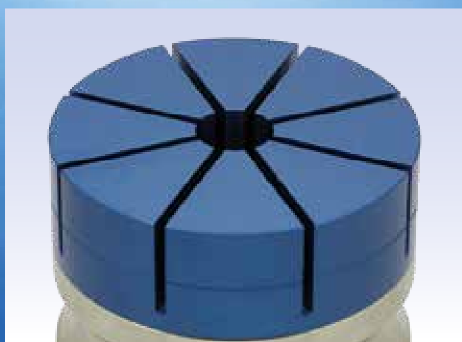
STATIONARY WORKHOLDING





Additional Catalogue

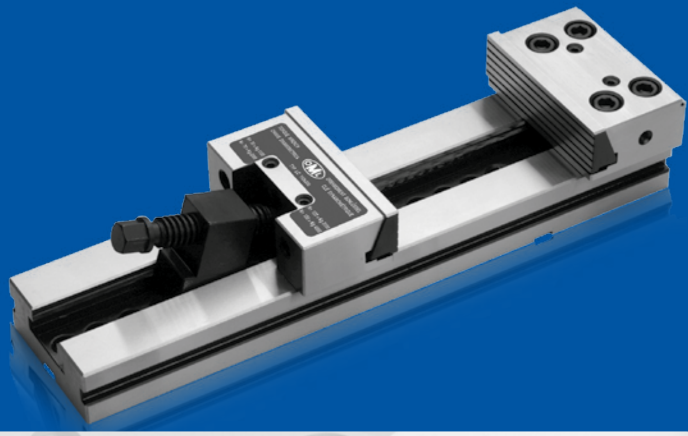
SMW® AUTOBLOK

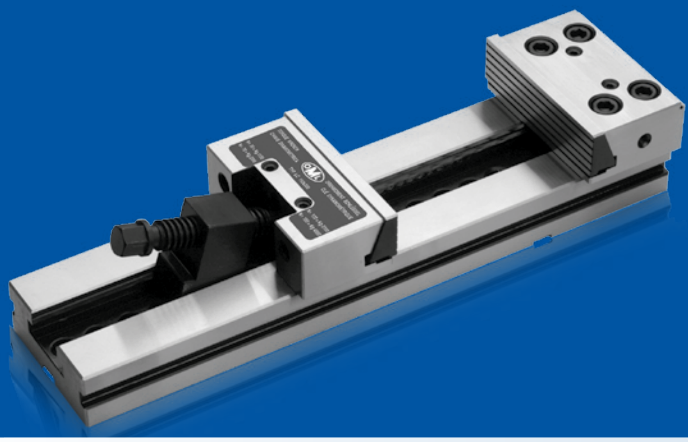
www.omlspa.it

MODULAR CLAMPING SYSTEMS

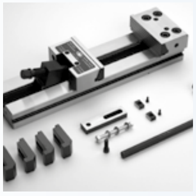
INDEX

LC
Modular clamping equipment





LC
Modular clamping equipment



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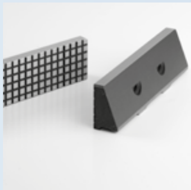
LC
Modular clamping equipment



Page 3.2.8

LC
Spare parts for clamping equipment

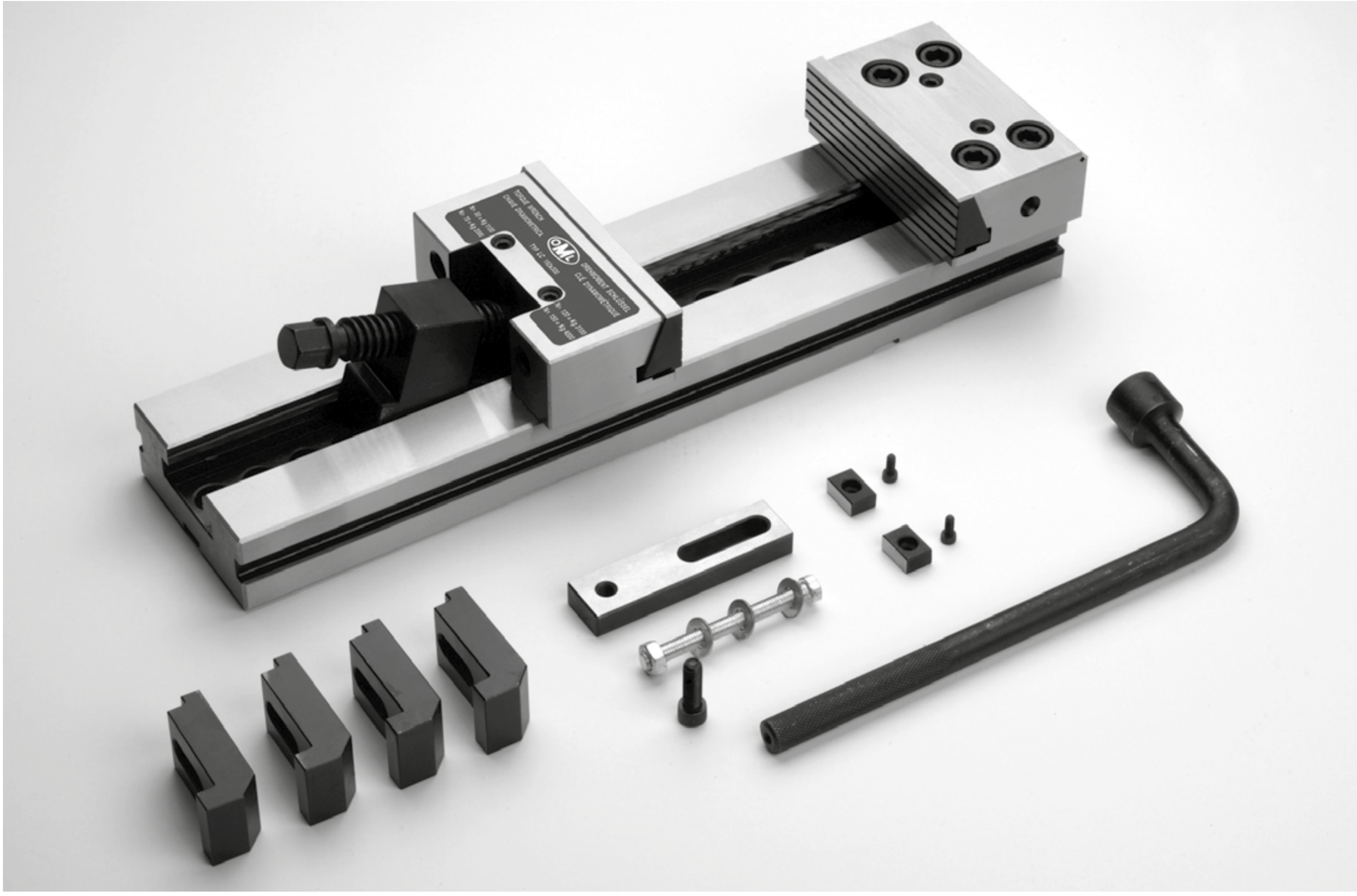
Page 3.2.4

LC
Accessories for clamping equipment

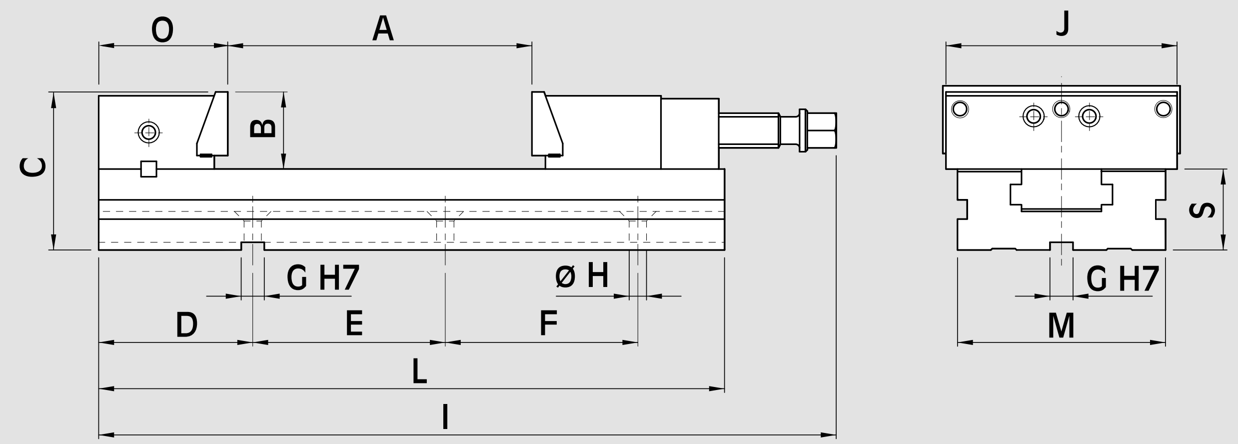
LC
is...

LOW COST

The new LC VISE joins the original OML TC and MC VISES as "low cost" solution.

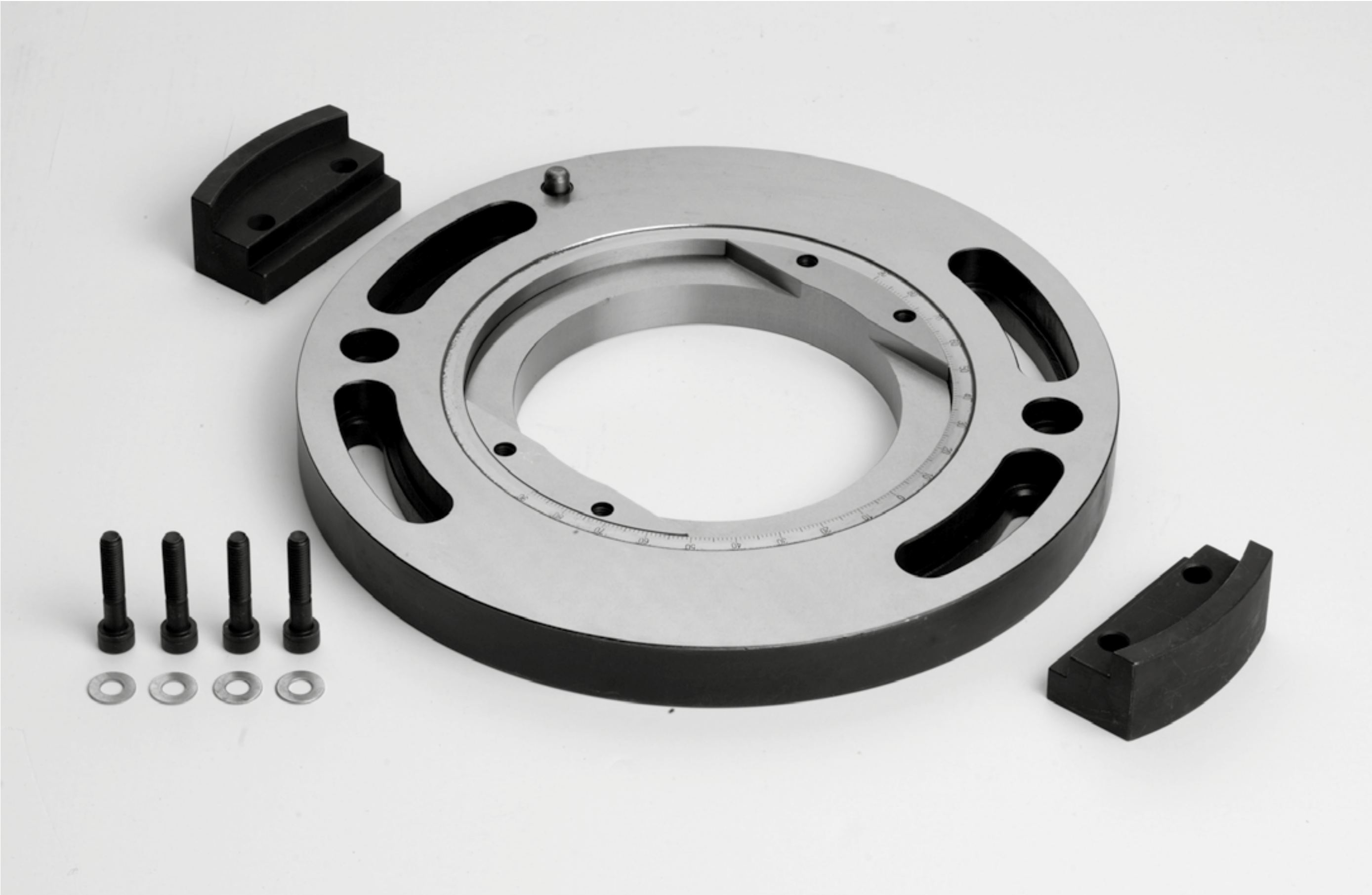


Clamping equipment LC complete with: wrench, rigid slide way (floating slide-way at request for raw workpiece), work stop, pair of positioning keys h6, cover for protection of the screw, 4 clamps, cardboard box.



Cod.	type	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	L mm	M mm	O mm	S mm	weight kg
77 58 95 01	LC 125 x 150	150	40	80	111	100	100	16	8,5	410	125	345	95	77,9	40	13
77 58 96 01	LC 150 x 200	200	50	100	122,5	100	100	16	12,5	500	150	420	125	89,4	50	26
77 58 96 02	LC 150 x 300	300	50	100	122,5	100	100	16	12,5	600	150	520	125	89,4	50	29
77 58 97 01	LC 200 x 300	300	65	135	145	100	100	16	12,5	680	200	595	170	113	70	69
77 58 97 02	LC 200 x 400	400	65	135	145	100	100	16	12,5	780	200	695	170	113	70	74

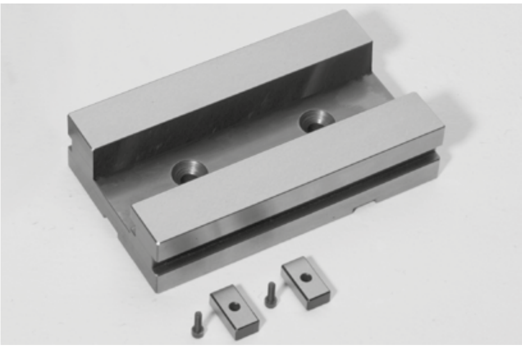
Swivel base for clamping equipment LC

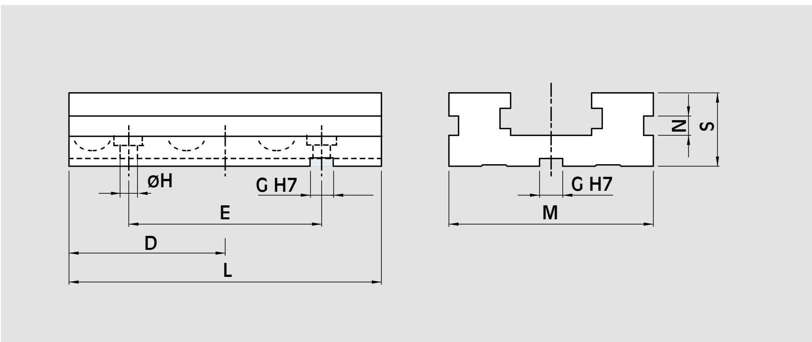


Cod.	for type
77 58 95 50	LC 125
77 58 96 50	LC 150
77 58 97 50	LC 200

LC extension element

with pair of positioning keys (at customer's choice)

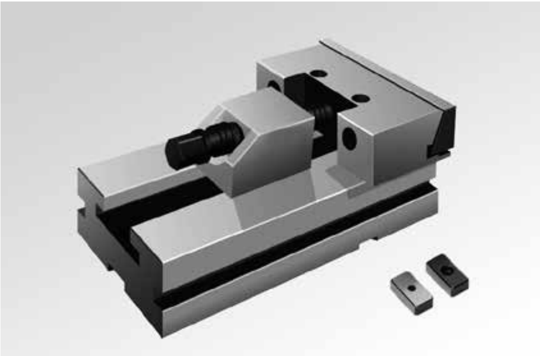


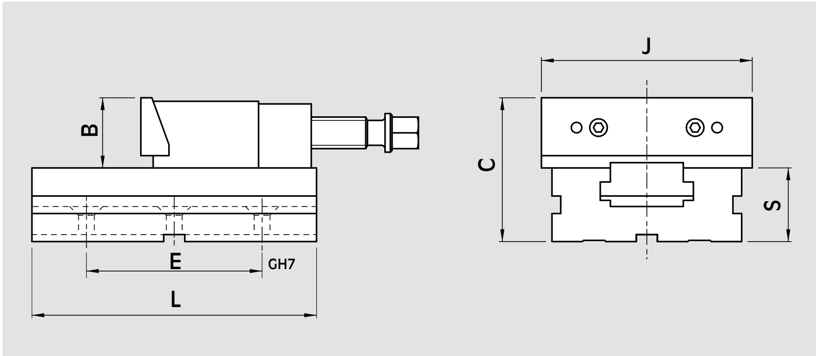


Cod.	for type	D mm	E mm	G mm	H mm	L mm	M mm	S mm
58 95 17 00	LC 125	40	40	16	8,5	160	95	40
58 96 17 00	LC 150	40	50	16	13	230	125	50
58 97 17 00	LC 200	50	100	16	17	300	170	70

Complete extension element LC

with pair of positioning keys (at customer's choice)

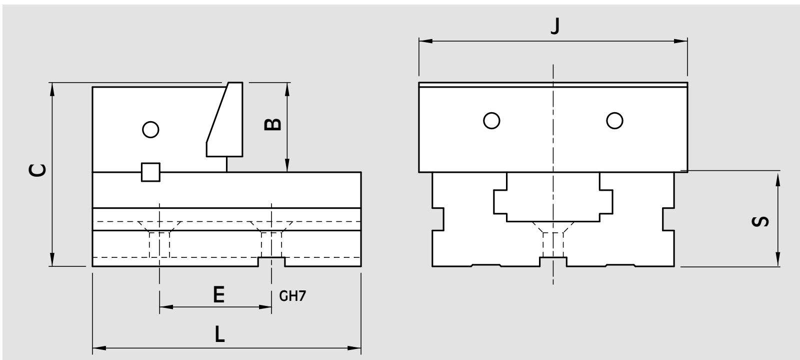




Cod.	for type	B mm	C mm	J mm	L mm	S mm	E mm	Weight kg
58 95 71 20	LC 125	40	80	125	160	40	40	6,3
58 96 71 20	LC 150	50	100	150	230	50	50	14,2
58 97 71 20	LC 200	65	135	200	300	70	100	35,0

Base wiyh fixed support LC

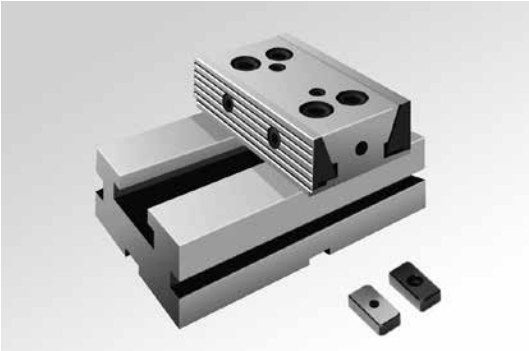
with pair of positioning keys (at customer's choice)

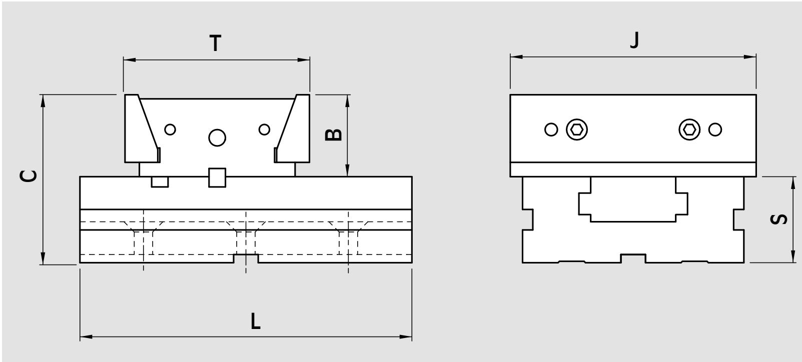


Cod.	for type	B mm	C mm	J mm	L mm	S mm	E mm	Weight kg
58 95 70 20	LC 125	40	80	125	160	40	40	5,8
58 96 70 20	LC 150	50	100	150	230	50	50	12,6
58 97 70 20	LC 200	65	135	200	300	70	100	29,8

Base with double fixed support - LC

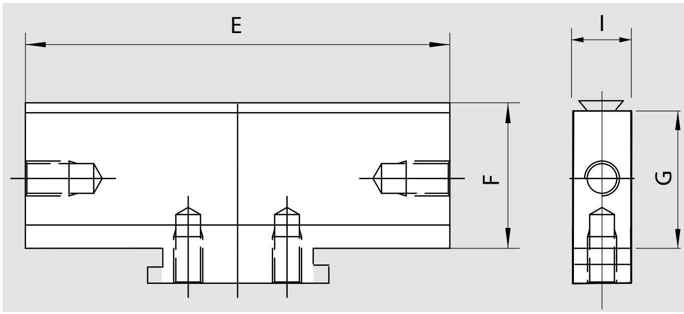
with pair of positioning keys (at customer's choice)



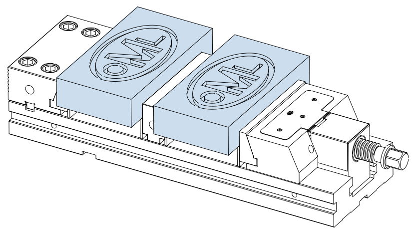


Cod.	for type	B mm	C mm	J mm	L mm	S mm	T mm	Weight kg
58 95 70 60	LC 125	40	80	125	160	40	84,8	6,0
58 96 70 60	LC 150	50	100	150	230	50	101,8	13,3
58 97 70 60	LC 200	65	135	200	300	70	132,8	30,0

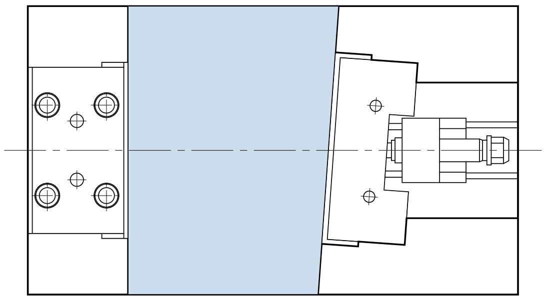
Middle jaw LC



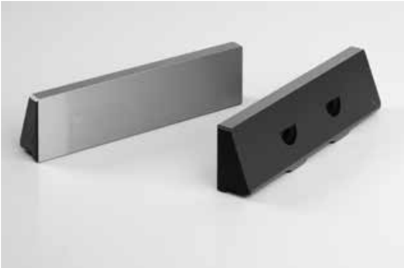
Cod.	for type	E mm	F mm	G mm	I mm
58 95 41 10	LC 125	121	38	33	30
58 96 41 10	LC 150	146	48	43	30
58 97 41 10	LC 200	196	68	53	30



Floating movable support with jaw LC

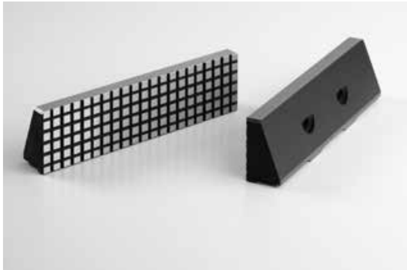


Cod.	for type
58 95 73 50	LC 125
58 96 73 50	LC 150
58 97 73 50	LC 200



Pair of smooth jaws LC

Cod.	for type	
58 95 04 09	LC 125	
58 96 04 09	LC 150	
58 97 04 09	LC 200	



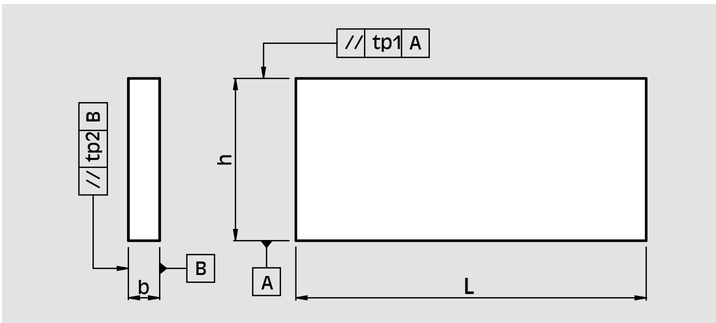
Pair of serrated jaws LC

Cod.	for type	
58 95 44 29	LC 125	
58 96 44 29	LC 150	
58 97 44 29	LC 200	

Insert for vertical use

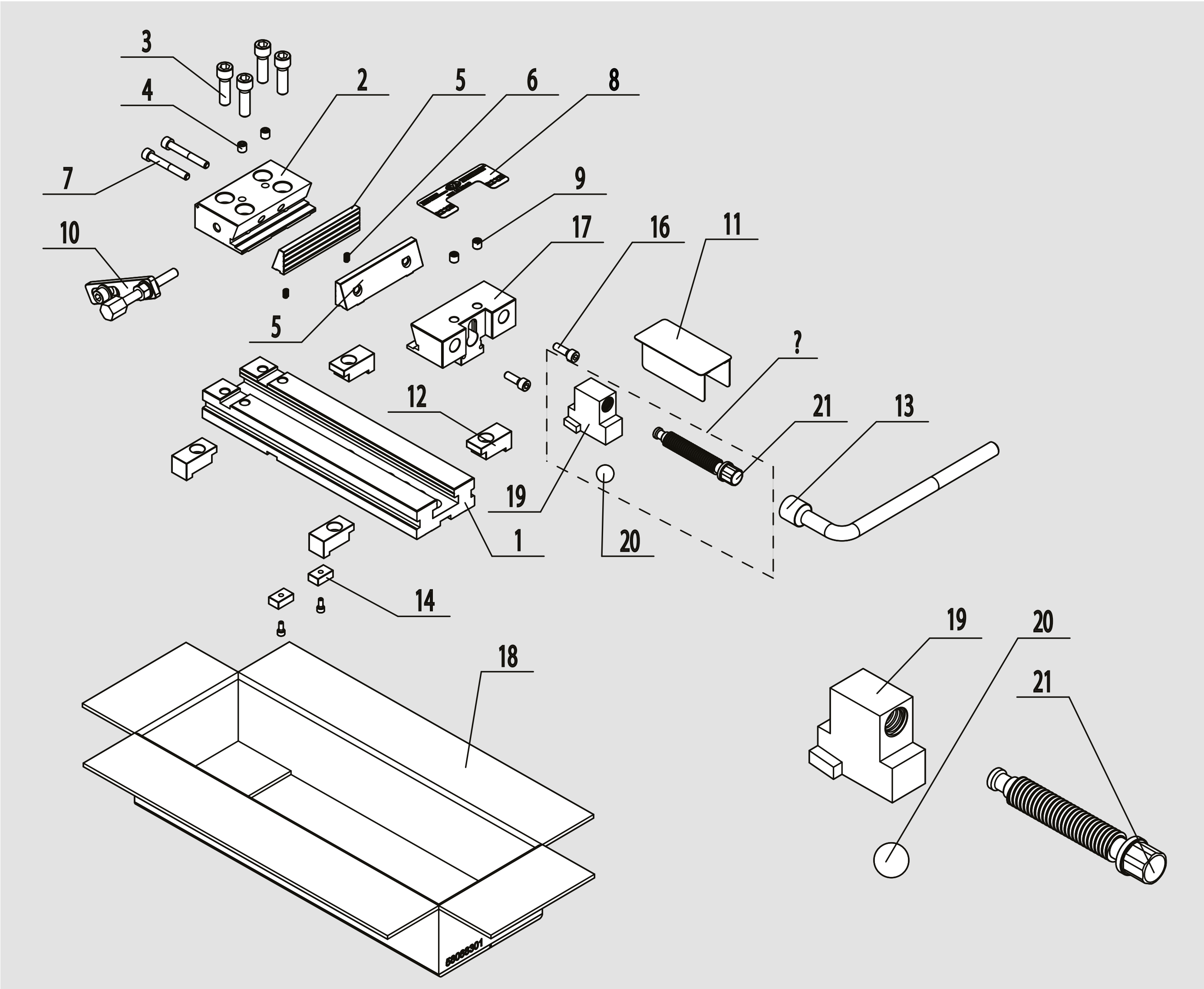
cod.	for type	
58 95 33 00	LC 125	
58 96 33 00	LC 150	
58 97 33 00	LC 200	

Set of 6 pairs of parallels (no clak) LC

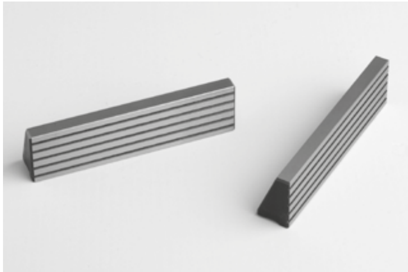


cod.	for type	h mm	L mm	B mm	tollerance A	tollerance B
58 96 92 06	LC 150	25 - 30 - 35 - 40 - 45 - 47	150	8	0,009	0,005
58 97 92 06	LC 200	40 - 45 - 50 - 55 - 60 - 62	200	8	0,009	0,005

Spare parts for clamping equipment



Pos.	Description	Quantity	Pos.	Description	Quantity
21	Clamping screw		10	Workstop	
20	Positioning ball		9	Screw STEI	
19	Block for clamping screw		8	Label	
18	Cardboard box		7	Screw STEI	
17	Guided movable support		6	Spring	
16	Screw TCEI		5	Grooved jaw	
15	Screw TCEI		4	Screw STEI	
14	Positioning key		3	Screw STEI	
13	Wrench		2	Fixed support	
12	Set 4 clamps		1	Base	
11	Cover for protection of the screw				

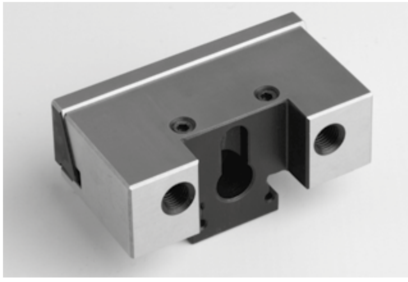


Pair of grooved jaws

Cod.	for type
58 95 44 19	LC 125
58 96 44 19	LC 150
58 97 44 19	LC 200

Fixed support with jaw

Cod.	for type
58 95 72 10	LC 125
58 96 72 10	LC 150
58 97 72 10	LC 200

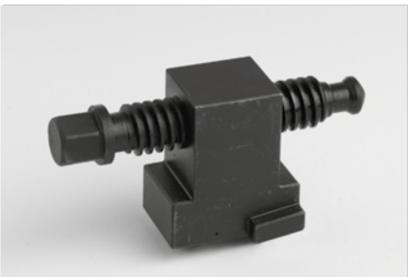


Guided support with jaw

Cod.	for type
58 95 73 60	LC 125
58 96 73 60	LC 150
58 97 73 60	LC 200

Wrench

Cod.	for type
58 95 19 00	LC 125
58 96 19 00	LC 150
58 97 19 00	LC 200



Complete clamping block

Cod.	for type
58 95 74 10	LC 125
58 96 74 10	LC 150
58 97 74 10	LC 200

Block for clamping screw

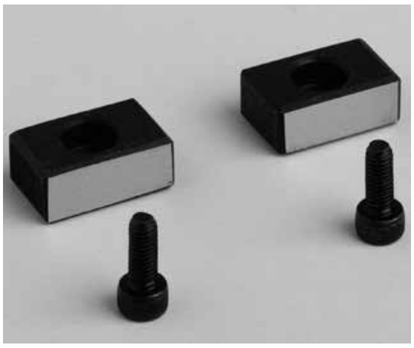
Cod.	for type
58 95 12 10	LC 125
58 96 12 10	LC 150
58 97 12 10	LC 200

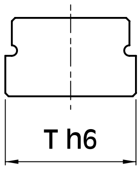
Clamping screw

Cod.	for type
58 95 08 10	LC 125
58 96 08 10	LC 150
58 97 08 10	LC 200

Positioning ball

Cod.	for type
58 95 10 00	LC 125
58 96 10 00	LC 150
58 97 10 00	LC 200





Pair of positioning keys

Cod.	T h6	for type
58 96 13 92	16/12	LC 125 - LC 150 - LC 200
58 96 13 93	16/14	
58 96 13 94	16/16	
58 96 13 95	16/18	
58 96 13 96	16/20	
58 96 13 97	16/22	

Work stop

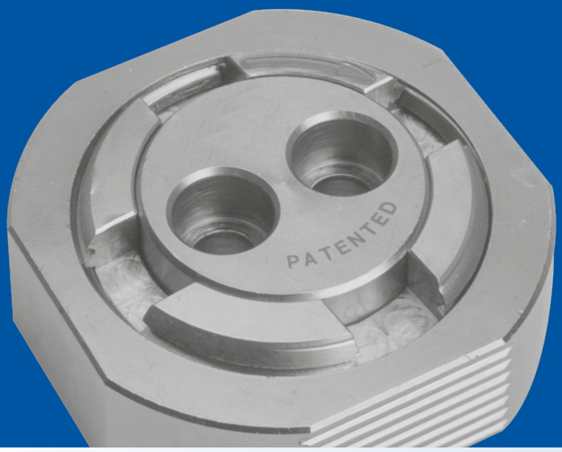
Cod.	for type
58 95 50 00	LC 125
58 96 50 00	LC 150
58 97 50 00	LC 200

Cover for protection of the screw

Cod.	for type
58 95 28 10	LC 125
58 96 28 10	LC 150
58 97 28 10	LC 200

Set of 2 pairs of clamps

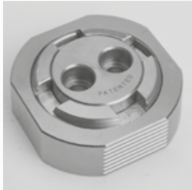
Cod.	for type
58 95 27 09	LC 125
58 96 27 09	LC 150
58 97 27 09	LC 200



CAM SYSTEM
Eccentric self-locking clamping device

Page 7.3

Set
CAM SYSTEM "t"
Eccentric self-locking clamping device



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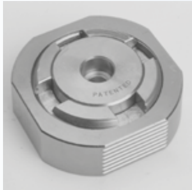
CAM SYSTEM "t"
Eccentric self-locking clamping device



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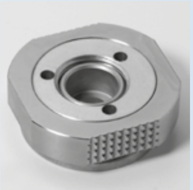
CAM SYSTEM "g"
Eccentric self-locking clamping device

Page 7.6

Set
CAM SYSTEM "s"
Eccentric self-locking clamping device



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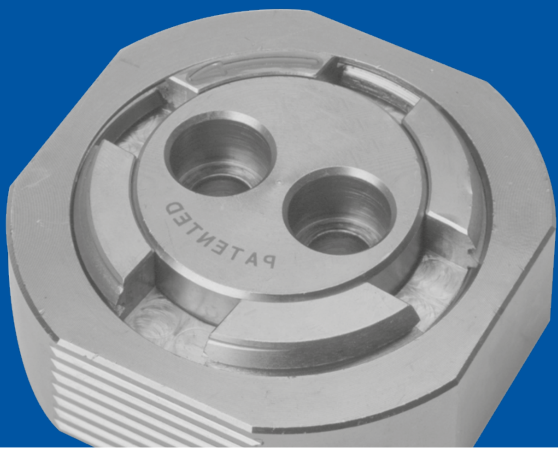
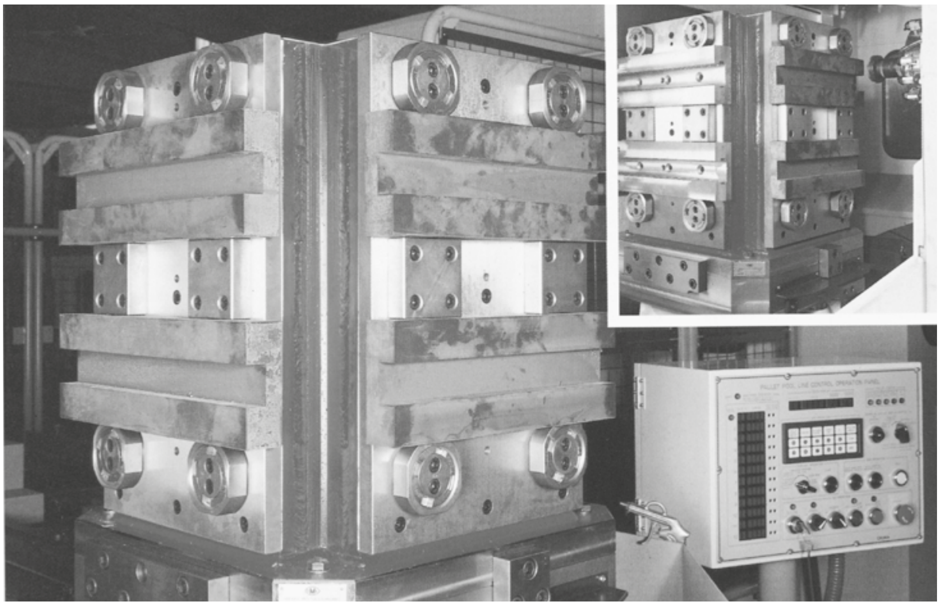
CAM SYSTEM "s"
Eccentric self-locking clamping device

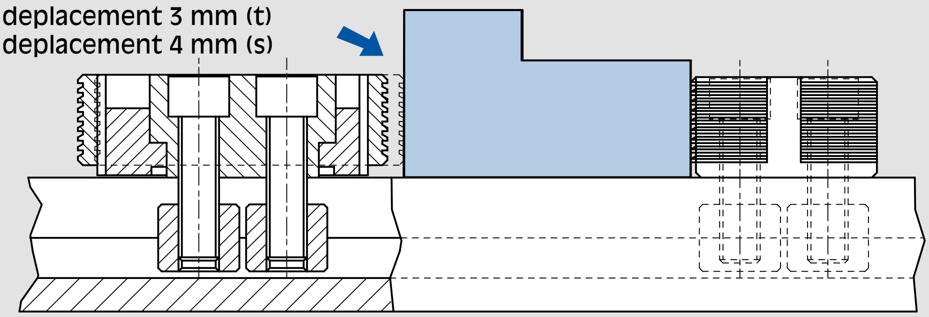
CAM SYSTEM

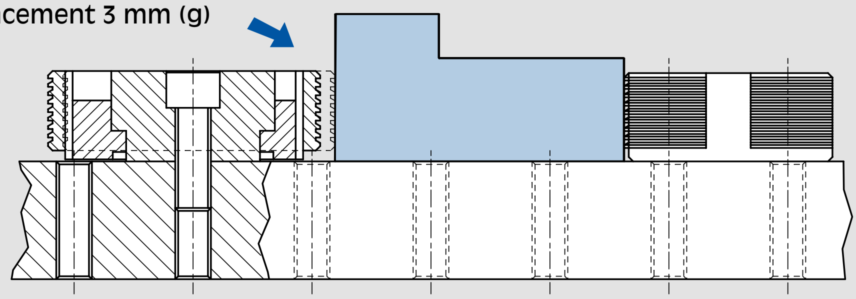
Eccentric self-locking clamping device





The **CAM SYSTEM** has been developed and patented to easily clamp workpieces with varied forms. This compact product enables double locking (Axial and Radial) using the eccentric and propeller principle.
With a rotation of approximately 15°, contact is made with the workpiece with the complete clamping face of the CAM.
The **CAM SYSTEM** clamps the workpiece with a clamping force of 4,000 kg (**t**) and 2,000 kg (**s**).
CAM SYSTEM is supplied with both cap heads bolts and T-nuts to suit the particular machine tool cross slots.
CAM SYSTEM "g" is supplied singly, to the customer detailed grid specification.

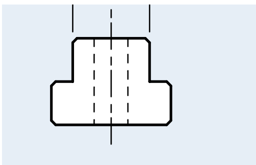




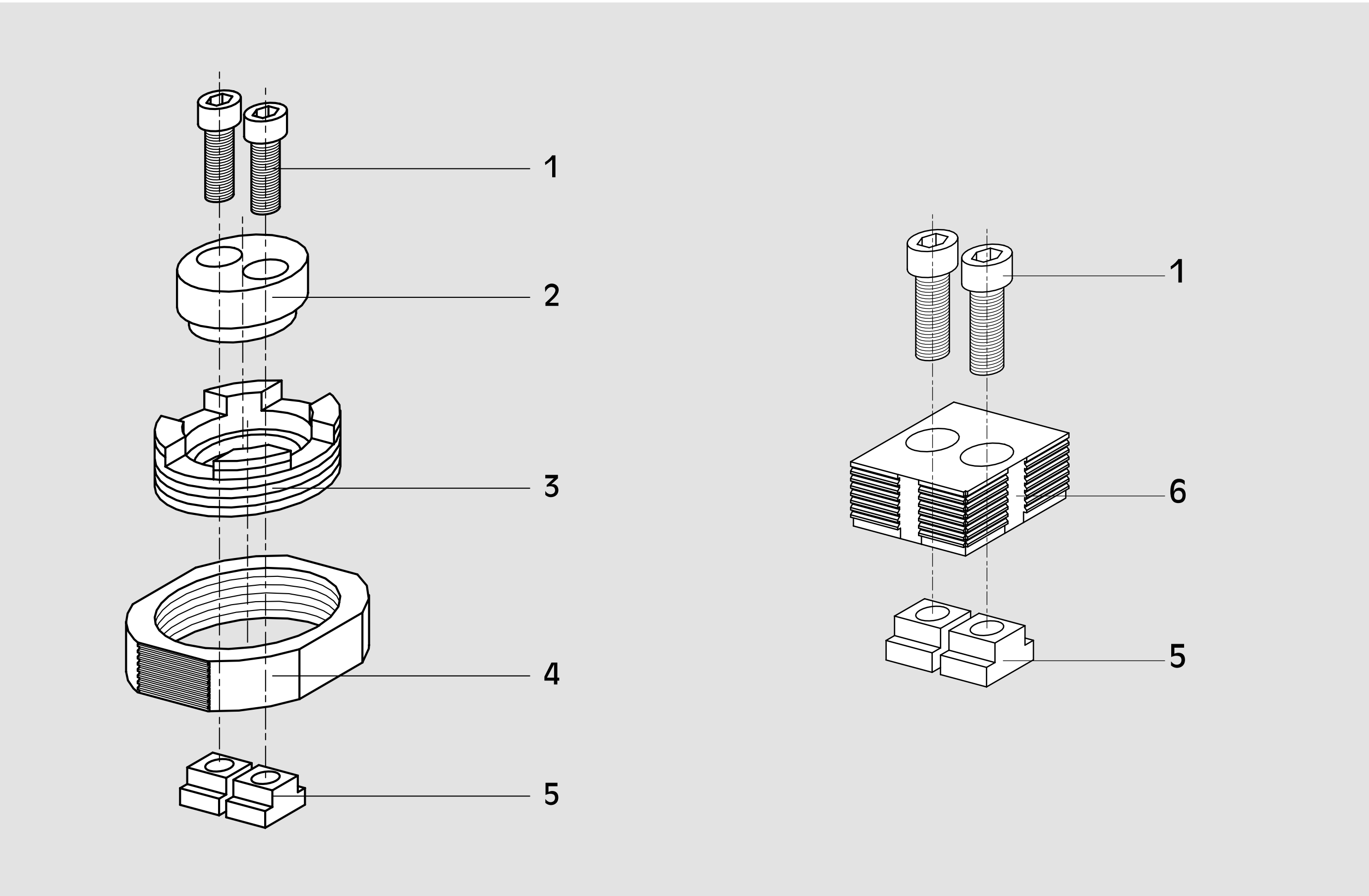
CAM SYSTEM "t"

Set

Set CAM SYSTEM "t" complete with:
N. 4 CAM SYSTEM "t"
N. 4 fixed block CAM SYSTEM 't'
N. 8 pair of T-nuts with screw
N. 1 key for CAM SYSTEM 't'
wooden packing case



Cod.	T mm
77 58 44 14	14
77 58 44 16	16
77 58 44 18	18
77 58 44 20	20
77 58 44 22	22

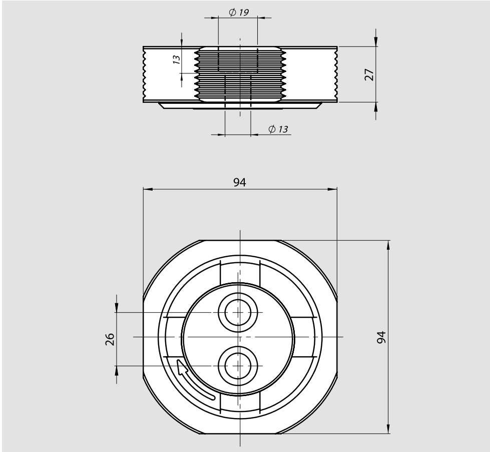


Description

01 .... Screw	03 .... Eccentric element	05 .... T-nuts
02 .... Cental element	04 .... Clamping element	06 .... Fixed block

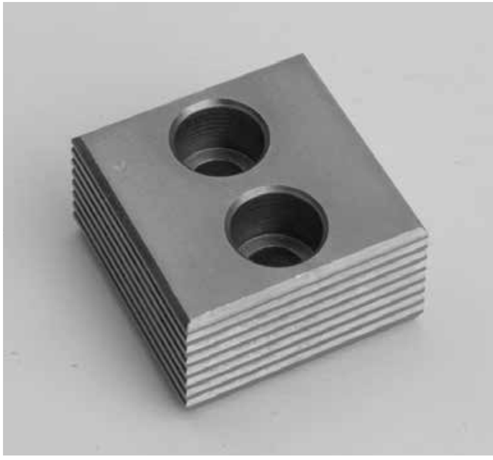
CAM SYSTEM "t"

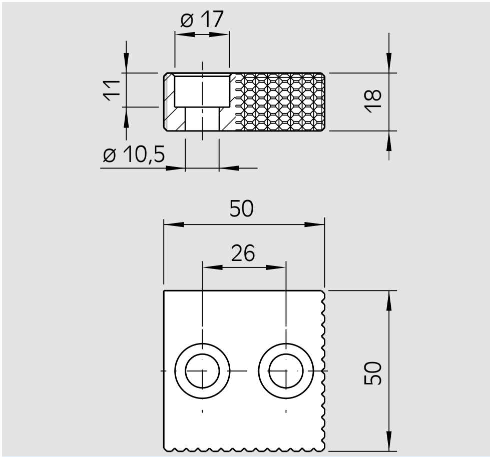
Eccentric self-locking clamping device



CAM SYSTEM "t" single

Cod.
58 44 50 10



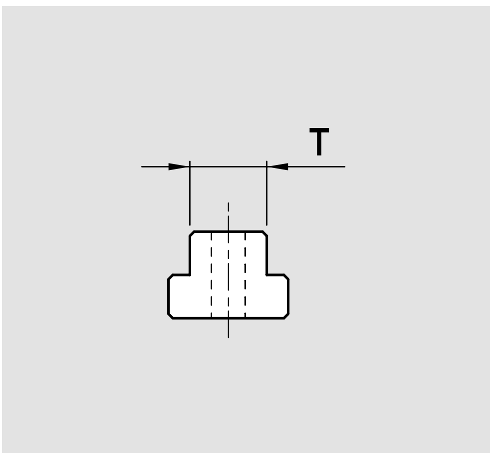


Fixed block CAM SYSTEM "t"

Cod.
58 44 04 00

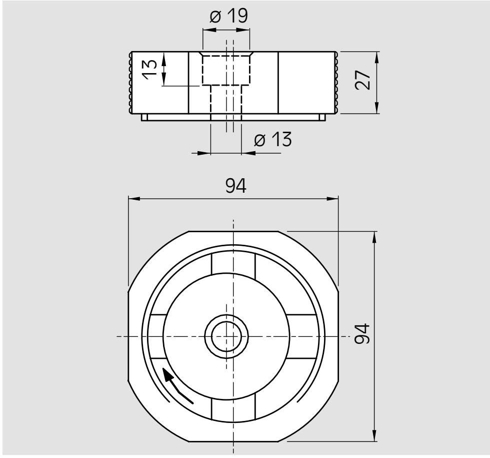
Key for CAM SYSTEM "t"

Cod.
58 44 08 00



Pair of T-nuts with screw CAM SYSTEM "t"

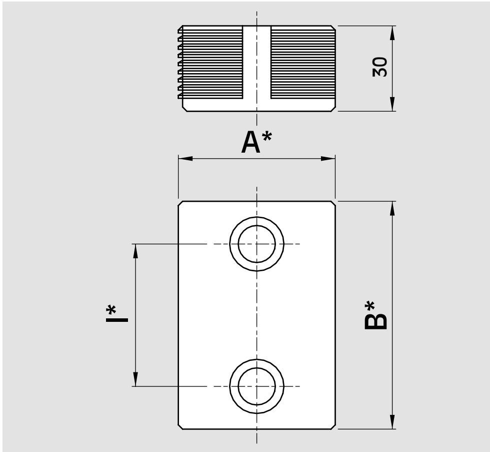
Cod.	T mm
58 44 25 93	14
58 44 25 94	16
58 44 25 95	18
58 44 25 96	20
58 44 25 97	22



CAM SYSTEM “g” single

Cod.

58 44 50 20

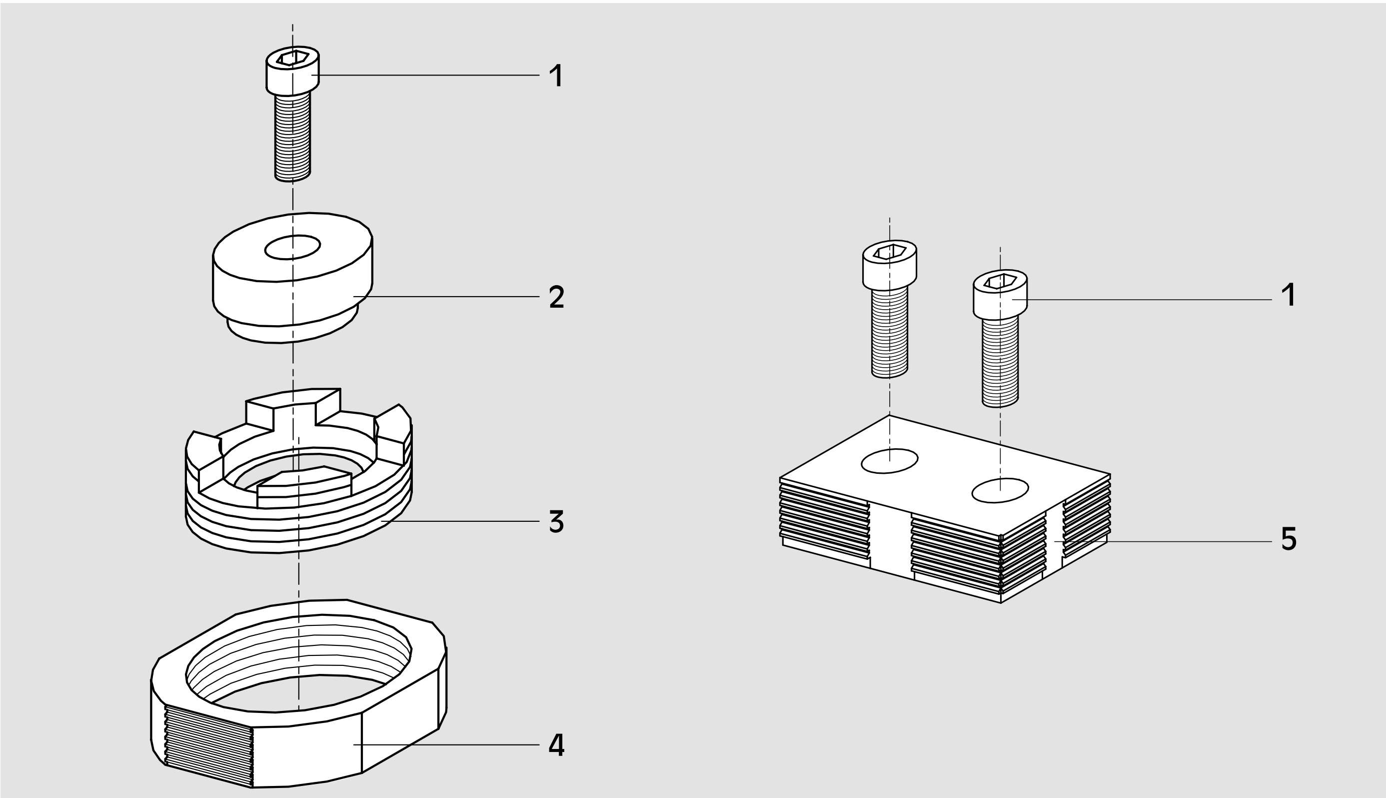


Fixed block CAM SYSTEM “g”

dimensions A,B,I must be specified when ordering

Cod.

58 44 14 00



Description

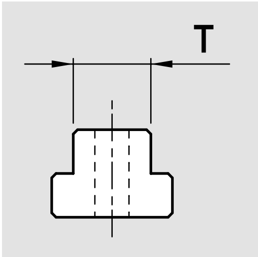
01 .... Screw
02 .... central element
03 .... Eccentric element
04 .... Clamping element
05 .... Fixed block

CAM SYSTEM "s"

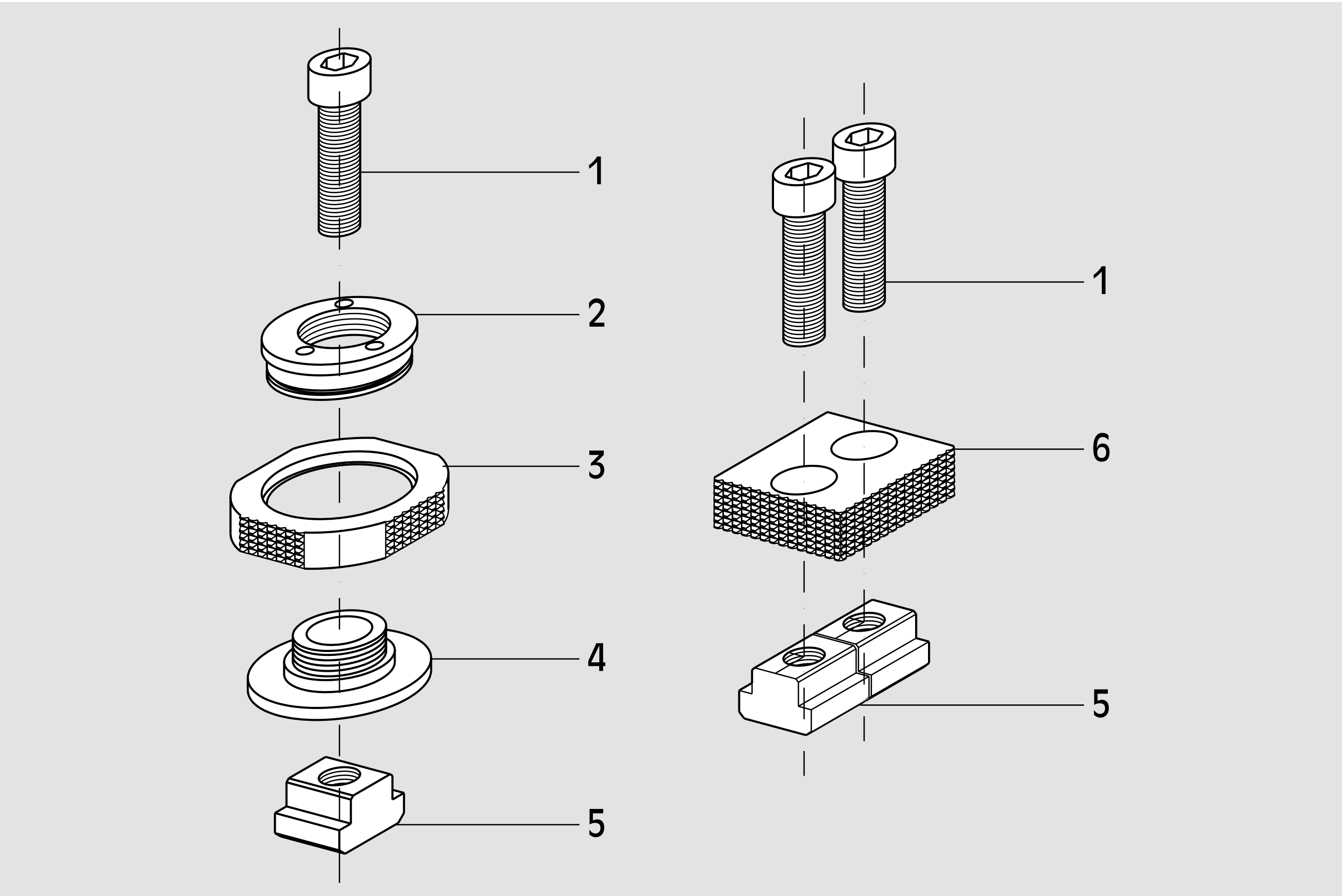
Eccentric self-locking clamping device

Set

Set Cam SYSTEM "s" complete with:
N. 4 CAM SYSTEM "s"
N. 4 fixed block CAM SYSTEM "s"
N. 6 pair of T-nuts with screw
N. 1 Key for CAM SYSTEM "s"
wooden packing case



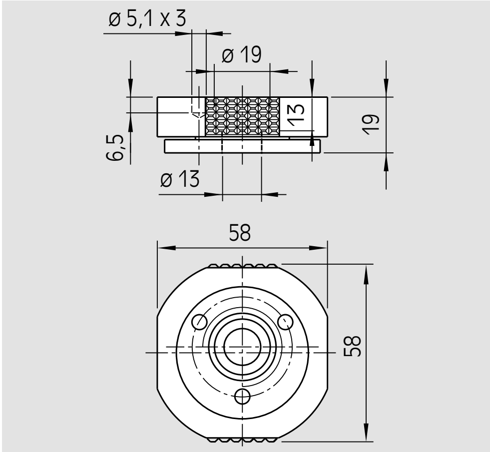
Cod.	T mm
77 58 43 14	14
77 58 43 16	16
77 58 43 18	18
77 58 43 20	20
77 58 43 22	22



Description

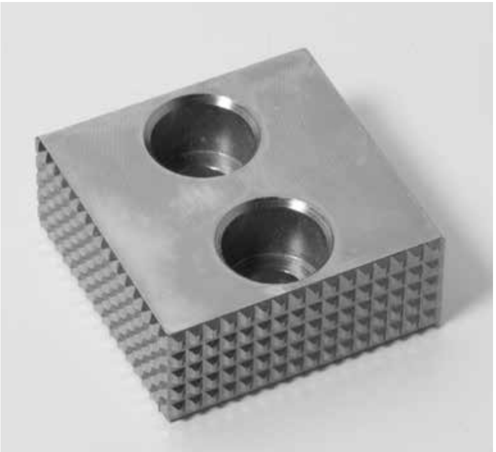
01 .... Screw	03 .... Clamping element	05 .... TT-nuts
02 .... Eccentric element	04 .... Central element	06 .... Fixed block

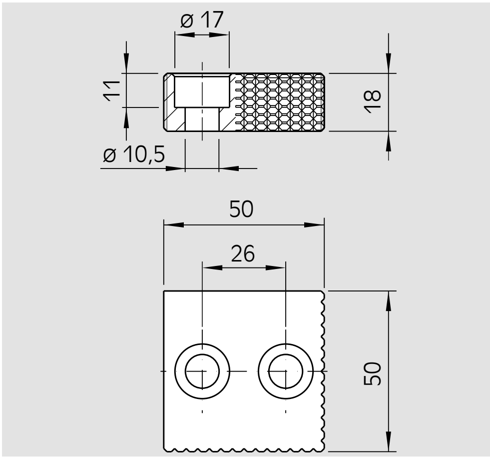
CAM SYSTEM “s“



CAM SYSTEM “s” single

Cod.
58 43 50 00



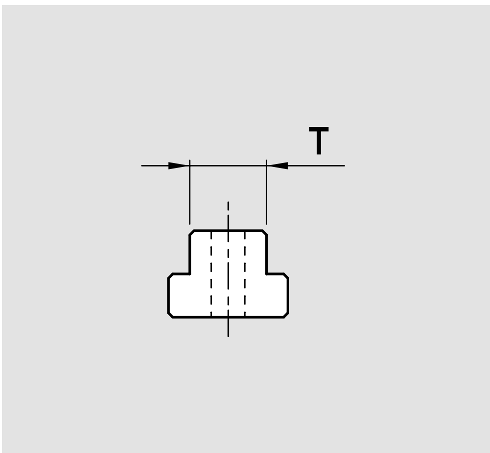


Fixed block CAM SYSTEM “s”

Cod.
58 43 04 00

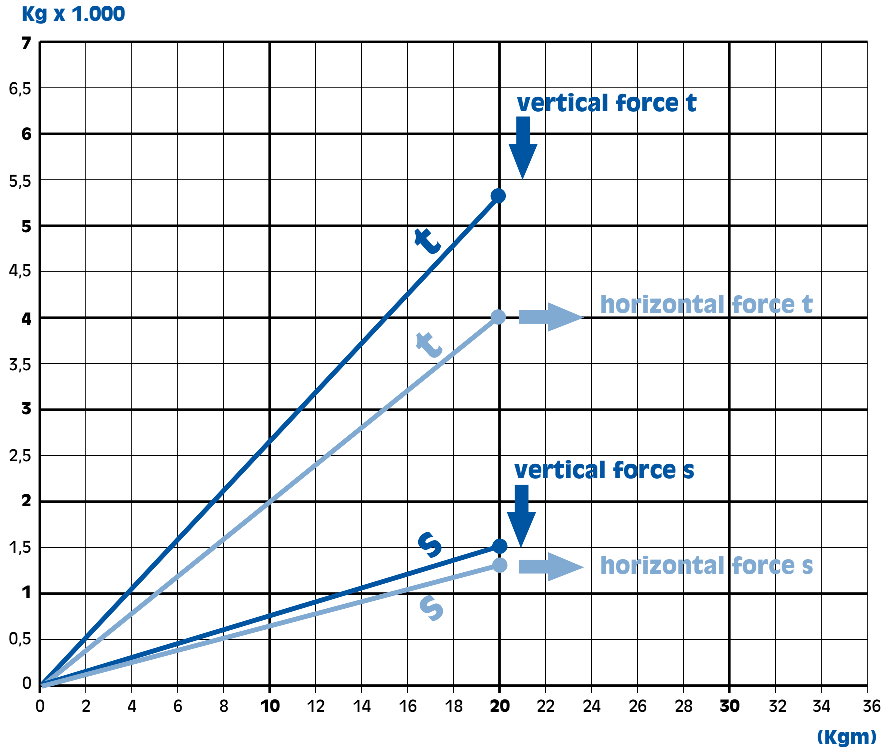
Key for CAM SYSTEM “s”

Cod.
58 43 08 00

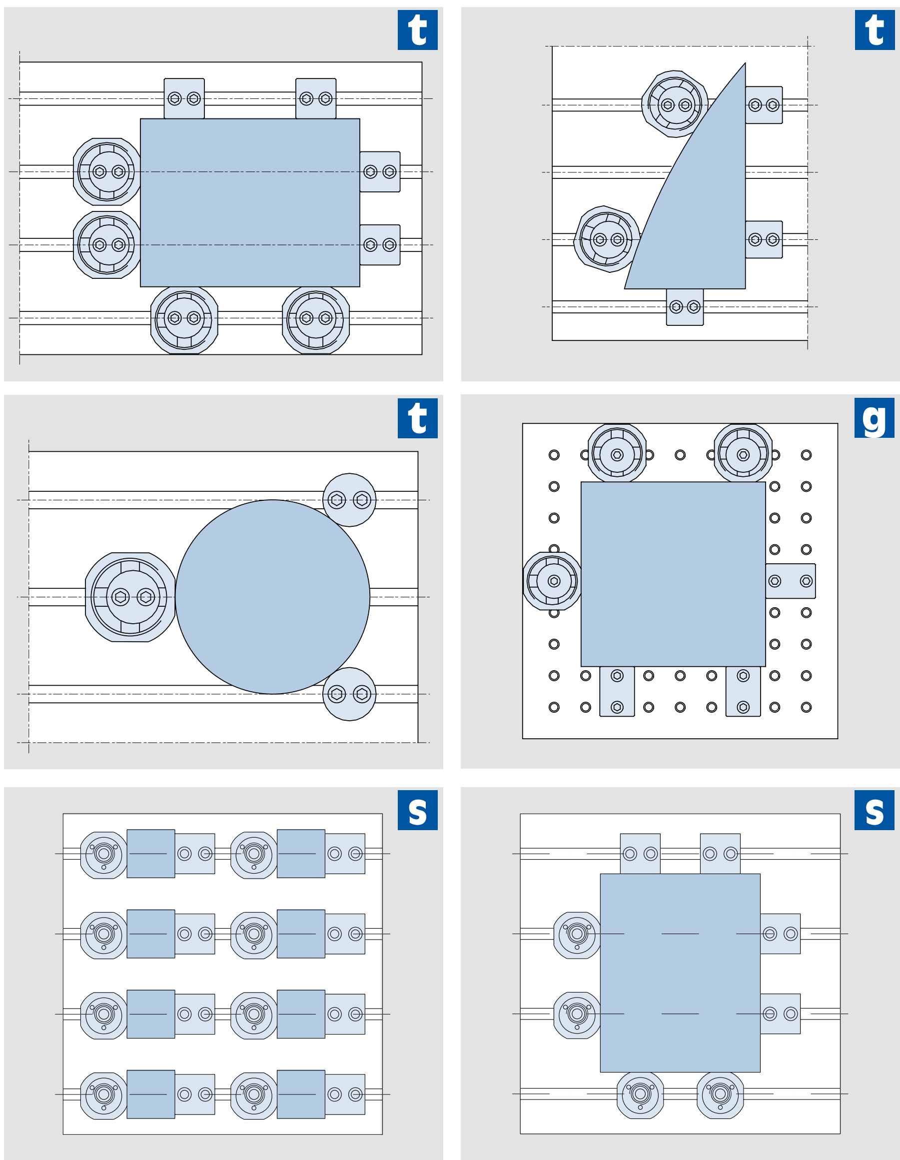


Pair of T-nuts with screw CAM SYSTEM “s”

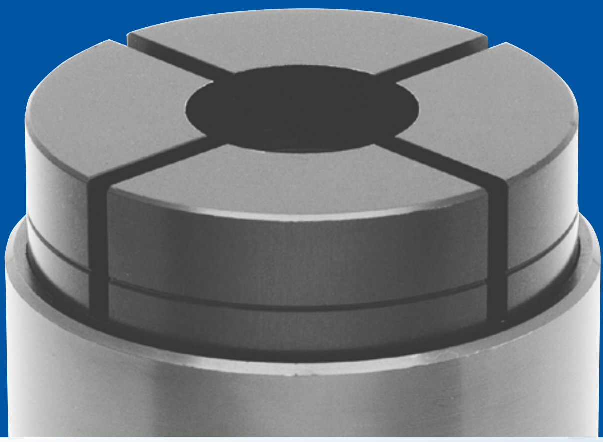
Cod.	T mm
58 43 25 93	14
58 43 25 94	16
58 43 25 95	18
58 43 25 96	20
58 43 25 97	22



Kg x 1.000
7
6,5
6
5,5
5
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
(Kgm)
vertical force t
horizontal force t
vertical force s
horizontal force s
t
t
s
s



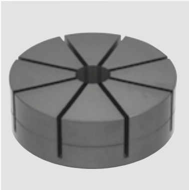
t
t
t
g
s
s



FORM HOLDING CLAMPS
For holding on external/internal form

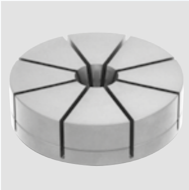
Page 8.4

FORM HOLDING CLAMPS



Page 8.6

JAWS
for external Form Holding

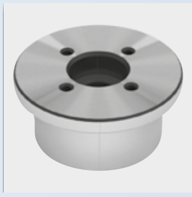


Page 8.8

JAWS
for internal Form Holding

Page 8.8

TAPERED SCREWS
For internal Form Holding

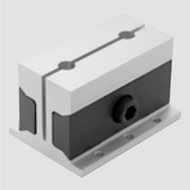


Page 8.11

MOUNTING-ON-LATHE ADAPTERS

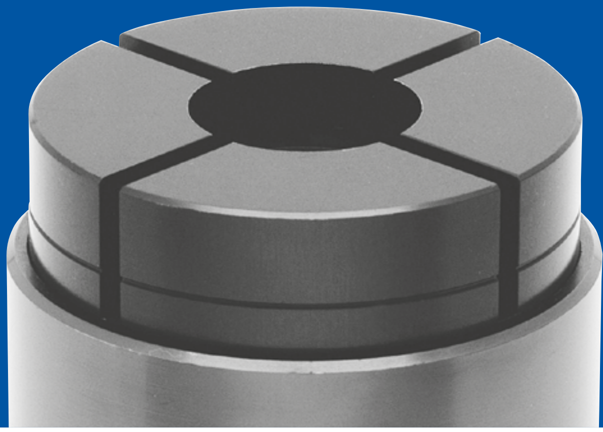
Page 8.12

FORM HOLDING CLAMPS
Wedge Style/Round



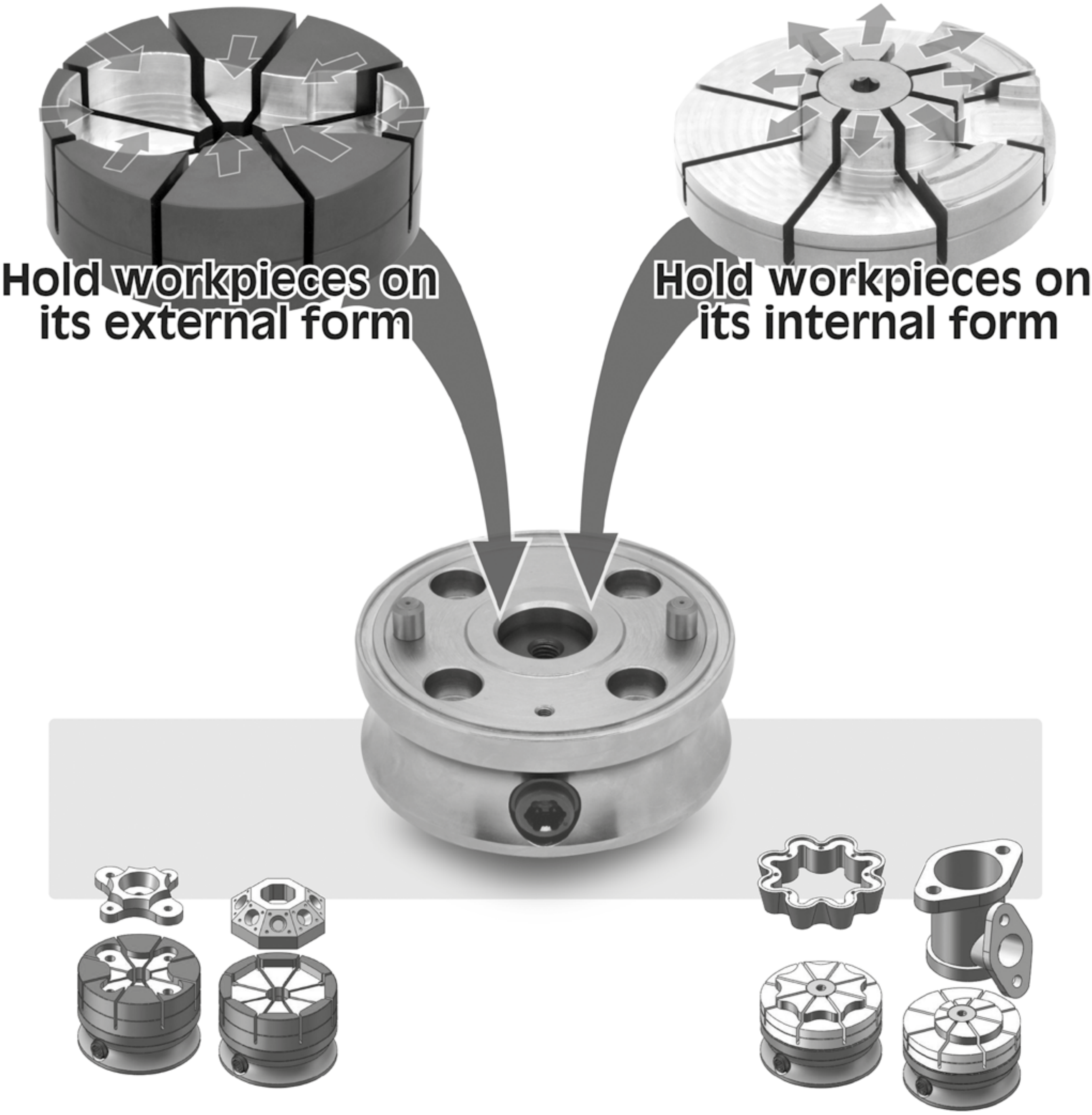
Page 8.14

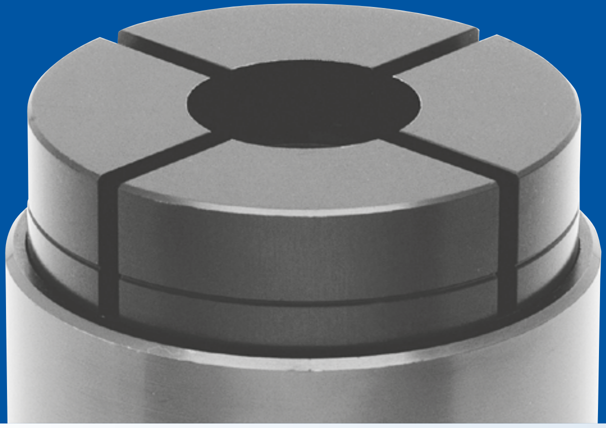
FORM HOLDING CLAMPS
Wedge Style/Square



For holding on external / internal form!

