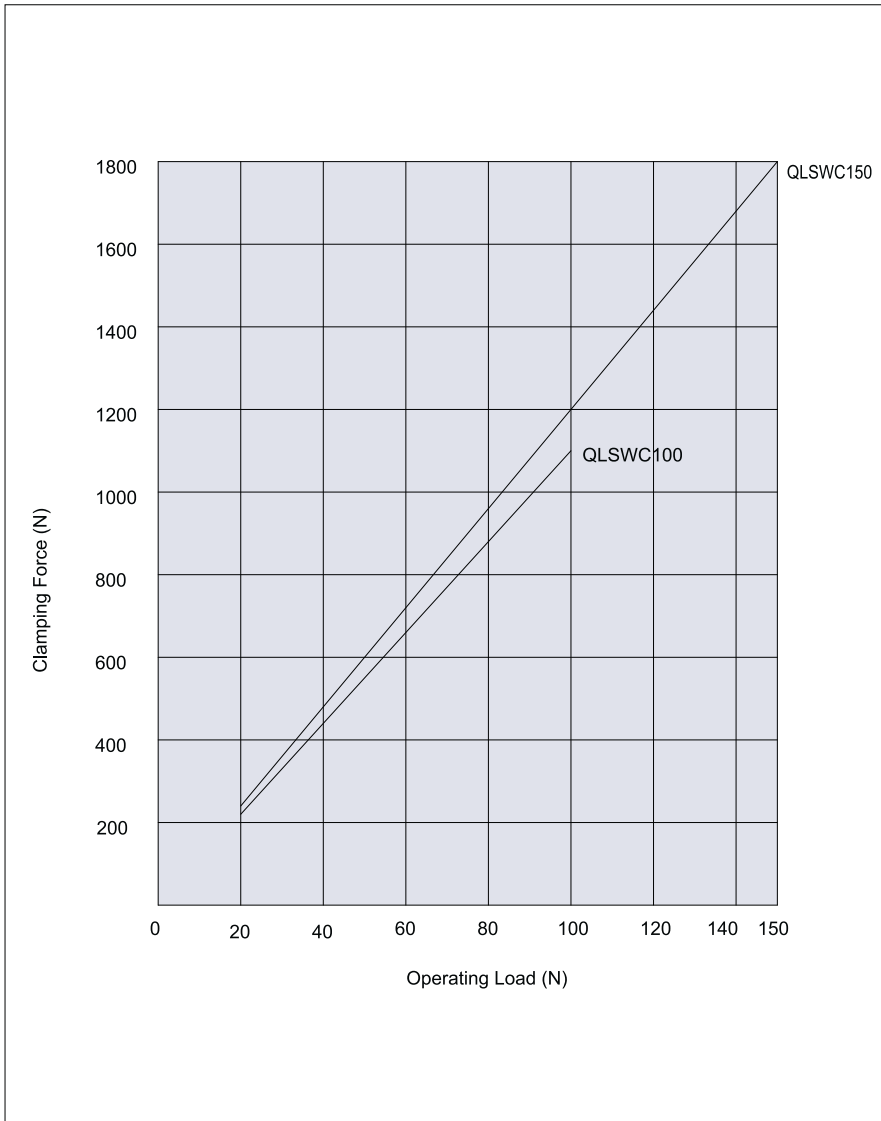
\*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

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	30	10	18	18	45.8	49	26	22	6	11.5	8	4.3	50	15	36
51991824	40	14	23	23	61.3	66	35	30	8	15.3	10	5.3	63	20	45
51991825	40	14	23	23	61.3	66	35	30	8	15.3	10	5.3	63	20	45

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	6	22.8	M4×0.7	4.3	27	8	100	1,100		112
51991824	8	28.5	M5×0.8	5.3	34	10	150	1,800	Spiral Cam Cam Angle:5°	250
51991825	8	28.5	M5×0.8	5.3	34	10	150	1,800		250

\*\*\*) Allowable load to operate the handle

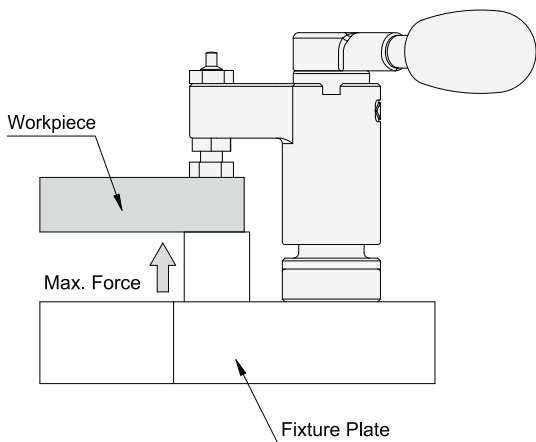
### Performance Curve



### Technical Information

#### Allowable Loads in Machining of Workpiece Bottom

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

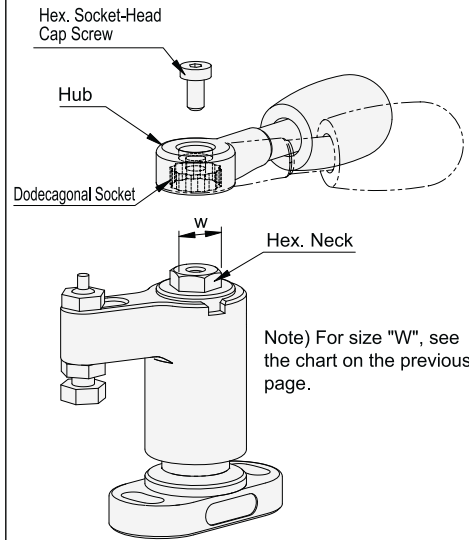


Series	Allowable Force to Workpiece Bottom (per Clamp)
QLSWC100	max.2,300N
QLSWC150	max.3,600N

### How To Operate

#### How To Change Handle Position

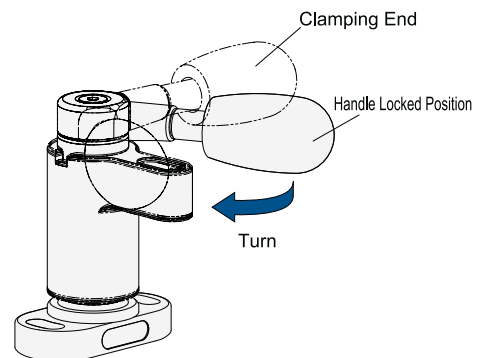
The dodecagonal socket in the hub of the handle allows changing the handle operating angle by 30°.



#### How To Release Locked Handle

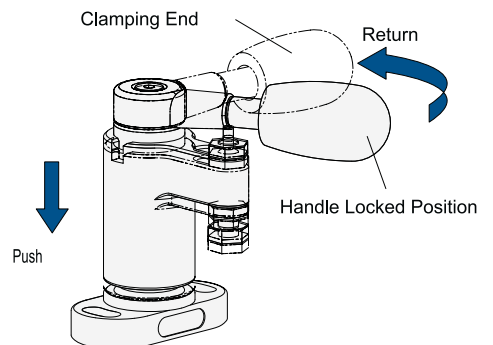
When turned beyond the clamping end, the handle will be locked with a click. The locked handle can be released by following the instructions below.

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.

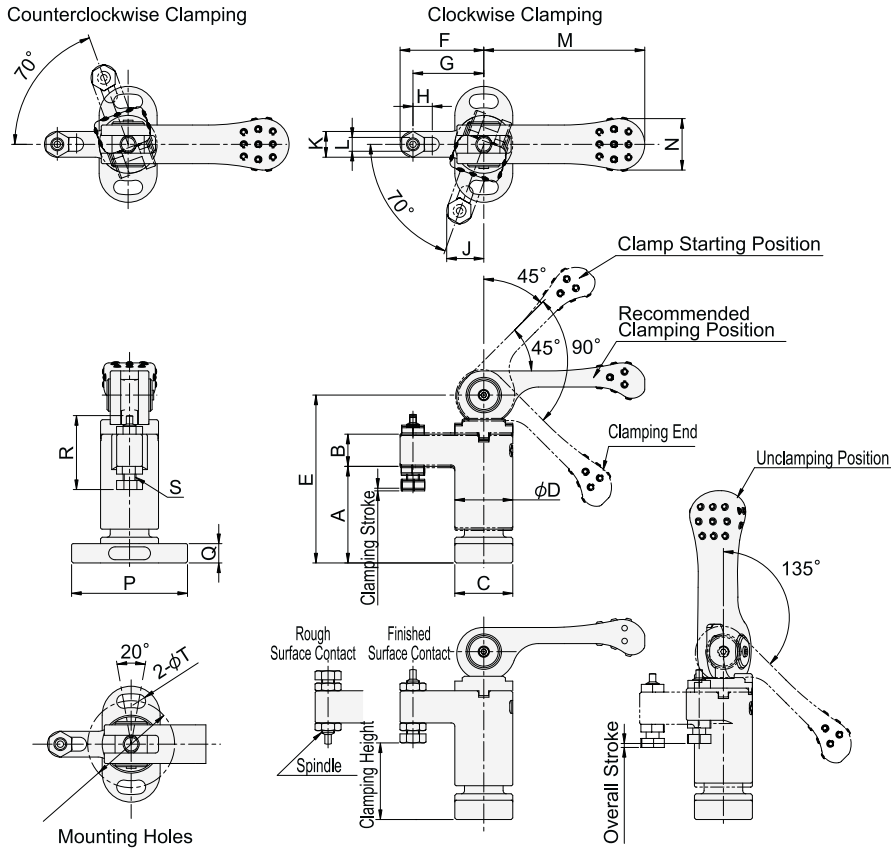
# QLSWC

# SWING CLAMPS (Mini) WITH CAM HANDLE

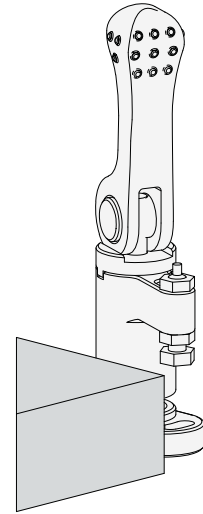


Body / Washer / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

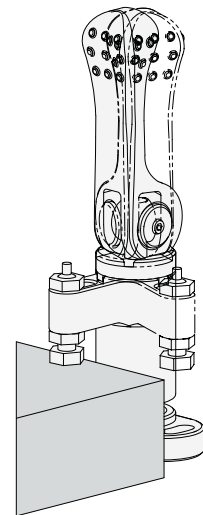
Arm / Cam Shaft / Handle	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered



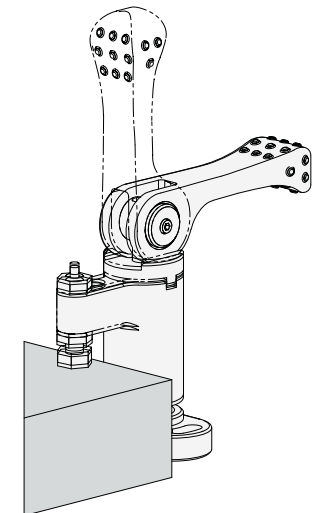
## How To Operate



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.

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.

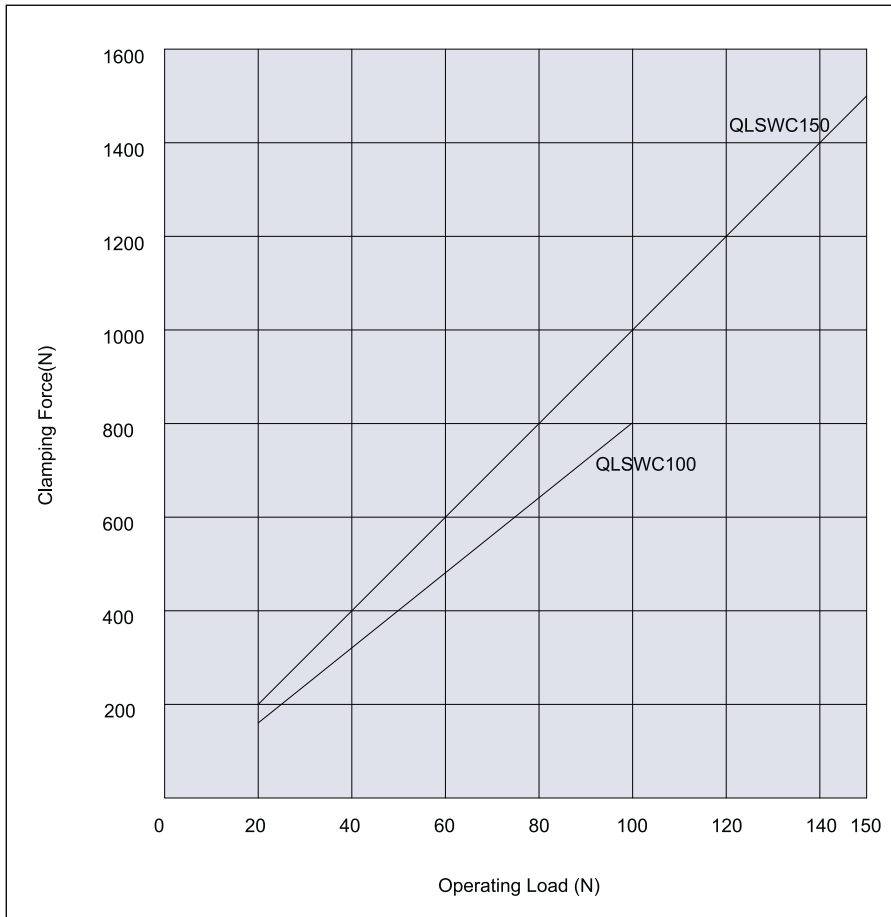
Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
51991826	30	10	18	18	52	26	22	6	11.5	8	4.3	50	15	36	6
51991827															
51991828	40	14	23	23	68	35	30	8	15.3	10	5.3	63	20	45	8
51991829															

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	134
51991827									
51991828	28.5	M5×0.8	5.3	34	QLCA-06	150	1,500	Cam Angle:4°	272
51991829									

\*\*\*) Allowable load to operate the handle



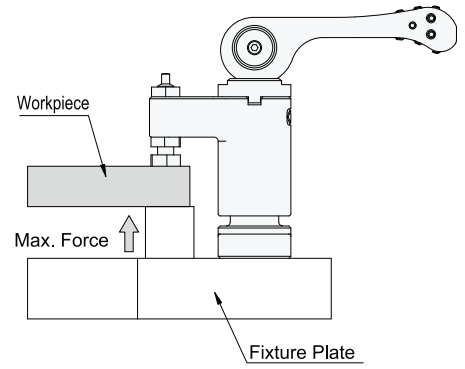
## Performance Curve



## 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

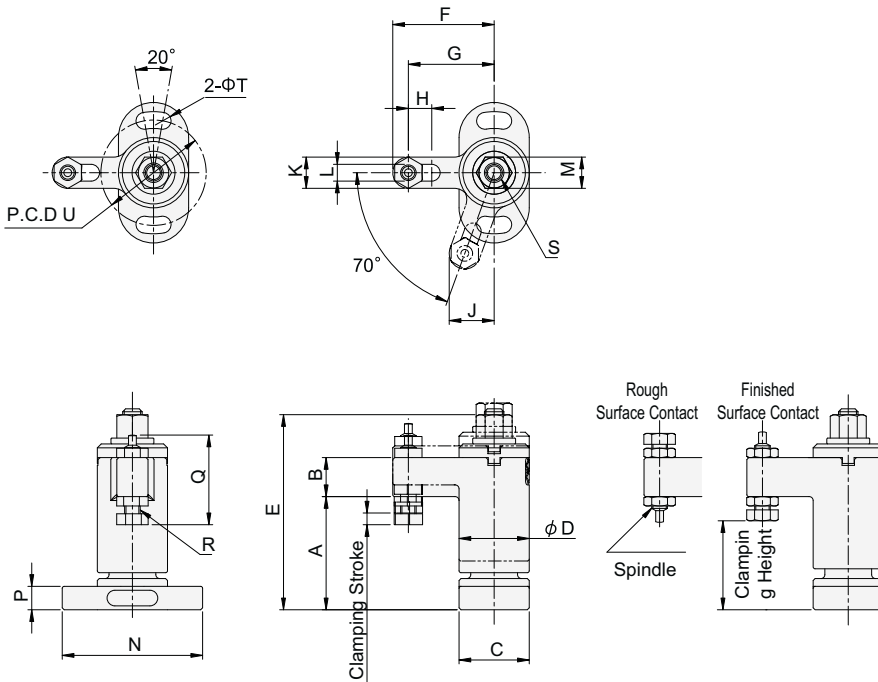
**NEW**



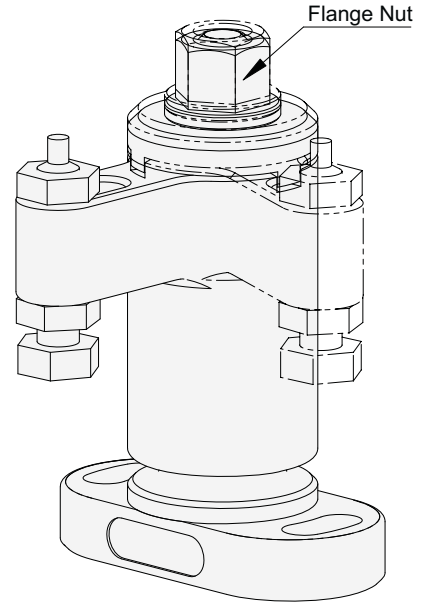
Body / Washer / Flange Nut / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

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

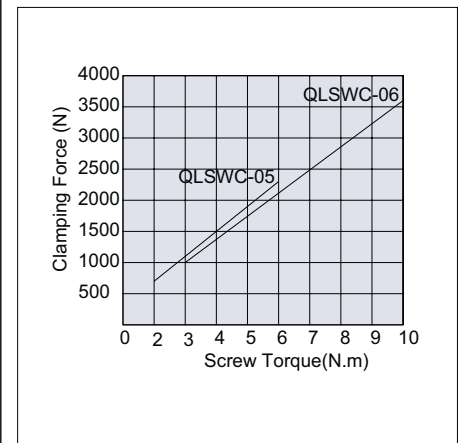


Turning the flange nut allows the arm to swing into position for clamping.

## Warning

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

## Performance Curve



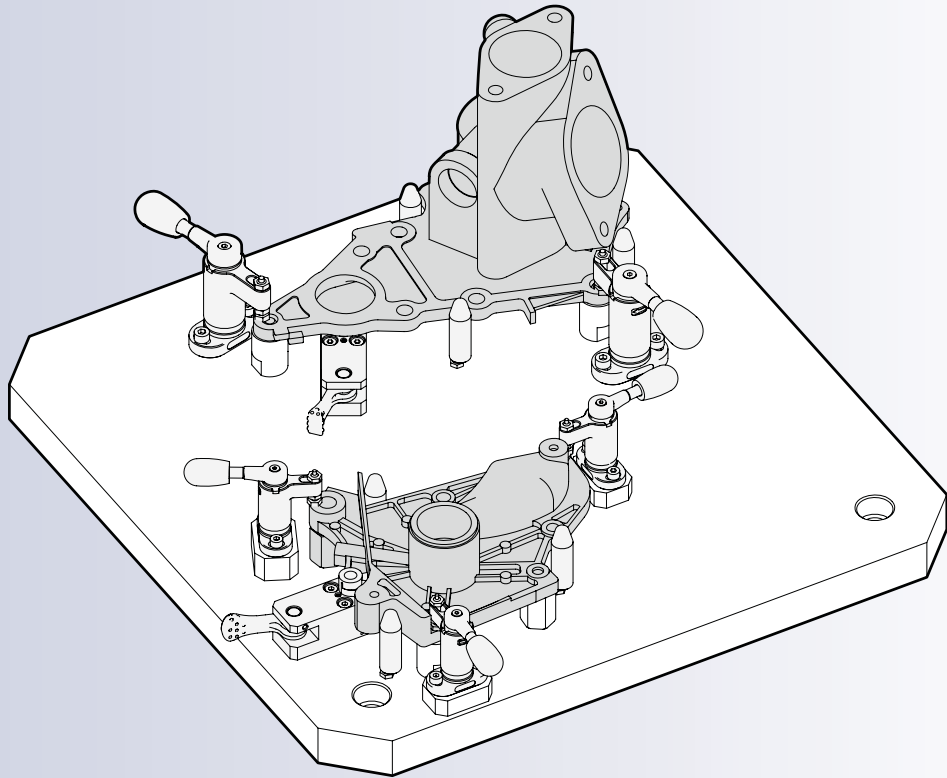
Part Number	Clamping Height *)				Clamping Stroke	A	B	C	D	E
	Finished Surface Contact		Rough Surface Contact							
	Min.	Max.	Min.	Max.						
51991830	22.8 (22.8-25.8)	24.8 (24.8-27.8)	22.4 (22.4-25.4)	24.4 (24.4-27.4)	3	29	10	18	18	52.5
51991831	31.3 (31.3-35.3)	33.3 (33.3-37.3)	32.2 (32.2-36.2)	34.2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

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

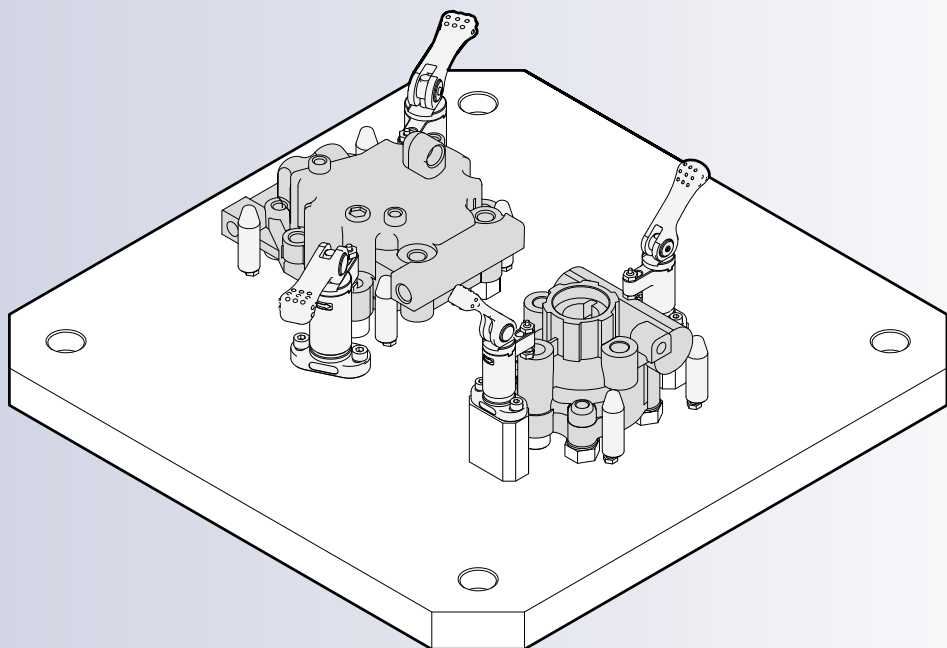
Part Number	F	G	H	J	K	L	M	N	P	Q
51991830	26	22	6	11.5	8	4.3	8	36	6	22.8
51991831	35	30	8	15.3	10	5.3	10	45	8	28.5

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

Fixturing with Swing Clamps(Mini)



Fixturing with Swing Clamps(Mini) with Cam Handle



# QLRE

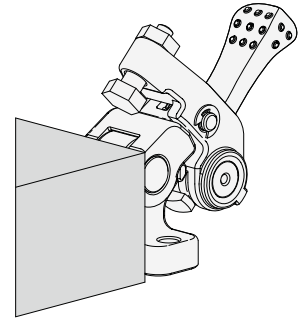
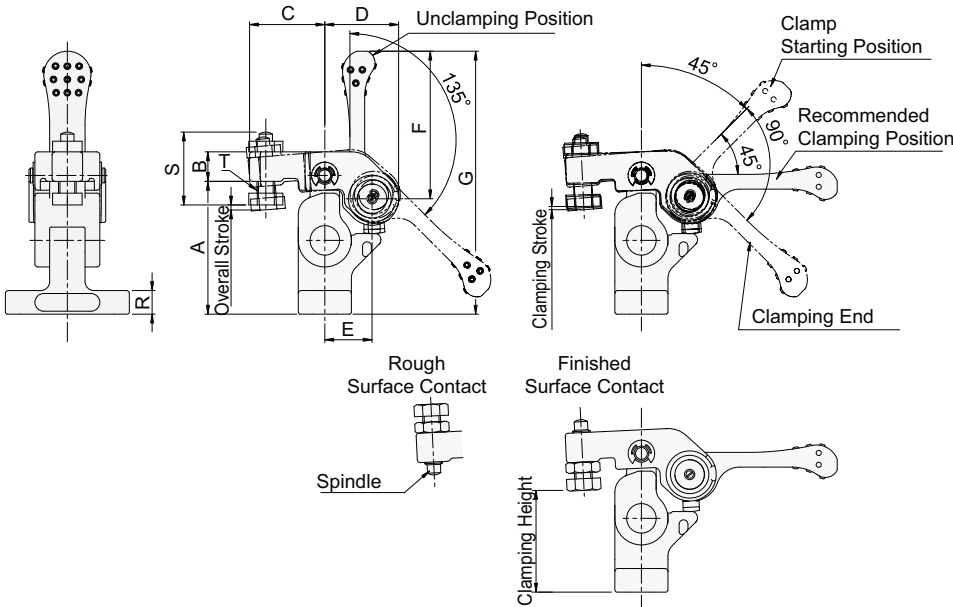
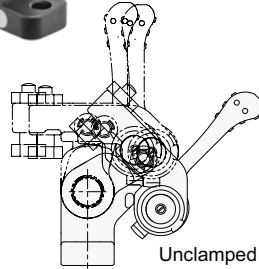
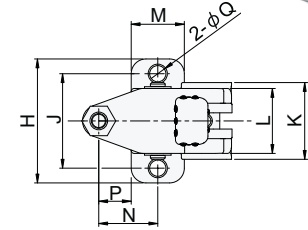
# RETRACTABLE CLAMPS (Mini) WITH CAM HANDLE

**NEW**

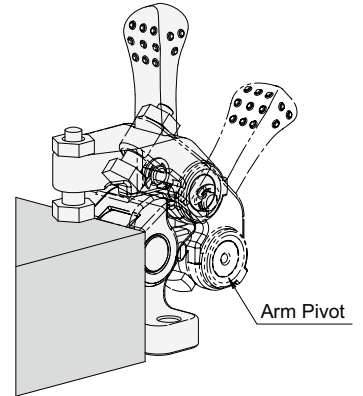


Body / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered
Arm / Joint	
Material	SCM435 steel
Finish	Black oxide
Heat treat	Quenched and tempered
Cam Handle	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered

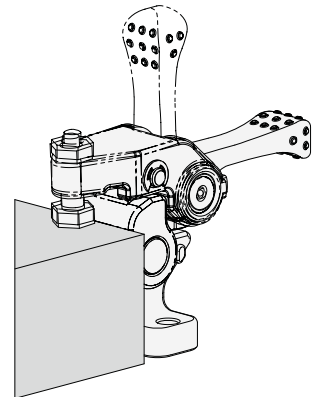
## How To Operate



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.

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

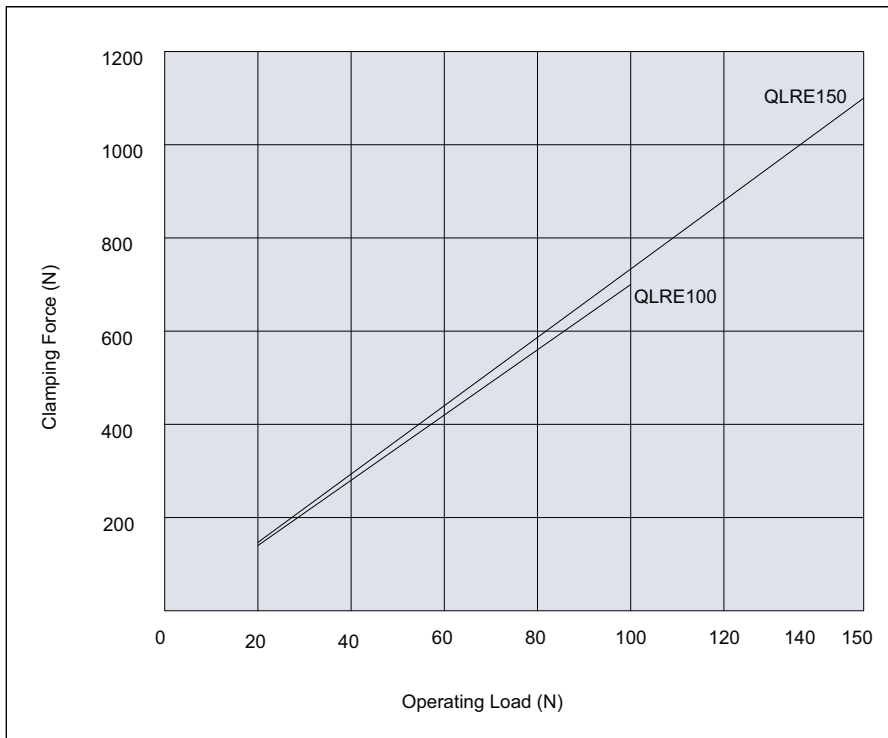
\*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
<b>51991832</b>	45	10	25.5	25	16	50	89	42	32	26	22	18	20	11	5.5
<b>51991833</b>	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)
<b>51991832</b>	8	24	M6×1	QLCA-05	100	700	Spiral Cam Cam Angle:4°	244
<b>51991833</b>	10	30.5	M8×1.25	QLCA-06	150	1,100		468

\*\*\*) Allowable load to operate the handle

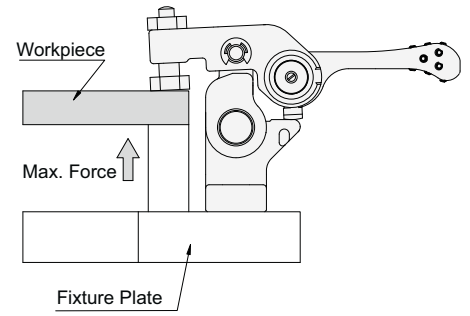
## Performance Curve



## Technical Information

### Allowable Loads in Machining of Workpiece Bottom

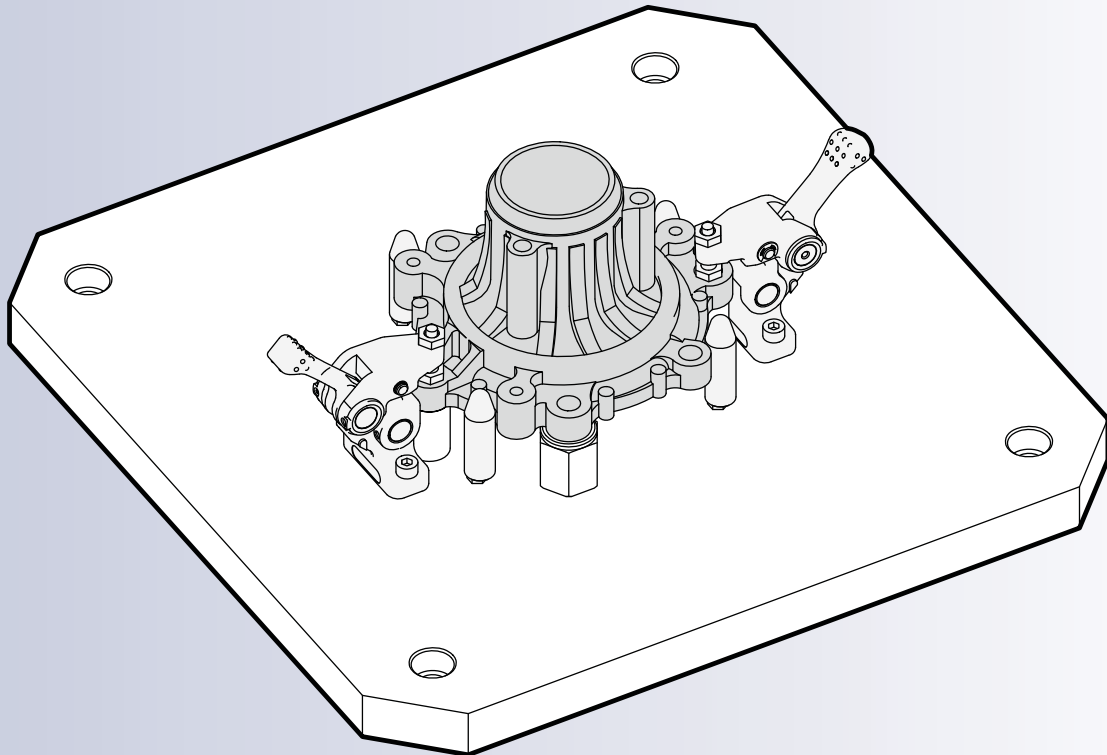
Ensure that any force more than stated below is not applied.



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

## APPLICATION EXAMPLES

### Fixturing with Retractable Clamps (Mini) with Cam Handle



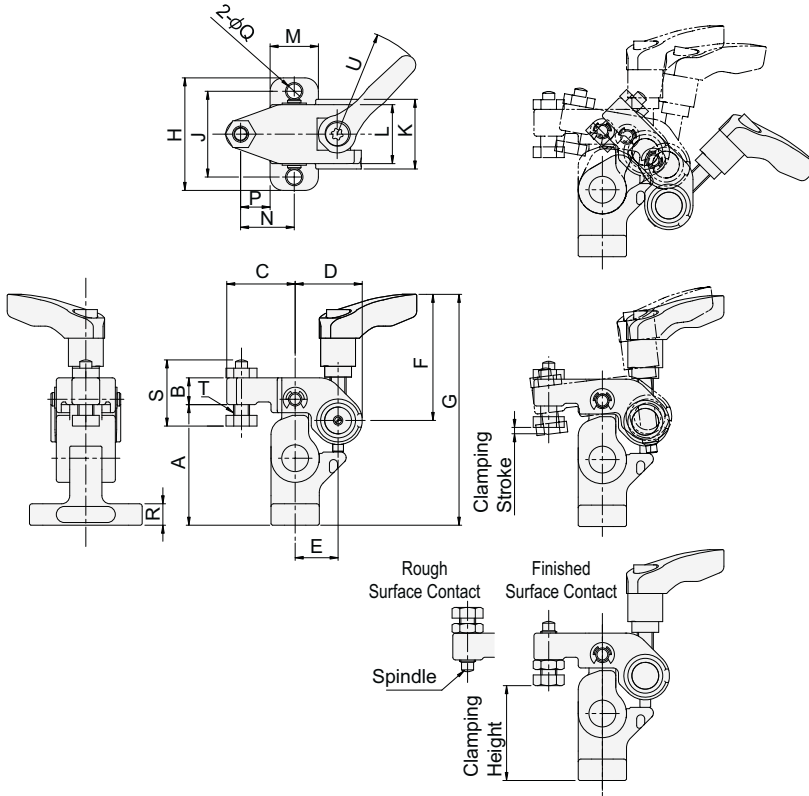
# QLRE

# RETRACTABLE CLAMPS (Mini) WITH ADJUSTABLE HANDLE

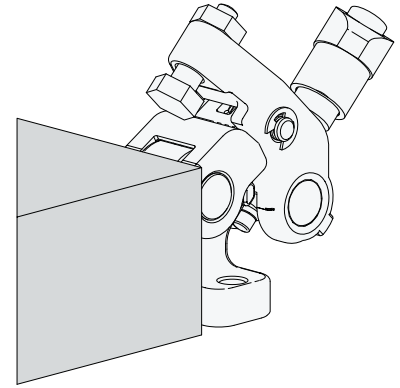


Body / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered
Arm / Joint	
Material	SCM435 steel
Finish	Black oxide
Heat treat	Quenched and tempered

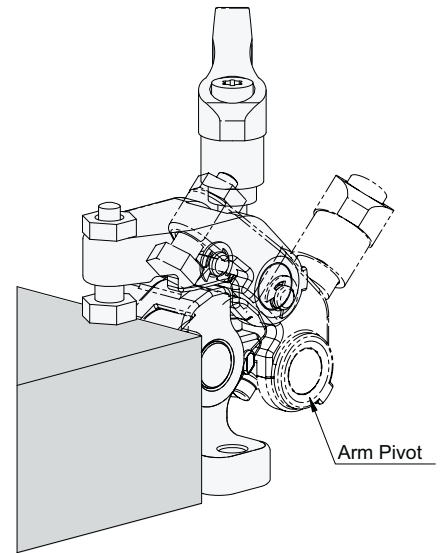
\* Screw clamping mechanism allows for longer clamping stroke and greater clamping force.



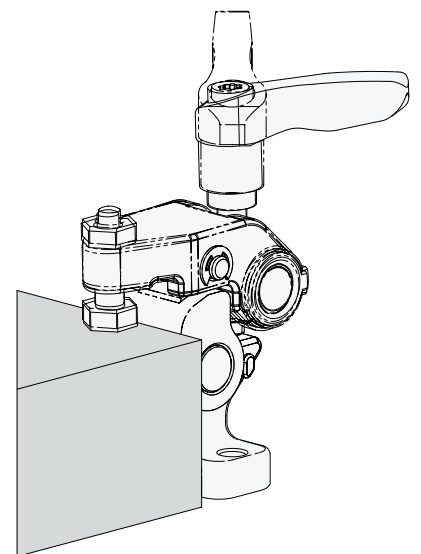
## How To Operate



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.

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

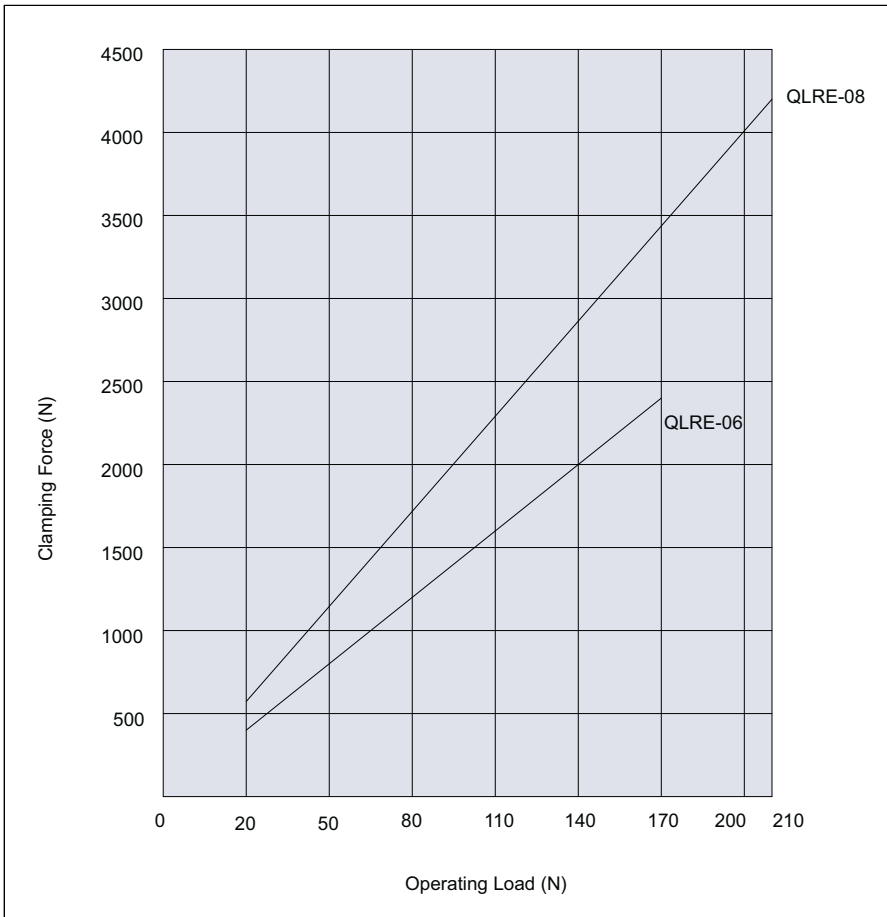
\*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

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

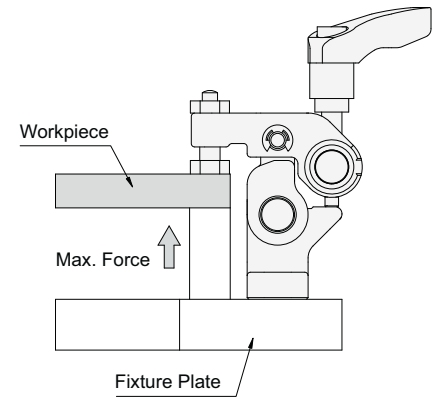
## Performance Curve



## Technical Information

### Allowable Loads in Machining of Workpiece Bottom

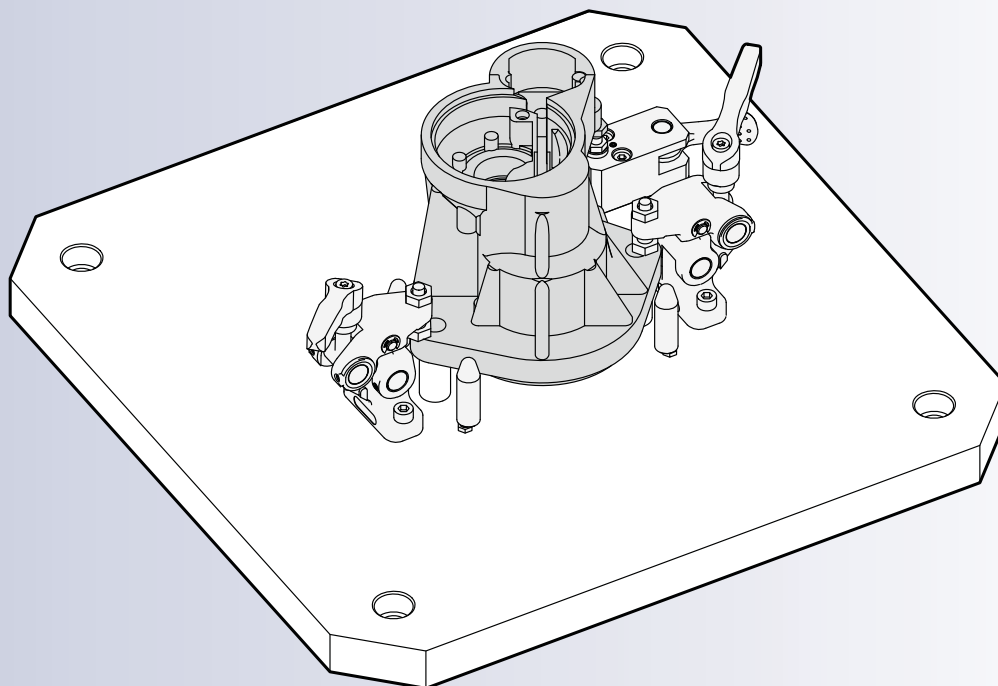
Ensure that any force more than stated below is not applied.



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

## APPLICATION EXAMPLES

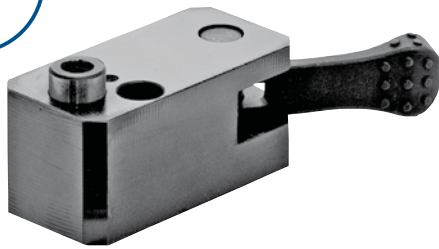
### Fixturing with Retractable Clamps (Mini) with Adjustable Handle



# BJ352

# WORK SUPPORT WITH CAM HANDLE

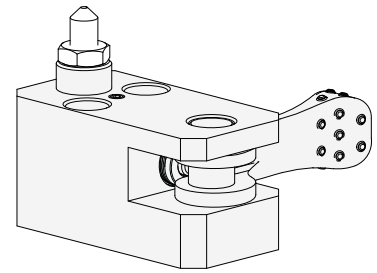
**NEW**



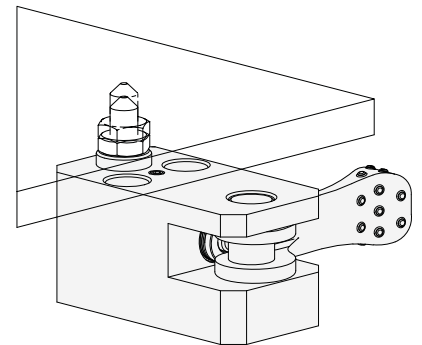
Body	
Material	S45C steel
Finish	Black oxide
Piston	
Material	SK4 steel
Finish	Black oxide
Heat treat	Quenched and tempered
Locking Pin	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered
Handle	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered

\* The clamping direction can easily be changed.

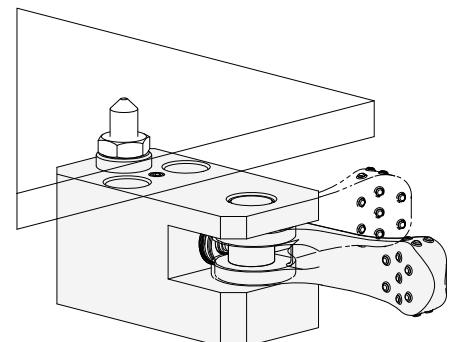
## How To Operate



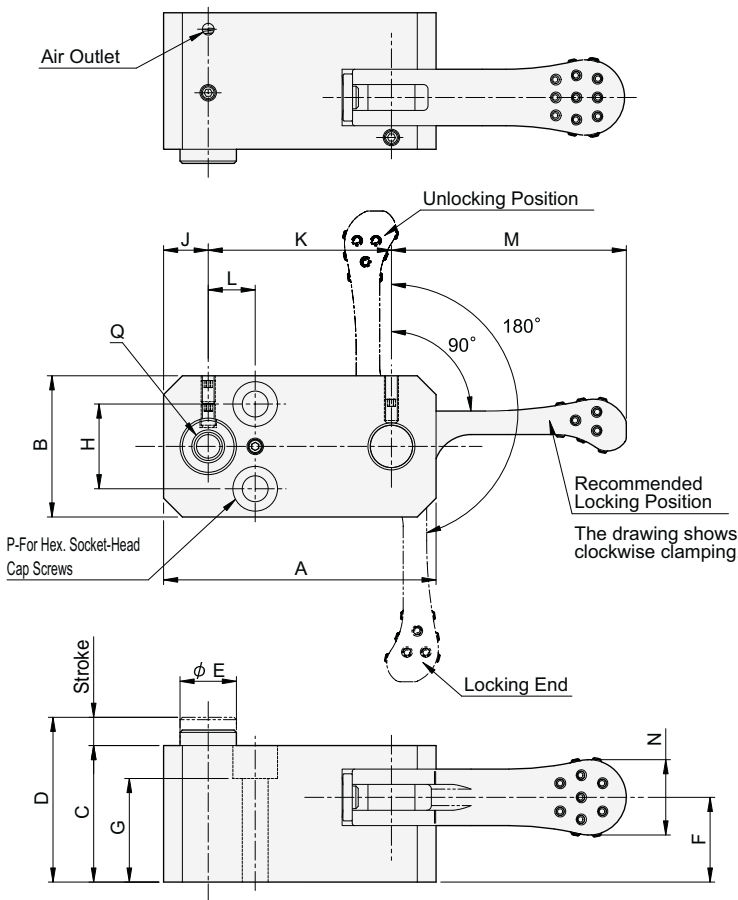
1. Unlocked  
No workpiece loaded



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



3. Clamping  
Turn the handle to lock the piston.



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

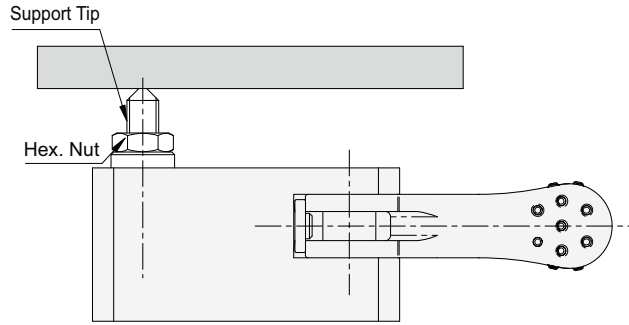
Part Number	P	Q	Cam Handles Part Number	Allowable Operating Load (N) *	Support Capacity (N)	Piston Spring Force (N)	Locking Mechanism	Weight (g)
51991836	M4	M5×0.8 8 deep	QLCA-04	80	500	0-6	Spiral Cam Cam Angle:4°	213
51991837	M5	M6×1 10 deep	QLCA-05	100	700	0-6		335
51991838	M6	M8×1.25 15 deep	QLCA-06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



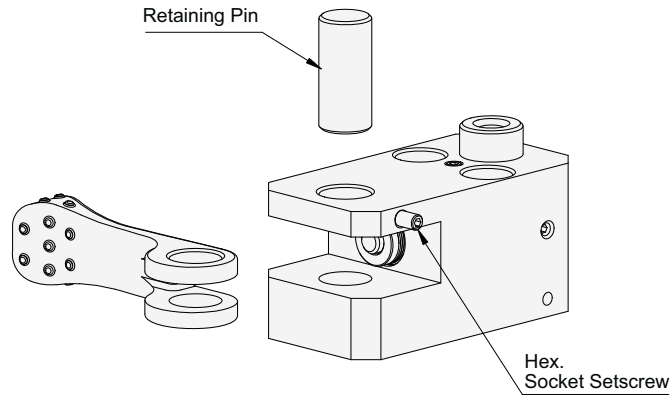
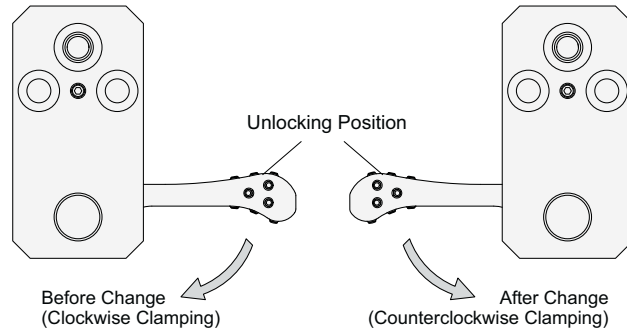
## Adjusting Handle Locking Position

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

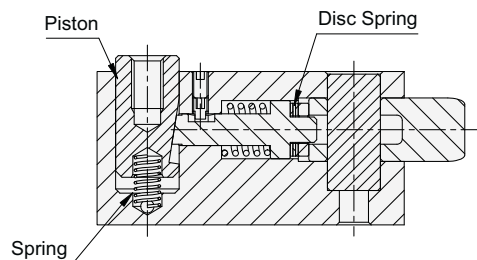


## Changing Clamping Direction

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

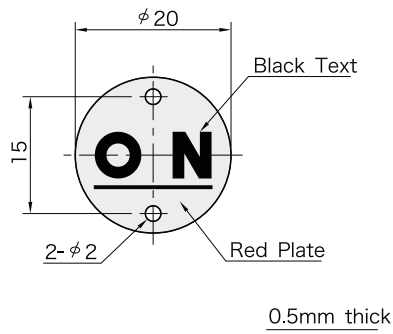


The built-in disc spring prevents loosened locking.



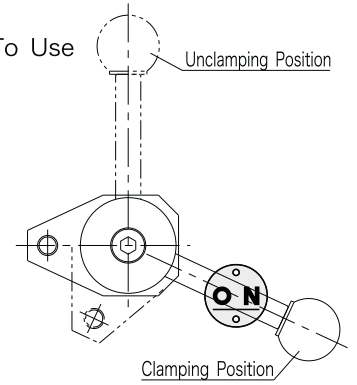


Material: Aluminum



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.

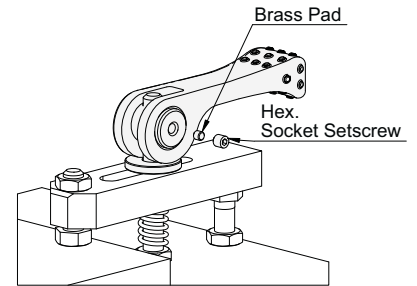
Part Number

**51991147**

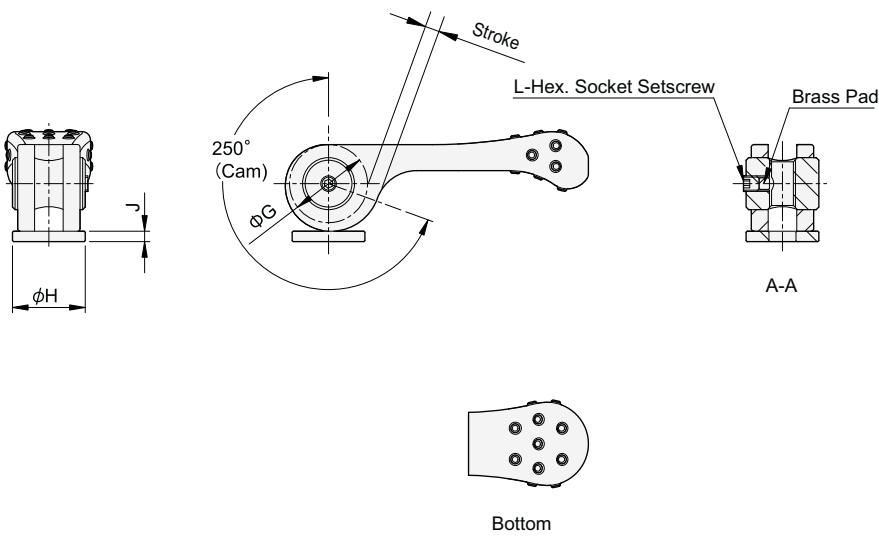
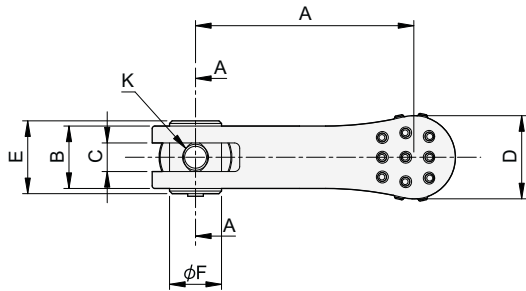


Lever	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered
Ring Nut / Washer	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

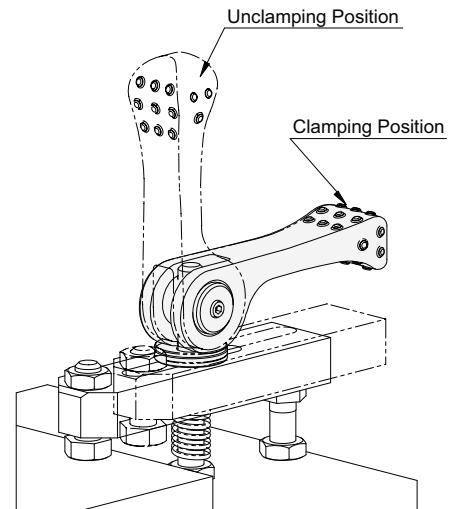
### Installing the cam handle



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



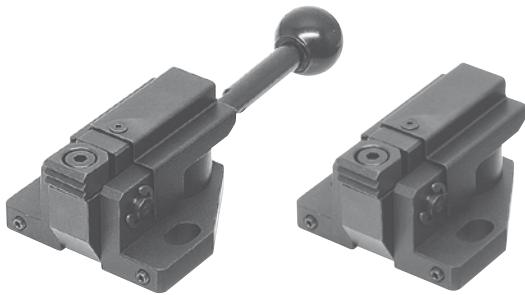
### Application Example



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



With Handle

Without Handle

[Base]  
 Material: S45C steel  
 Finish :Black oxide  
 Heat Treat: Quenched and tempered

[Jaw]  
 Material: SKH51 steel  
 Finish :Black oxide  
 Heat Treat: Quenched and tempered

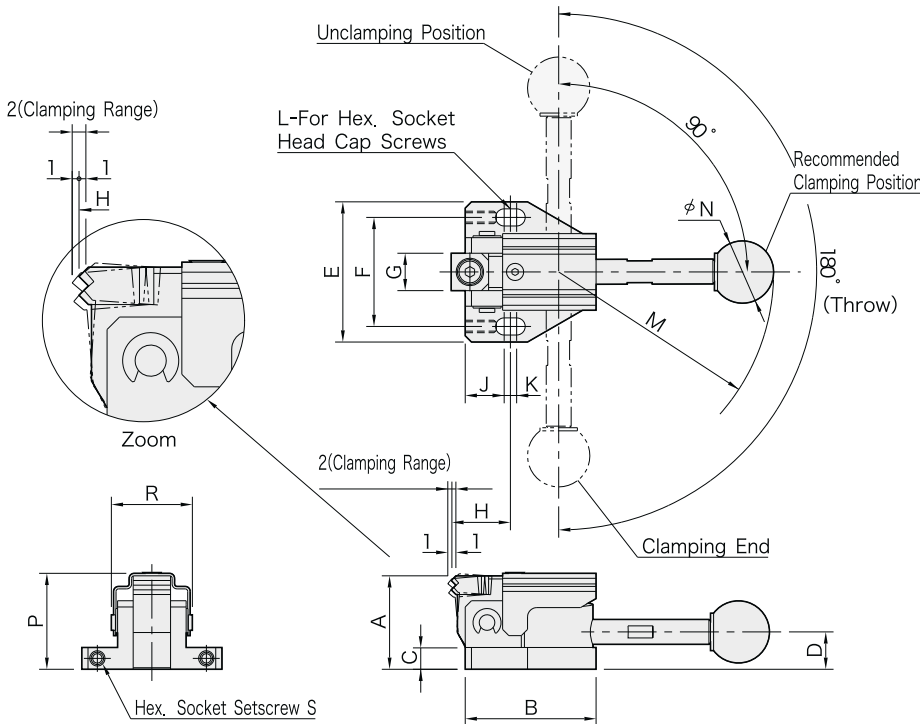
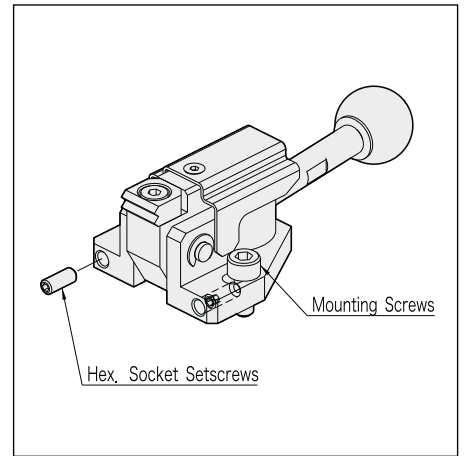
[Cam]  
 Material: SCM440 steel  
 Finish :Black oxide  
 Heat Treat: Quenched and tempered

[Handle]  
 Material: S45C steel  
 Finish :Black oxide

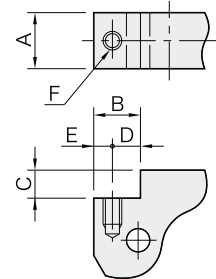
[Ball Knob]  
 Material: ABS resin  
 Color :Black

### 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.

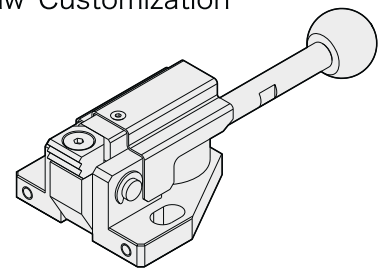


### Dimensions of Jaw Base



Size	A	B	C	D	E	F
<b>QLSC150</b>	12	10	6	6	4	M4x0.7 7 deep
<b>QLSC200</b>	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
<b>QLSC150</b>	30	42	7	12	45	35	12	19	12.5	4	M5	31
<b>QLSC200</b>	40	62	10	16	65	50	16	28	18.5	5	M8	41

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

### With Handle

Part Number	M	N	Allowable Operating Load (N) *)	Weight (g)
<b>51991125</b>	69	20	150	210
<b>51991126</b>	104	25	200	580

### Without Handle

Part Number	Weight (g)
<b>51991127</b>	185
<b>51991128</b>	530

Note: The handle must be ordered separately.

Wide Serrated Jaw

Edged Jaw

Pointed Jaw

Note  
See page 151 and 154 for performance curves.



With Handle

Without Handle

[Cam]  
 Material: SCM440 steel  
 Finish : Black oxide  
 Heat Treat: Quenched  
 and tempered

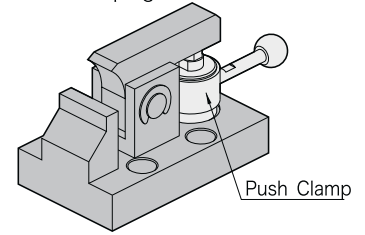
[Piston]  
 Material: S45C steel  
 Finish : Black oxide  
 Heat Treat: Quenched  
 and tempered

[Handle]  
 Material: S45C steel  
 Finish : Black oxide

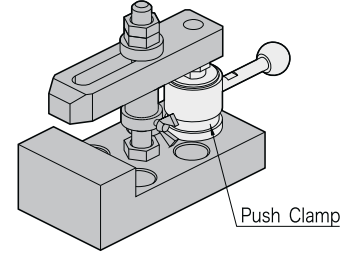
[Ball Knob]  
 Material: ABS resin  
 Color : Black

## Application Examples

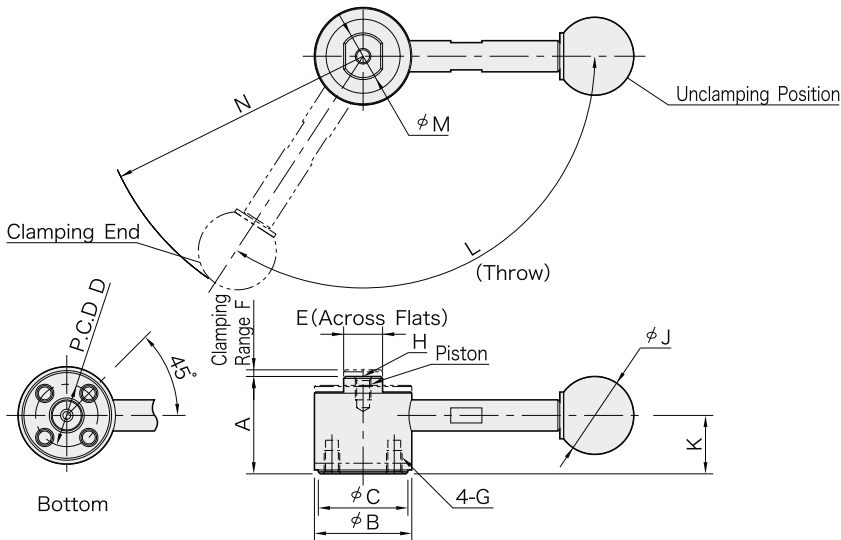
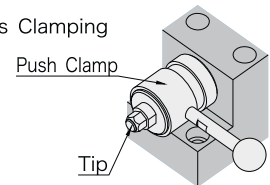
### Downthrust Clamping



### Downward Clamping



### Sideways Clamping



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

### Without Handle

Part Number	Weight (g)
51991131	150
51991132	310

Note: The handle must be ordered separately.

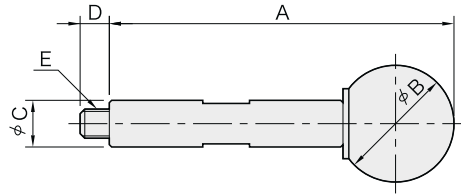
\*) Allowable load to operate the handle

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

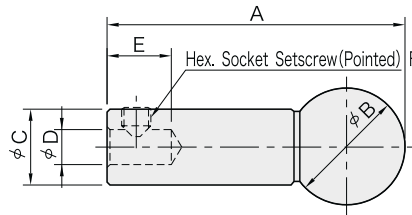
Note : See page 151 and 154 for performance curves.



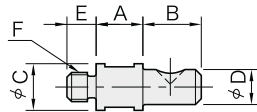
**QLSL (Screw-In Handles)**  
 [Handle]  
 Material: S45C steel  
 Finish : Black oxide  
 [Ball Knob]  
 Material: ABS resin  
 Color : Black



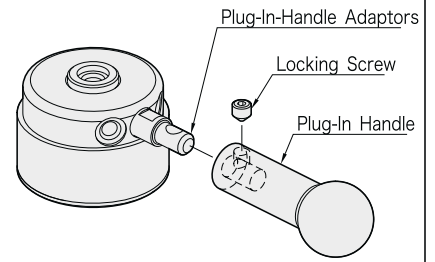
**QLSL-RL (Plug-In Handles)**  
 [Handle]  
 Material: S45C steel  
 Finish : Black oxide  
 [Ball Knob]  
 Material: ABS resin  
 Color : Black



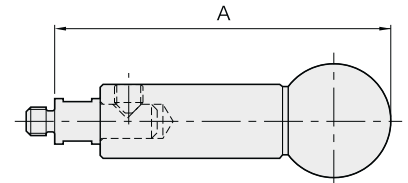
**QLSL-RA (Plug-In-Handle Adaptors)**  
 Material: SCM435 steel  
 Finish: Black oxide  
 Heat Treat: Quenched and tempered



### 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
<b>QLSL150</b>	59
<b>QLSL200</b>	89

### QLSL (Screw-in Handles)

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

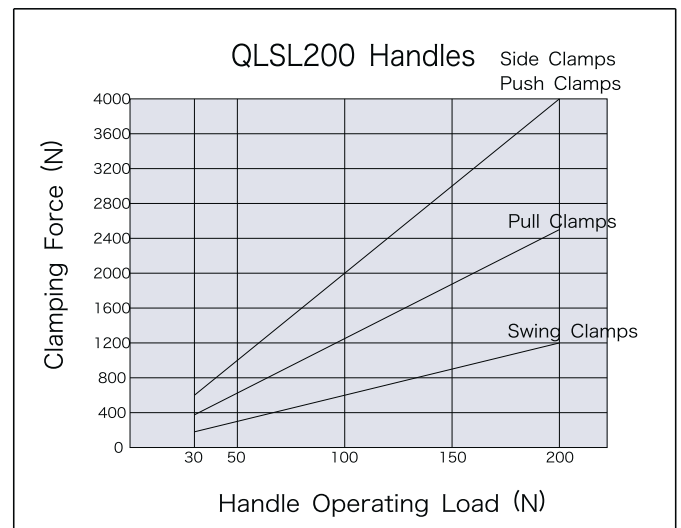
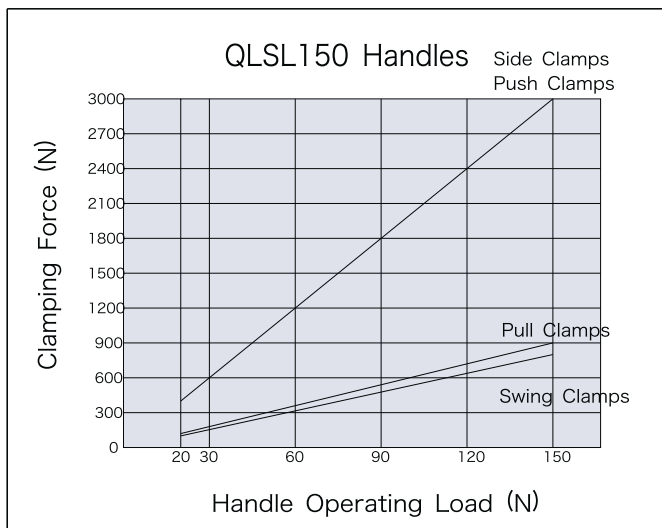
### QLSL-RL (Plug-In Handles)

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

### QLSL-RA (Plug-In-Handle Adaptors)

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

### Performance Curves





QLTL (Screw-In Handles)



QLTL-RL (Plug-In Handles)



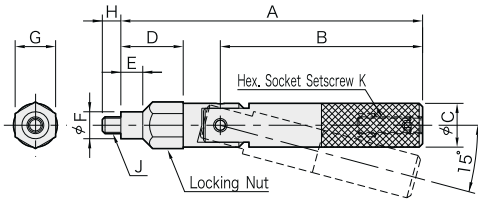
QLTL-RA (Plug-In-Handle Adaptors)

[Stem]  
Material: SCM435 steel  
Finish : Black oxide  
Heat Treat: Quenched and tempered

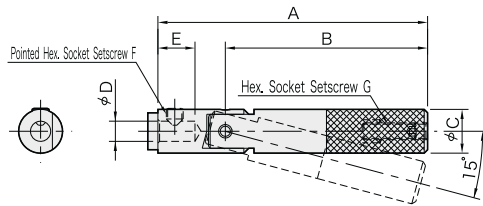
[Locking Nut]  
Material: S45C steel  
Finish : Black oxide

[Handle]  
Material: S45C steel  
Finish : Black oxide  
Heat Treat: Quenched and tempered

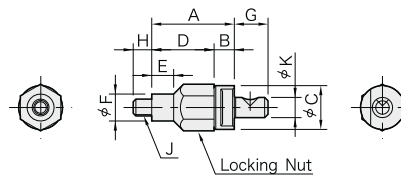
QLTL (Screw-In Handles)



QLTL-RL (Plug-In Handles)

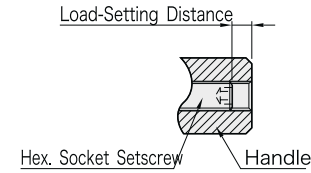


QLTL-RA (Plug-In-Handle Adaptors)



## How To Use

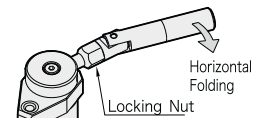
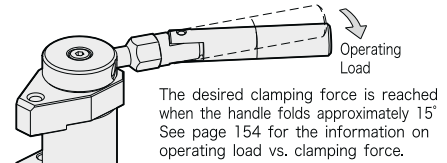
Turning the setscrew inside the handle allows adjusting the torque to set a desired clamping force.



### [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.



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)

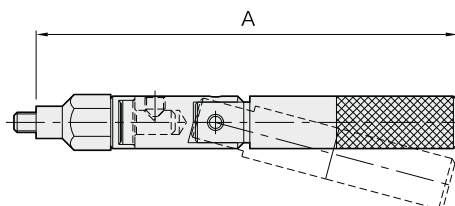
Part Number	A	B	C	D	E	F	G	Weight (g)
51991143	80	60	13	6	11	M5x0.8-5L	M5x0.8-16L	70
51991144	107	84	15	8	13	M6x1 -6L	M6x1 -20L	130

### QLTL-RA (Plug-In-Handle Adaptors)

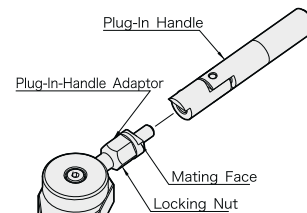
Part Number	A	B	C	D	E	F	G	H	J	K	Weight (g)
51991145	24.5	6	13	18.5	6.5	8	10	5.5	M5x0.8	6	20
51991146	30	7	15	23	8	10	12	6.5	M6x1	8	40

## Plug-In Handle Coupled with the Adaptor

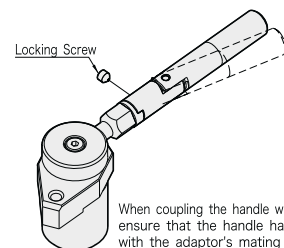
Part Number	A
51991143	104.5
51991145	
51991144	137
51991146	



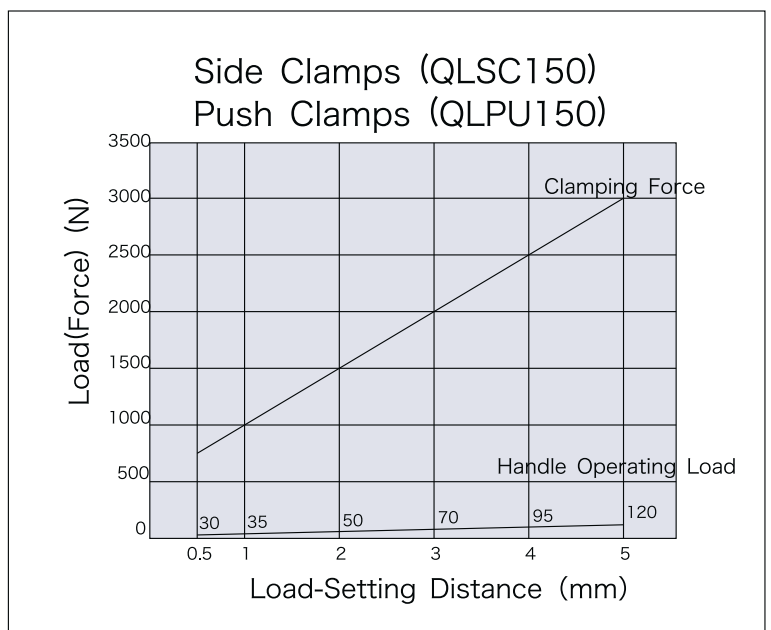
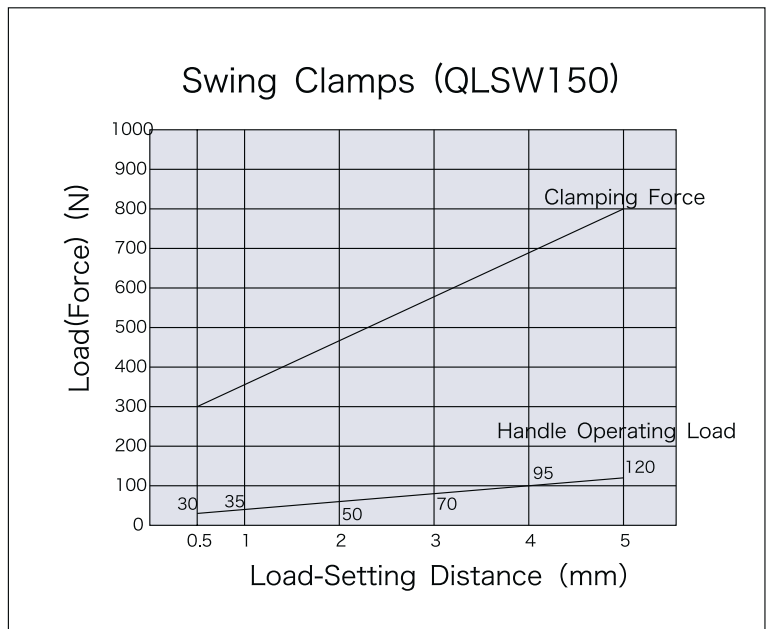
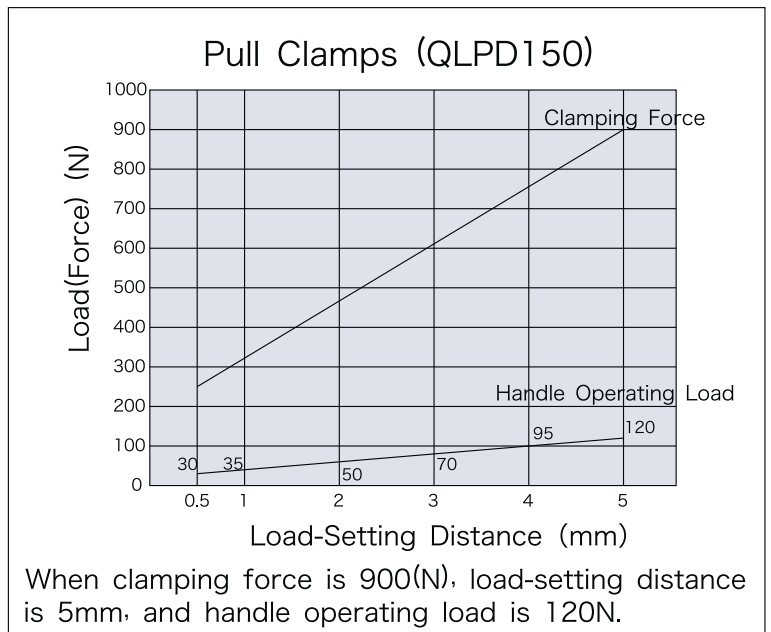
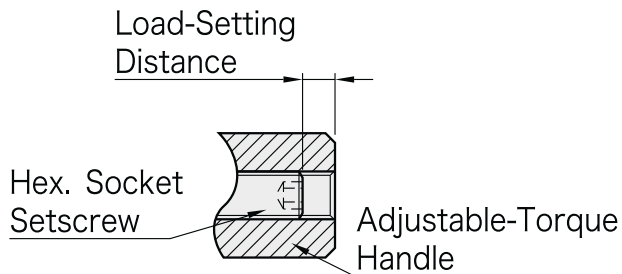
### Plug-In Handle Installation



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



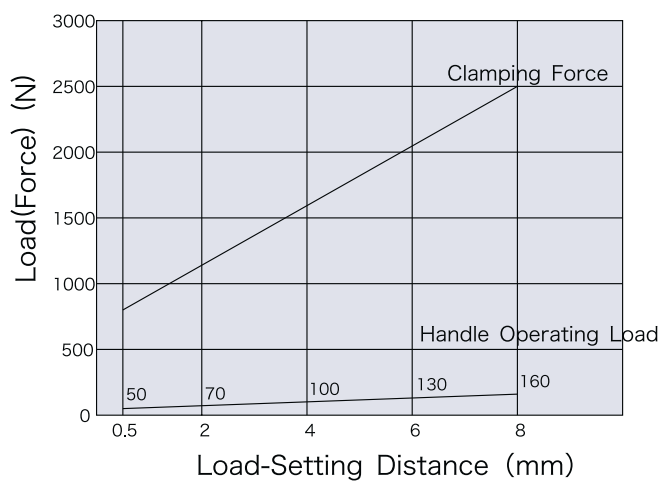
# Performance Curves



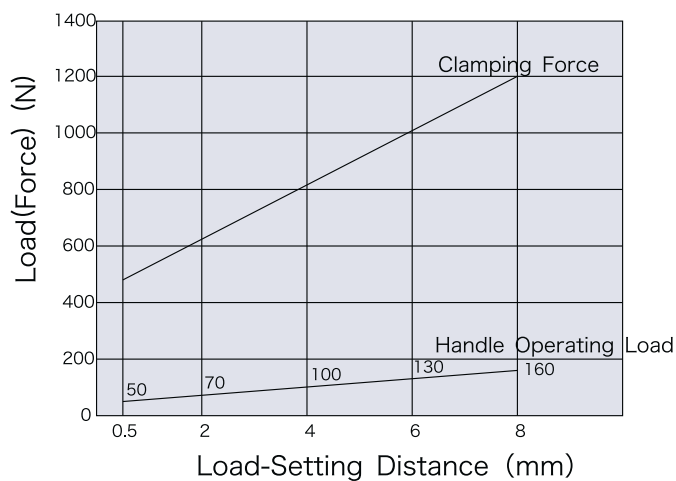
Note : The above performance curves apply when clamps are degreased.