Form Holding Clamps that have a machinable jaw to hold irregular-shaped workpieces.



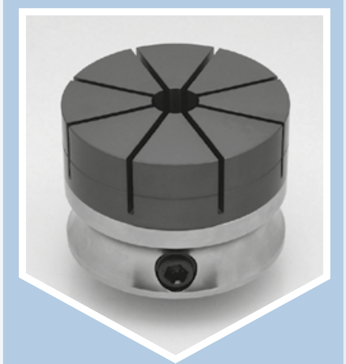


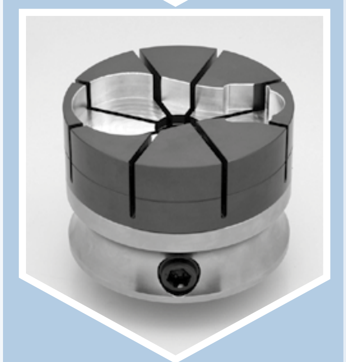
FORM HOLDING CLAMPS

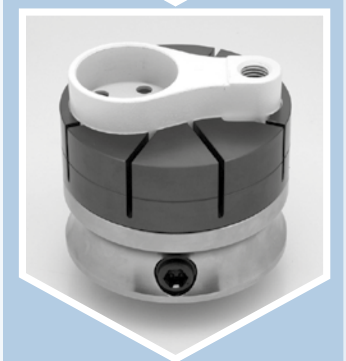
For holding on external/internal form

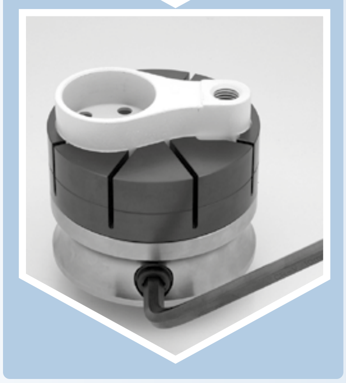
Two optional jaws clamping workpieces both on its external form and internal form.

For external form holding









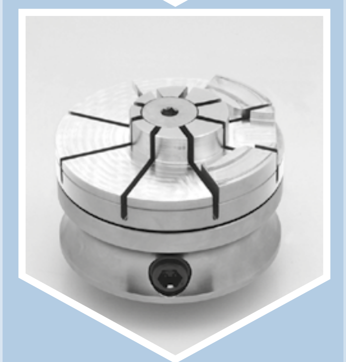
1 Prepare the jaw

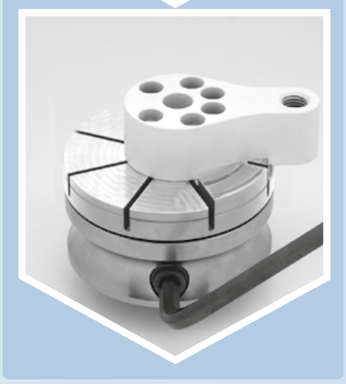
2 Machine the jaw

3 Mount a workpiece

4 Tighten the cam cylinder

For internal form holding





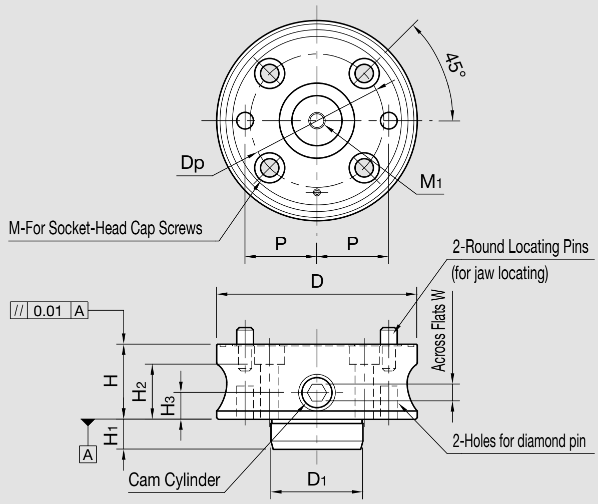
CP125

Form Holding Clamps

Body	Pull Cylinder	Cam Cylinder
S45C Steel Electroless nickel plated	SCM415 Steel Carburized-hardened Black oxide finish	SCM435 Steel Quenched & tempered Black oxide finish

Note: Jaws must be ordered separately

★Key Point
Can hold on external/internal form.



Part Number	D	H (± 0.01)	D_1 (g6)	H_1	M	H_2	Dp	P (± 0.02)	W	H_3	M_1
51992224	65	35	28	12	M 6	27	42	22	8	12	M 8x1.25
51992225	90	40	42	14	M 8	30	60	30	8	14	M10x1.5
51992226	120	45	55	18	M10	33	80	43	10	16	M10x1.5
51992227	160	50	63	24	M12	36	110	60	10	18	M12x1.75

Part Number	Allowable Screw Torque (N-m)	Weight (kg)
51992224	15	0,8
51992225	25	1,7
51992226	40	3,5
51992227	40	7,1

Proper Jaws					
For external Form Holding			For internal Form Holding		
Part Number	Clamping Force (kN)	Clamping Stroke	Part Number	Clamping Force (kN)	Clamping Stroke
51992228	4.5	ø 0.3	51992232	4.5	ø 0.3
51992229	7	ø 0.3	51992233	7	ø 0.3
51992230	10	ø 0.3	51992234	10	ø 0.3
51992231	12	ø 0.3	51992235	10	ø 0.3

Technical Information:

- Part locating repeatability: ±0.03
- Jaw locating repeatability: ±0.02

Notes:

Do not actuate clamping without a workpiece to avoid damage and deformation. Tightening with torque greater than the allowable screw torque will lower the durability of the jaw.

Furnished Parts:

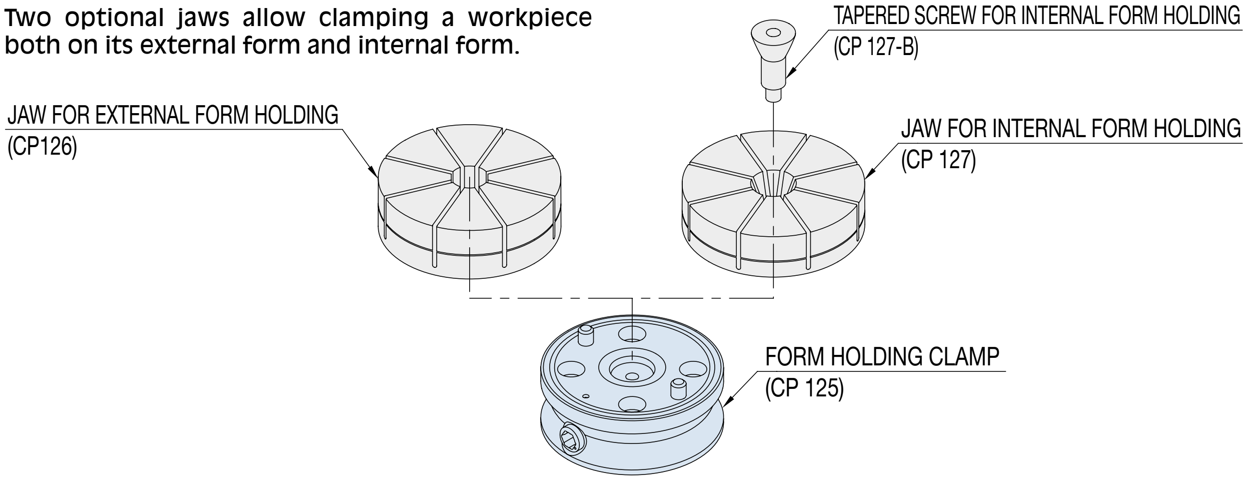
- **51992224**: 1 pc. of Diamond Locating Pin
- **51992225**: 1 pc. of Diamond Locating Pin
- **51992226**: 1 pc. of Diamond Locating Pin
- **51992227**: 1 pc. of Diamond Locating Pin

Related Products:

- **51992228/...29/...30/...31**: Jaws for External Form Holding
- **51992232/...33/...34/...35**: Jaws for Internal Form Holding

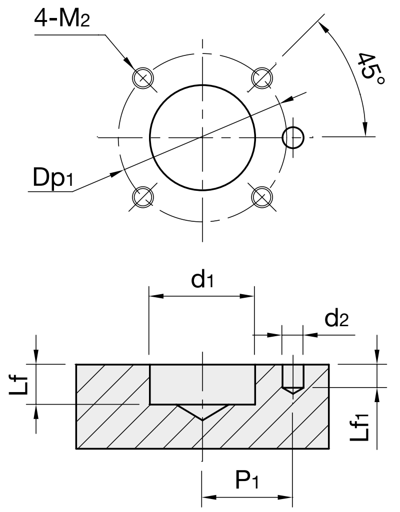
Features:

Two optional jaws allow clamping a workpiece both on its external form and internal form.



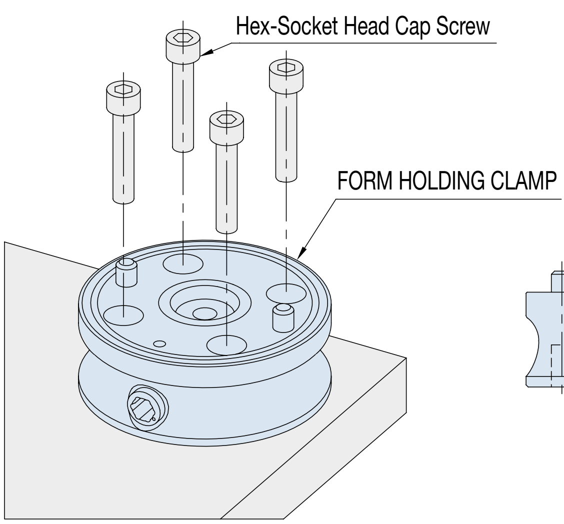
How to use:

Mounting-Hole Dimensions



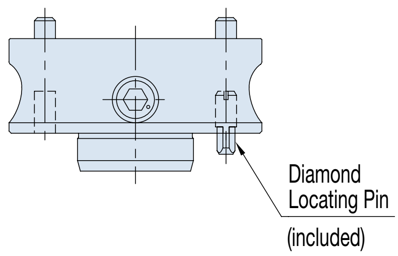
Part Number	d_1 H7	Lf	d_2 G7	Lf_1	P_1 ±0.02	M_2	Dp_1
51992224	28	13	6	6	22	M 6×1	42
51992225	42	15	8	8	30	M 8×1.25	60
51992226	55	19	10	11	43	M10×1.5	80
51992227	63	25	12	13	60	M12×1.75	110

Installation Instructions



Insert an included diamond pin into the body for locating and secure the body to the fixture plate with 4 socket-head cap screws.

Note: Use either of the holes for diamond locating pin for your application.

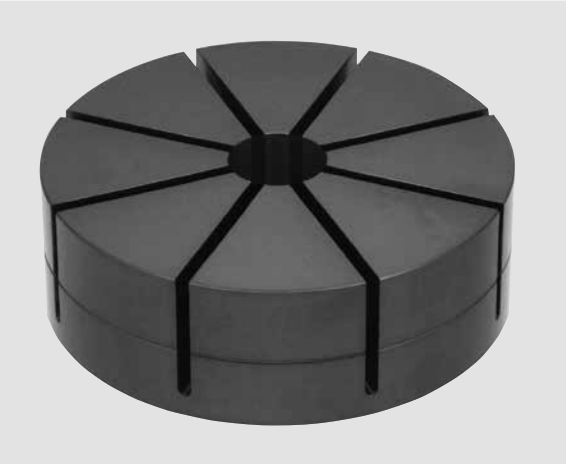


Dimensions of Diamond Locating Pin

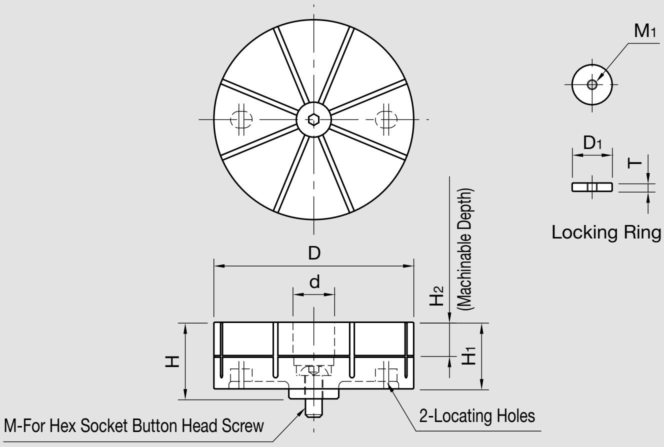
Part Number	Diameter
51992224	ø 6h6
51992225	ø 8h6
51992226	ø 10h6
51992227	ø 12h6

CP126

JAWS for external Form Holding



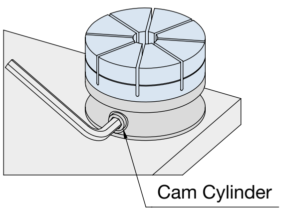
Jaw	Locking Ring
Aluminum (A7075) Blue	Steel (S45C) Black oxide finish



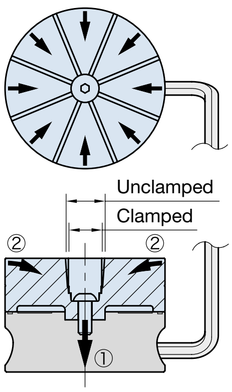
Part Number	D	d	H_1	H_2	M	H	M_1	D_1	T	Weight (kg)	Proper Clamps
51992228	65	21	25	10	M 8x20L Across Flats5	29	M5x0.8	20	4	0.2	51992224
51992229	90	25	35	15	M10x20L Across Flats6	40	M6x1	24	5	0.5	51992225
51992230	120	25	40	20	M10x25L Across Flats6	46	M6x1	24	5	1.1	51992226
51992231	160	29	45	25	M12x25L Across Flats8	52	M8x1.25	28	6	2.2	51992227

Furnished Parts:

- 1 pc. of O-ring
- 1 pc. of Locking Ring
- 1 pc. of Hex Socket Button Head Screw



Features



- The diaphram clamping mechanism allows securely clamping a part with 8 jaw sections.
- 0.15mm clamping stroke of each jaw section is perfect for clamping of lost-wax parts, die-cast parts, extruded parts, solid-drawn parts, prefinished parts, etc.

① When the cam cylinder is tightened, the central bottom part of the jaw is pulled down.

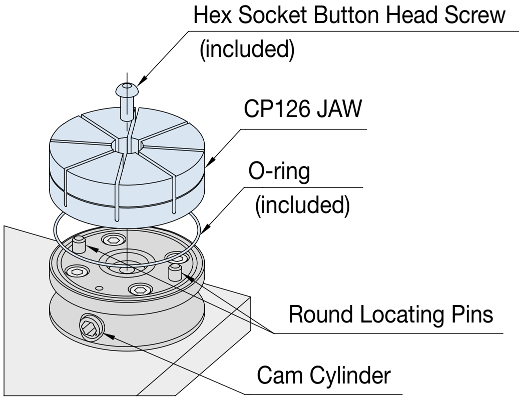
② At the same time the 8 jaw sections tilt toward the center to clamp the external form of a part.

How To Use

① Jaw Mounting

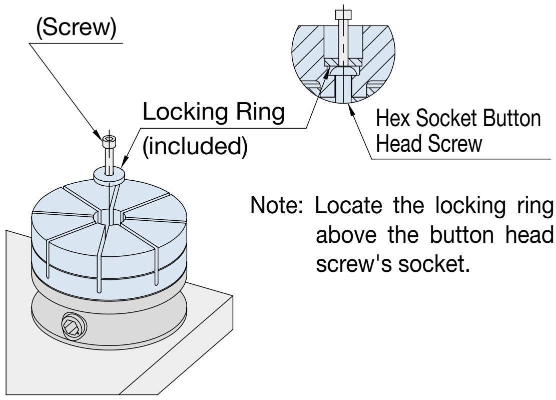
- Insert an O-ring to the groove on top surface of the Form Holding Clamp.
- Set a Jaw putting its locating holes onto the round locating pins and fix it with a hex socket button head screw.

Note: At jaw installation, ensure the cam cylinder is fully loosened by turning counterclockwise until it stops.



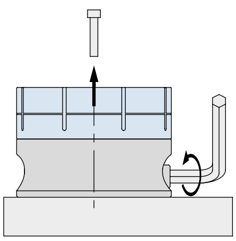
② Jaw Machining

(2-1) Set the locking ring in the jaw.
(Using a screw facilitates setting.)

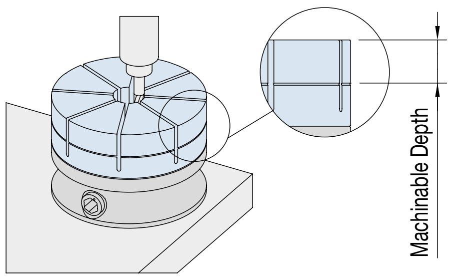


Note: Locate the locking ring above the button head screw's socket.

(2-2) Tighten the cam cylinder to clamp the locking ring.
(Recommended Tightening Torque: 15N-m)
After clamping the screw should be removed from the locking ring.

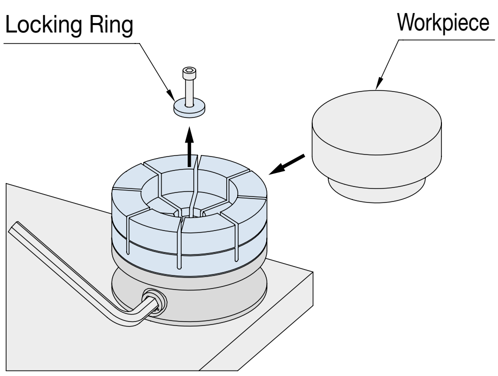


(2-3) Machine the jaw to the contours of a part.
Note: Do not machine the jaw deeper than allowed.

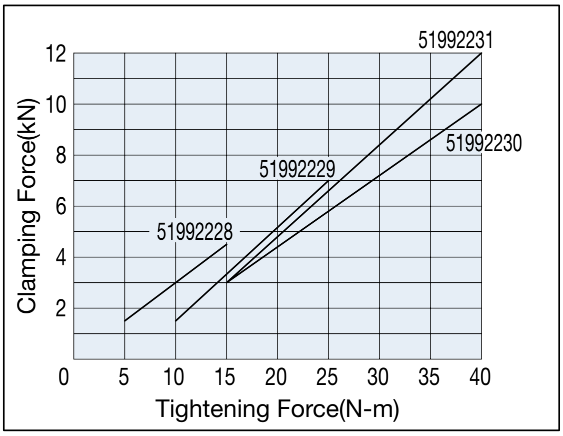


③ Workpiece Setting

- After machining loosen the cam cylinder to take out the locking ring.
- Mount a workpiece and tighten the cam cylinder for clamping.



Performance Curve



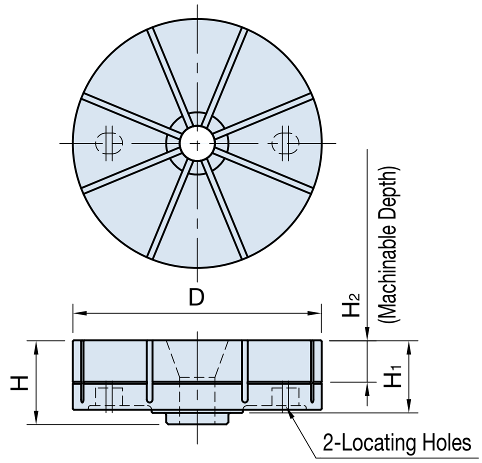
Notes

Do not actuate clamping without a workpiece to avoid damage and deformation.Tightening with torque greater than the allowable screw torque will lower the durability of the jaw.

8

CP127

JAWS for internal Form Holding



Jaw
Aluminum (A7075) Silver

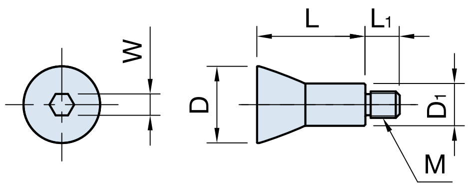
Part Number	D	H_1	H_2	H	Weight (kg)	Proper Clamps	Proper Screws
51992232	65	25	10	28.5	0.2	51992224	51992236
51992233	90	30	15	34.5	0.4	51992225	51992237
51992234	120	35	20	40.5	0.9	51992226	51992238
51992235	160	40	25	46.5	1.9	51992227	51992239

Furnished Parts:

- 1 pc. of O-ring

CP127-B

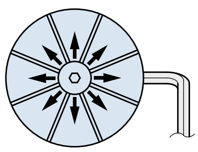
TAPERED SCREWS for internal Form Holding



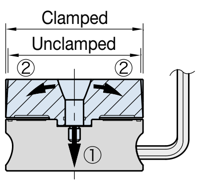
Body
SCM435 Steel Quenced and tempered Electroless nickel plated

Part Number	D	L	M	L_1	D_1	W	Weight (g)	Proper Jaws
51992236	22.5	29	M 8x1.25	10	13.2	6	50	51992232
51992237	27	35	M10x1.5	11	16	8	80	51992233
51992238	29	41	M10x1.5	13	16	8	100	51992234
51992239	33	47	M12x1.75	14	18	10	150	51992235

Features

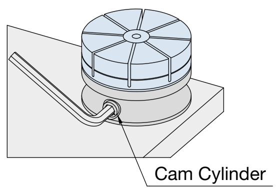


The tapered screw expands the jaws towards eight directions to hold different irregular-ly-shaped parts securely.
0.15mm clamping stroke of each jaw section is perfect for clamping of lost-wax parts, die-cast parts, extruded parts, solid-drawn parts, prefinished parts, etc.



① When the cam cylinder is tightened, the tapered screw is pulled down.

② At the same time the 8 jaw sections expand to clamp the internal form of a part.

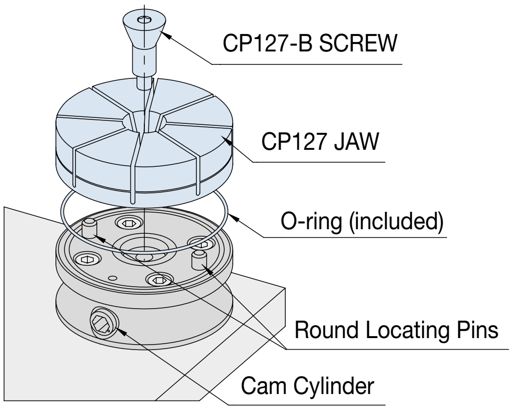


How To Use

①Jaw Mounting

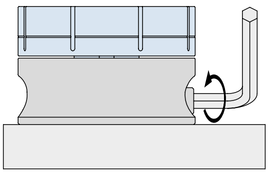
- Insert an O-ring to the groove on top surface of the Form Holding Clamp.
- Set a Jaw putting its locating holes onto the round locating pins and fix it with a tapered screw.

Note: At jaw installation, ensure the cam cylinder is fully loosened by turning counterclockwise until it stops.

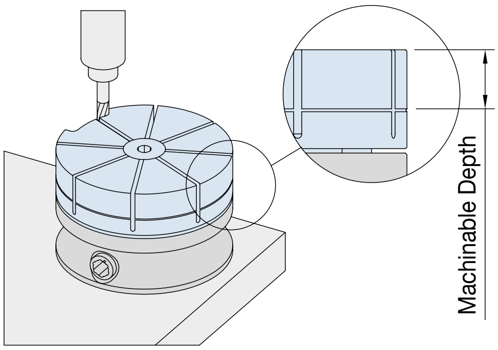


② Jaw Machining

(2-1) Loosen the cam cylinder fully and measure the dimension of the jaw for machining. Then tighten the cam cylinder until each jaw section expands 0.15mm.

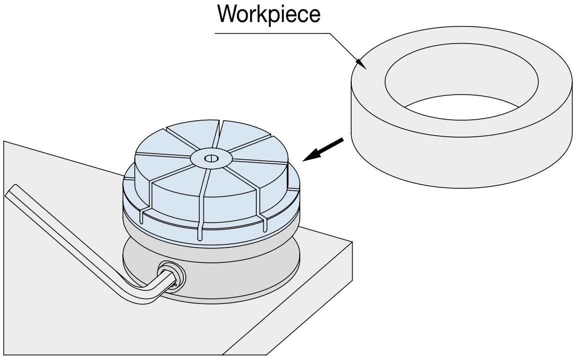


(2-2) Machine the jaw to the contours of a part.
Note: Do not machine the jaw deeper than allowed.

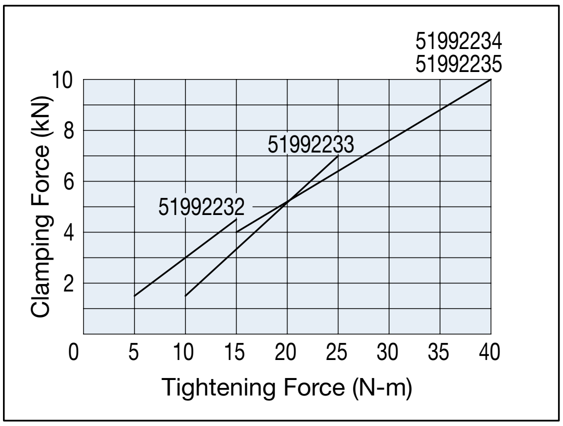


③ Workpiece Setting

After machining loosen the cam cylinder to set a part and tighten the cam cylinder again for clamping.



Performance Curve



Notes

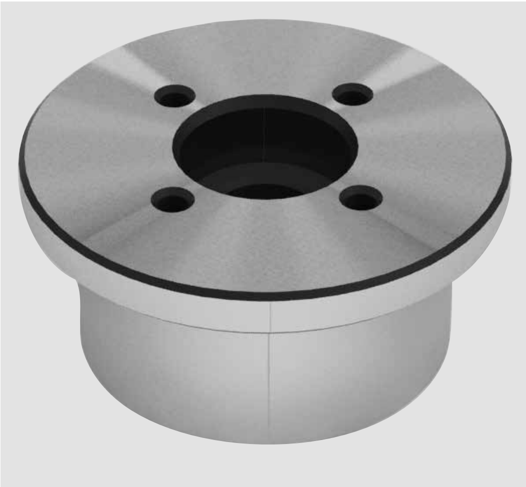
Do not actuate clamping without a workpiece to avoid damage and deformation. Tightening with torque greater than the allowable screw torque will lower the durability of the jaw.

FORM HOLDING CLAMPS

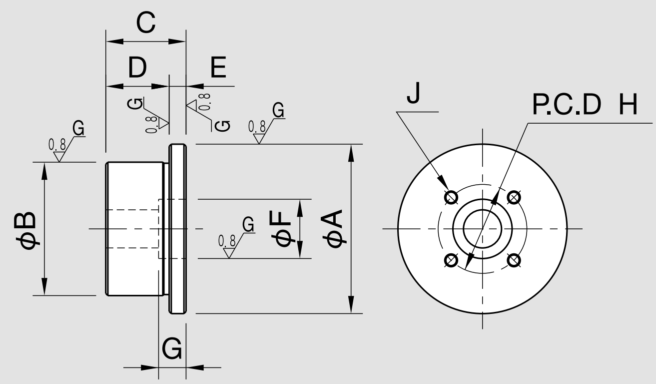
CLAMPING RANGE

Code	Description	Workpiece min.	Workpiece max.
51992212	FORM HOLDING CLAMPS CP 120	Ø 20	Ø 55
51992213	FORM HOLDING CLAMPS CP 120	Ø 24	Ø 80
51992218	ROUND FORM HOLDING CLAMPS CP 123	Ø 8.4	Ø 22
51992219	ROUND FORM HOLDING CLAMPS CP 123	Ø 12.4	Ø 40
51992220	SQUARE FORM HOLDING CLAMPS CP 124	Ø 8.4	Ø 22
51992221	SQUARE FORM HOLDING CLAMPS CP 124	Ø 8.4	Ø 22
51992222	SQUARE FORM HOLDING CLAMPS CP 124	Ø 12.4	Ø 40
51992223	SQUARE FORM HOLDING CLAMPS CP 124	Ø 12.4	Ø 40
51992228	JAWS FOR EXTERNAL FORM HOLDING CP 126	Ø 22	Ø 55
51992229	JAWS FOR EXTERNAL FORM HOLDING CP 126	Ø 26	Ø 80
51992230	JAWS FOR EXTERNAL FORM HOLDING CP 126	Ø 26	Ø 110
51992231	JAWS FOR EXTERNAL FORM HOLDING CP 126	Ø 30	Ø 150
51992232	JAWS FOR INTERNAL FORM HOLDING CP 127	Ø 30	Ø 64
51992233	JAWS FOR INTERNAL FORM HOLDING CP 127	Ø 34	Ø 89
51992234	JAWS FOR INTERNAL FORM HOLDING CP 127	Ø 36	Ø 119
51992235	JAWS FOR INTERNAL FORM HOLDING CP 127	Ø 40	Ø 159

CP122



Body
Steel (SCM415) Black oxide finish Carburized-hardened

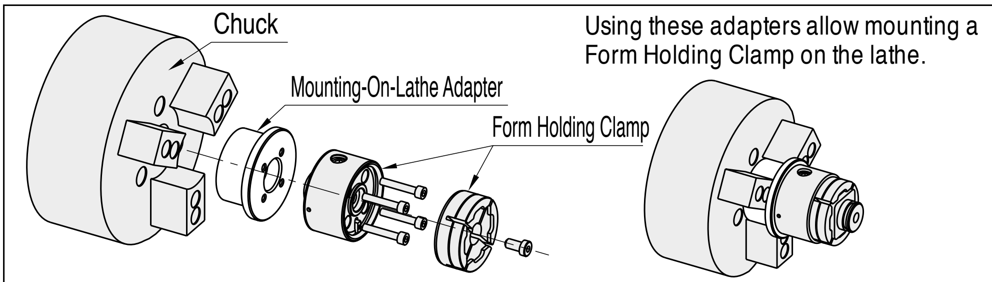


Part Number	A	B ±0,01	C	D	E ±0,01	F H7	G	H	J	Weight (g)
51992216	80	63	38	30	8	28	13	42	M6x1 12 deep	910
51992217	100	80	43	35	8	42	15	60	M8x1.25 16 deep	1.600

Form holding clamps
51992212
51992213

How To Use:

Using these adapters allow mounting a Form Holding Clamp on the lathe.

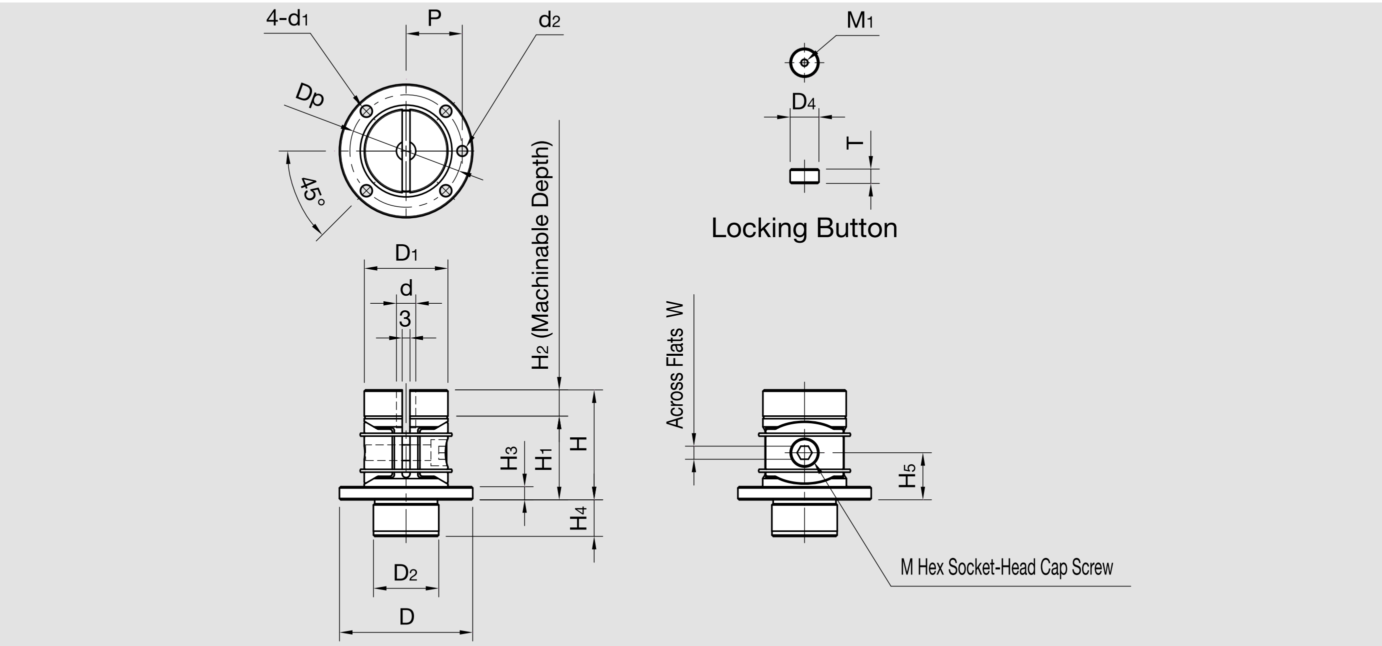


Note : A diamond pin included with a FormHolding Clamp is not required in this combination use.

CP123

FORM HOLDING CLAMPS Wedge Style/Round

Body	Wedge
Steel(S45C) Black oxide finished	Steel(S45C) Black oxide finished Quenched & tempered



Part Number	D_1	d	H	H_2	D	H_1	H_3	D_2 (g7)	H_4	d_1	Dp	d_2	P
51992218	32	7.4	42	10	51	32	5	25	14	4.5	43	5	21.5
51992219	50	11.4	63	15	75	48	7	40	19	5.5	65	6	32.5

Part Number	M	w	H_5	M_1	D_4	T	Clamping Force (N)	Allowable Screw Torque (N-m)	Weight (kg)
51992218	M 6x1 -25L	5	18	M3x0.5	7	3.5	3,000	9	0.33
51992219	M 10x1.5 -35L	8	27	M3x0.5	11	5.5	7,000	42	1.2

Technical Information:

- Locating repeatability: ±0.08

Furnished Parts:

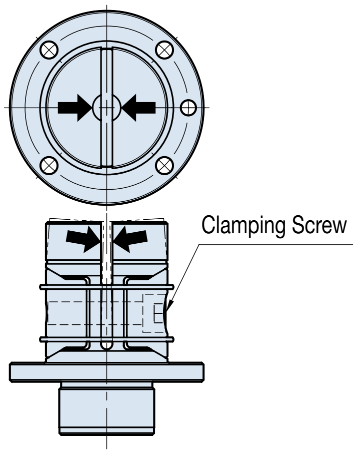
- 1 of locking button
- Spring pin
  (ø 5x10L for 51992218)
  (ø 6x14L for 51992219)

Notes:

- Do not tighten the clamping screw without the workpiece set to prevent damage and deformation.
- Do not machine the jaws beyond the machinable depth.

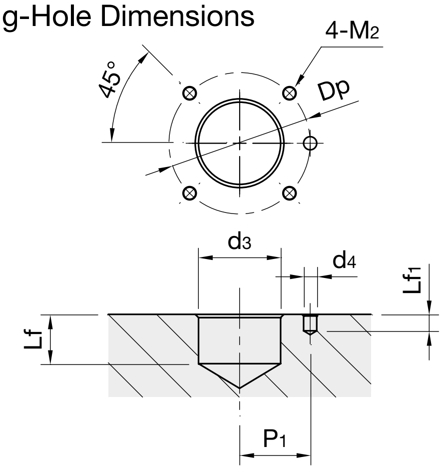
Features:

- When the clamp screw is tightened, both jaws tilt toward the center to clamp the circumference of the workpiece.
- The clamping stroke is 0.5mm.
- Cutting the machinable jaw to the contours of parts allows holding parts of different shapes.
- Simple and compact design permits multiple-parts holding arrangement.



How To Use

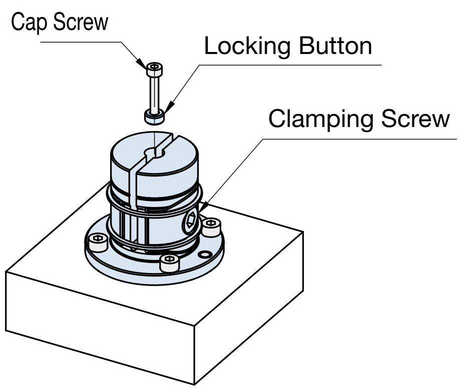
Mounting-Hole Dimensions

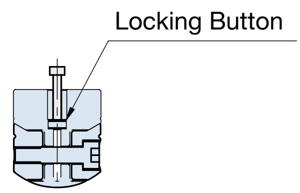


Part Number	d_3 (H7)	Lf	d_4 (+0.12)	Lf_1	P_1 (±0.05)	M_2	Dp
51992218	25	15	5	5	21.5	M4×0.7	43
51992219	40	20	6	7	32.5	M5×0.8	65

How To Machine Jaws

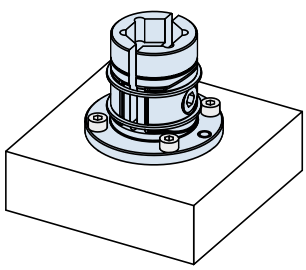
① Setting the locking button
Insert the locking button into the jaw, and then tighten the clamp screw to fasten the locking button.
(Using a cap screw facilitates setting)





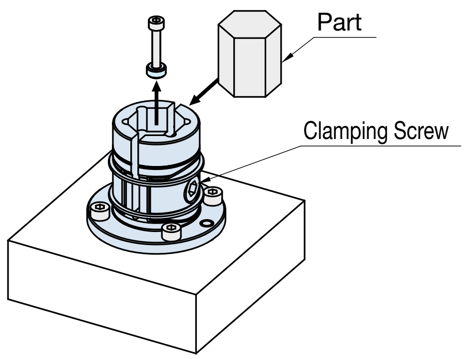
Note:The locking button must be inserted onto the bottom.

② Machining the jaw
Cut the jaw to the contours of the part.



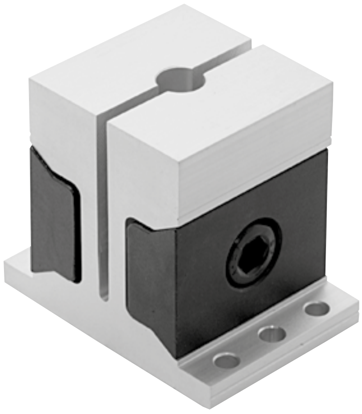
Note:Do not cut beyond the machinable depth.

③ Loading the part
Loosen the clamping screw to remove the locking button. Load the part and tighten the clamping screw for clamping.

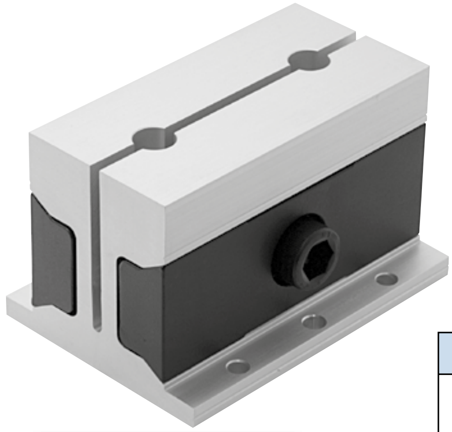


CP124

FORM HOLDING CLAMPS Wedge Style/Square

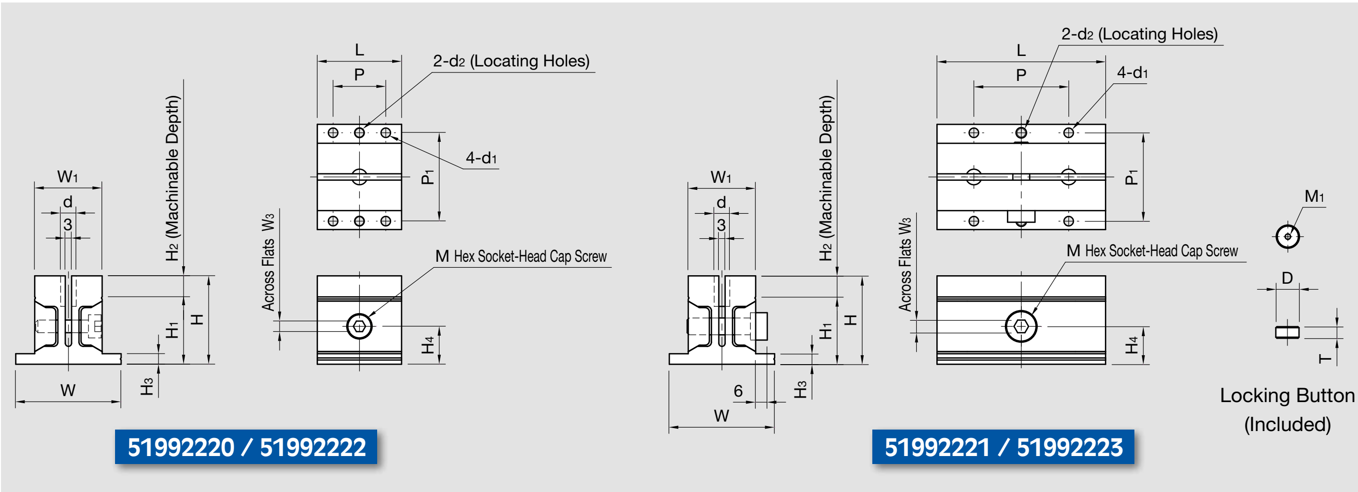


51992220 / 51992222



51992221 / 51992223

Body	Wedge
Aluminum(A6N01) Anodized Natural color	Steel(SCM440) Black oxide finished Quenched & tempered



Part Number	W_1	d	L	H	H_2	W	H_3	H_1	D_2 (H7)	d_1	P	P_1	M
51992220	32	7.4	40	42	10	50	5	32	5	4.5	25	42	M 6x1 -25L
51992221	32	7.4	80	42	10	50	5	32	5	4.5	45	42	M 8x1.25 -30L
51992222	50	11.4	50	63	15	72	7	48	6	5.5	30	62	M10x1.5 -40L
51992223	50	11.4	100	63	15	72	7	48	6	5.5	58	62	M12x1.75 -45L

Part Number	W_3	H_4	M_1	D	T	Clamping Force (N)	Allowable Screw Torque (N-m)	Weight (kg)
51992220	5	18	M3x0.5	7	3.5	2,500	7.5	0.22
51992221	6	18	M3x0.5	7	3.5	2,500	14	0.42
51992222	8	27	M3x0.5	11	5.5	5,500	26	0.62
51992223	10	27	M3x0.5	11	5.5	5,500	46	1.29

Technical Information:

- Locating repeatability: ±0.08

Furnished Parts:

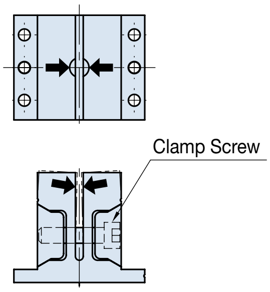
- 1 of locking button for 51992220/51992222
  2 of locking button for 51992221/51992223
- 2 of parallel pin (m6 tollerance)
  (ø 5x10L for 51992220/51992222)
  (ø 6x15L for 51992221/51992223)

Notes:

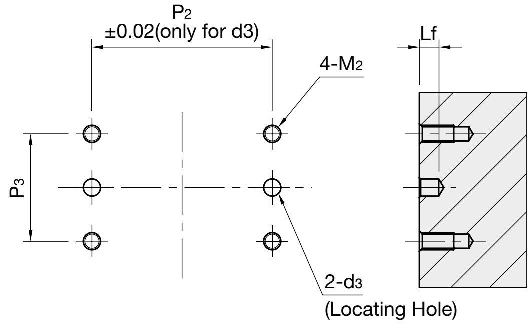
- Do not tighten the clamping screw without the workpiece set to prevent damage and deformation.
- Do not machine the jaws beyond the machinable depth.

Features:

- When the clamp screw is tightened, both jaws tilt toward the center to clamp the circumference of the workpiece
- The clamping stroke is 0.5mm.
- Cutting the machinable jaw to the contours of parts allows holding parts of different shapes.
- Simple and compact design permits multiple-parts holding arrangement.



Mounting-Hole Preparation



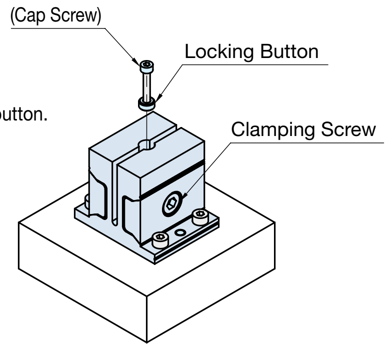
Use the included parallel pin for locating.

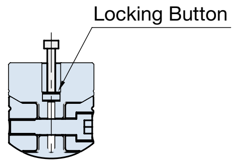
Part Number	d_3 (H7)	Lf	M_2	P_2	P_3
51992220	5	5	M4x0.7	42	25
51992221	5	5	M4x0.7	42	45
51992222	6	8	M5x0.8	62	30
51992223	6	8	M5x0.8	62	58

8

How To Machine Jaws

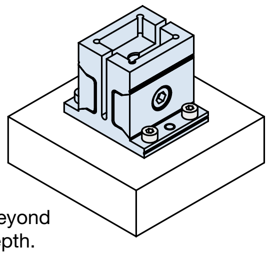
① Setting the locking button
Insert the locking button into the jaw,
and then tighten the clamp screw to fasten the locking button.
(Using a cap screw facilitates setting)





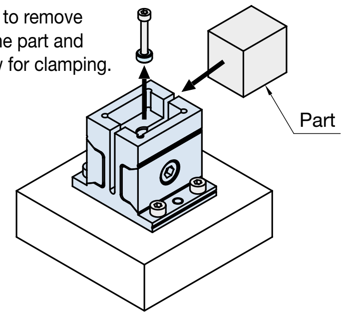
Note:The locking button must be inserted onto the bottom.

② Machining the jaw
Cut the jaw to the contours of the part.

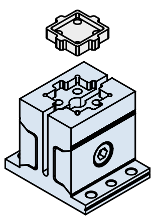


Note:Do not cut beyond the machinable depth.

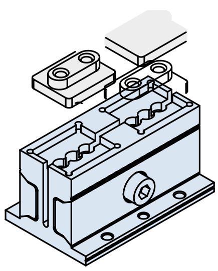
③ Loading the part
Looen the clamping screw to remove the locking button. Load the part and tighten the clamping screw for clamping.



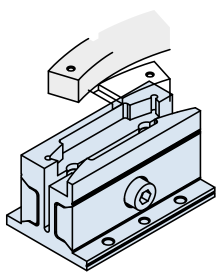
Application Examples



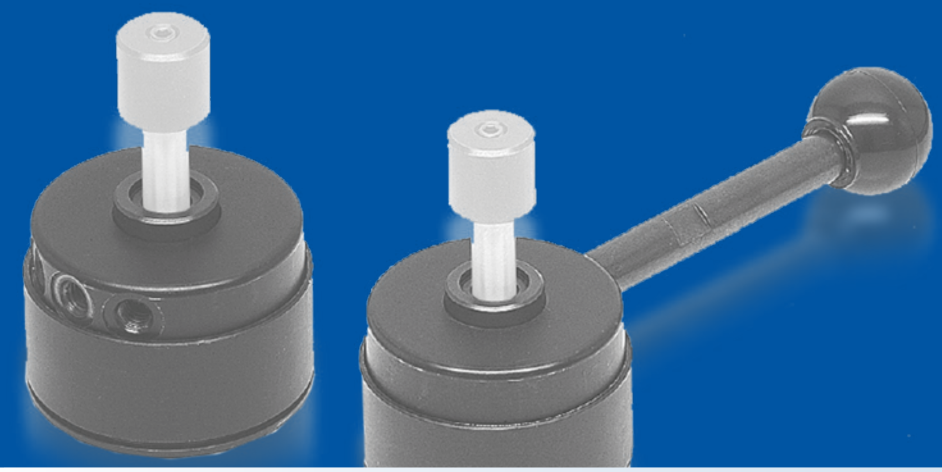
Single-station mode on the short-type clamp



Dual-station mode on the long-type clamp



Single-station mode on the long-type clamp

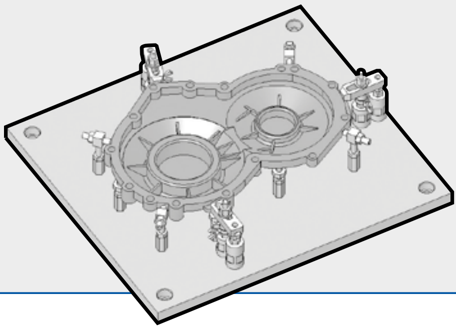


FAST CLAMPS

Fast Clamps

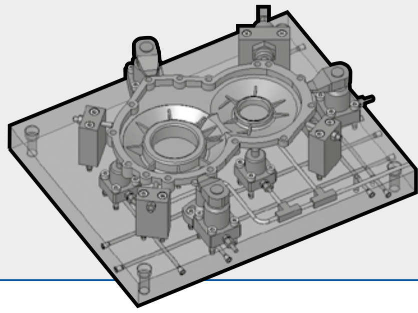
Speedier In Setup Than Conventional Manual Clamping

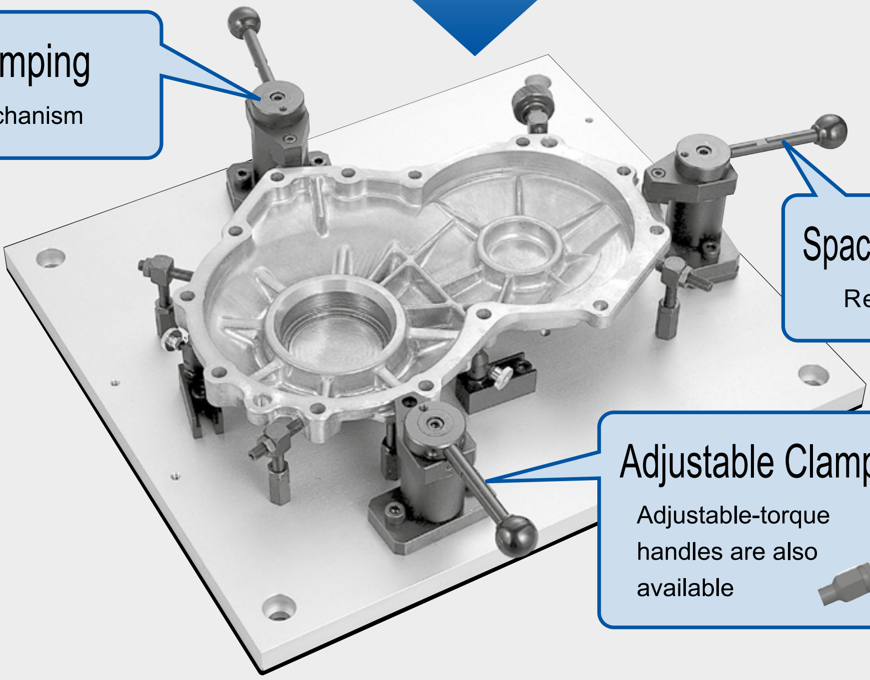
No tools needed



More Economical Than Hydraulic Clamping

Much lower fixture costs
Maintenance free





Positive Clamping

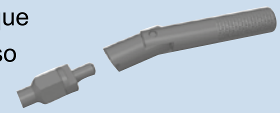
Spiral cam mechanism

Space-Saving Design

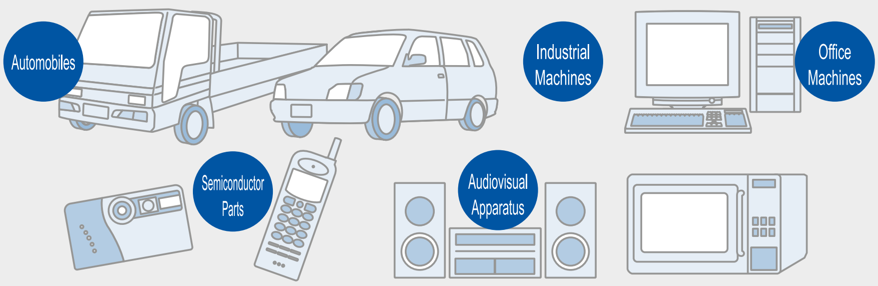
Removable handle

Adjustable Clamping Force

Adjustable-torque handles are also available



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



Added Product Items Offer A Wider Range Of Applications

Stronger Clamping Force
Clamping-Height Adjustment

Greater Performance

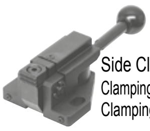
Clamping Force

NEW

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

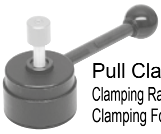
Swing Clamps Heavy
Clamping Range:up to 1.6mm
Clamping Force:up to 6,000N

NEW



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

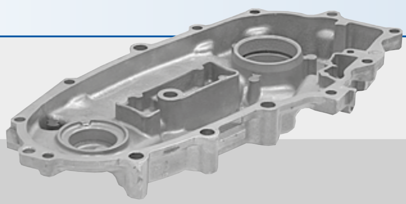
Push Clamps, Standard
Clamping Range:up to 2.5mm
Clamping Force:up to 4,000N



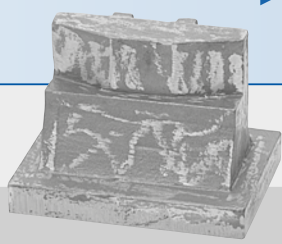
Pull Clamps, Standard
Clamping Range:up to 2mm
Clamping Force:up to 2,500N

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

Clamping-Height Adjustment



Die-Cast Parts



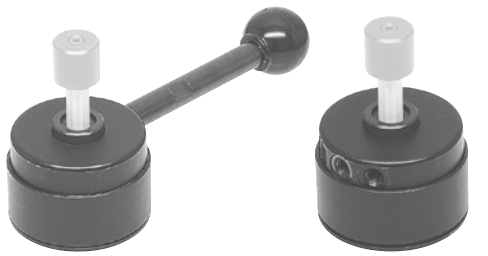
Cast-Iron Parts

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

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

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

QLPD PULL CLAMPS(Standard)



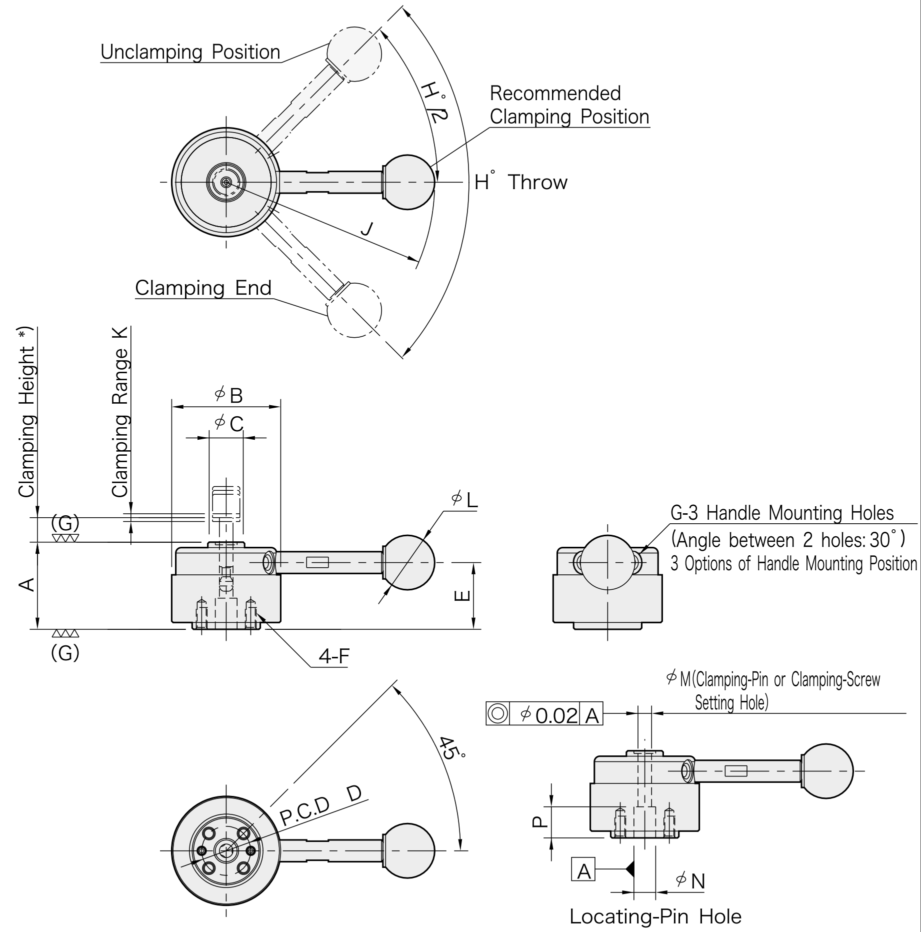
With Handle　　Without Handle

Note) Clamping Pins or Screws must be ordered separately.

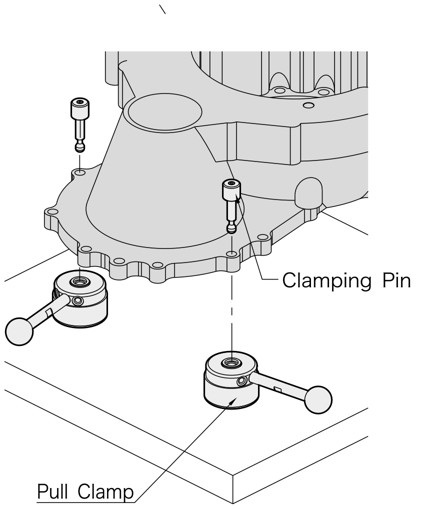
Body & CAM	
Material	SCM440 steel
Finish	Black oxide
Heat Treat	Quenced and tempered

Handle	
Material	S45C steel
Finish	Black oxide

Ball Knob	
Material	ABS resin
Color	Black

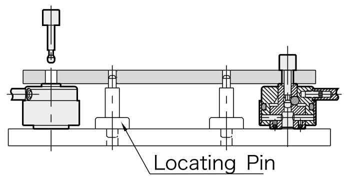


How To Use

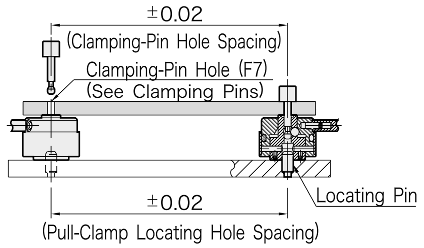


How To Locate Workpiece

1. Basic Method



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



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

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

With Handle

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

Without Handle

Part Number	Weight (g)
51991103	220
51991104	420

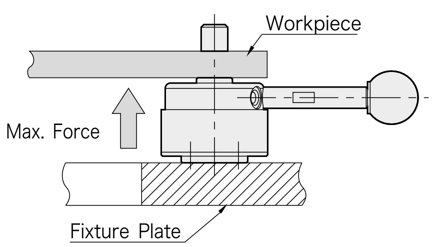
*) Grip length of Clamping Pin(workpiece thickness)
**) Maintaining these recommended tolerances allows minimizing the variation of handle position in the clamping mode in clamping with the use of the Clamping Pin.
***) Allowable load to operate the handle.

Technical Infomation

Allowable Loads in Machining of Workpiece Bottom

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

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

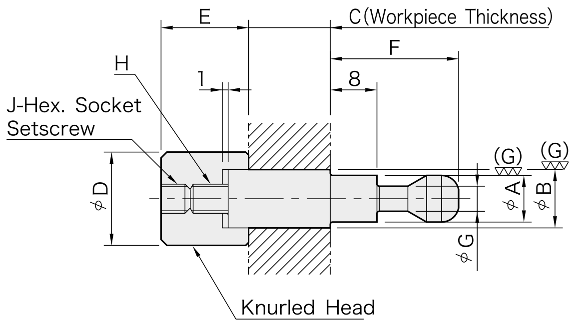


Note : See page 151 and 154 for performance curves.

QLPD-X CLAMPING PINS(Standard)

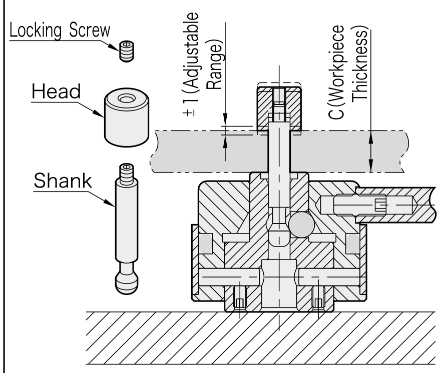
Shank	
Material	SCM435 steel
Finish	Precision ground
Heat	Treated (shank end)

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



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

How To Use



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

*) For ordering, specify workpiece thickness.

Ordering Example

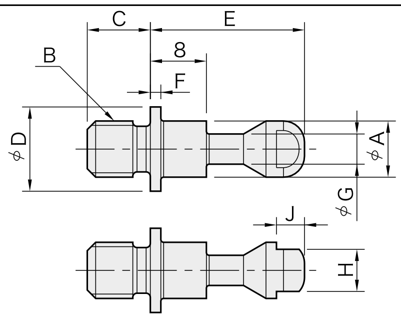
QLPD150-5x5-10.5

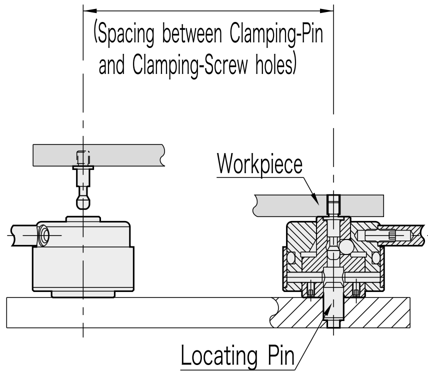
Shank Size C Dim.

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

QLPD-M CLAMPING SCREWS(Standard)

Material	SCM440 steel
Finish	Black oxide
Heat Treat	Quenched and tempered





Recommended Spacing Tolerance in Use of Clamping Screws

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

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

QLPDH PULL CLAMPS (Heavy)

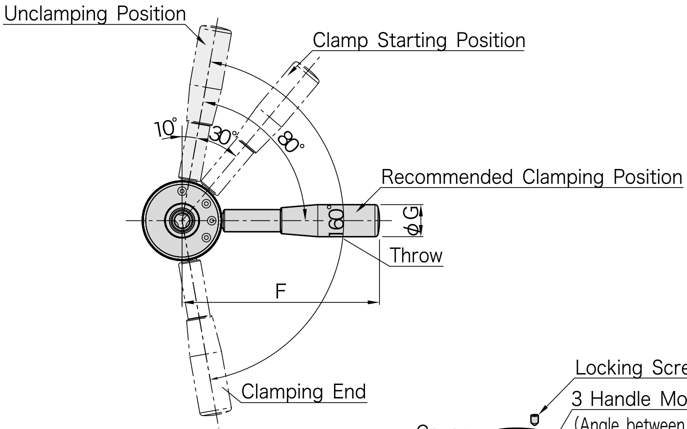
NEW

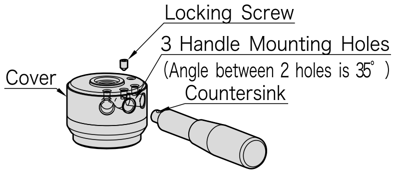
Body & Clamp ring	
Material	SCM440 steel
Finish	Black oxide
Heat Treat	Quenced and tempered

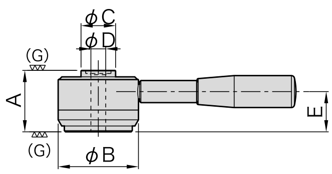
Handle Shank	
Material	S45C steel
Finish	Black oxide
Heat Treat	Quenced and tempered

Handle	
Material	Plastic
Color	Black

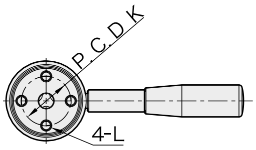
Note) Clamping Pins or Screws must be ordered separately.

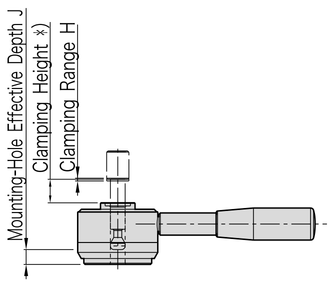




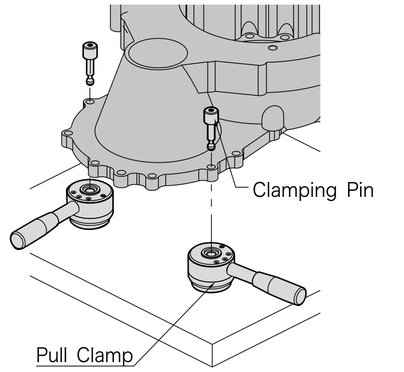


The handle can be removed by loosening the locking screw.
To keep the handle mounted permanently,make sure that the locking screw is fully tightened.
3 options of handle mounting position.



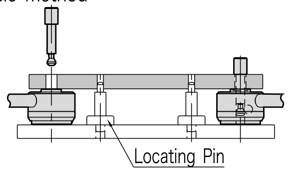


How To Use

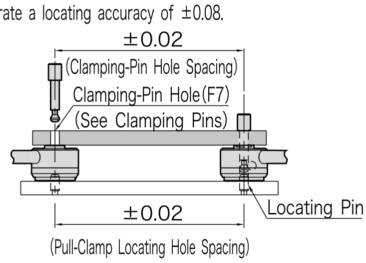


How To Locate Workpiece

1. Basic method

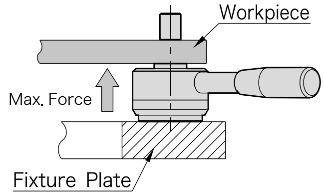


2. Method for clamping and locating a workpiece at a time. Give an accuracy shown below to the hole spacing to generate a locating accuracy of ±0.08.

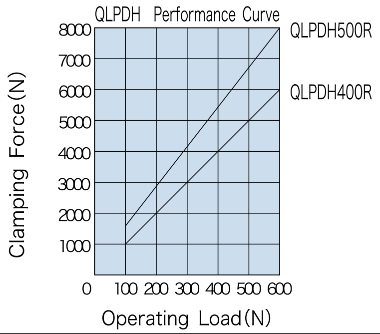


Technical Information

Allowable Loads in Machining of Workpiece Bottom



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



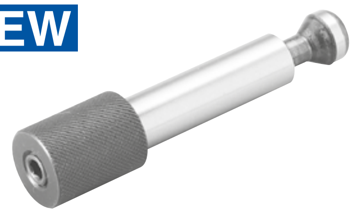
Part number	Series	A (±0.01)	B	C	D (F7)	E	F	G	H	J	K (P.C.D)
51991501	QLPDH 400 R	50	65	28	12	36	160	26	2	10	40
51991502	QLPDH 500 R	63	80	34	16	45	180	28	2.5	12	50

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

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

QLPDH-X CLAMPING PINS (Heavy)

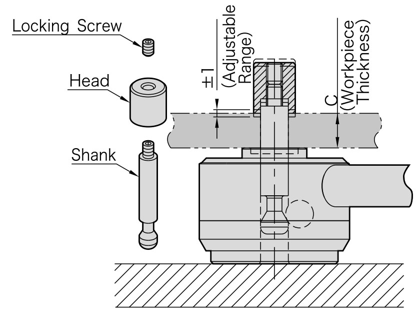
NEW



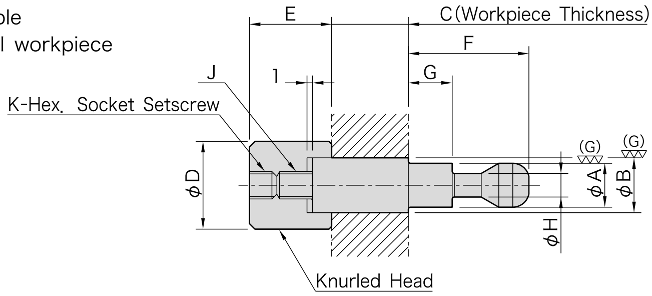
Shank	
Material	SCM435 steel
Finish	Precision ground

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

How To Use



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



Ordering Example

QLPDH400-12-20.5
Part Number C Dim.

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

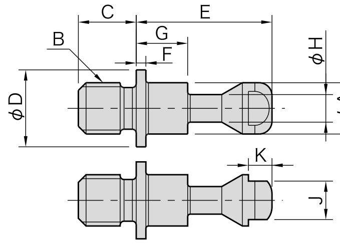
Part Number	A (f7)	B (f7)	C *) (By 0.1mm)	D	E	F	G	H	J	K	Pull Clamps	Weight (g)
51991503-(C Dim. In mm)	12	12	0<C≦100	18	23	38	21.5	6.5	M 8x1.25	M 8x1.25- 8L	QLPDH400R	70 to 160
51991504-(C Dim. In mm)		16		24								175 to 265
51991505-(C Dim. In mm)	16	16	0<C≦120	24	29	48	28	9.5	M10x1.5	M10x1.5 -10L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

*) For ordering, specify workpiece thickness.

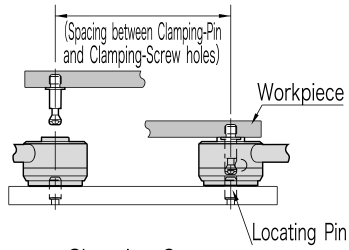
QLPDH-M CLAMPING SCREWS (Heavy)

NEW

Material	SCM 435
Finish	Black oxide
Heat Treat	Quenched and tempered



Recommended Spacing Tolerance in Use of Clamping Screws

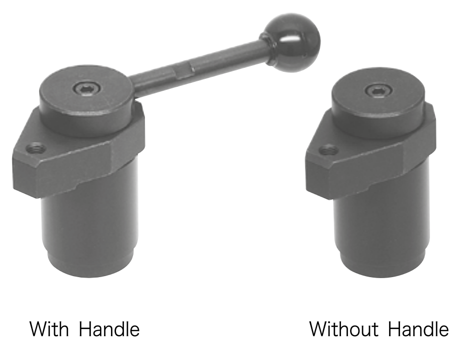


Custom Clamping Screws (different screw thread sizes) are available on request.

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

14

QLSW SWING CLAMPS(Standard)

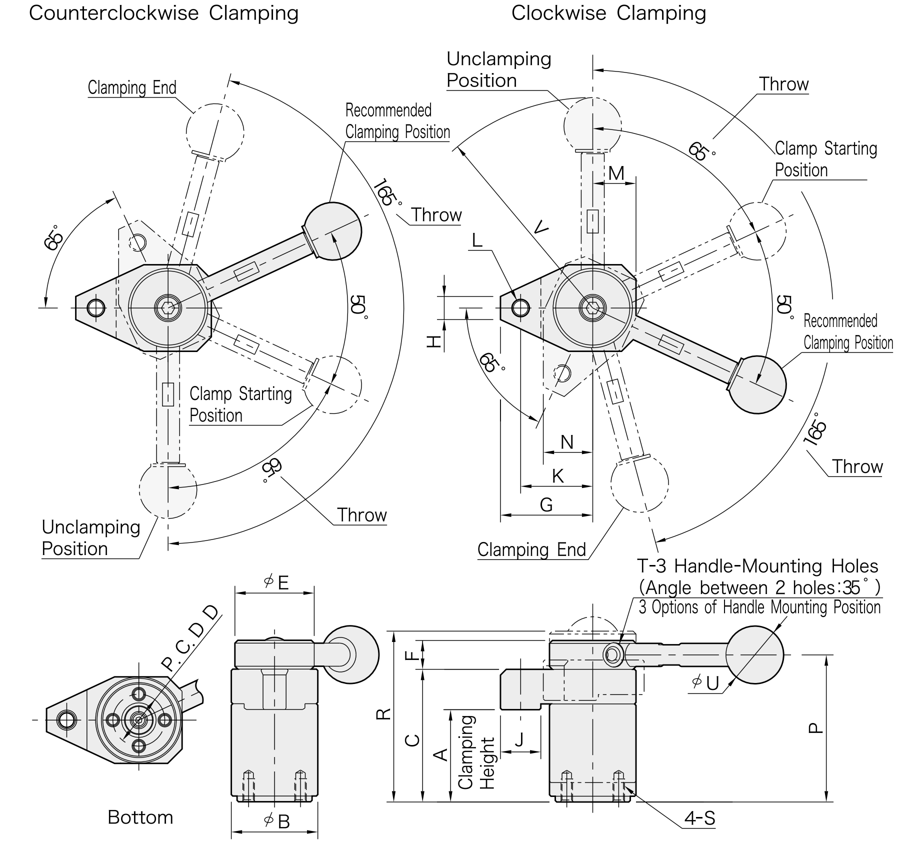


Body & Shaft	
Material	SCM440 steel
Finish	Quenched and tempered

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

Handle	
Material	S45C steel
Finish	Black oxide

Ball Knob	
Material	ABS resin
Finish	Black



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

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

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

With Handle

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

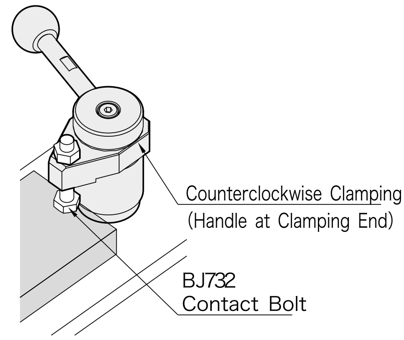
***) Allowable load to operate the handle

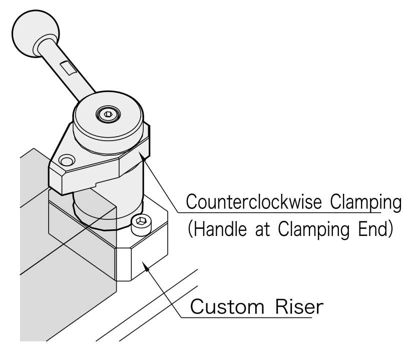
Without Handle

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

Note : The handle must be ordered separately.

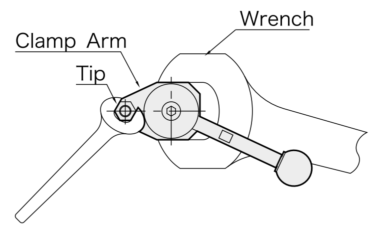
How To Use





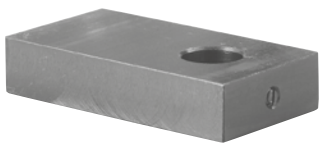
Tip Installation

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

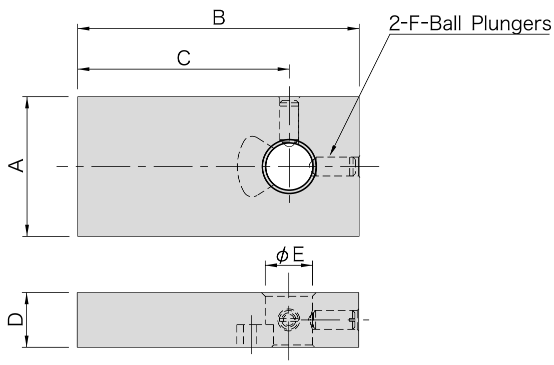


QLSW-SH MACHINABLE CLAMP ARMS FOR STANDARD SWING CLAMPS

NEW

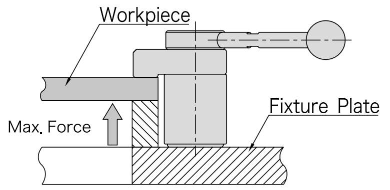


Material: S45C steel
Finish : Black oxide



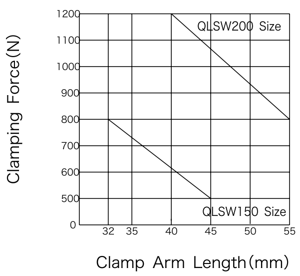
Technical Infomation

Allowable Loads in Machining of Workpiece Bottom

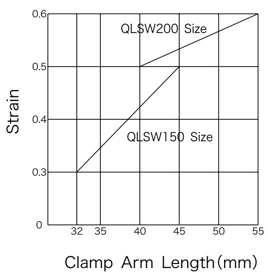


Series	Allowable Force To Workpiece Bottom (Per Clamp)
QLSW150	max.2100N
QLSW200	max.2700N

Clamp Arm Length Vs. Clamping Force



Clamp Arm Length Vs. Strain During Clamping

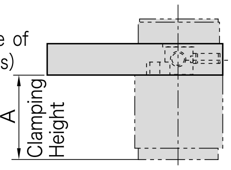


Notes :
- Clamp arm length denotes C dimensions below.
- Clamping force and strain during clamping denote values gained when the max. allowable load is applied to the handle.

How To Use

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

(Clamping Height in Use of Machinable Clamp Arms)



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

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

Part Number	A
51991113	34**)
51991114	47***)

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

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QLSWH SWING CLAMPS (Heavy)

NEW

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

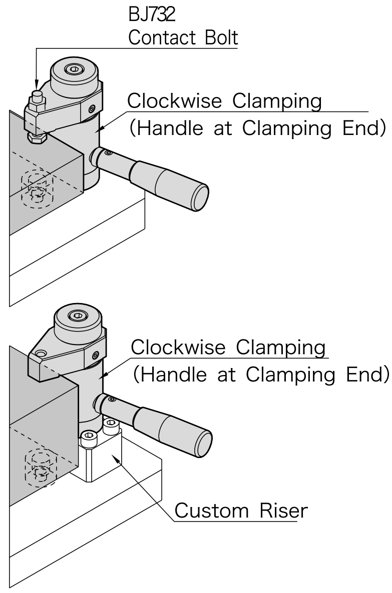
Perno	
Material	SCM435 steel
Finish	Black oxide
Heat Treat	Quenced and tempered

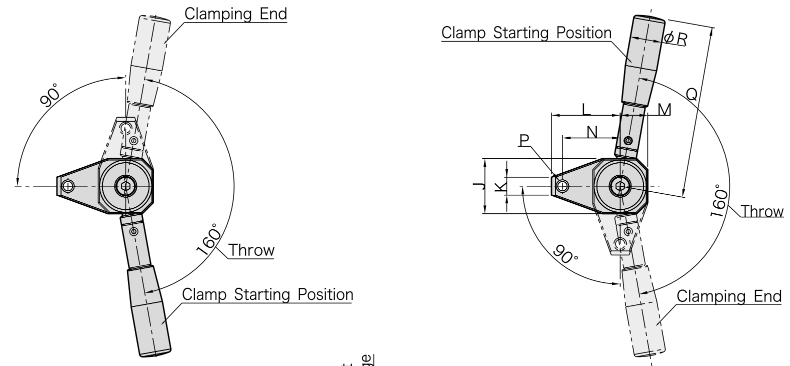
Staffa/Copertura/Leva	
Material	S45C steel
Finish	Black oxide
Heat Treat	Quenced and tempered

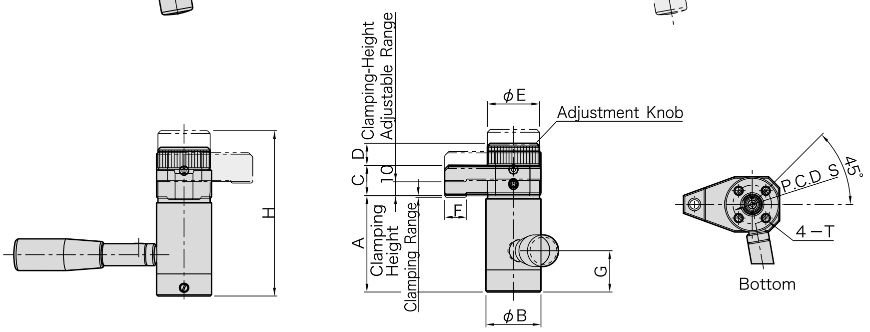
Manopola di regolazione	
Material	S45C steel
Finish	Black oxide

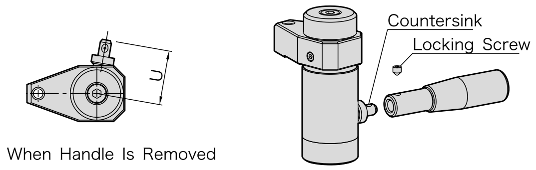
Leva	
Material	Plastic
Color	Black

How To Use





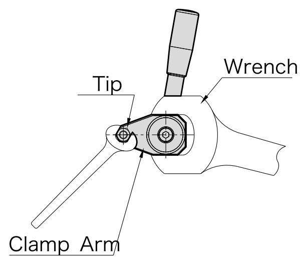




The handle can be removed by loosening the locking screw. To keep the handle mounted permanently, make sure that the locking screw is fully tightened.
3 options of handle mounting position.

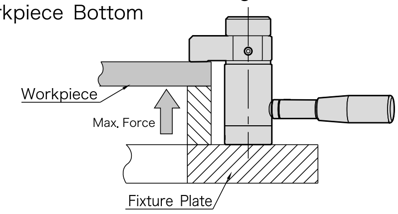
Tip Installation

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



Technical Information

Allowable Loads in Machining of Workpiece Bottom

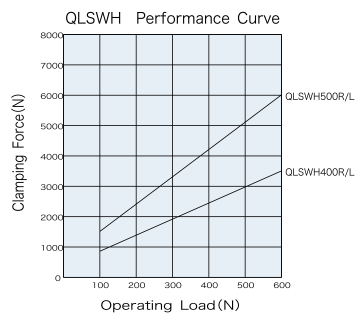


Series	Allowable Force To Workpiece Bottom (Per Clamp)
QLSWH400	max. 8000N
QLSWH500	max.14000N

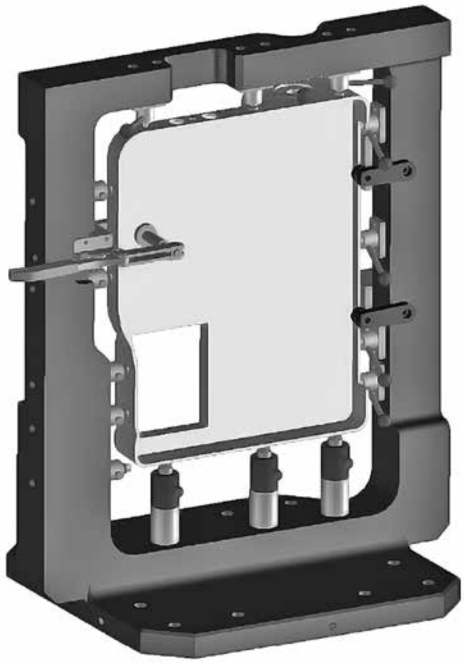
Part Number	Clamping Direction	Clamping Range	Clamping Height	B	C	D	E	F	G	H	J	K	L	M
51991515	Clockwise	1.2	70 to 80	40	22	16	38	16	30	120	40	13	50	20
51991516	Counter-clockwise													
51991517	Clockwise	1.6	80 to 90	50	25	20	48	24	38	137	50	18	60	25
51991518	Counter-clockwise													

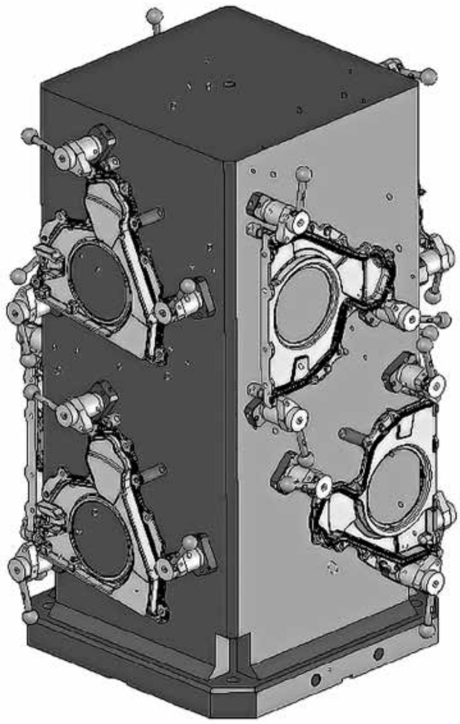
Part Number	N	P	Q	R	S (P.C.D)	T	U	Allowable Oerating Load (N) *)	Clamping Force (N)	Clamping Mechanism	Weight (kg)
51991515	42	M 8x1.25	125	23	28	M6x1 12 deep	39	600	3,500	Spiral Cam Cam Angle 2°	1.1
51991516											
51991517	48	M12x1.75	160	28	35	M8x1.25 16 deep	47	600	6,000		2
51991518											

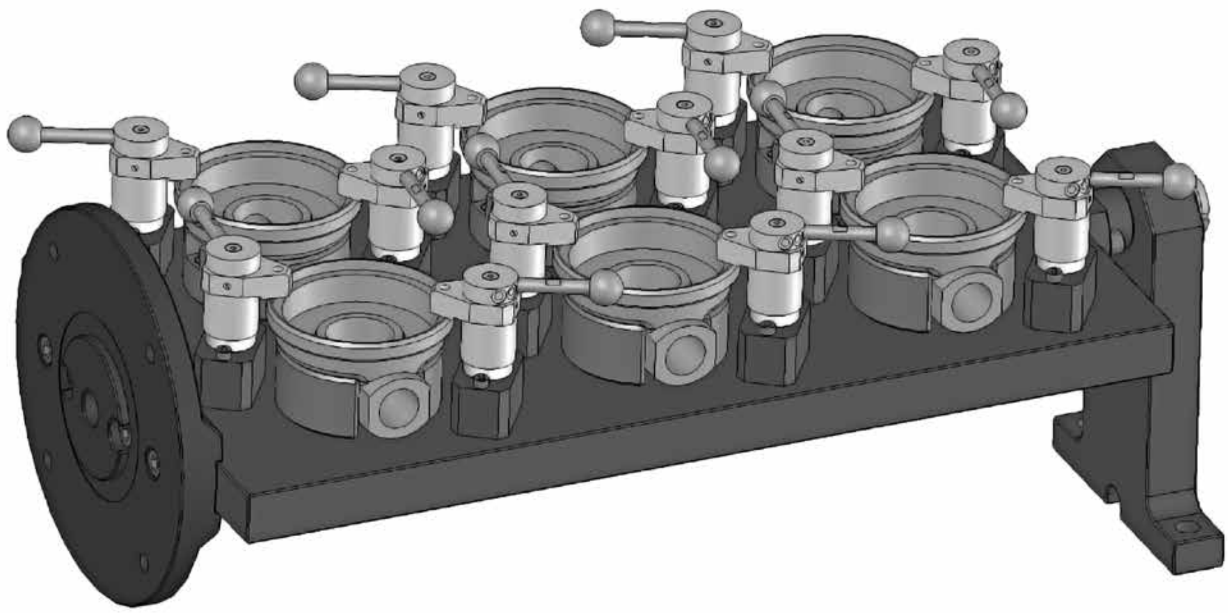
*) Allowable load to operate the handle



Examples







14

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

Recommeded Dimensions

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

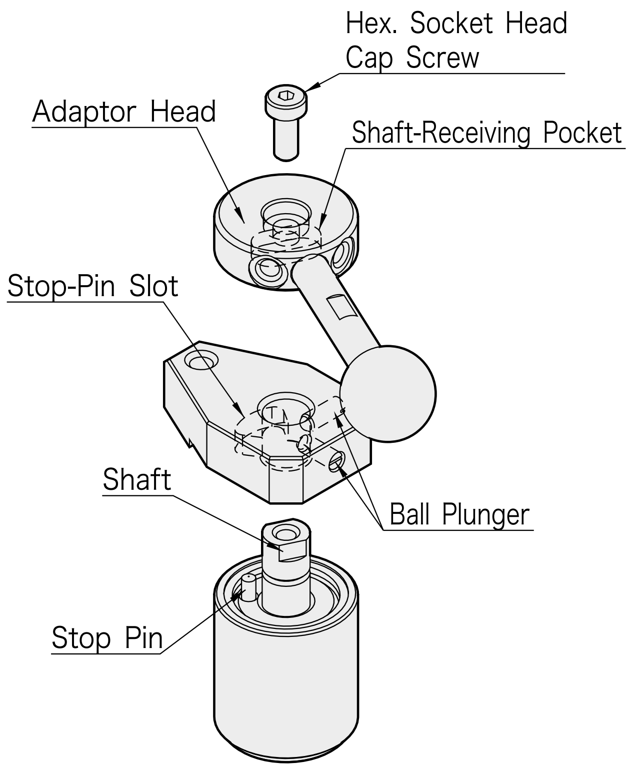
*) See page 138 clamping force vs. clamp-arm length

Clamp Arm Installation/Removal Instructions

To install a clamp arm,

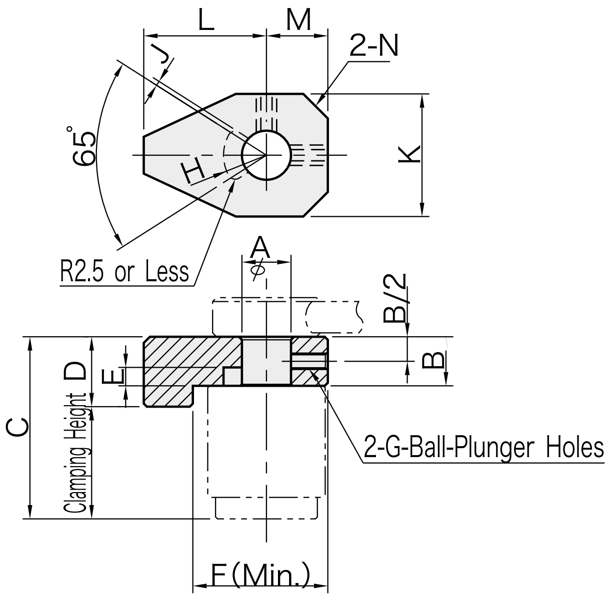
1. Fit it onto the shaft getting the stop pin received in the stop-pin slot provided on the clamp-arm bottom.
2. Place the adaptor head onto the shaft getting the shaft fitted into the shaft-receiving pocket in the adaptor head, and then lock the adaptor head using a hex. socket head cap screw.
3. Tighten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

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

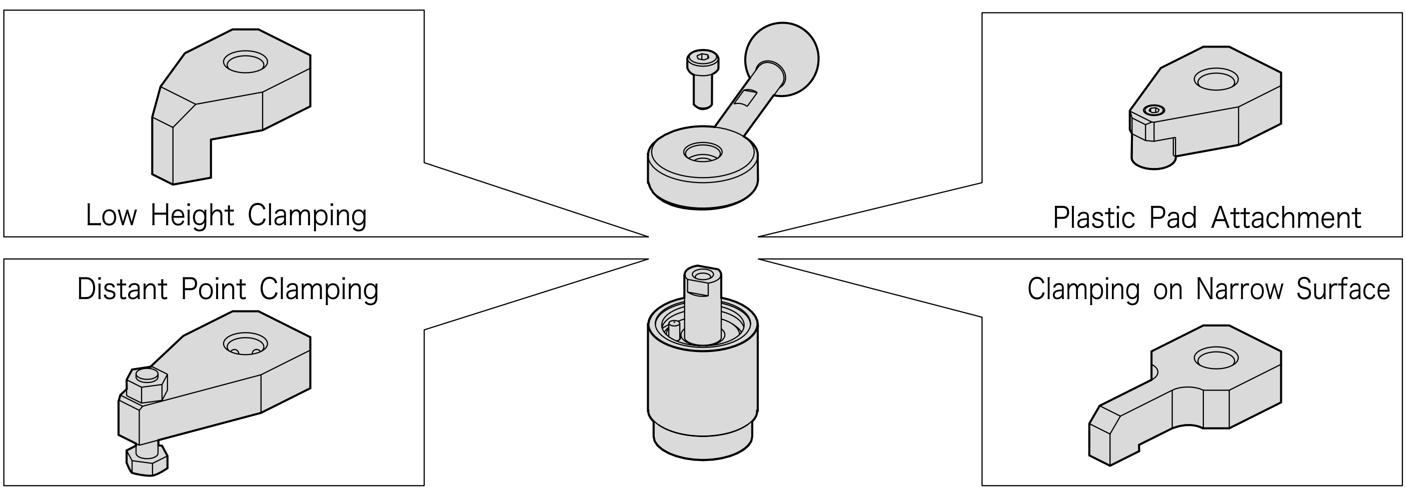


How To Determine D Dimensions

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



Clamp Arm Customization Examples



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

Recommended Dimensions

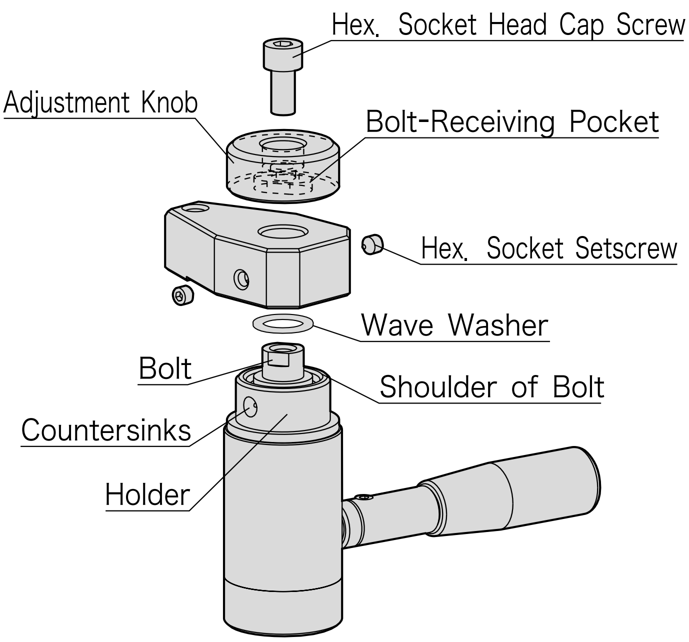
Series	A (F8)	B	C	D	E (±0.1)	F	G	H	L (Max.)
QLSWH400	32	15	21	13	5	M6x1	20	40	50
QLSWH500	41	19	24	15	6	M8x1.25	25	50	60

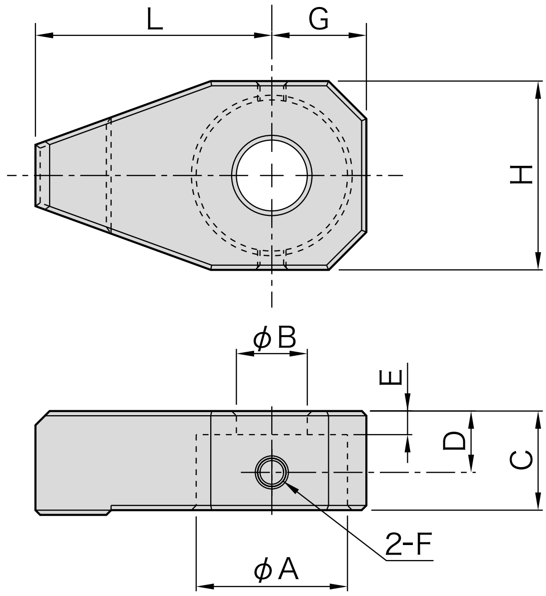
Clamp Arm Installation/Removal Instructions

To install a clamp arm,

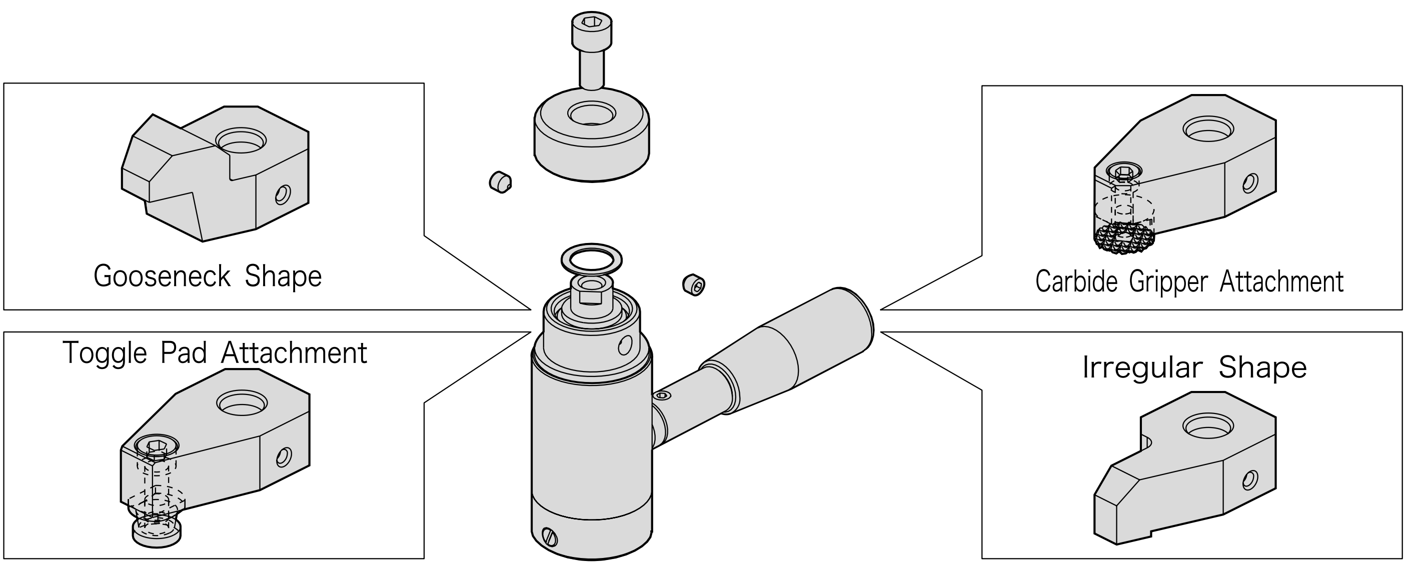
1. Place the wave washer on the shoulder of the bolt and then fit the clamp arm onto the bolt.
2. Place the adjustment knob onto the bolt getting the bolt fitted into the bolt-receiving pocket in the adjustment knob, and then lock the adjustment knob using a hex. socket head cap screw.
3. Align the countersinks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

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





Clamp Arm Customization Examples



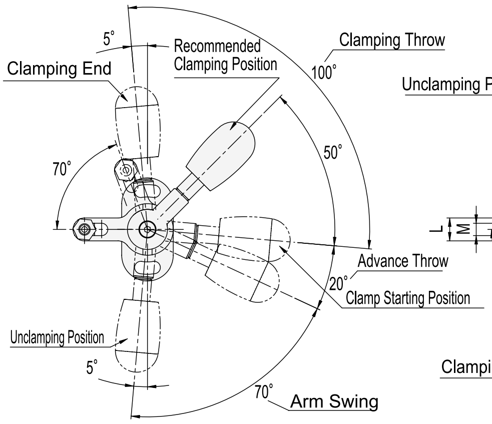
NEW

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

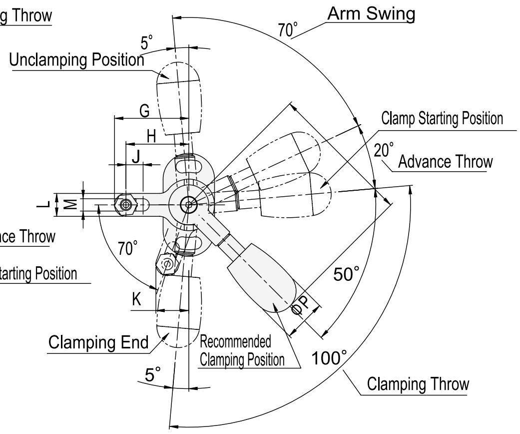
Arm / Cam Shaft	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered

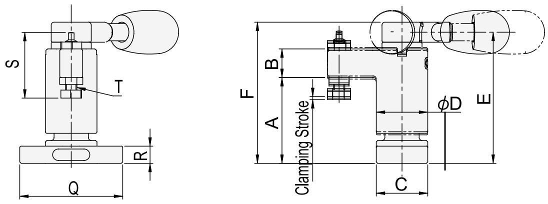
Knob	
Material	Phenolic plastic
Color	Black

Counterclockwise Clamping

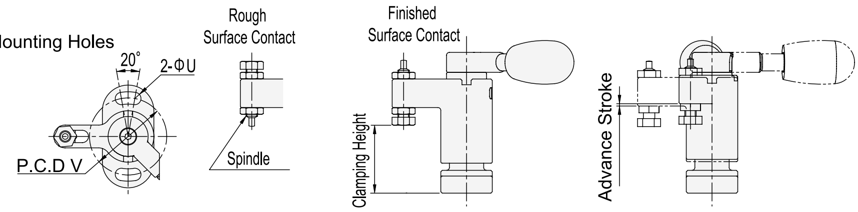


Clockwise Clamping





Mounting Holes



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

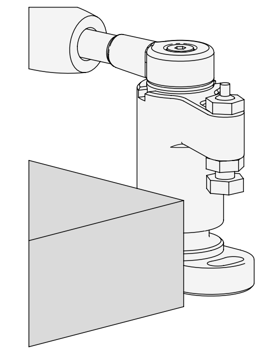
*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

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

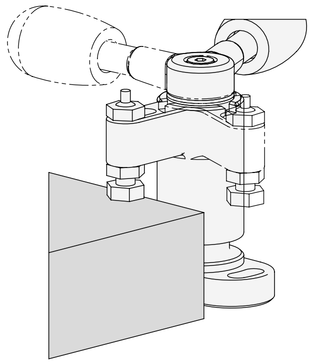
Part Number	R	S	T	U	V	W	Allowable Operating Load (N) **)	Clamping Force (N)	Clamping Mechanism	Weight (g)
51991822 51991823	6	22.8	M4×0.7	4.3	27	8	100	1,100	Spiral Cam Cam Angle:5°	112
51991824 51991825	8	28.5	M5×0.8	5.3	34	10	150	1,800		250

**) Allowable load to operate the handle

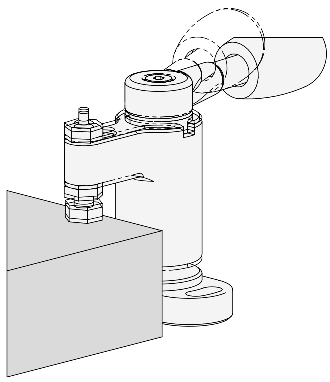
How To Operate



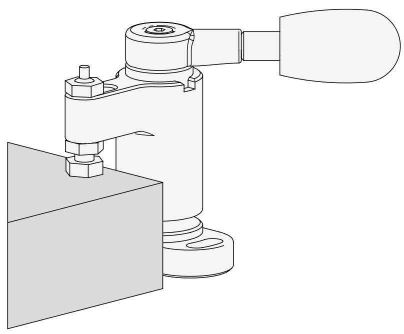
1. Unclamped
Load a workpiece.



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

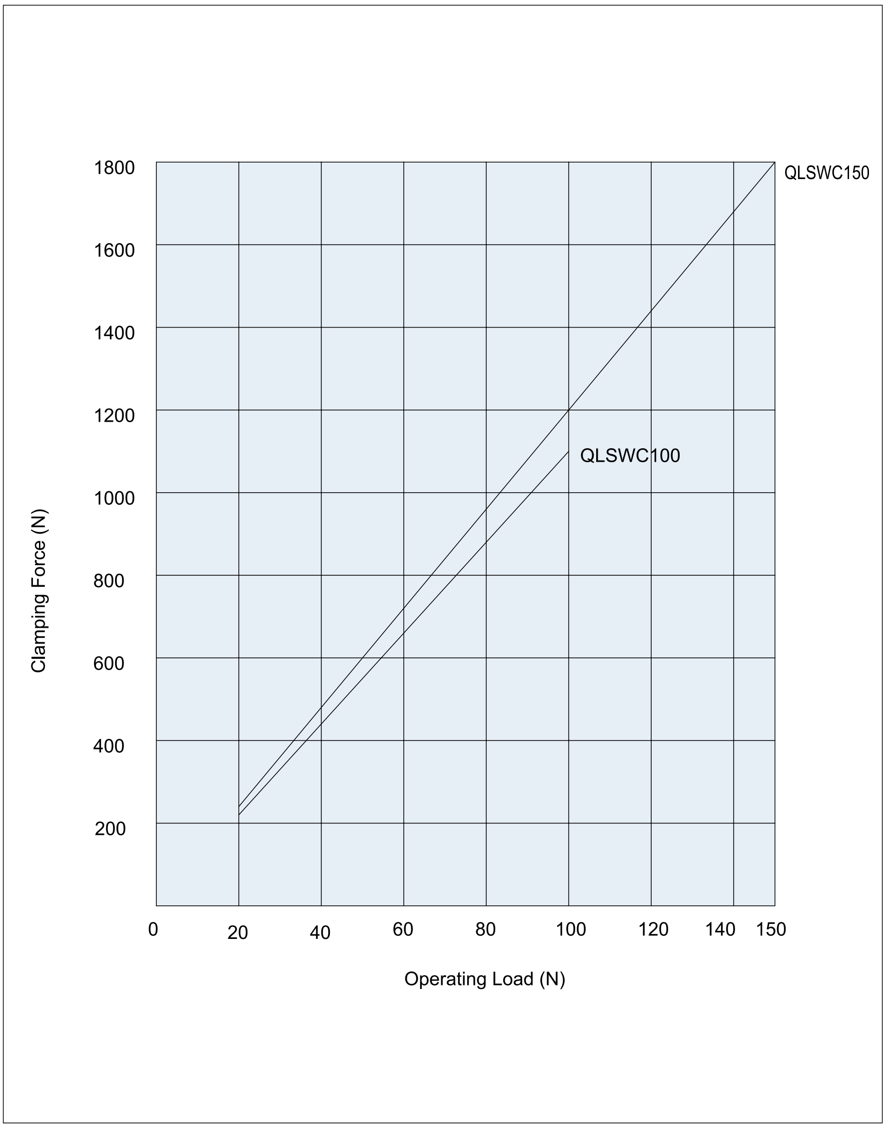


3. Clamping Setup
Continue turning the handle to set the spindle close to the workpiece.



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

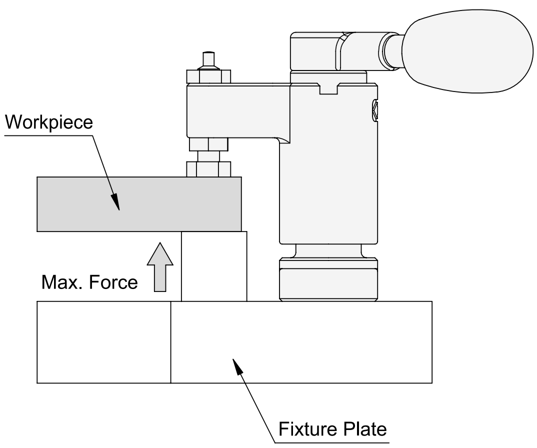
Performance Curve



Technical Information

Allowable Loads in Machining of Workpiece Bottom

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

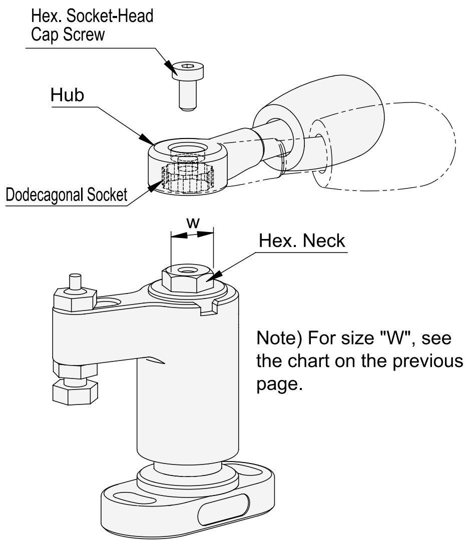


Series	Allowable Force to Workpiece Bottom (per Clamp)
QLSWC100	max.2,300N
QLSWC150	max.3,600N

How To Operate

How To Change Handle Position

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

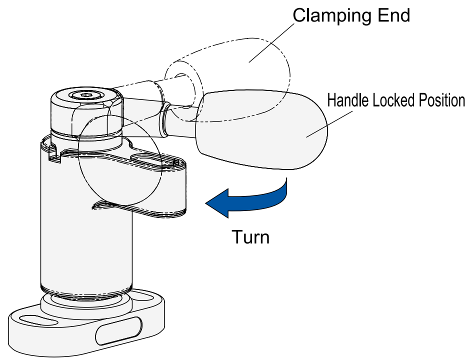


Note) For size "W", see the chart on the previous page.

How To Release Locked Handle

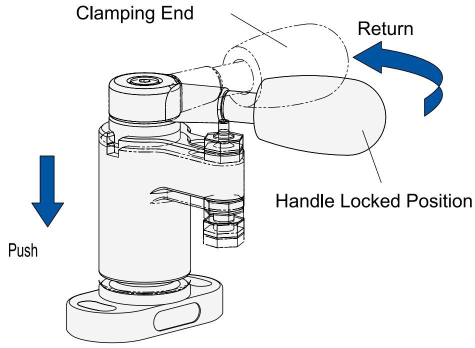
When turned beyond the clamping end, the handle will be locked with a click. The locked handle can be released by following the instructions below.

When the spindle is not installed,



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

When the spindle is installed,



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

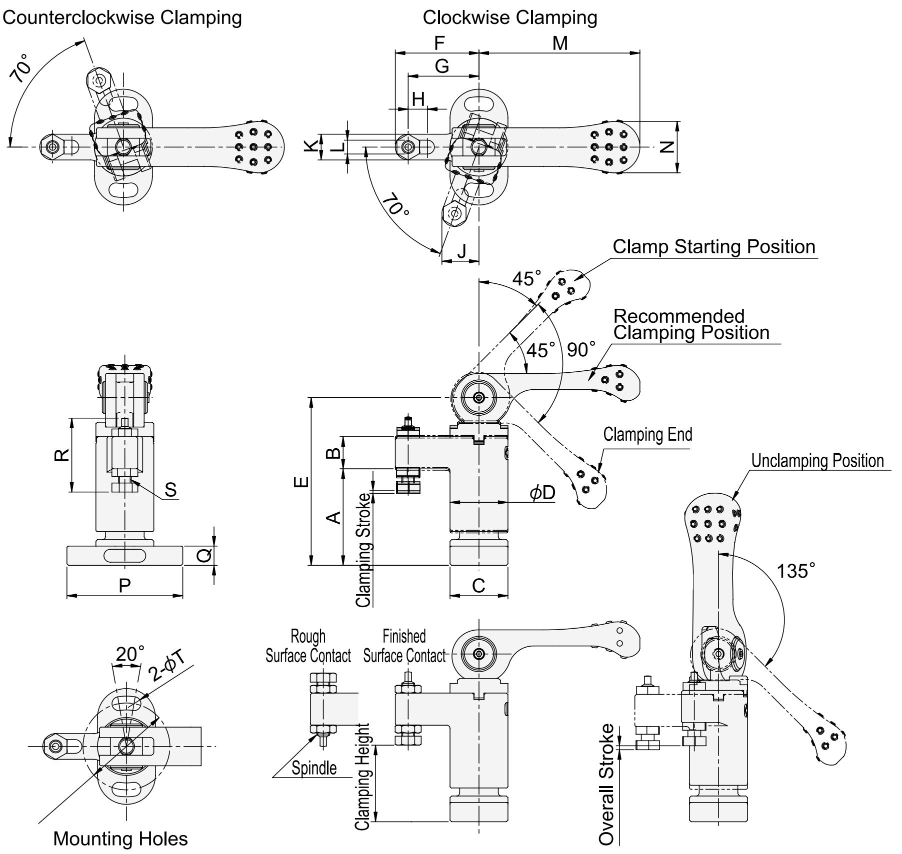
14

QLSWC SWING CLAMPS (Mini) WITH CAM HANDLE

NEW

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

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



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

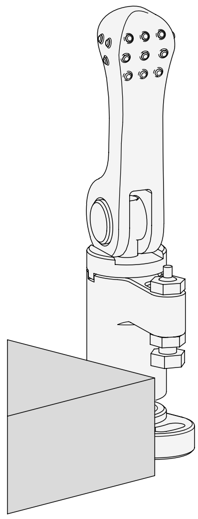
*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

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

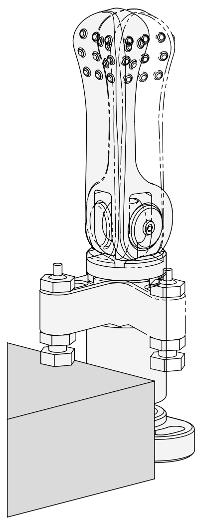
Part Number	R	S	T	U	Cam Handles Part Number	Allowable Operating Load (N) **)	Clamping Force (N)	Clamping Mechanism	Weight (g)
51991826 51991827	22.8	M4×0.7	4.3	27	QLCA-05	100	800	Spiral Cam Cam Angle:4°	134
51991828 51991829	28.5	M5×0.8	5.3	34	QLCA-06	150	1,500		272

**) Allowable load to operate the handle

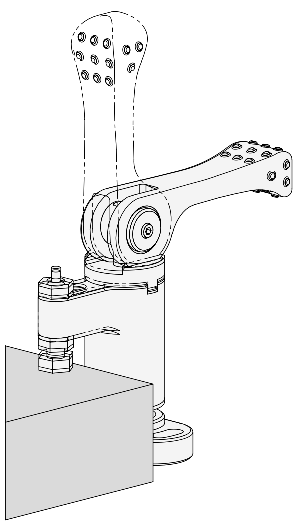
How To Operate



1. Unclamped
Load a workpiece.

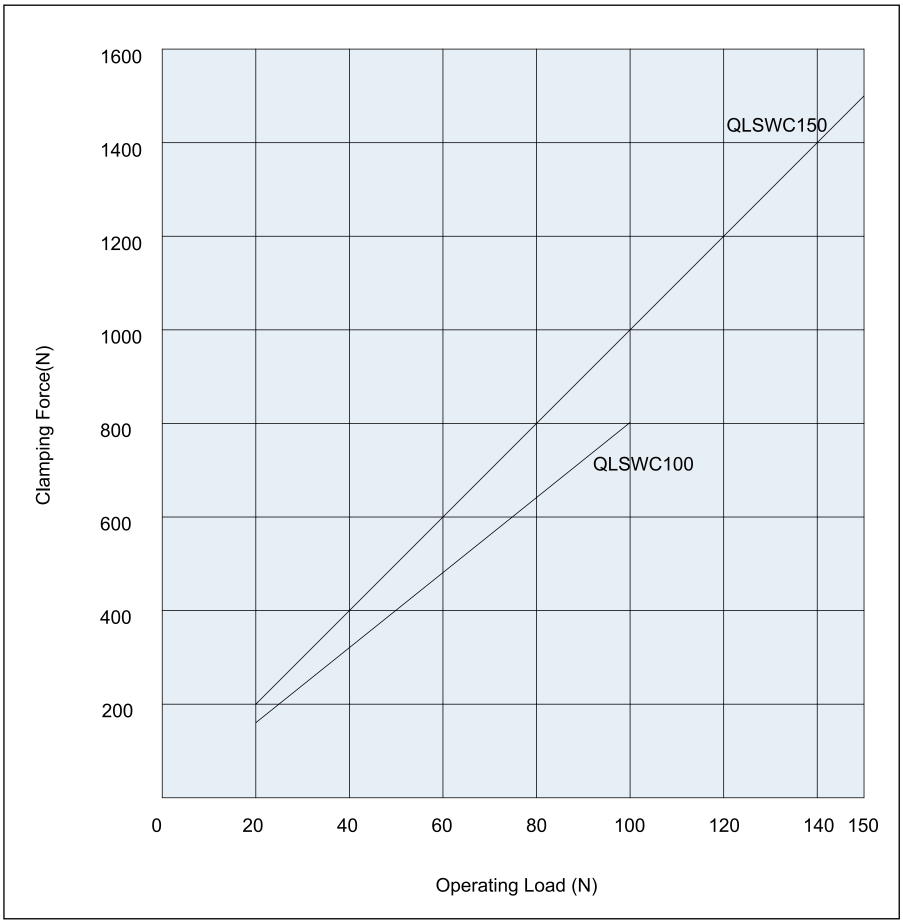


2. Arm Swing
Turn the handle to set the arm in position.



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

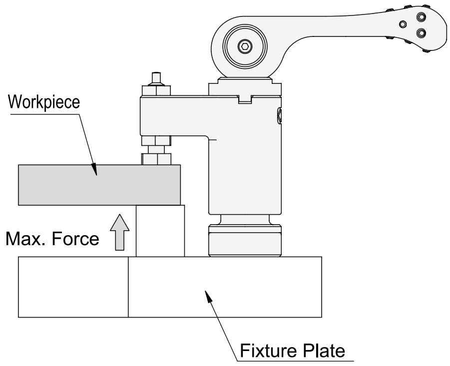
Performance Curve



Technical Information

Allowable Loads in Machining of Workpiece Bottom

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



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

14

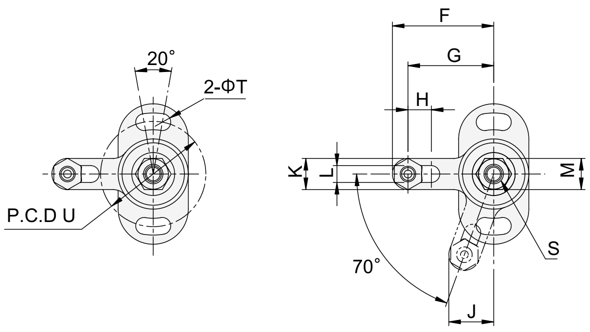
QLSWC SWING CLAMPS (Mini) FOR TORQUE CONTROL

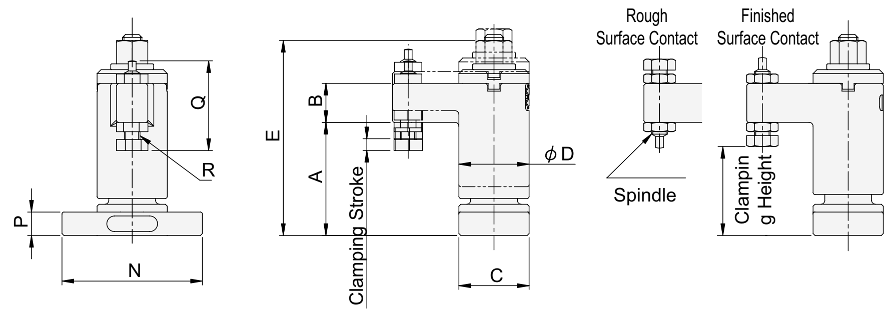
NEW

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

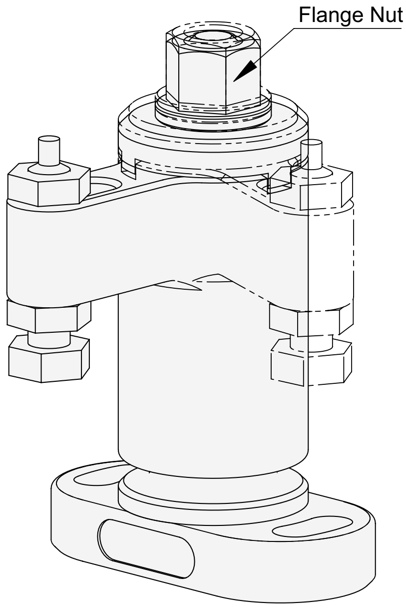
Arm	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered

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





How To Operate



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

Warning

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

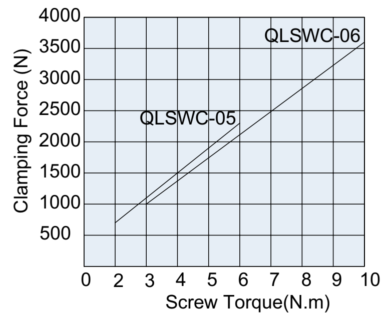
Part Number	Clamping Height *)				Clamping Stroke	A	B	C	D	E
	Finished Surface Contact		Rough Surface Contact							
	Min.	Max.	Min.	Max.						
51991830	22.8 (22.8-25.8)	24.8 (24.8-27.8)	22.4 (22.4-25.4)	24.4 (24.4-27.4)	3	29	10	18	18	52.5
51991831	31.3 (31.3-35.3)	33.3 (33.3-37.3)	32.2 (32.2-36.2)	34.2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

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

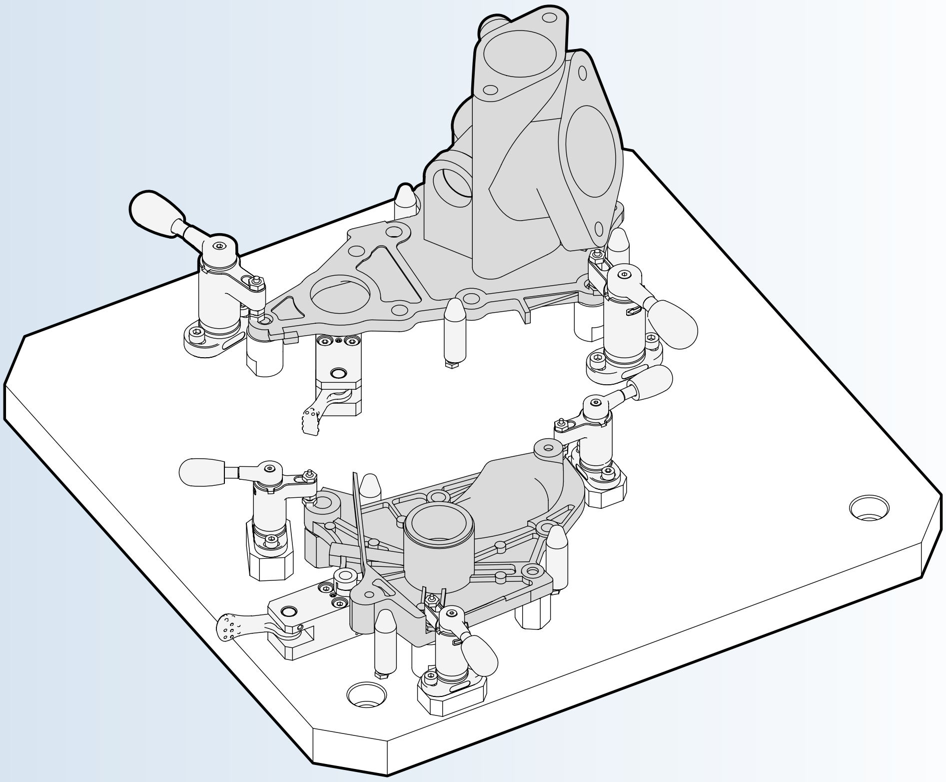
Part Number	F	G	H	J	K	L	M	N	P	Q
51991830	26	22	6	11.5	8	4.3	8	36	6	22.8
51991831	35	30	8	15.3	10	5.3	10	45	8	28.5

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

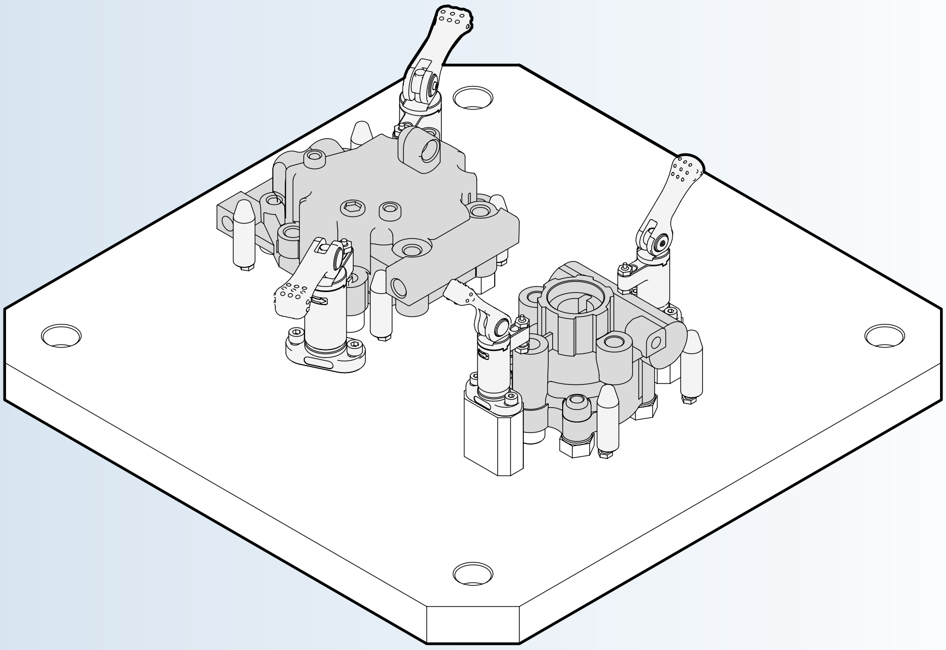
Performance Curve



Fixturing with Swing Clamps(Mini)



Fixturing with Swing Clamps(Mini) with Cam Handle



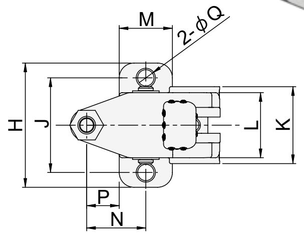
QLRE RETRACTABLE CLAMPS (Mini) WITH CAM HANDLE

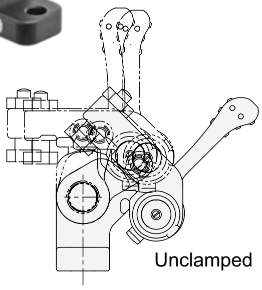
NEW

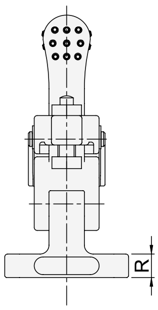
Body / Spindle	
Material	S45C steel
Finish	Black oxide
Heat treat	Quenched and tempered

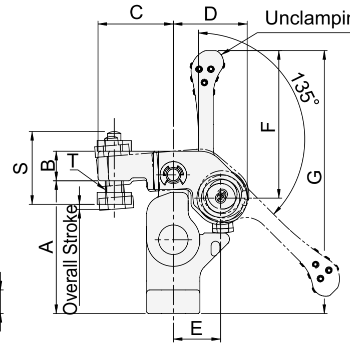
Arm / Joint	
Material	SCM435 steel
Finish	Black oxide
Heat treat	Quenched and tempered

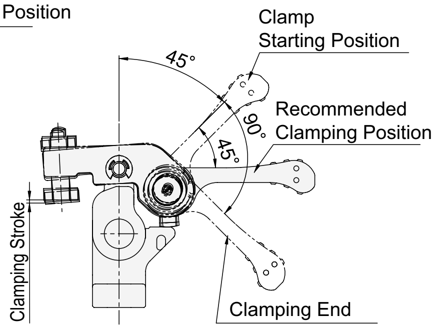
Cam Handle	
Material	SCM440 steel
Finish	Black oxide
Heat treat	Quenched and tempered



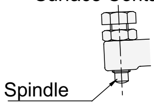

Unclamped



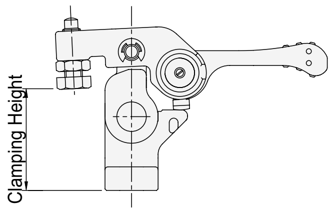




Rough
Surface Contact



Finished
Surface Contact



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

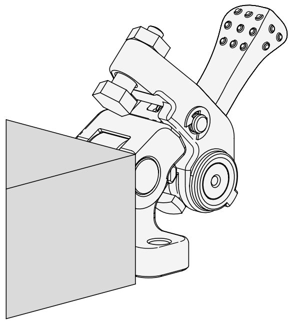
*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

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

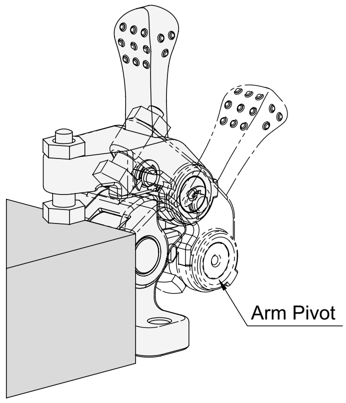
Part Number	R	S	T	Cam Handles Part Number	Allowable Operating Load (N) **)	Clamping Force(N)	Clamping Mechanism	Weight (g)
51991832	8	24	M6×1	QLCA-05	100	700	Spiral Cam Cam Angle:4°	244
51991833	10	30.5	M8×1.25	QLCA-06	150	1,100		468

**) Allowable load to operate the handle

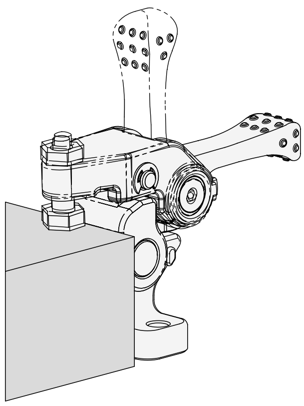
How To Operate



1. Unclamped
Load a workpiece.



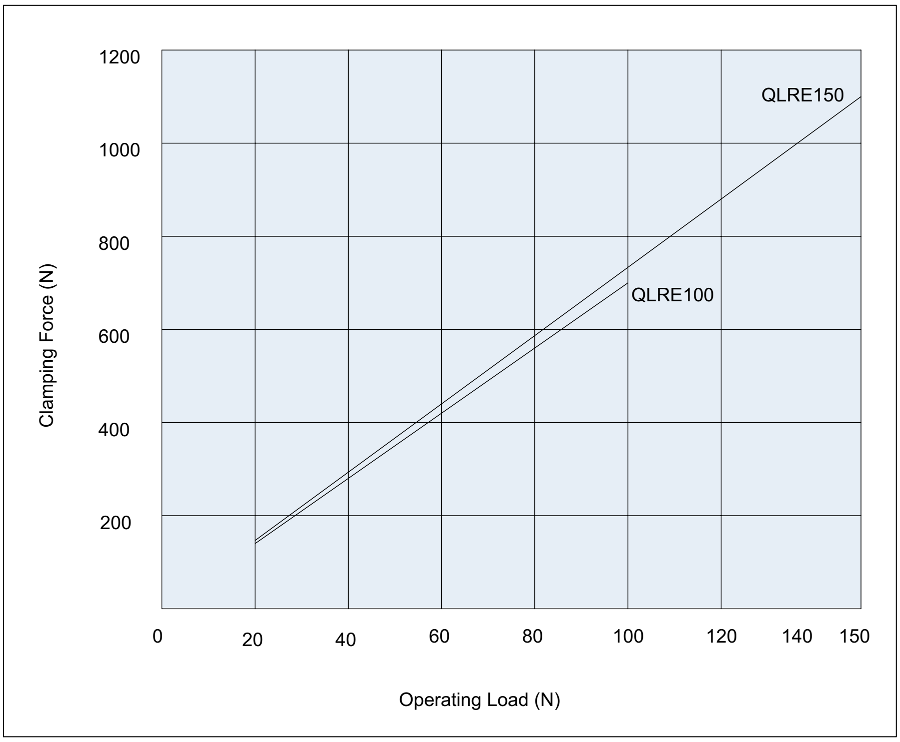
2. Clamping Setup
Set the arm in clamping position holding it at the arm pivot.