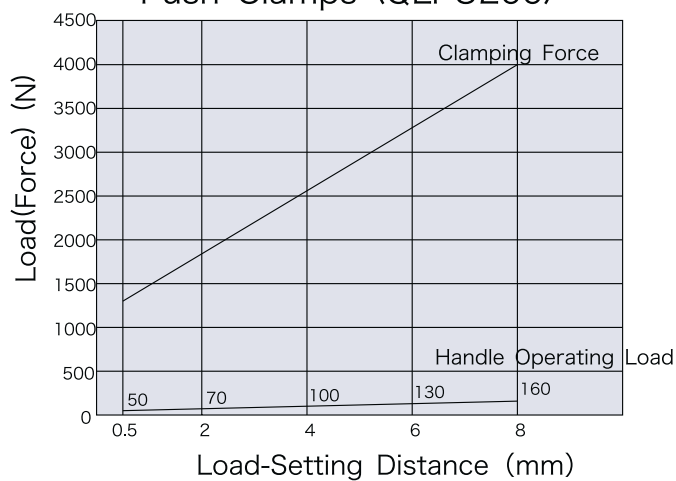
### Pull Clamps (QLPD200)



### Swing Clamps (QLSW200)



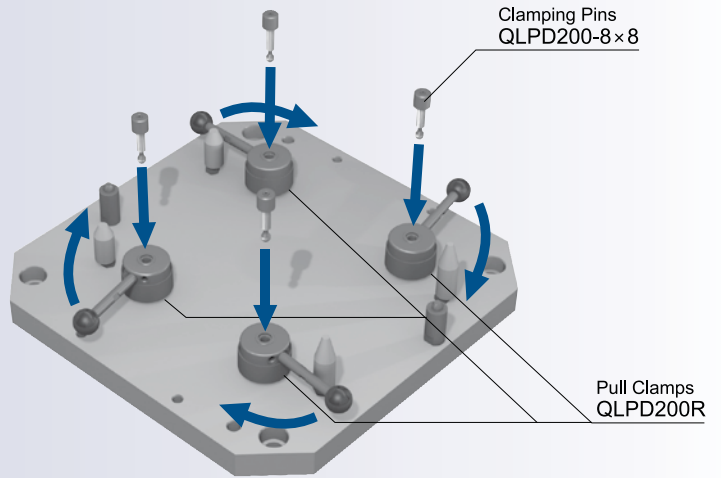
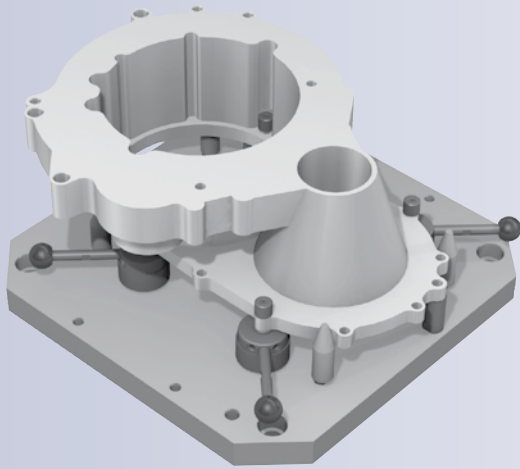
### Side Clamps (QLSC200) Push Clamps (QLPU200)



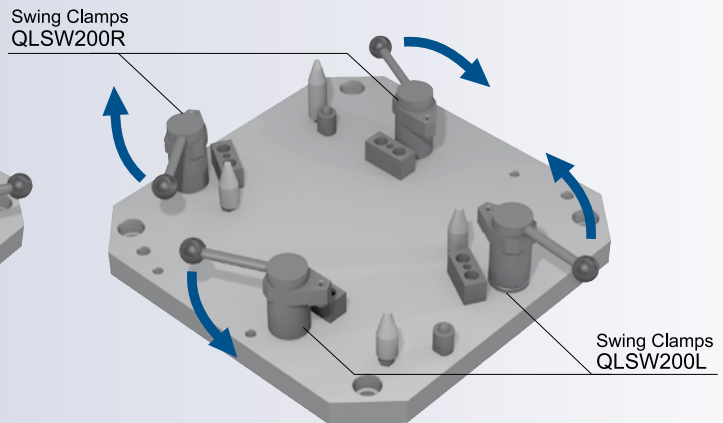
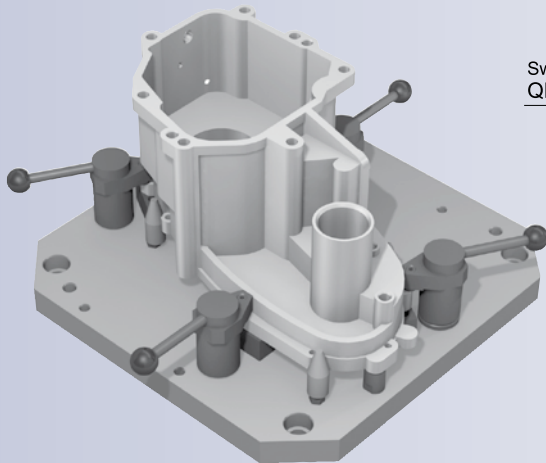
Note : The above performance curves apply when clamps are degreased.

# APPLICATION EXAMPLES

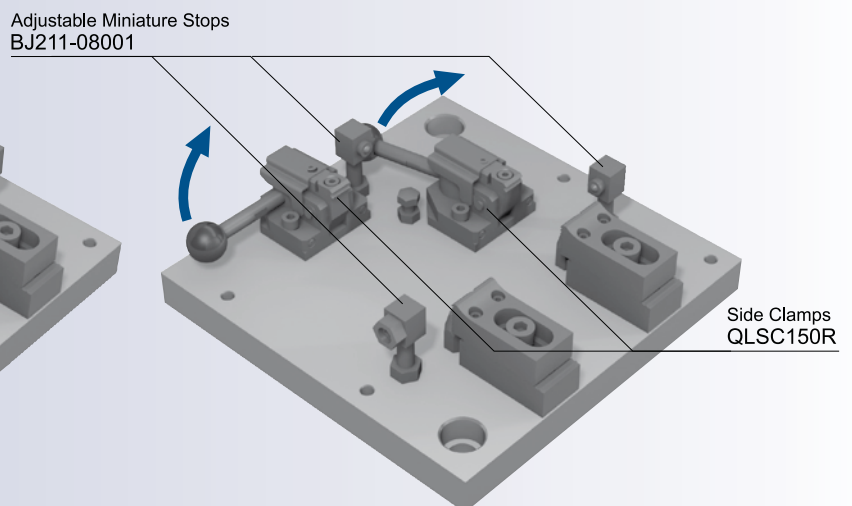
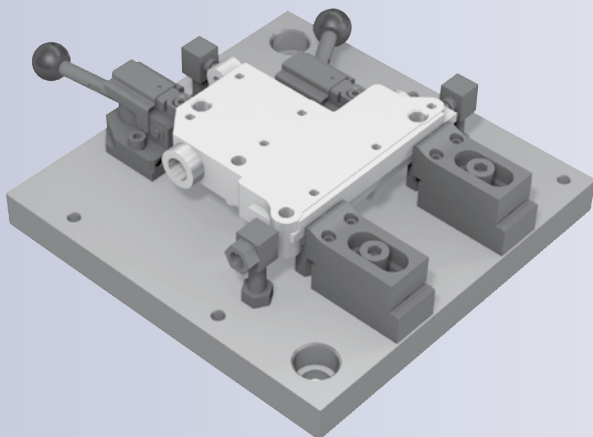
## Pull Clamps



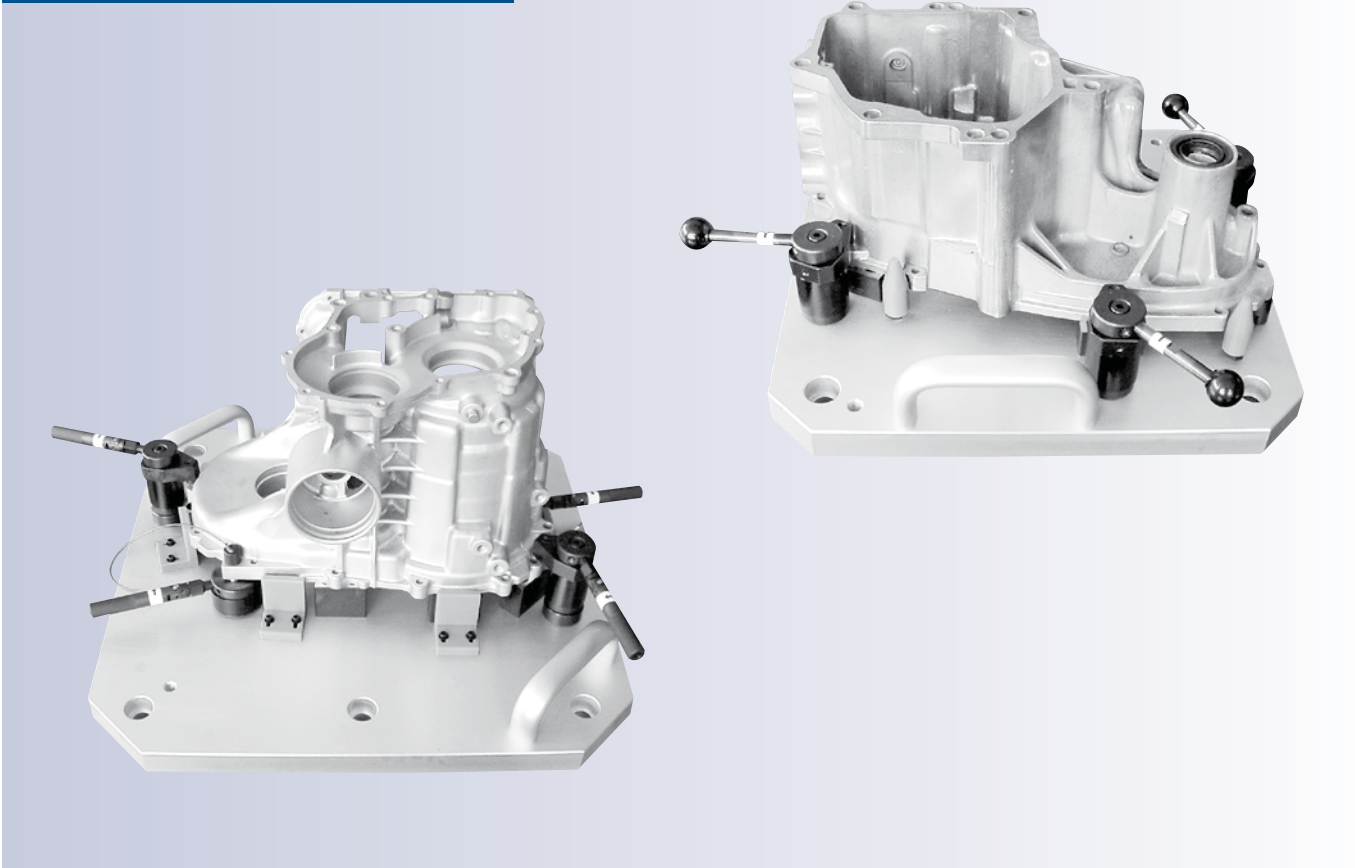
## Swing Clamps



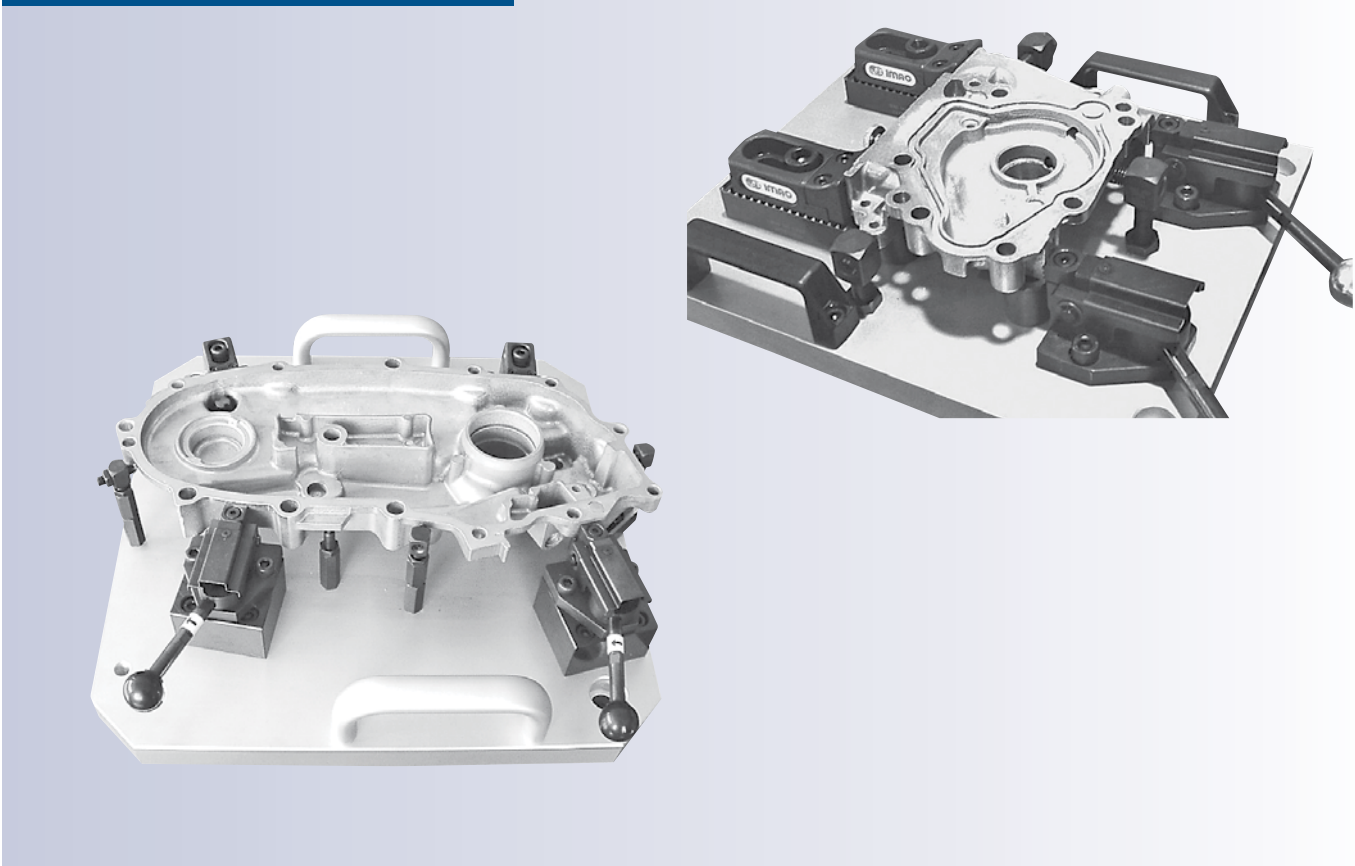
## Side Clamps



## Actual Applications of Swing Clamps



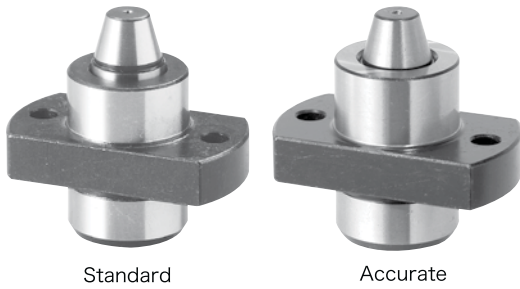
## Actual Applications of Side Clamps



# CP710

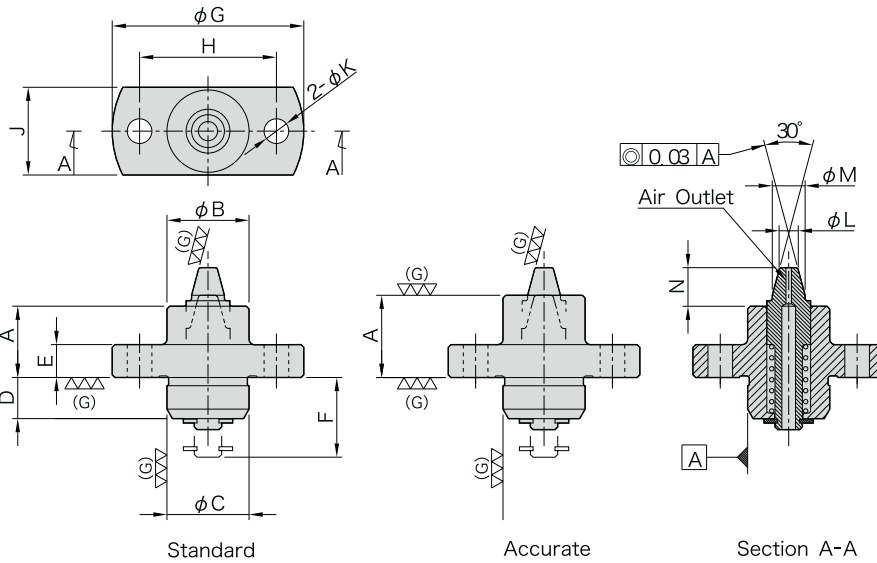
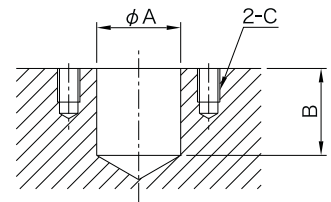
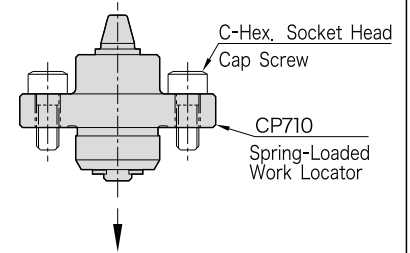
# SPRING-LOADED WORK LOCATORS

**NEW**



[Body]  
 Material: S45C steel  
 Finish : 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
<b>51991521</b> <b>51991522</b>	15 (H7-effective depth: 8)	16	M4x0.7
<b>51991523</b> <b>51991524</b>	20 (H7-effective depth: 10)	21	M4x0.7
<b>51991527</b> <b>51991528</b>			

### Standard

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

Part Number	N	Locating Hole Dia. *)	Support Capacity (N)	Weight (g)
<b>51991521</b>	7.4	$\phi 3.8$ to $\phi 5.2$	6.4 to 19.3	45
<b>51991522</b>		$\phi 4.8$ to $\phi 6.2$		45
<b>51991523</b>	9.3	$\phi 5.8$ to $\phi 8.2$	5.5 to 20.5	95
<b>51991524</b>		$\phi 7.8$ to $\phi 10.2$		95

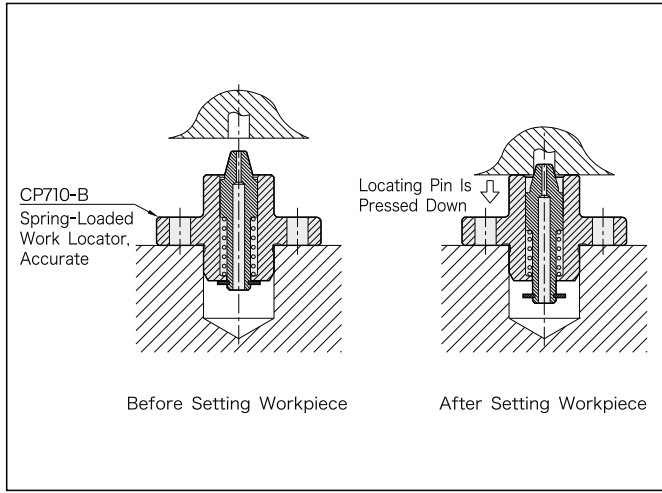
### Accurate

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

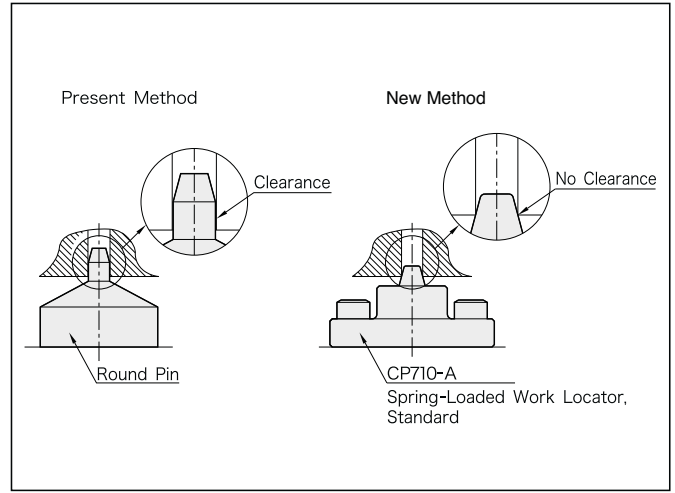
Part Number	N	Locating Hole Dia. *)	Support Capacity (N)	Weight (g)
<b>51991525</b>	5.4	$\phi 3.8$ to $\phi 5.2$	6.4 to 19.3	50
<b>51991526</b>		$\phi 4.8$ to $\phi 6.2$		50
<b>51991527</b>	7.3	$\phi 5.8$ to $\phi 8.2$	5.5 to 20.5	100
<b>51991528</b>		$\phi 7.8$ to $\phi 10.2$		100

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

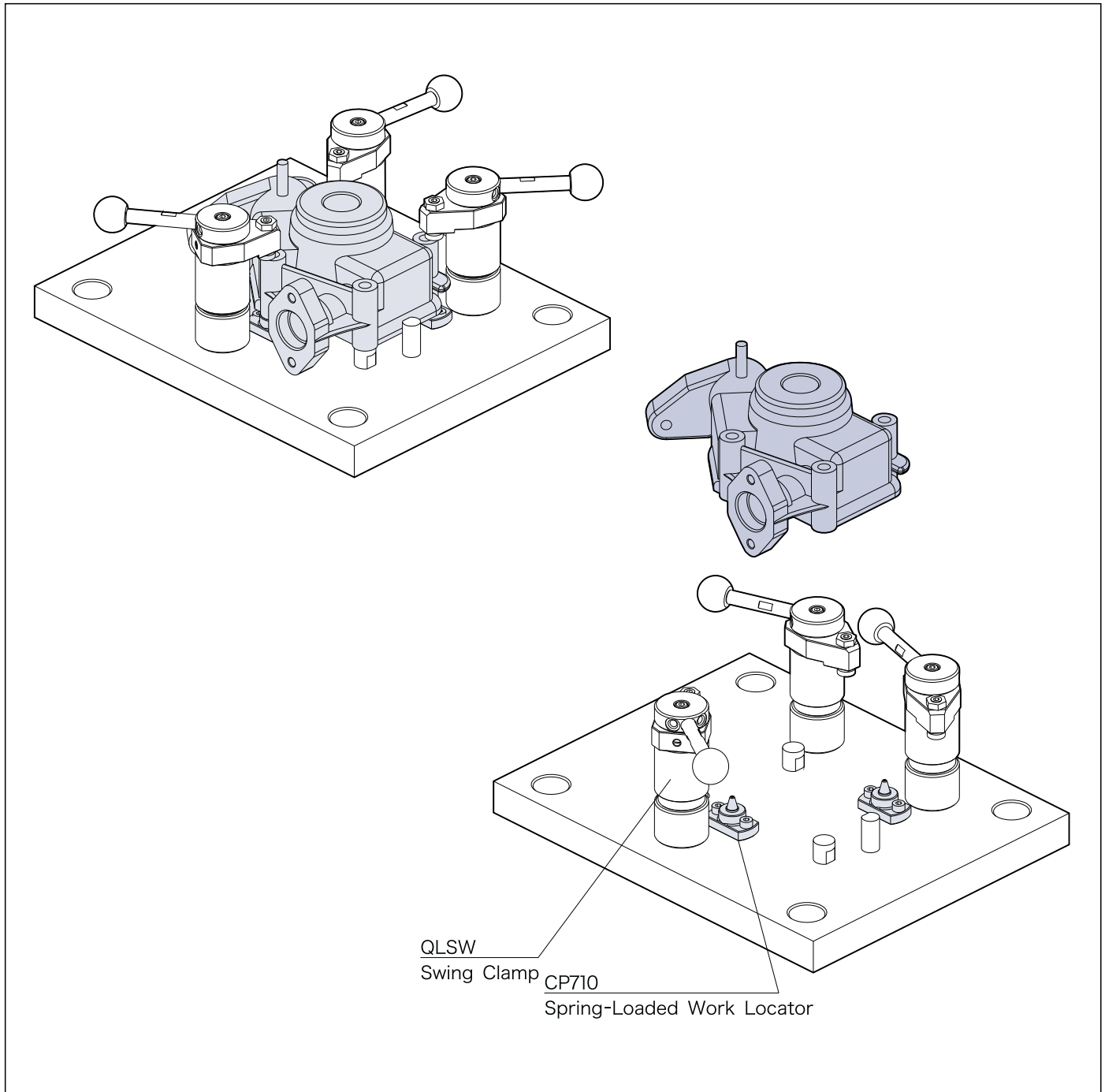
How To Use



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.

**NEW**



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

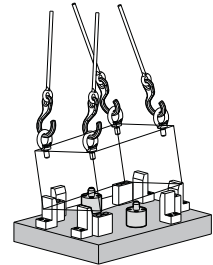
[Piston]  
Material: SCM440 steel  
Finish : Black oxide  
Heat Treat: Quenched and tempered

[Handle]  
Material: S45C steel  
Finish : Black oxide

[Ball Knob]  
Material: ABS resin  
Color : Black

### How To Use

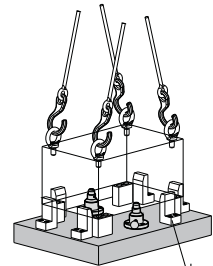
#### Present Method



Galling and damage caused

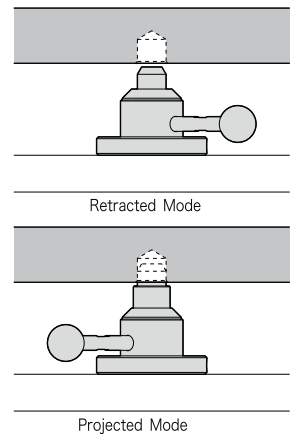
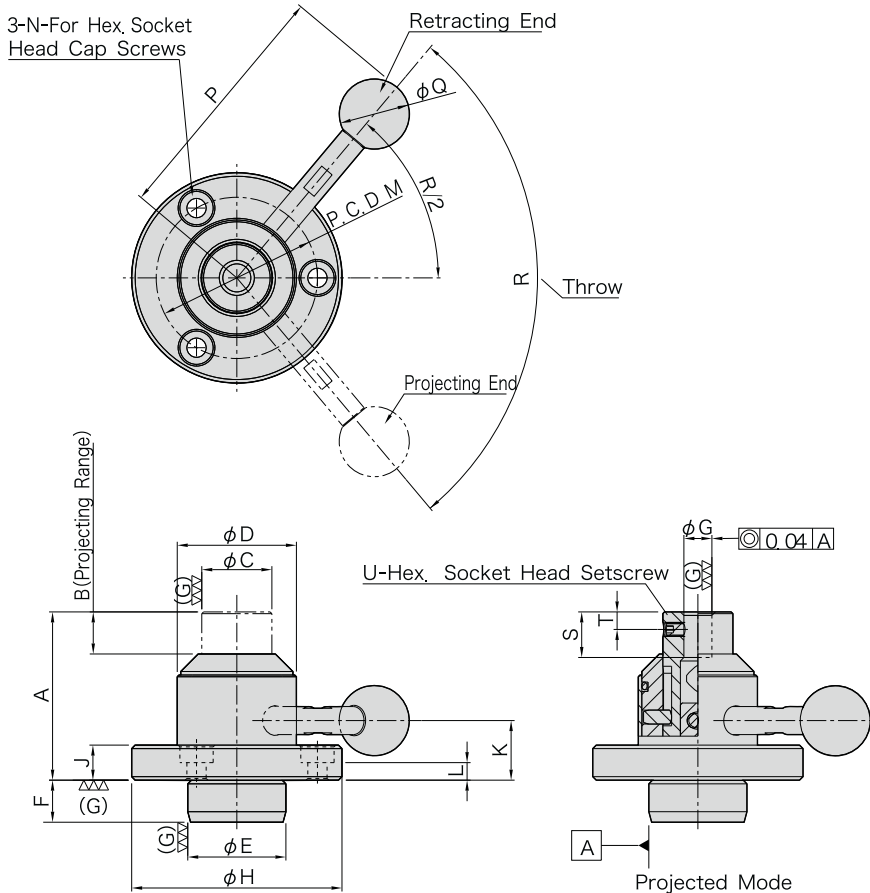


#### Our Method



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.

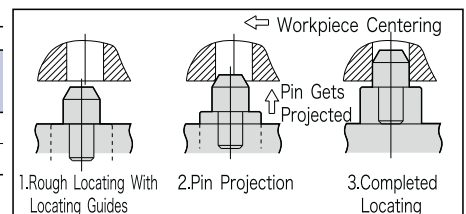


Part Number	A	B	C	D	E (g6)	F	G (G7)	H	J	K	L	M (P, C, D)	N	P
51991529	48	12	20	34	28	12	8	60	10	17	5	46	M5	71
51991530	61	15	30	48	42	14	12	80	13	23	7	63	M6	94

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



**NEW**

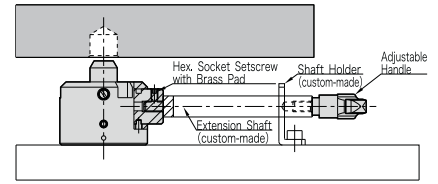


[Body & Piston]  
 Material: S45C steel  
 Finish : Black oxide  
 Heat Treat: Quenched and tempered

[Crank shaft]  
 Material: S45C steel  
 Color : Black

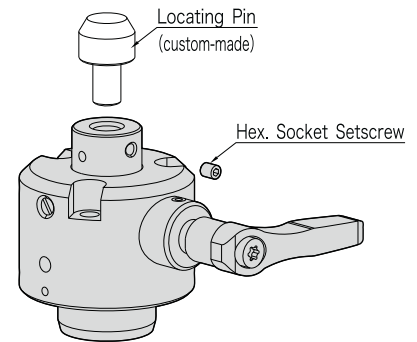
### How To Use

#### 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.

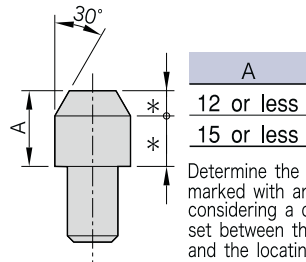
#### Locating-Pin Mounting



#### 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).

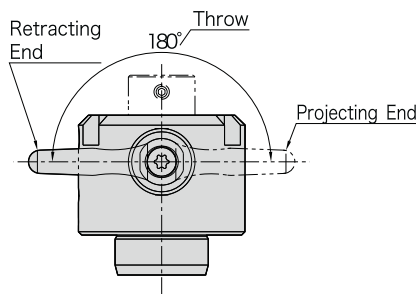
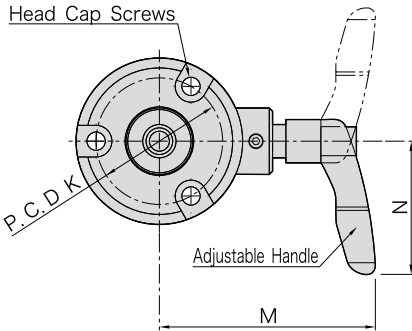
#### Locating-Pin Head Dimensions



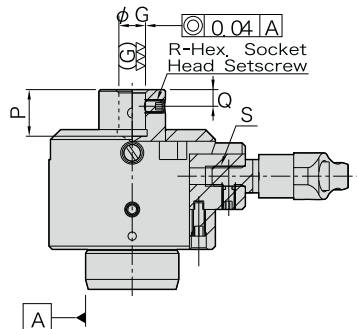
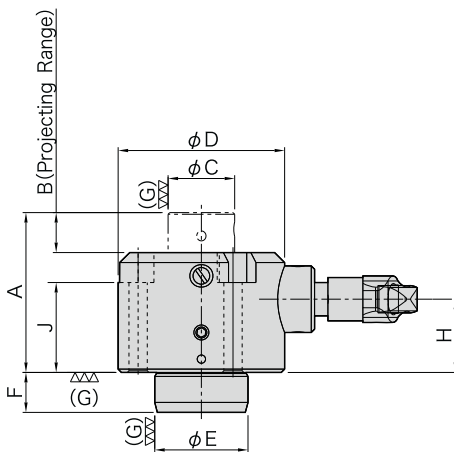
**A**  
 12 or less  
 15 or less

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.

3-L-For Hex. Socket Head Cap Screws



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



#### Projected Mode

Part Number	A	B	C	D	E (g6)	F	G (G7)	H	J	K (P, C, D)	L	M	N	P
<b>51991533</b>	48	12	20	50	28	12	8	22	27	38	M5	65	40	14
<b>51991534</b>	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)
<b>51991533</b>	5	M4x0.7-5L	M6x1 12 deep	FKR6X10-BR	170	250	0.59
<b>51991534</b>	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

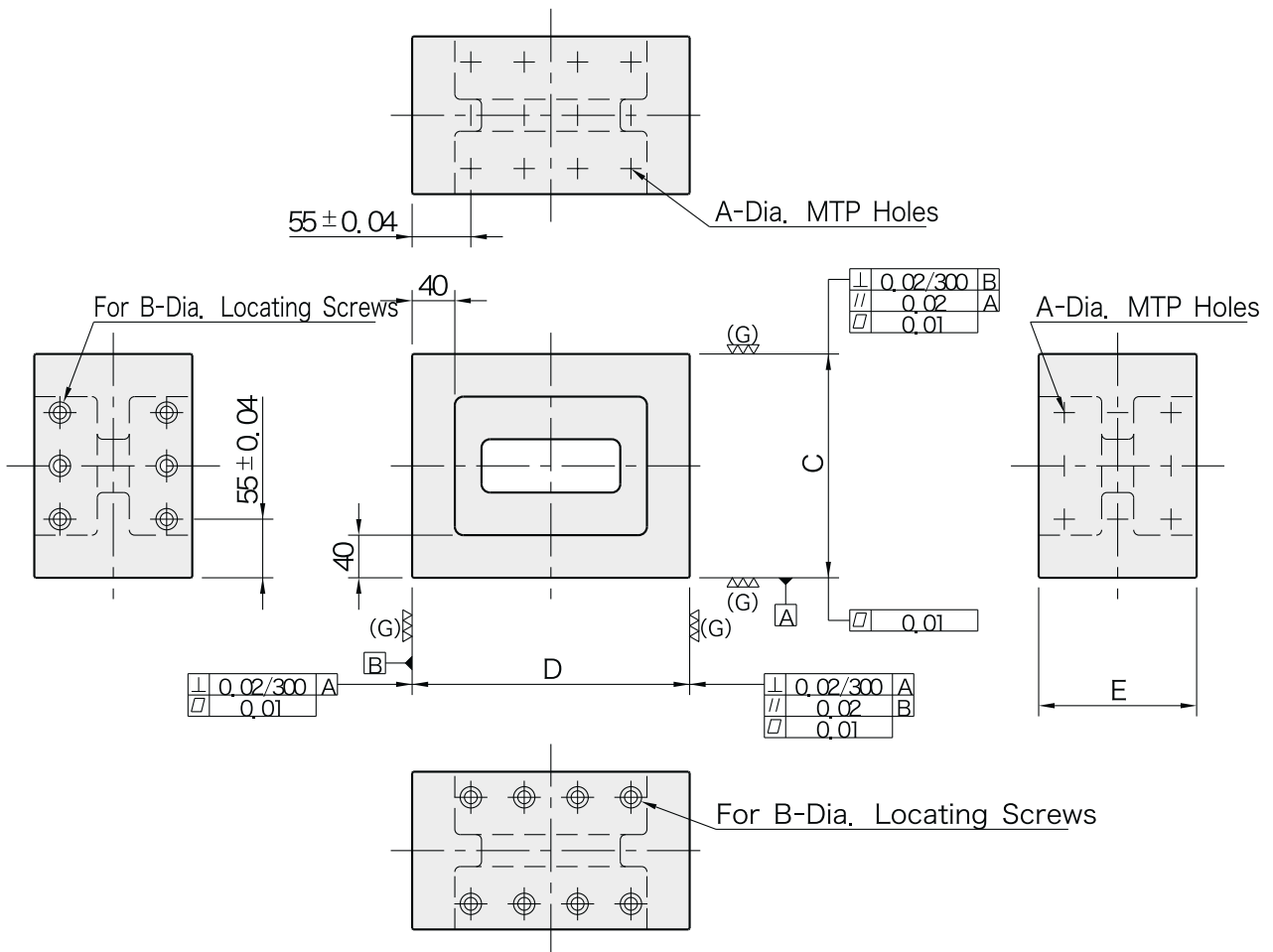
- Can support heavy workpieces made from steel or cast iron
- No tools needed
- Different locating pins can be mounted depending on workpiece's locating holes.
- The piston stays locked when it is fully projected or retracted until the handle is operated again.



[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 (F7)	C (±0.02)	D (±0.02)	E	No. of MTP Holes	No. of Mounting Holes	Proper Locating Screws Cod.	Weight (kg)
	(F7)	(Thread)								
<b>51991535</b>	12	M12x1.75	12	160	210	148	15	10	<b>51991863</b>	26
<b>51991536</b>				210	260					37
<b>51991537</b>	16	M16x2	16	160	210	148	15	10	<b>51991865</b>	25
<b>51991538</b>				210	260					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

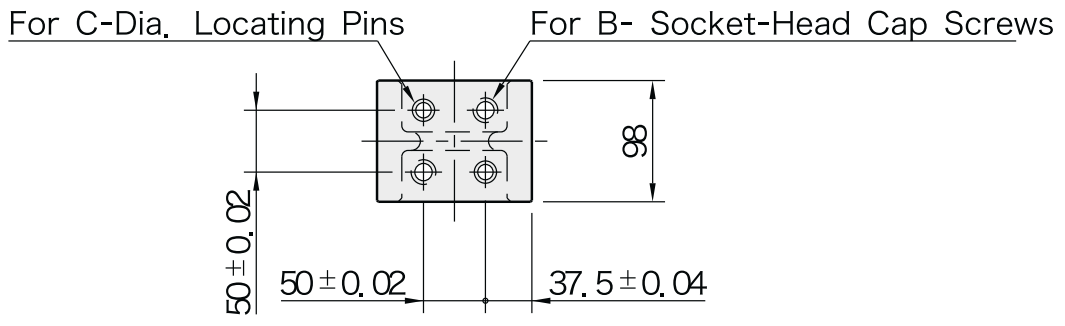
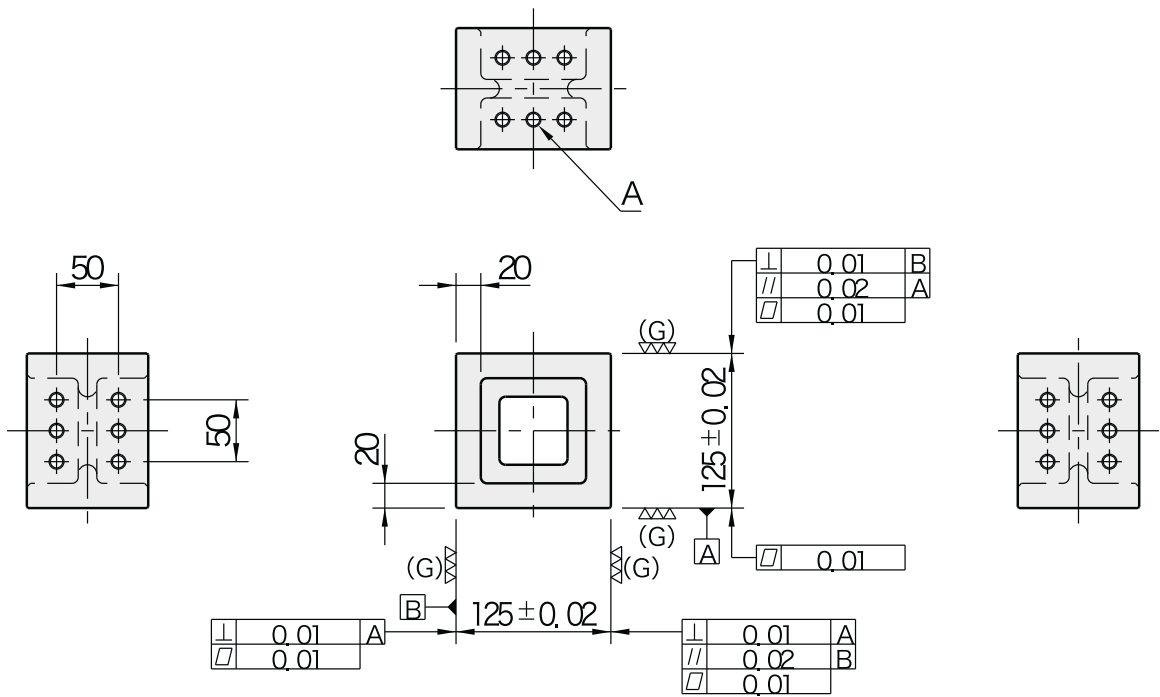




[Body]  
 Material:FC300 cast iron  
 Annealed  
 Precision ground

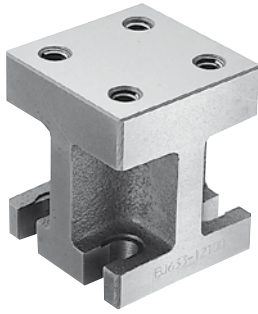
[Alignment Bushing]  
 Material:SUJ2 steel  
 Heat treated

[Threaded Insert]  
 Material:S45C steel  
 Heat treated



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

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

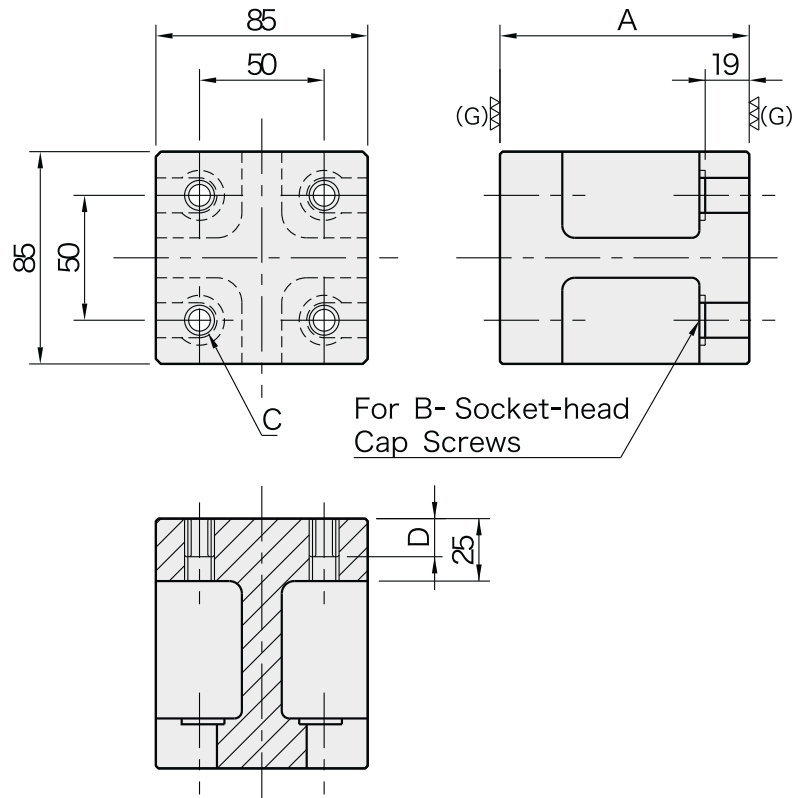


**[Body]**

- Material : FC300 cast iron
- Annealed
- Precision ground

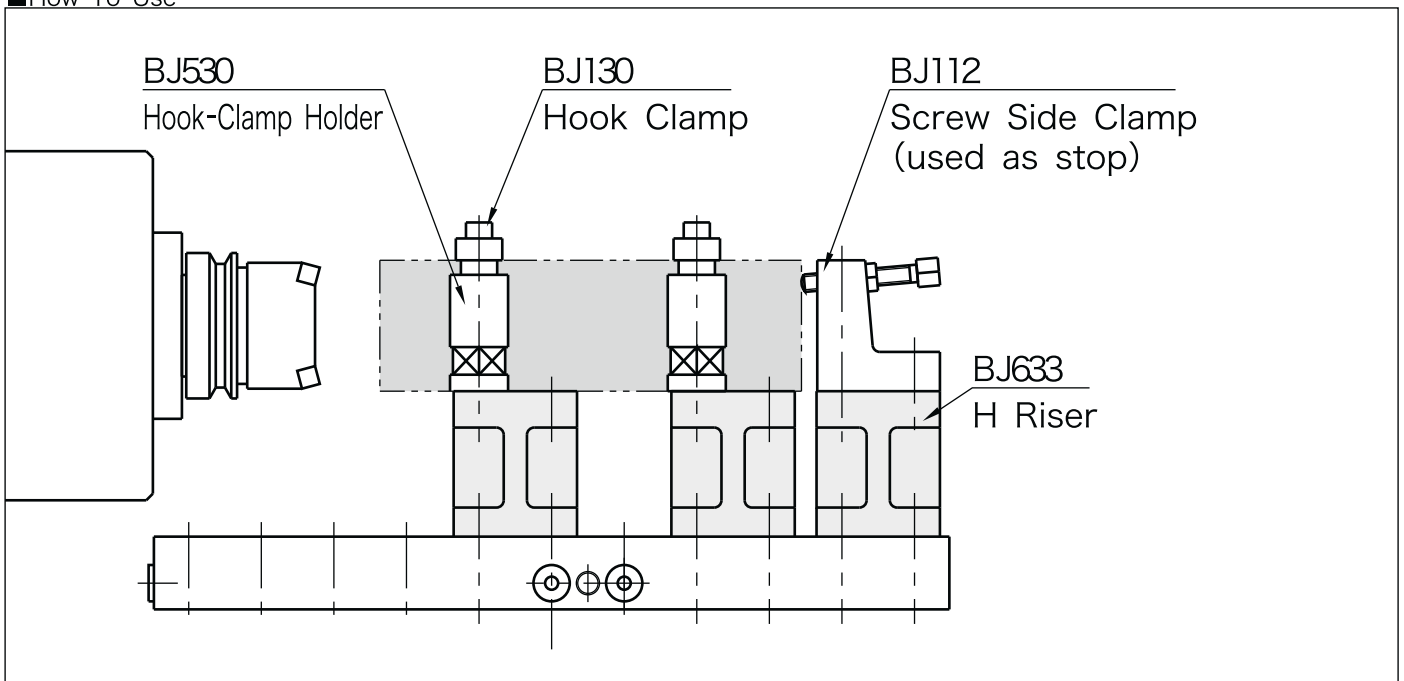
**[Threaded Insert]**

- Material : S45C steel
- Heat treated

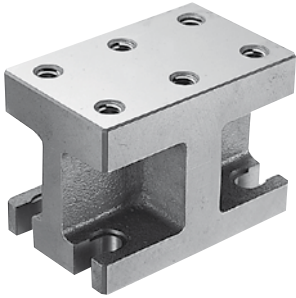


Part Number	A (±0,01)	B	C	D	Weight (kg)
<b>51991543</b>	100	M16	M16×2	16	3.2
<b>51991544</b>	125				3.8

**■ How To Use**



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

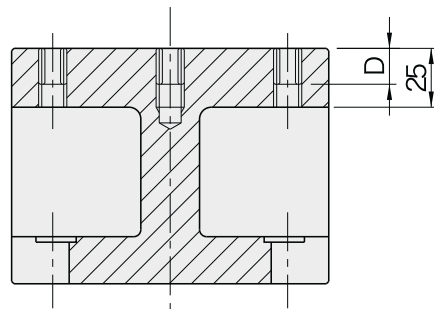
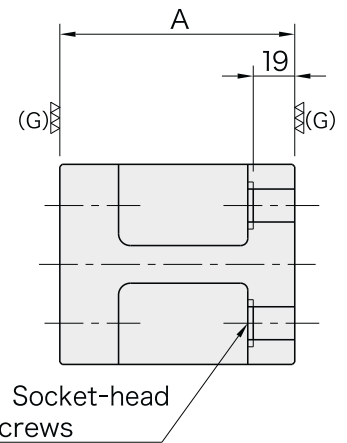
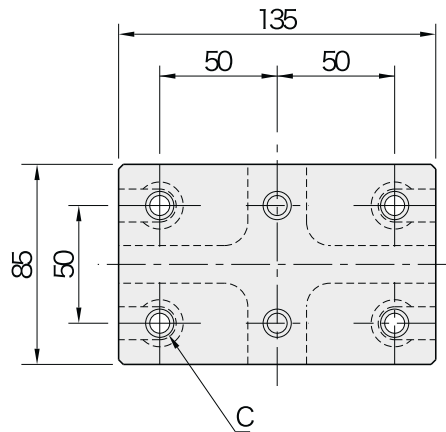


**【Body】**

- Material : FC300 cast iron
- Annealed
- Precision ground

**【Threaded Insert】**

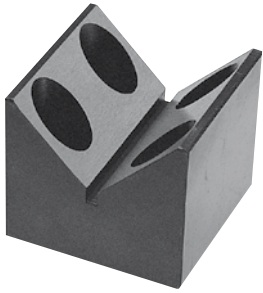
- Material : S45C steel
- Heat treated



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

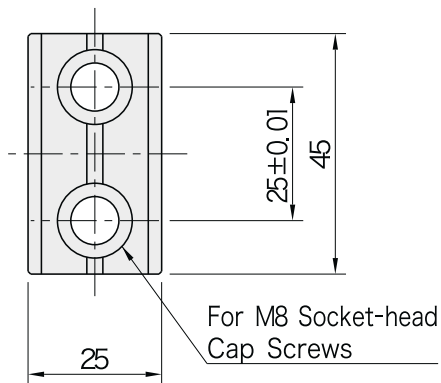
# BJ440(Mini)

# V BLOCKS

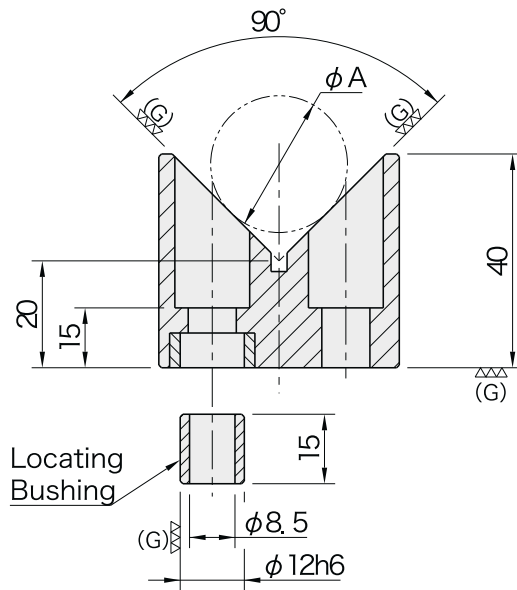
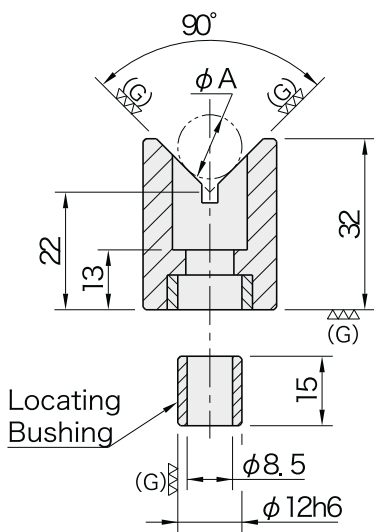
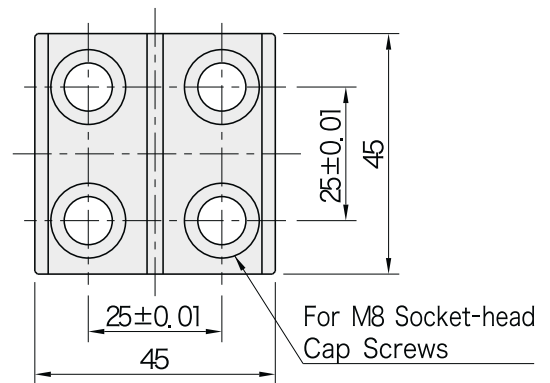


- Material : S45C steel
- Heat treated
- Black oxide finish
- Precision ground

**BJ440-08032**



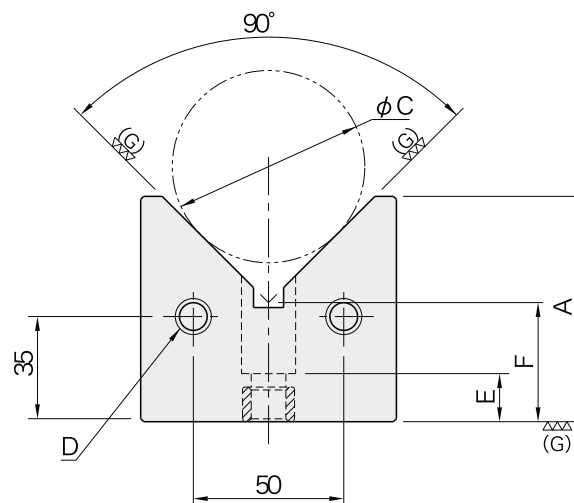
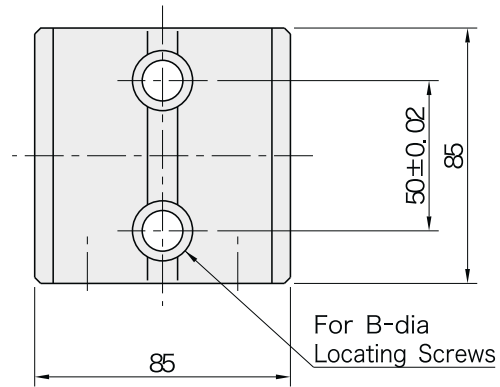
**BJ440-08040**



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



- 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	15	80	M16×2 35 deep	25	34.72
51991554	75			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

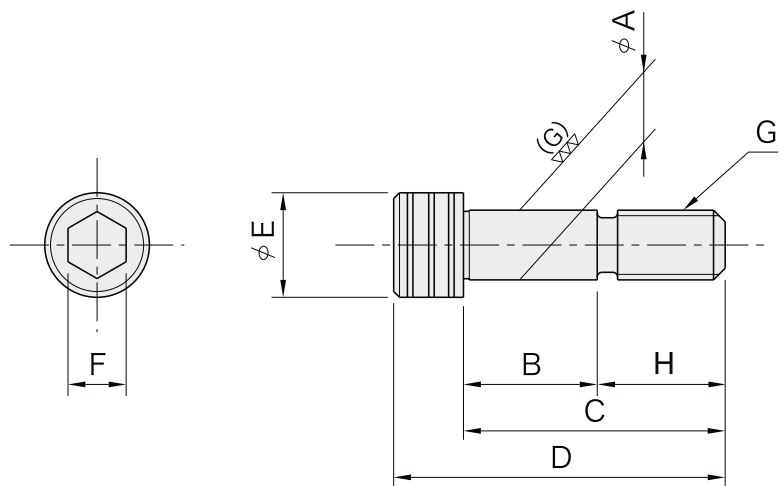
- Replacement protection plugs.
- Use to keep chips and dirt out of unused MTP holes.

# BJ701

# HIGH PRECISION LOCATING SCREW



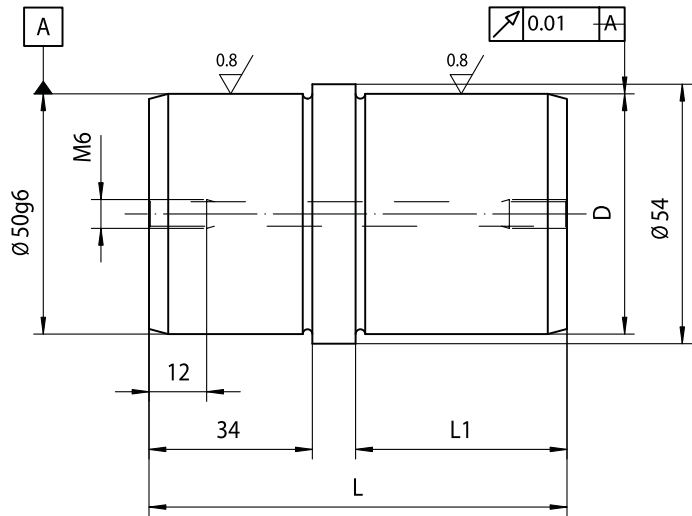
Material:SCM435 steel  
Heat treated  
Black oxide finish  
Precision ground



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

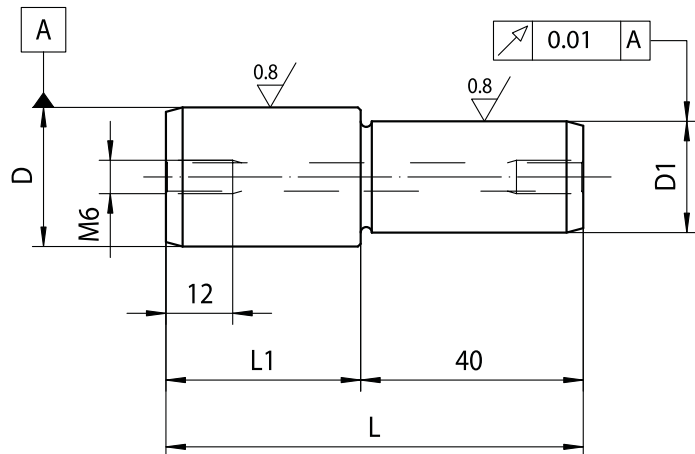
\* - 0,005  
- 0,013

# CENTERING PIN



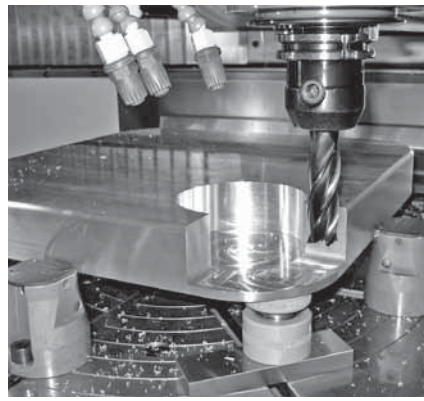
Part Number	D <sub>g6</sub>	L	L1	Weight (Kg)
57001051	25	77	34	0.81
57001052	40	87	44	1.12
57001053	50	87	44	1.36

# CENTERING PIN FOR ALIGNING HOLE



Part Number	D <sub>g6</sub>	D1 <sub>g6</sub>	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

# EDGE CLAMP



## Edge clamp


M12x14, complete with M12 mounting.

Body is made of case-hardened steel and blued.

Clamping hook is made of case-hardened steel and blued.

Tightening torque 75 Nm.

Mounted using strength grade 10.9 screws.

Order no.	Size		H ± 0,1	G	F1 [kN]	F2 [kN]	Weight [g]
58990101	M12x14	14	65	M12	12	5	1530

Special versions (dimension H ±0.01) are available on request

## Use:

The mechanical side clamp with holddown effect can be used as a clamping element and as a fixed stop.

Moving the adjusting bolt causes hook ends to clamp the workpiece. At the same time, a pull-down effect occurs on the contact surface.

Attaching a lateral stop enables the workpiece to be repeatedly clamped.

When used in conjunction with base plate 58990103, the side clamp can also be placed across the table groove.

In conjunction with round base plate 58990102, only along the table groove.

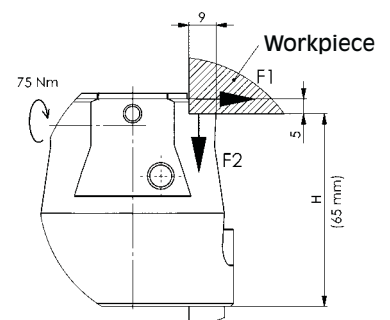
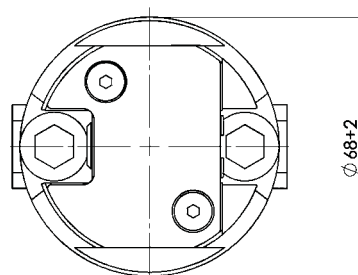
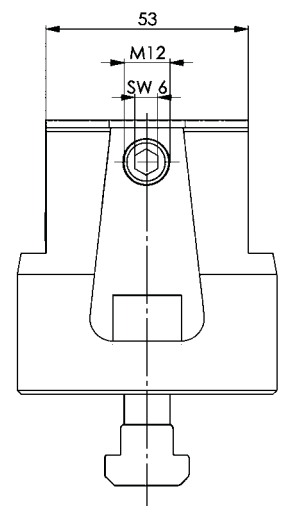
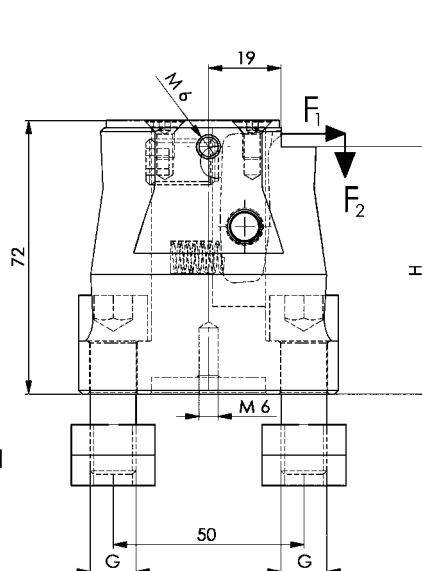
## Advantages:

- compact dimensions
- workpiece fastened rigid and secure through pull-down effect
- plate tension increased to make holes and grooves
- lateral plate tension to completely finish surfaces without collision contour
- lateral thread enables a stop to be fastened
- can be used for horizontal and vertical applications
- reduced tooling time and tool elements cuts tooling costs
- diverse and variable applications

## Note:

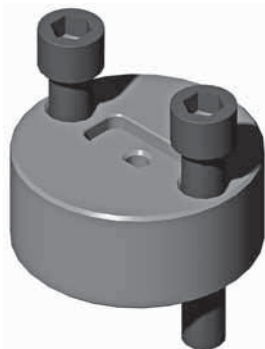
Flat sliding block 58990104

Enables the side clamp to be accurately positioned in the machine table groove.





## BASE PLATE, ROUND



### Base plate, round

M12x14, complete with fixing screws.  
Housing from hardened, nitride steel.  
Fastened with screws of strength class 10.9.

### Use:

Used in conjunction with side clamp 58990101 to clamp slot the table groove.

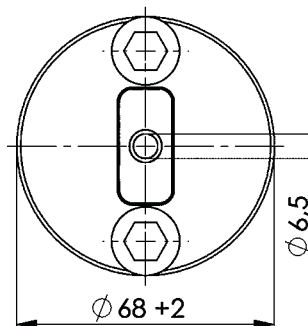
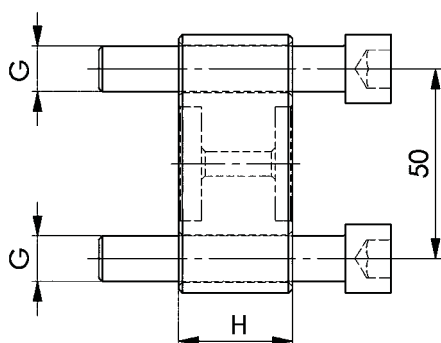
### Advantages:

- clamping along the groove achieved with the side clamp only
- workpiece mounting surface increased by 30 mm.
- same external diameter as side clamp 58990101

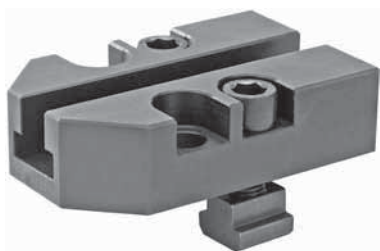
### Note:

Flat sliding block 58990104  
Enables the side clamp with round base plate to be accurately positioned in the machine table groove.

Order no.	Size		H	G	Weight [g]
58990102	M12x14	14	30	M12	910



## BASE PLATE



### Base plate

M12x14, complete with M12 mounting.  
Body is made of hardened and tempered alloy steel,  
Mounted using strength grade 10.9 screws.

### Use:

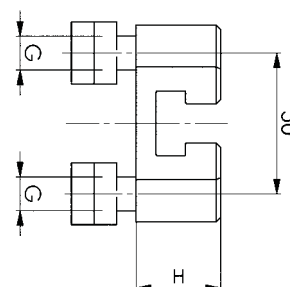
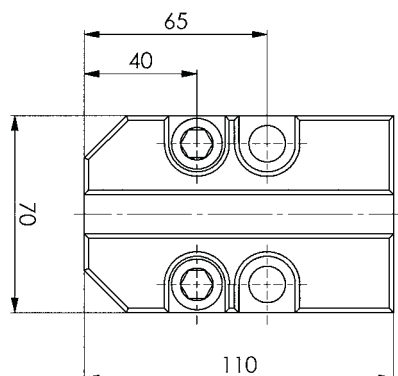
Used in conjunction with side clamp 58990101 to also clamp slot the table groove.

### Advantages:

- clamping also along the groove achieved with the lateral clamp only
- workpiece mounting surface increased by 30 mm.
- side clamp can be pushed 40 mm on the base plate

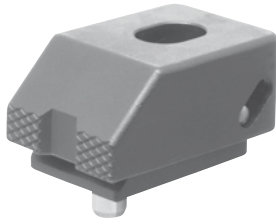
Special versions (dimension H  $\pm 0.01$ ) are available on request.

Order no.	Size		H	G	Weight [g]
58990103	M12x14	14	30	M12	1330

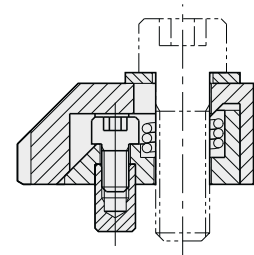
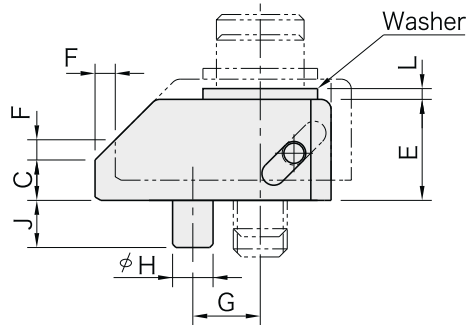
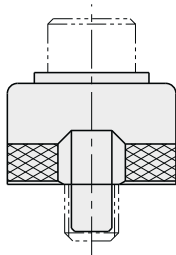
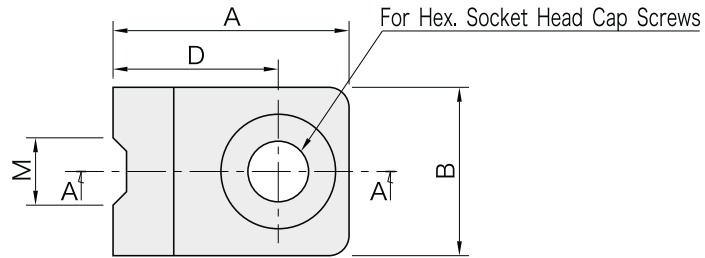


# CP106

# TOE CLAMPS



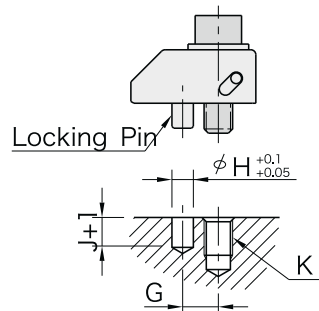
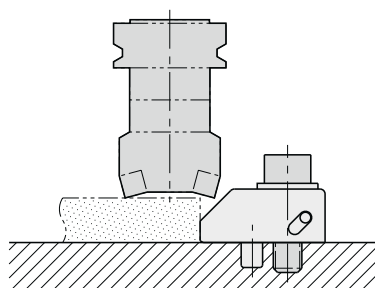
Material: S45C steel  
 Finish : Black oxide  
 Heat Treated



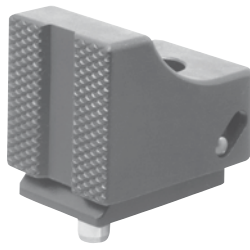
Section A-A

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)
<b>51991557</b>	35	25	6	24.5	15	3	10	6	7	M 8	1.6	10	7,000	25	100
<b>51991558</b>	43	30	8	29	19	4	12	6	7	M10	2	11	8,500	50	185
<b>51991559</b>	54	35	9	37	23	5	16	8	10	M12	2.3	12	20,000	90	320
<b>51991560</b>	65	40	10	45	25	6	20	10	10	M16	3.2	14	40,000	200	520

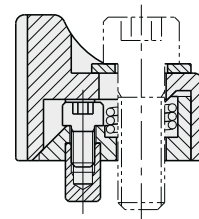
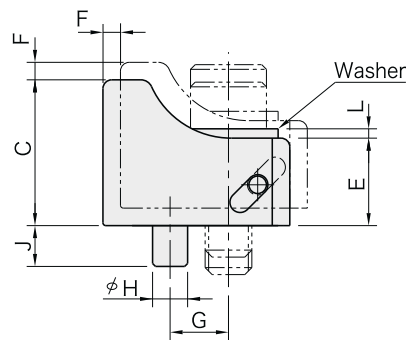
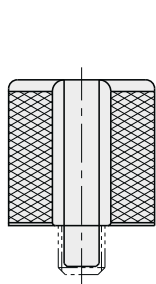
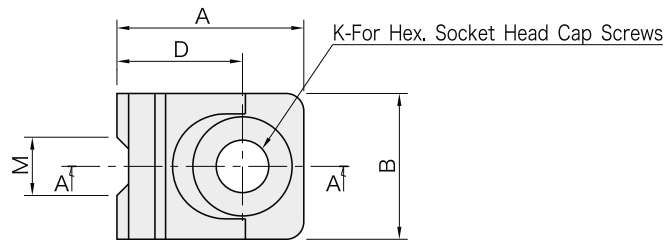
## How To Use and Install



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



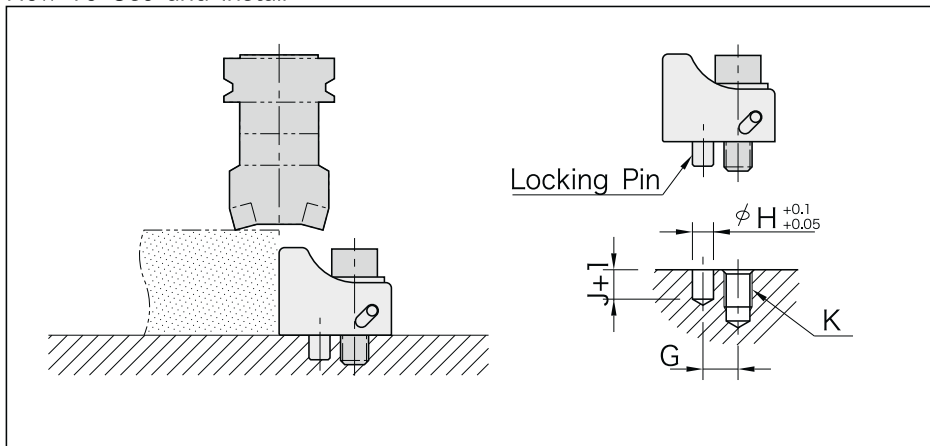
Material: S45C steel  
 Finish : Black oxide  
 Heat Treated



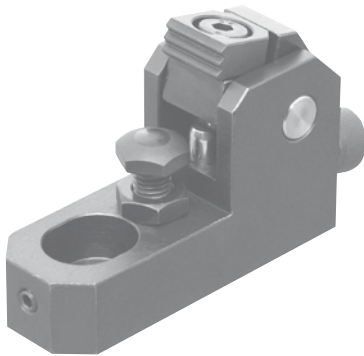
Section A-A

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)
<b>51991561</b>	32	25	25	21.5	15	3	10	6	7	M 8	1.6	10	7,000	25	115
<b>51991562</b>	40	30	32	26	19	4	12	6	7	M10	2	11	8,500	50	225
<b>51991563</b>	50	35	38	33	23	5	16	8	10	M12	2.3	12	20,000	90	390
<b>51991564</b>	60	40	45	40	25	6	20	10	10	M16	3.2	14	40,000	200	640

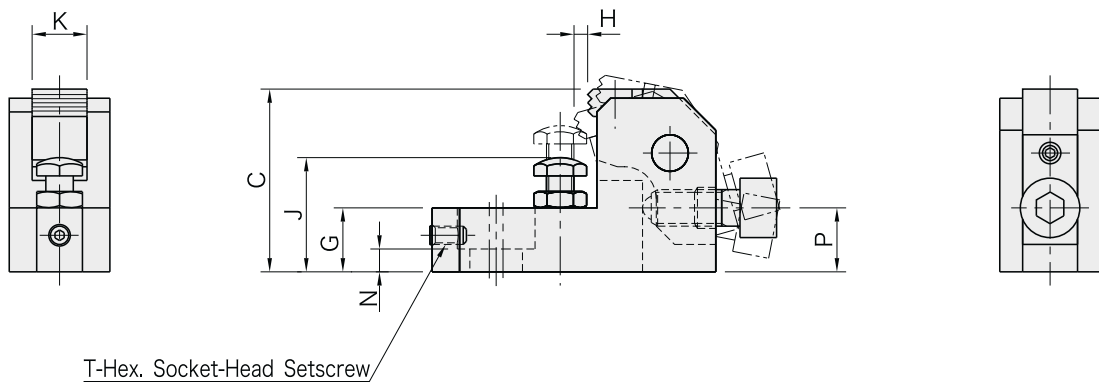
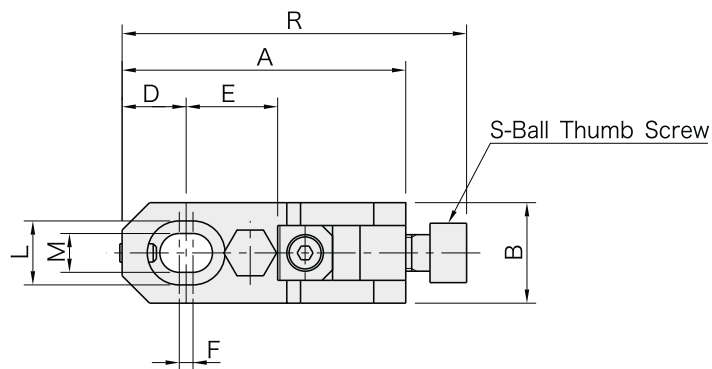
### How To Use and Install



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



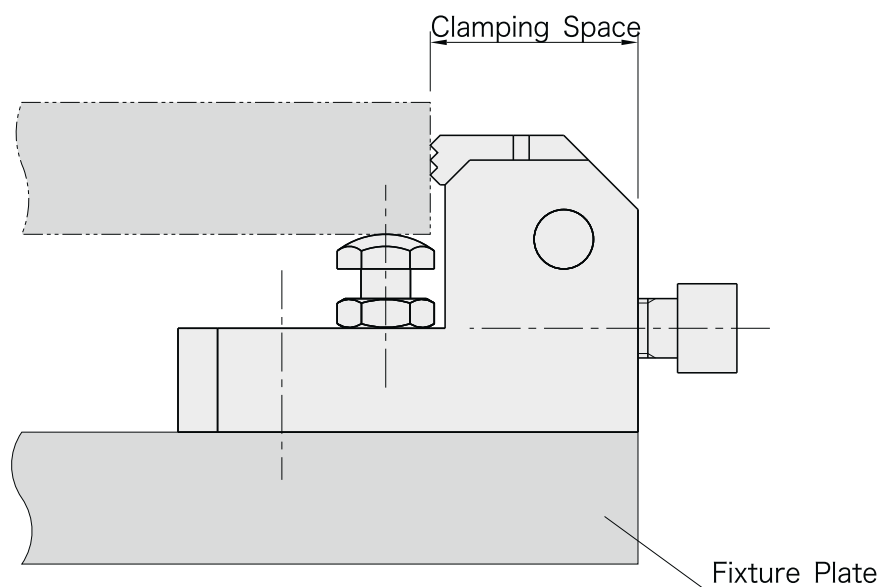
- [Body]
  - Material: S45C steel
  - Finish : Black oxide
  - Heat Treated
- [Arm]
  - Material: S45C steel
  - Finish : Black oxide
- [Jaw]
  - Material: SKH51 steel
  - Finish : Black oxide
  - Heat Treated



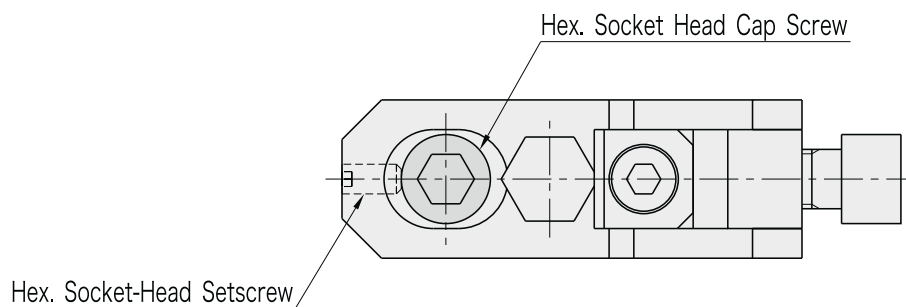
Part Number	A	B	C	D	E	F	G	H	J	K	L	M
<b>51991565</b>	62	22	40	14	20	3	14	3	25 to 32	12	14	8.5
<b>51991566</b>	78	25	50	18	25	4	18	3.7	32 to 40	16	17.5	11
<b>51991567</b>	93	32	60	21	30	5	21	4.5	40 to 48	20	20	13
<b>51991568</b>	124	38	80	28	40	6	27	6	48 to 63	25	26	17

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

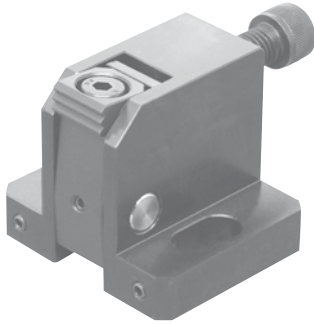
#### How To Use and Install



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.