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

For unclamping, follow the above steps back.

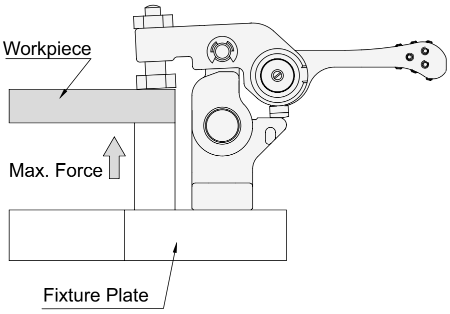
Performance Curve



Technical Information

Allowable Loads in Machining of Workpiece Bottom

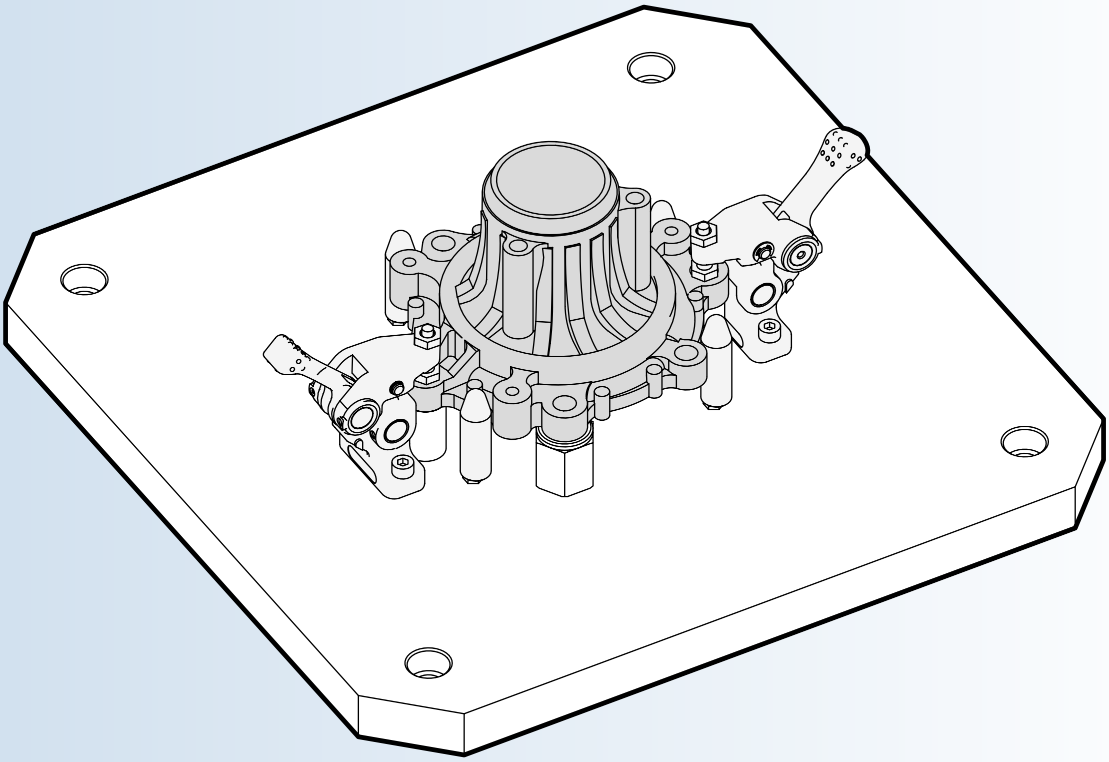
Ensure that any force more than stated below is not applied.



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

APPLICATION EXAMPLES

Fixturing with Retractable Clamps (Mini) with Cam Handle



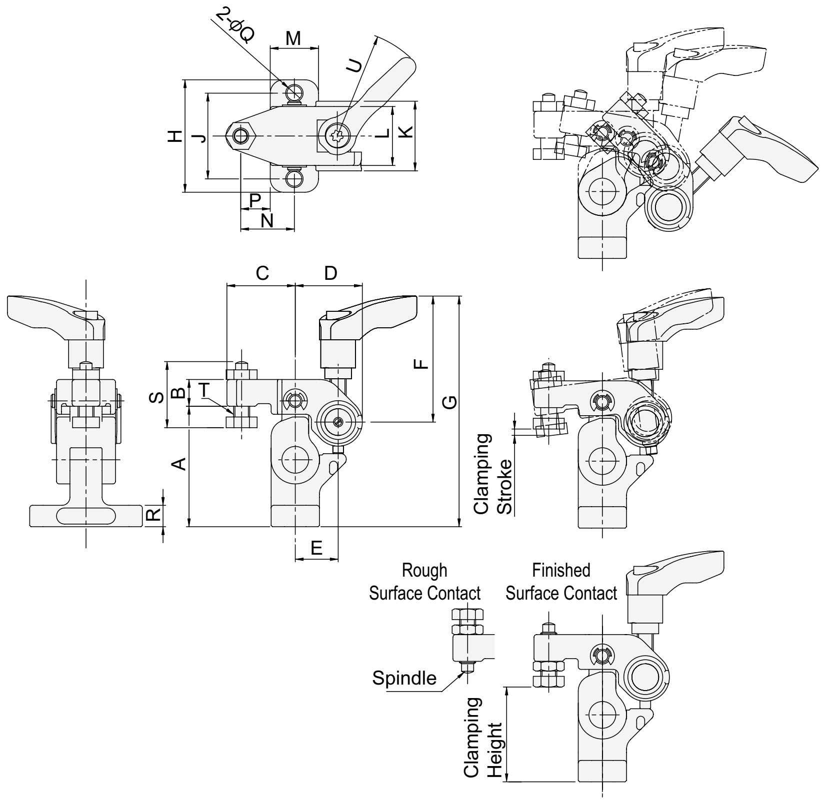
QLRE RETRACTABLE CLAMPS (Mini) WITH ADJUSTABLE HANDLE

NEW

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

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

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



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

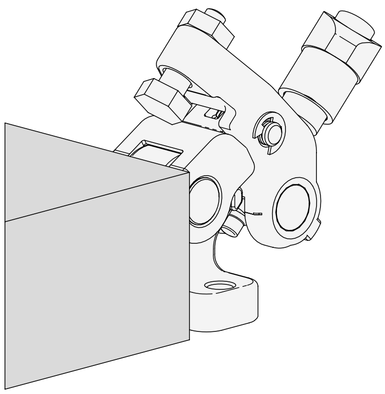
*) Clamping height can be adjusted. The parenthesised values denote actual clamping height.

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

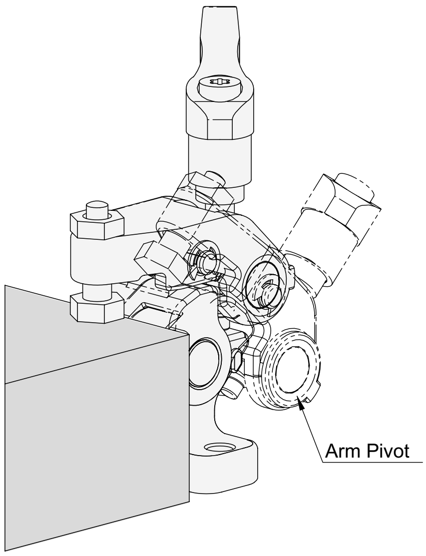
Part Number	R	S	T	U	Adjustable Handles	Allowable Operating Load (N) **)	Clamping Force(N)	Clamping Mechanism	Weight (g)
51991834	8	24	M6×1	40	FKF6-BR	170	2,400	Screw	242
51991835	10	30.5	M8×1.25	65	FKF8-BR	210	4,200		490

**) Allowable load to operate the handle

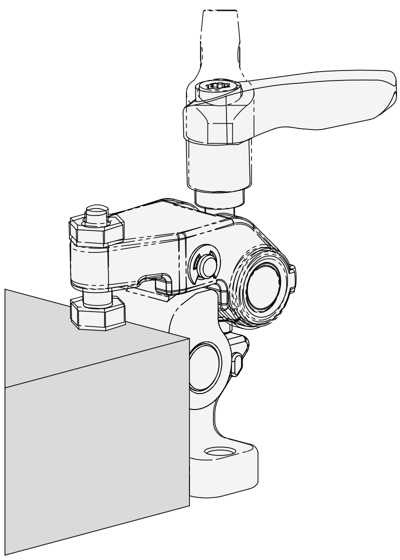
How To Operate



1. Unclamped
Load a workpiece.



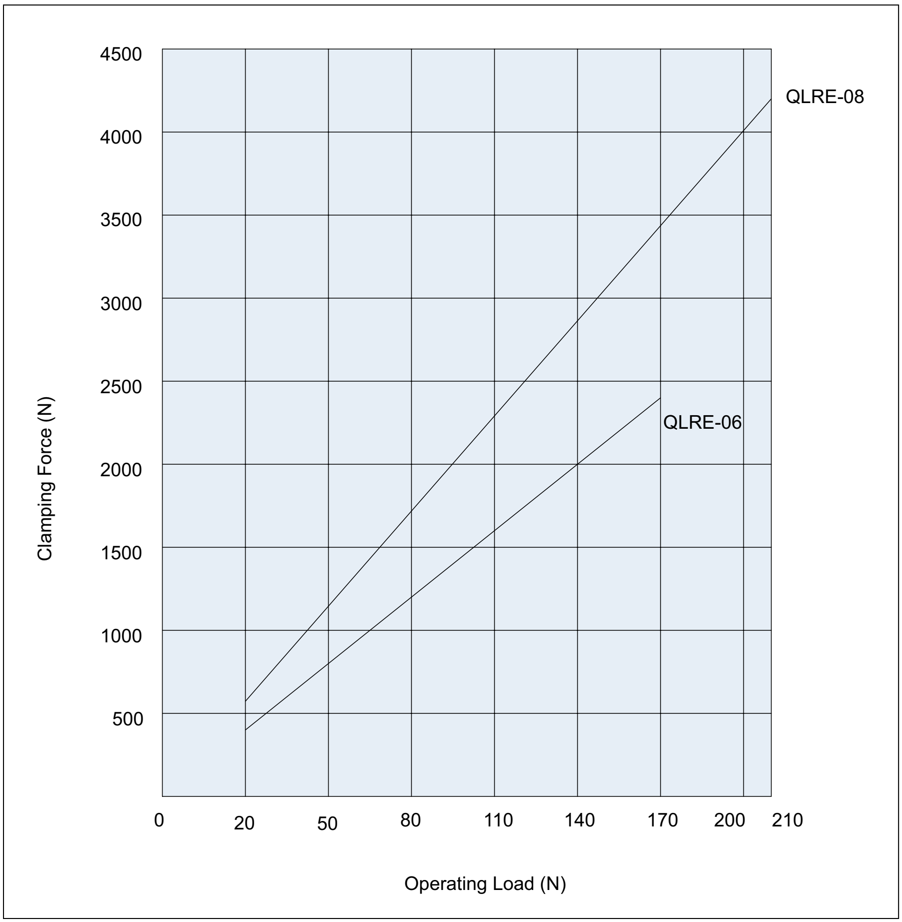
2. Clamping Setup
Set the arm in clamping position holding it at the arm pivot.



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

For unclamping, follow the above steps back.

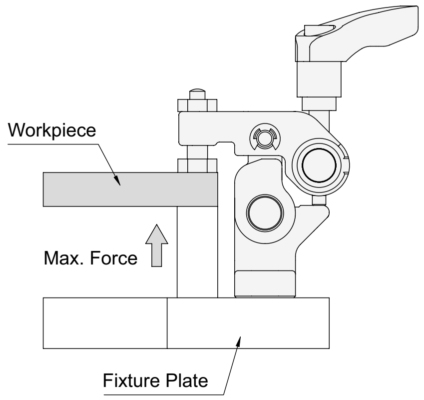
Performance Curve



Technical Information

Allowable Loads in Machining of Workpiece Bottom

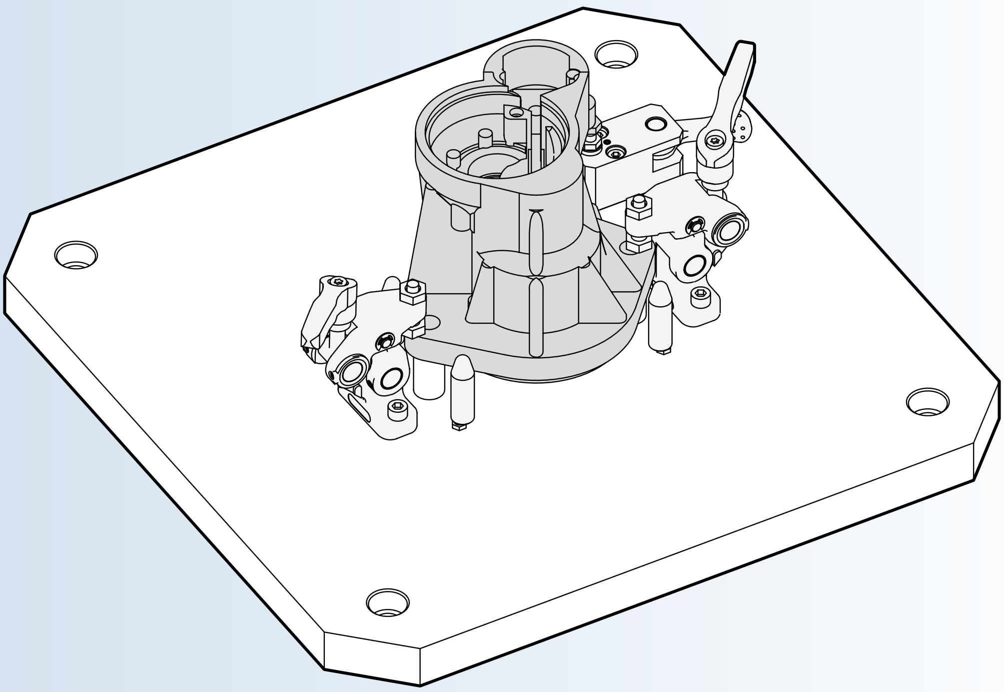
Ensure that any force more than stated below is not applied.



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

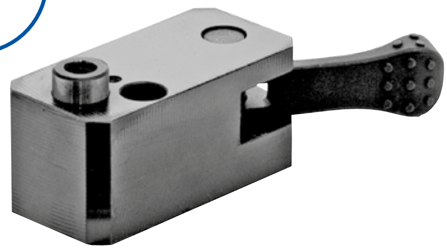
APPLICATION EXAMPLES

Fixturing with Retractable Clamps (Mini) with Adjustable Handle



BJ352 WORK SUPPORT WITH CAM HANDLE

NEW



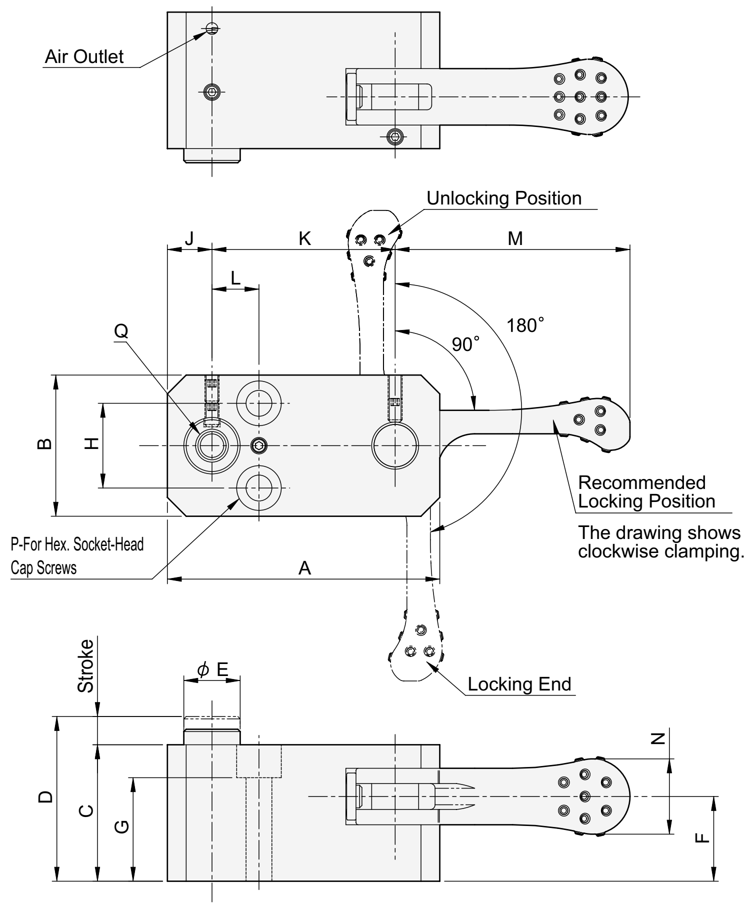
Body	
Material	S45C steel
Finish	Black oxide

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

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

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

· The clamping direction can easily be changed.

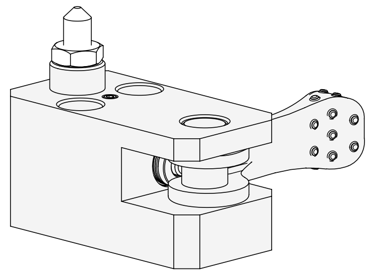


Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N
51991836	52	25	24	29	10	14	19	15	8	36	8	40	14
51991837	58	30	29	35	12	18	22	18	9.5	39	10	50	16
51991838	75	38	37	45	16	23	25	24	12	51	12	63	19
51991839	85	45	42	52	19	26	30	28	14.5	56	15	80	24

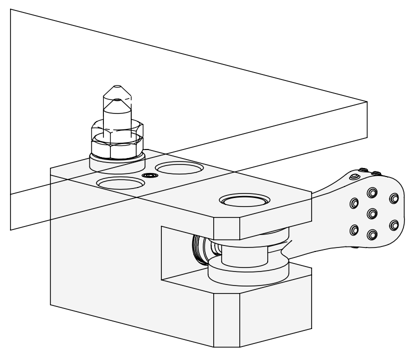
Part Number	P	Q	Cam Handles Part Number	Allowable Operating Load (N) *)	Support Capacity (N)	Piston Spring Force (N)	Locking Mechanism	Weight (g)
51991836	M4	M5×0.8 8 deep	QLCA-04	80	500	0-6	Spiral Cam Cam Angle:4°	213
51991837	M5	M6×1 10 deep	QLCA-05	100	700	0-6		335
51991838	M6	M8×1.25 15 deep	QLCA-06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

*) Allowable load to operate the handle

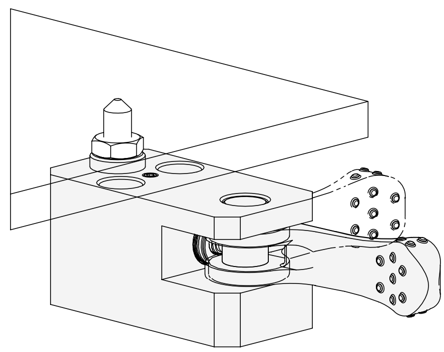
How To Operate



1. Unlocked
No workpiece loaded



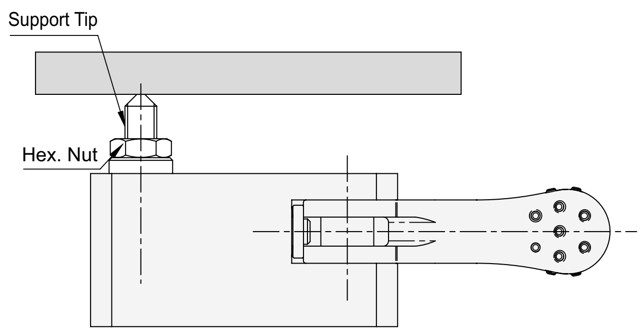
2. Workpiece Loading
Load a workpiece, and the piston lowers.



3. Clamping
Turn the handle to lock the piston.

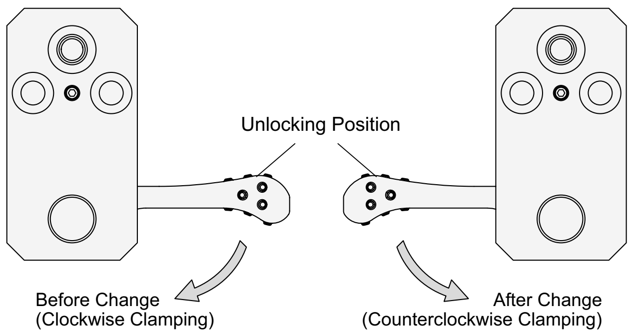
Adjusting Handle Locking Position

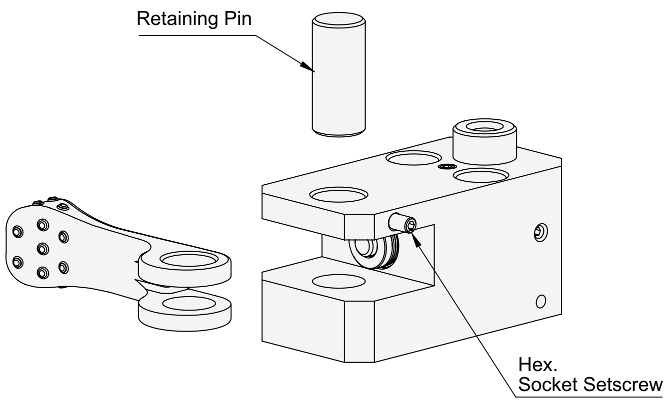
Ensure before use that the handle comes to the recommended position when the piston is locked, by adjusting the height of a support tip.



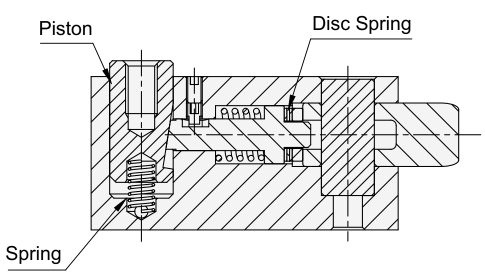
Changing Clamping Direction

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





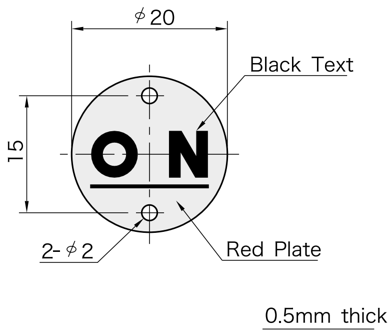
The built-in disc spring prevents loosened locking.



14

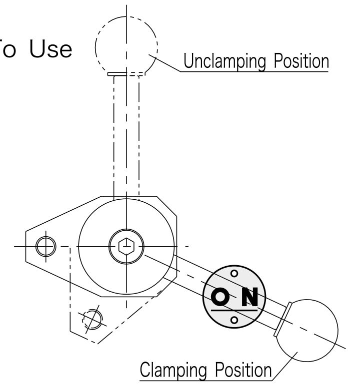
QLST MARKER PLATES

Material: Aluminum



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

How To Use



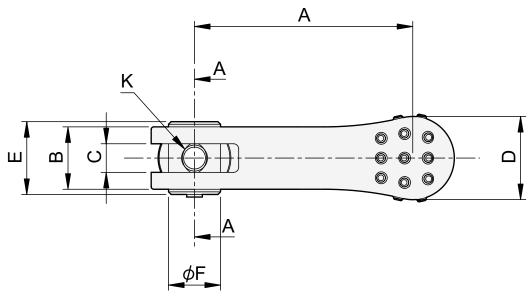
Use to mark the handle position in the clamping mode.

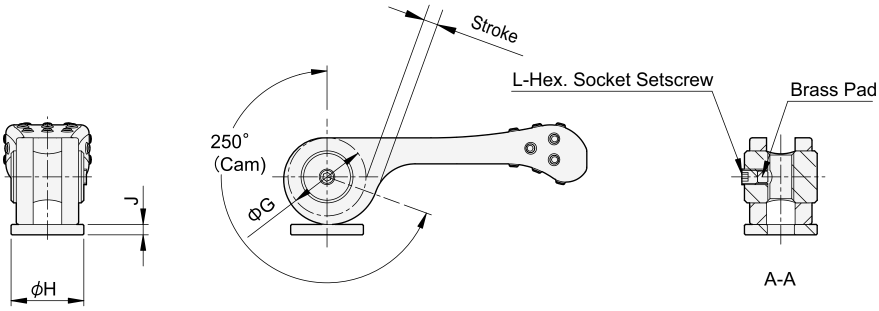
Part Number
51991147

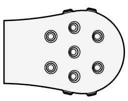
NEW

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

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

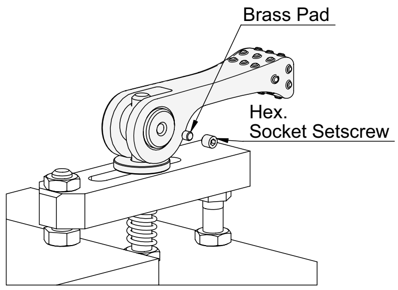






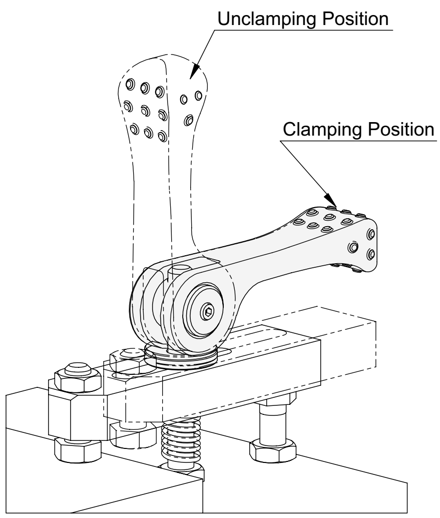
Bottom

Installing the cam handle



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

Application Example

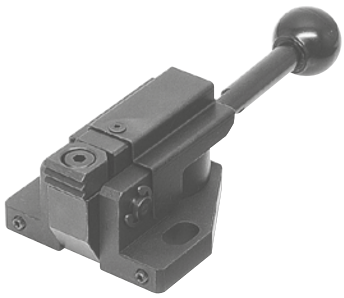


Part Number	A	B	C	D	E	F	G	H	J
51991858	40	10	4.5	14	12	8	12	12	2
51991859	50	12	5.5	16	14	10	15	14	2
51991860	63	14	6.5	19	16	12	18	16	3
51991861	80	18	9	24	20	15	22	20	3

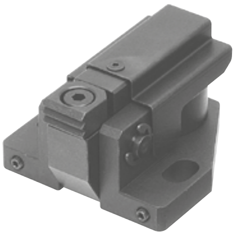
Part Number	K	L	Stroke	Allowable Operating Load (N) *)	Clamping Force(N)	Clamping Mechanism	Weight (g)
51991858	M4×0.7	M3×0.5−3L	1.8	80	900	Spiral Cam Cam Angle:4°	26
51991859	M5×0.8	M3×0.5−3L	2.3	100	1,300		46
51991860	M6×1	M4×0.7−4L	2.7	150	2,600		80
51991861	M8×1.25	M4×0.7−4L	3.3	200	4,000		154

*) Allowable load to operate the handle

QLSC SIDE CLAMPS(Standard)



With Handle



Without Handle

Base	
Material	S45C steel
Finish	Quenched and tempered

Jaws	
Material	SKH51 steel
Finish	Quenched and tempered

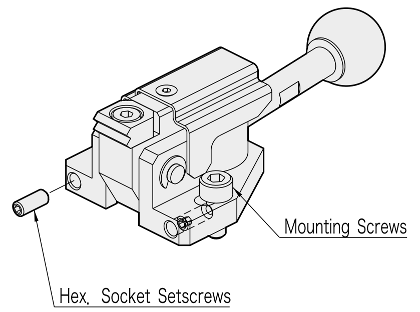
Cam	
Material	SK4 steel
Finish	Quenched and tempered

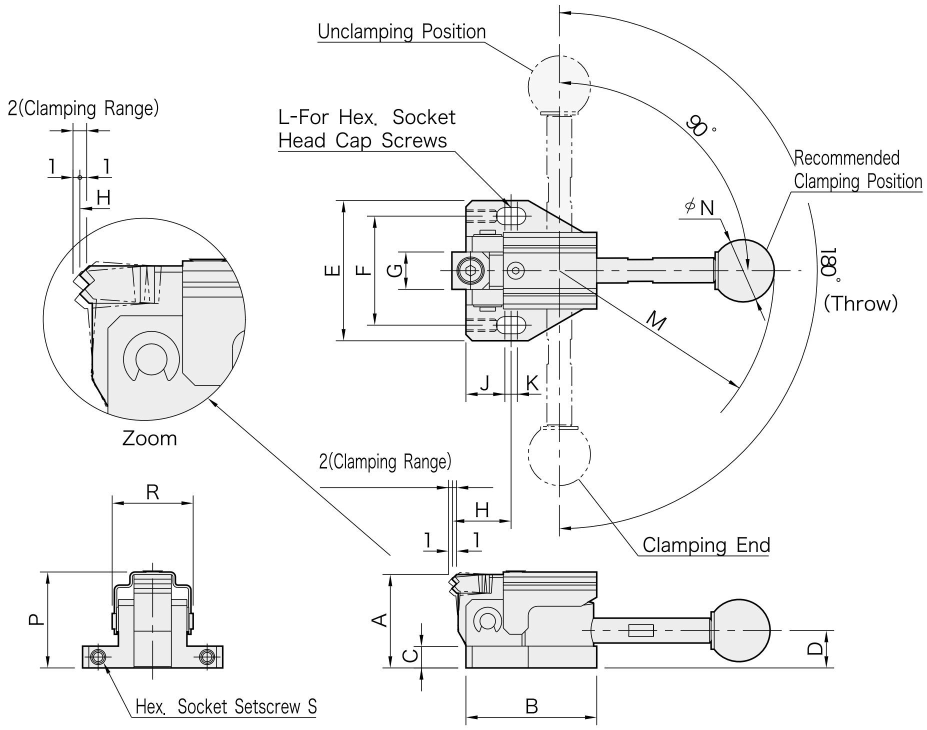
Handle	
Material	S45C steel
Finish	Black oxide

Ball Knob	
Material	ABS resin
Finish	Black

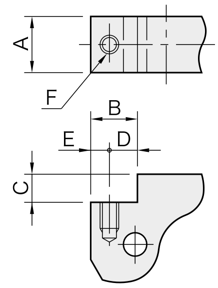
How To Use

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



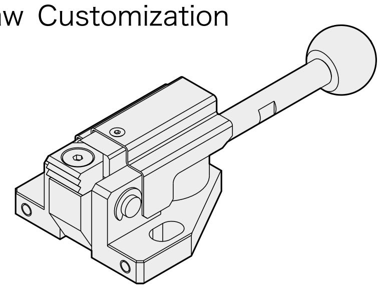


Dimensions of Jaw Base



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

Jaw Customization



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

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

With Handle

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

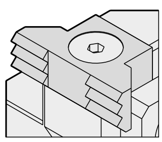
Without Handle

Part Number	Weight (g)
51991127	185
51991128	530

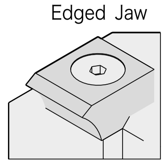
Note: The handle must be ordered separately.

※) Allowable load to operate the handle

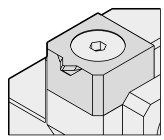
Wide Serrated Jaw



Edged Jaw



Pointed Jaw



Note

See page 151 and 154 for performance curves.

QLPU PUSH CLAMPS(Standard)

With Handle

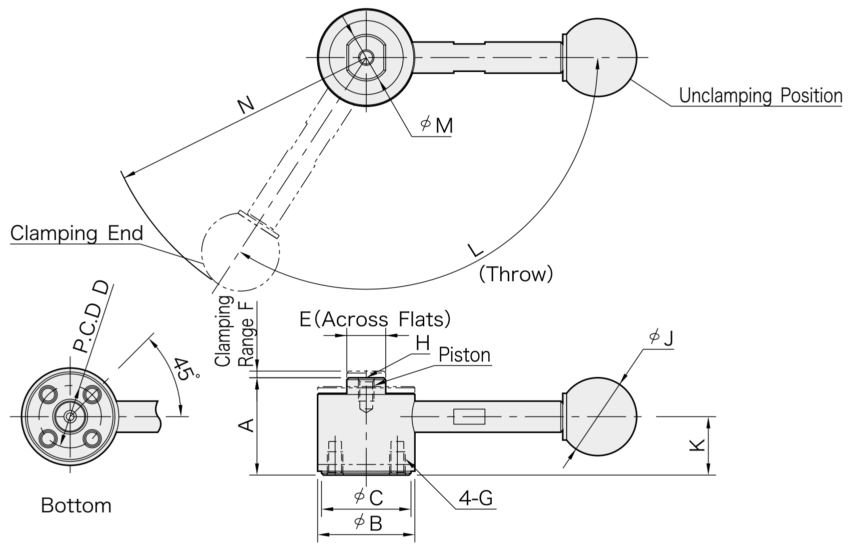
Without Handle

Cam	
Material	SK4 steel
Finish	Quenched and tempered

Albero	
Material	S45C steel
Finish	Quenched and tempered

Leva	
Material	S45C steel
Finish	Black oxide

Pomello	
Material	ABS resin
Finish	Black



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

With Handle

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

*) Allowable load to operate the handle

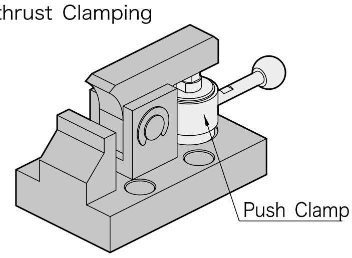
Without Handle

Part Number	Weight (g)
51991131	150
51991132	310

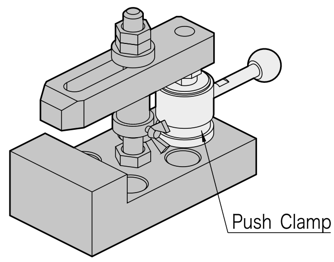
Note: The handle must be ordered separately.

Application Examples

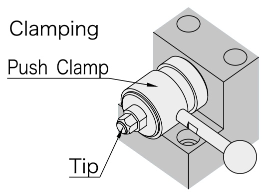
Downthrust Clamping



Downward Clamping



Sideways Clamping



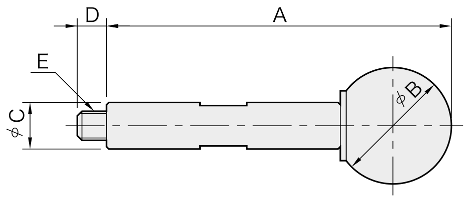
When installing a tip on the piston, lock the piston using a wrench to prevent the clamp from receiving any torque.

Note : See page 151 and 154 for performance curves.

14

QLSL STANDARD HANDLES

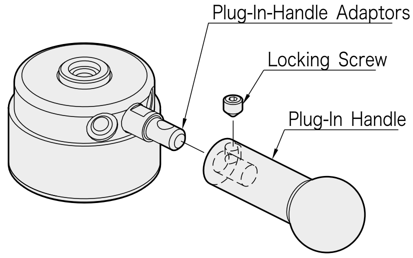
QLSL
Screw-In Handles



Handle	
Material	S45C steel
Finish	Black oxide

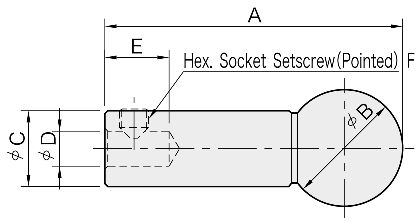
Ball Knob	
Material	ABS resin
Finish	Black

How To Use



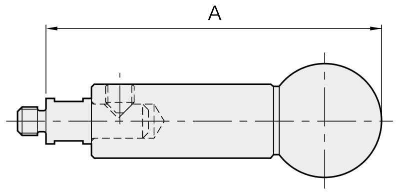
Secure the Plug-In Handle to the Adaptor using the locking screw if necessary.

QLSL-RL
Plug-In Handles



Handle	
Material	S45C steel
Finish	Black oxide

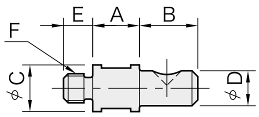
Ball Knob	
Material	ABS resin
Finish	Black



Plug-In Handle Coupled with the Adaptor

Size	A
QLSL150	59
QLSL200	89

QLSL-RA
Plug-In Handles
adaptors



Material	SCM440 steel
Finish	Quenched and tempered

QLSL (Screw-in Handles)

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

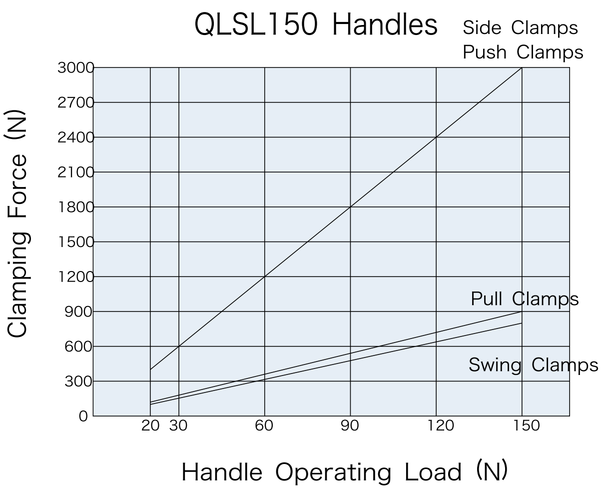
QLSL-RL(Plug-In Handles)

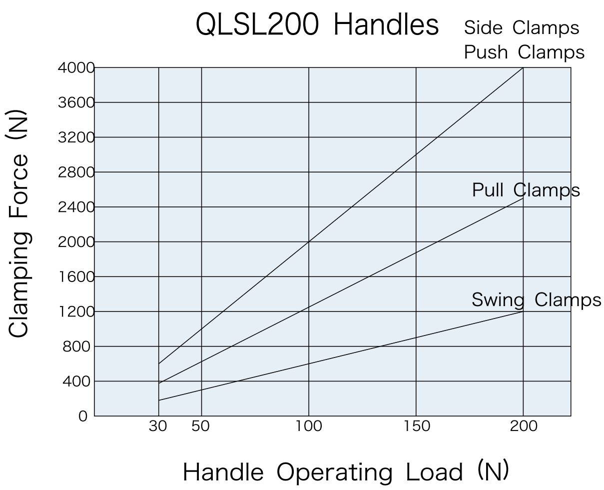
Part Number	A	B	C	D	E	F	Weight (g)
51991137	51	20	13	6	11	M5x0.8-5L	45
51991138	79	25	15	8	13	M6x1 -6L	90

QLSL-RA(Plug-In-Handle Adaptors)

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

Performance Curves

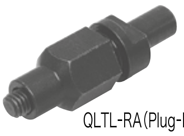




QLTL ADJUSTABLE-TORQUE HANDLES

QLTL(Screw-In Handles)

QLTL-RL(Plug-In Handles)



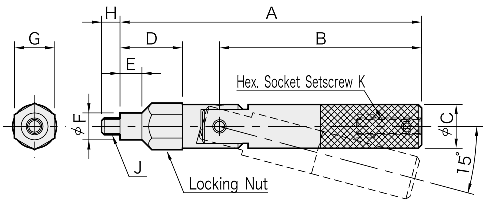
QLTL-RA(Plug-In-Handle Adaptors)

Stem	
Material	SCM440 steel
Finish	Quenched and tempered

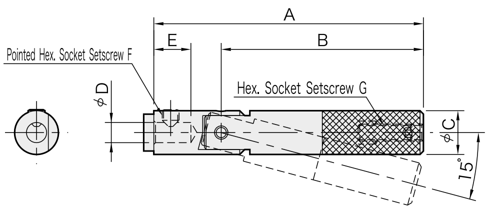
Lockin nut	
Material	S45C steel
Finish	Black oxide

Handle	
Material	S45C steel
Finish	Quenched and tempered

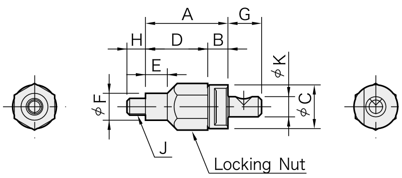
QLTL(Screw-In Handles)



QLTL-RL(Plug-In Handles)

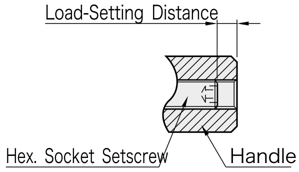


QLTL-RA(Plug-In-Handle Adaptors)



How To Use

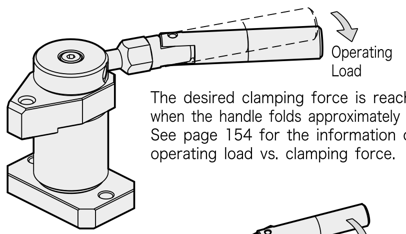
Turning the setscrew inside the handle allows adjusting the torque to set a desired clamping force.



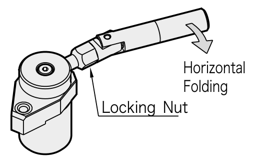
[Operating-Load Setting Range]

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

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



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



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

QLTL(Screw-In Handles)

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

QLTL−RL(Plug-In Handles)

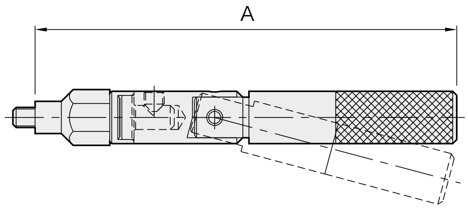
Part Number	A	B	C	D	E	F	G	Weight (g)
51991143	80	60	13	6	11	M5x0.8-5L	M5x0.8-16L	70
51991144	107	84	15	8	13	M6x1 -6L	M6x1 -20L	130

QLTL−RA(Plug-In-Handle Adaptors)

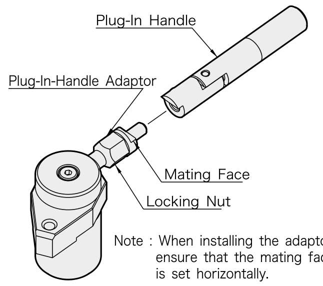
Part Number	A	B	C	D	E	F	G	H	J	K	Weight (g)
51991145	24.5	6	13	18.5	6.5	8	10	5.5	M5x0.8	6	20
51991146	30	7	15	23	8	10	12	6.5	M6x1	8	40

Plug-In Handle Coupled with the Adaptor

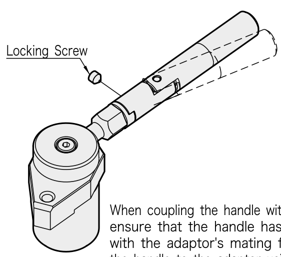
Part Number	A
51991143 **51991145**	104.5
51991144 **51991146**	137



Plug-In Handle Installation

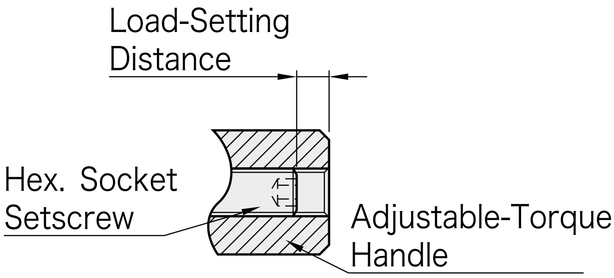


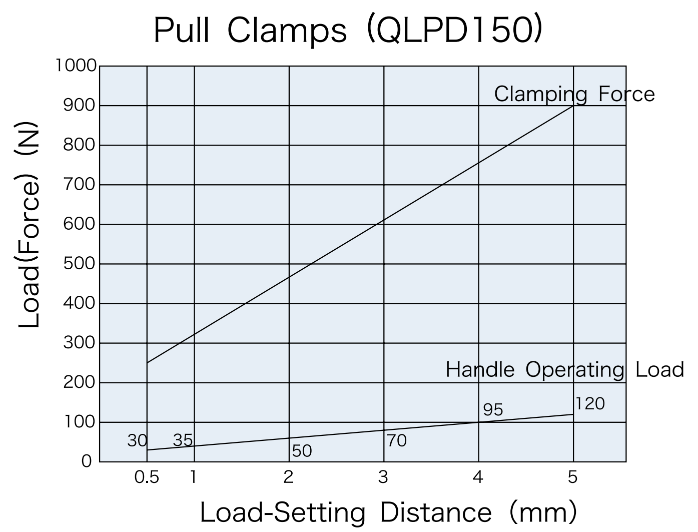
Note : When installing the adaptor, ensure that the mating face is set horizontally.



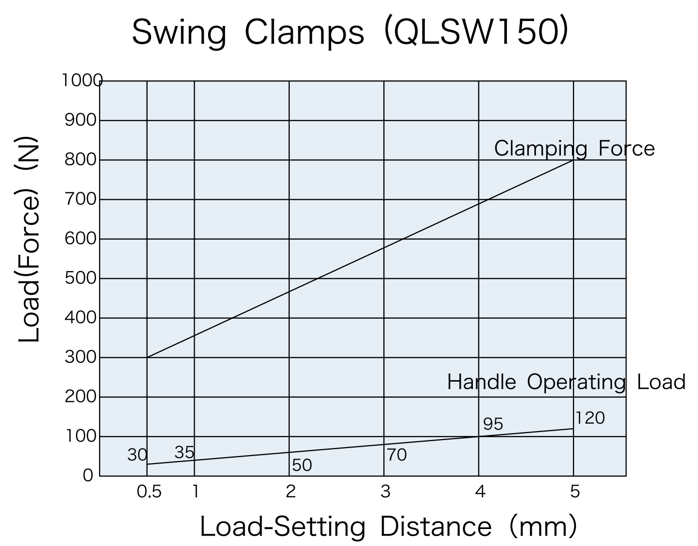
When coupling the handle with the adaptor, ensure that the handle has full contact with the adaptor's mating face. Secure the handle to the adaptor using the locking screw if necessary.

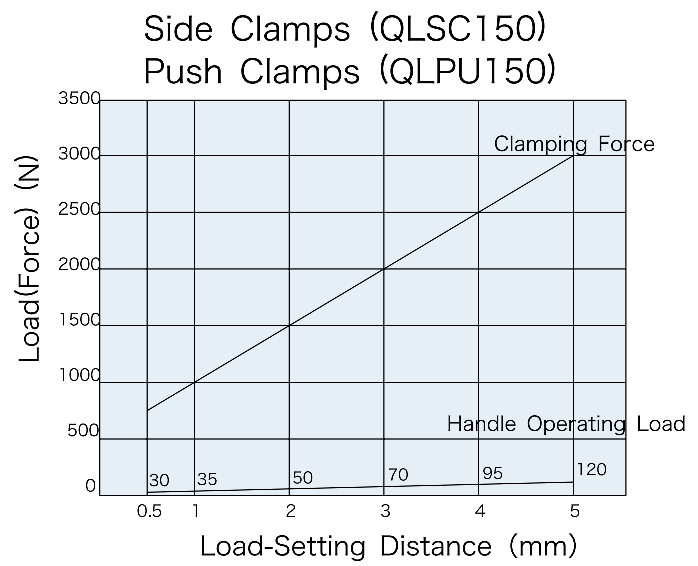
Performance Curves



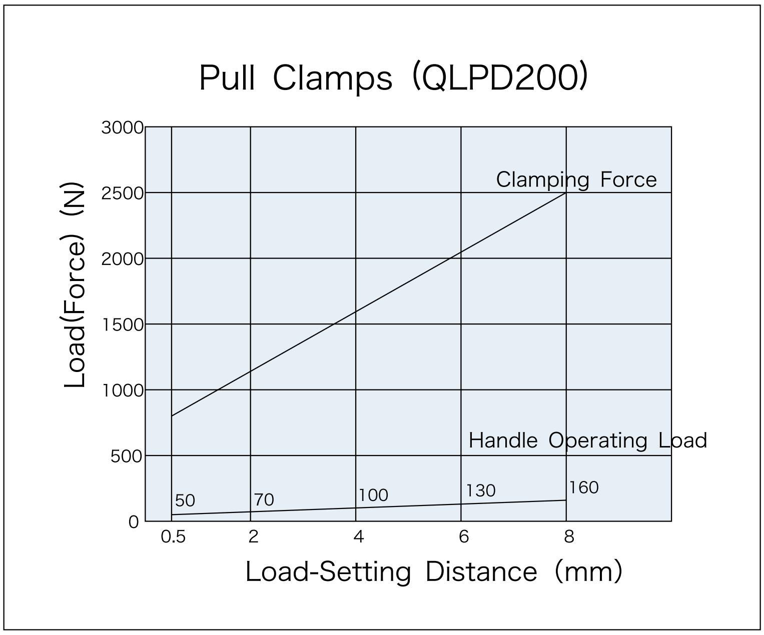


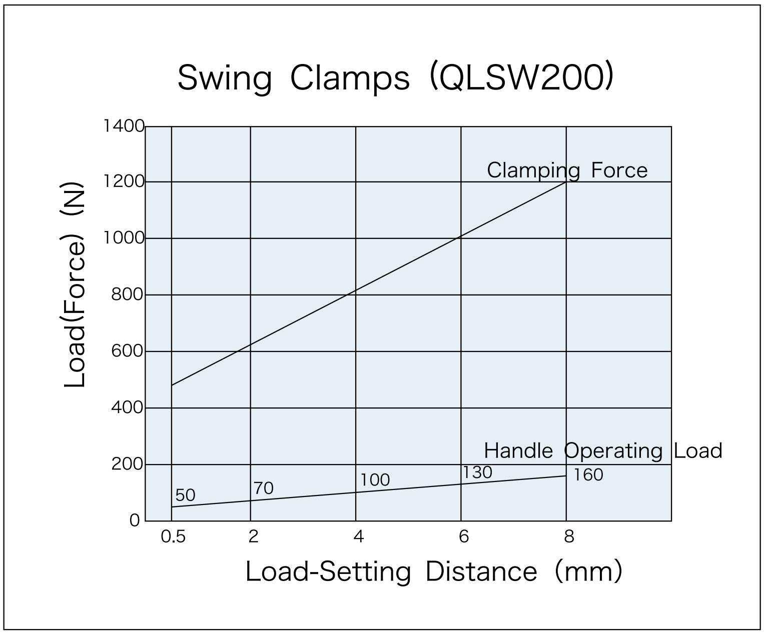
When clamping force is 900(N), load-setting distance is 5mm, and handle operating load is 120N.

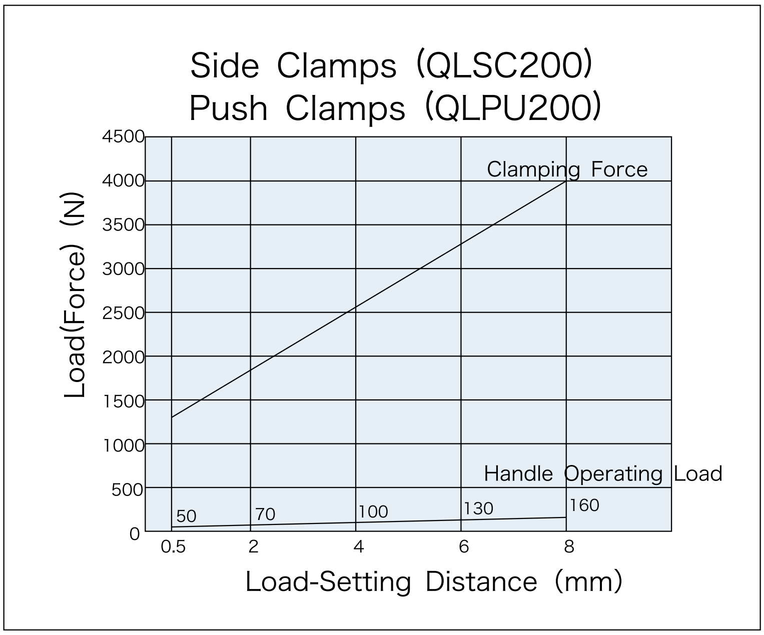




Note : The above performance curves apply when clamps are degreased.





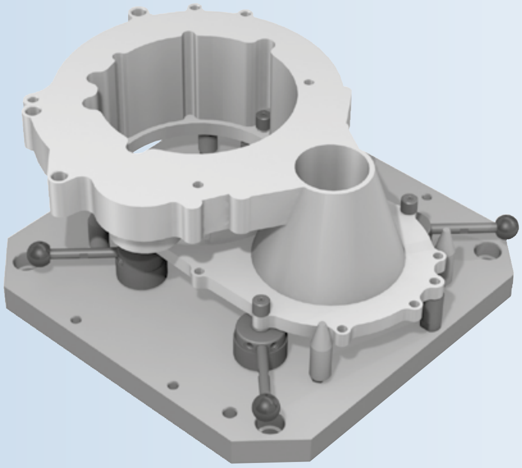


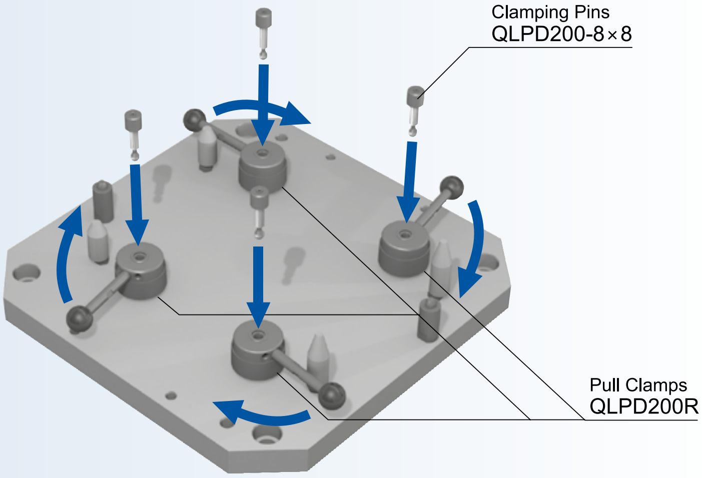
Note : The above performance curves apply when clamps are degreased.

14

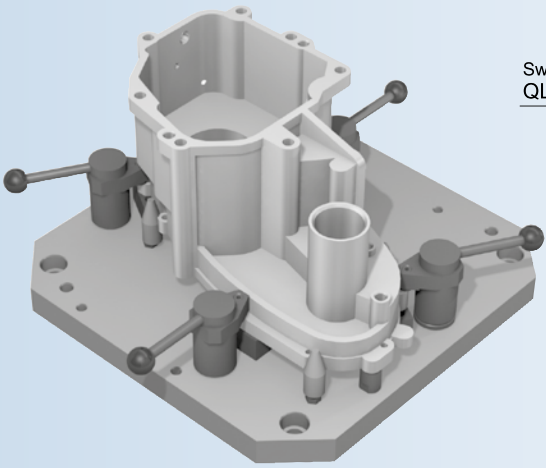
APPLICATION EXAMPLES

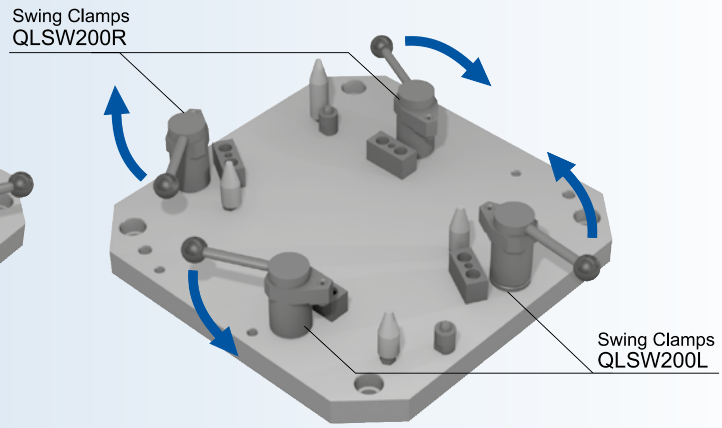
Pull Clamps



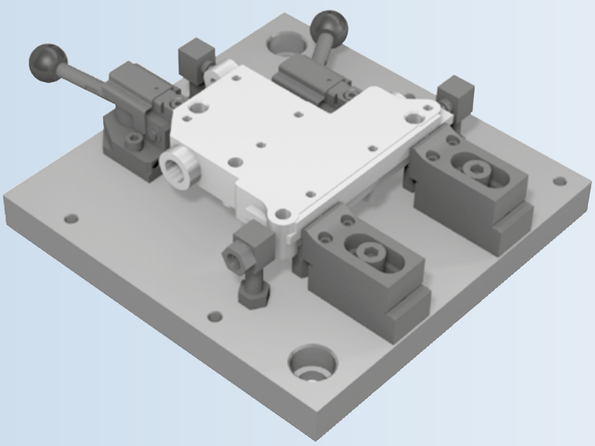


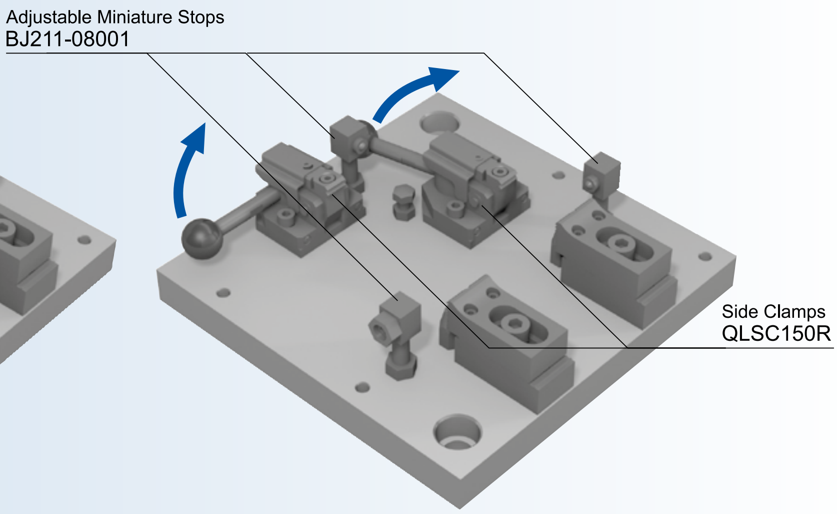
Swing Clamps



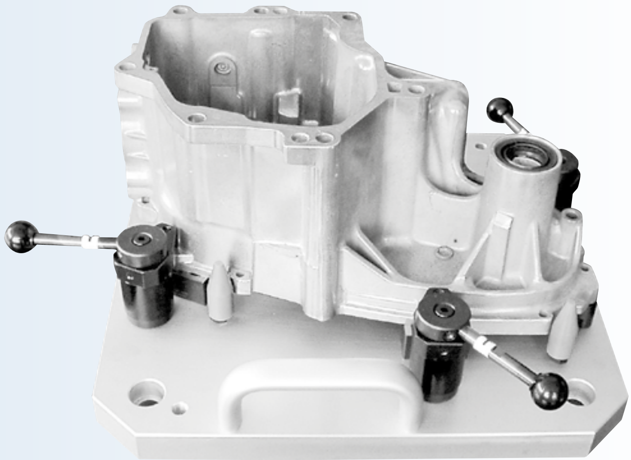


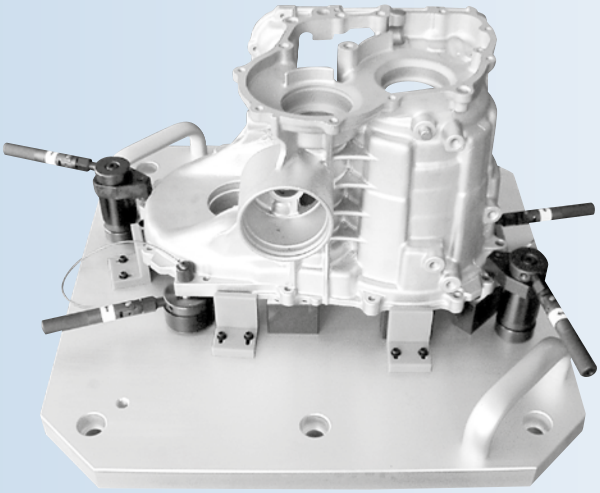
Side Clamps



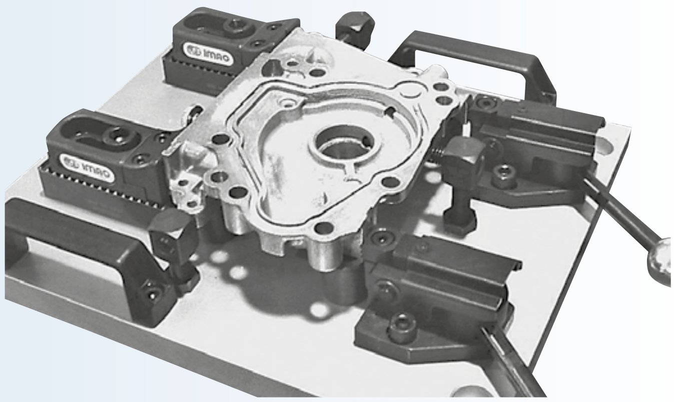


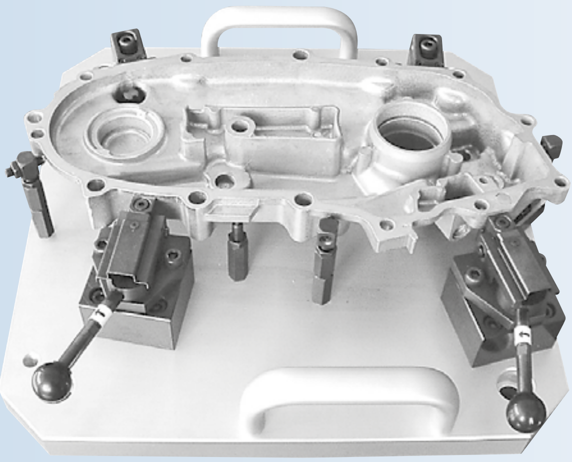
Actual Applications of Swing Clamps





Actual Applications of Side Clamps





CP710 SPRING-LOADED WORK LOCATORS

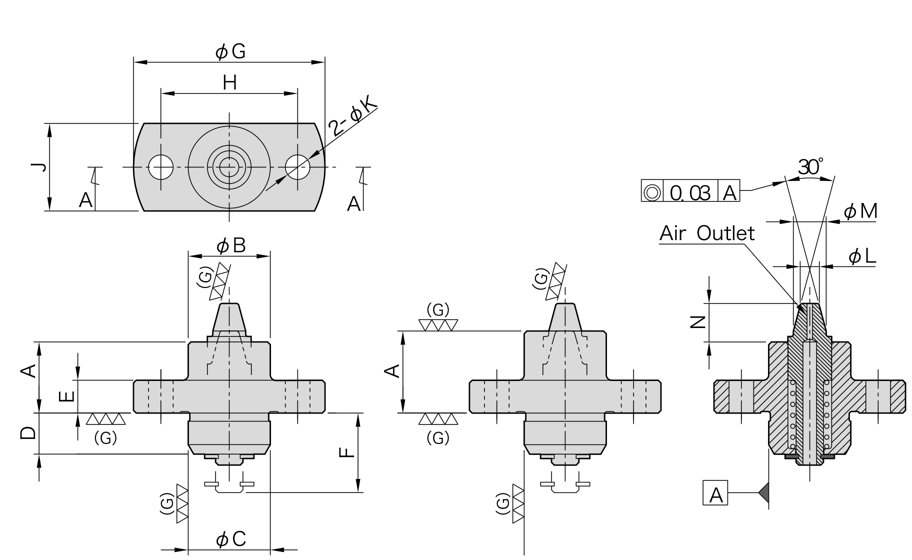
NEW

Standard

Accurate

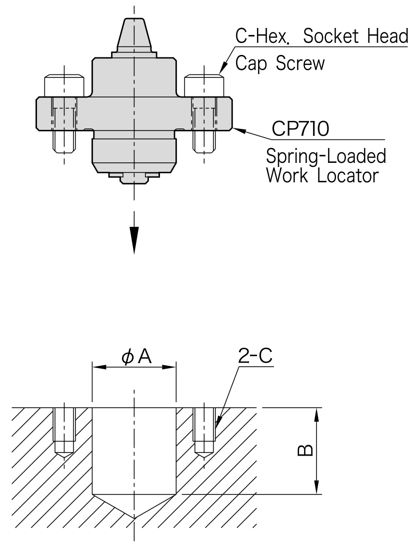
Body	
Material	S45C steel
Finitura	Black oxide
Heat Treat	Quenched and tempered

Locating Pin	
Material	SK4 steel
Heat Treat	Quenched and tempered



Standard　　Accurate　　Section A-A

Mounting Hole Dimensions



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

Standard

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

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

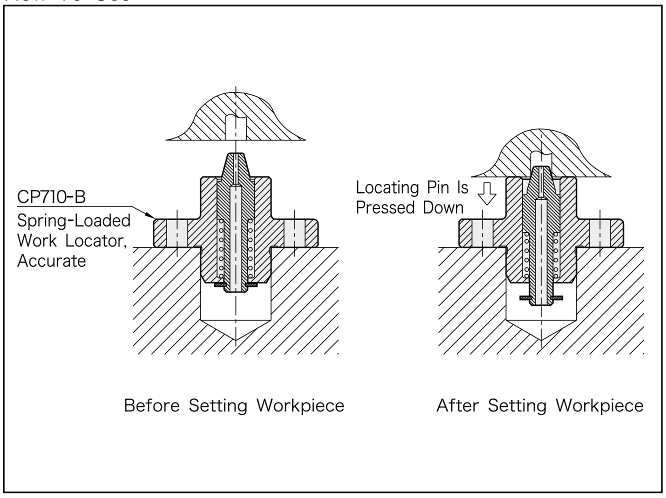
Accurate

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

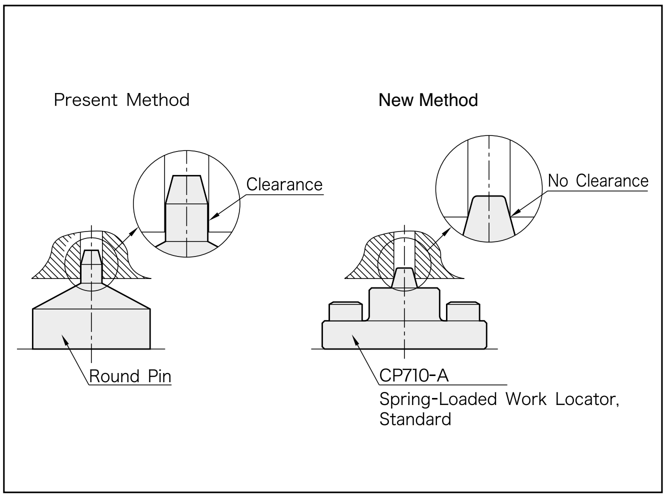
Part Number	N	Locating Hole Dia. ※)	Support Capacity (N)	Weight (g)
51991525	5.4	ϕ3.8 to ϕ 5.2	6.4 to 19.3	50
51991526		ϕ4.8 to ϕ 6.2		50
51991527	7.3	ϕ5.8 to ϕ 8.2	5.5 to 20.5	100
51991528		ϕ7.8 to ϕ10.2		100

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

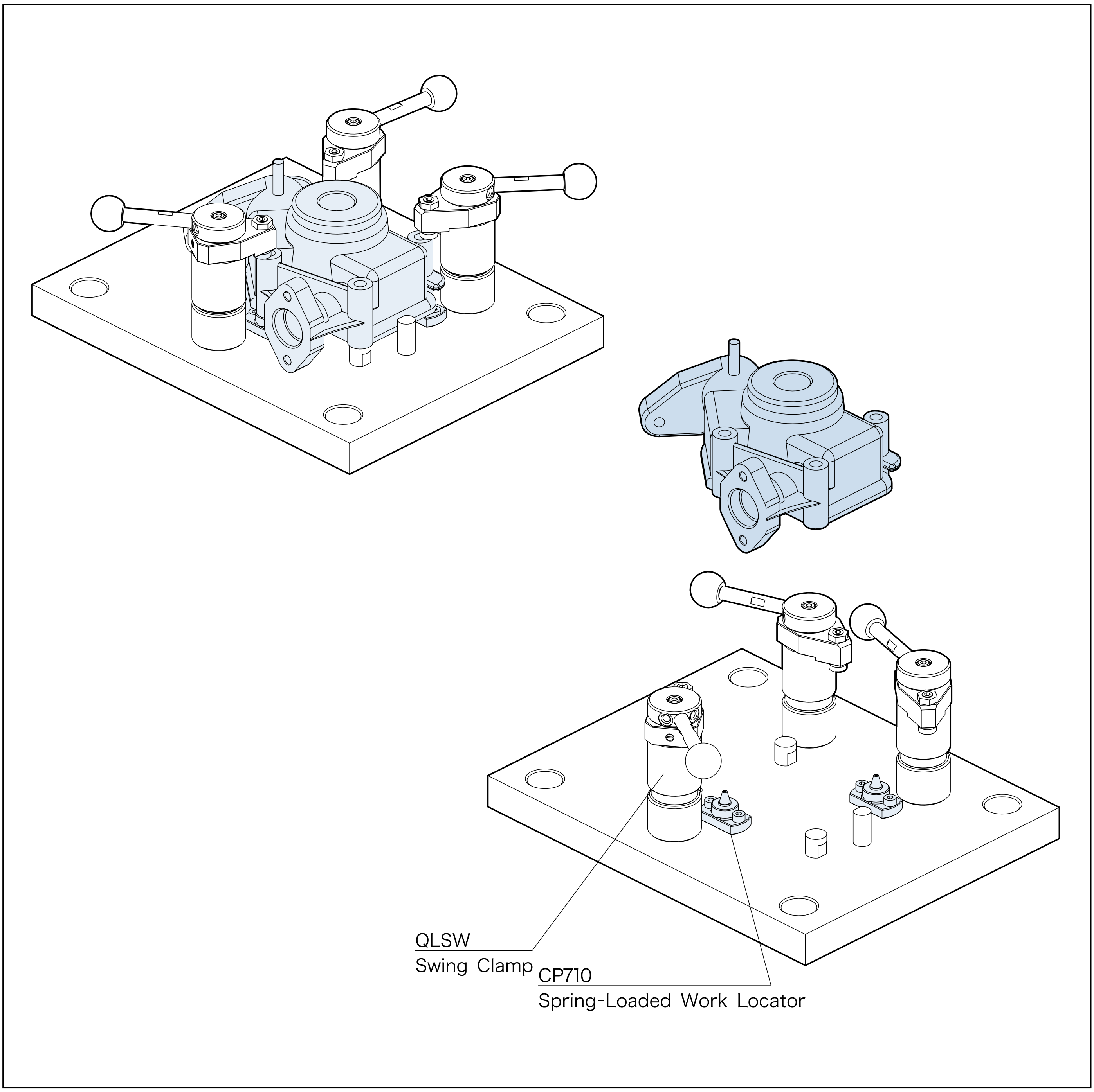
How To Use



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.

CP700 WORK LOCATORS

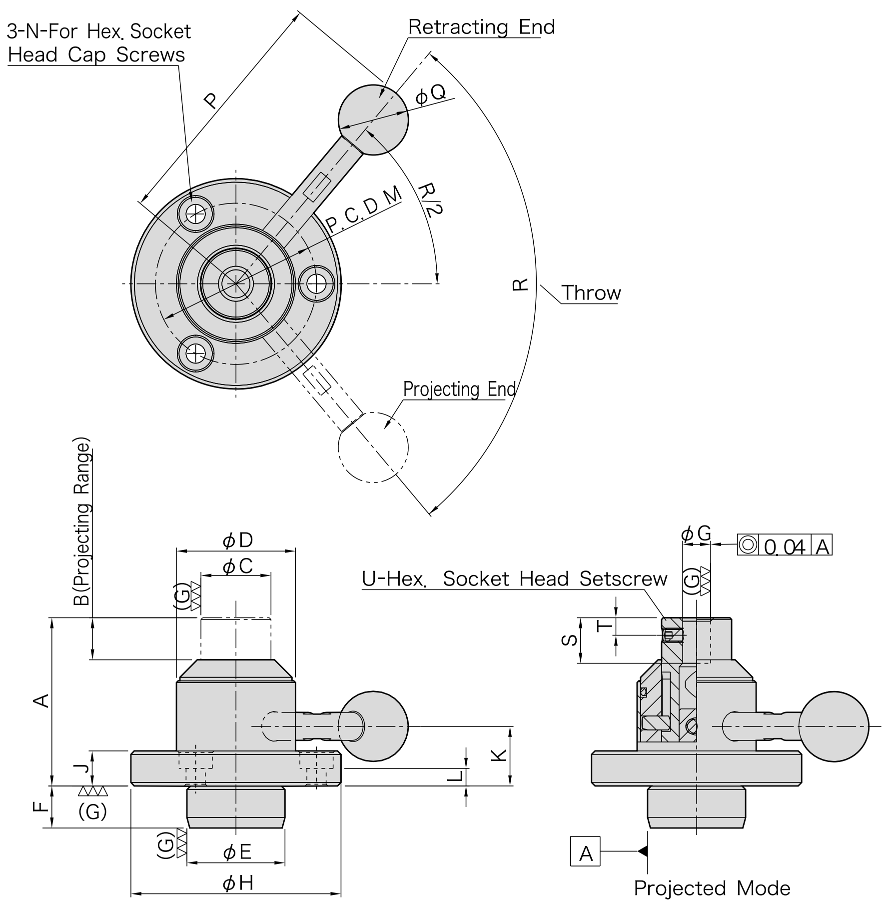
NEW

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

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

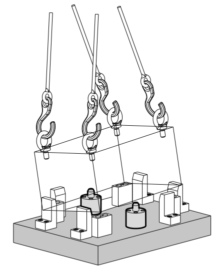
Handle	
Material	SC45 steel
Finish	Black oxide

Ball Knob	
Material	ABS resin
Color	Black



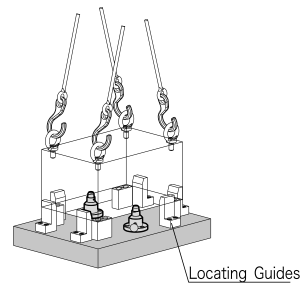
How To Use

Present Method



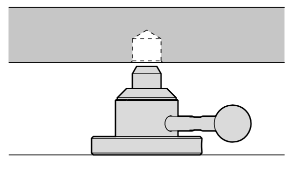
Galling and damage caused

Our Method

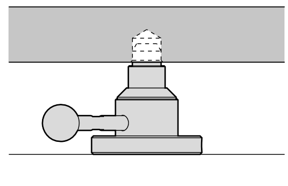


No galling caused

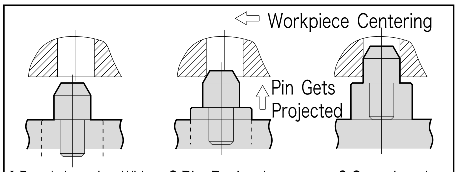
The locating pin gets projected only after the workpiece is set on supports. This allows loading and unloading the workpiece smoothly, with no galling. Get the locating pin projected to locate the workpiece after it is roughly positioned with the help of locating guides.



Retracted Mode



Projected Mode



1.Rough Locating With Locating Guides 2.Pin Projection 3.Completed Locating

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

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

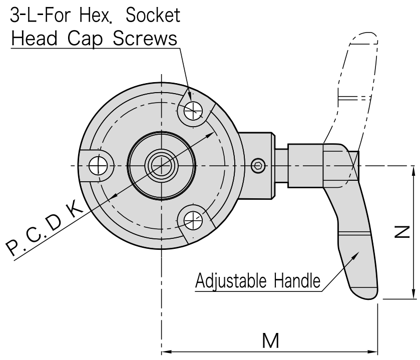
*) Allowable load to operate the handle
**)Max. weight that allows the locating pin to project and provide workpiece centering

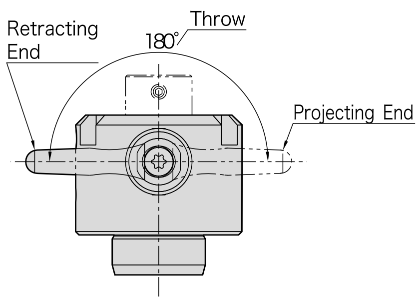
CP701 EXTENDABLE WORK LOCATORS

NEW

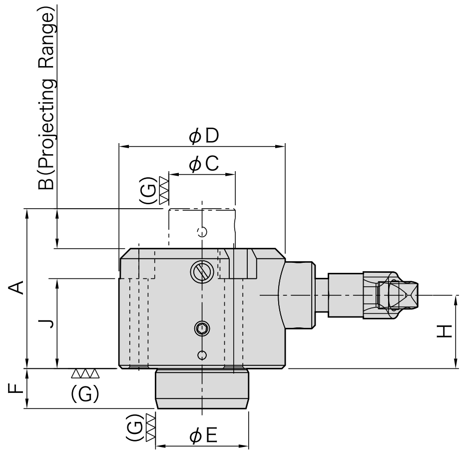
Body	
Materiale	S45C steel
Finitura	Black oxide
Trattamento	Quenched and tempered

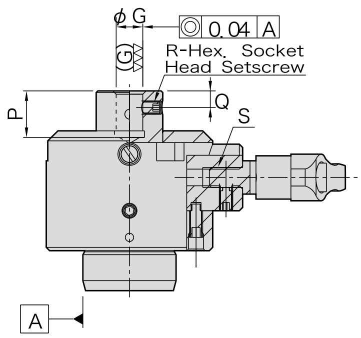
Pistone	
Materiale	SC45 steel
Finitura	Black oxide





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

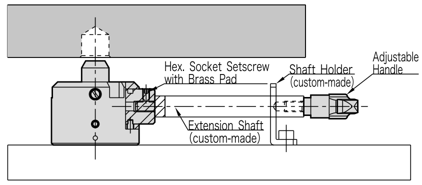




Projected Mode

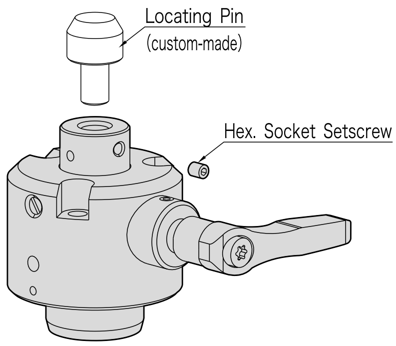
How To Use

Extended Application



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

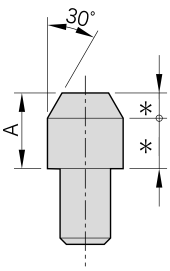
Locating-Pin Mounting



Projected Mode

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

Locating-Pin Head Dimensions



A	
12 or less	
15 or less	

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

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

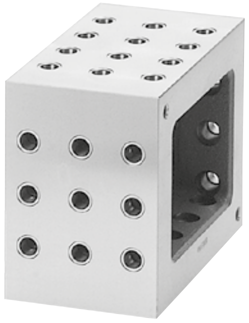
Part Number	Q	R	S	Adjustable Handles	Allowable Operating Load(N)*)	Max. Workpiece Weight(kg)**)	Weight (kg)
51991533	5	M4x0.7-5L	M6x1 12 deep	FKR6X10-BR	170	250	0.59
51991534	6	M5x0.8-8L	M8x1.25 17 deep	FKR8X15-BR	210	300	1.31

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

Features

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

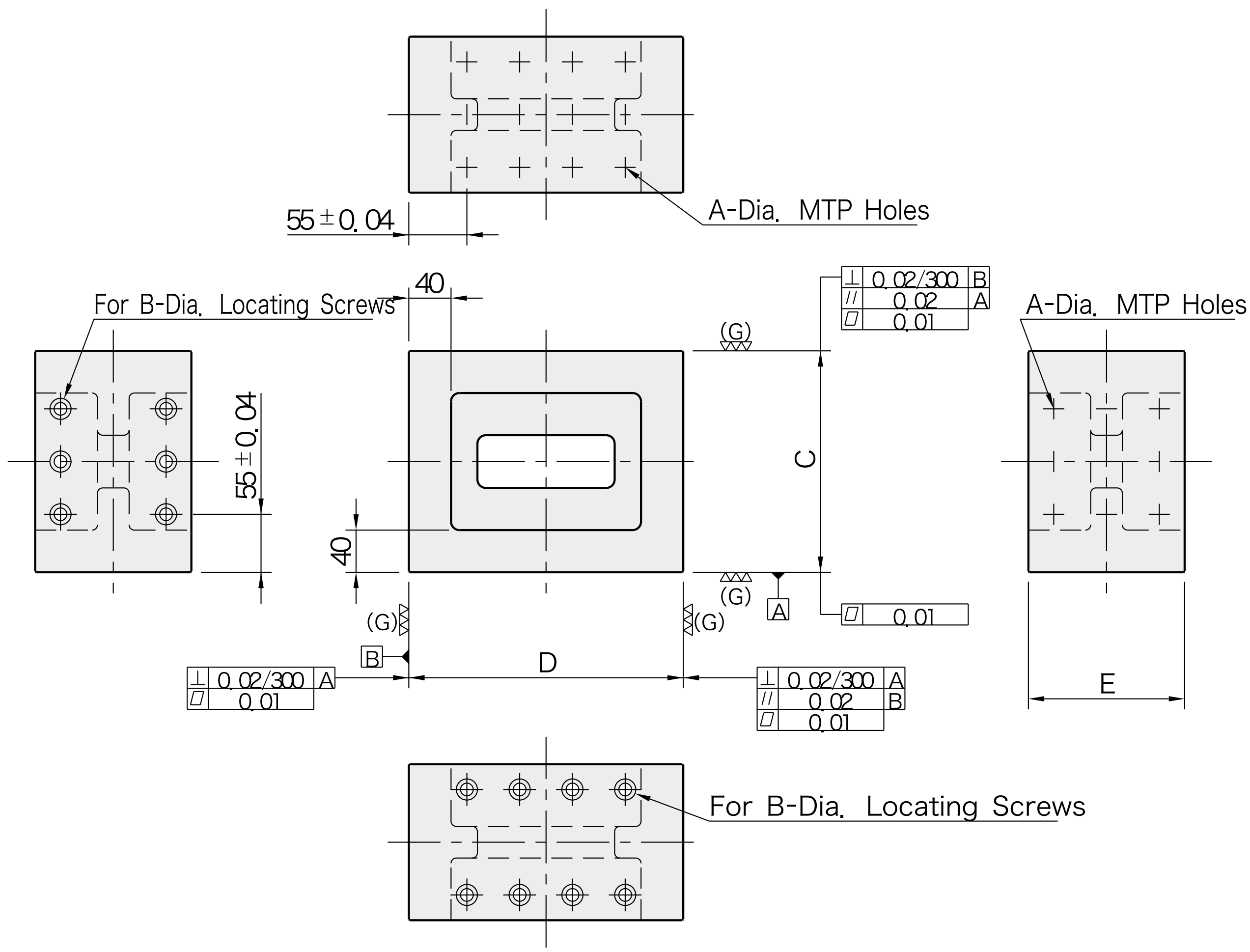
BJ090 RISER BLOCKS



[Body]
Material:FC300 cast iron
Annealed
Precision ground

[Alignment Bushing]
Material:SUJ2 steel
Heat treated

[Threaded Insert]
Material:S45C steel
Heat treated



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

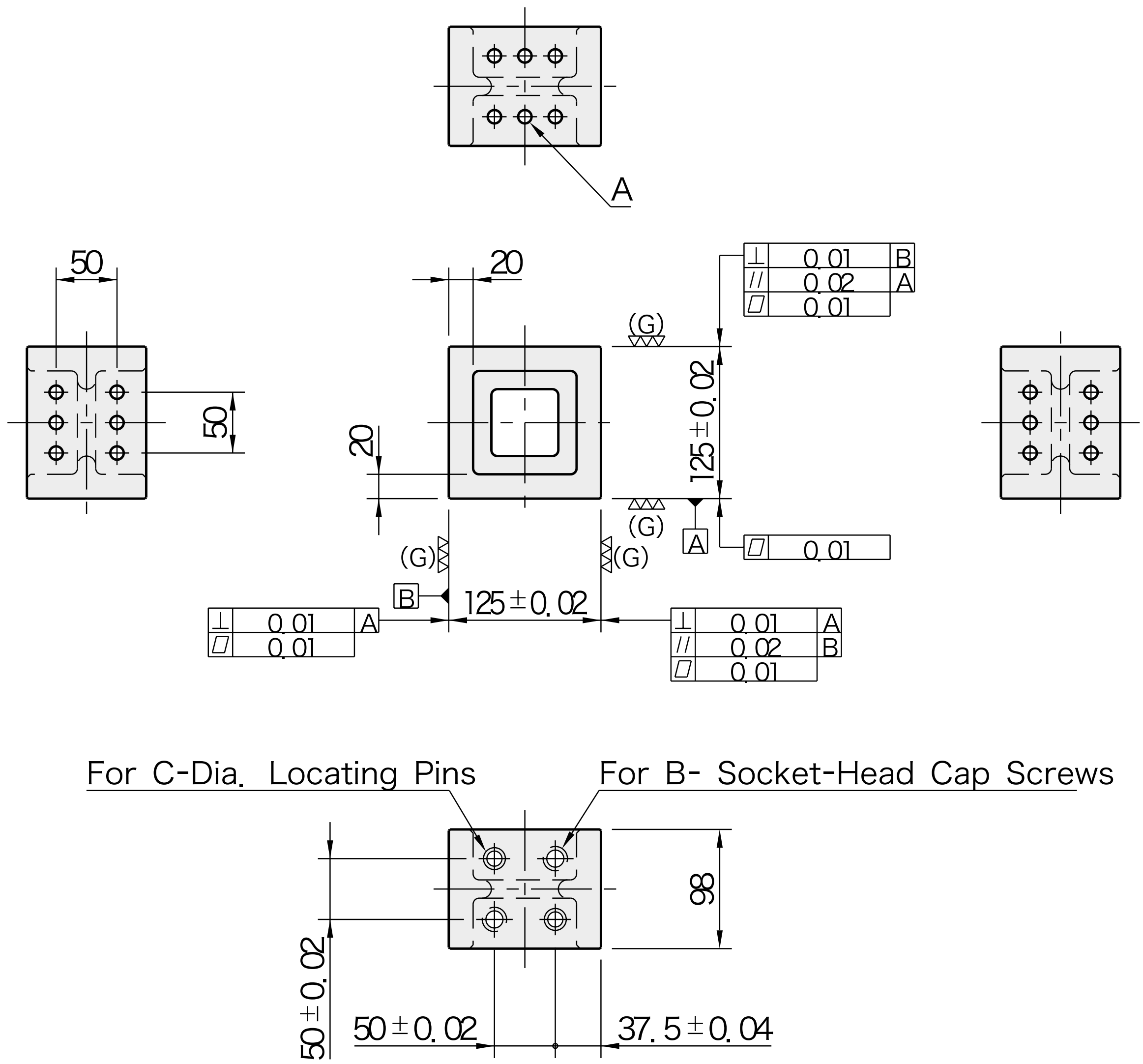
·MTP-hole protection plugs and eye bolts are included.
·Locate on a tooling plate or block using Locating Screws.
·MTP holes spacing : 50 ± 0.02mm

BJ091 COMPACT RISER BLOCKS

[Body]
Material:FC300 cast iron
Annealed
Precision ground

[Alignment Bushing]
Material:SUJ2 steel
Heat treated

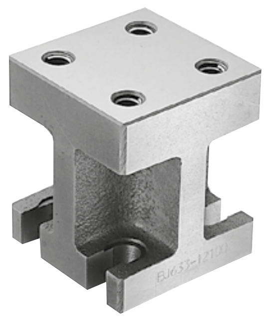
[Threaded Insert]
Material:S45C steel
Heat treated

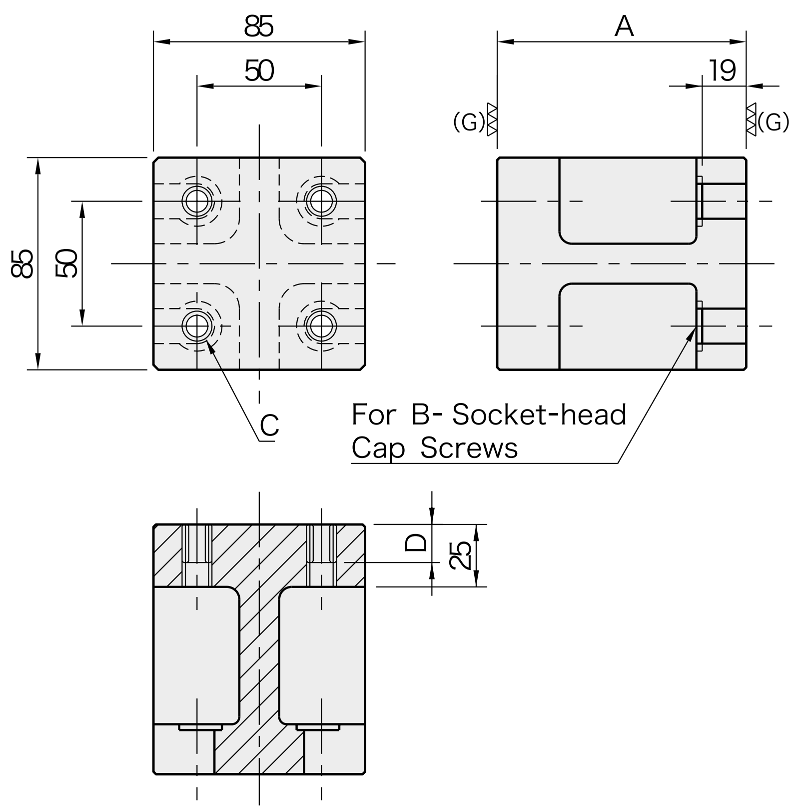


Part Number	A	B	C (F7)	Weight (kg)
51991539	M12x1.75	M12	12	6.3
51991540	M16x2	M16	16	6.2

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

BJ633 H RISERS



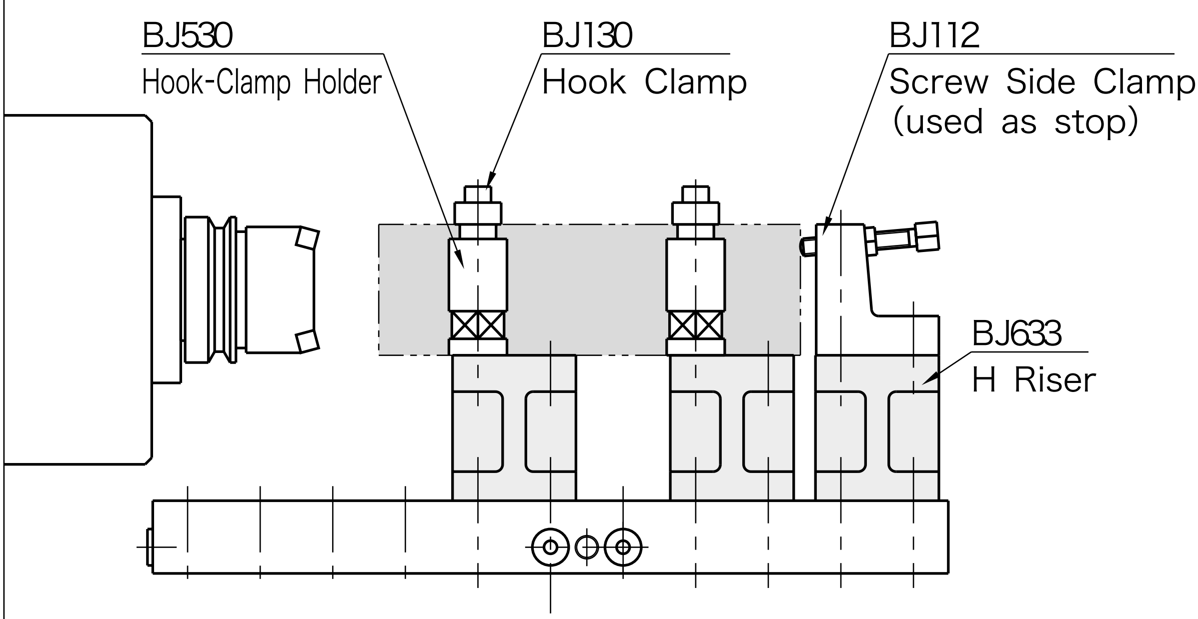


【Body】
- ■Material : FC300 cast iron
- ■Annealed
- ■Precision ground

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

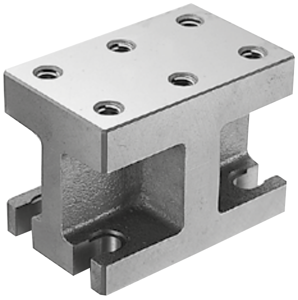
Part Number	A (±0.01)	B	C	D	Weight (kg)
51991543	100	M16	M16×2	16	3.2
51991544	125				3.8

■How To Use



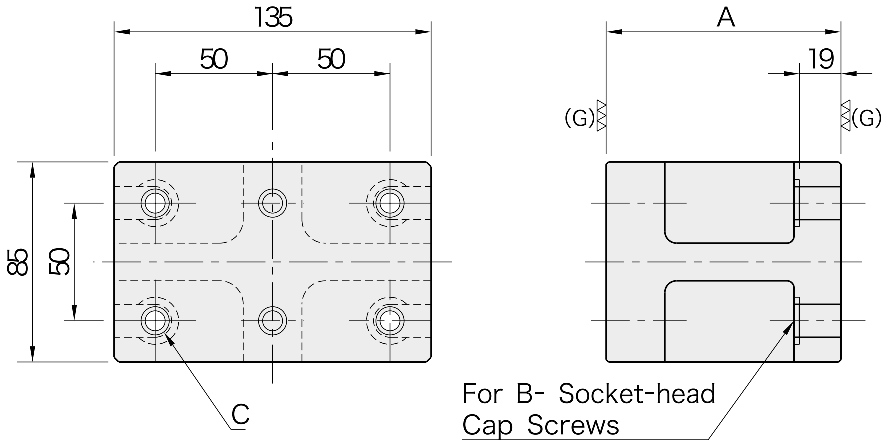
Use to raise a workpiece or components, parallel to a tooling plate.

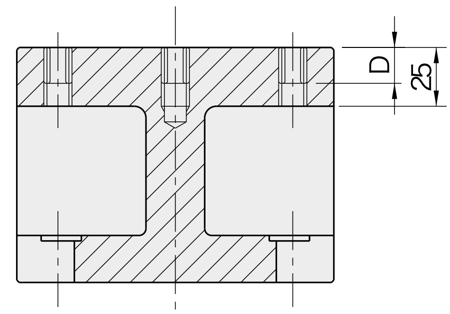
BJ634 H RISERS



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

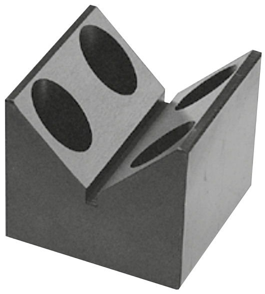
【Threaded Insert】
- ■Material : S45C steel
- ■Heat treated





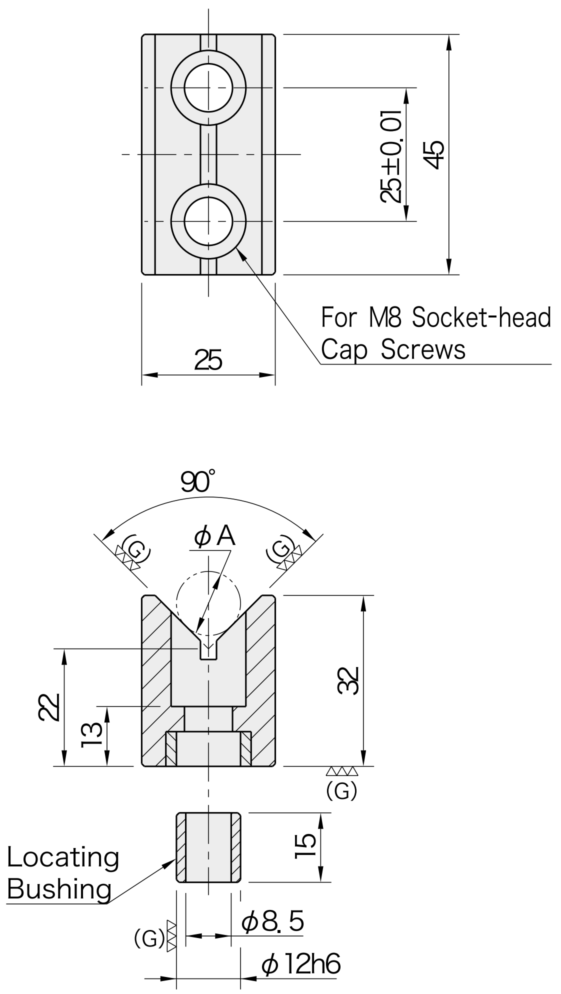
Part Number	A (±0.01)	B	C	D	Weight (kg)
51991547	100	M16	M16×2	16	5.1
51991548	125				5.8

BJ440(Mini) V BLOCKS

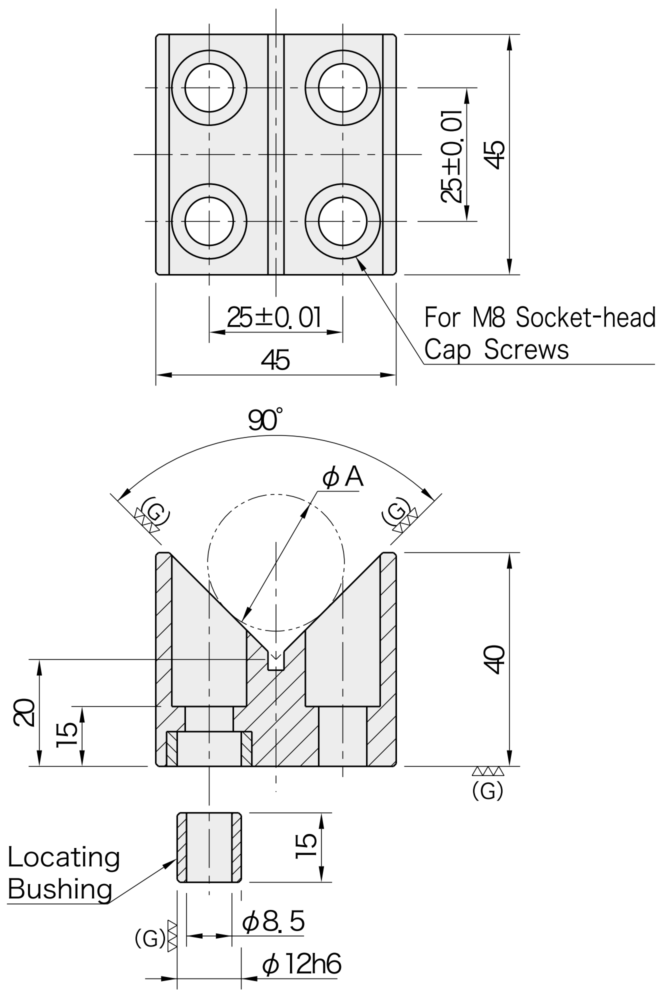


- ■Material : S45C steel
- ■Heat treated
- ■Black oxide finish
- ■Precision ground

BJ440-08032

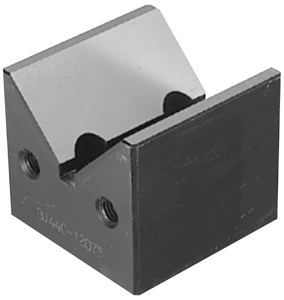


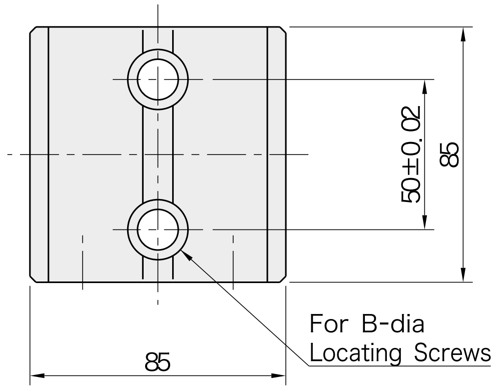
BJ440-08040



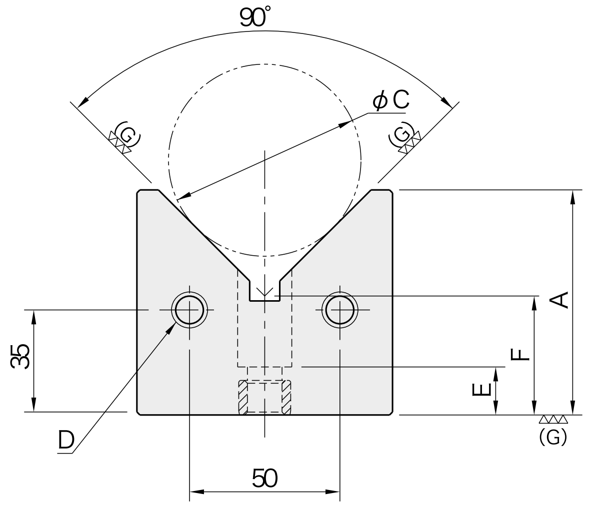
Part Number	A		Weight (g)
	min.	max.	
51991549	10	25	200
51991550	15	50	370

BJ440 | V BLOCKS





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



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

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

BJ770 METAL PROTECTION PLUGS

51991556

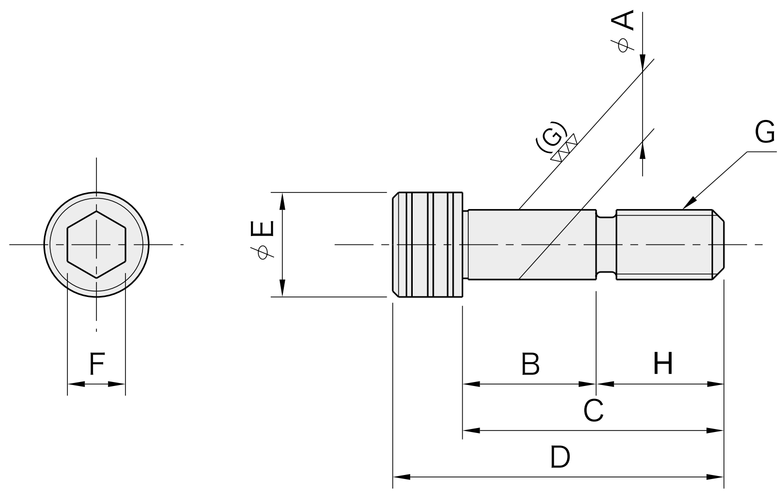
51991555

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

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

BJ701 HIGH PRECISION LOCATING SCREW

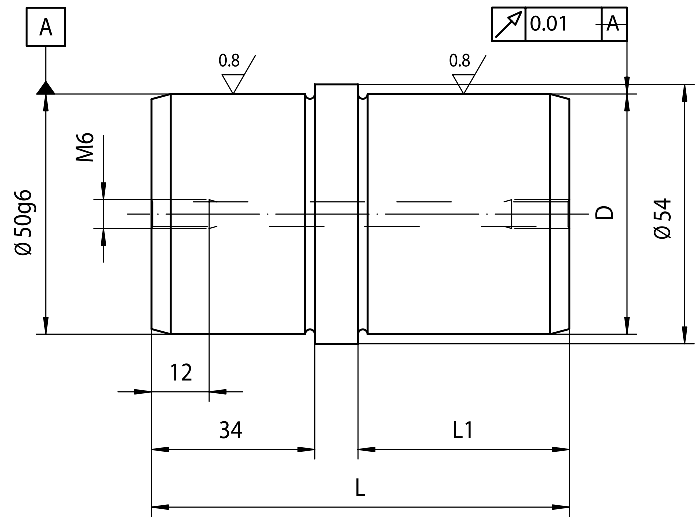
Material:SCM435 steel
Heat treated
Black oxide finish
Precision ground



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

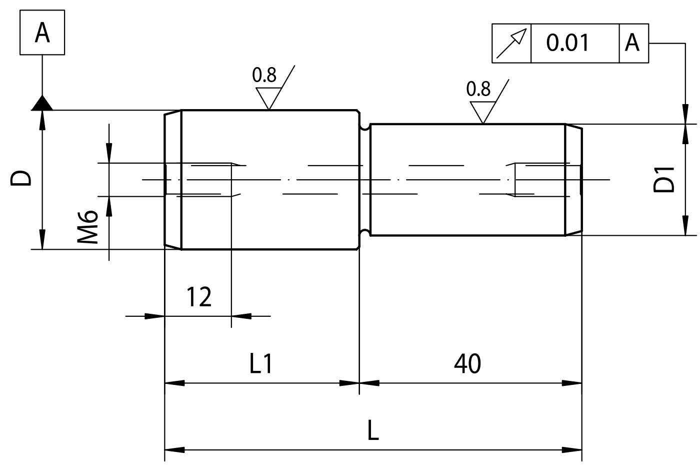
* - 0,005
- 0,013

CENTERING PIN



Part Number	Dg6	L	L1	Weight (Kg)
57001051	25	77	34	0.81
57001052	40	87	44	1.12
57001053	50	87	44	1.36

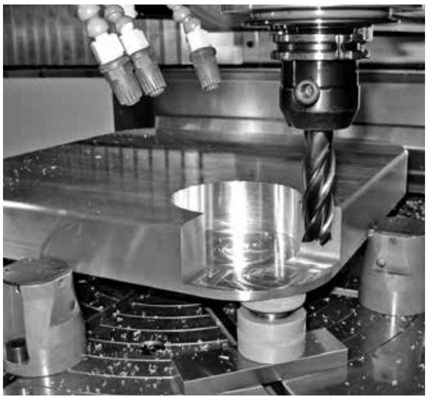
CENTERING PIN FOR ALIGNING HOLE



Part Number	Dg6	D1g6	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

14

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.

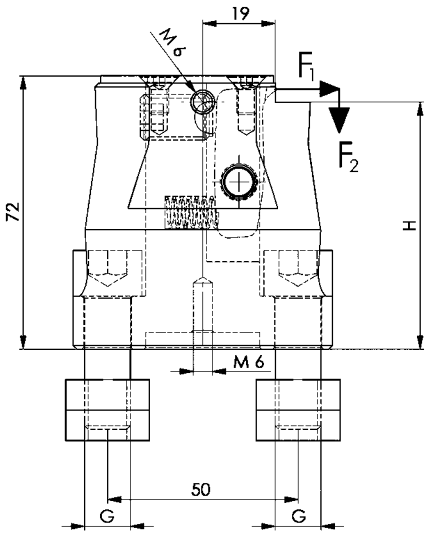
Order no.	Size		H ± 0,1	G	F1 [kN]	F2 [kN]	Weight [g]
58990101	M12x14	14	65	M12	12	5	1530

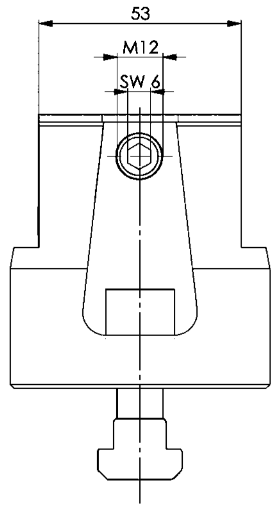
Special versions (dimension H ±0.01) are available on request

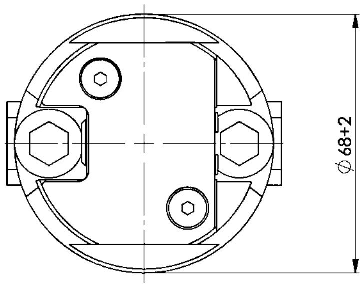
Use:
The mechanical side clamp with holddown effect can be used as a clamping element and as a fixed stop.
Moving the adjusting bolt causes hook ends to clamp the workpiece. At the same time, a pull-down effect occurs on the contact surface.
Attaching a lateral stop enables the workpiece to be repeatedly 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.

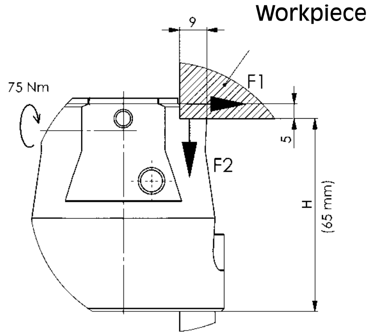
Advantages:
- compact dimensions
- workpiece fastened rigid and secure through pull-down effect
- plate tension increased to make holes and grooves
- lateral plate tension to completely finish surfaces without collision contour
- lateral thread enables a stop to be fastened
- can be used for horizontal 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.

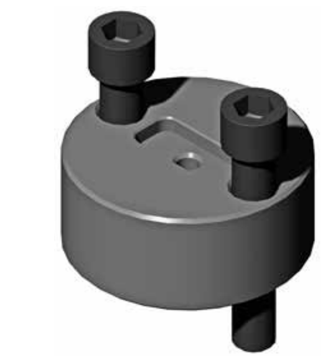








BASE PLATE, ROUND



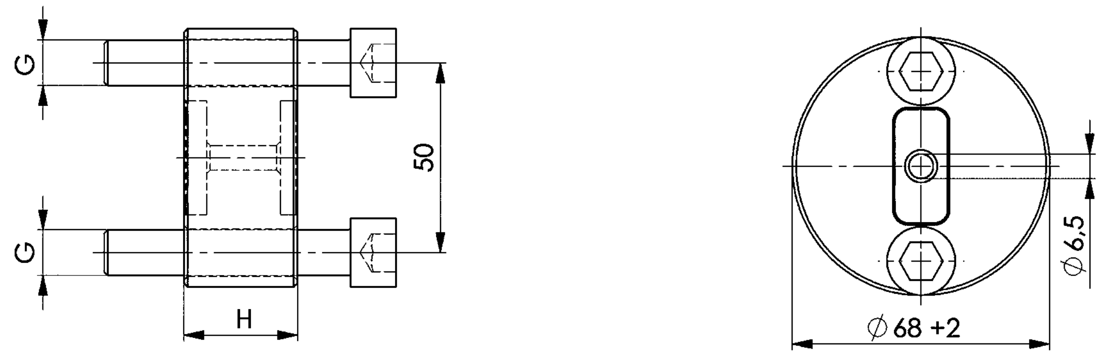
Base plate, round
M12x14, complete with fixing screws.
Housing from hardened, nitride steel.
Fastened with screws of strength class 10.9.

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

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

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



BASE PLATE

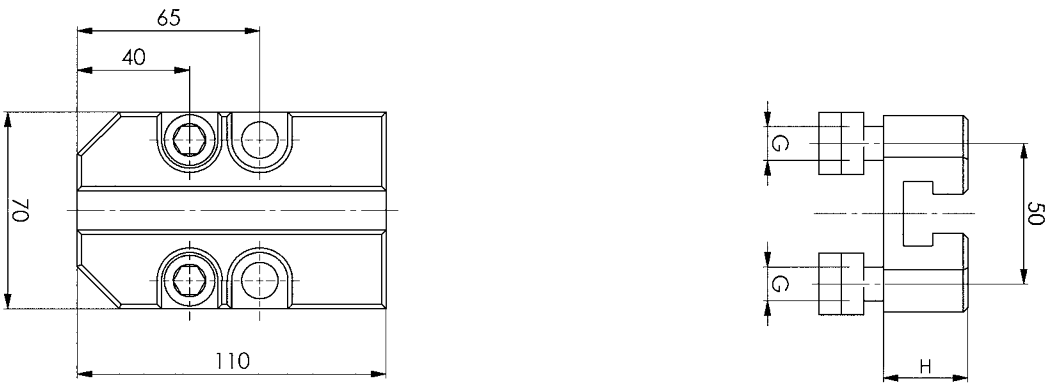
Base plate
M12x14, complete with M12 mounting.
Body is made of hardened and tempered alloy steel,
Mounted using strength grade 10.9 screws.

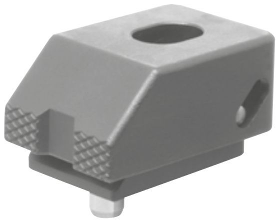
Use:
Used in conjunction with side clamp 58990101
to also clamp slot the table groove.

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

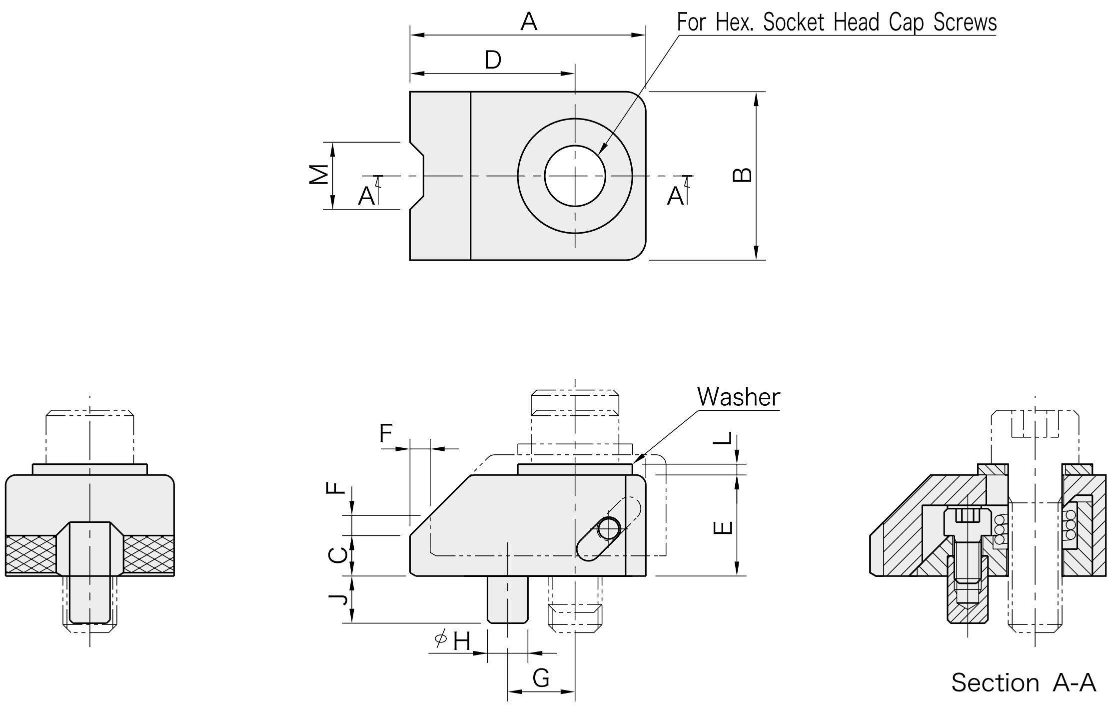
Order no.	Size		H	G	Weight [g]
58990103	M12x14	14	30	M12	1330

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



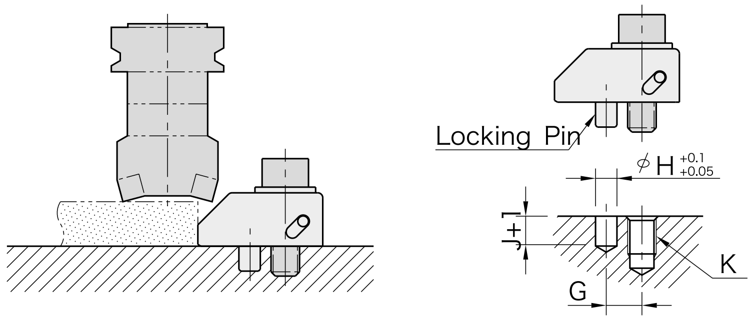


Material:S45C steel
Finish :Black oxide
Heat Treated



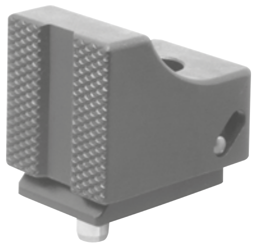
Part Number	A	B	C	D	E	F	G	H (h7)	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991557	35	25	6	24.5	15	3	10	6	7	M 8	1.6	10	7,000	25	100
51991558	43	30	8	29	19	4	12	6	7	M10	2	11	8,500	50	185
51991559	54	35	9	37	23	5	16	8	10	M12	2.3	12	20,000	90	320
51991560	65	40	10	45	25	6	20	10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

How To Use and Install

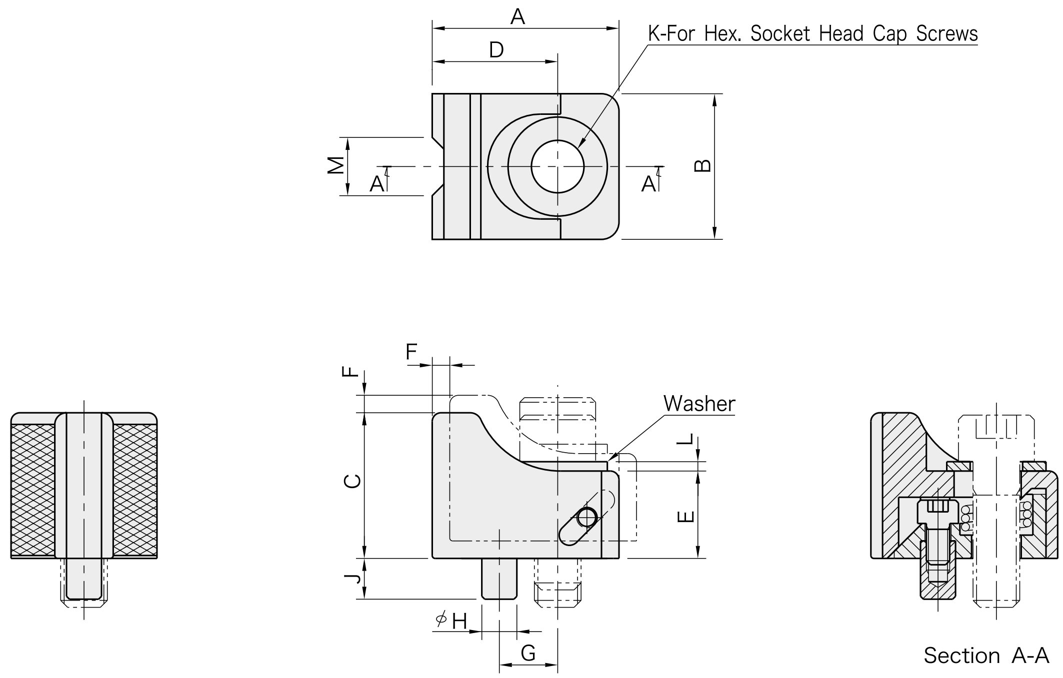


·Drill a cap-screw hole and a locking-pin hole as specified.
·One flat washer is included.

CP107 SIDE CLAMPS

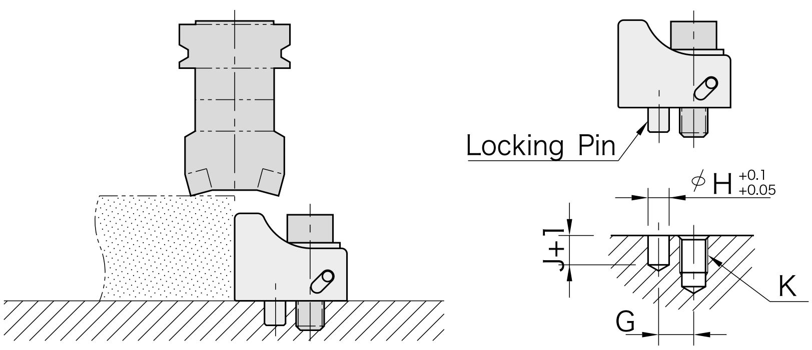


Material: S45C steel
Finish : Black oxide
Heat Treated



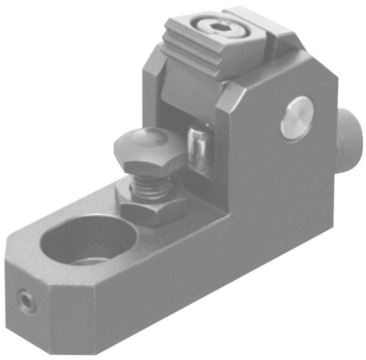
Part Number	A	B	C	D	E	F	G	H (h7)	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991561	32	25	25	21.5	15	3	10	6	7	M 8	1.6	10	7,000	25	115
51991562	40	30	32	26	19	4	12	6	7	M10	2	11	8,500	50	225
51991563	50	35	38	33	23	5	16	8	10	M12	2.3	12	20,000	90	390
51991564	60	40	45	40	25	6	20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

How To Use and Install



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

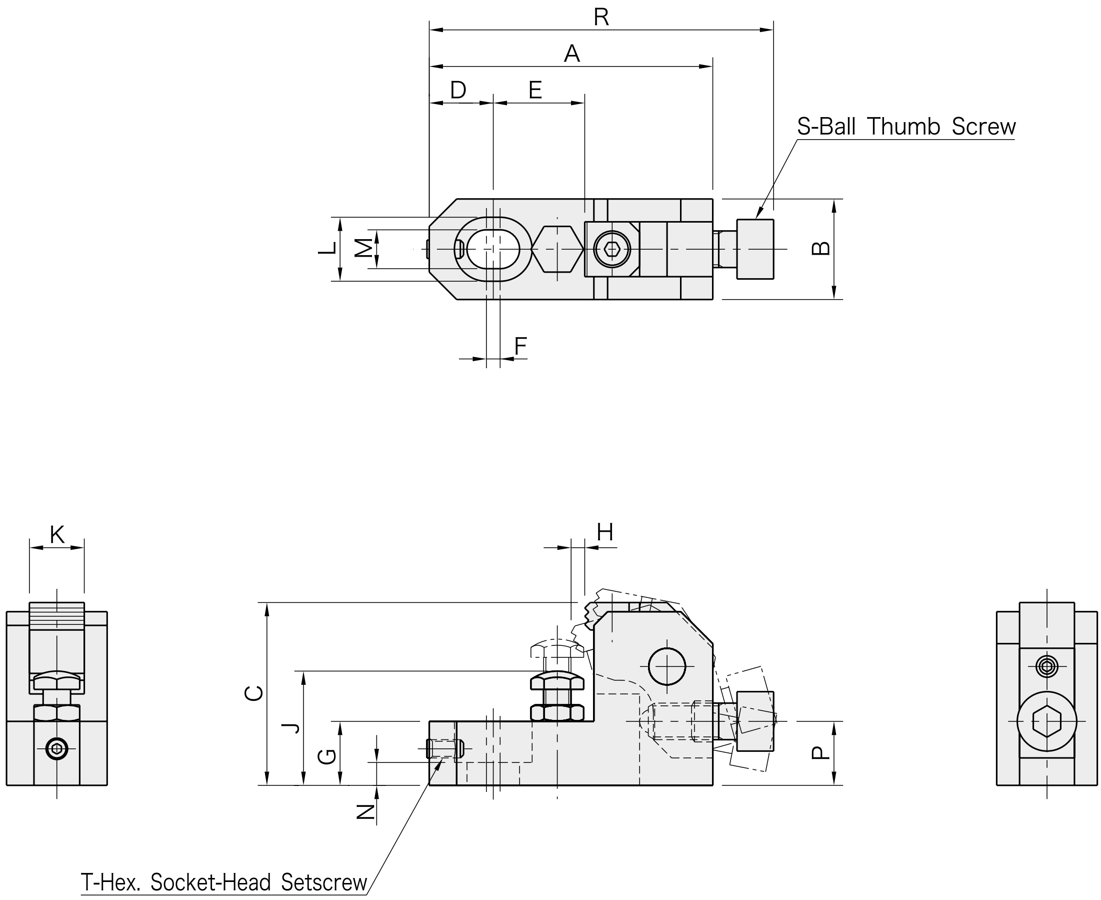
SIDE CLAMPS



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

[Arm]
Material: S45C steel
Finish : Black oxide

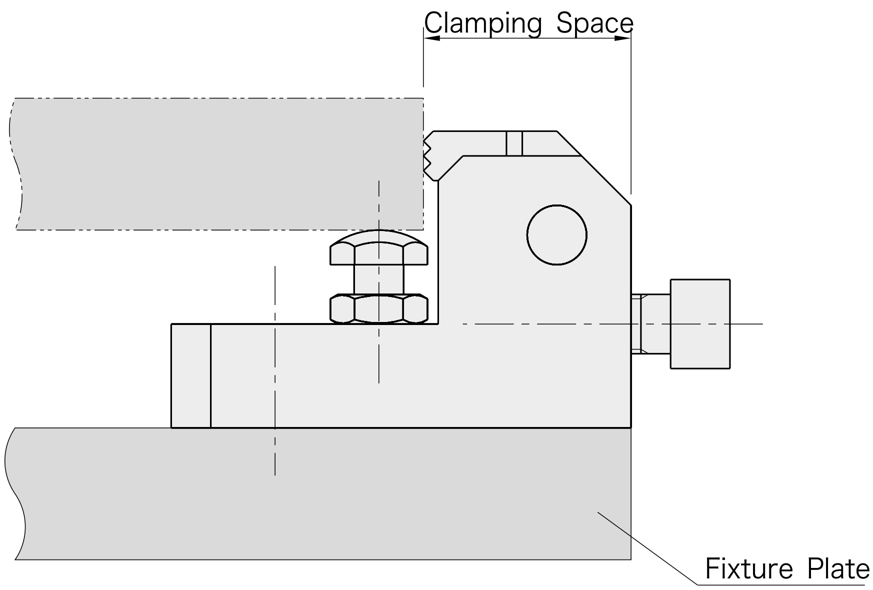
[Jaw]
Material: SKH51 steel
Finish : Black oxide
Heat Treated



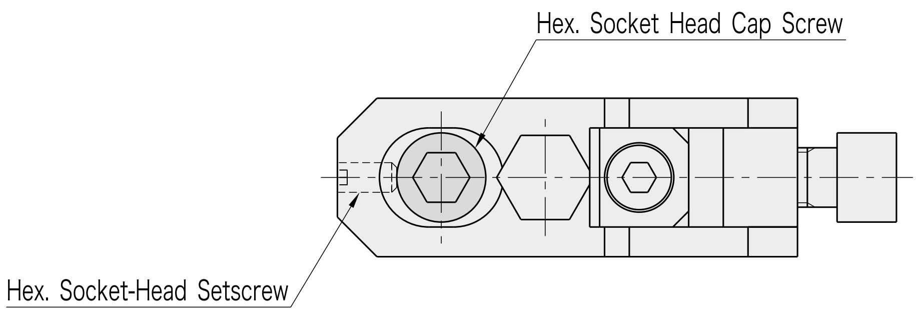
Part Number	A	B	C	D	E	F	G	H	J	K	L	M
51991565	62	22	40	14	20	3	14	3	25 to 32	12	14	8.5
51991566	78	25	50	18	25	4	18	3.7	32 to 40	16	17.5	11
51991567	93	32	60	21	30	5	21	4.5	40 to 48	20	20	13
51991568	124	38	80	28	40	6	27	6	48 to 63	25	26	17

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

How To Use and Install

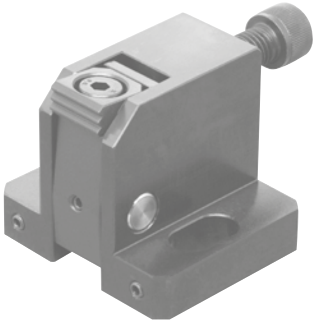


Smaller clamping space allows clamping a larger workpiece.