[Body]

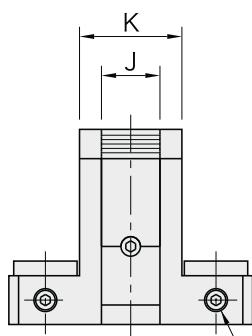
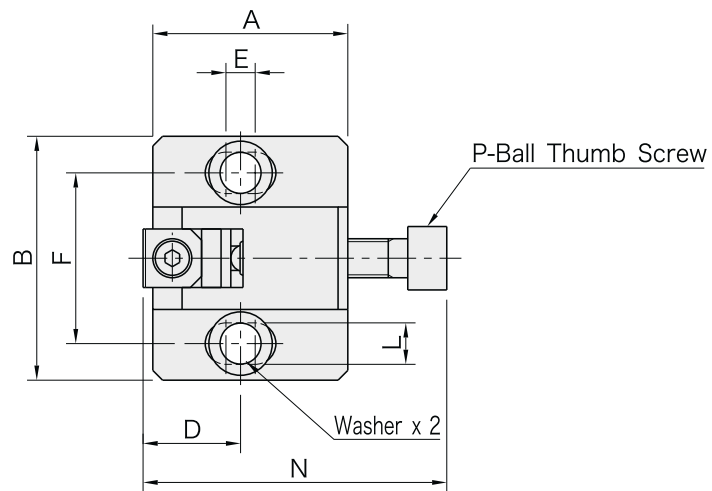
Material: S45C steel  
Finish : Black oxide

[Arm]

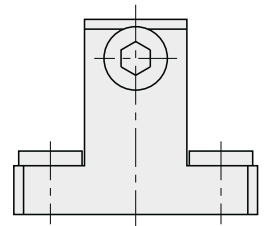
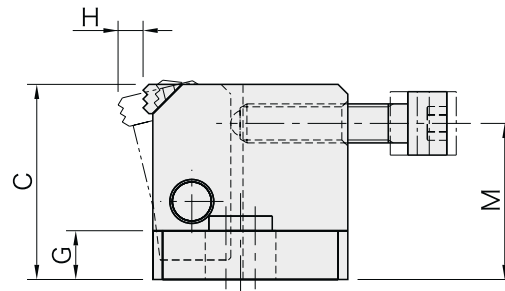
Material: S45C steel  
Finish : Black oxide  
Heat Treated

[Jaw]

Material: SKH51 steel  
Finish : Black oxide  
Heat Treated



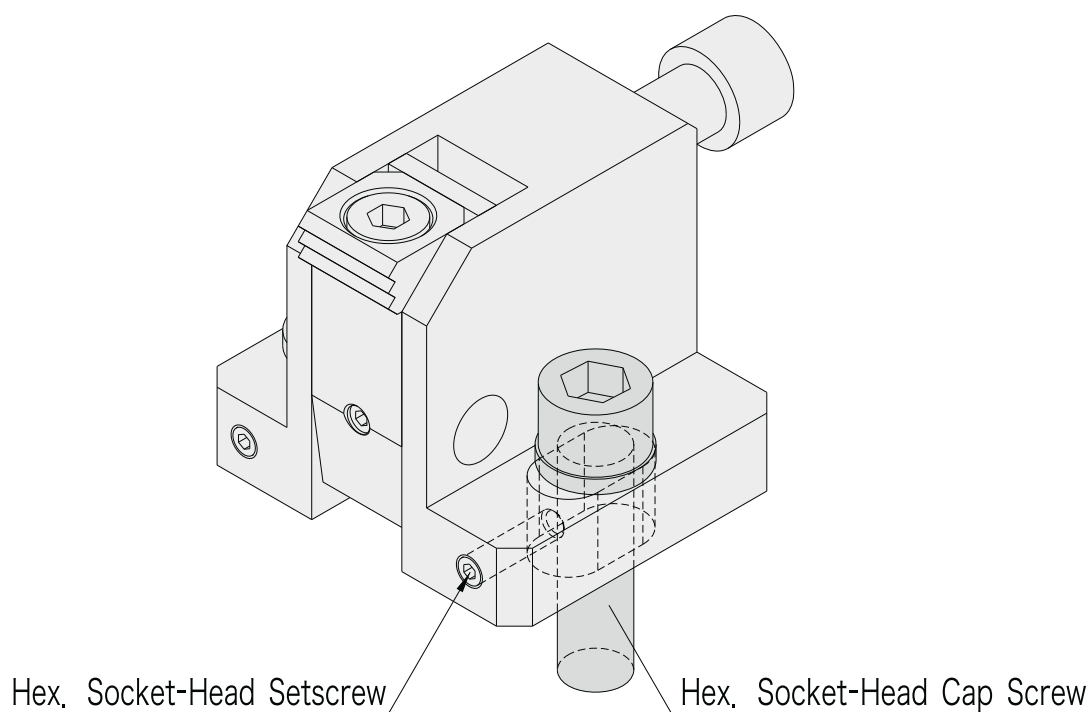
R-Hex. Socket-Head Setscrew



Part Number	A	B	C	D	E	F	G	H	J	K	L
<b>51991569</b>	40	50	40	20	6	35	10	5.3	12	21	8.5
<b>51991570</b>	50	65	50	25	8	45	12	7.1	16	27	11
<b>51991571</b>	60	70	60	30	10	50	15	8	20	31	13
<b>51991572</b>	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)
<b>51991569</b>	32	62.5	M 8x1.25-35L	M4x0.7-10L	11.000	25	0.33
<b>51991570</b>	40	74	M10x1.5-40L	M4x0.7-12L	18.000	50	0.66
<b>51991571</b>	48	91	M12x1.75-50L	M5x0.8-15L	25.000	90	1.06
<b>51991572</b>	64	115	M16x2-60L	M6x1-20L	46.000	200	2.38

#### How To Install

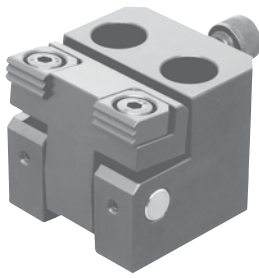


The hex. socket-head setscrew works to prevent the clamp from sliding back if screwed in until it contacts the cap screw.

\*Two flat washers are included.

# CP102

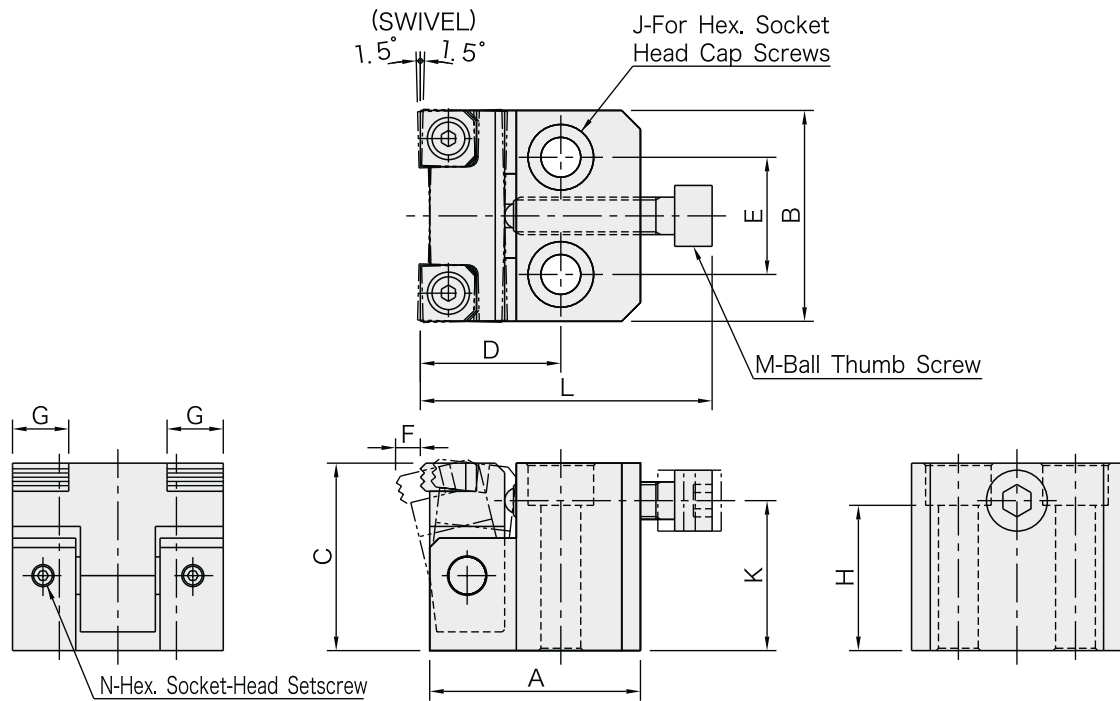
# WIDE-JAW SIDE CLAMPS



[Body]  
 Material: S45C steel  
 Finish : Black oxide

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

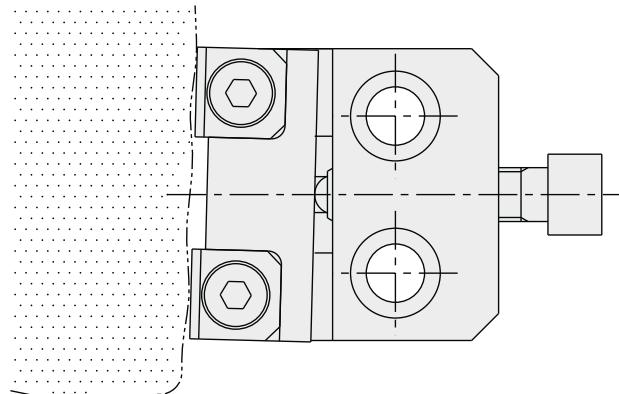
[Jaw]  
 Material: SKH51 steel  
 Finish : Black oxide  
 Heat Treated



Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N
<b>51991573</b>	45	45	40	30	25	5.3	12	31	M 8	32	62.5	M 8x1.25-35L	M4x0.7-4L
<b>51991574</b>	55	55	50	40	30	7.1	16	39	M10	40	74	M10x1.5 -40L	M4x0.7-4L
<b>51991575</b>	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)
<b>51991573</b>	11.000	25	0.55
<b>51991574</b>	18.000	50	1
<b>51991575</b>	25.000	90	1.69

## How To Use

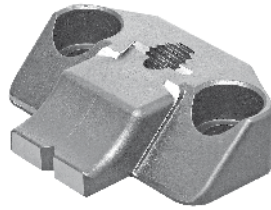


The jaw swivels to fit an unmachined surface of the workpiece.





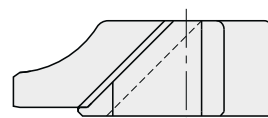
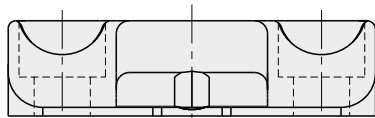
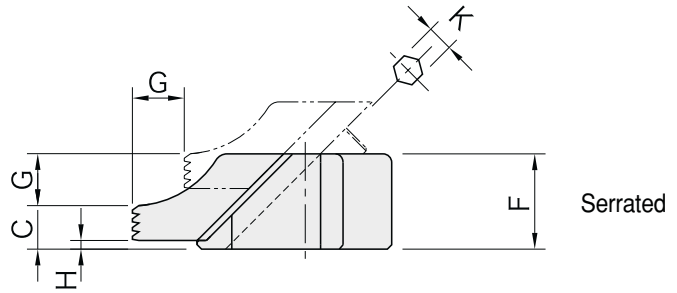
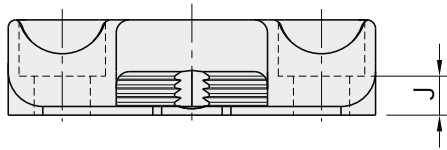
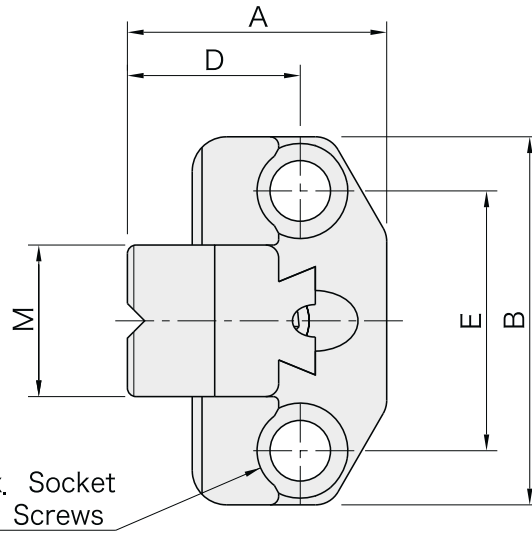
Serrated



Ground

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

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

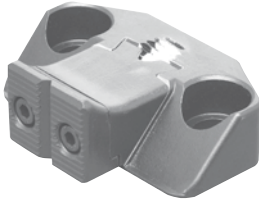


<b>Serrated</b>	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
<b>51991576</b>	39.5	65	7.5	25	45	16	7	1.5	7	4	M 8	25	4,000	8	160
<b>51991578</b>	60	85	10	40	60	22	12	2	9	6	M12	35	9,000	26	450
<b>51991580</b>	77	100	14	50	70	30	14	2	13	8	M16	40	17,000	60	900

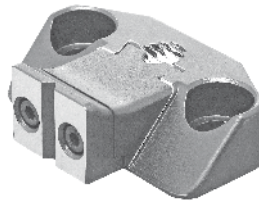
<b>Ground</b>	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
<b>51991577</b>	39.5	65	7.5	25	45	16	7	1.5	7	4	M 8	25	4,000	8	160
<b>51991579</b>	60	85	10	40	60	22	12	2	9	6	M12	35	9,000	26	450
<b>51991581</b>	77	100	14	50	70	30	14	2	13	8	M16	40	17,000	60	900

# CP105

# SIDE CLAMPS



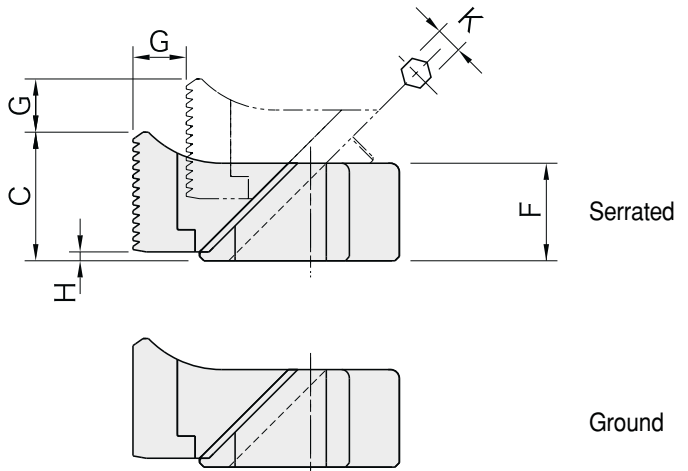
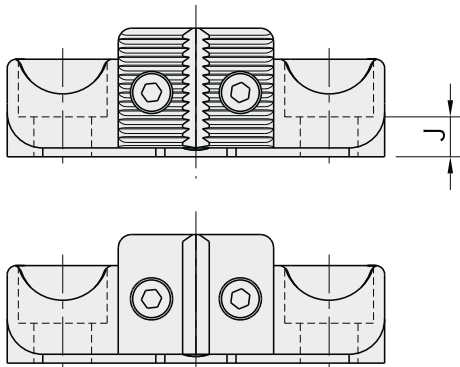
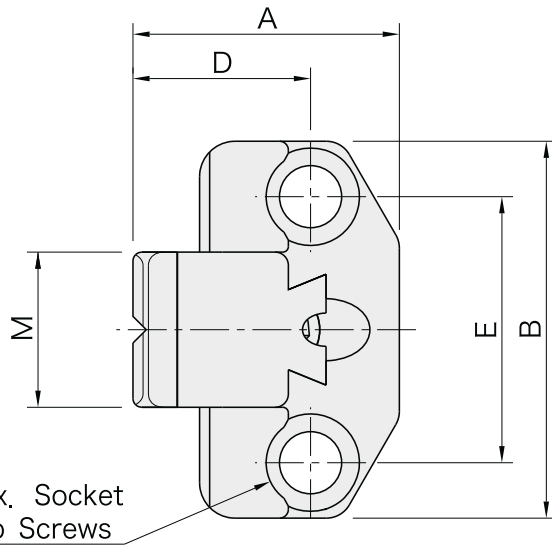
Serrated



Ground

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

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

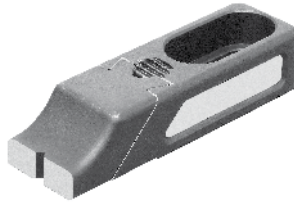


<b>Serrated</b>															
Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991582	39.5	65	19.5	25	45	16	7	1.5	7	4	M 8	25	4.000	8	180
51991584	60	85	29	40	60	22	12	2	9	6	M12	35	9.000	26	500
51991586	77	100	38	50	70	30	14	2	13	8	M16	40	17.000	60	1.010

<b>Ground</b>															
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



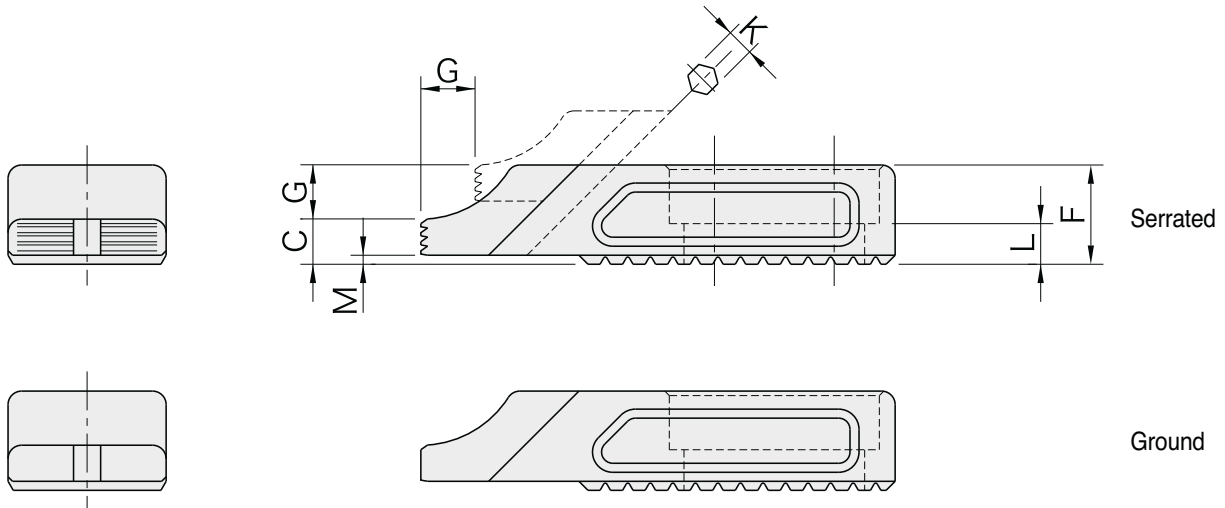
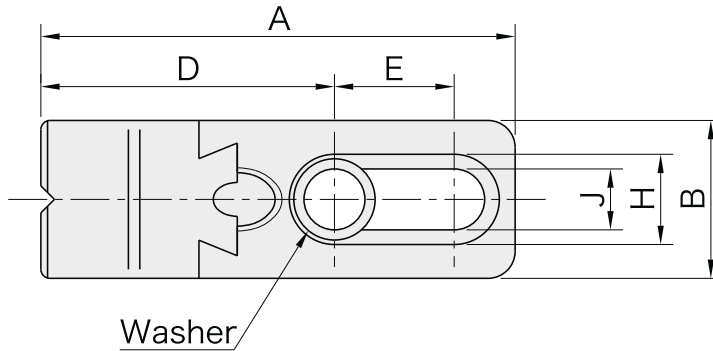
Serrated



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



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

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

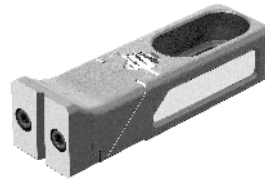
Part Number	When Used Singularly		When Used with Slide Stop		Weight (g)
	Clamping Force (N)	Allowable Screw Torque (N*m)	Clamping Force (N)	Allowable Screw Torque (N*m)	
<b>51991588</b>	3,600	6,5	4,000	8	150
<b>51991589</b>					
<b>51991590</b>	7,400	19	10,400	26	400
<b>51991591</b>					
<b>51991592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

# BJ102

# ADJUSTABLE SIDE CLAMPS



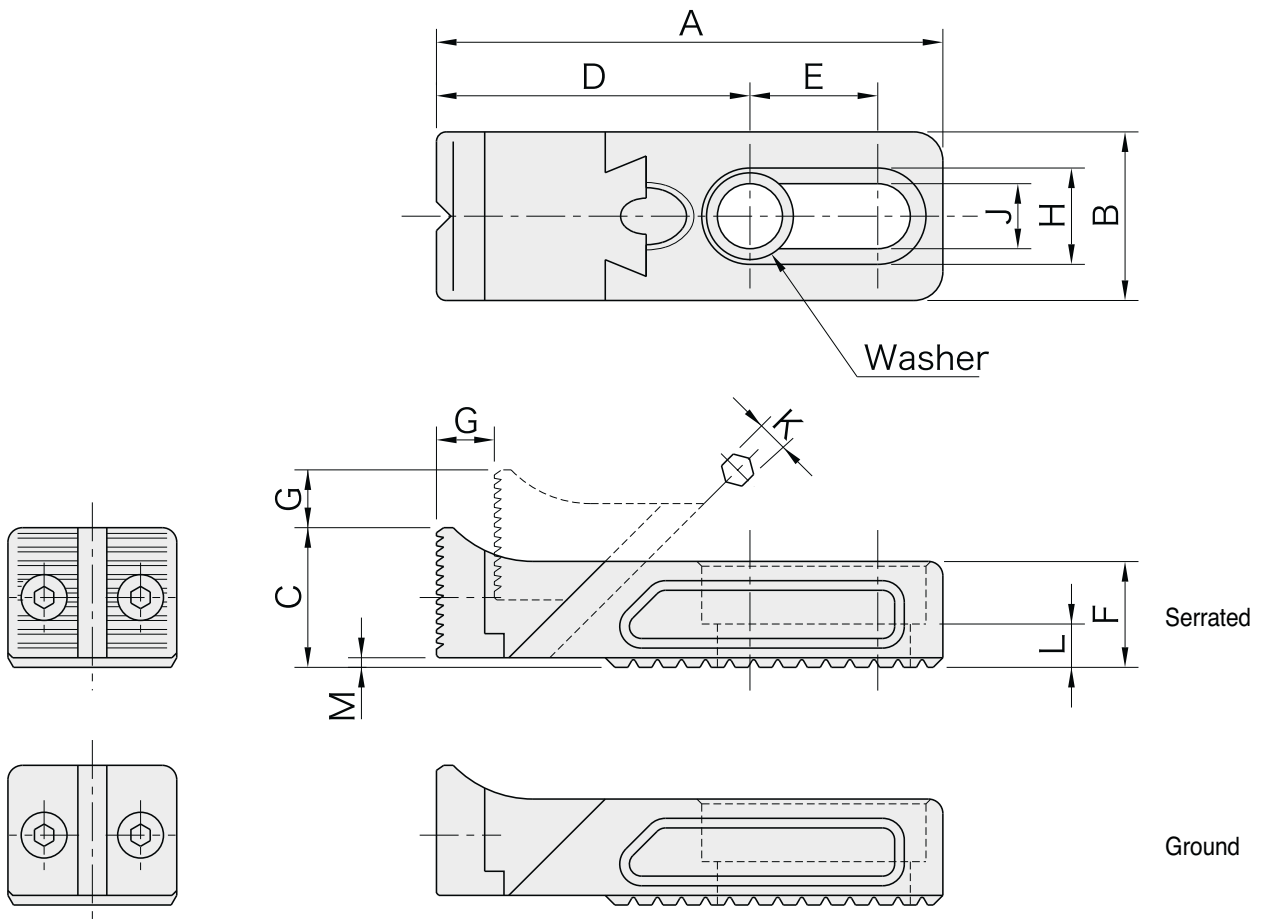
Serrated



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



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

<b>Ground</b>													
Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Weight (g)
<b>51991595</b>	72	25	19.5	45.5	16.5	16	7	14	8.5	4	7	1.5	160
<b>51991597</b>	105	35	29	65	26.5	22	12	20	13	6	9	2	440
<b>51991599</b>	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)
<b>51991594</b>	3,600	6,5	160
<b>51991595</b>			
<b>51991596</b>	7,400	19	440
<b>51991597</b>			
<b>51991598</b>	11,700	32	920
<b>51991599</b>			

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



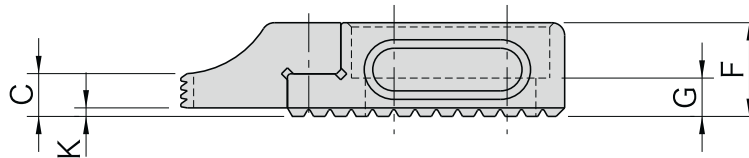
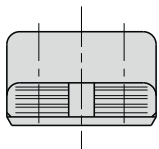
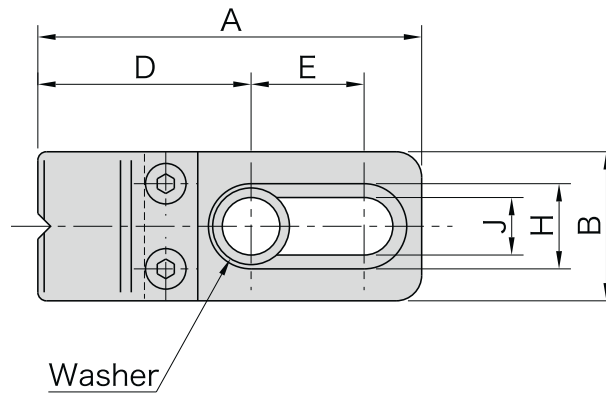
Serrated

**【Body】**

- Material : FCM440 steel
- Black oxide finish

**【Jaw】**

- Material : SCM440 steel
- Heat treated
- Black oxide finish
- Precision serrated



Serrated

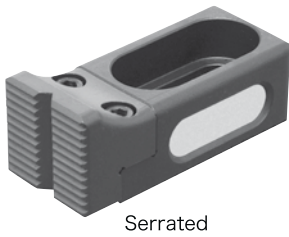
Part Number	A	B	C	D	E	F	G	H	J	K	Weight (g)
<b>51991600</b>	60	25	7.5	33.5	16.5	16	7	14	8.5	1.5	120
<b>51991601</b>	90	35	10	50	26.5	22	9	20	13	2	330
<b>51991602</b>	115	40	14	67.5	30	30	13	26	17	2	660

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

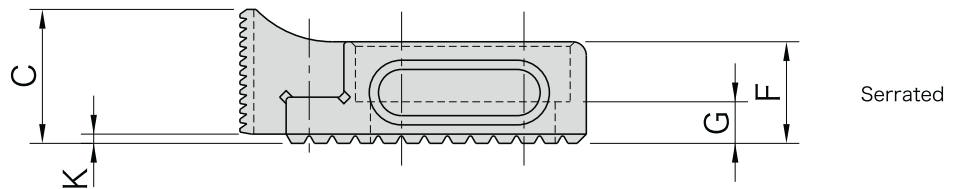
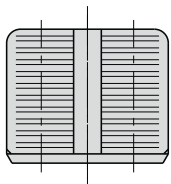
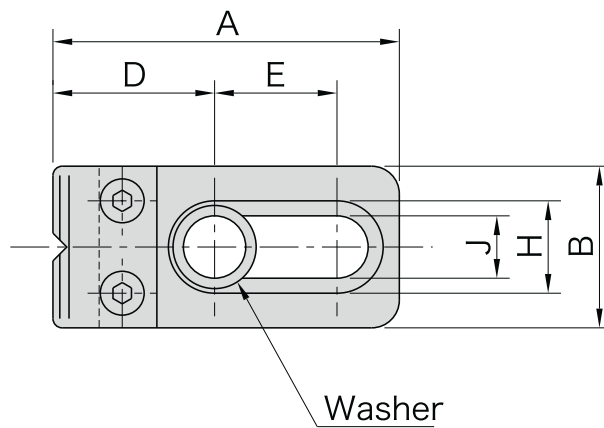
· Stop that mounts on a BJ500. Rack Block to prevent backslide.

# BJ202

# ADJUSTABLE SIDE STOPS

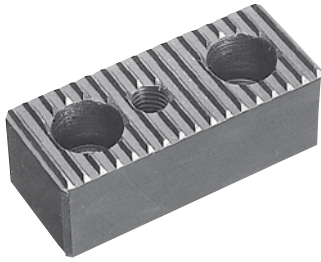


- 【Body】**  
 ■Material : FCM440 steel  
 ■Black oxide finish
- 【Jaw】**  
 ■Material : SCM440 steel  
 ■Heat treated  
 ■Black oxide finish  
 ■Precision serrated

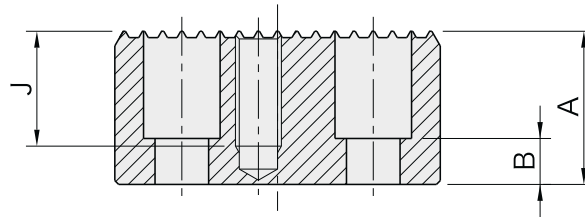
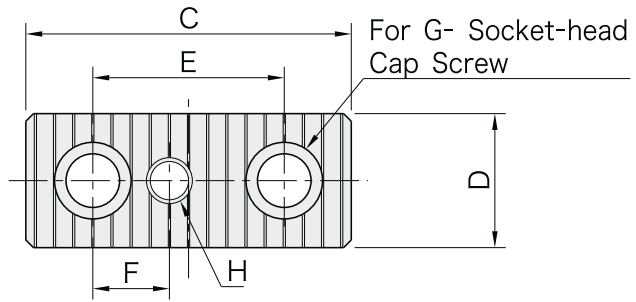


Part Number	A	B	C	D	E	F	G	H	J	K	Weight (g)
<b>51991603</b>	50	25	19.5	23.5	16.5	16	7	14	8.5	1.5	100
<b>51991604</b>	75	35	29	35	26.5	22	9	20	13	2	310
<b>51991605</b>	95	40	38	47.5	30	30	13	26	17	2	625

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.

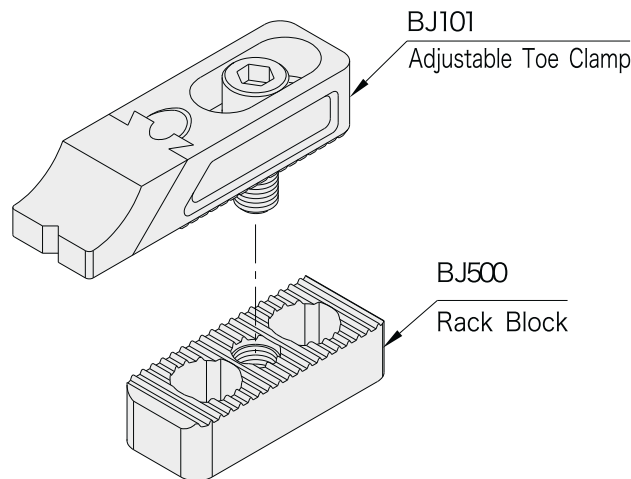


- Material : S45C steel
- Black oxide finish



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								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									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								0.78
51991620	50									0.98
51991621	63									1.24

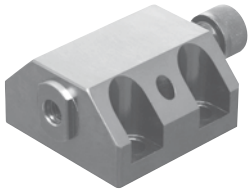
■ How To Use



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

# CP110/CP111

# BLOCK PUSH CLAMPS

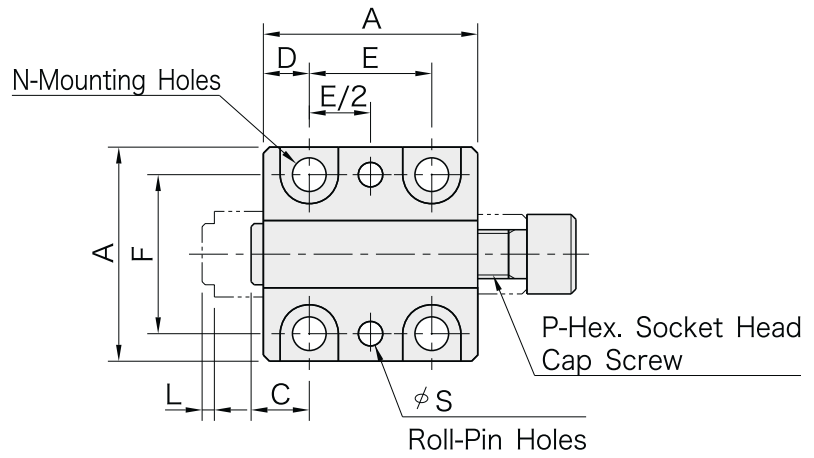


CP110  
(Cap Screw Style)

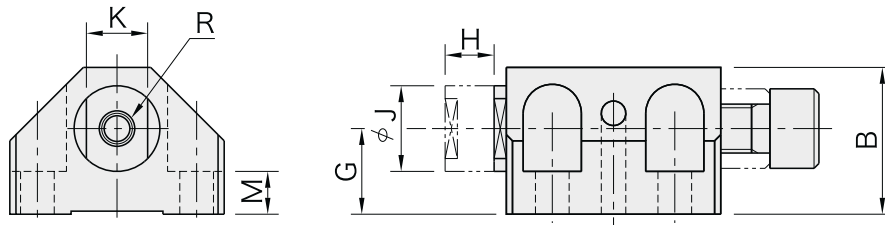
[Body]  
Material: S45C steel  
Finish : Black oxide

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

[Knurled Knob]  
Material: S45C steel  
Finish : Black oxide



CP110  
(Cap Screw Style)

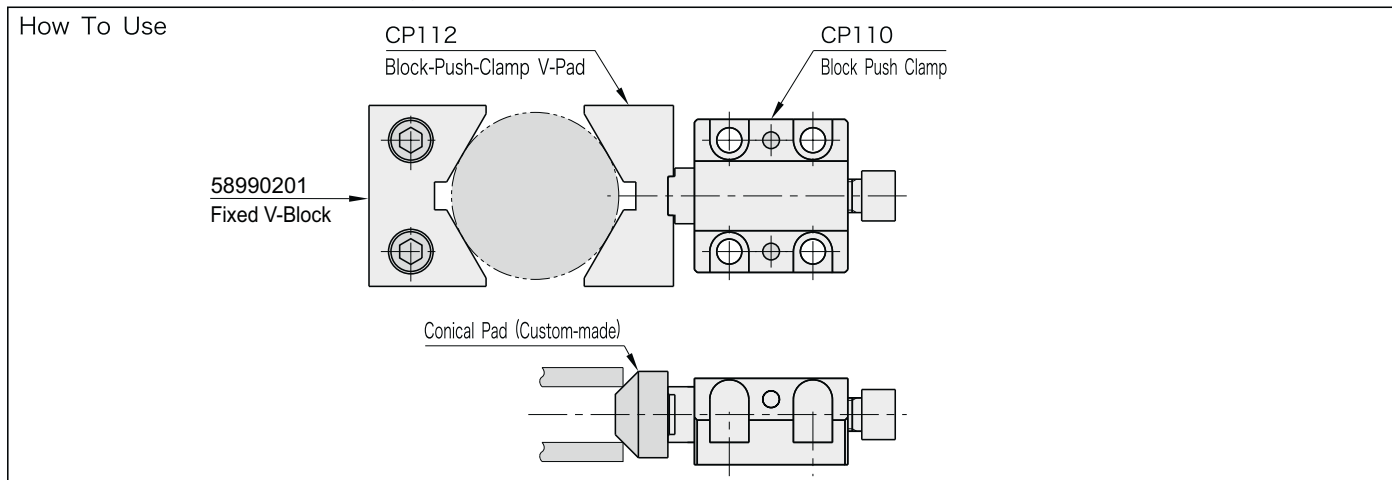


Part Number		A	B	C	D	E	F	G	H	J	K ( $\frac{R}{3}$ )	L	M	N	P	R		S	T	U
<b>51991622</b>		35	24	9.5	7.5	20	26	14	8	14	10	2	7	M 5	M 8x1.25	M 5x0.8	8 deep	4	24	14
<b>51991623</b>		45	29	12	10	25	35	16	10	18	12	2	8	M 6	M10x1.5	M 6x1	10 deep	4	24	14
<b>51991624</b>		55	31	15	12.5	30	40	18	12	20	14	2.5	8	M 8	M12x1.75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



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

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



Depending on workpiece shapes, a custom pad can mount on the Block Push Clamp.