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

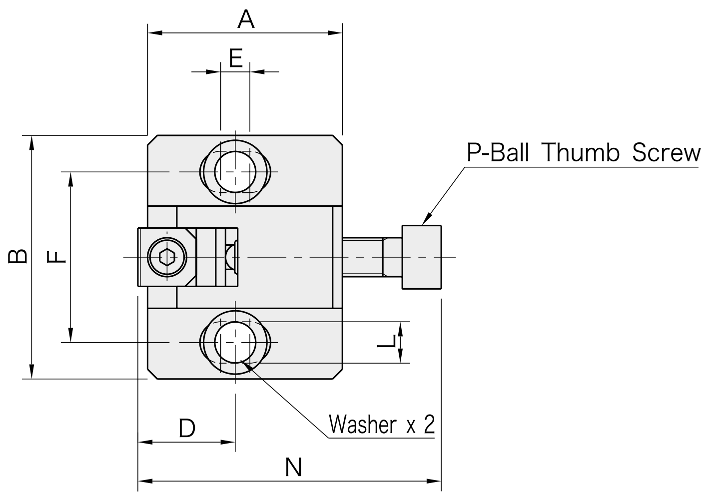
14

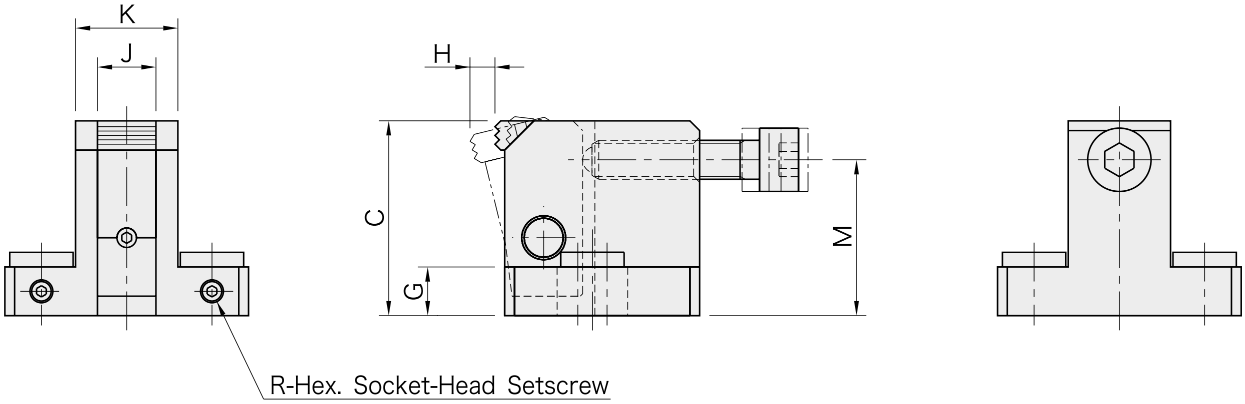


[Body]
Material: S45C steel
Finish : Black oxide

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

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

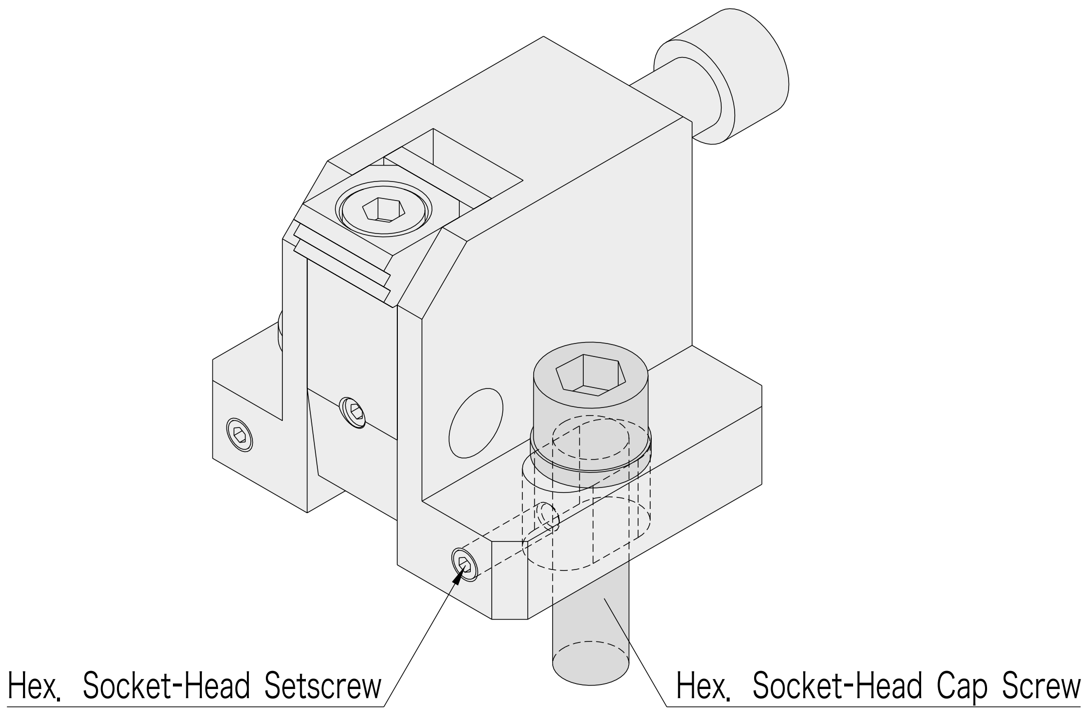




Part Number	A	B	C	D	E	F	G	H	J	K	L
51991569	40	50	40	20	6	35	10	5.3	12	21	8.5
51991570	50	65	50	25	8	45	12	7.1	16	27	11
51991571	60	70	60	30	10	50	15	8	20	31	13
51991572	80	90	80	40	15	65	20	10.2	25	39	17

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

How To Install

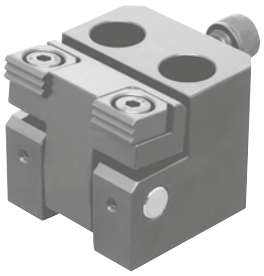


The hex. socket-head setscrew works to prevent the clamp from sliding back if screwedin until it contacts the cap screw.

·Two flat washers are included.

14

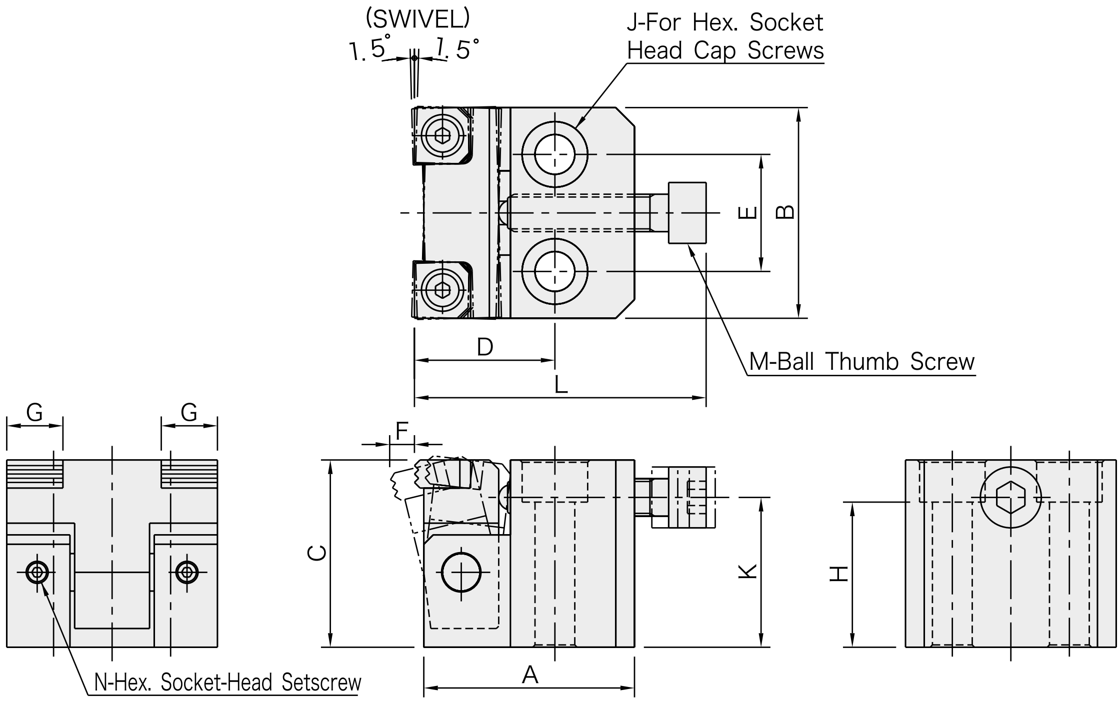
CP102 WIDE-JAW SIDE CLAMPS



[Body]
Material: S45C steel
Finish : Black oxide

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

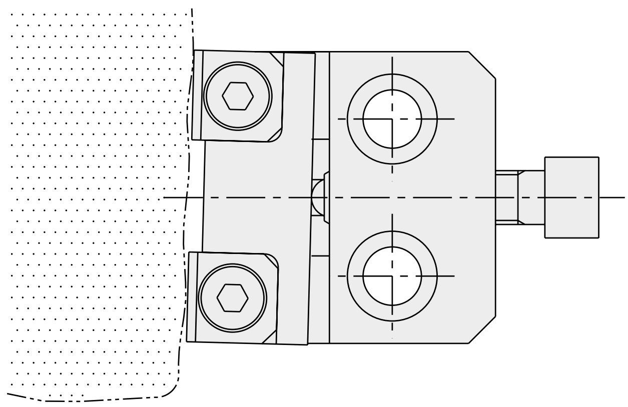
[Jaw]
Material: SKH51 steel
Finish : Black oxide
Heat Treated



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

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

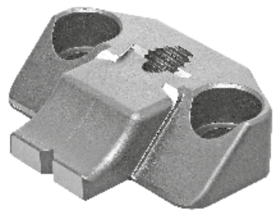
How To Use



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

CP104 TOE CLAMPS

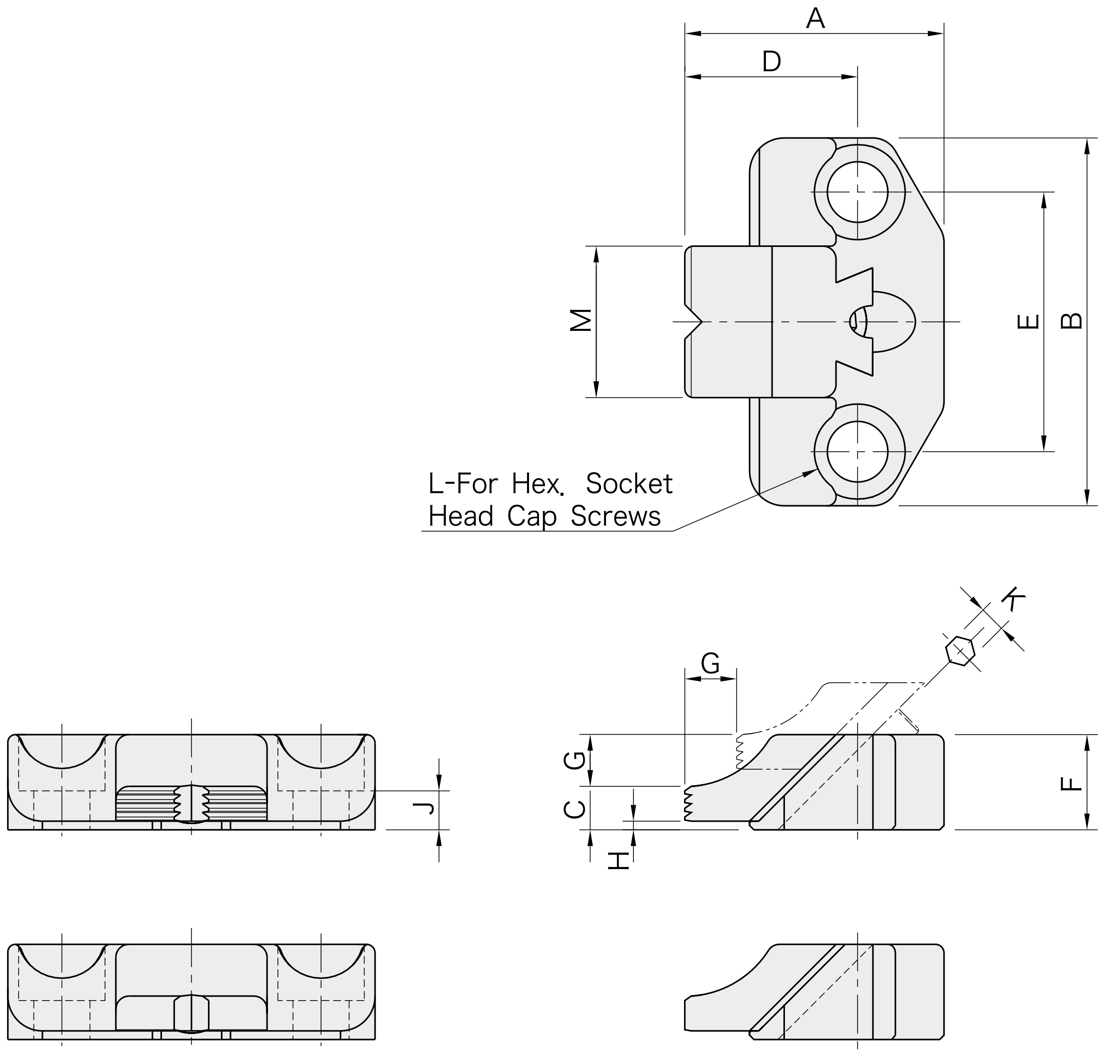
Serrated



Ground

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

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

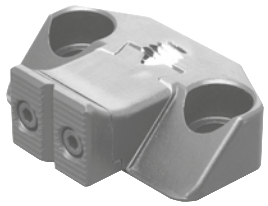


Serrated

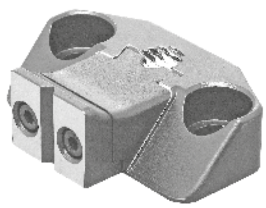
Ground

Serrated Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991576	39.5	65	7.5	25	45	16	7	1.5	7	4	M 8	25	4,000	8	160
51991578	60	85	10	40	60	22	12	2	9	6	M12	35	9,000	26	450
51991580	77	100	14	50	70	30	14	2	13	8	M16	40	17,000	60	900
Ground Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991577	39.5	65	7.5	25	45	16	7	1.5	7	4	M 8	25	4,000	8	160
51991579	60	85	10	40	60	22	12	2	9	6	M12	35	9,000	26	450
51991581	77	100	14	50	70	30	14	2	13	8	M16	40	17,000	60	900

CP105 SIDE CLAMPS



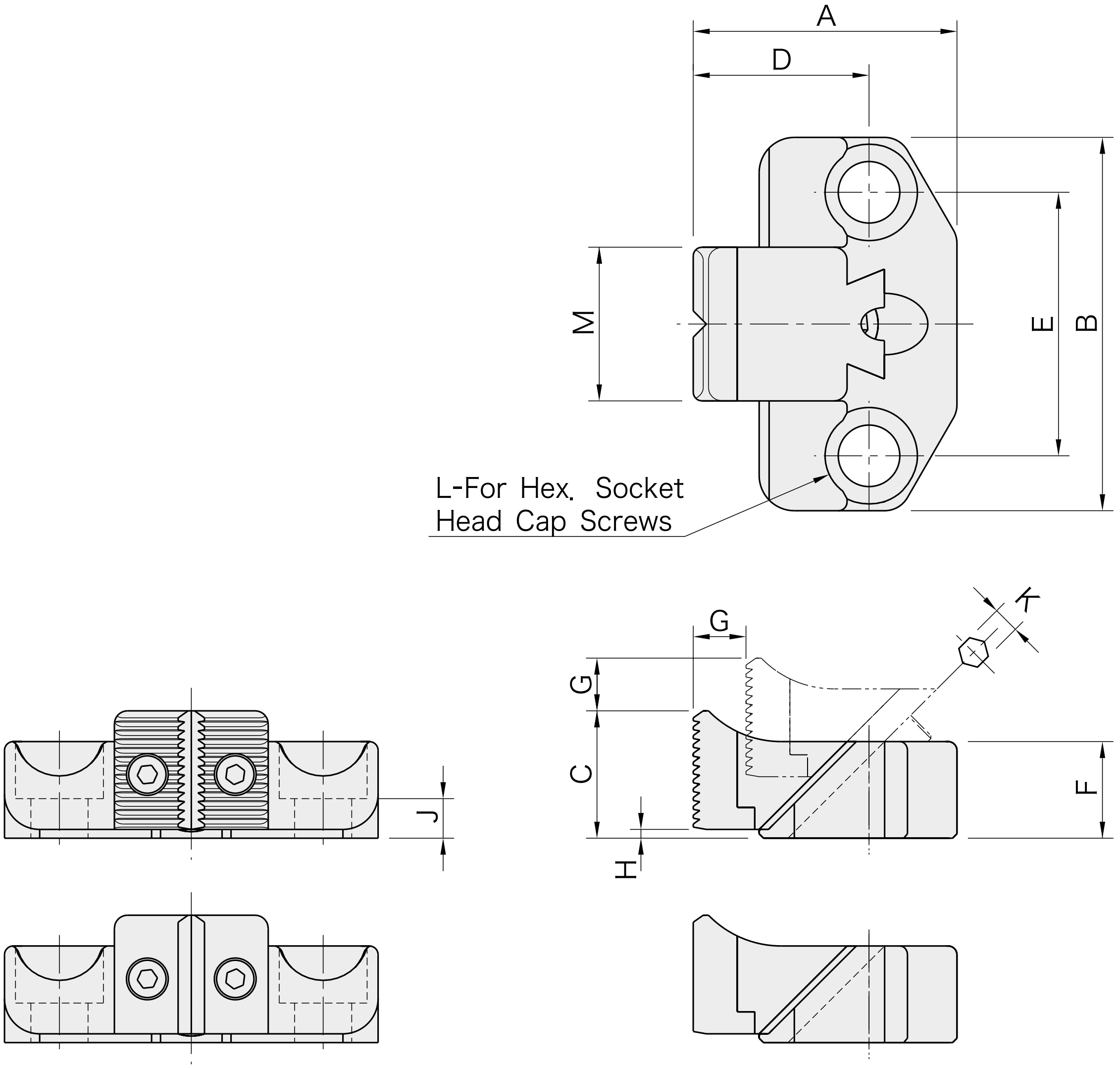
Serrated



Ground

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

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



Serrated

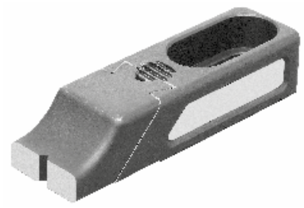
Ground

Serrated Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991582	39.5	65	19.5	25	45	16	7	1.5	7	4	M 8	25	4,000	8	180
51991584	60	85	29	40	60	22	12	2	9	6	M12	35	9,000	26	500
51991586	77	100	38	50	70	30	14	2	13	8	M16	40	17,000	60	1,010

Ground Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Force (N)	Allowable Screw Torque (N·m)	Weight (g)
51991583	39.5	65	19.5	25	45	16	7	1.5	7	4	M 8	25	4,000	8	180
51991585	60	85	29	40	60	22	12	2	9	6	M12	35	9,000	26	500
51991587	77	100	38	50	70	30	14	2	13	8	M16	40	17,000	60	1,010

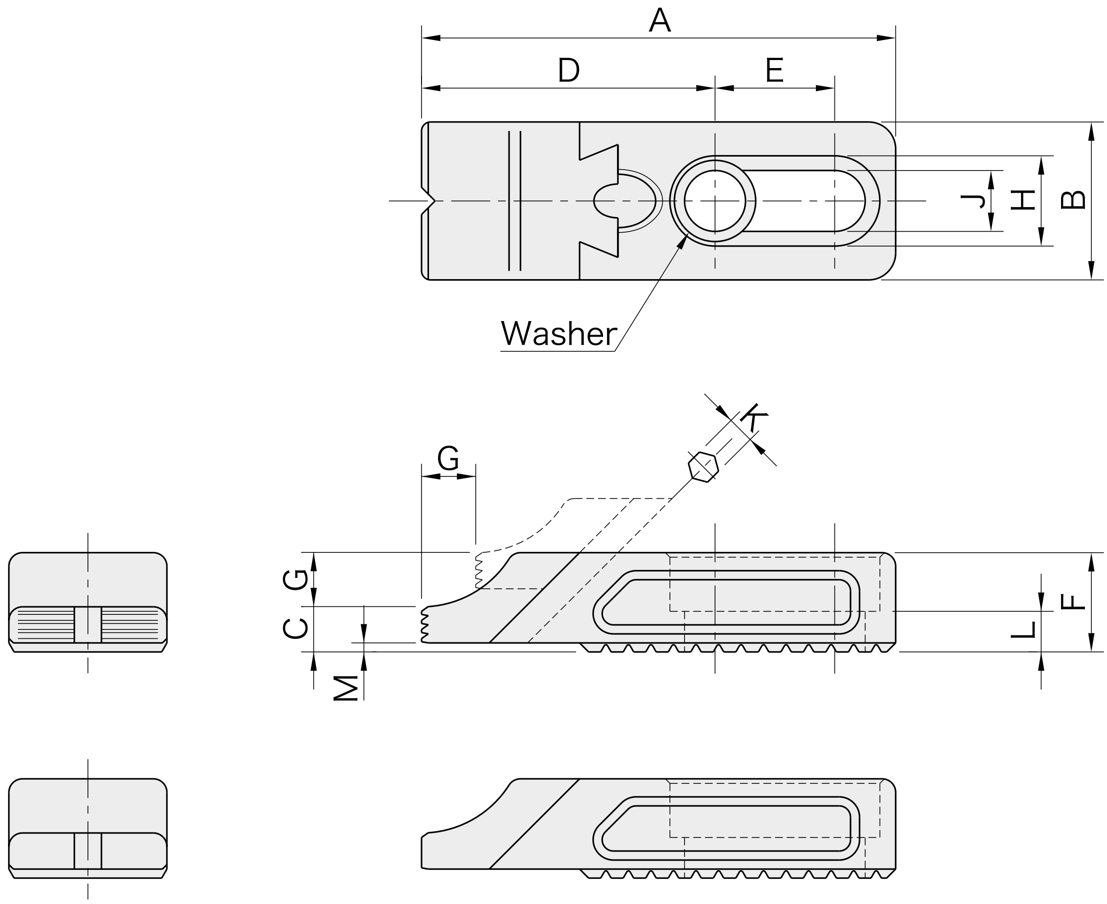
BJ101 ADJUSTABLE TOE CLAMPS


Serrated


Ground

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

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



Serrated

Ground

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

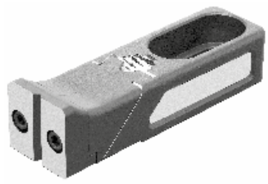
Ground Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Weight (g)
51991589	72	25	7.5	45.5	16.5	16	7	14	8.5	4	7	1.5	150
51991591	105	35	10	65	26.5	22	12	20	13	6	9	2	400
51991593	137	40	14	89.5	30	30	14	26	17	8	13	2	830

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

14

BJ102 ADJUSTABLE SIDE CLAMPS

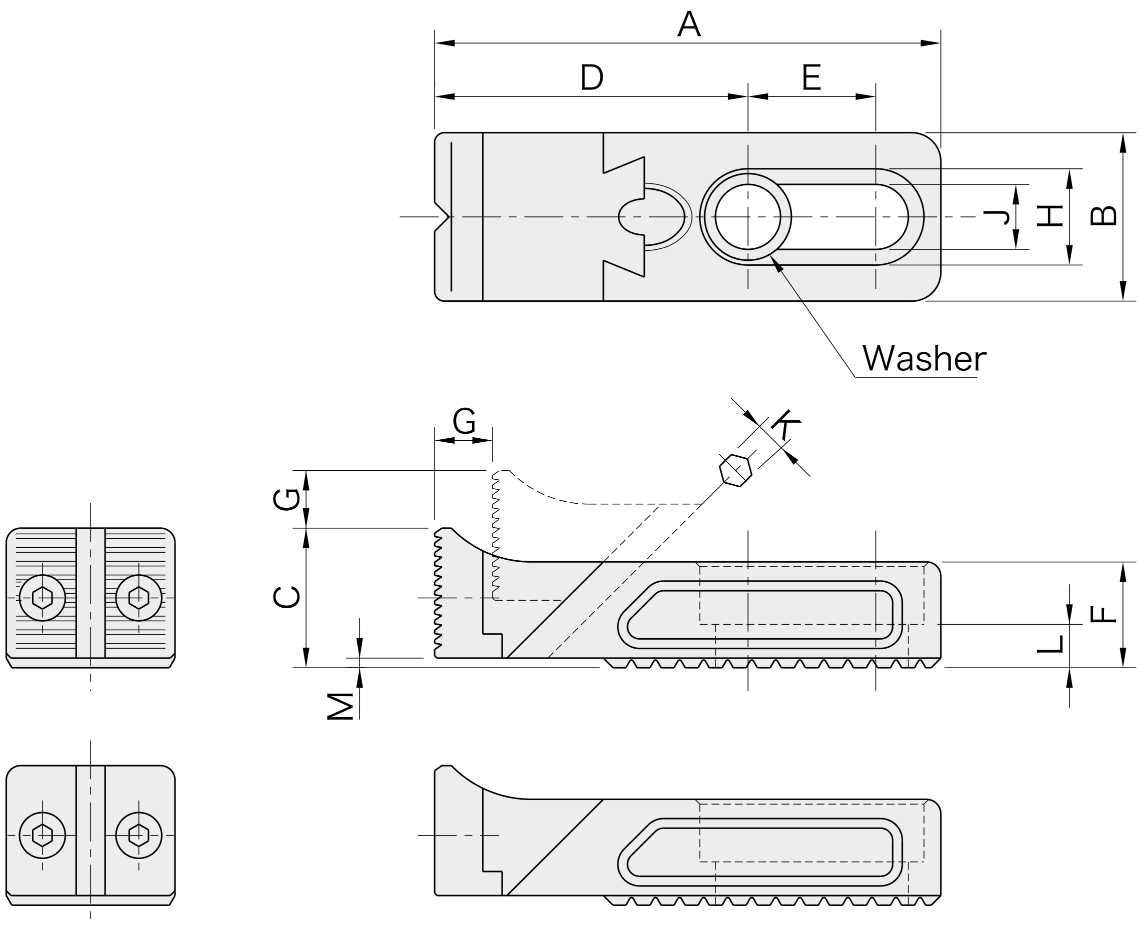
Serrated



Ground

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

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



Serrated

Ground

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

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

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

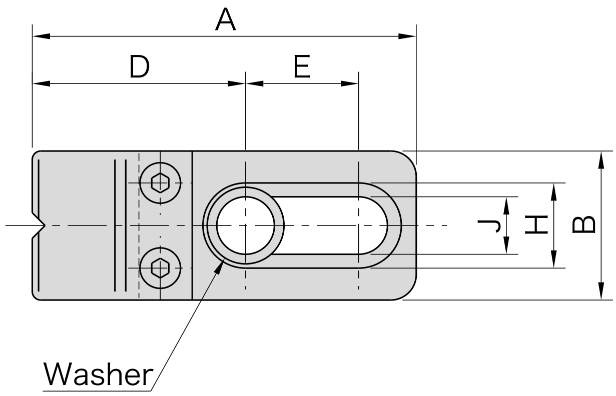
Note *) The stated values are effective when used singularly (not mounted on a serrated adaptor).

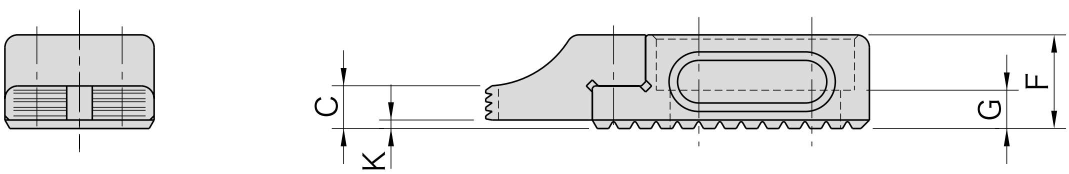
BJ201 ADJUSTABLE TOE STOPS

Serrated

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

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





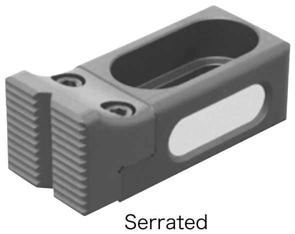
Serrated

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

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

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

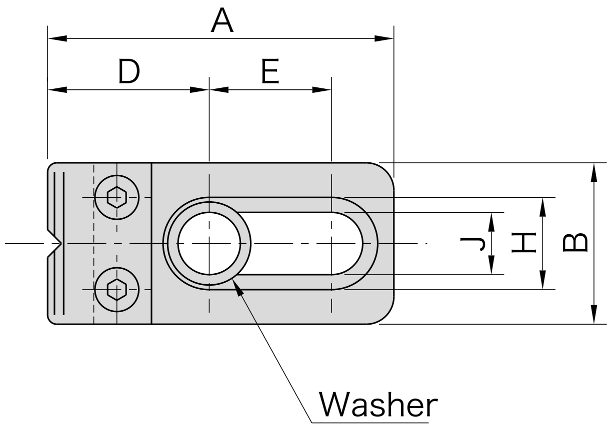
BJ202 ADJUSTABLE SIDE STOPS

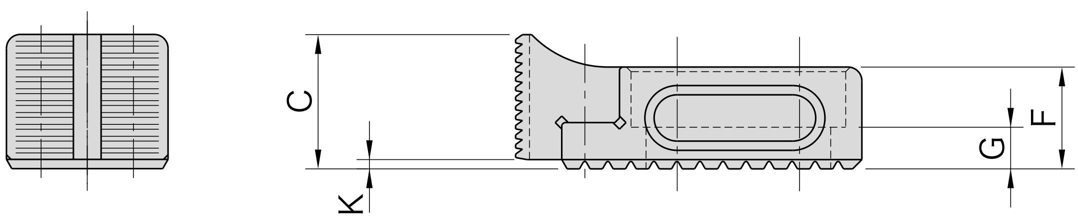


Serrated

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

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





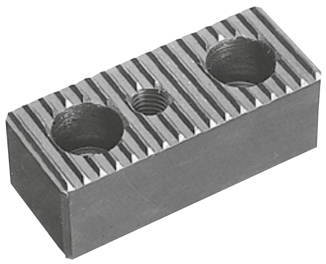
Serrated

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

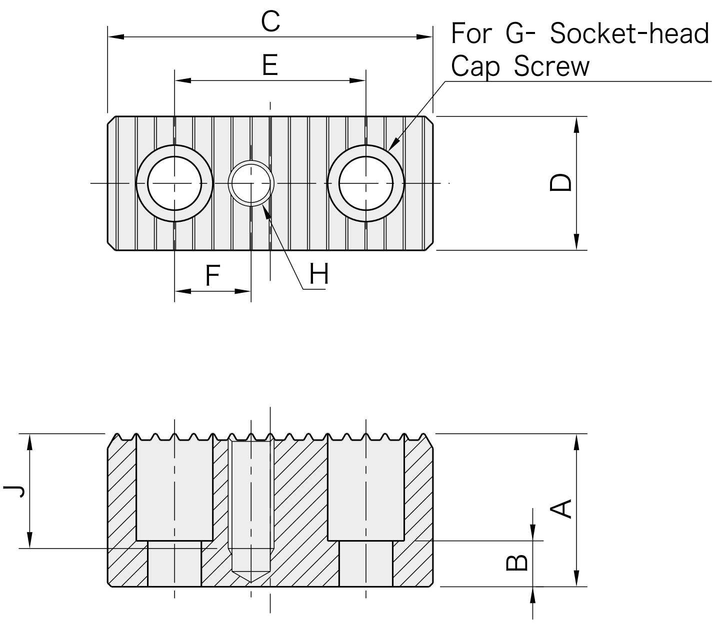
Note *) The stated values are effective when used singularly (not mounted on a serrated adaptor).

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

BJ500 RACK BLOCKS

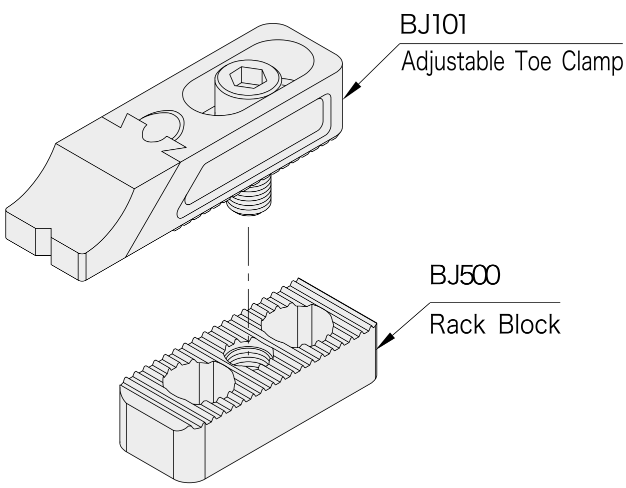


■Material : S45C steel
■Black oxide finish



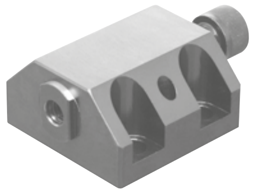
Part Number	A	B	C	D	E	F	G	H	J	Weight (kg)
51991606	16	7	50	25	25	12.5	M 8	M 8×1.25	Through	0.13
51991607	20	9								0.17
51991608	25	13							20	0.21
51991609	32	20								0.27
51991610	40	28								0.33
51991611	50	38								0.42
51991612	20	5	85	35	50	20	M12	M12×1.75	Through	0.34
51991613	25	10		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

■How To Use



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

CP110/CP111 BLOCK PUSH CLAMPS

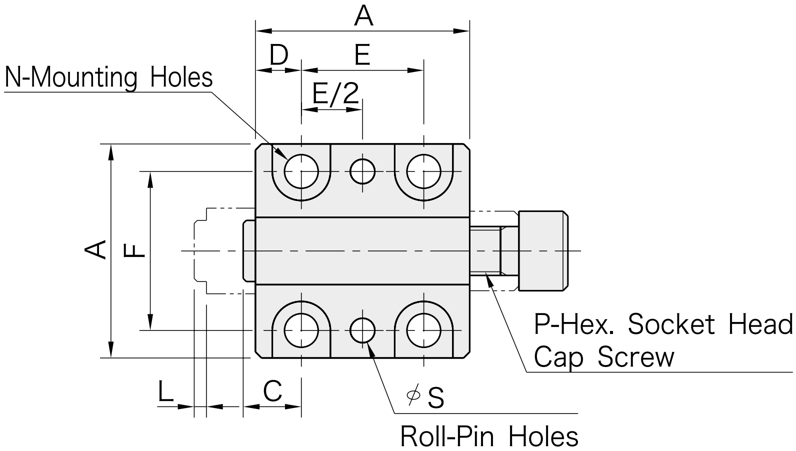


CP110
(Cap Screw Style)

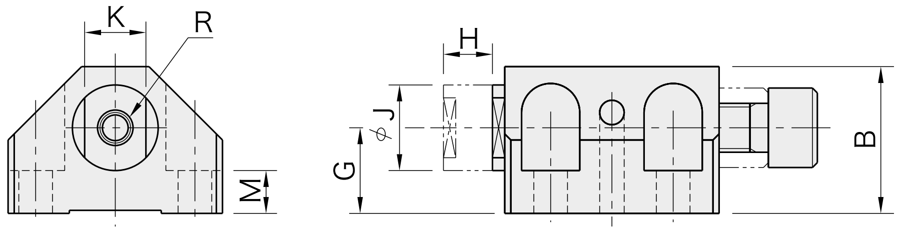
[Body]
Material: S45C steel
Finish : Black oxide

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

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



CP110
(Cap Screw Style)

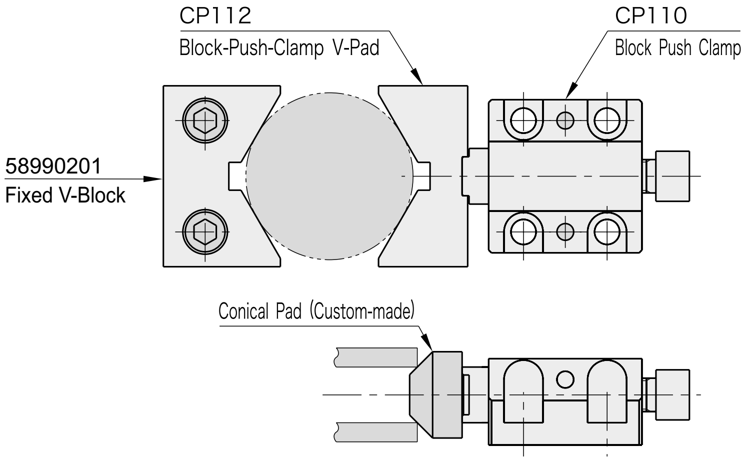


Part Number		A	B	C	D	E	F	G	H	J	K $\binom{-0.1}{-0.3}$	L	M	N	P	R	S	T	U
51991622		35	24	9.5	7.5	20	26	14	8	14	10	2	7	M 5	M 8x1.25	M 5x0.8 8 deep	4	24	14
51991623		45	29	12	10	25	35	16	10	18	12	2	8	M 6	M10x1.5	M 6x1 10 deep	4	24	14
51991624		55	31	15	12.5	30	40	18	12	20	14	2.5	8	M 8	M12x1.75	M 8x1.25 12 deep	6	30	17
51991625		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)
51991622	6,200	10	160
51991623	11,000	22	340
51991624	20,000	48	540
51991625	37,000	121	1,050

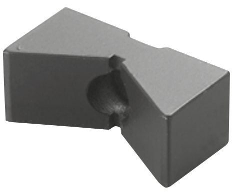
Note : The stated values of both "Clamping Force" and "Allowable Screw Torque" are based on the manual operation of the knob.

How To Use

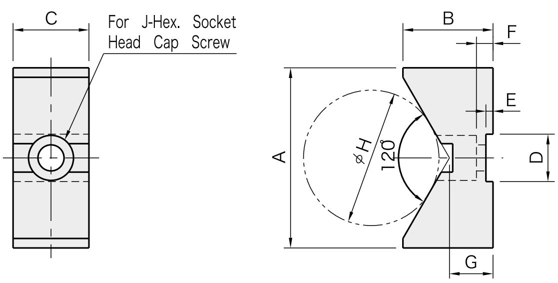


Depending on workpiece shapes, a custom pad can mount on the Block Push Clamp.

CP112 MOVABLE BLOCK PUSH CLAMP V-PADS



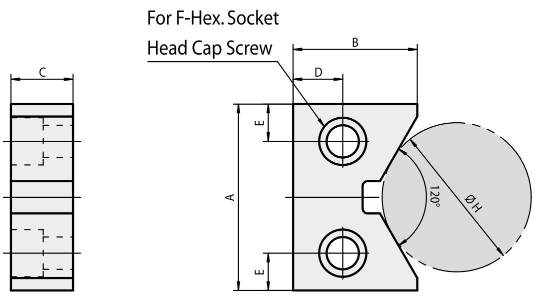
Material: S45C steel
Finish : Black oxide
Heat treated



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

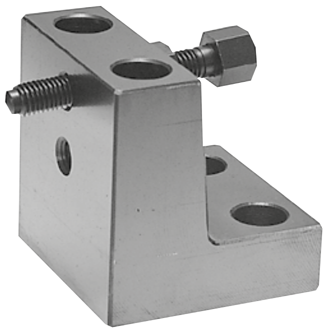
CP112F FIXED V-BLOCK PUSH CLAMP

Material: S45C steel
Finish : Black oxide
Heat treated



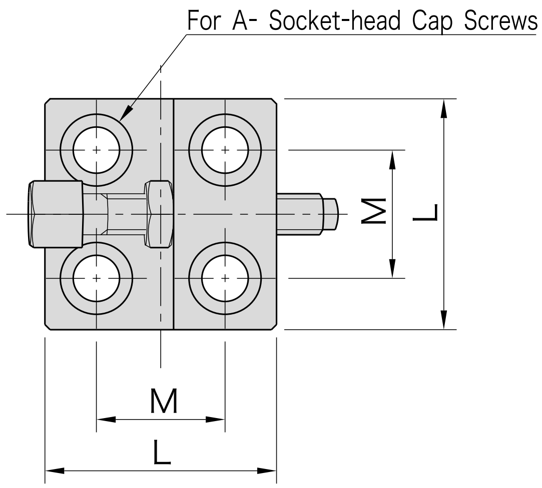
Part Number	A	B	C	D	E	F	H		Weight (Kg)
							min	max	
58990201	38	25	16	8	8	M6	15	60	0.09
58990202	50	35	19	10	10	M8	20	80	0.19
58990203	65	40	22	12	12	M10	25	100	0.30
58990204	75	50	25	20	15	M12	30	120	0.52

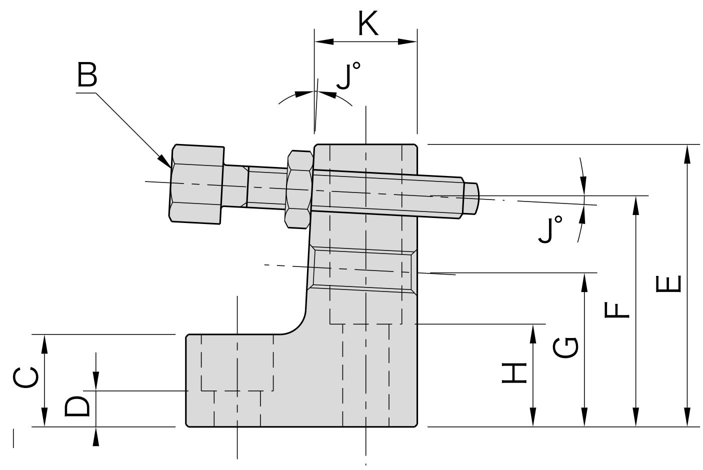
BJ112 REVERSE SCREW SIDE CLAMPS



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

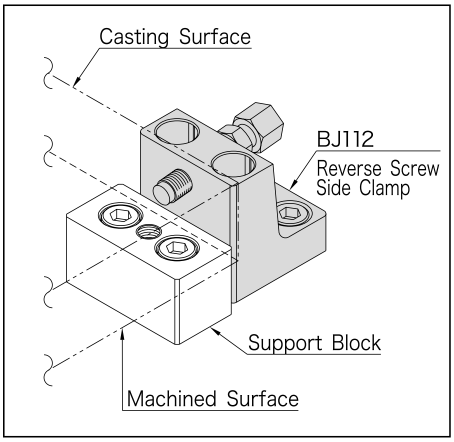
【Screw】
- ■Material : SCM435 steel
- ■Heat treated
- ■Black oxide finish

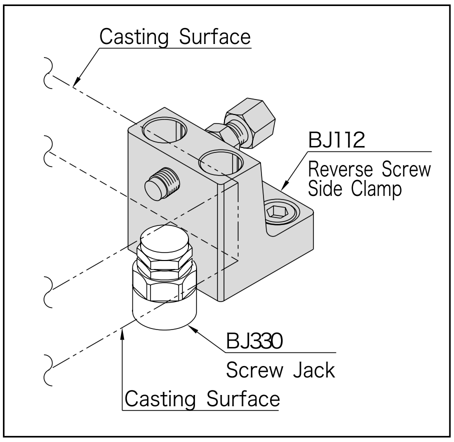


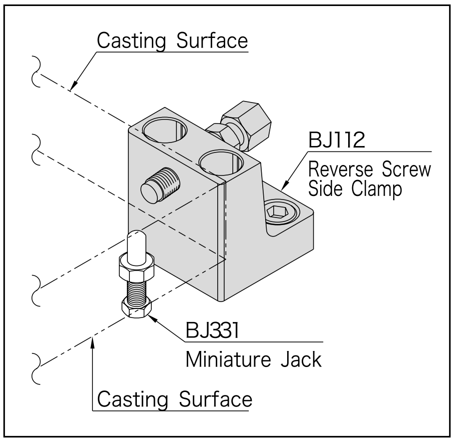


Part Number	A	B	C	D	E	F	G	H	J	K	L	M	Weight (kg)
51991634	M 8	M 8×1.25-50L	18	7	55	45	30	20	3	20	45	25	0.45
51991636	M16	M16×2 -80L	27	10	90	75	50	33	5	33	85	50	2.3

■Application Examples

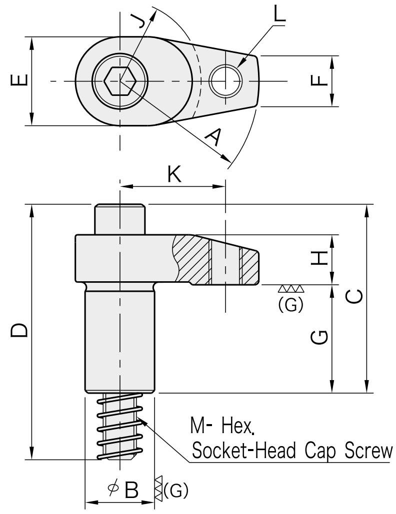






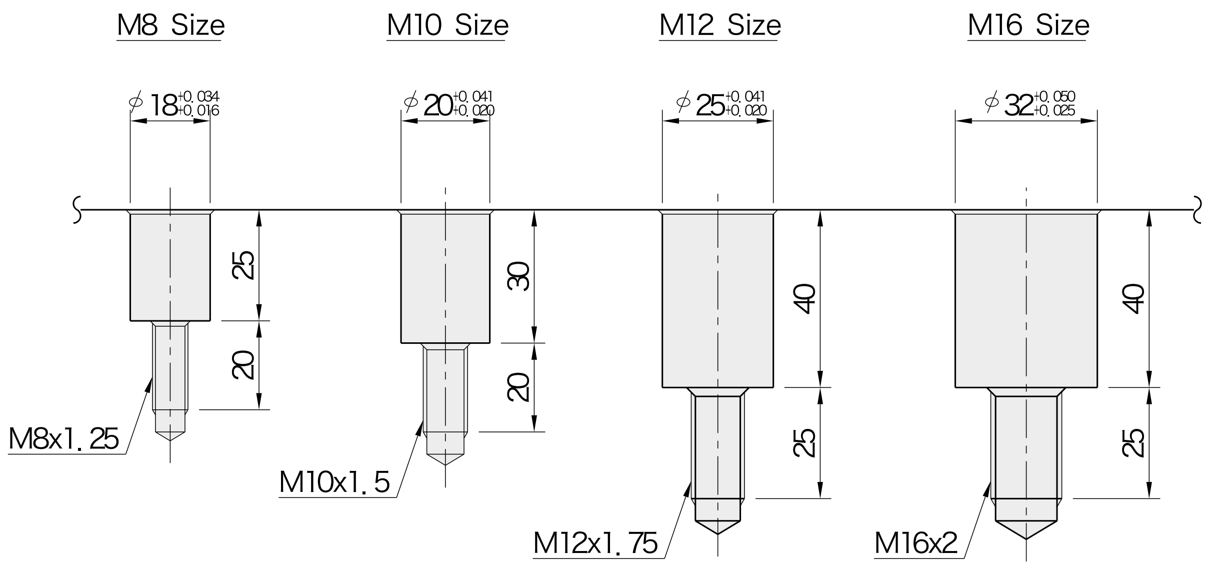
BJ130 HOOK CLAMPS

Material:SCM435 steel
Heat treated
Black oxide finish
Precision ground



・Use with a BJ530 Hook-Clamp Holder.

How To Use
(Reference)

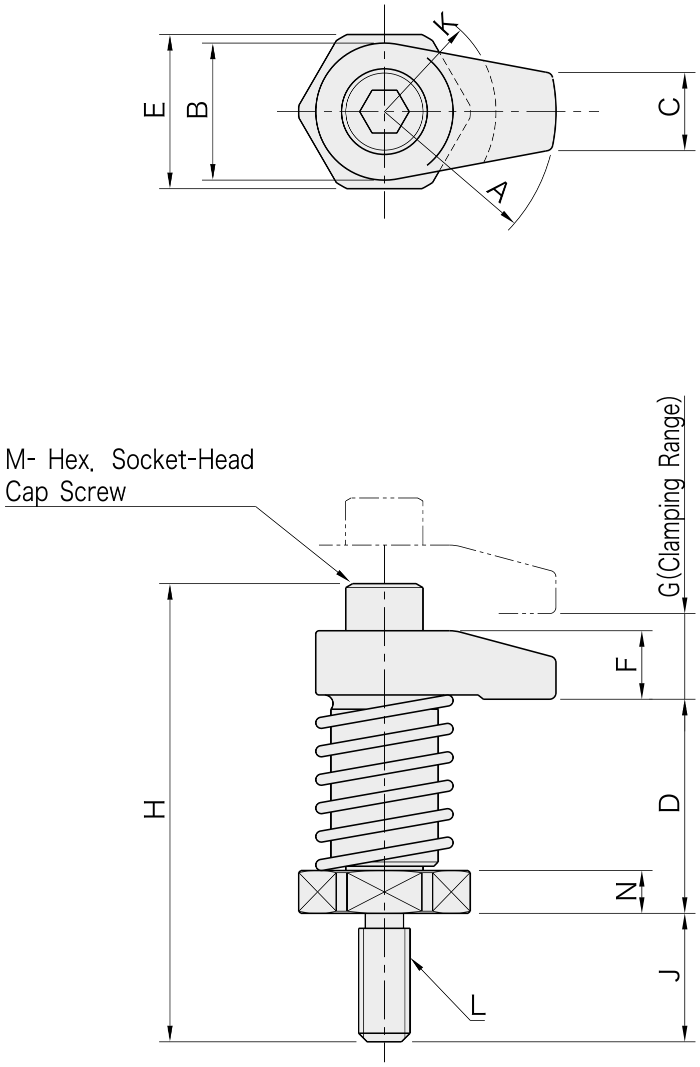


Hook Clamps can be plugged directly into custom blocks with receiving holes as specified above.

Part Number	A	B (h7)	C	D	E	F	G	H	J	K	L	M	Allowable Screw Torque (N·m)	Weight (Kg)
51991637	20	18	37	58	22	10	23	12	15	–	–	M8x1.25 - 50L	38	90
51991638	25												33	100
51991639	30								20				30	105
51991640	30	20	54	75	25	12	30	15	20	–	–	M10x1.5 - 65L	38	165
51991641	40								25				32	180
51991642	40	25	66	92	32	18	39	16	25	–	–	M12x1.75 - 80L	60	305
51991643	50		68					18					50	360
51991644	60												46	380
51991645	40	25	66	92	32	18	39	16	25	31	M12x1.75	M12x1.75 - 80L	60	295
51991646	50		68					18		38			50	350
51991647	60									46			46	370
51991648	40	32	75	101	36	22	39	21	25	–	–	M16x2 - 85L	170	530
51991649	50												150	580
51991650	60												130	615
51991651	50	32	75	101	36	22	39	21	25	38	M12x1.75	M16x2 - 85L	150	565
51991652	60									46			130	610

BJ131 HOOK CLAMPS WITH SPRING

Material:SCM435 steel
Heat treated
Black oxide finish
Precision ground

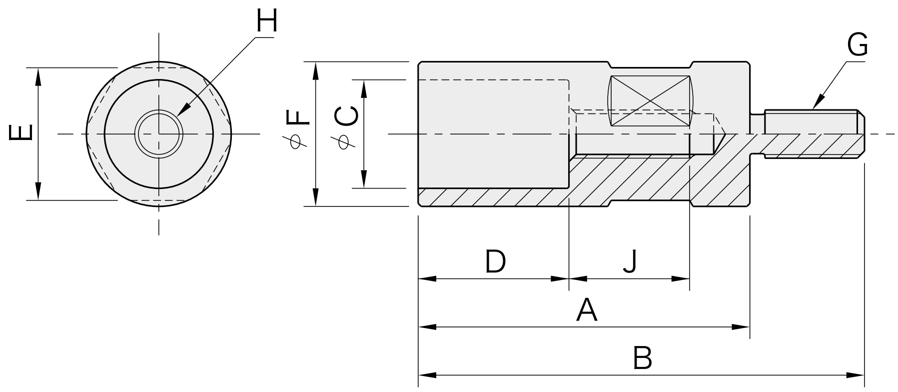


Part Number	A	B	C	D	E	F	G	H	J	K	L
51991655	30	22	10	35	22	12	10	68	19	20	M 8x1.25
51991659	40					16		107			
51991660	50	32	18	50	36	18	15	109	30	25	M12x1.75
51991661	60										
51991665	40										
51991666	50	36	22	50	36	21	15	116	30	25	M16x2
51991667	60										

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

BJ530 HOOK CLAMP HOLDERS

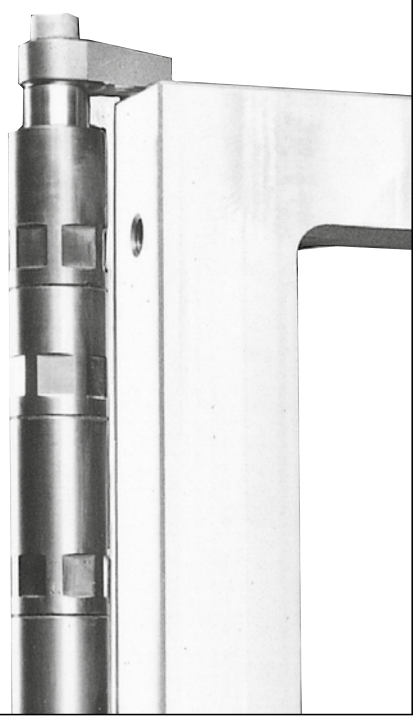
Material:S45C steel
Black oxide finish



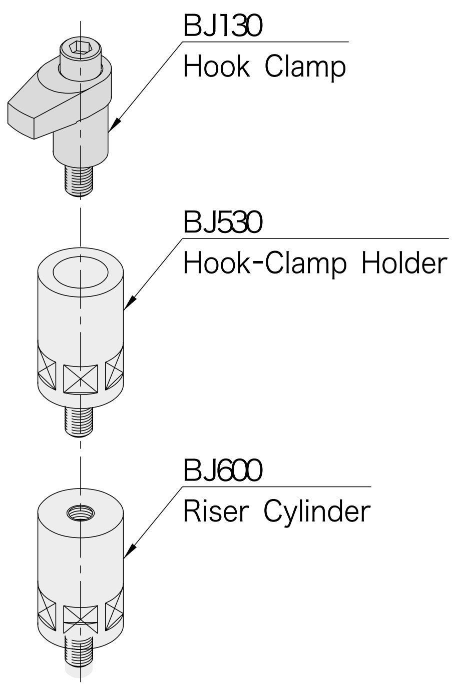
Part Number	A	B	C (F7)	D	E	F	G	H	J	Allowable Screw Torque (N·m) *)	Weight (g)
51991671	55	74	18	25	22	24	M 8x1.25	M 8x1.25	20	30	140
51991672	63	93	20	30	30	32	M12x1.75	M10x1.5	21	40	400
51991673	80	110							23		500
51991674	80	110	25	40	36	40	M12x1.75	M12x1.75	25	50	1,080
51991675	100	130									1,280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

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

How To Use



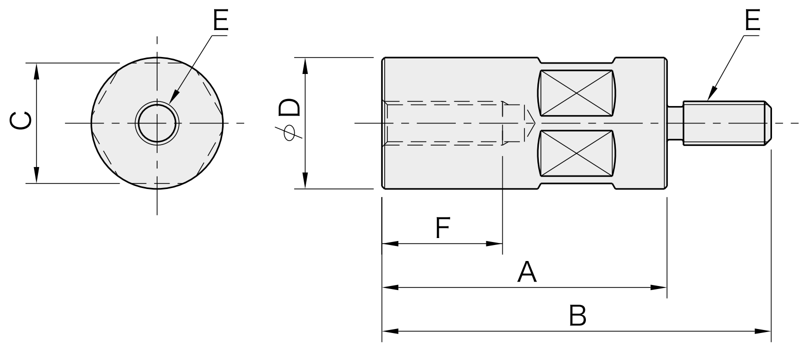
Holder that is specifically designed to receive a BJ130 Hook Clamp.



14

BJ600 RISER CYLINDERS

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

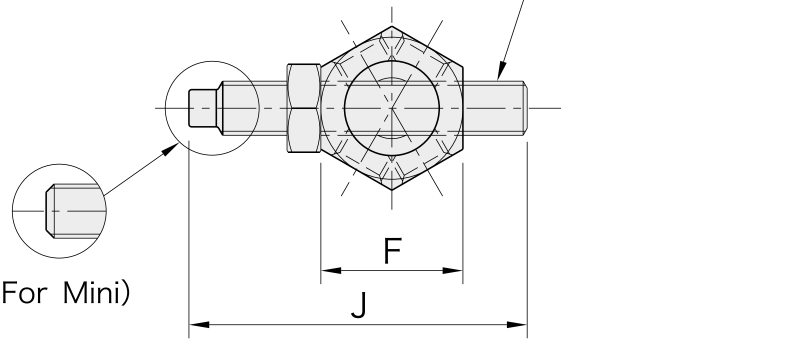


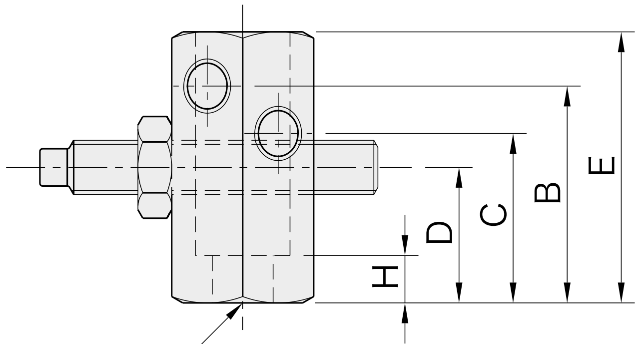
Part Number	A	B	C	D	E	F	Weight (g)
51991678	32	51	22	24	M 8x1.25	20	105
51991679	40	59					135
51991680	50	69					170
51991681	65	84					220
51991684	50	80	36	40	M12x1.75	35	480
51991685	65	95					640
51991686	80	110					780
51991687	100	130					980
51991688	125	155					1,230
51991691	50	80	46	50	M16x2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

BJ210 ADJUSTABLE STOPS

[Body]
Material:S45C steel
Black oxide finish

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



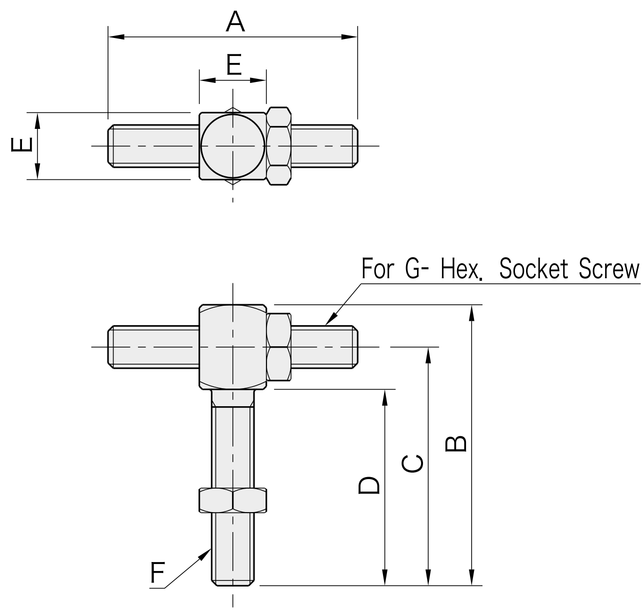


Part Number	A	B	C	D	E	F	G	H	J	Weight (g)
51991698	M 8x1.25	32	25	20	40	21	M 8	7	50	95
51991699	M12x1.75	50	40	32	60	36	M12	12	100	500
51991700	M16x2	63	50	40	80	46	M16	14	100	1,200

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

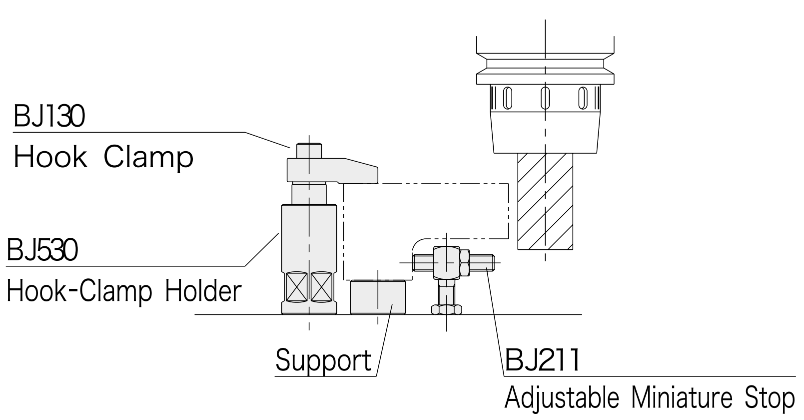
BJ211 ADJUSTABLE MINIATURE STOPS

Material:S45C steel
Heat treated
Black oxide finish

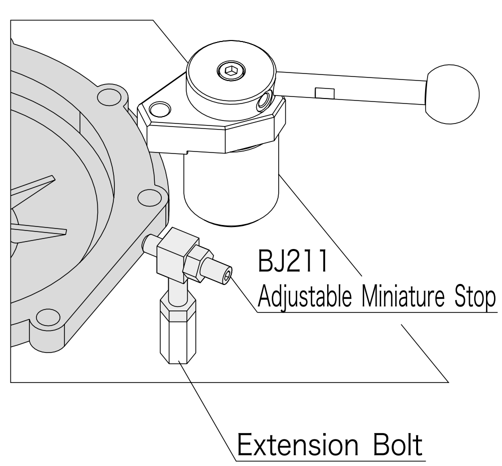


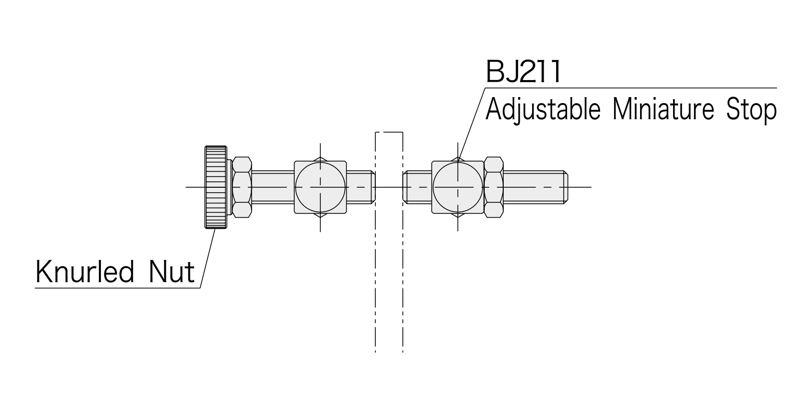
Part Number	A	B	C	D	E	F	G	Weight (g)
51991213	40	56	48	40	13	M 8x1.25	M 8x1.25	60
51991214	50	70	60	50	17	M10x1.5	M10x1.5	120
51991215	60	84	72	60	19	M12x1.75	M12x1.75	190
51991216	80	112	96	80	24	M16x2	M16x2	410

Application Examples



Miniature size allows use in small space.

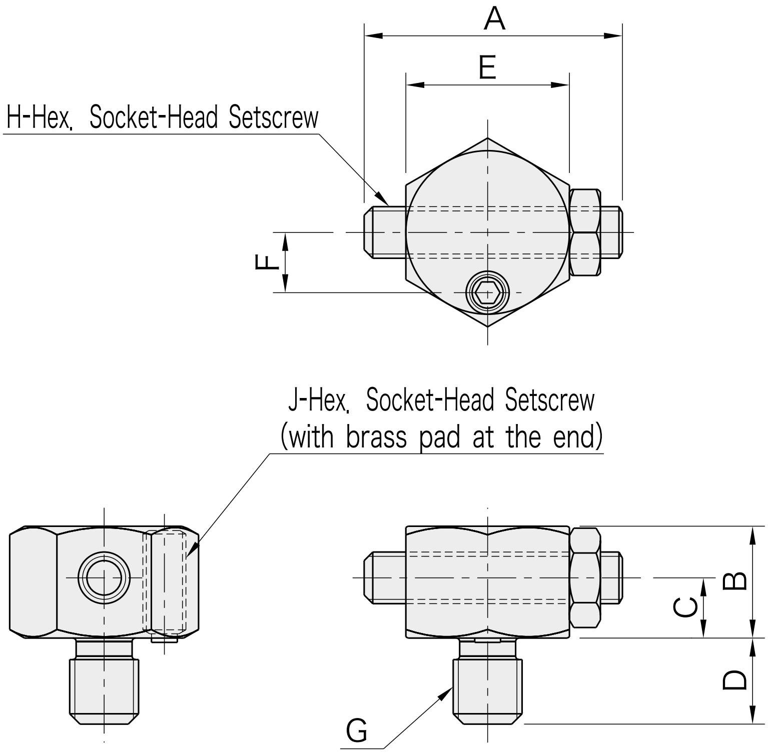




Can be used as auxiliary clamps.

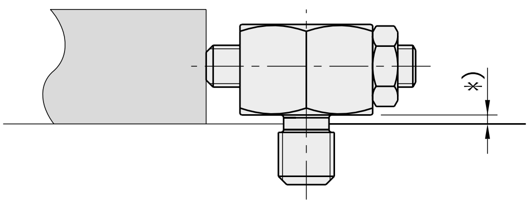
BJ214 SCREW STOP BUTTONS

Material: S45C steel
Finish : Black oxide
Heat treated

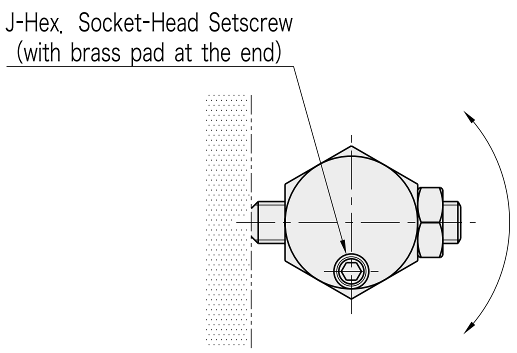


Part Number	A	B	C	D	E	F	G	H	J	Weight (g)
51991701	30	13	7	10	19	7	M 8x1.25	M 6x1	M5x0.8-12L	40
51991702	40	16.5	8.5	12	22	8	M10x1.5	M 8x1.25	M5x0.8-12L	75
51991703	50	21	11	15	24	9	M12x1.75	M10x1.5	M6x1 -20L	120
51991704	60	23	12	20	30	12	M16x2	M12x1.75	M6x1 -20L	210

How To Use



*) Minimize this clearance
when installing.



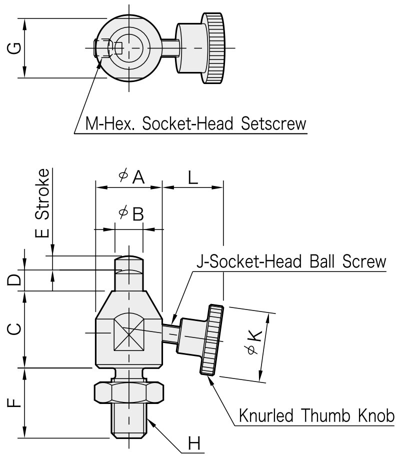
Installation Information
1. Screw in the body completely.
2. Screw back the body and set the adjustment screw.
3. Tighten up the hex. socket-head setscrew to lock the body.

·Use to stop a low-profile workpiece.

BJ360 COMPACT WORK SUPPORTS

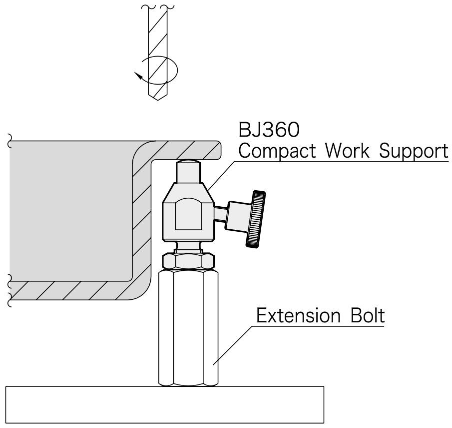
[Body]
Material: S45C steel
Finish : Black oxide

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



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

How To Use



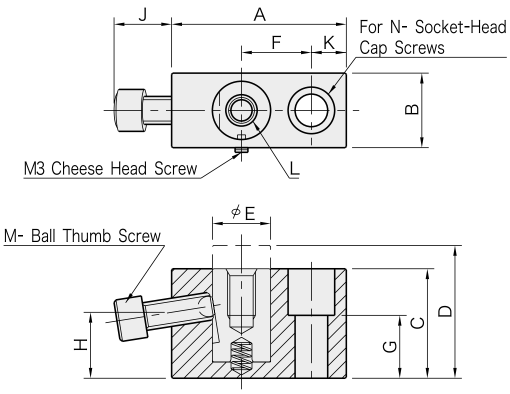
Part Number	A	B	C	D	E	F	G	H	J	K
51991148	15	6	18	5	3	16	13	M 8x1.25	M4x0.7-16L	16
51991149	19	8	22	6	4	20	17	M10x1.5	M5x0.8-20L	20
51991150	22	10	25			24	19	M12x1.75	M6x1 -25L	24

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

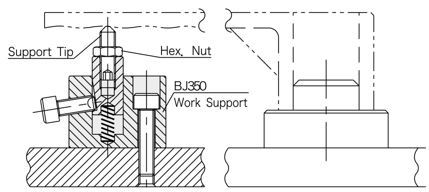
BJ350 WORK SUPPORTS

[Body]
Material:S45C steel
Black oxide finish

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



Application Example



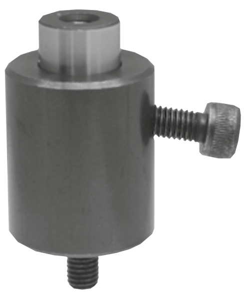
Ideal for preventing the workpiece from chattering and deflecting.

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

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

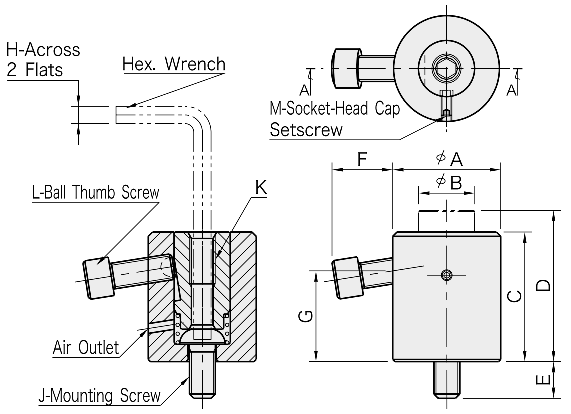
Part Number	L	M	N	Support Capacity (N)	Piston Spring Force (N)	Weight (g)
51991152	M 6x1 10 deep	M 6x1 -16L	M 6	4,000	0 to 6	150
51991153	M 8x1.25 15 deep	M 8x1.25 -20L	M 8	6,000	0 to 7	285
51991154	M10x1.5 15 deep	M10x1.5 -25L	M10	7,500	1 to 11	480
51991155	M12x1.75 20 deep	M12x1.75 -30L	M12	9,000	1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

BJ351 WORK SUPPORT CYLINDERS



[Body]
Material:S45C steel
Black oxide finish

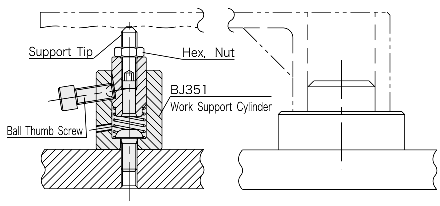
[Piston]
Material:SK4 steel
Heat treated
Black oxide finish



Section A-A

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

Application Example



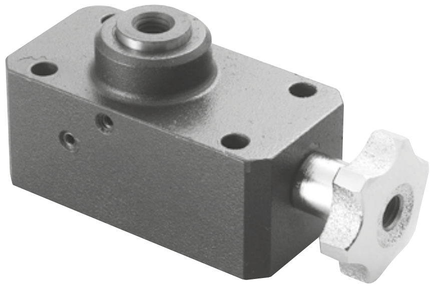
Ideal for preventing the workpiece from chattering and deflecting.

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

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

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

CP300 EXTENDABLE WORK SUPPORTS



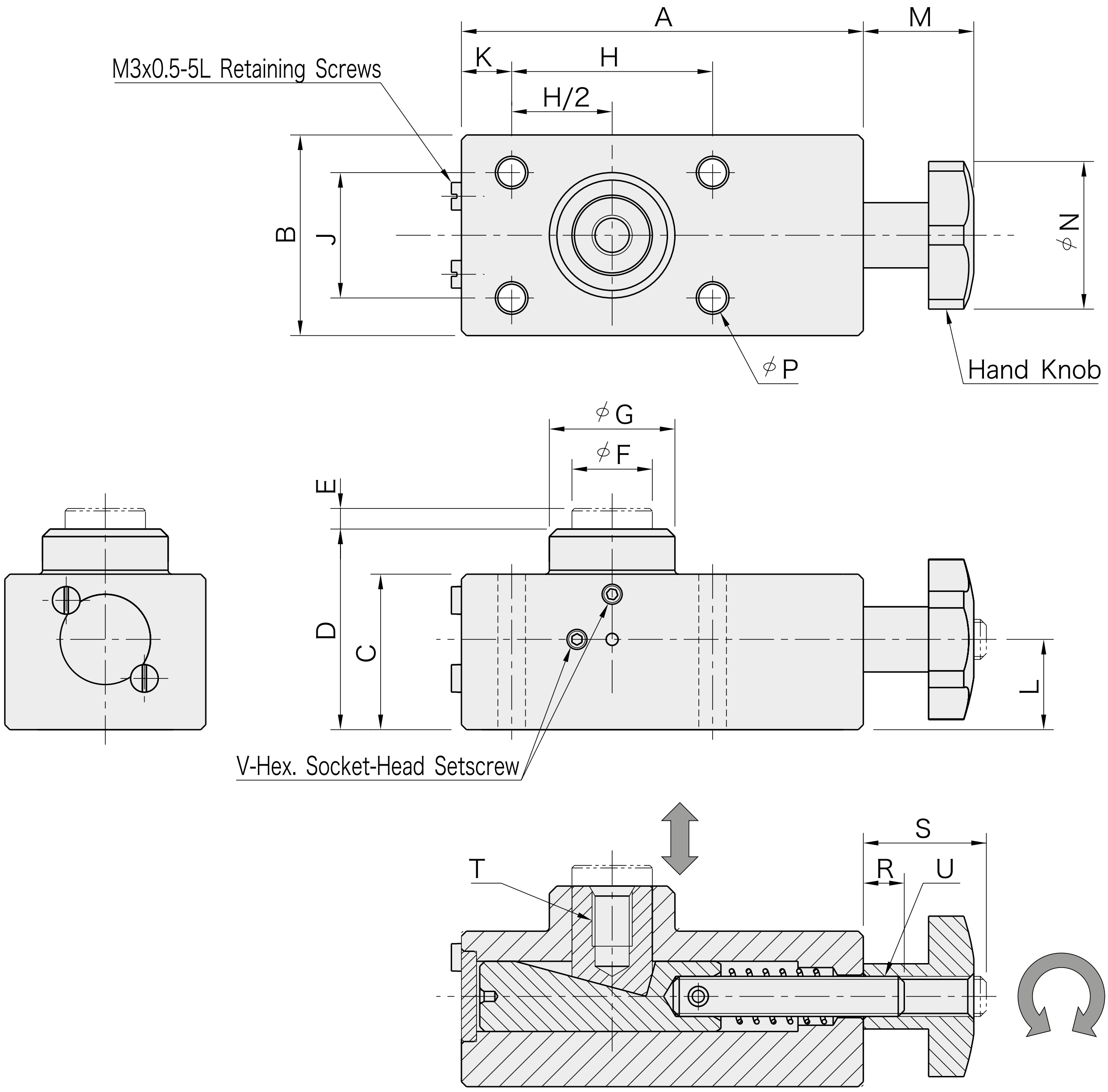
[Body]
Material: S45C steel
Finish : Black oxide

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

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

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

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



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

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

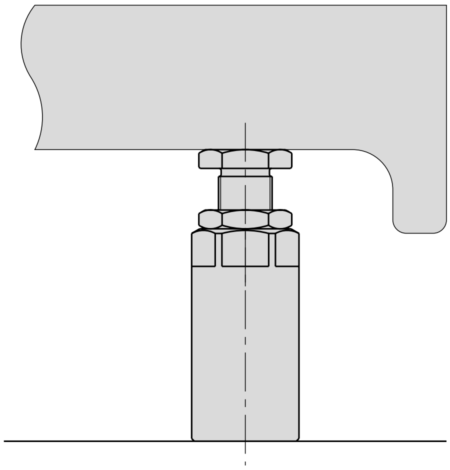
Part Number	T	U	V	Support Capacity(N)	Allowable Screw Torque (N·m)	Weight (kg)
51991709	M 8x1.25 12 deep	M 8x1.25	M4x0.7-10L	700	1	0.82
51991710	M10x1.5 15 deep	M10x1.5	M4x0.7-10L	800	1.5	1.52
51991711	M12x1.75 18 deep	M12x1.75	M5x0.8-16L	900	2	2.67

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

How To Use

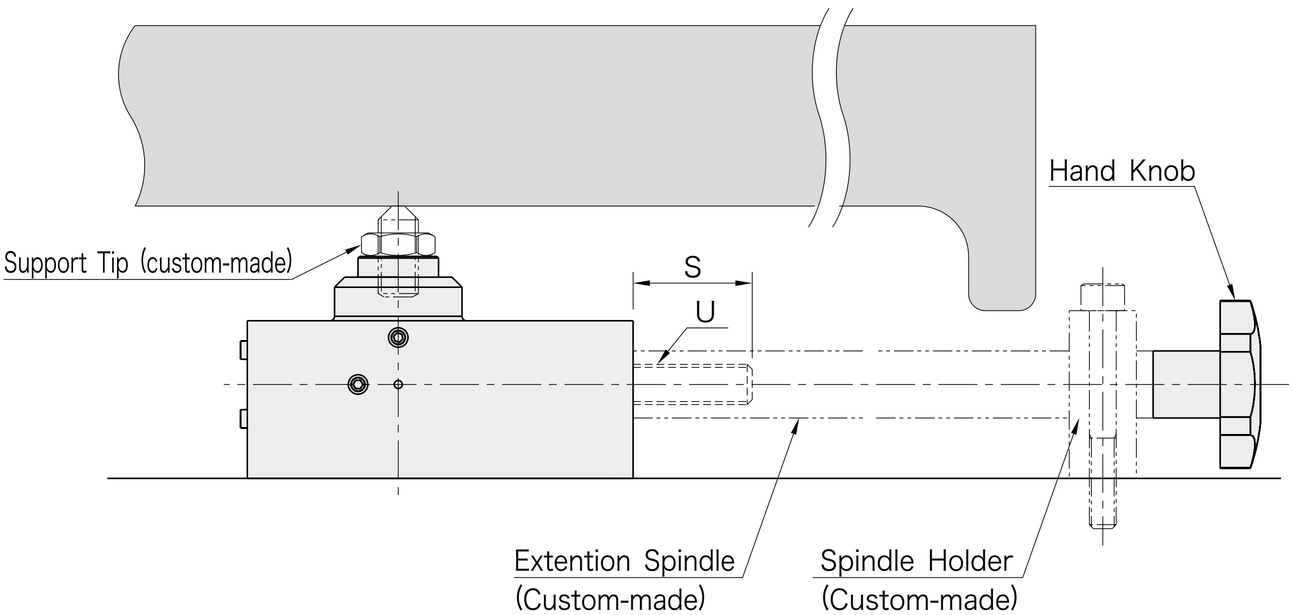
Conventional Method

Cumbersome height adjustment with a wrench
Limited positioning area



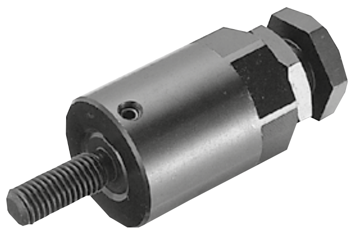
Extendable Work Support Method

Easy height adjustment with a hand knob
Flexible positioning



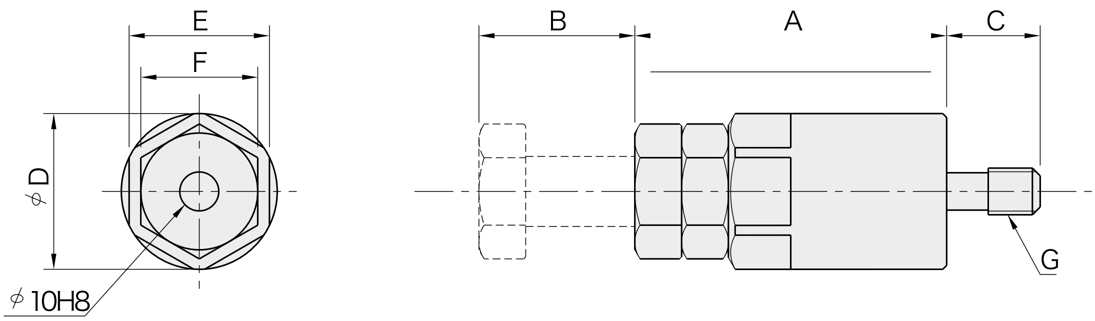
·Connecting an extention spindle allows adjusting the part height with ease.
·Provide a tapped hole for the extention spindle for connection, as specified in chart above.

BJ330 SCREW JACKS



[Body]
Material:S45C steel
Black oxide finish

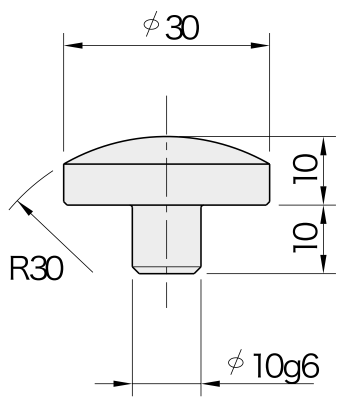
[Bolt]
Material:SCM435 steel
Heat treated
Black oxide finish



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

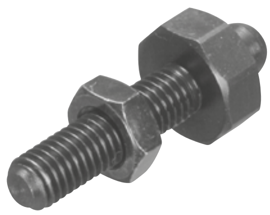
BJ733 SCREW-JACK TIP

Material:S45C steel
Heat treated
Black oxide finish

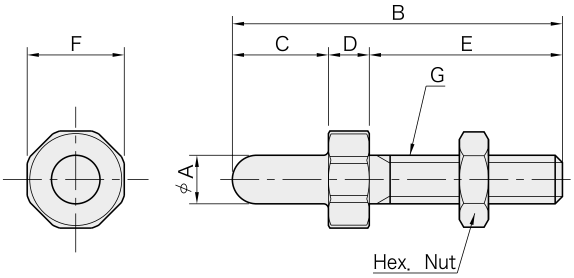


Part Number	Weight (g)
51991722	50

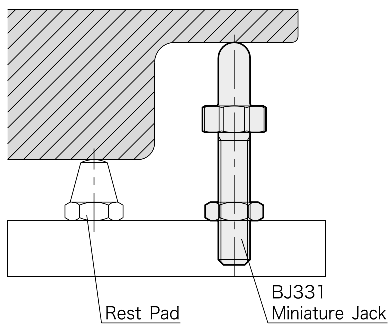
BJ331 MINIATURE JACKS



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

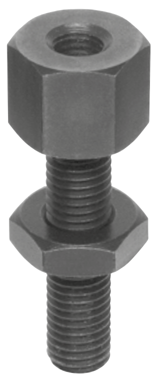


How To Use

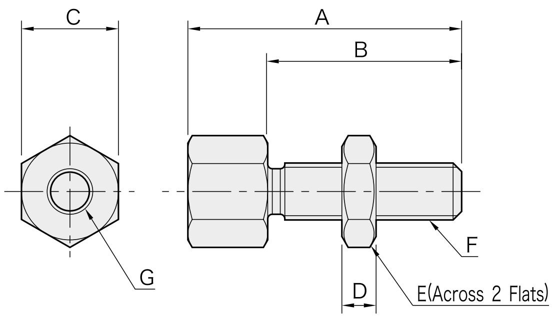


Part Number	A	B	C	D	E	F	G	Weight (g)
51991161	6	37	6	6	25	13	M 6x1	11
51991162		43	12					13
51991163	8	45	8	7	30	17	M 8x1.25	40
51991164		53	16					45
51991165	10	58	10	8	40	19	M10x1.5	60
51991166		68	20					65
51991167	12	72	12	10	50	24	M12x1.75	110
51991168		84	24					120
51991169	16	89	16	13	60	30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

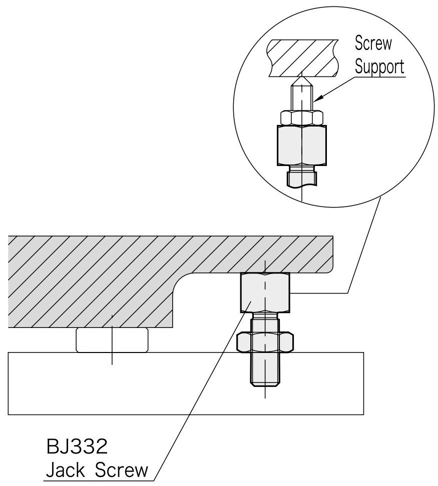
BJ332 JACK SCREWS



Material: S45C steel
Finish : Black oxide



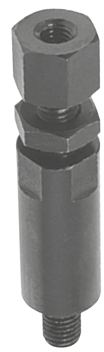
How To Use



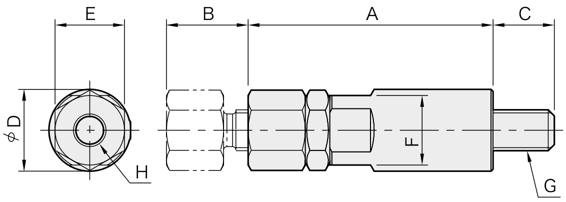
Part Number	A	B	C	D	E	F	G	Weight (g)
51991173	30	20	13	5	13	M 8x1.25	M 6x1 6 deep	20
51991174	40	30						25
51991175	38	24	17	6	17	M10x1.5	M 8x1.25 8 deep	45
51991176	48	34						50
51991177	51	33	22	7	22	M12x1.75	M10x1.5 10 deep	95
51991178	66	48						110
51991179	62	40	27	10	27	M16x2	M12x1.75 12 deep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

14

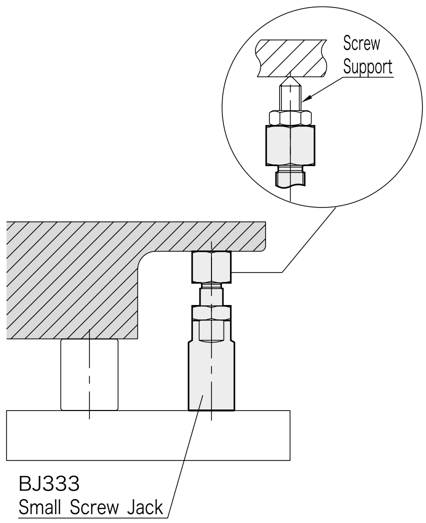
BJ333 SMALL SCREW JACKS



Material: S45C steel
Finish : Black oxide



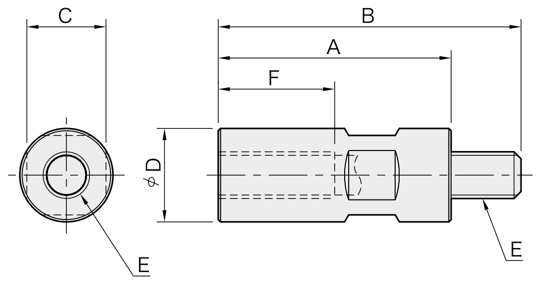
How To Use



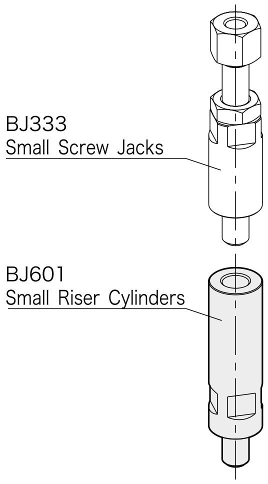
Part Number	A	B	C	D	E	F	G	H	Weight (g)
51991181	40	10	12	16	13	13	M 8 x1.25	M 6x1 6 deep	55
51991182	50	20							70
51991183	50	10	14	20	17	17	M10x1.5	M 8x1.25 8 deep	110
51991184	60	20							135
51991185	65	15	19	24	22	22	M12x1.75	M10x1.5 10 deep	220
51991186	80	30							275
51991187	80	15	24	32	27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

BJ601 SMALL RISER CYLINDERS

Material: S45C steel
Finish : Black oxide



How To Use

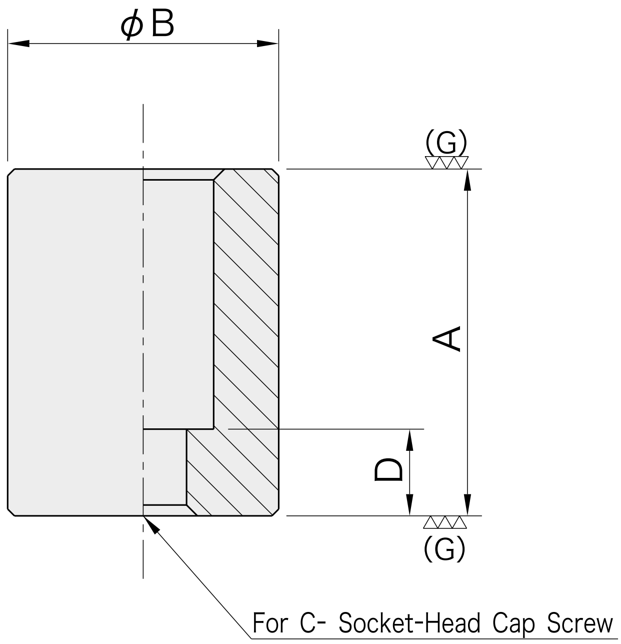


Part Number	A	B	C	D	E	F	Weight (g)
51991189	32	44	13	16	M 8X1.25	18	45
51991190	40	52				20	55
51991191	50	62					70
51991192	65	77					90
51991193	80	92					115
51991194	100	112					145
51991195	40	54	17	20	M10X1.5	23	85
51991196	50	64				25	105
51991197	65	79					145
51991198	80	94					180
51991199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

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

BJ300 SUPPORT CYLINDERS

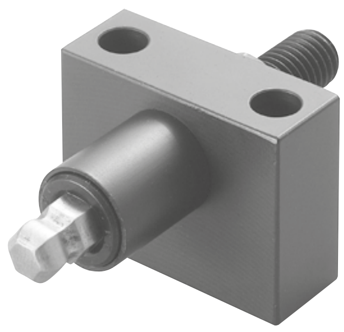
Material:S45C steel
Heat treated
Black oxide finish
Precision ground
Hardness:RC39 - 45



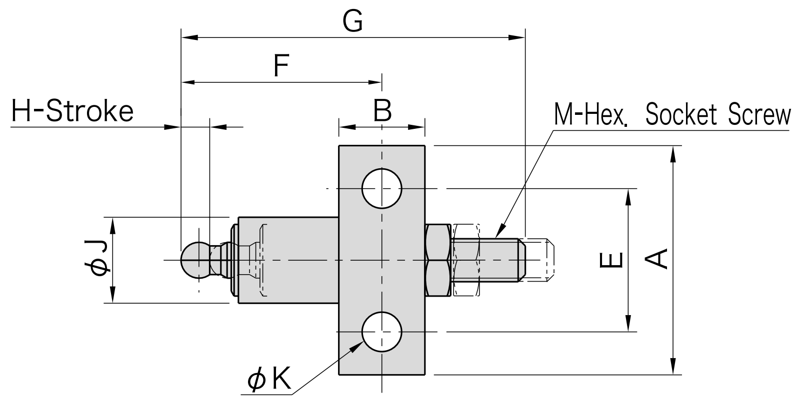
Part Number	A (±0.01)	B	C	D	Weight (g)
51991723	16	25	M 8	7	47
51991724	20				58
51991725	25				71
51991726	32				89
51991727	40				110
51991728	50				136
51991729	20	32	M10	9	97
51991730	25				120
51991731	32				151
51991732	40				186
51991733	50				229
51991734	63				287
51991735	20	40	M12	7	160
51991736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

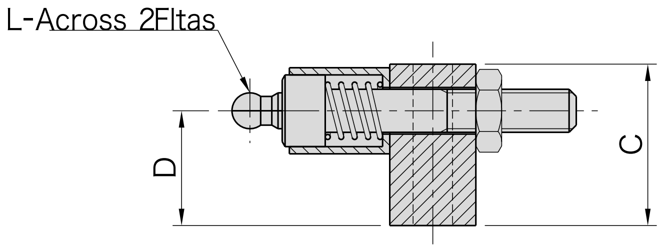
14

BJ650 REMOTE-CONTROL UNITS



Material: S45C steel
Finish : Black oxide





Short

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

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

Tall

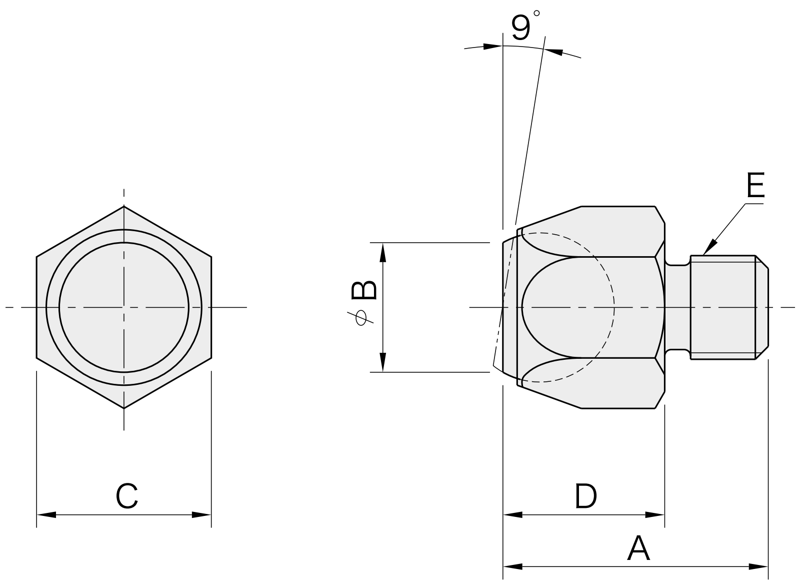
Part Number	A	B	C	D	E	F	G	H	J	K
51991756	32	12	26	20	20	30	48	4	12	5.5
51991757	32	12	33	25.2	20	34	57	4	15	5.5
51991759	44	16	49	38.2	30	50	86	5	20	9
51991760	44	16	54	43.7	30	50	86	5	20	9

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

BJ730 SWIVEL CONTACT BOLTS

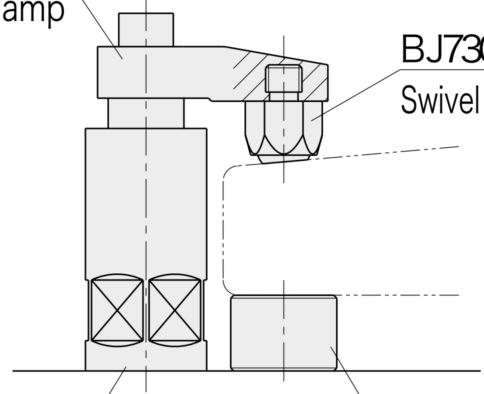
[Body]
Material:S45C steel
Heat treated (M6&M8 sizes)
Black oxide finish

[Ball]
Material:SUJ2
Heat treated



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

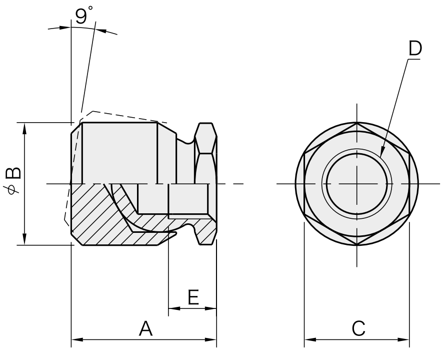
Application Example



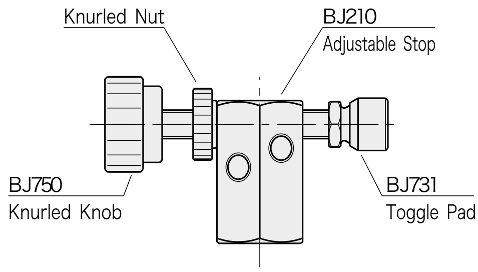
・Use to clamp from above and/or below a workpiece.
・Ball swivel is not limited.

BJ731 TOGGLE PADS

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



Application Example

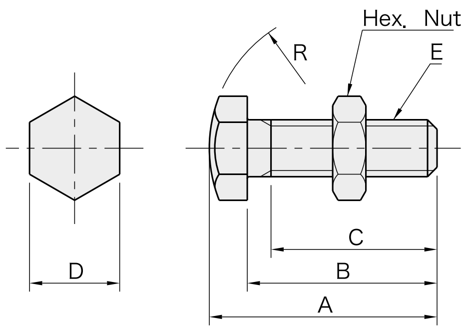


Use to distribute clamping pressure to irregular workpiece surfaces.

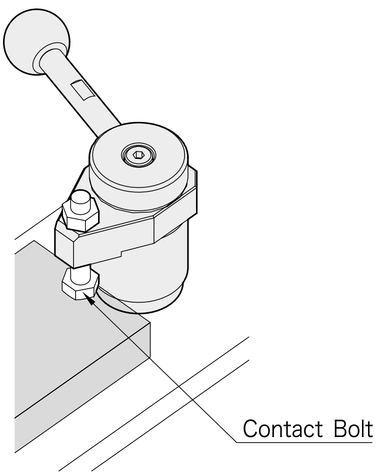
Part Number	A	B	C	D	E	Load Capacity(N)		Weight (g)
						Static	Repeated	
51991775	17	15	13	M 8x1.25	6	8,000	5,300	18
51991776	25	22	19	M12x1.75	8	15,900	10,600	60
51991777	33	28	24	M16x2	10	26,700	17,800	130

BJ732 CONTACT BOLTS

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



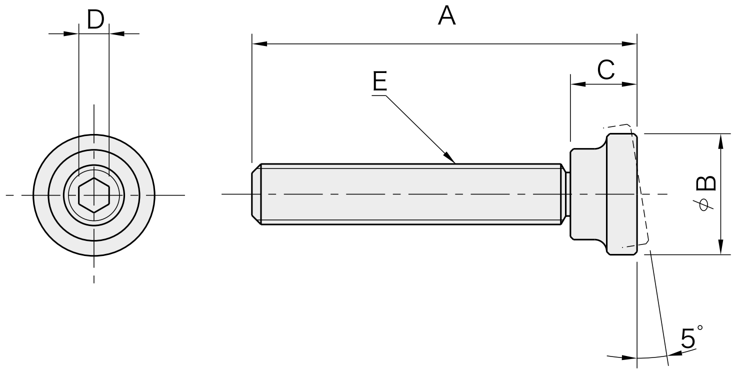
Application Example



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

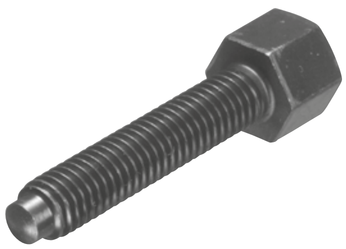
BJ746 SOCKET TOGGLE SCREWS

Material:S45C steel
Heat treated
Black oxide finish

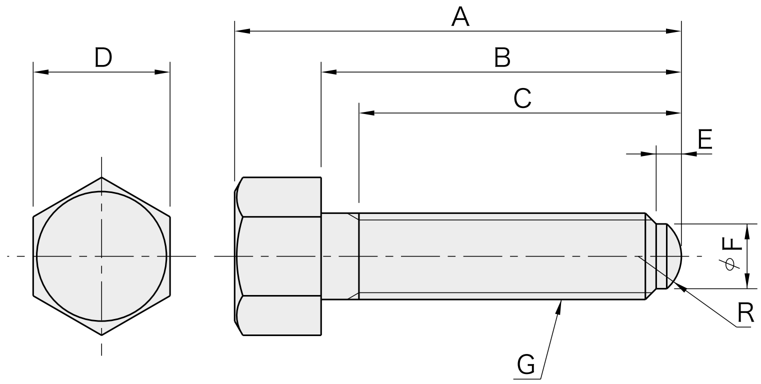


Part Number	A	B	C	D	E	Weight (g)
51991780	43	16	9	4	M 8x1.25	28
51991781	63					37
51991782	83					46
51991783	64	20	11	5	M10x1.5	50
51991784	84					60
51991785	104					70
51991786	65	25	13	6	M12x1.75	75
51991787	85					95
51991788	105					110
51991789	130					130
51991790	85	32	15	8	M16x2	170
51991791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

BJ748 CLAMP SCREWS



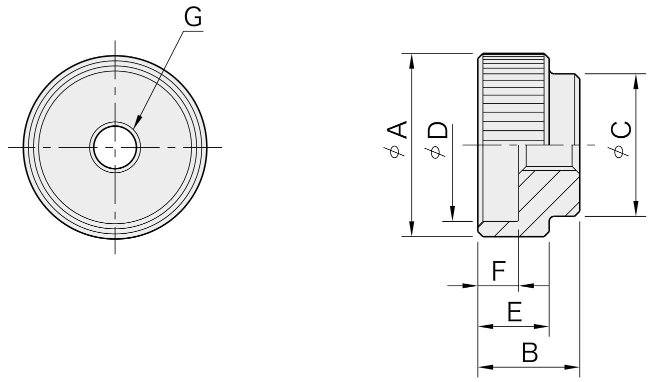
Material:SCM435 steel
Heat treated
Black oxide finish
Hardness:RC33 - 39



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

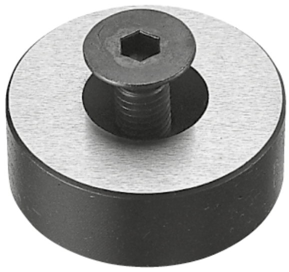
BJ750 KNURLED KNOBS

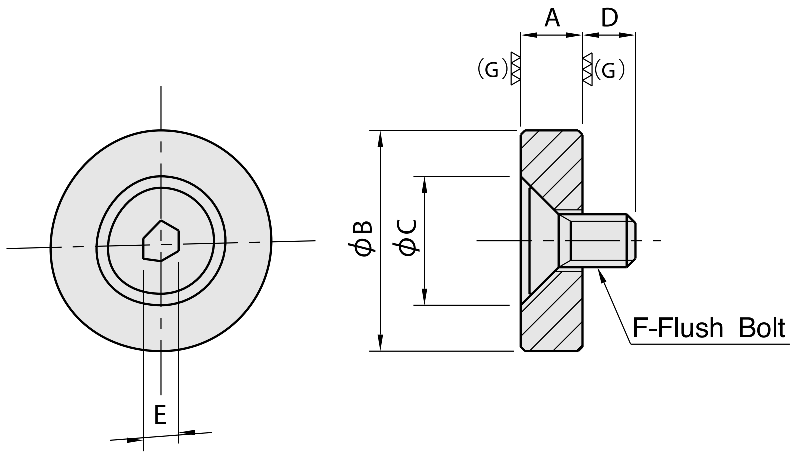
Material:S45C steel
Finish :Black oxide



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

BJ763 FLAT FEET

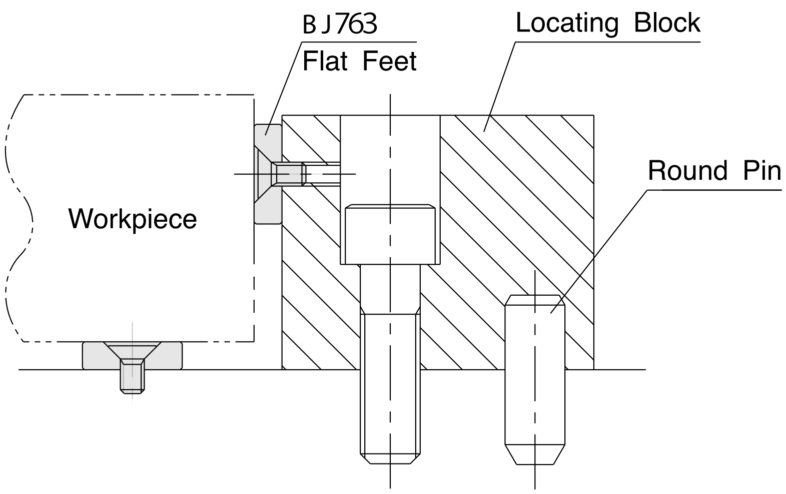




- Material：S45C steel
- Heat treated
- Black oxide finish
- Precision ground
- Hardness：RC39 to 45

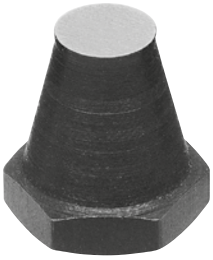
Code	A ($^{+0.01}_{0}$)	φB	φC	D	E	F	Weight (g)
51 99 18 67	5	25	14	7.7	4	M6× 1	20
51 99 18 68		30					30
51 99 18 69		35					40
51 99 18 70	10	25		10.7			40
51 99 18 71		30					60
51 99 18 72		35					80
51 99 18 73	10	30	19.4	11.3	5	M8× 1.25	60
51 99 18 74		35					80
51 99 18 75		40					100
51 99 18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

■Application Example

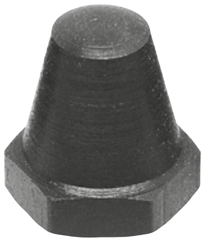


Precision locator that keeps workpieces machined surfaces out of damage.
The accuracy of a locating block with Flat Feet installed can easily be compensated by regrinding the feet.

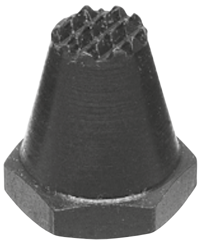
BJ810 REST PADS



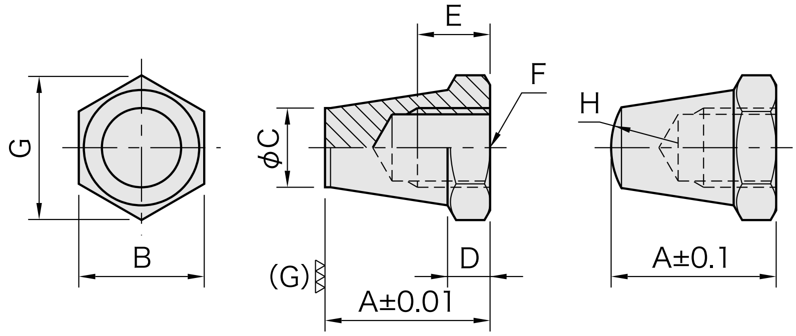
(Ground)



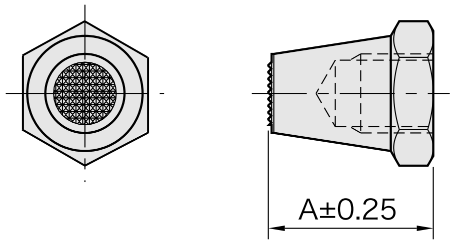
(Round)



(Serrated)



(Ground) (Round)



(Serrated)

Material&finish

Steel (S15C)
Carburized-hardened
Black oxide finish

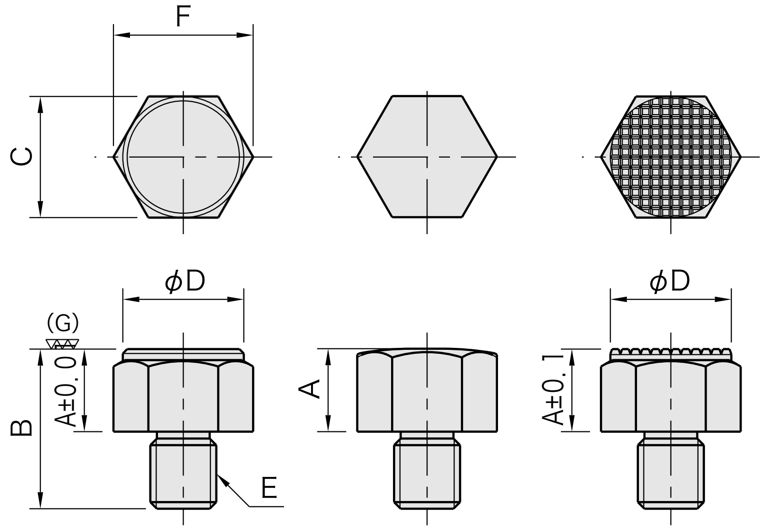
Ground code	Round code	Serrated code	A	B	C	D	E	F	G	H	Weight (g)
51 99 18 79	51 99 18 80	51 99 18 81	12.5	11	6	3	4	M 6×1	12.7	5	5
51 99 18 82	51 99 18 83	51 99 18 84	25				7				8
51 99 18 85	51 99 18 86	51 99 18 87	15	13	8	4	6	M 8×1.25	15	8.5	9
51 99 18 88	51 99 18 89	51 99 18 90	30				9				18
51 99 18 91	51 99 18 92	51 99 18 93	20	17	10	5	9	M10×1.5	19.6	9	17
51 99 18 94	51 99 18 95	51 99 18 96	40				13				35
51 99 18 97	51 99 18 98	51 99 18 99	25	19	12	6	11	M12×1.75	21.9	12.8	25
51 99 19 00	51 99 19 01	51 99 19 02	50				16				62

BJ811 SCREW REST BUTTONS

(Ground)

(Round)

(Serrated)



(Ground) (Round) (Serrated)

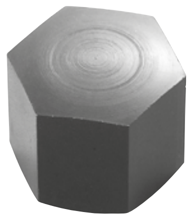
Material&finish

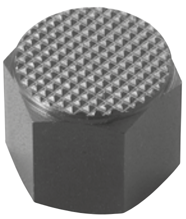
Steel (SUM22L)
Carburized - hardened
Black oxide finish

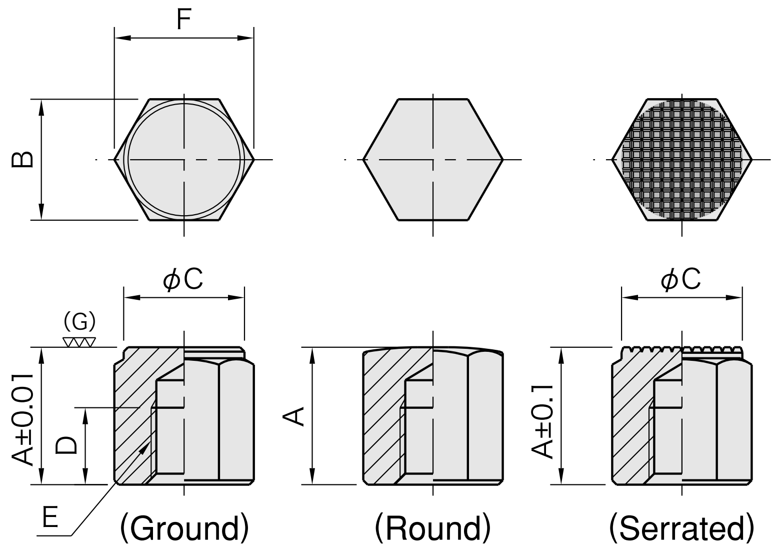
Ground code	Round code	Serrated code	A	B	C	D	E	F	Weight (g)
51 99 19 03	51 99 19 04	51 99 19 05	10	20	17	17	M 8×1.25	19.4	24
51 99 19 06	51 99 19 07	51 99 19 08		24	22	22	M12×1.75	25.2	40
51 99 19 09	51 99 19 10	51 99 19 11	15	29					56

BJ812 REST BUTTONS


(Ground)


(Round)


(Serrated)

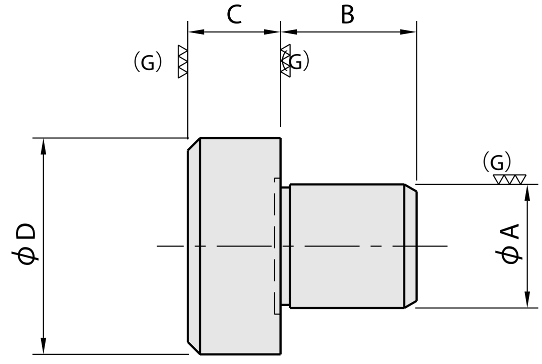


Material&finish
Steel（SUM22L） Carburized-hardened Black oxide finish

Ground code	Round code	Serrated code	A	B	C	D	E	F	Weight (g)
51 99 19 12	51 99 19 13	51 99 19 14	15	17	17	6	M 8×1.25	19.4	23
51 99 19 15	51 99 19 16	51 99 19 17	25			16			40
51 99 19 18	51 99 19 19	51 99 19 20	20	22	22	10	M12×1.75	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

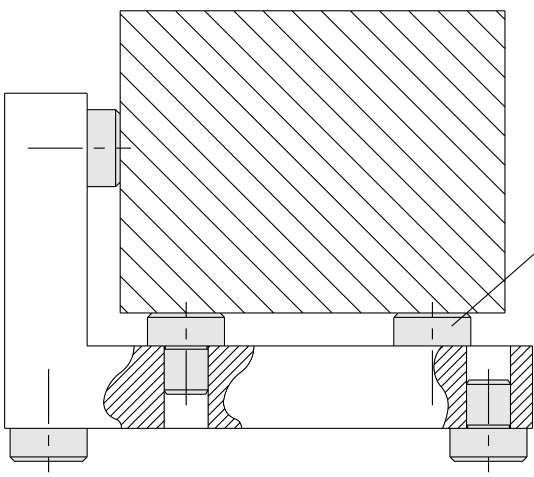
BJ769 REST BUTTONS

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

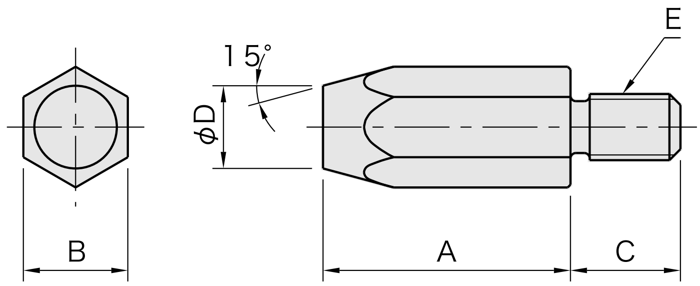


Part Number	ϕA (+0.025 +0.012)	B	C (+0.03 0)	ϕD	Weight (g)
51 99 19 33	6	8	5	10	5
51 99 19 34			10		8
51 99 19 35	8	10	5	16	12
51 99 19 36			10		20
51 99 19 37			15		28
51 99 19 38			20		36
51 99 19 39	10	12	10	20	32
51 99 19 40			15		45
51 99 19 41			20		58

Application Example



BJ760 SCREW REST PADS



Material&finish

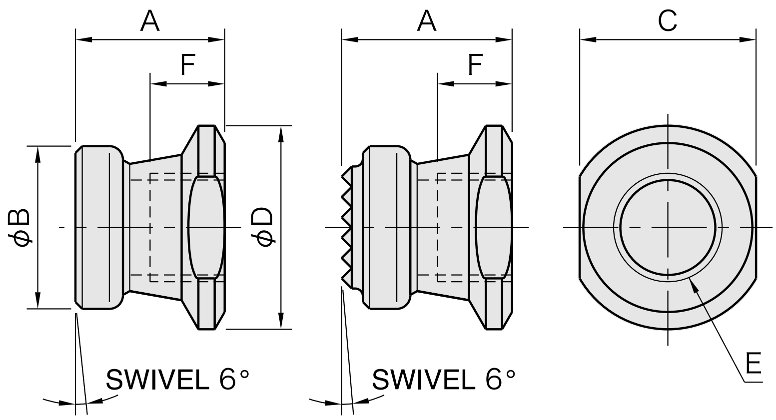
Steel (S45C)
Quenched and tempered
Black oxide finish
Heat treated to Rc33-39

Part Number	A	B	C	D	E	Weight (g)
51 99 19 42	10	10	11	8	M 6×1	6
51 99 19 43	20			6		13
51 99 19 44	15	13	13	10	M 8×1.25	18
51 99 19 45	30			9		33
51 99 19 46	20	17	16	13	M10×1.5	44
51 99 19 47	40					80
51 99 19 48	25	19	20	15	M12×1.75	70
51 99 19 49	50					120

BJ735 TOGGLE PADS

(Plain)

(Serrated)



(Plain) (Serrated)

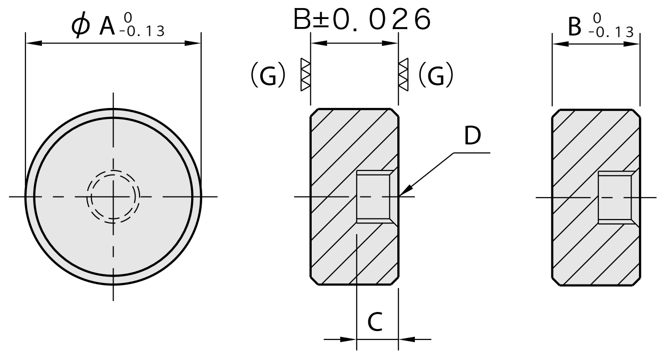
Type	Body	Pad	Insert Tip
Plain	Steel (SCM440) Black oxide finish	Steel (SCM440) Quenched and tempered	-
Serrated		Black oxide finish Heat treated to Rc36-40	Carbide Black oxide finish

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

SRP / DRP REST PADS

(Steel)

(Plastic)

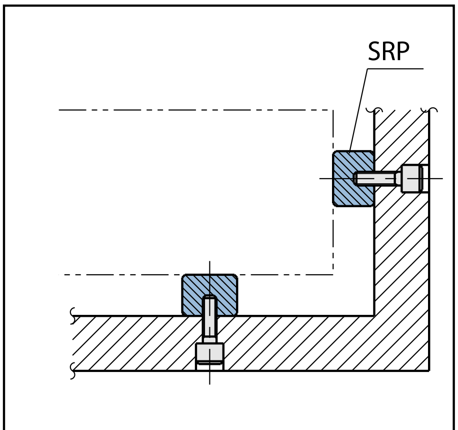


(Steel) (Plastic)

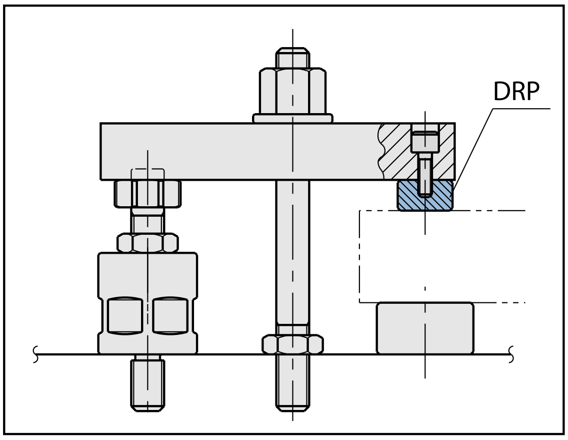
Type	Material & Finish
Steel	Steel (SNCM220) Carburized-hardened Black oxide finish Heat treated to Rc60
Plastic	Polyacetal plastic White

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

Application Examples

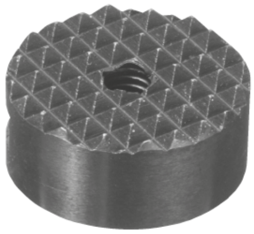


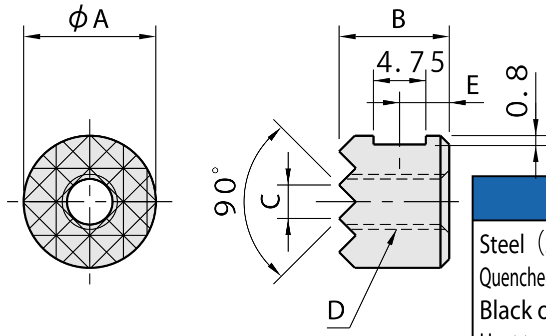
・Workpiece positioning



・Protecting a soft or precision ground workpiece.

HS ROUND GRIPPERS, Tapped

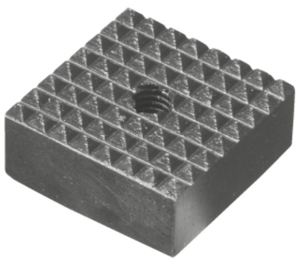


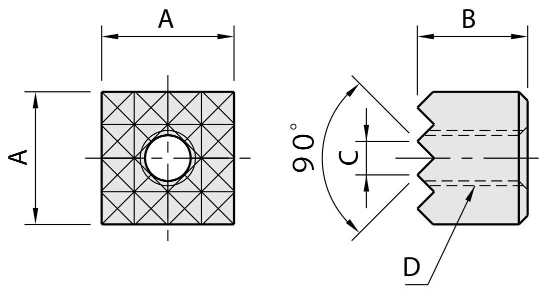


Steel（SKH51 ）
Quenched and tempered
Black oxide finish
Heat treated to Rc62

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

HS SQUARE GRIPPERS, Tapped



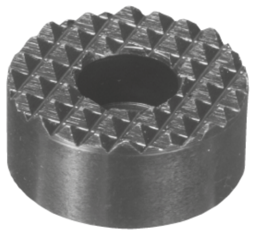


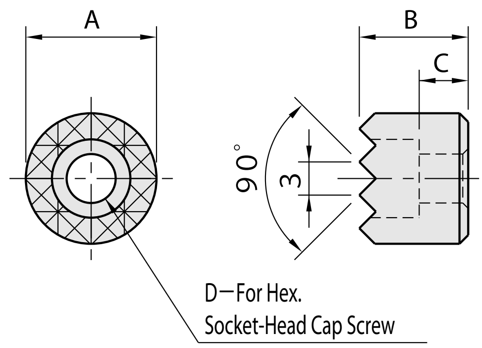
Material & Finish

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

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

HS-C ROUND GRIPPERS, C'Bored

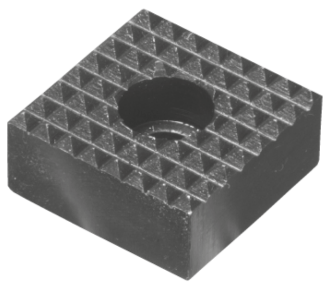


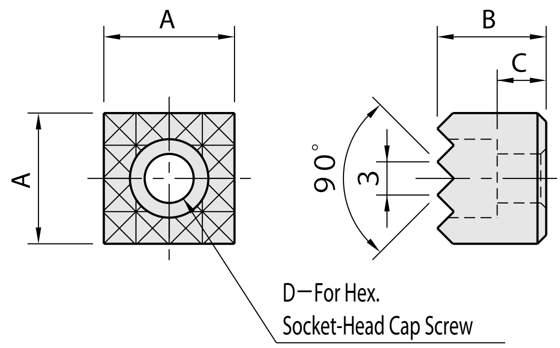


Steel (SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

Part Number	A $\left(^{0}_{-0.13}\right)$	B $\left(^{0}_{-0.13}\right)$	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

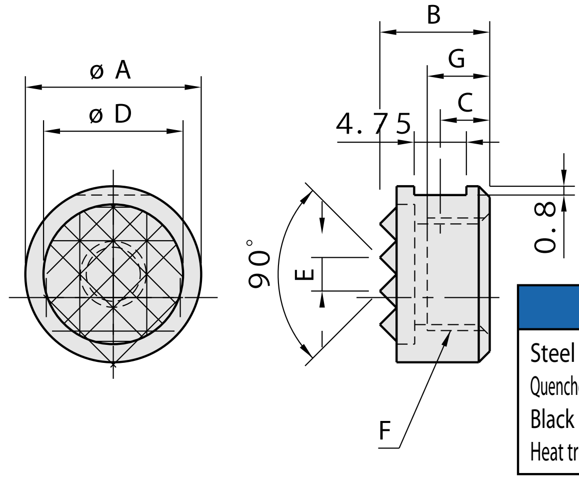




Steel (SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

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

CT ROUND GRIPPERS

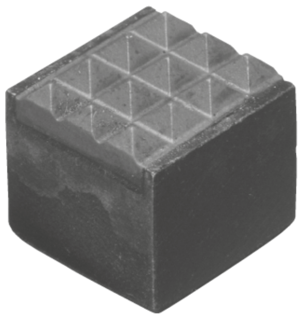


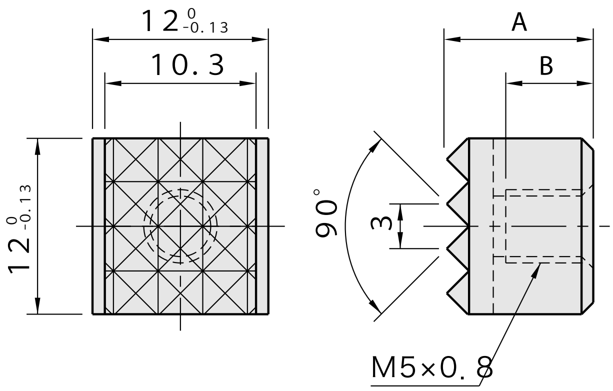
Body	Tip
Steel (SCM440) Quenched and tempered Black oxide finish Heat treated to Rc32	Carbide Black oxide finish

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

14

CT SQUARE GRIPPERS

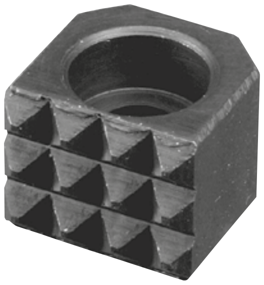


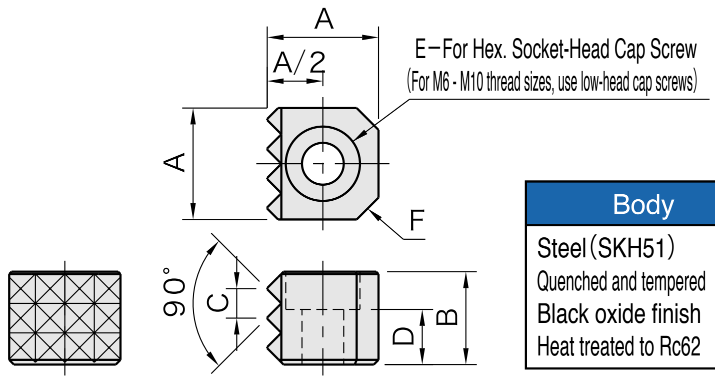


code	A $(^{0}_{-0.13})$	B (Effective Thread Length)	Weight (g)
51 99 20 18	10	6.5	10
51 99 20 19	12	8.5	13

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

HSE EDGE GRIPPERS, Diamond Serration

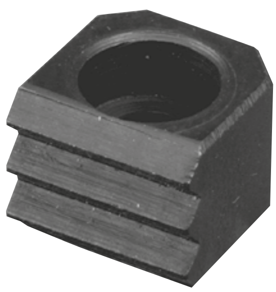


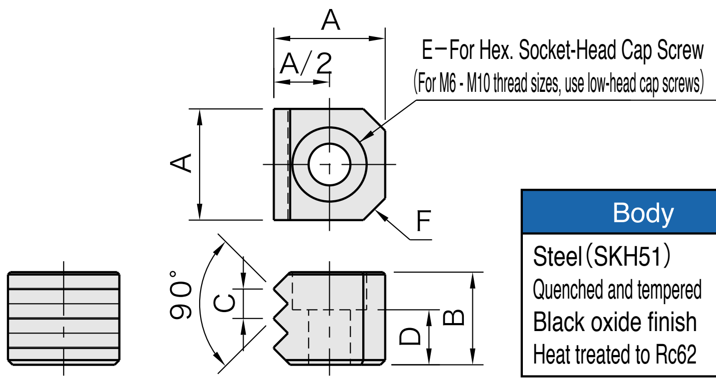


Body
Steel (SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

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

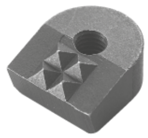
HSE-SS EDGE GRIPPERS, Straight Serration



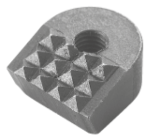


Body
Steel (SKH51)
Quenched and tempered
Black oxide finish
Heat treated to Rc62

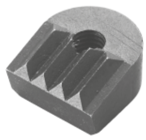
code	A ($^{0}_{-0.13}$)	B ($^{0}_{-0.13}$)	C	D	E	F	Weight (g)
51 99 20 33	10	6	2.3	2.8	M 3	1.6	4
51 99 20 34		10		6.8			6
51 99 20 35	12	6	3	1.9	M 4	2.3	5
51 99 20 36		10		5.9			8
51 99 20 37		12		7.9			10
51 99 20 38	16	6	3	1.8	M 6	3.2	8
51 99 20 39		10		5.8			14
51 99 20 40		12		7.8			18
51 99 20 41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



51 99 20 46

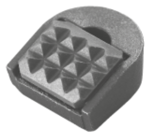


51 99 20 47

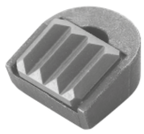


51 99 20 48

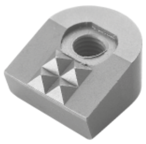
51 99 20 49



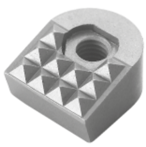
51 99 20 50



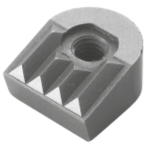
51 99 20 51



51 99 20 52

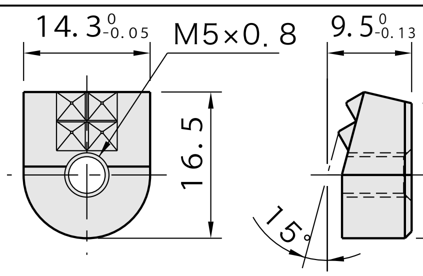


51 99 20 53

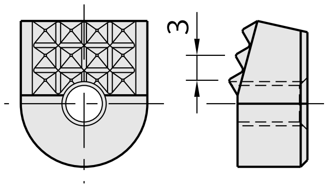


51 99 20 54

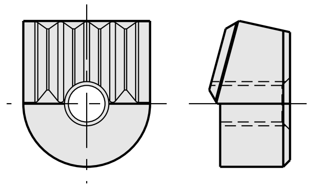
51 99 20 46 51 99 20 47 51 99 20 48	Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc62	
51 99 20 49 51 99 20 50 51 99 20 51	Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc62	Carbide Black oxide finish
51 99 20 52 51 99 20 53 51 99 20 54	Carbide Black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



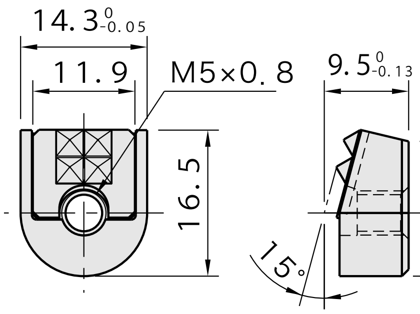
51 99 20 46



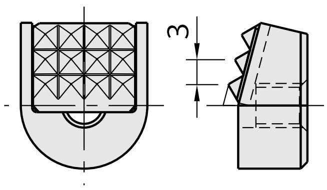
51 99 20 47



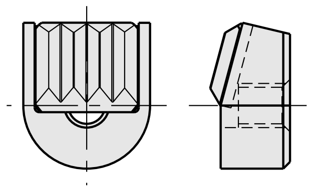
51 99 20 48



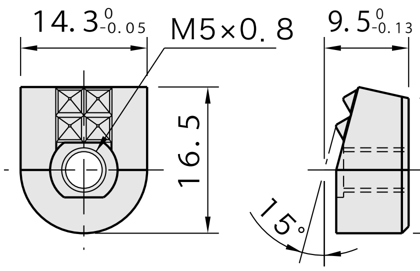
51 99 20 49



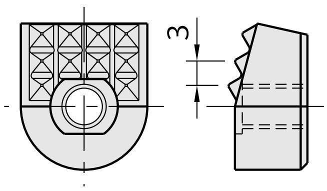
51 99 20 50



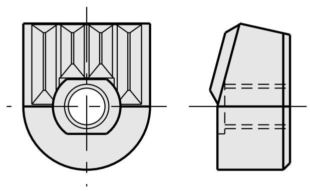
51 99 20 51



51 99 20 52



51 99 20 53



51 99 20 54

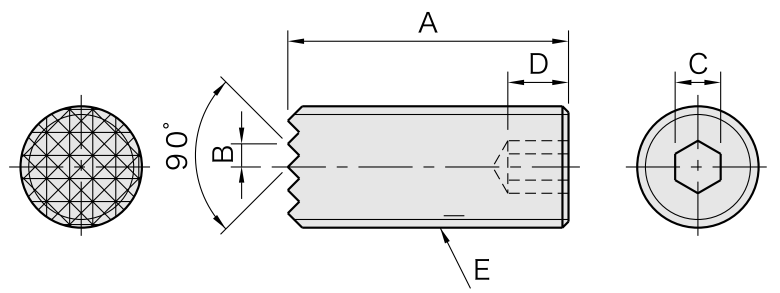
Part Number	Weight (g)
51 99 20 46	11
51 99 20 47	12
51 99 20 48	

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	

14

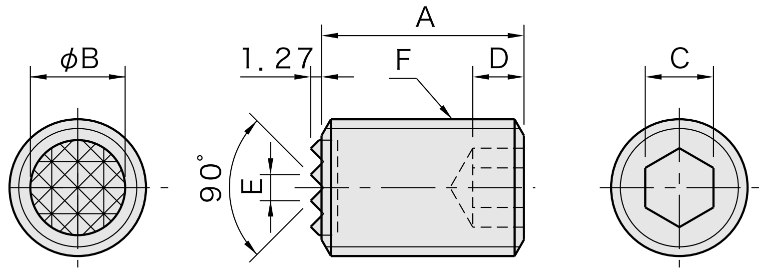
HS SOCKET SCREW GRIPPERS



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

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

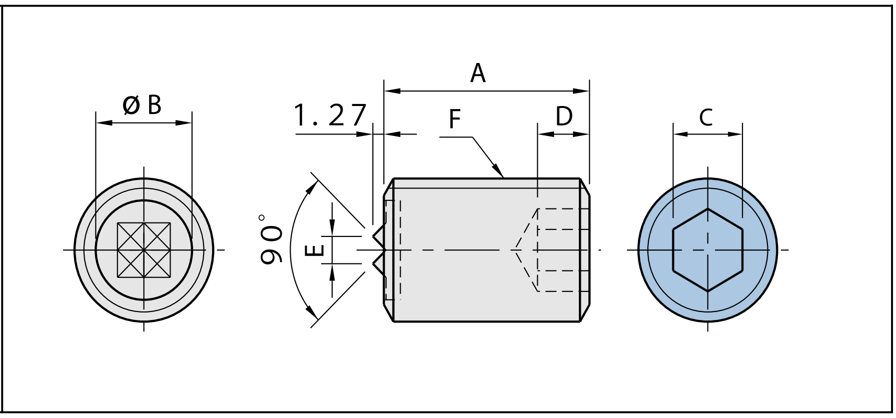
PG TIPPED SOCKET SCREW GRIPPERS



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

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

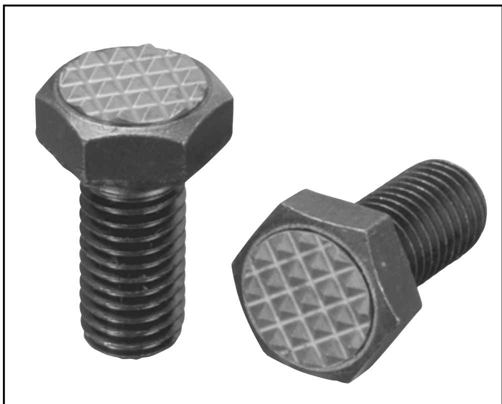
PG TIPPED SOCKET SCREW GRIPPERS

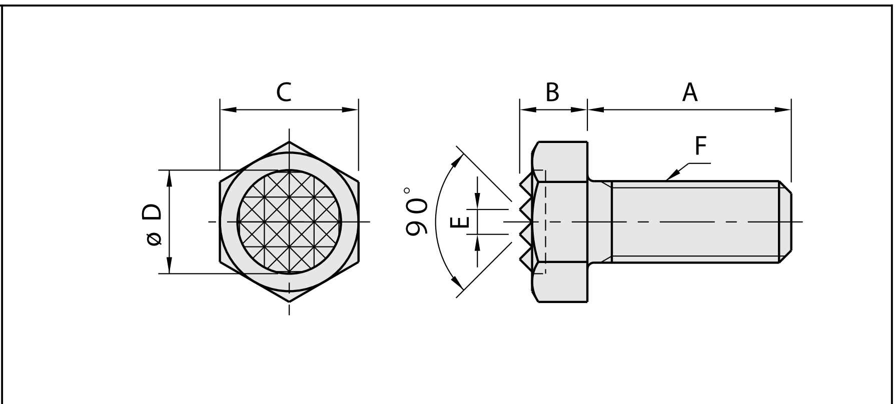


code	A	B	C	D	E	F	Weight (g)
51 99 20 71	25	7.9	6	5	3	M12×1.75	21
51 99 20 72	50						43
51 99 20 73	25	11.1	8	6	3	M16×2	37
51 99 20 74	50						77
51 99 20 75	25	12.7	10	8	3	M20×2.5	57
51 99 20 76	50						119

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

CT HEX-HEAD SCREW GRIPPERS





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

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

BUH HEX-HEAD SWIVEL GRIPPER SCREW

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

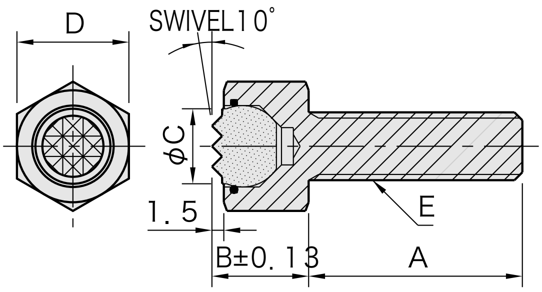
51 99 20 98 - 21 11
(Serrated, Steel Tip)

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

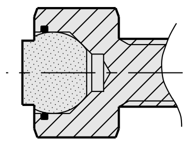
51 99 21 18 - 21 31
(Plain, Steel Tip)

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

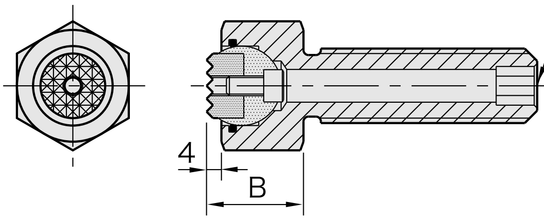
51 99 21 38 - 21 51
(Plain, Plastic Tip)



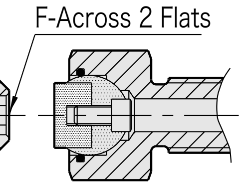
51 99 20 92 - 20 97
(Serrated, Steel Ball)



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



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

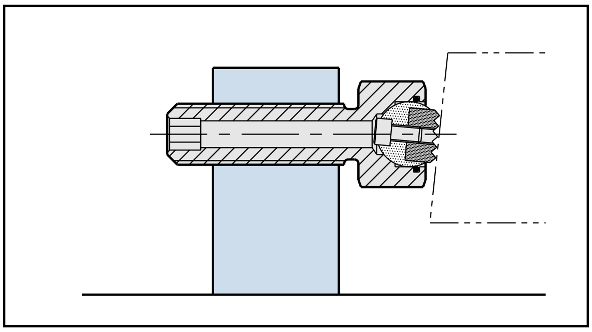


51 99 21 18 - 21 31
(Plain, Steel Tip)
51 99 21 38 - 21 51
(Plain, Plastic Tip)

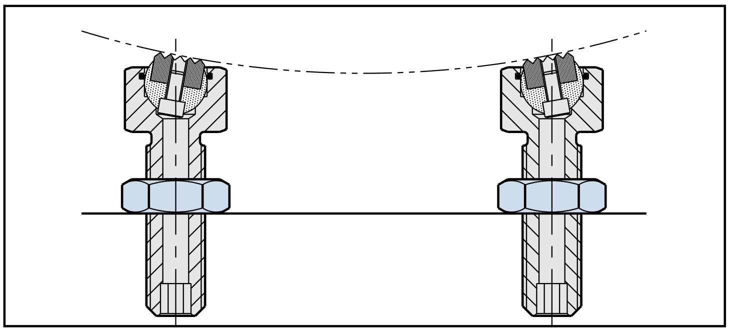
code	Body	Ball	Tip
51 99 20 92 - 20 97 **51 99 21 12 - 21 17**	Steel(SCM440) Quenched and tempered Black oxide finish	Steel(SKH51) Quenched and tempered Black oxide finish Heat treated to Rc60	
51 99 21 32 - 21 37		Polyacetal plastic White	
51 99 20 98 - 21 11		Stainless steel (SUS440)	Steel(SKH51) Quenched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

Serrated (Steel)		Plain (Steel)		Plain (Plastic)		A	B	C	D	E	F	Load Capacity (N)
code	Weight (g)	code	Weight (g)	code	Weight (g)							
51 99 20 92	7	51 99 21 12	7	51 99 21 32	6	12						
51 99 20 93	8	51 99 21 13	8	51 99 21 33	7	25	9.5	6	10	M 6×1	-	5,300
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						
51 99 20 96	18	51 99 21 16	18	51 99 21 36	16	25	13	8.5	13	M 8×1.25	-	10,900
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						
51 99 20 99	33	51 99 21 19	33	51 99 21 39	29	30	17	10	17	M10×1.5	3	18,400
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						
51 99 21 02	65	51 99 21 22	65	51 99 21 42	59	40	19	12	19	M12×1.75	5	24,500
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						
51 99 21 05	117	51 99 21 25	117	51 99 21 45	105	50	23	16	24	M16×2	6	43,600
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						
51 99 21 08	205	51 99 21 28	206	51 99 21 48	186	60	24	20	30	M20×2.5	8	57,700
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	M24×3	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.