## CP112

## MOVABLE BLOCK PUSH CLAMP V-PADS

Material: S45C steel  
Finish : Black oxide  
Heat treated

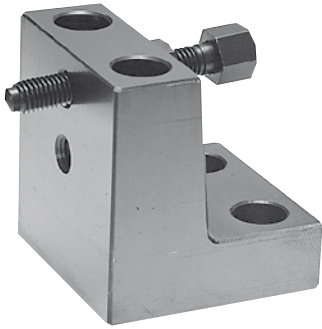
Part Number	A	B	C	D (°)	E	F	G	H		J	Weight (g)
								min.	max.		
<b>51991630</b>	38	19	16	10	1.5	3.5	9.2	15	60	M 5	65
<b>51991631</b>	50	24	19	12	1.5	4.5	11	20	80	M 6	125
<b>51991632</b>	65	32	22	14	2	5.5	15	25	100	M 8	250
<b>51991633</b>	75	38	25	19	2.5	7.5	18.7	30	120	M10	390

## CP112F

## FIXED V-BLOCK PUSH CLAMP

Material: S45C steel  
Finish : Black oxide  
Heat treated

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



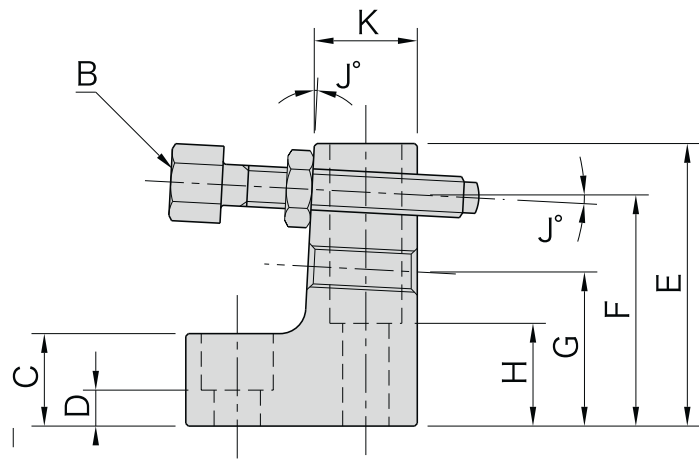
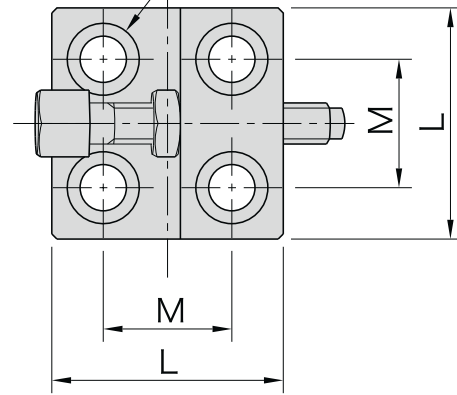
**[Body]**

- Material : S45C steel
- Black oxide finish

**[Screw]**

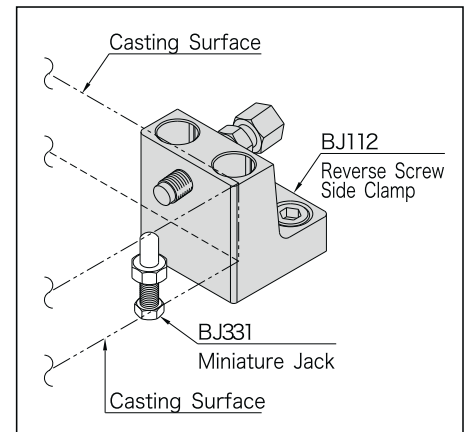
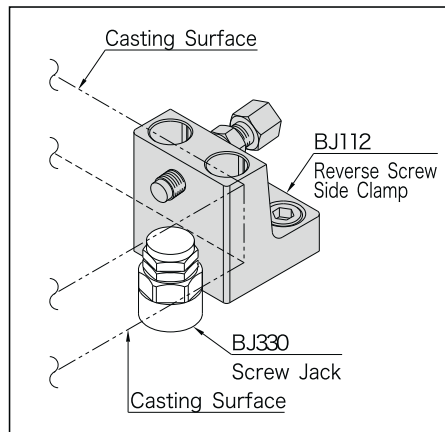
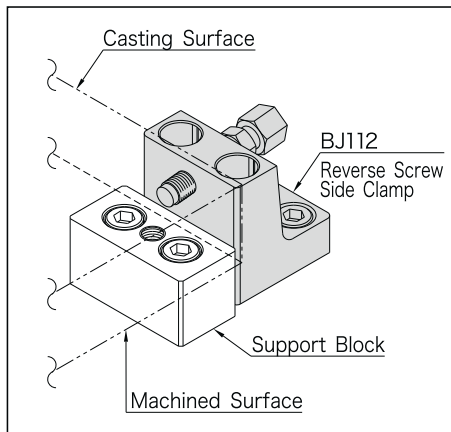
- Material : SCM435 steel
- Heat treated
- Black oxide finish

For A- Socket-head Cap Screws



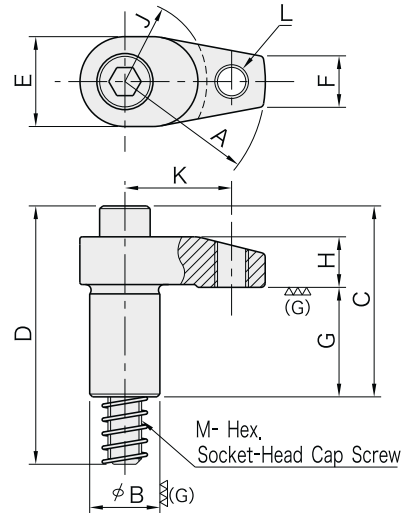
Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Weight (kg)
<b>51991634</b>	M 8	M 8×1.25-50L	18	7	55	45	30	20	3	20	45	25	0.45
<b>51991636</b>	M16	M16×2 -80L	27	10	90	75	50	33	5	33	85	50	2.3

**Application Examples**



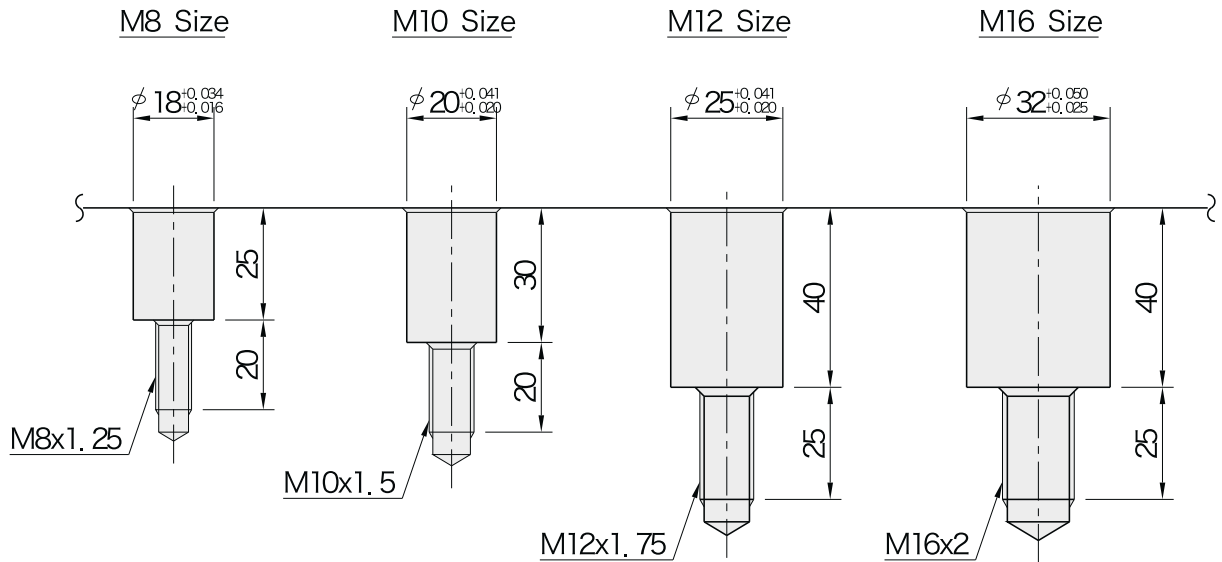


Material:SCM435 steel  
Heat treated  
Black oxide finish  
Precision ground



·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.

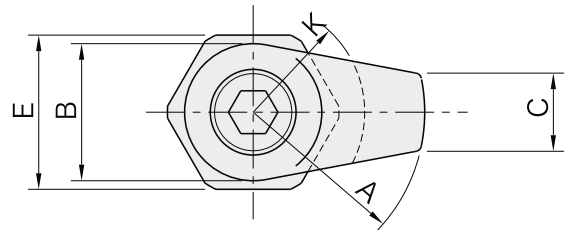
Part Number	A	B (h7)	C	D	E	F	G	H	J	K	L	M	Allowable Screw Torque (N·m)	Weight (Kg)
51991637	20	18	37	58	22	10	23	12	15	-	-	M8x1.25 - 50L	38	90
51991638	25								20				33	95
51991639	30								30				105	
51991640	30	20	54	75	24	12	30	15	20	-	-	M10x1.5 - 65L	38	200
51991641	40							25					32	210
51991642	40	25	66	92	32	18	39	16	25	-	-	M12x1.75 - 80L	60	280
51991643	50							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							18					50	310
51991647	60							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

# BJ131

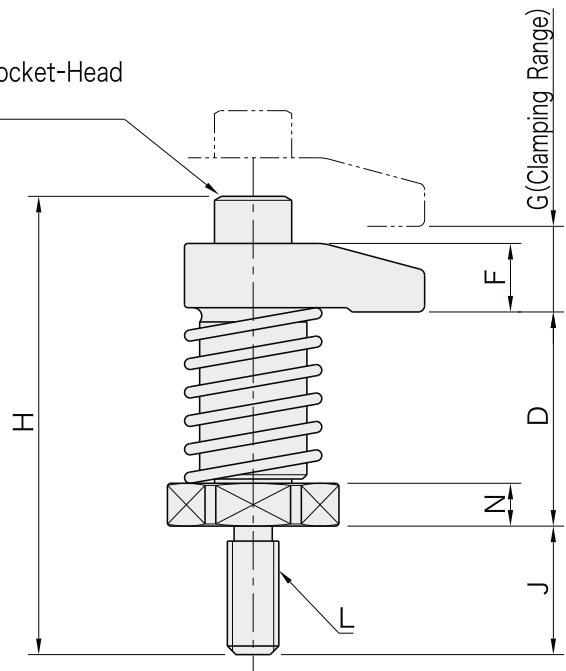
# HOOK CLAMPS WITH SPRING



Material:SCM435 steel  
Heat treated  
Black oxide finish  
Precision ground



M- Hex. Socket-Head  
Cap Screw

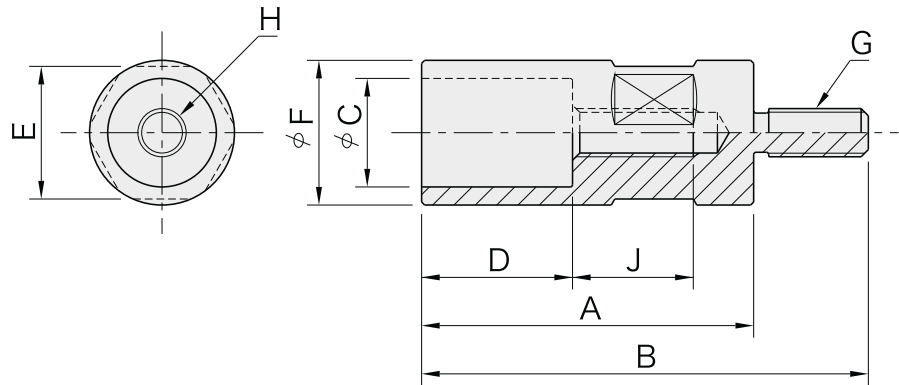


Part Number	A	B	C	D	E	F	G	H	J	K	L
<b>51991655</b>	30	22	10	35	22	12	10	68	19	20	M 8x1.25
<b>51991659</b>	40	32	18	50	36	16	15	107	30	25	M12x1.75
<b>51991660</b>	50					18		109			
<b>51991661</b>	60					109					
<b>51991665</b>	40	36	22	50	36	21	15	116	30	25	M16x2
<b>51991666</b>	50										
<b>51991667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

Part Number	M	N	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
<b>51991655</b>	M 8x1.25-30L	6	6.700	20	135
<b>51991659</b>	M12x1.75-45L	10	13.500	45	450
<b>51991660</b>			12.600		480
<b>51991661</b>			11.700		520
<b>51991665</b>	M16x2 -55L	10	13.400	60	630
<b>51991666</b>			12.400		680
<b>51991667</b>			12.000		740



Material:S45C steel  
Black oxide finish



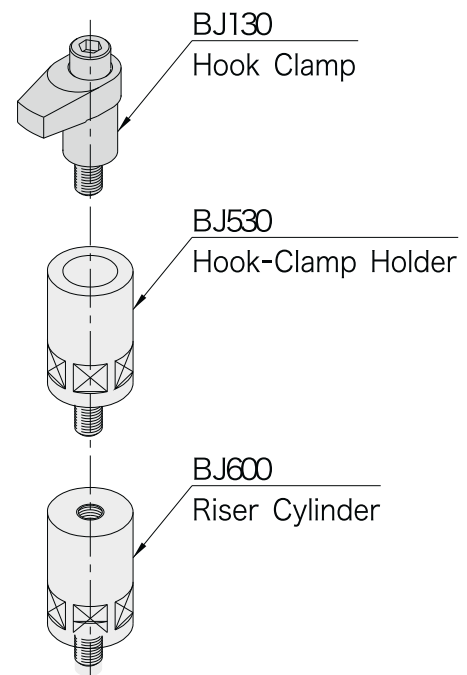
Part Number	A	B	C (F7)	D	E	F	G	H	J	Allowable Screw Torque (N·m) ※	Weight (g)
51991671	55	74	18	25	22	24	M 8x1.25	M 8x1.25	20	30	140
51991672	63	93	20	30	30	32	M12x1.75	M10x1.5	21	40	400
51991673	80	110	20	30	30	32	M12x1.75	M10x1.5	23	40	500
51991674	80	110	25	40	36	40	M12x1.75	M12x1.75	25	50	1,080
51991675	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 installation of Hook Clamps.

### How To Use



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

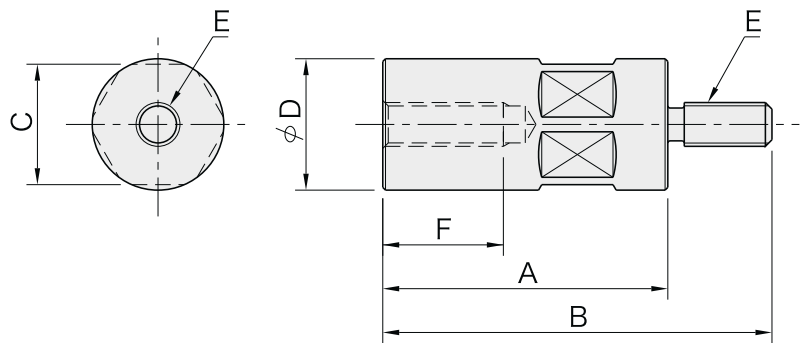


# BJ600

# RISER CYLINDERS



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

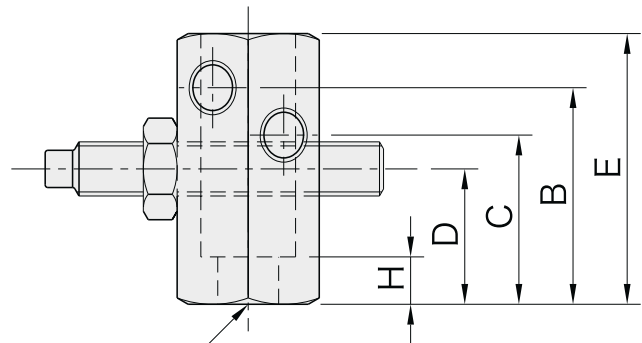
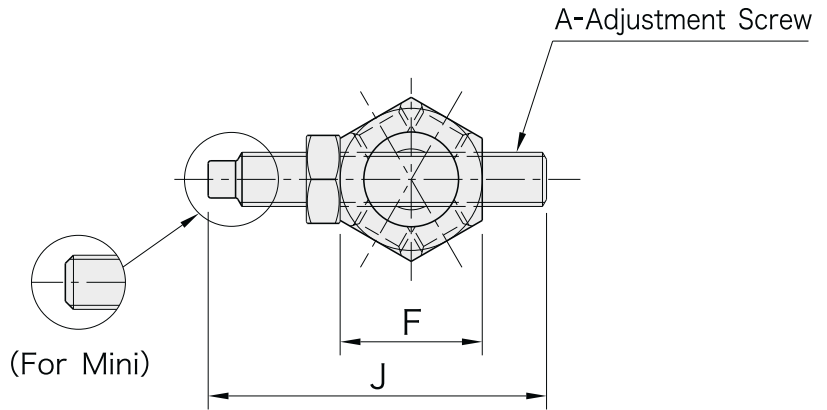


Part Number	A	B	C	D	E	F	Weight (g)
<b>51991678</b>	32	51	22	24	M 8x1.25	20	105
<b>51991679</b>	40	59					135
<b>51991680</b>	50	69					170
<b>51991681</b>	65	84					220
<b>51991684</b>	50	80	36	40	M12x1.75	35	480
<b>51991685</b>	65	95					640
<b>51991686</b>	80	110					780
<b>51991687</b>	100	130			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



[Body]  
 Material:S45C steel  
 Black oxide finish

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



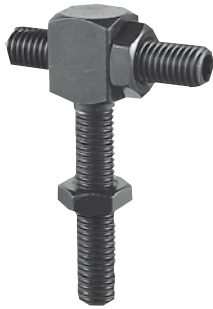
For G- Socket-Head  
 Cap Screw

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

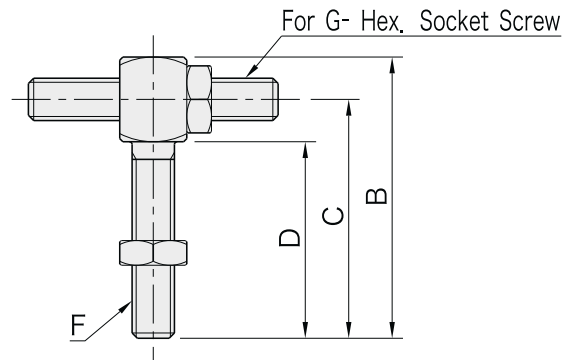
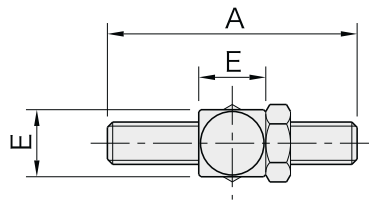
·Side stop that offers three options of screw height.  
 ·Can also be used as auxiliary clamps.

# BJ211

# ADJUSTABLE MINIATURE STOPS

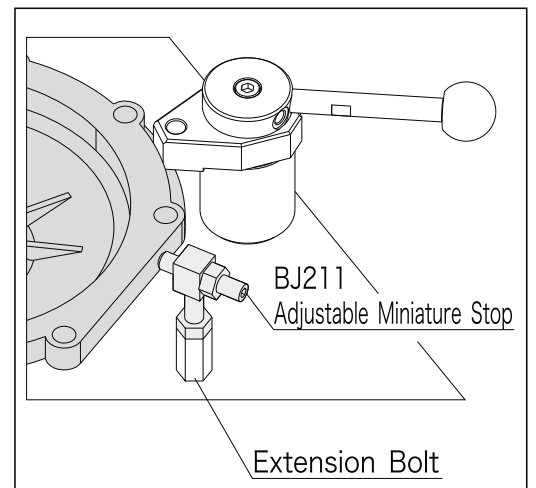
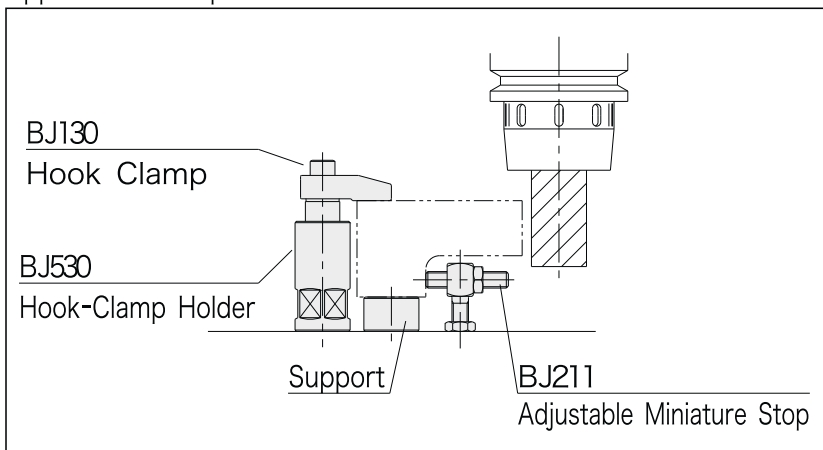


Material: S45C steel  
Heat treated  
Black oxide finish

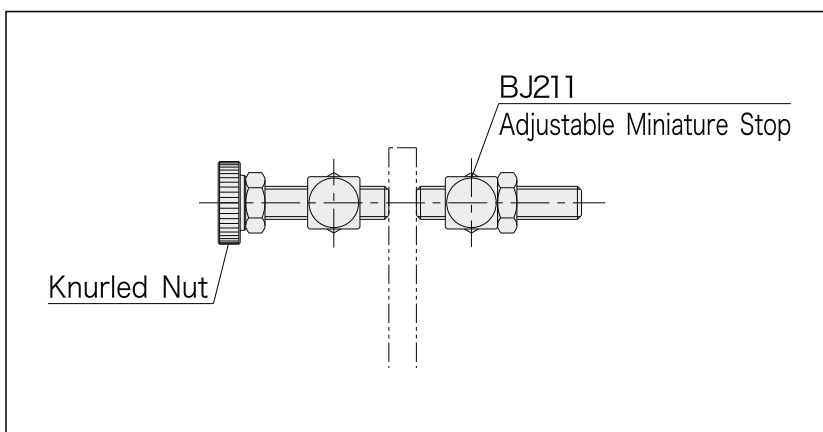


Part Number	A	B	C	D	E	F	G	Weight (g)
<b>51991213</b>	40	56	48	40	13	M 8x1.25	M 8x1.25	60
<b>51991214</b>	50	70	60	50	17	M10x1.5	M10x1.5	120
<b>51991215</b>	60	84	72	60	19	M12x1.75	M12x1.75	190
<b>51991216</b>	80	112	96	80	24	M16x2	M16x2	410

### Application Examples



Miniature size allows use in small space.

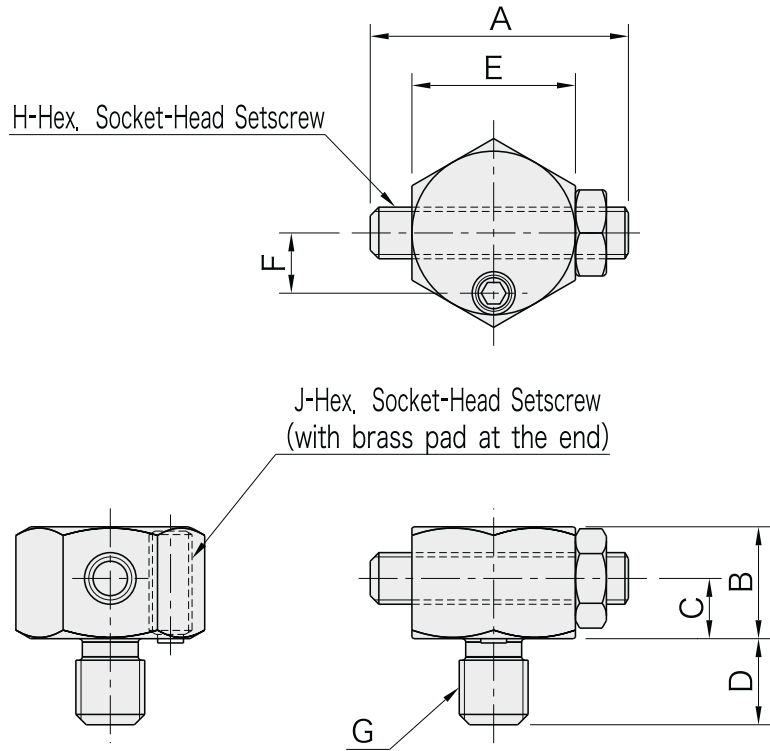


Can be used as auxiliary clamps.



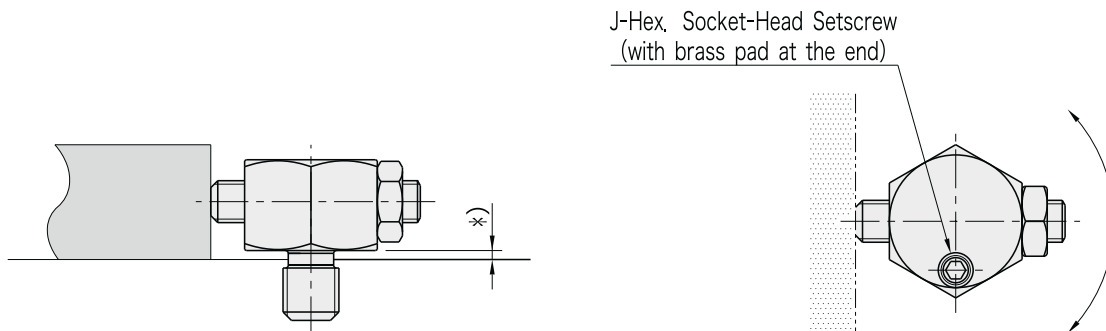


Material: S45C steel  
 Finish : Black oxide  
 Heat treated



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

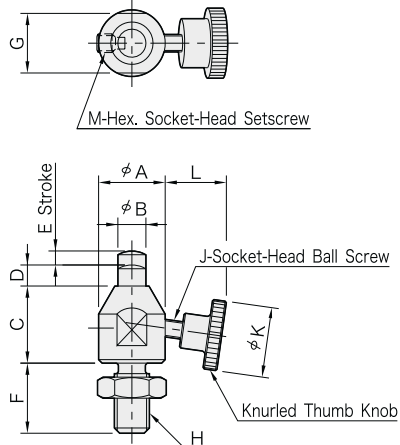
# BJ360

# COMPACT WORK SUPPORTS



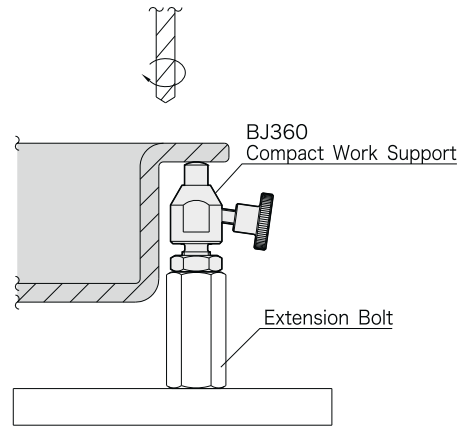
[Body]  
 Material: S45C steel  
 Finish : Black oxide

[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
<b>51991148</b>	15	6	18	5	3	16	13	M 8x1.25	M4x0.7-16L	16
<b>51991149</b>	19	8	22	6	4	20	17	M10x1.5	M5x0.8-20L	20
<b>51991150</b>	22	10	25			24	19	M12x1.75	M6x1 -25L	24

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

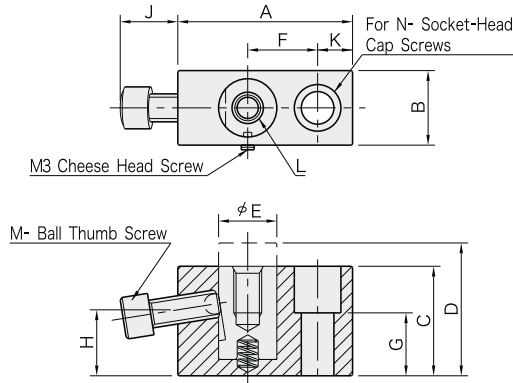
# BJ350

# WORK SUPPORTS

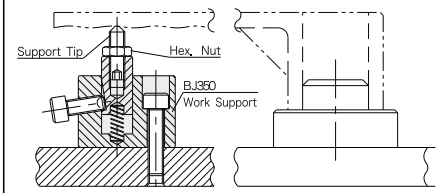


[Body]  
Material:S45C steel  
Black oxide finish

[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

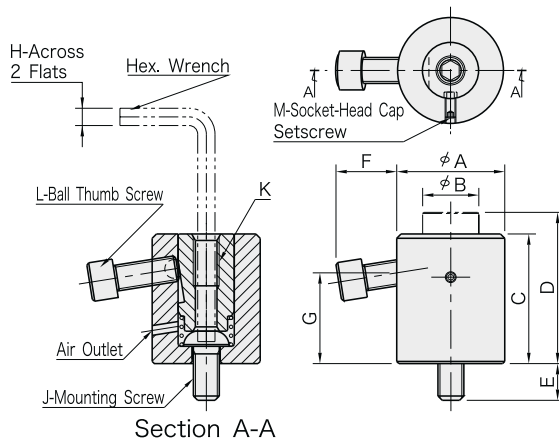
# BJ351

# WORK SUPPORT CYLINDERS



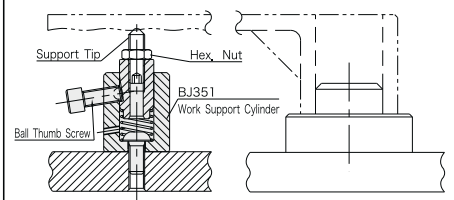
[Body]  
Material:S45C steel  
Black oxide finish

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



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

### Application Example

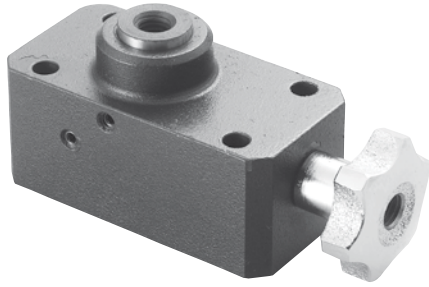


Ideal for preventing the workpiece from chattering and deflecting.

- 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
51991159	50	26	60	70	16	28.1	42.1	8	M12x1.75	M12x1.75 24 deep
51991160	60	33	70	80	22	26.6	47.4	10	M16x2	M16x2 32 deep

Part Number	L		M	Support Capacity (N)	Piston Spring Force (N)	Weight (g)
51991156	M 6x1	-16L	M4x0.7 - 8L	4000	10 to 22	150
51991157	M 8x1.25	-20L	M4x0.7 - 8L	6000	10 to 27	300
51991159	M12x1.75	-30L	M5x0.8 -12L	9000	15 to 30	865

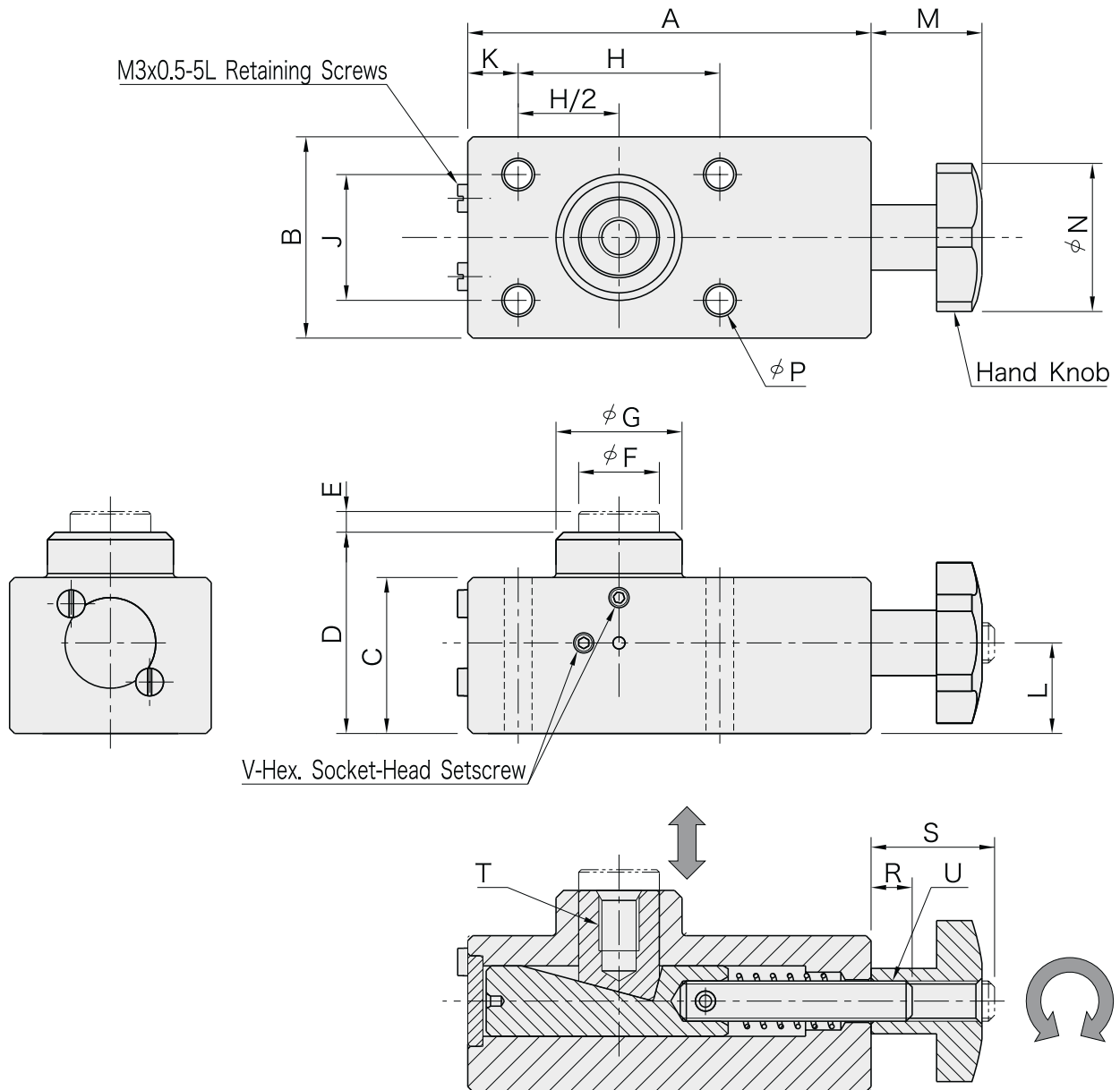


[Body]  
 Material: S45C steel  
 Finish : Black oxide  
 [Piston & Locking Pin]  
 Material: SK4 steel  
 Finish : Black oxide  
 Heat Treated

[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
<b>51991709</b>	80	40	31	40	4	16	25	40	25	10	18	22	32	5.5	8	23.5
<b>51991710</b>	95	50	39	50	5	20	32	50	30	10	23	25	40	6.5	9	28
<b>51991711</b>	115	60	47	60	6	24	38	60	40	15	28	32	50	9	12	35.5

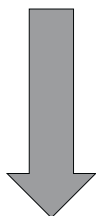
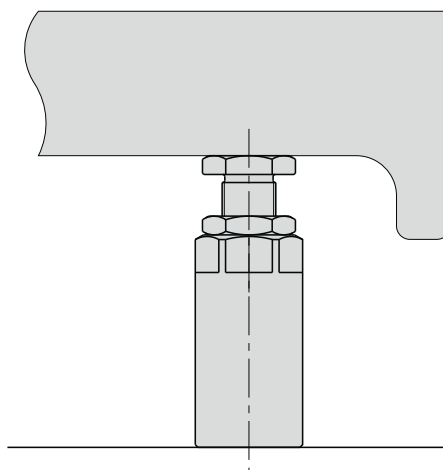
Part Number	T	U	V	Support Capacity (N)	Allowable Screw Torque (N·m)	Weight (kg)
<b>51991709</b>	M 8x1.25 12 deep	M 8x1.25	M4x0.7-10L	700	1	0.82
<b>51991710</b>	M10x1.5 15 deep	M10x1.5	M4x0.7-10L	800	1.5	1.52
<b>51991711</b>	M12x1.75 18 deep	M12x1.75	M5x0.8-16L	900	2	2.67

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

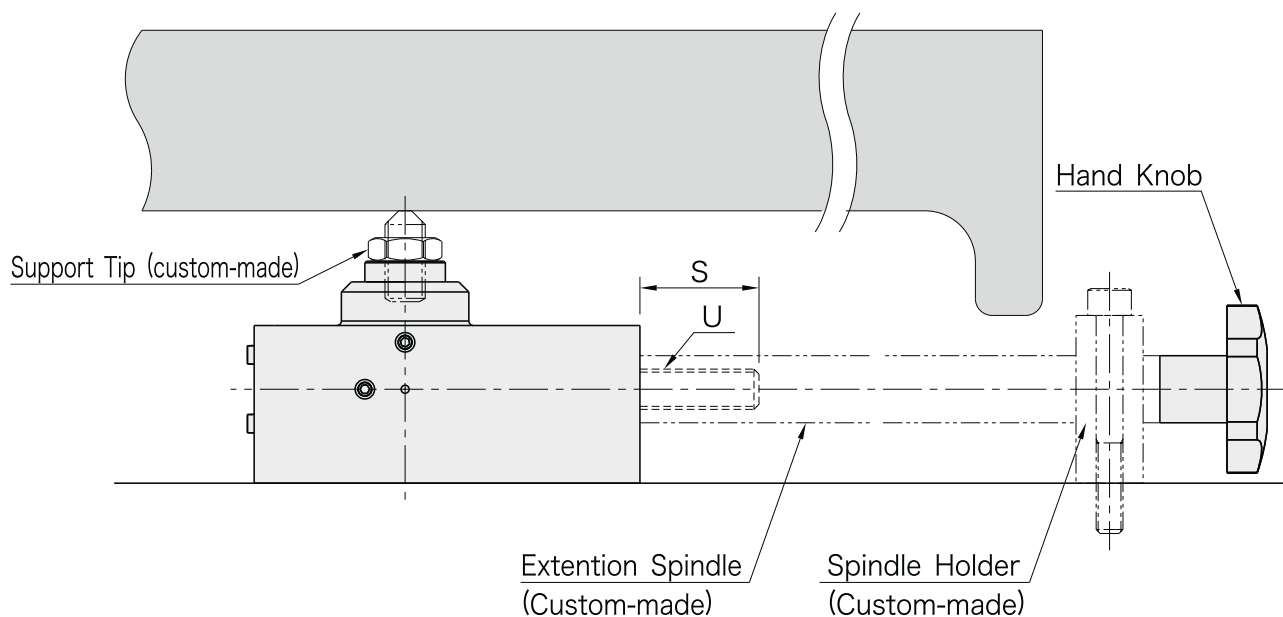
Conventional Method

Cumbersome height adjustment with a wrench  
Limited positioning area



Extendable Work Support Method

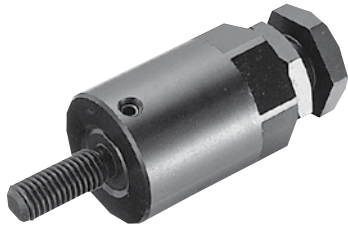
Easy height adjustment with a hand knob  
Flexible positioning



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

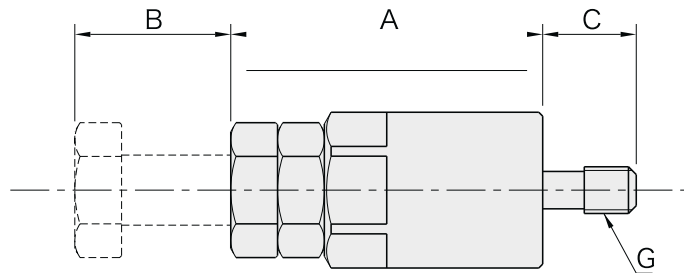
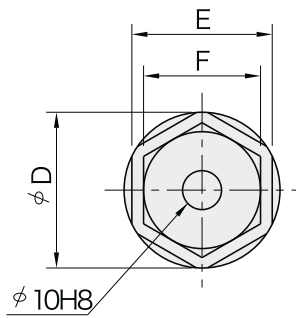
# BJ330

# SCREW JACKS



[Body]  
 Material:S45C steel  
 Black oxide finish

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



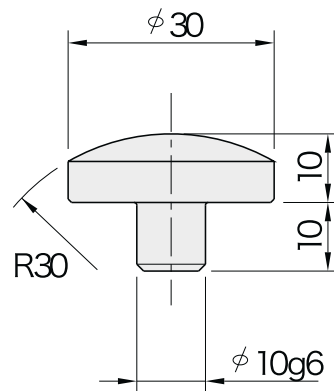
Part Number	A	B	C	D	E	F	G	Load Capacity (N)	Weight (g)
<b>51991712</b>	40	10	30	40	36	30	M12x1.75	31,800	350
<b>51991713</b>	50	20							420
<b>51991714</b>	70	40							570
<b>51991718</b>	50	20	30	40	36	30	M16x2	31,800	430
<b>51991719</b>	70	40							580

# BJ733

# SCREW-JACK TIP



Material:S45C steel  
 Heat treated  
 Black oxide finish



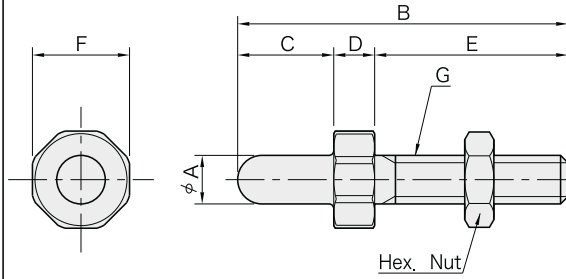
Part Number	Weight (g)
<b>51991722</b>	50

# BJ331

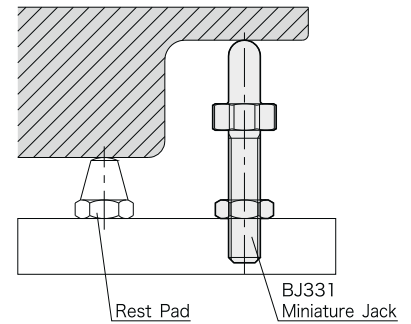
# MINIATURE JACKS



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



### How To Use



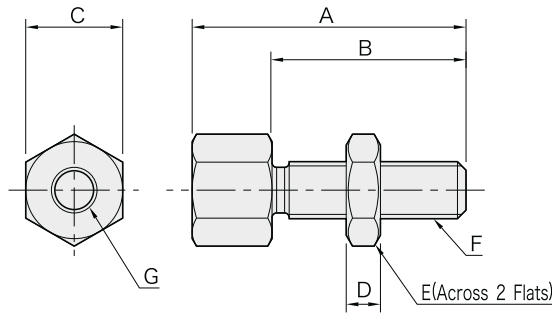
Part Number	A	B	C	D	E	F	G	Weight (g)
<b>51991161</b>	6	37	6	6	25	13	M 6x1	11
<b>51991162</b>		43	12					13
<b>51991163</b>	8	45	8	7	30	17	M 8x1.25	40
<b>51991164</b>		53	16					45
<b>51991165</b>	10	58	10	8	40	19	M10x1.5	60
<b>51991166</b>		68	20					65
<b>51991167</b>	12	72	12	10	50	24	M12x1.75	110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

# BJ332

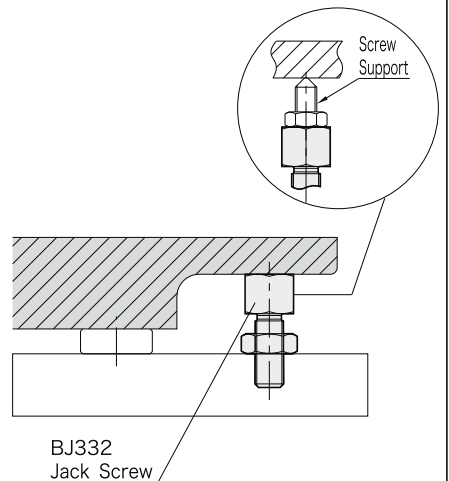
# JACK SCREWS



Material: S45C steel  
Finish : Black oxide



### How To Use



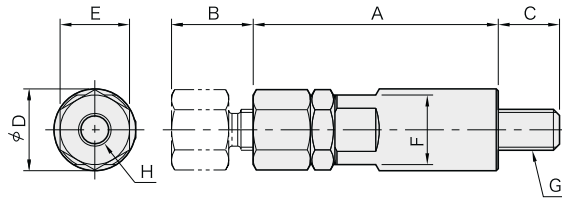
Part Number	A	B	C	D	E	F	G	Weight (g)	
<b>51991173</b>	30	20	13	5	13	M 8x1.25	M 6x1	6 deep	20
<b>51991174</b>	40	30						25	
<b>51991175</b>	38	24	17	6	17	M10x1.5	M 8x1.25	8 deep	45
<b>51991176</b>	48	34						50	
<b>51991177</b>	51	33	22	7	22	M12x1.75	M10x1.5	10 deep	95
<b>51991178</b>	66	48						110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

# BJ333

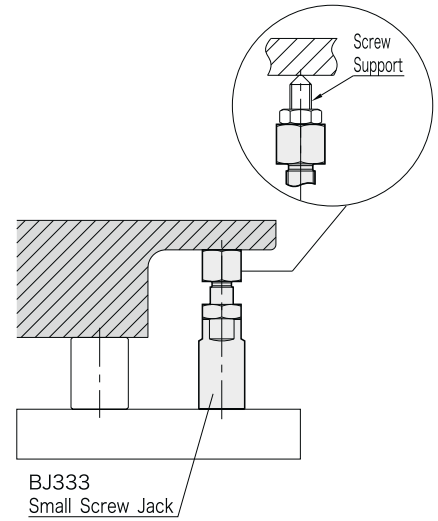
# SMALL SCREW JACKS



Material: S45C steel  
Finish : Black oxide



### How To Use



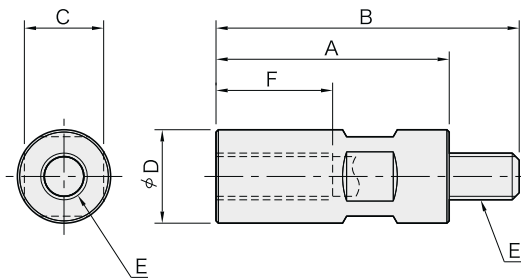
Part Number	A	B	C	D	E	F	G	H	Weight (g)
51991181	40	10	12	16	13	13	M 8 x1.25	M 6x1 6 deep	55
51991182	50	20							70
51991183	50	10	14	20	17	17	M10x1.5	M 8x1.25 8 deep	110
51991184	60	20							135
51991185	65	15	19	24	22	22	M12x1.75	M10x1.5 10 deep	220
51991186	80	30							275
51991187	80	15	24	32	27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

# BJ601

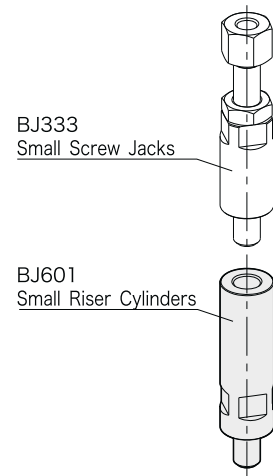
# SMALL RISER CYLINDERS



Material: S45C steel  
Finish : Black oxide



### How To Use



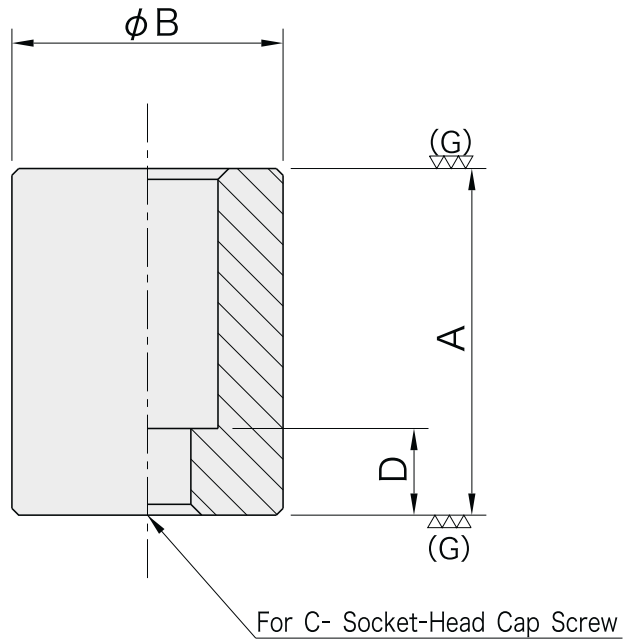
Part Number	A	B	C	D	E	F	Weight (g)
51991189	32	44	13	16	M 8X1.25	18	45
51991190	40	52				55	
51991191	50	62				70	
51991192	65	77				90	
51991193	80	92				115	
51991194	100	112				145	
51991195	40	54	17	20	M10X1.5	23	85
51991196	50	64				105	
51991197	65	79				145	
51991198	80	94				180	
51991199	100	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				350	
51991209	80	104				430	
51991210	100	124				560	
51991211	125	149				715	
51991212	160	184				935	

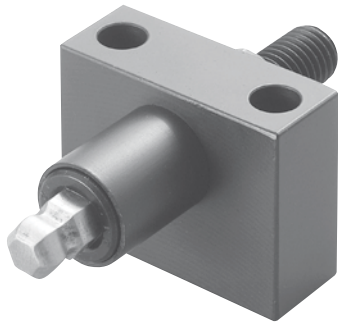




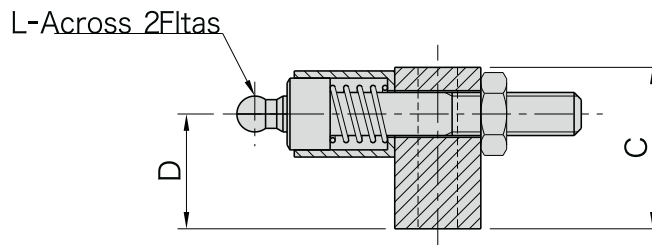
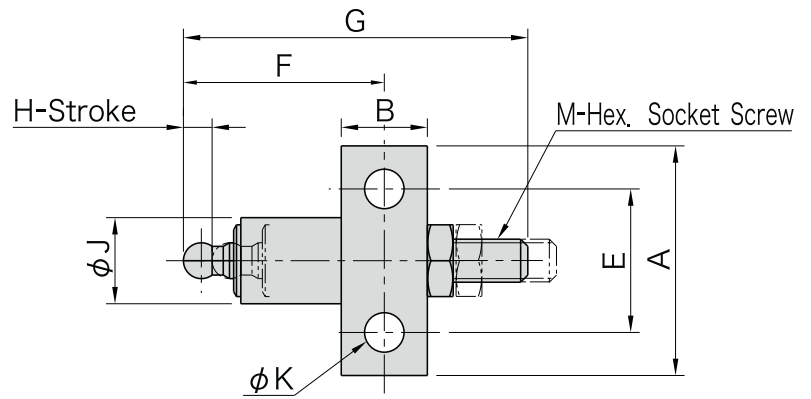
Material:S45C steel  
Heat treated  
Black oxide finish  
Precision ground  
Hardness:RC39 - 45



Part Number	A ( $\pm 0.01$ )	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				200		
51991737	32				260		
51991738	40				330		
51991739	50			12	12	420	
51991740	63					530	
51991741	80					660	
51991742	100			22	22	840	
51991744	25			50	M16	8	350
51991745	32	390					
51991746	40	15	15				500
51991747	50						630
51991748	63						810
51991749	80	35	35			1,000	
51991750	100					1,260	
51991751	125					1,600	



Material: S45C steel  
Finish : Black oxide



### Short

Part Number	A	B	C	D	E	F	G	H	J	K
<b>51991752</b>	32	12	22	16	20	30	48	4	12	5.5
<b>51991753</b>	32	12	27	19.2	20	34	57	4	15	5.5
<b>51991754</b>	44	16	32	22.2	30	45	76	5	18	9
<b>51991755</b>	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
<b>51991752</b>	5	M 6x1 -35L	<b>51991152</b>	75	66
<b>51991753</b>	6	M 8x1.25-40L	<b>51991153</b>	100	81
<b>51991754</b>	8	M10x1.5 -55L	<b>51991154</b>	210	103
<b>51991755</b>	10	M12x1.75-60L	<b>51991155</b>	250	121

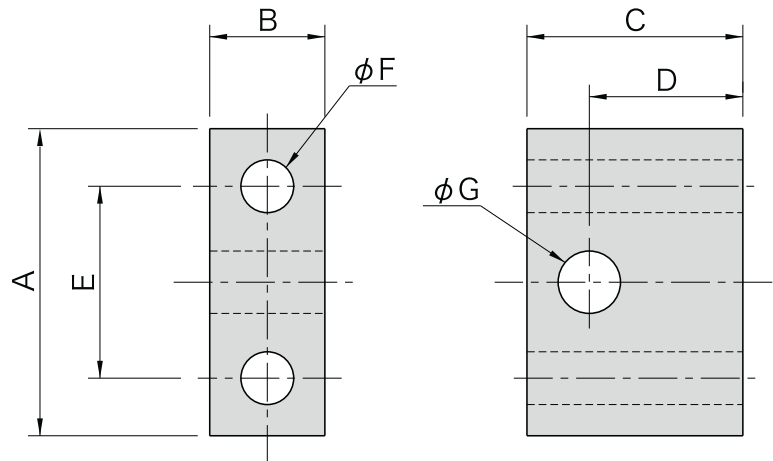
### Tall

Part Number	A	B	C	D	E	F	G	H	J	K
<b>51991756</b>	32	12	26	20	20	30	48	4	12	5.5
<b>51991757</b>	32	12	33	25.2	20	34	57	4	15	5.5
<b>51991759</b>	44	16	49	38.2	30	50	86	5	20	9
<b>51991760</b>	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 Support and Remote-Control Unit
<b>51991756</b>	5	M 6x1 -35L	<b>51991156</b>	85	52
<b>51991757</b>	6	M 8x1.25-40L	<b>51991157</b>	115	62
<b>51991759</b>	10	M12x1.75-60L	<b>51991159</b>	310	92
<b>51991760</b>	10	M12x1.75-60L	<b>51991160</b>	335	95



Material: S45C steel  
Finish : Black oxide



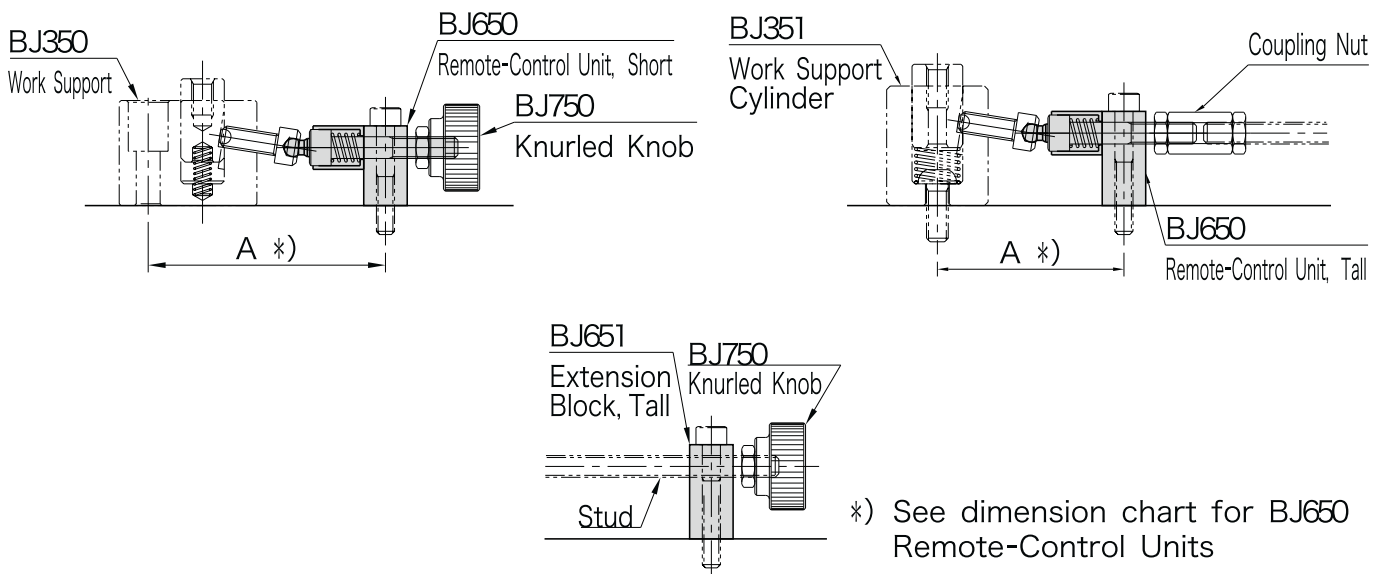
### Short

Part Number	A	B	C	D	E	F	G	Remote-Control Units BJ 650	Weight (g)
<b>51991761</b>	32	12	22	16	20	5.5	6.5	<b>51991752</b>	55
<b>51991762</b>	32	12	27	19.2	20	5.5	8.5	<b>51991753</b>	65
<b>51991763</b>	44	16	32	22.2	30	9	10.5	<b>51991754</b>	140
<b>51991764</b>	44	16	36	25.2	30	9	12.5	<b>51991755</b>	145

### Tall

Part Number	A	B	C	D	E	F	G	Remote-Control Units BJ 650	Weight (g)
<b>51991765</b>	32	12	26	20	20	5.5	6.5	<b>51991756</b>	65
<b>51991766</b>	32	12	33	25.2	20	5.5	8.5	<b>51991757</b>	80
<b>51991768</b>	44	16	49	38.2	30	9	12.5	<b>51991758</b>	205
<b>51991769</b>	44	16	54	43.7	30	9	12.5	<b>51991759</b>	230

### How To Use



Block that works with a BJ650 Remote-Control Unit to extend the remote-control distance.

Note: When used with a BJ650 Remote-Control Unit, a BJ350 or BJ351 Work Support provides lower support capacity.

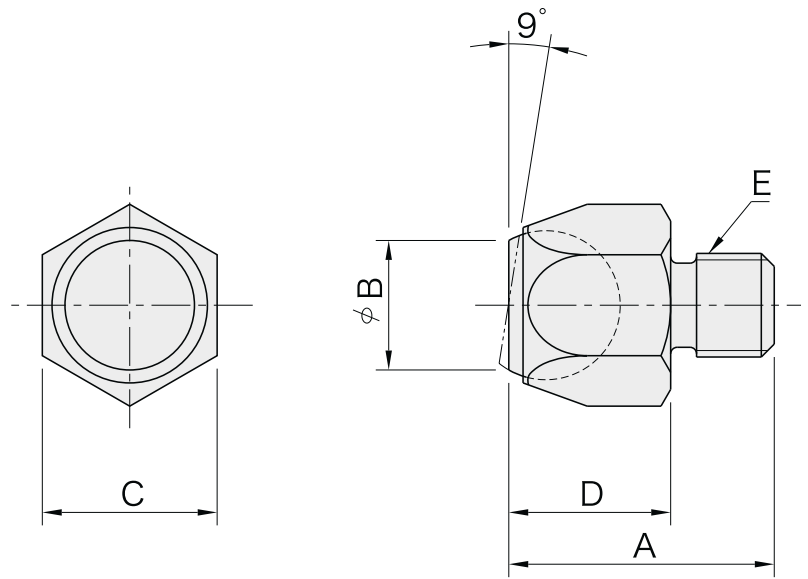
# BJ730

# SWIVEL CONTACT BOLTS



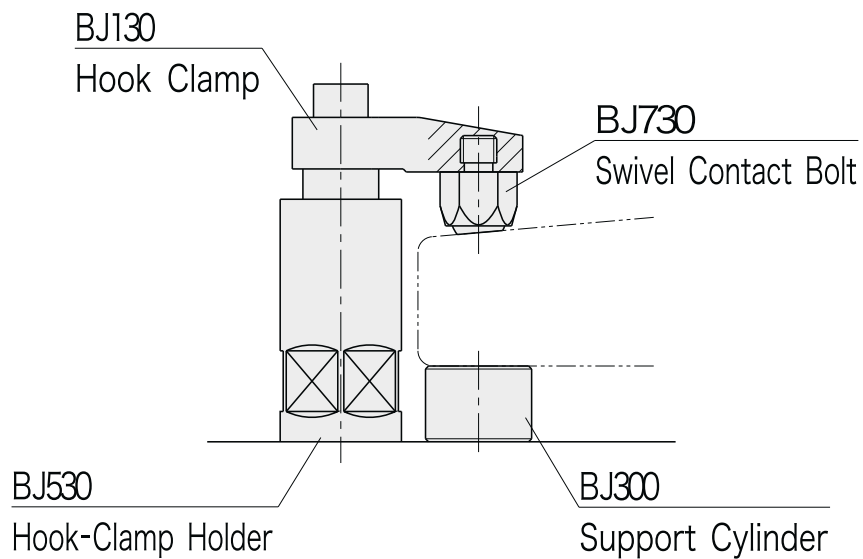
[Body]  
 Material:S45C steel  
 Heat treated (M6&M8 sizes)  
 Black oxide finish

[Ball]  
 Material:SUJ2  
 Heat treated



Part Number	A	B	C	D	E	Load Capacity (N)	Weight (g)
<b>51991770</b>	16	7.4	10	9	M 6x1	13.700	12
<b>51991771</b>	21	10.5	13	12	M 8x1.25	25.600	15
<b>51991772</b>	27	12.7	17	16	M10x1.5	40.000	45
<b>51991773</b>	32	15	22	20	M12x1.75	59.400	50
<b>51991774</b>	41	20	27	25	M16x2	96.400	115

### Application Example



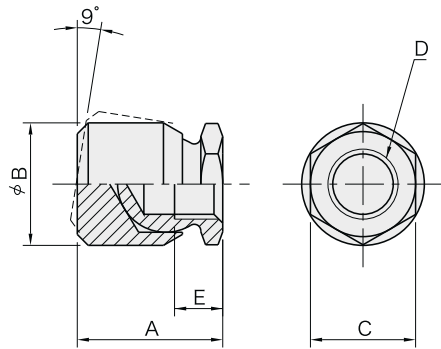
- Use to clamp from above and/or below a workpiece.
- Ball swivel is not limited.

# BJ731

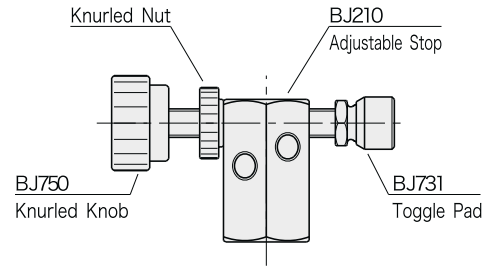
# TOGGLE PADS



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



### Application Example



Use to distribute clamping pressure to irregular workpiece surfaces.

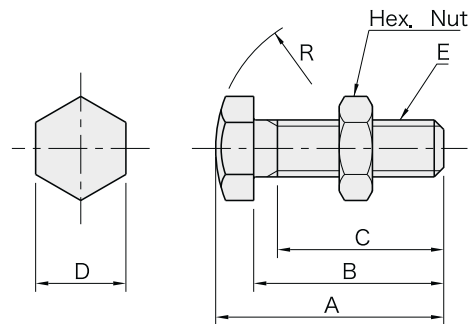
Part Number	A	B	C	D	E	Load Capacity(N)		Weight (g)
						Static	Repeated	
51991775	17	15	13	M 8x1.25	6	8,000	5,300	18
51991776	25	22	19	M12x1.75	8	15,900	10,600	60
51991777	33	28	24	M16x2	10	26,700	17,800	130

# BJ732

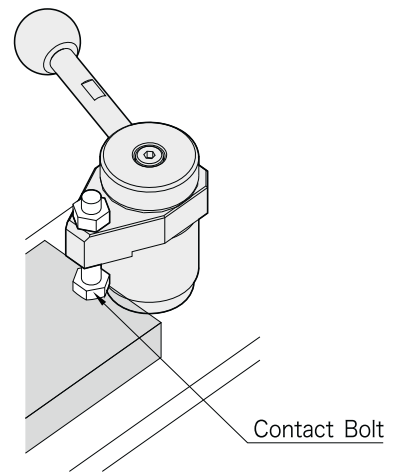
# CONTACT BOLTS



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



### Application Example



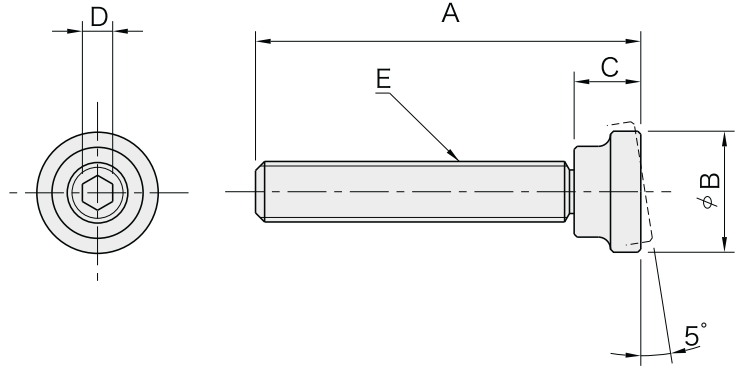
Part Number	A	B	C	D	E	R	Weight (g)
51991235	30	25	22	10	M 6x1	R15	7
51991236	40	35	32				9
51991237	50	45	42				11
51991238	36	30	27	13	M 8x1.25	R17.5	16
51991239	46	40	37				19
51991240	56	50	47				22
51991241	48	40	37	17	M10x1.5	R20	33
51991242	58	50	47				38
51991243	68	60	57				42
51991244	50	40	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



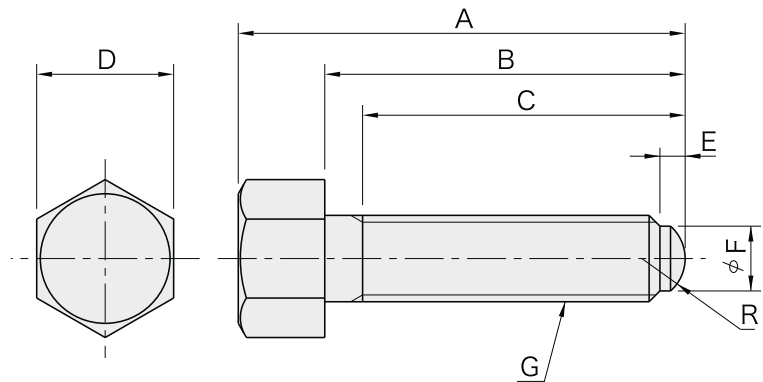
Part Number	A	B	C	D	E	Weight (g)
51991780	43	16	9	4	M 8x1.25	28
51991781	63					37
51991782	83					46
51991783	64	20	11	5	M10x1.5	50
51991784	84					60
51991785	104					70
51991786	65	25	13	6	M12x1.75	75
51991787	85					95
51991788	105					110
51991789	130	32	15	8	M16x2	130
51991790	85					170
51991791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

# BJ748

# CLAMP SCREWS



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



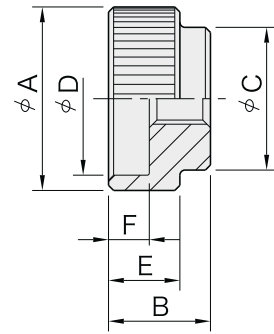
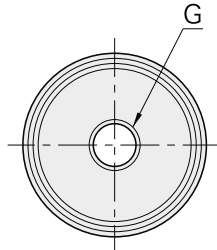
Part Number	A	B	C	D	E	F	G	R	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991800	50	40	37	13	3	5.5	M 8x1.25	R 6	53.000	84	21
51991801	60	50	47								24
51991802	70	60	57								26
51991803	52	40	37	17	3.5	7.5	M10x1.5	R 8	89.000	178	38
51991804	62	50	47								42
51991805	72	60	57								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	24	6	12	M16x2	R12	130.000	417	115
51991810	100	80	75								165
51991811	120	100	95								185
51991812	145	125	120	215							

# BJ750

# KNURLED KNOBS



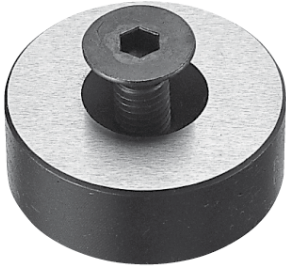
Material:S45C steel  
Finish :Black oxide



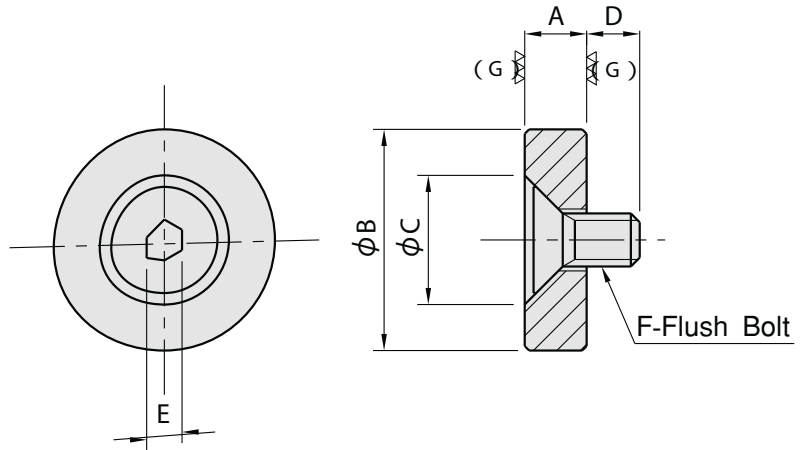
Part Number	A	B	C	D	E	F	G	Weight (g)
<b>51991819</b>	30	17	20	24	12	7	M 8x1.25	50
<b>51991820</b>	36	20	28	30	14	8	M10x1.5	90
<b>51991821</b>	40	24	32	34	16	10	M12x1.75	125

# BJ763

# FLAT FEET

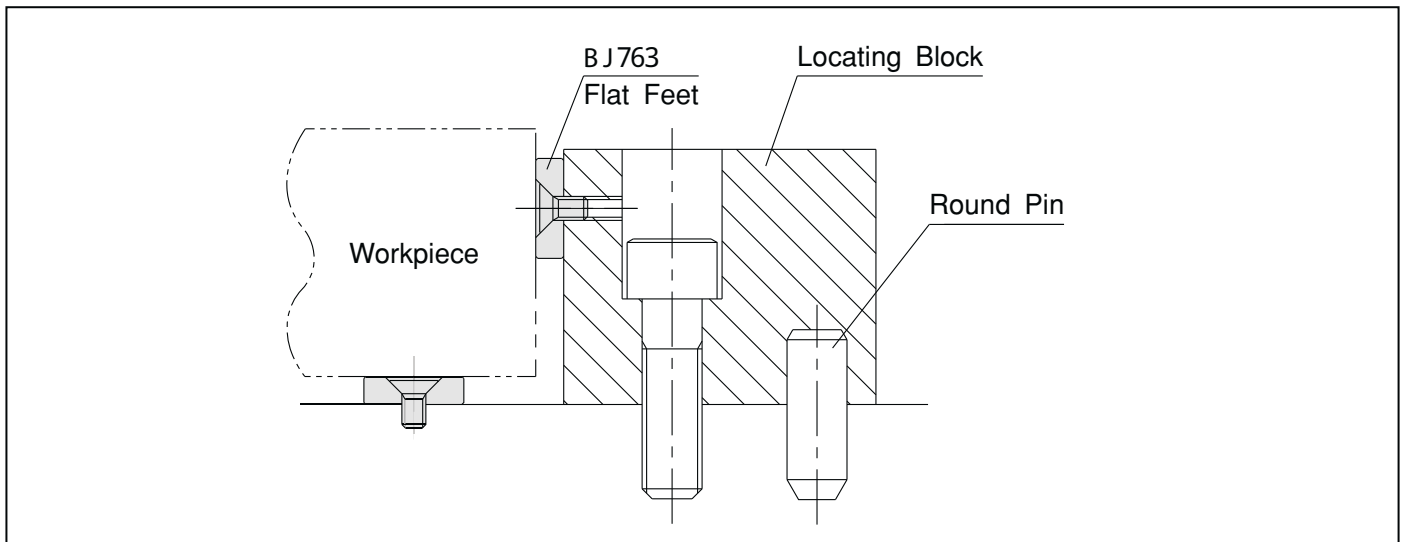


- Material: S45C steel
- Heat treated
- Black oxide finish
- Precision ground
- Hardness: RC39 to 45



Code	A ( $\begin{smallmatrix} +0.01 \\ 0 \end{smallmatrix}$ )	$\phi B$	$\phi C$	D	E	F	Weight (g)
51 99 18 67	5	25	14	7.7	4	M6x 1	20
51 99 18 68		30					30
51 99 18 69		35					40
51 99 18 70	10	25	10.7	10.7	4	M6x 1	40
51 99 18 71		30					60
51 99 18 72		35					80
51 99 18 73	10	30	19.4	11.3	5	M8x 1.25	60
51 99 18 74		35					80
51 99 18 75		40					100
51 99 18 76	15	30	19.4	11.3	5	M8x 1.25	90
51 99 18 77		35					115
51 99 18 78		40					150

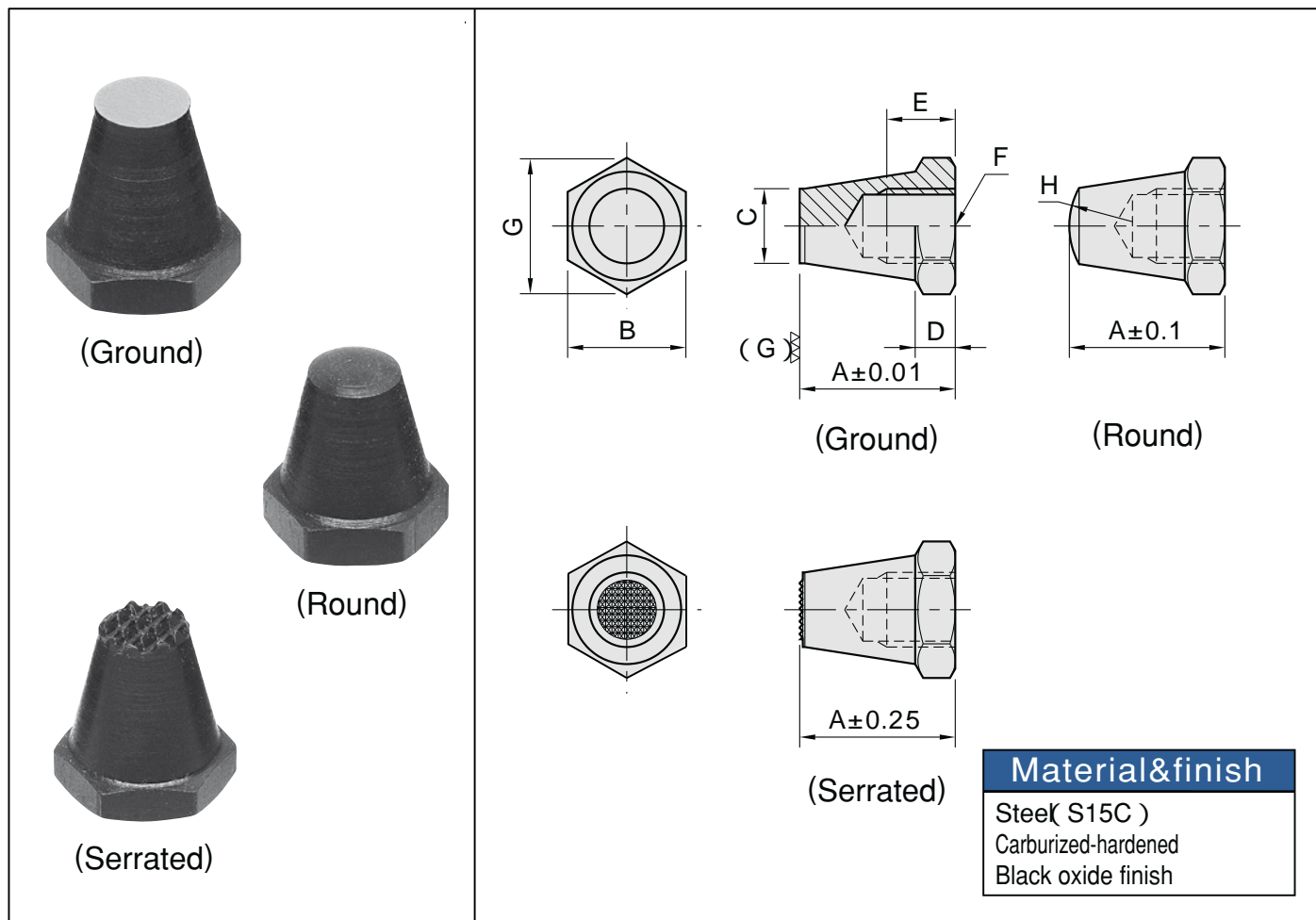
## Application Example



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 .





**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				17
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				19
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				50



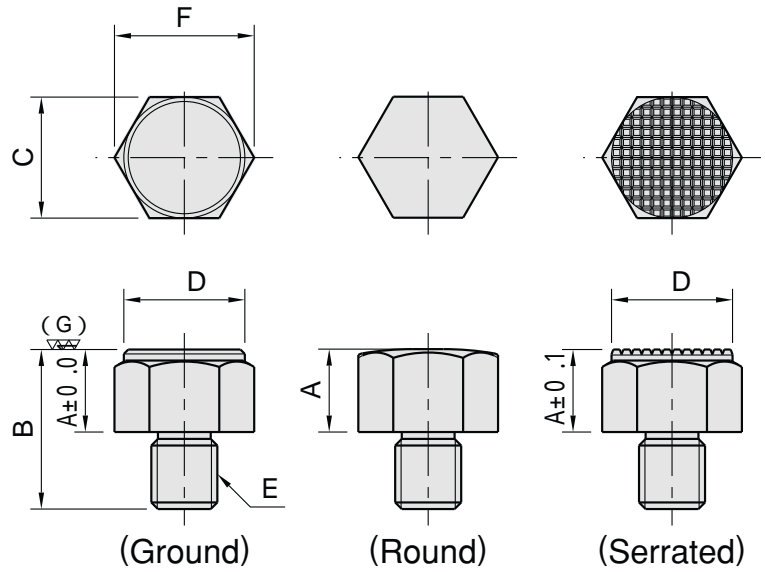
(Ground)



(Round)



(Serrated)



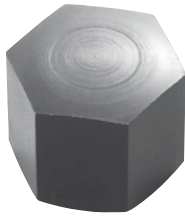
### Material&finish

Steel( SUM22L )  
 Carburized - hardened  
 Black oxide finish

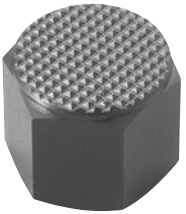
Ground code	Round code	Serrated code	A	B	C	D	E	F	Weight (g)
51 99 19 03	51 99 19 04	51 99 19 05	10	20	17	17	M 8x1.25	19.4	24
51 99 19 06	51 99 19 07	51 99 19 08		24	22	22	M12x1.75	25.2	40
51 99 19 09	51 99 19 10	51 99 19 11	15	29					



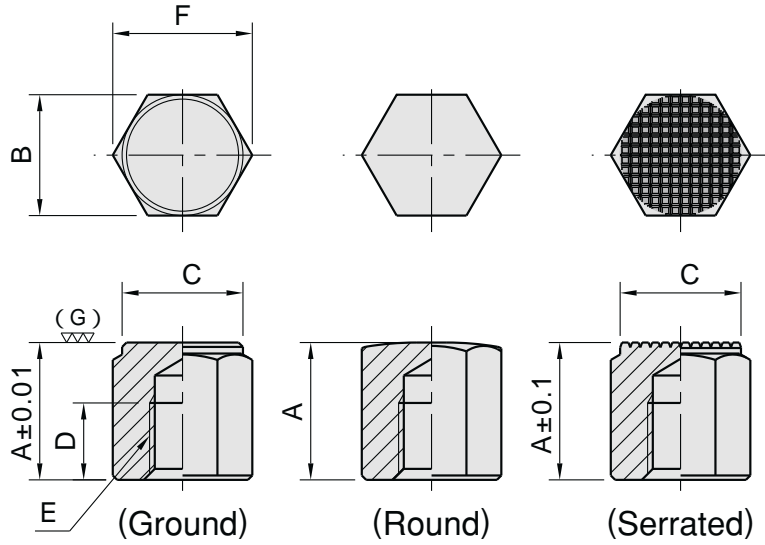
(Ground)



(Round)



(Serrated)



### Material&finish

Steel (SUM22L)  
 Carburized-hardened  
 Black oxide finish

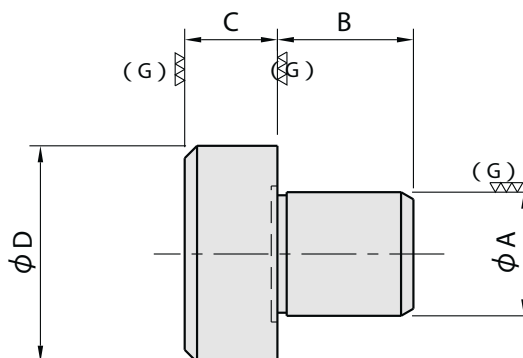
Ground code	Round code	Serrated code	A	B	C	D	E	F	Weight (g)
			51 99 19 12	51 99 19 13	51 99 19 14	15			
51 99 19 15	51 99 19 16	51 99 19 17	25	16	40				
51 99 19 18	51 99 19 19	51 99 19 20	20	22	22	10	M12x1.75	25.2	52
51 99 19 21	51 99 19 22	51 99 19 23	25			15			65
51 99 19 24	51 99 19 25	51 99 19 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

# BJ769

# REST BUTTONS

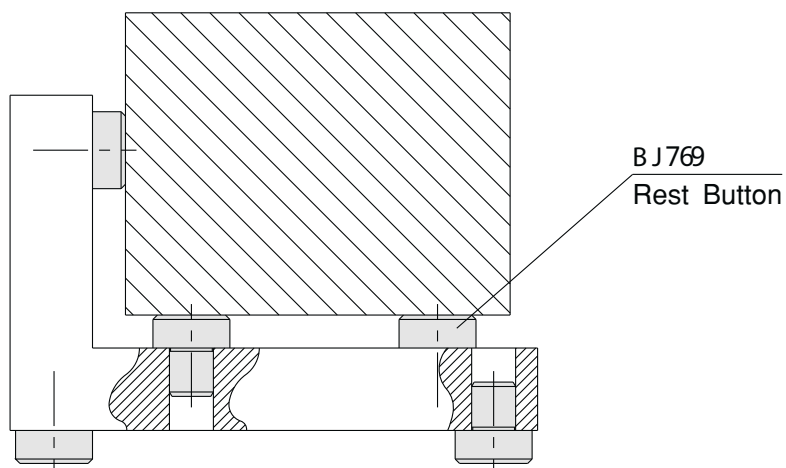


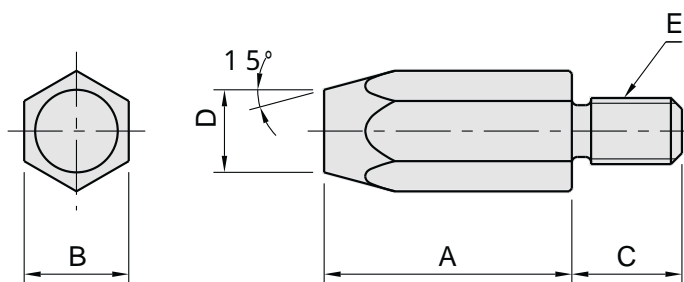
- Material: SUM43 steel
- Heat treated
- Black oxide finish
- Precision ground
- Hardness: RC40 to 45



Part Number	$\phi A$ ( $\begin{smallmatrix} +0.025 \\ +0.012 \end{smallmatrix}$ )	B	C ( $\begin{smallmatrix} +0.03 \\ 0 \end{smallmatrix}$ )	$\phi D$	Weight (g)
51 99 19 33	6	8	5	10	5
51 99 19 34			10		8
51 99 19 35	8	10	5	16	12
51 99 19 36			10		20
51 99 19 37			15		28
51 99 19 38			20		36
51 99 19 39	10	12	10	20	32
51 99 19 40			15		45
51 99 19 41			20		58

## ■ Application Example





### Material&finish

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

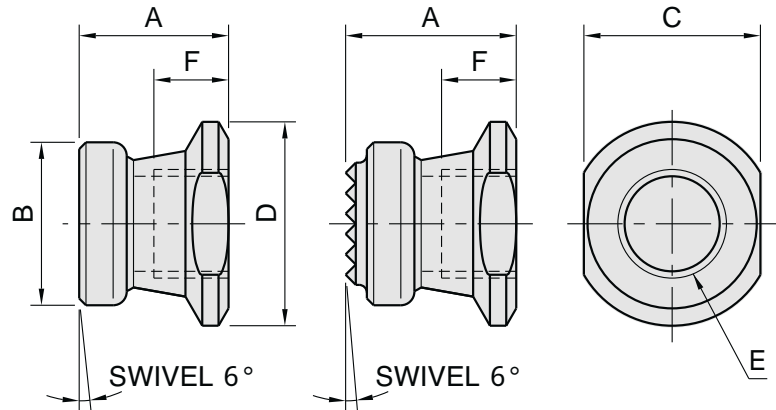
Part Number	A	B	C	D	E	Weight (g)
51 99 19 42	10	10	11	8	M 6x1	6
51 99 19 43	20			6		13
51 99 19 44	15	13	13	10	M 8x1.25	18
51 99 19 45	30			9		33
51 99 19 46	20	17	16	13	M10x1.5	44
51 99 19 47	40					80
51 99 19 48	25	19	20	15	M12x1.75	70
51 99 19 49	50					120



(Plain)



(Serrated)



(Plain)

(Serrated)

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

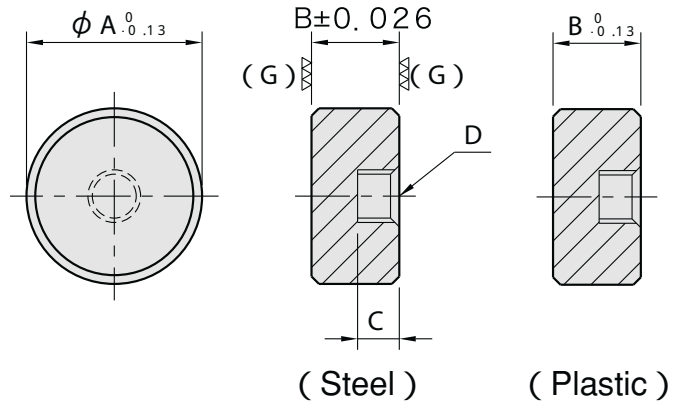
code	A	B	C	D	E	F	Load Capacity (N)	Weight (g)
51 99 19 50	15.5	14	12	14.3	M 6x1	5.5	5,000	9
51 99 19 51	13							
51 99 19 52	19.5	16	14	16	M 8x1.25	7	10,000	13
51 99 19 53	17							
51 99 19 54	21.5	18	16	19.1	M10x1.5	8	13,000	21
51 99 19 55	18							
51 99 19 56	25.5	21	22	25.4	M12x1.75	9.5	24,000	34
51 99 19 57	22							
51 99 19 58	28	24	22	25.4	M16x2	11	38,000	50
51 99 19 59	25							
51 99 19 60	33	28	30	31.5	M20x2.5	13.5	57,000	82
51 99 19 61	29							



( Steel )



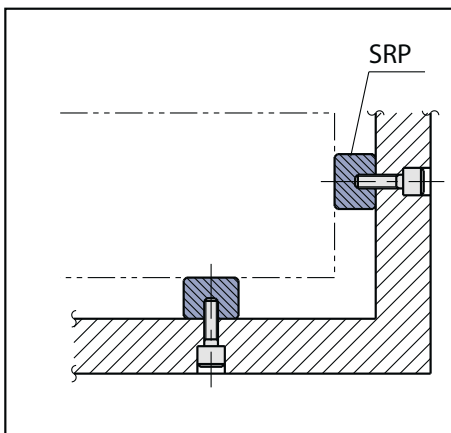
( Plastic )



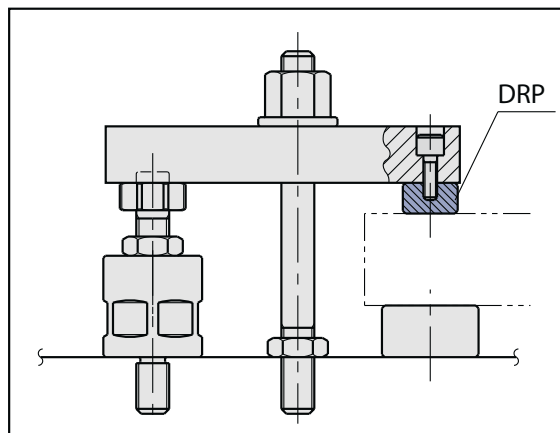
Type	Material & Finish
Steel	Steel ( SNCM220 ) Carburized-hardened Black oxide finish Heat treated to Rc60
Plastic	Polyacetal plastic White

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

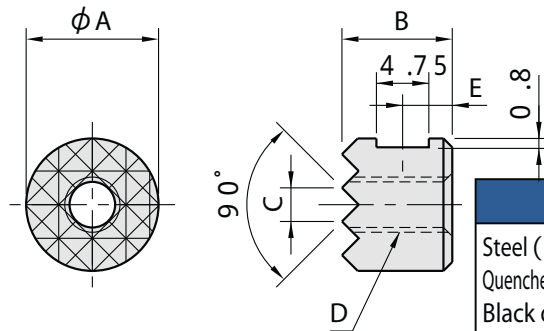
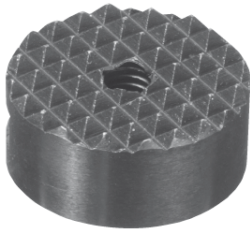
### Application Examples



• Workpiece positioning

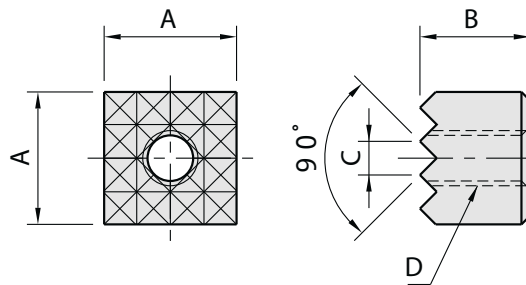
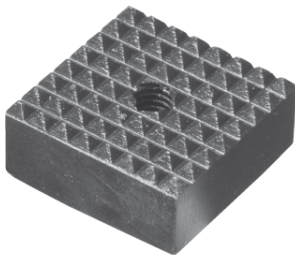


• Protecting a soft or precision ground workpiece.

**HS****ROUND GRIPPERS, Tapped**

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

Part Number	A ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	B ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	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**

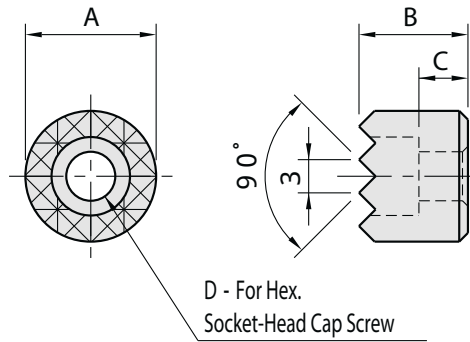
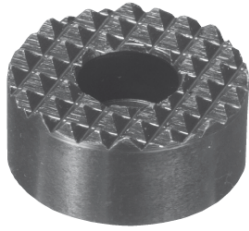
Steel ( SKH51 )  
 Quenched and tempered  
 Black oxide finish  
 Heat treated to Rc62

Part Number	A ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	B ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	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

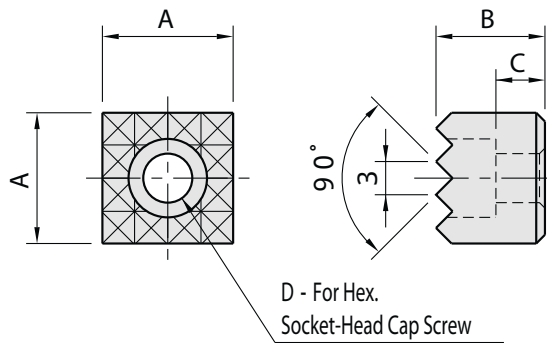
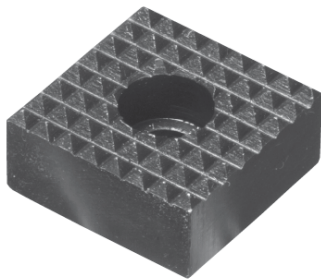


Steel (SKH51)  
 Quenched and tempered  
 Black oxide finish  
 Heat treated to Rc62

Part Number	A ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	B ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	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

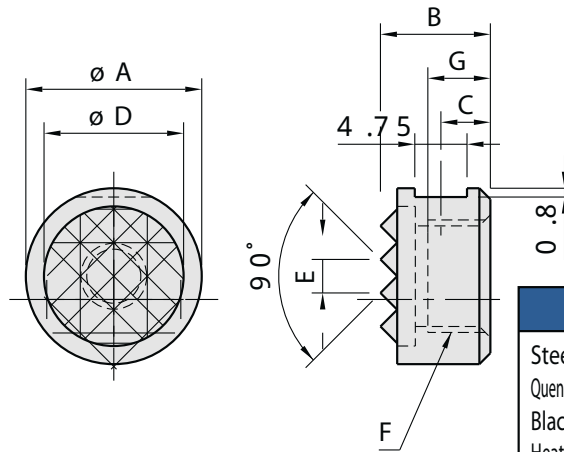


Steel (SKH51)  
 Quenched and tempered  
 Black oxide finish  
 Heat treated to Rc62

Part Number	A ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	B ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	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

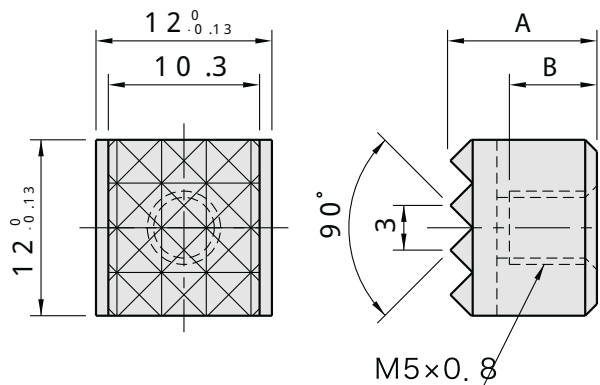
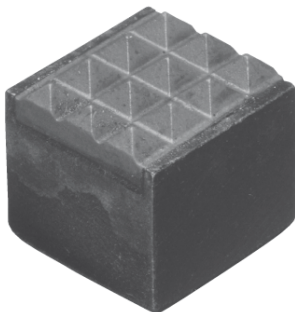


Body	Tip
Steel (SCM440) Quenched and tempered Black oxide finish Heat treated to Rc32	Carbide Black oxide finish

code	A ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	B ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	C	D	E	F	G (Effective Thread Length)	Weight (g)
51 99 20 08	10	10	4.5	7.9	2.3	M5x0.8	6.5	5
51 99 20 09		12	6				8.5	
51 99 20 10	12	10	4.5	9.5	3	M5x0.8	6.5	8
51 99 20 11		12	6				8.5	
51 99 20 12	16	10	4.5	12.7	3	M6x1	6.5	14
51 99 20 13		12	6				8.5	
51 99 20 14	20	10	4.5	15.9	3	M6x1	6.5	23
51 99 20 15		12	6				8.5	
51 99 20 16	25	10	4.5	19.1	3	M6x1	6.5	35
51 99 20 17		12	6				8.5	

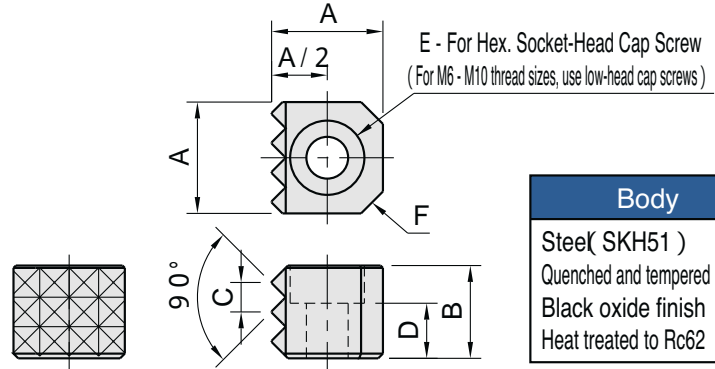
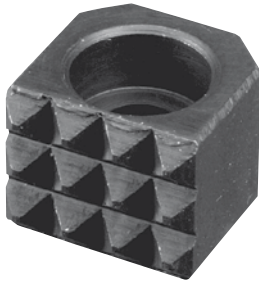
# CT

## SQUARE GRIPPERS



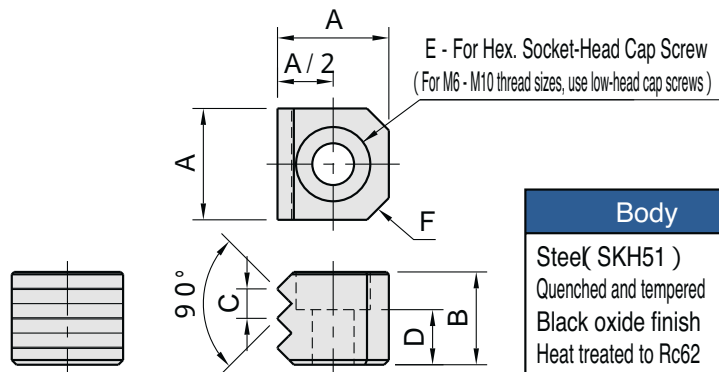
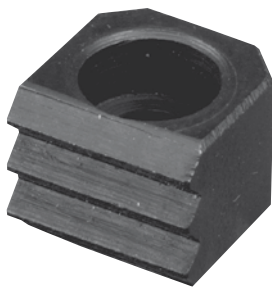
code	A ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	B (Effective Thread Length)	Weight (g)
51 99 20 18	10	6.5	10
51 99 20 19	12	8.5	13

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



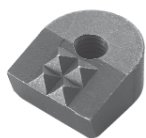
Body
Steel( SKH51 )
Quenched and tempered
Black oxide finish
Heat treated to Rc62

code	A ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	B ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	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

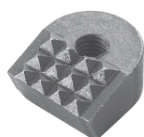


Body
Steel( SKH51 )
Quenched and tempered
Black oxide finish
Heat treated to Rc62

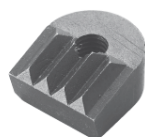
code	A ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	B ( $\begin{smallmatrix} 0 \\ -0.13 \end{smallmatrix}$ )	C	D	E	F	Weight (g)
51 99 20 33	10	6	2.3	2.8	M 3	1.6	4
51 99 20 34		10		6.8			6
51 99 20 35	12	6	3	1.9	M 4	2.3	5
51 99 20 36		10		5.9			8
51 99 20 37		12		7.9			10
51 99 20 38	16	6	3	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



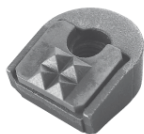
51 99 20 46



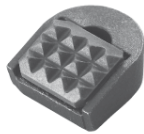
51 99 20 47



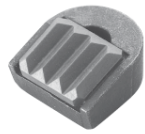
51 99 20 48



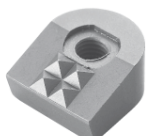
51 99 20 49



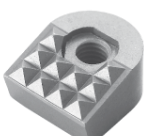
51 99 20 50



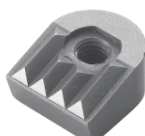
51 99 20 51



51 99 20 52

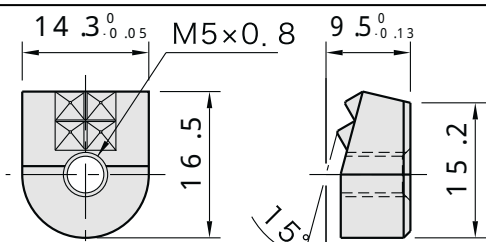


51 99 20 53

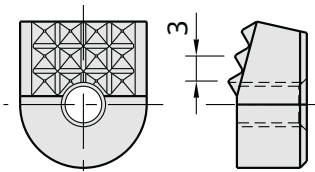


51 99 20 54

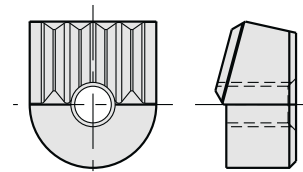
51 99 20 46	Steel( SKH51 )	
51 99 20 47	Quenched and tempered	
51 99 20 48	Black oxide finish	
51 99 20 49	Heat treated to Rc62	
51 99 20 49	Steel( SKH51 )	Carbide Black oxide finish
51 99 20 50	Quenched and tempered	
51 99 20 51	Black oxide finish	
51 99 20 51	Heat treated to Rc62	
51 99 20 52	Carbide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



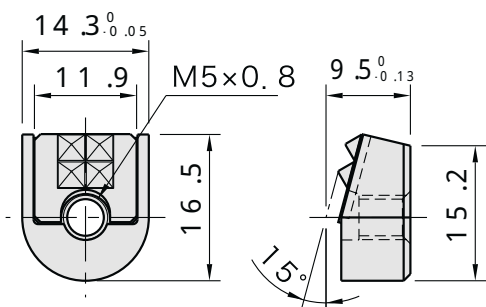
51 99 20 46



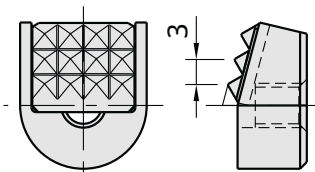
51 99 20 47



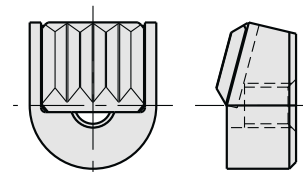
51 99 20 48



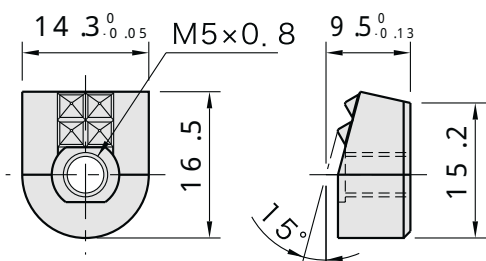
51 99 20 49



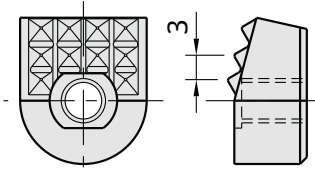
51 99 20 50



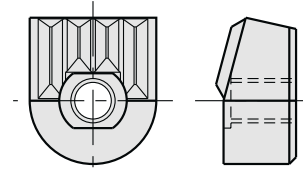
51 99 20 51



51 99 20 52



51 99 20 53

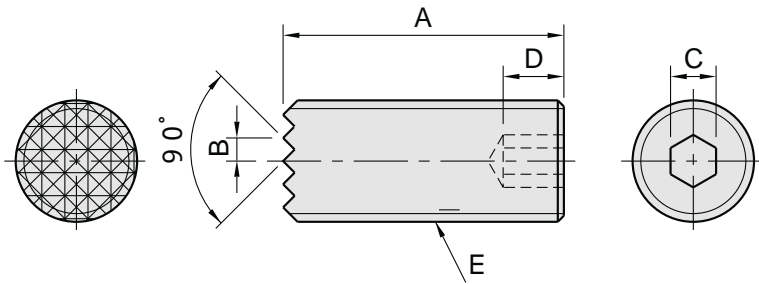


51 99 20 54

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

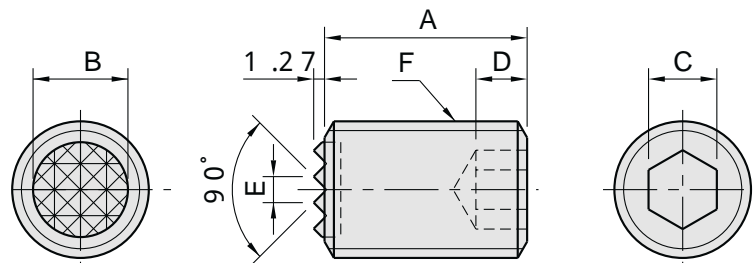
Part Number	Weight (g)
51 99 20 49	12
51 99 20 50	13
51 99 20 51	

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



code	A	B	C	D	E	Weight (g)
51 99 20 55	25	2.3	3	4	M10x1.5	13
51 99 20 56	40					21
51 99 20 57	25	3	5	6	M12x1.75	16
51 99 20 58	40					29
51 99 20 59	25	3	6	8	M16x2	34
51 99 20 60	40					53
51 99 20 61	25	3	8	10	M20x2.5	54
51 99 20 62	40					82

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

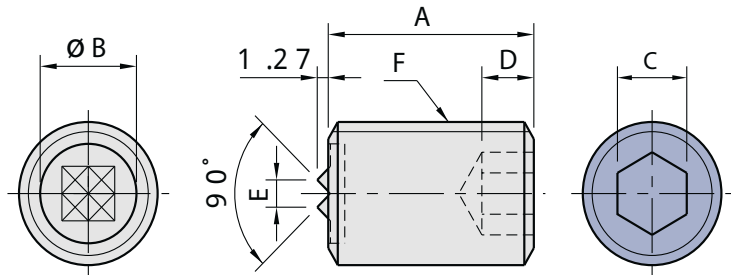


Body	Tip
Steel( SCM440 ) Quenched and tempered Black oxide finish	Carbide Black oxide finish

code	A	B	C	D	E	F	Weight (g)
51 99 20 63	25	6.4	5	4	2.3	M10x1.5	15
51 99 20 64	50						30
51 99 20 65	25	7.9	6	5	2.3	M12x1.75	21
51 99 20 66	50						43
51 99 20 67	25	11.1	8	6	3	M16x2	37
51 99 20 68	50						77
51 99 20 69	25	12.7	10	8	3	M20x2.5	57
51 99 20 70	50						119

# PG

# TIPPED SOCKET SCREW GRIPPERS

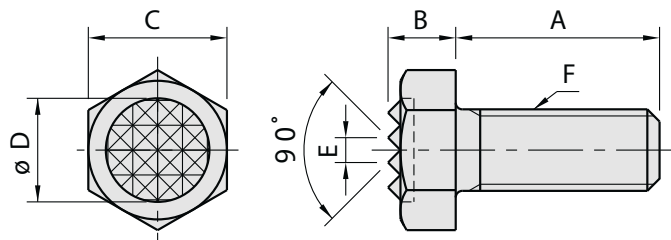


code	A	B	C	D	E	F	Weight (g)
51 99 20 71	25	7.9	6	5	3	M12×1.75	21
51 99 20 72	50						43
51 99 20 73	25	11.1	8	6	3	M16×2	37
51 99 20 74	50						77
51 99 20 75	25	12.7	10	8	3	M20×2.5	57
51 99 20 76	50						119

Steel ( SCM440 ) Quenched and tempered Black oxide finish	Carbide Black oxide finish
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# 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	8.3	17	12.7	3	M10×1.25	17
51 99 20 82	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	8.7	19	15.9	3	M12×1.75	36
51 99 20 86	25						42
51 99 20 87	40	11	24	19.1	3	M16×2	55
51 99 20 88	35						88
51 99 20 89	50	13.5	30	25.4	2.3	M20×2.5	127
51 99 20 90	40						133
51 99 20 91	60						231

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



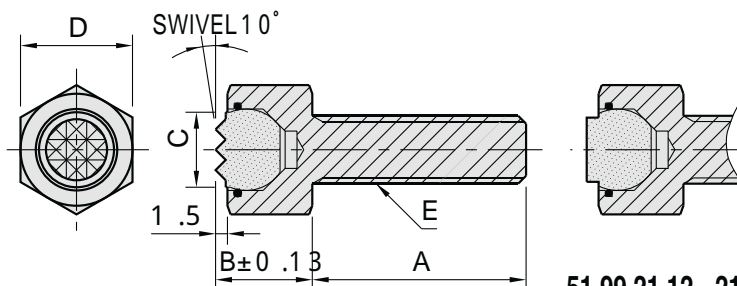
**51 99 21 18 - 21 31**  
(Plain, Steel Tip)



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

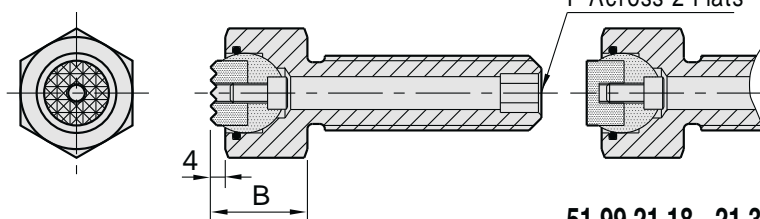


**51 99 21 38 - 21 51**  
(Plain, Plastic Tip)



**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)



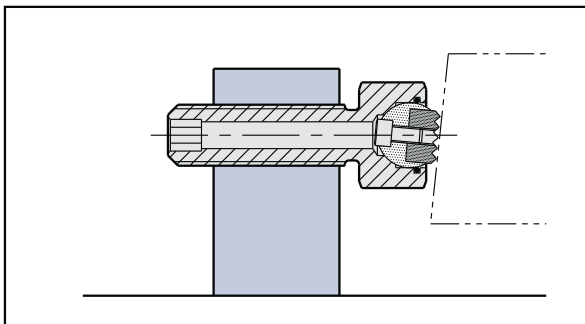
**51 99 20 98 - 21 11**  
(Serrated, Steel Tip)

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

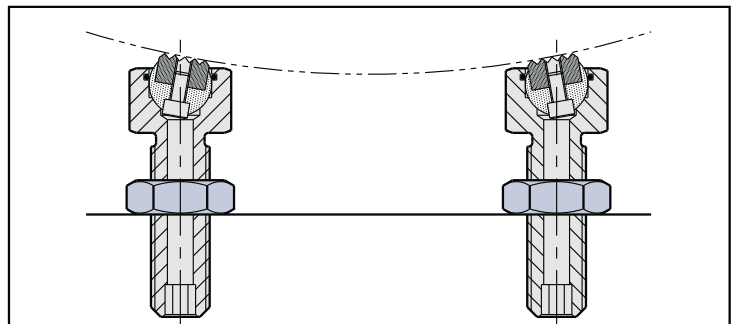
code	Body	Ball	Tip
51 99 20 92 - 20 97 51 99 21 12 - 21 17		Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc60	
51 99 21 32 - 21 37	Steel (SCM440)	Polyacetal plastic White	
51 99 20 98 - 21 11	Quenched and tempered		Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc62
51 99 21 18 - 21 31	Black oxide finish	Stainless steel (SUS440)	Steel (SNM220) 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.





**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)



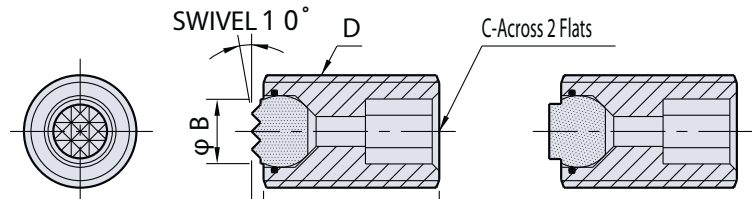
**51 99 21 69 - 21 73**  
(Plain, Steel Tip)



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

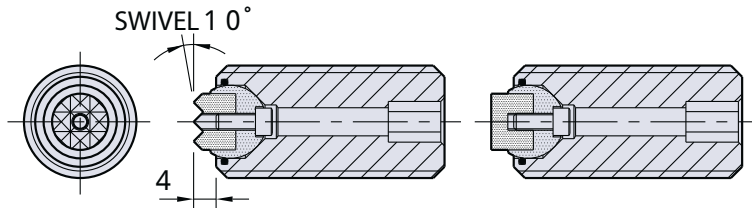


**51 99 21 80 - 21 84**  
(Plain, Plastic Tip)



**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 )



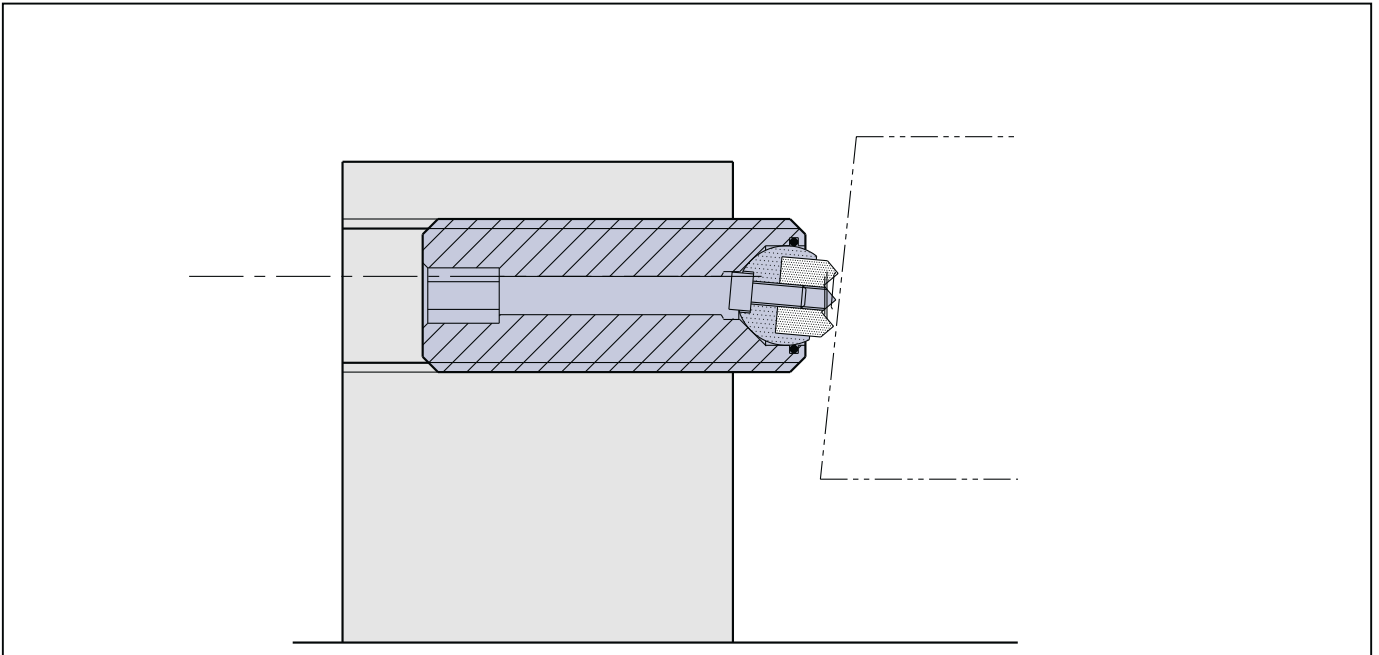
**51 99 21 58 - 21 62**  
(Serrated, Steel Tip)

**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 ( 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	Steel ( SCM440 ) Quenched and tempered Black oxide finish Heat treated to Rc45		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		Stainless steel ( SUS440 )	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				
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

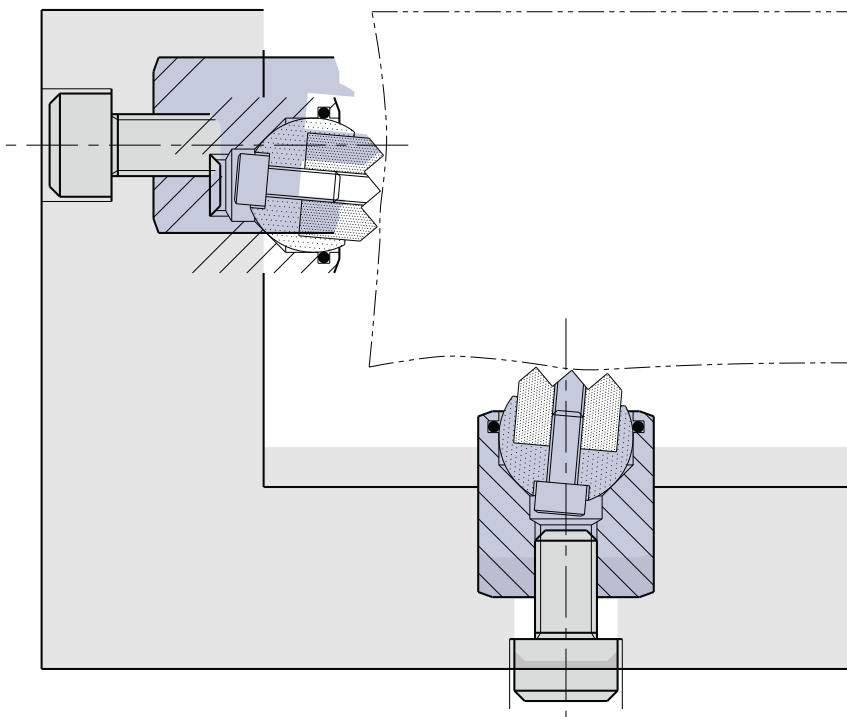


- Ideal for workpiece positioning and positive holding.

### 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.



**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 )



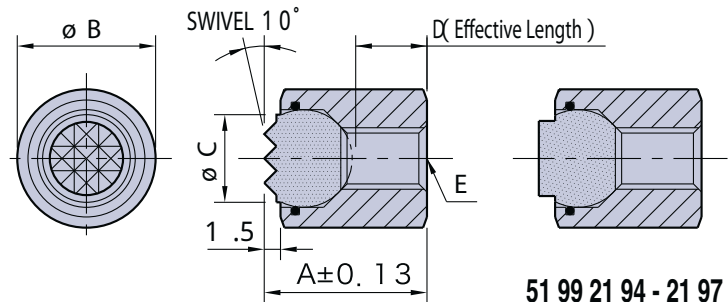
**51 99 21 98 - 22 02**  
(Plain, Steel Tip )



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

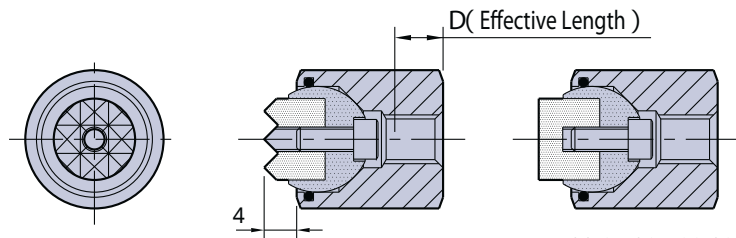


**51 99 22 07 - 22 11**  
(Plain, Plastic Tip )



**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 ( 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	Steel ( SCM440 ) Quenched and tempered Black oxide finish	Steel ( SKH51 ) Quenched and tempered Black oxide finish Heat treated to Rc62	
51 99 21 98 - 22 02		Stainless steel ( SUS440 )	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 4x0.7	5300
51 99 21 86	13	51 99 21 95	13	51 99 22 04	12	25					
51 99 21 87	12	51 99 21 96	12	51 99 22 05	11	16	13	8.5	6.5	M 5x0.8	10900
51 99 21 88	21	51 99 21 97	21	51 99 22 06	20	25					
51 99 21 89	31	51 99 21 98	31	51 99 22 07	27	22	17	10	7.5	M 6x1	18400
51 99 21 90	43	51 99 21 99	43	51 99 22 08	37	24	19	12	8.5	M 8x1.25	24500
51 99 21 91	72	51 99 22 00	73	51 99 22 09	61	28	24	16	9	M10x1.5	43600
51 99 21 92	128	51 99 22 01	129	51 99 22 10	109	30	30	20	8.5	M12x1.75	57700
51 99 21 93	235	51 99 22 02	237	51 99 22 11	205	36	36	25	12	M12x1.75	85600