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TBU SWIVEL GRIPPER SCREWS

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

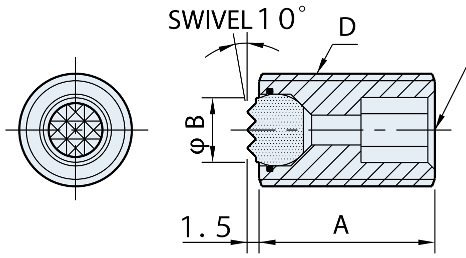
51 99 21 58 - 21 62
(Serrated, Steel Tip)

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

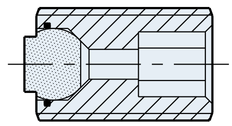
51 99 21 69 - 21 73
(Plain, Steel Tip)

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

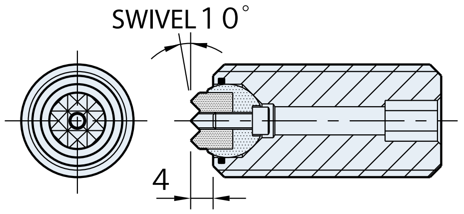
51 99 21 80 - 21 84
(Plain, Plastic Tip)



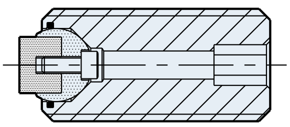
51 99 21 52 - 21 57
(Serrated, Steel Ball)



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



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

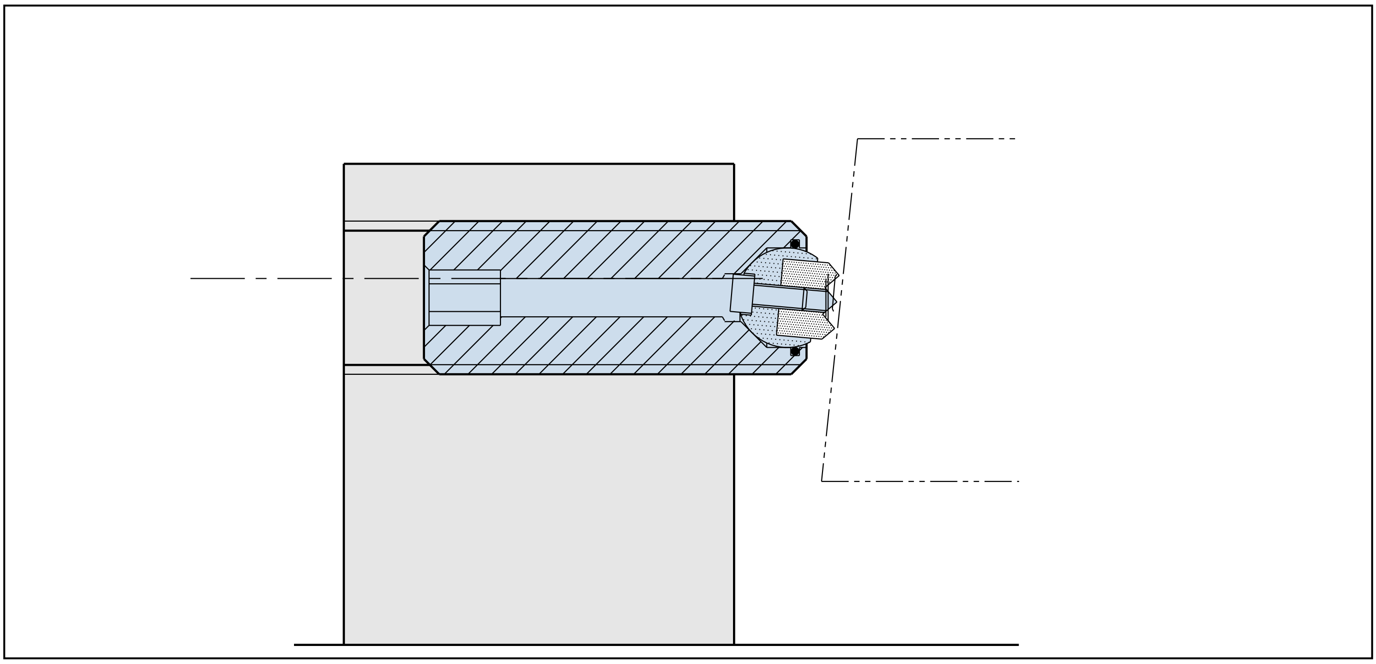


51 99 21 69 - 21 73
(Plain, Steel Tip)
51 99 21 80 - 21 84
(Plain, Plastic Tip)

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

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

Application Example TBU

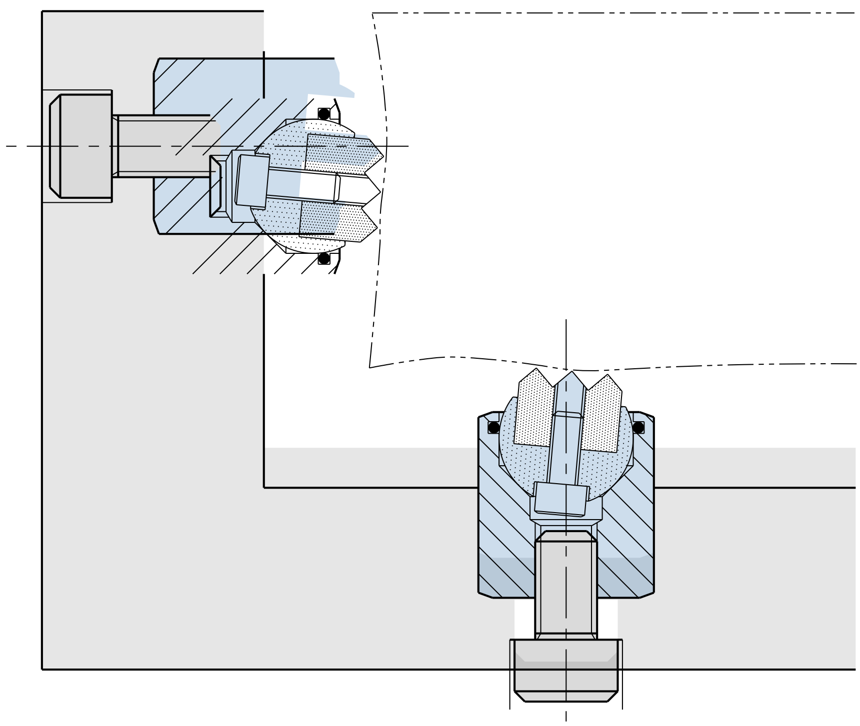


・Ideal for workpiece positioning and positive holding.

How To Install Tip

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

Application Example BBU



・Grippers for better workpiece positioning methods.

How To Install Tip

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

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

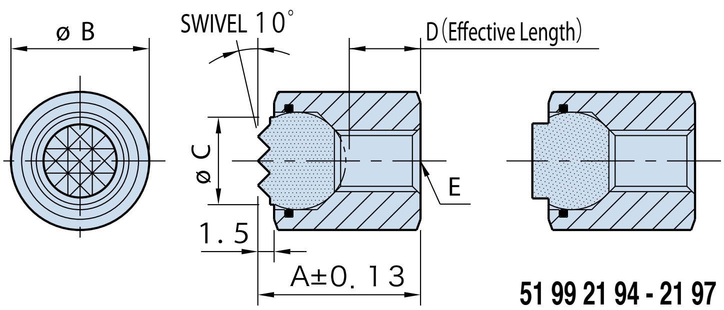
51 99 21 89 - 21 93
(Serrated, Steel Tip)

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

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

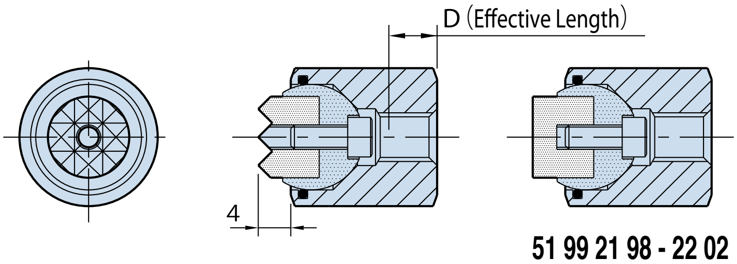
51 99 22 03 - 22 06
(Plain, Plastic Ball)

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



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

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

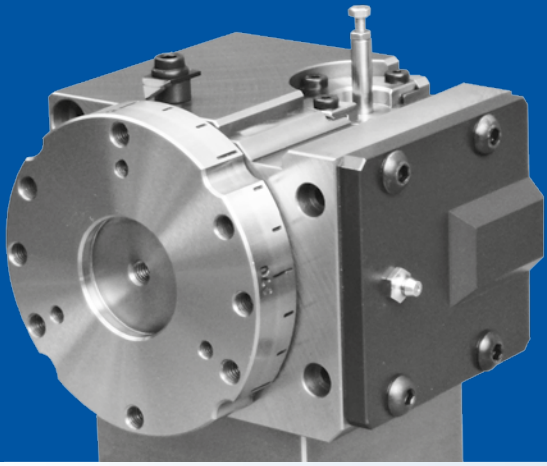


51 99 21 89 - 21 93
(Serrated, Steel Tip)

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

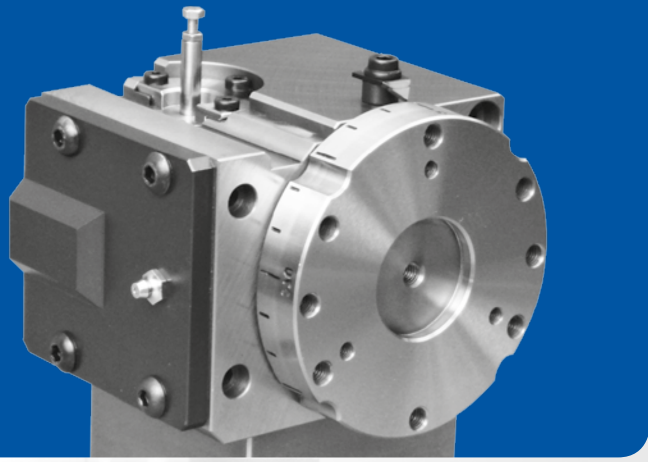
code			
51 99 21 85 - 21 88 **51 99 21 94 - 21 97**	Steel (SCM440) Quenched and tempered Black oxide finish	Steel (SKH51) Quenched and tempered Black oxide finish Heat treated to Rc60	
51 99 22 03 - 22 06		Polyacetal plastic White	
51 99 21 89 - 21 93		Stainless steel (SUS440)	Steel (SKH51) Quenched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

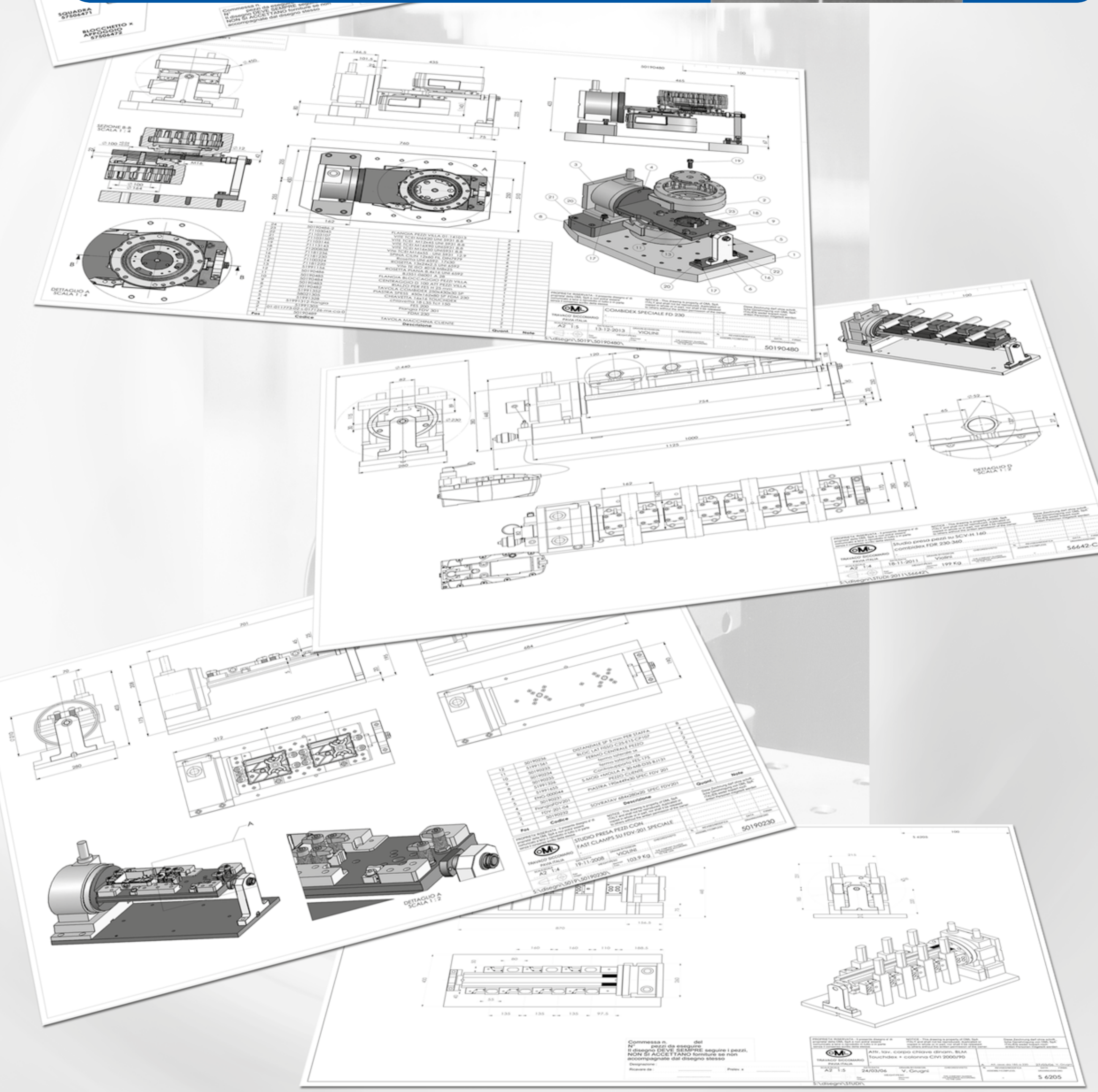
Serrated (Steel)		Plain (Steel)		Plain (Plastic)		A	B	C	D	E	Load Capacity (N)
Part Number	Weight (g)	Part Number	Weight (g)	Part Number	Weight (g)						
51 99 21 85	6	**51 99 21 94**	6	**51 99 22 03**	5	12	10	6	3.5	M 4×0.7	5300
51 99 21 86	13	**51 99 21 95**	13	**51 99 22 04**	12	25			9		
51 99 21 87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



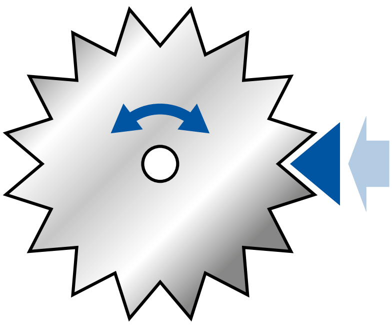
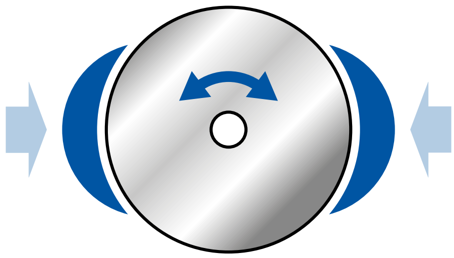
TOUCHDEX
Automatic mechanical indexing tables

TOUCHDEX
Automatic mechanical indexing tables

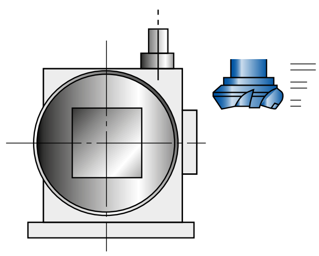
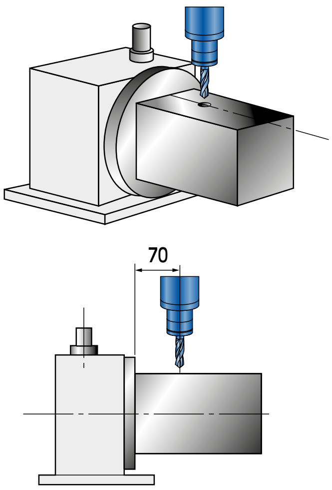
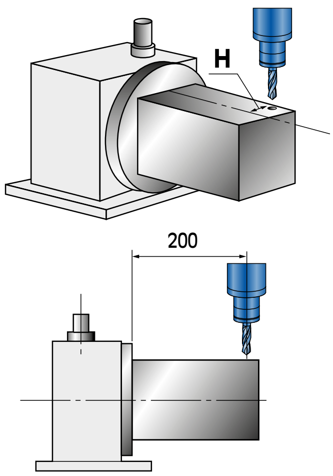


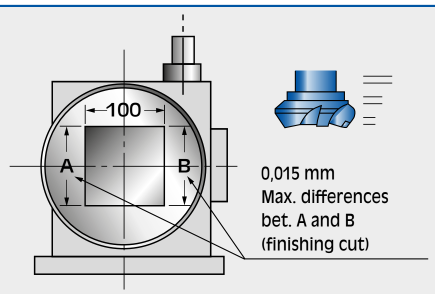


HIGH RIGIDITY AND PRECISION OF THE SYSTEM

TOUCHDEX	CNC System
	
Exclusive Mechanical clamping System "LOCKING PIN"	Traditional braking jaws system

The exclusive TOUCHDEX system provides a clamping force 2 to 3 times that an ordinary index table thus allowing heavy machining.

Example	Face Milling	Drilling	Drilling
Machining S45C Material			
FD-200	∆ 80 Face mill 3 mm (depth of cut) 130 mm/min (Feedrate)	∆ 35 Drill 20 mm/min (Feedrate)	∆ 20 Drill 30 mm/min (Feedrate) H = 80 mm
FD-300	∆ 80 Face mill 3 mm (depth of cut) 130 mm/min (Feedrate)	∆ 40 Drill 20 mm/min (Feedrate)	∆ 25 Drill 30 mm/min (Feedrate) H = 90 mm

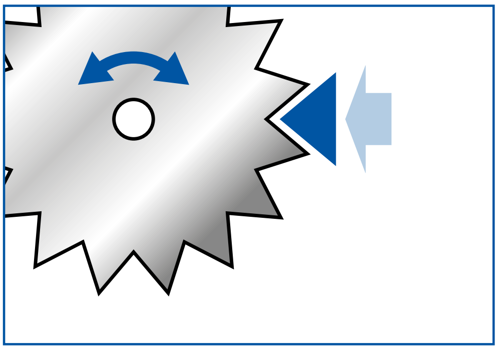


HIGH PRECISION

- **Indexing accuracy of less than 30"**
- **Repeat accuracy ± 3"**

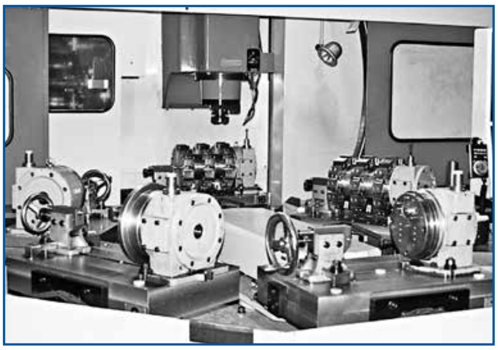
The unique clamping system ensures high accuracy despite locking pin wear, and with 0 backlash for the life of the unit (see example)

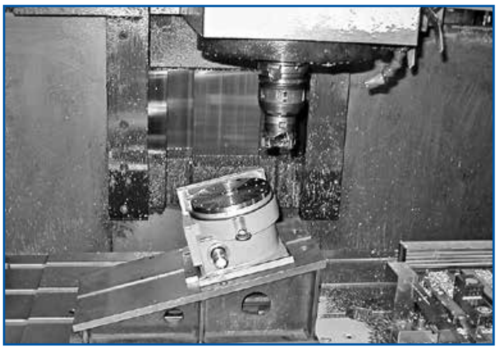
VERSATILITY OF THE SYSTEM

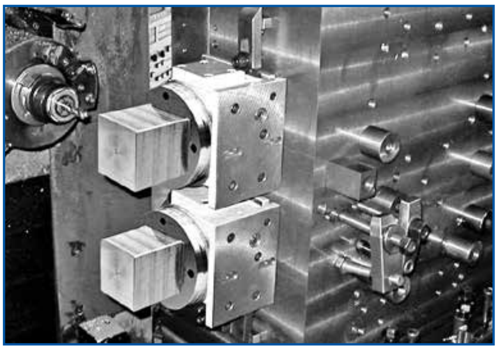


- **Minimum space required**

  Since it has no motorized part, it can be installed in a minimum amount of space

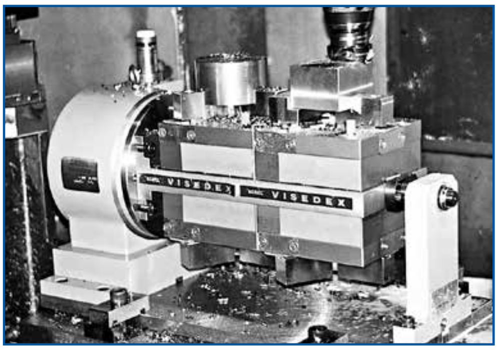


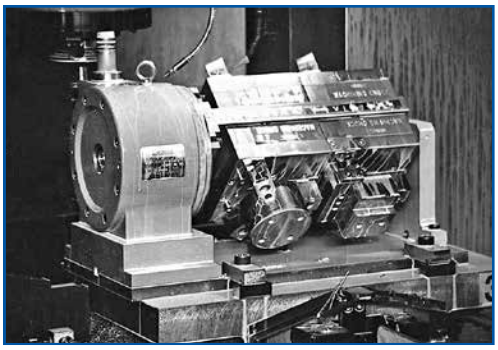


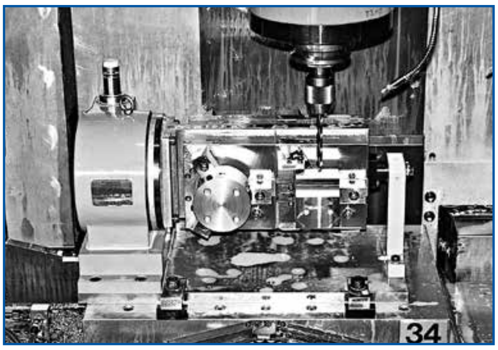


- **Versatility**

  Since it has no electric or pneumatic connections, it can be installed on MULTI-PALLET machining centers either vertical or horizontal with the possibility to create flexible production systems



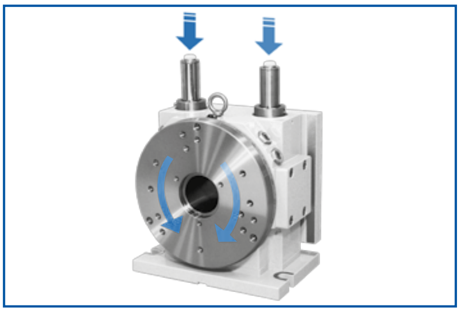




- **Easily mounted**

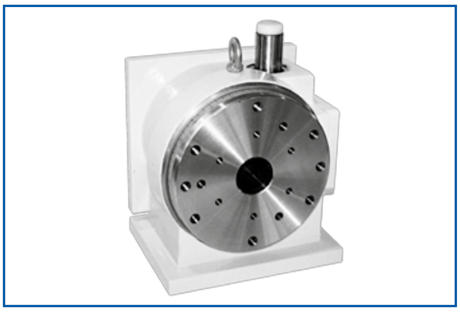
  As a power control cable is not required the displacement from a machining center to another one is very easy

VARIETY OF TOUCHDEX MODELS AVAILABLE

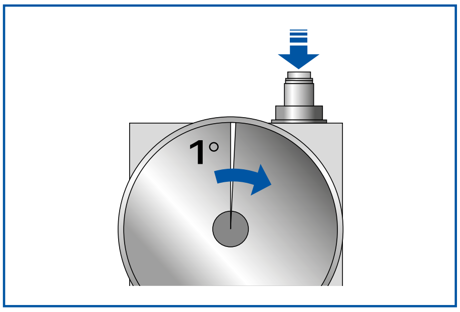


FDR
Indexing and rotation in TWO directions

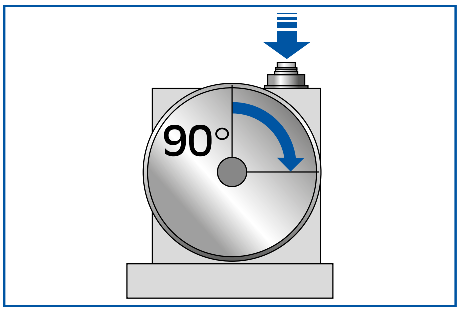
- Left pushbar for counterclockwise
- Right pushbar for clockwise



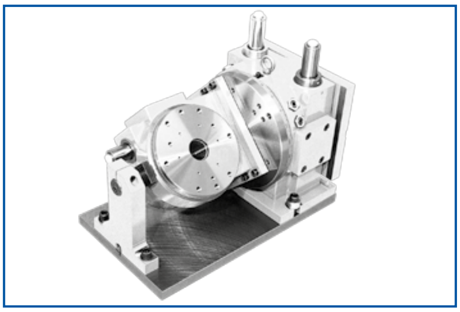
FDM
With the adaption for the installation either in horizontal or in vertical



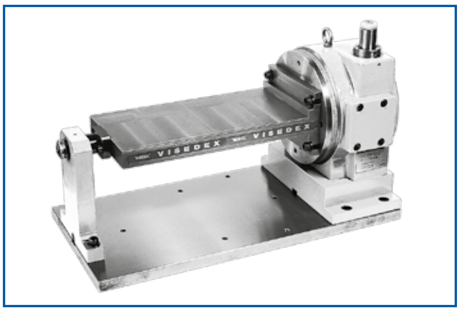
FD - ... - 360
1 deg. Indexing ideal for workpieces of complex shape



FD - ... - 04
90 deg. Indexing rotation per stroke. Pressing the pushbar down one rotate the table by 90 deg. Ideal for square workpieces

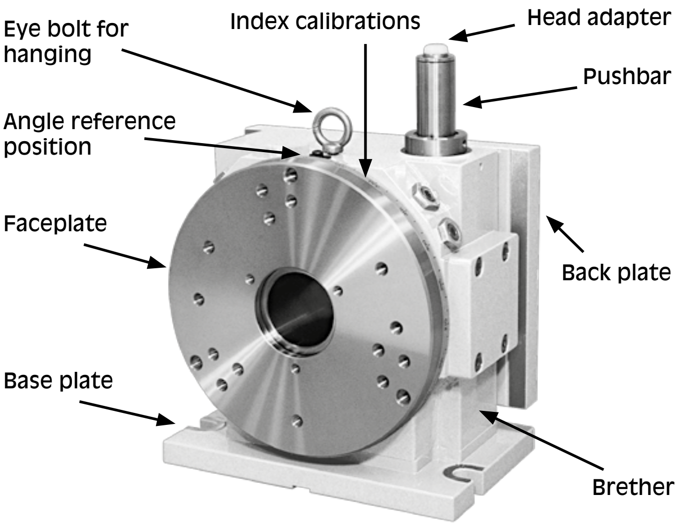


TILTING 230-150
Five-face machining. Integrates FDR-230 and FDM-150 for five-face machining on vertical machining centers

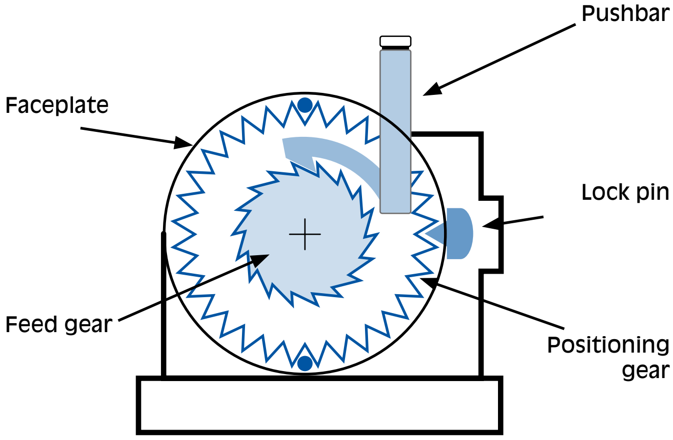


COMBIDEX
Integrates subplate and plate for workholding applications

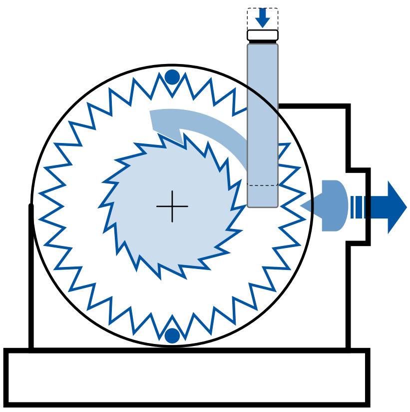
WORKING



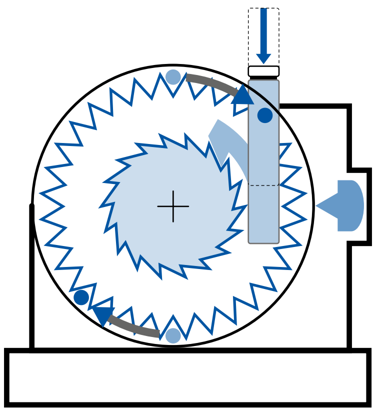
INTERNAL MECHANISM



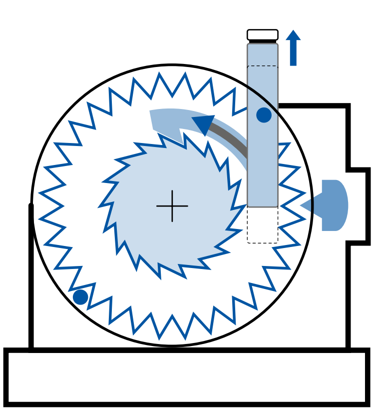
1 Wen the pushbar is pressed down a little, the lock pin retracts due to a grooved cam mechanism.



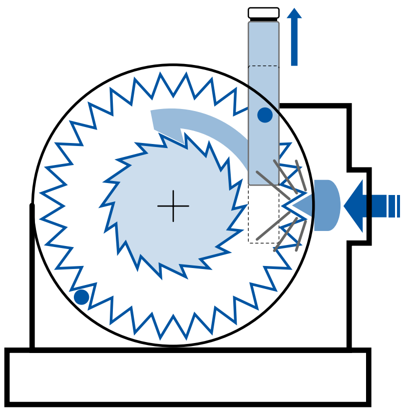
2 When pressed down further, the faceplate begins to rotate.



3 The pushbar returns, but until a certain position is reached the faceplate and the lock pin continue to be as they were.



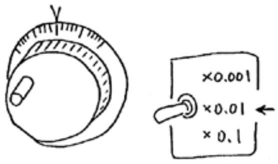
4 When the pushbar reaches the top most position, the lock pin engages with the positioning gear and fixes the table.

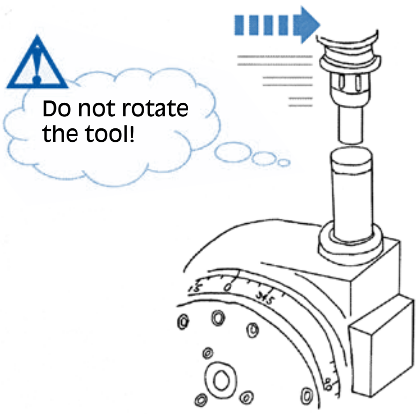


PROGRAMMING

* POSITION *A*

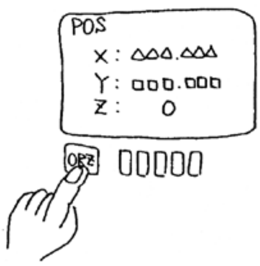
Using handle mode.





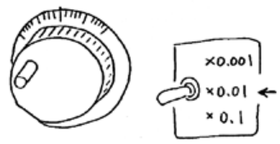
Move the tool over the pushbar, using manual mode.

Read and memory **Z** axis number.

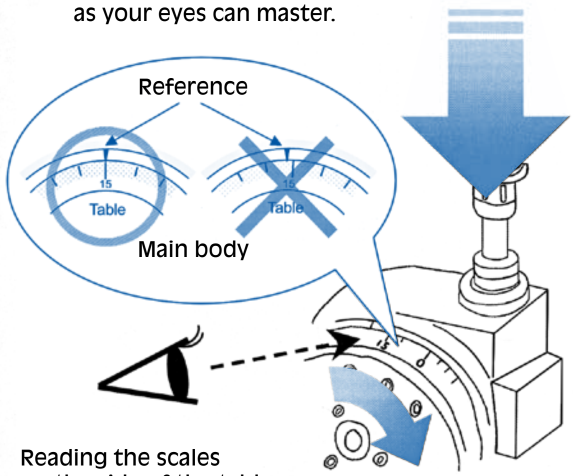


* POSITION *B*

Using handle mode.

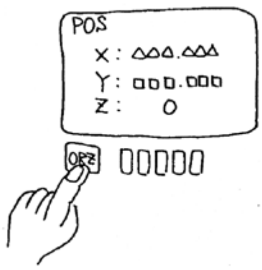


Adjust the indexing as accurately as your eyes can master.

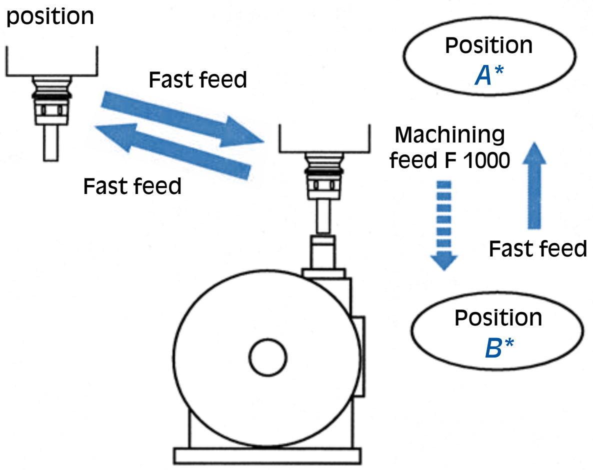


Reading the scales on the side of the table, move the **Z** axis with manual handle mode until the indexing is completed.

Read and memory **Z** axis number.



PROGRAM



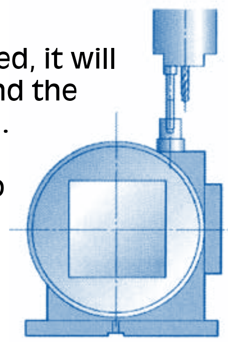
INFORMATION

Regarding the push-in tool

Providing the drill is Ø 10 mm or wider and no bending is caused during the pushing down, the tool you are using is appropriate.

If a tool with a sharp tip is used, it will badly wear down the resin and the resin will have to be replaced.

The main shaft cover can also be used to push down.

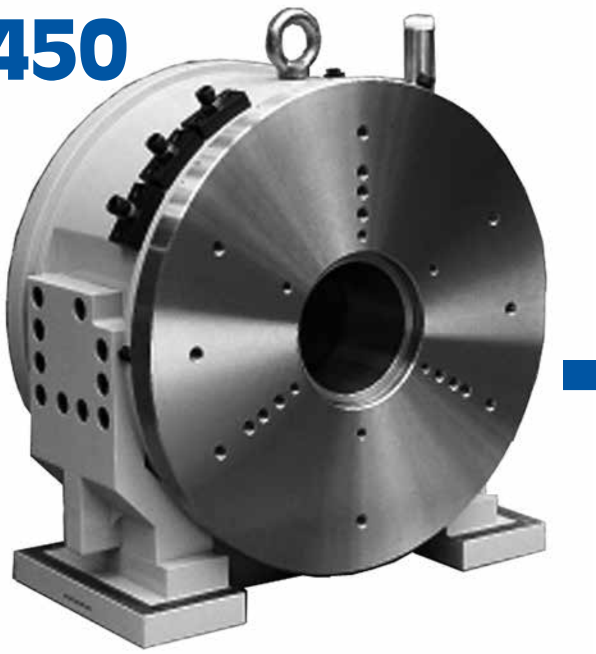


TOUCHDEX

Indexing tables

Code	Type	Indexing angles		Pushbar Stroke
		Min°	Max °	mm
51 99 13 20	**FDK-450**	**5°**	**45°**	**93**

FDK-450



New

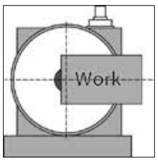
LARGEST TOUCHDEX

Table Dia 450mm

Large Center Hole Secured

Standard equipment with a Brake Ring Function

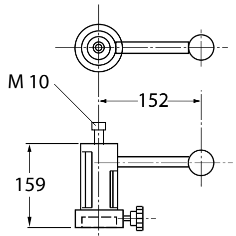
Brake Ring Function. This function suppresses a decrease in clamping force during indexing by continuously applying a constant friction force to the table. This function can respond to more unbalanced workpieces / jigs



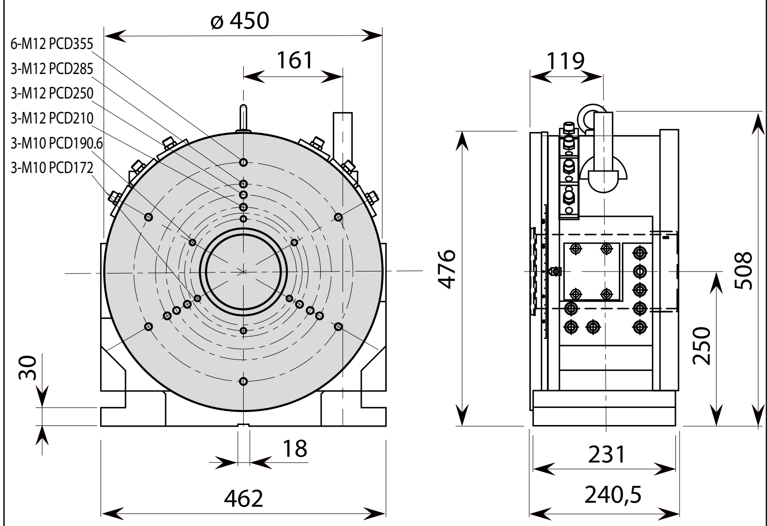
A manual indexing unit (MH-6) is supplied as standard accessory

With a lock cancelation function

Manual Unit MH-6
(stroke: 15mm)



Type		FDK-450
Table Diameter	mm	450
Center Heigh	mm	250
Spindle Bore Diameter	mm	120
Table indexing angles at full pushbar stroke	deg.	45
Min. indexing angles	deg.	5
Approx. Full pushbar stroke	mm	93
Approx. pushbar load	N [kgf]	1960 [200]
Loadings	kg	450
Allowable Unbalanced weight (differences in load at table periphery)	kg	40
Allowable load (Table clamped)	N-m [kgf-m]	4560 [465]
Accuracy	sec	30
Repeatability	sec	± 3
Weight	kg	214



Code	Type	Indexing angles		Pushbar Stroke
		Min°	Max °	mm
51 99 13 59	**FD-107**	**15°**	**45°**	**24**

FD-107

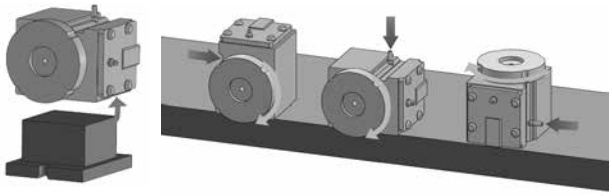
New

SMALLEST TOUCHDEX

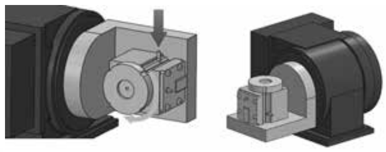
Table Dia 107mm

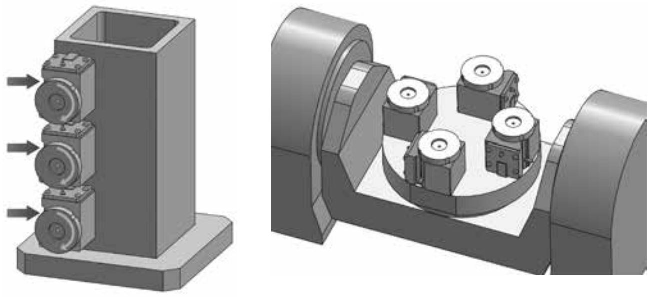
- Light-weight Compact
- Weight: 13kg
- Table indexing angles at full pushbar stroke: 45 deg.
- Min. indexing angles: 15 deg.

The detachable base plate diversifies mounting ways

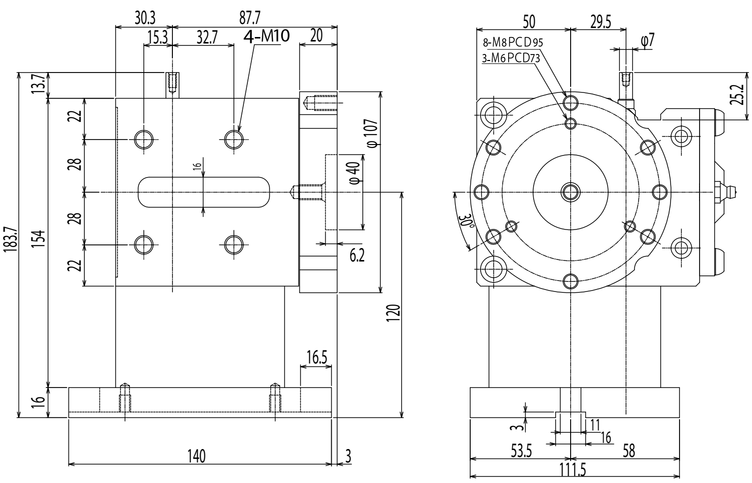


Example of installation

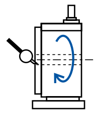
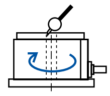
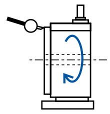
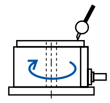
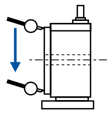
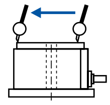




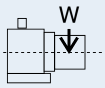
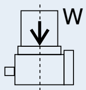
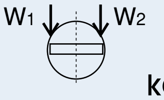
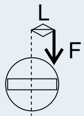
Type		FD-107
Table Diameter	mm	107
Center Heigh	mm	120
Spindle Bore Diameter	mm	-
Table indexing angles at full pushbar stroke	deg.	45
Min. indexing angles	deg.	15
Approx. Full pushbar stroke	mm	24
Approx. pushbar load	N [kgf]	295 [30]
Loadings	kg	20
Allowable Unbalanced weight (differences in load at table periphery)	kg	4
Allowable load (Table clamped)	N-m [kgf-m]	196 [20]
Accuracy	sec	60
Repeatability	sec	± 3
Weight	kg	13



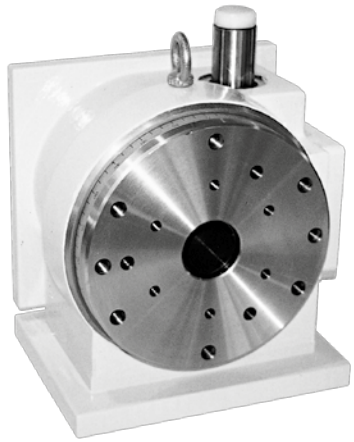
TOLERANCES

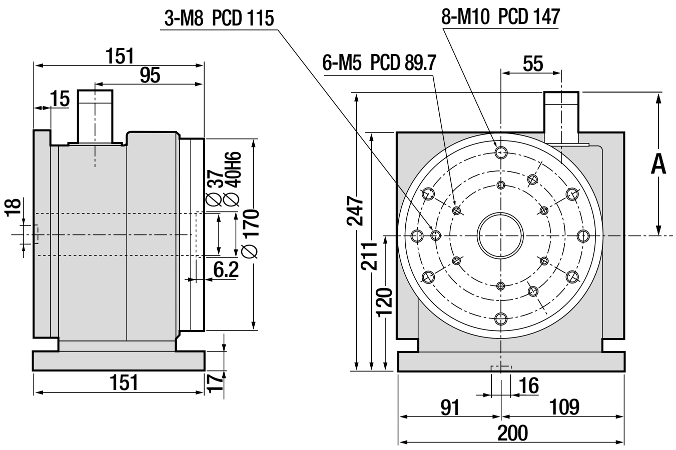
Inspecting item	Tollerances	Measurement Method (FD)	Measurement Method (FDM)
Table Center Hole Run-out	**0.01 mm**		
Table Surface Run-out (15 mm inside table periphery)	**0.01 mm**		
Table Surface Squareness (15 mm inside table periphery)	**0.03 mm**		

SPECIFICATIONS

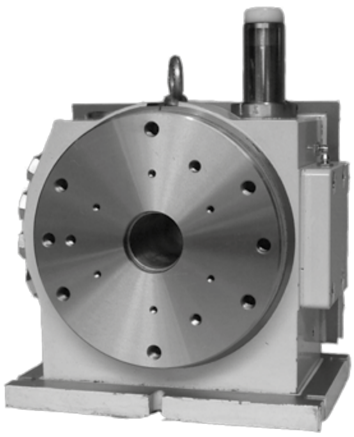
Type			FDM-150	FDMK-150-04	FD-200-04
Table diameter		mm	170	170	210
Spindle bore diameter		mm	37	37	16.5
Center height		mm	120	120	135
Table indexing anglesat full pushbar stroke		gradi	45	90	90
Min. indexing angles		gradi	5	5	5
Full pushbar stroke		mm	38	53	78
Approx. pushbar load		N [kgf]	295 [30]	392 [40]	784 [80]
Loadings	vertical use 	kg	200	200	250
	horizontal use 	kg	300	300	---
Allowable unbalanced weight differences in load at table periphery	$W_1 - W_2$ 	kg	4	20	4
Allowable load (Table clamped)	F x L 	N/m [kgf/m]	588 [60]	588 [60]	1030 [105]
Accuracy		sec	30	30	30
Ripeatability		sec	±3	±3	±3
Weight		kg	30	37	38

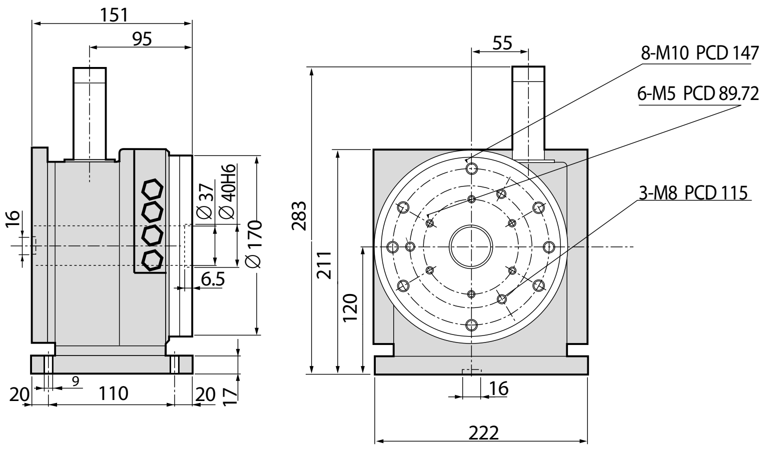
Code	Type	Indexing Angles		Pushbar Stroke	A
		Min °	Max °	mm	mm
51 99 13 01	**FDM-150**	**5°**	**45°**	**38**	**127**



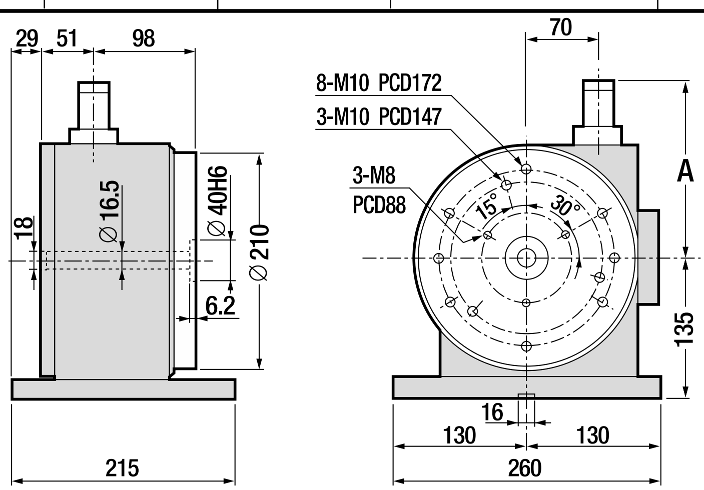


Code	Type	Indexing Angles		Pushbar Stroke	A
		Min °	Max °	mm	mm
51 99 13 16	**FDMK-150-04**	**5°**	**90°**	**53**	**163**





Code	Type	Indexing Angles		Pushbar Stroke	A
		Min °	Max °	mm	mm
51 99 13 02	**FD-200-04**	**5°**	**90°**	**78**	**208**



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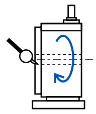
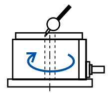
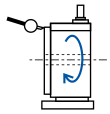
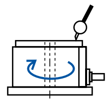
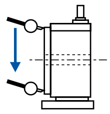
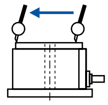
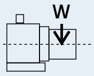
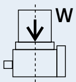
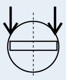
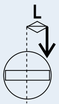
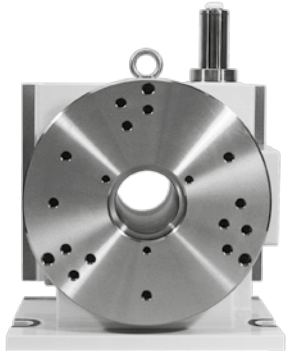
TOLERANCES

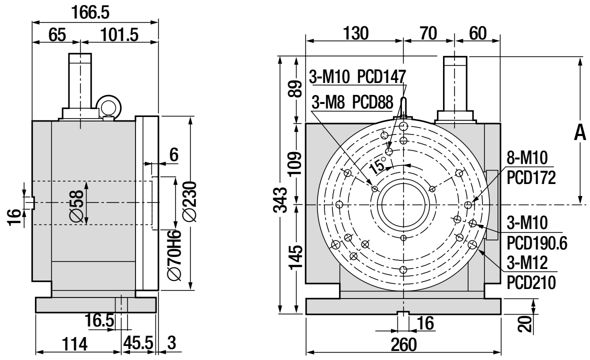
Inspecting item	Tollerances	Measurement Method (FD)	Measurement Method (FDM)
Table Center Hole Run-out	**0.01 mm**		
Table Surface Run-out (15 mm inside table periphery)	**0.01 mm**		
Table Surface Squareness (15 mm inside table periphery)	**0.03 mm**		

SPECIFICATIONS

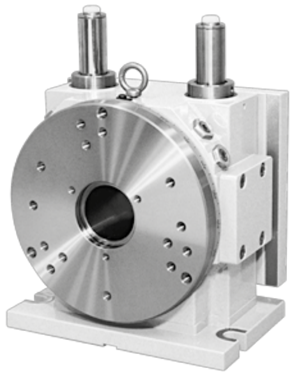
Type			FDM-230	FDM 230-360	FDR-230	FDR 230-360	FD-300	FD 300-360	FDMK 340	FDMK 340-360
Table Diameter		mm	230	230	230	230	310	310	340	340
Spindle Bore Diameter		mm	58	58	58	58	52	52	100	100
Center Height		mm	145	145	145	145	185	185	200	200
Table Indexing Angles at Full Pushbar Stroke		deg.	45	45	45	45	45	45	45	45
Min. Indexing Angles		deg.	5	1	5	1	5	1	5	1
Full Pushbar Stroke		mm	56	56	56	56	75	75	83	83
Approx. Pushbar Load		N [kgf]	784 [80]	784 [80]	1470 [150]	1470 [150]	1078 [110]	1078 [110]	1764 [180]	1764 [180]
Loadings	Vertical use  W	kg	250	250	250	250	350	350	350	350
	Horizontal use  W	kg	350	350	350	350	500	500	500	500
Allowable Unbalanced weight (differences in load at table periphery)	$W_1 - W_2$  W_1 W_2	kg	4	4	20	20	4	4	20	20
Allowable load (Table clamped)	F x L  L F	N/m [kgf/m]	1127 [115]	1127 [115]	1127 [115]	1127 [115]	2280 [232.5]	2280 [232.5]	2280 [233]	2280 [233]
Accuracy		sec	30	30	30	30	30	30	30	30
Repeatability		sec	±3	±3	±3	±3	±3	±3	±3	±3
Weight		kg	42	42	48	48	80	80	98	98

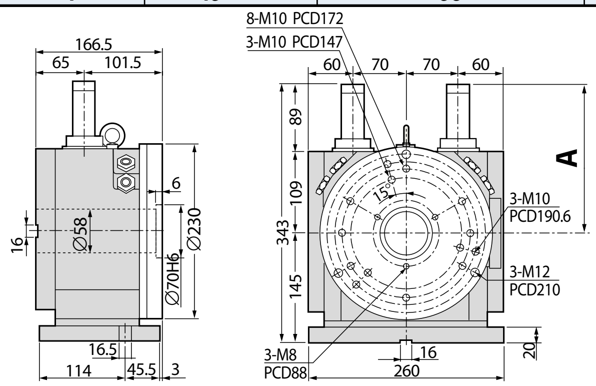
Code	Model	Indexing Angles		Pushbar Stroke	A
		Min	Max	mm	mm
51 99 13 04	FDM-230	5°	45°	56	198
51 99 13 05	FDM-230-360	1°	45°	56	198



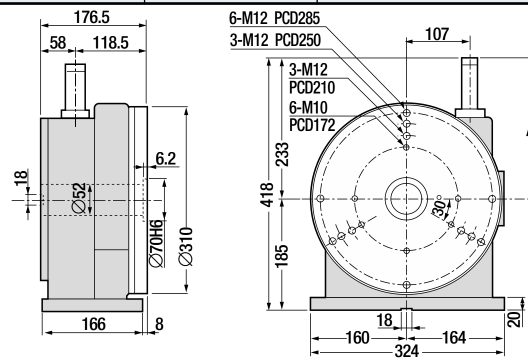


Code	Model	Indexing Angles		Pushbar Stroke	A
		Min	Max	mm	mm
51 99 13 06	FDR-230	5°	45°	56	198
51 99 13 60	FDR-230-360	1°	45°	56	198

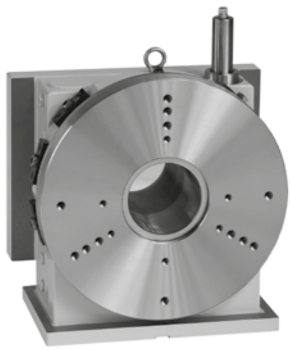


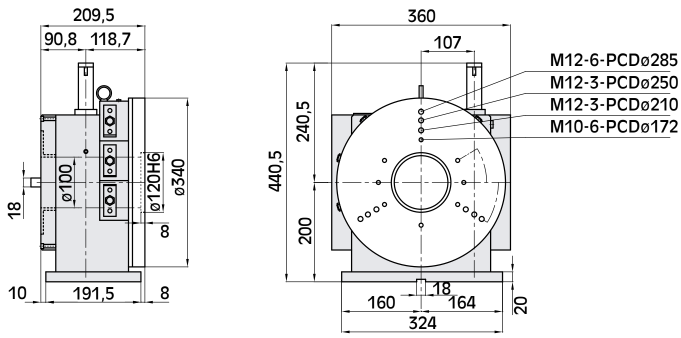


Code	Model	Indexing Angles		Pushbar Stroke	A
		Min	Max	mm	mm
51 99 13 07	FD-300	5°	45°	75	233
51 99 13 08	FD-300-360	1°	45°	75	233



Code	Model	Indexing Angles		Pushbar Stroke	A
		Min	Max	mm	mm
51 99 13 18	FDMK-340	5°	45°	83	240,5
51 99 13 19	FDMK-340-360	1°	45°	83	240,5





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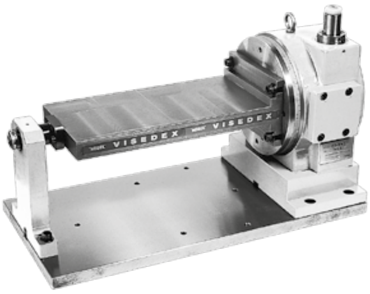
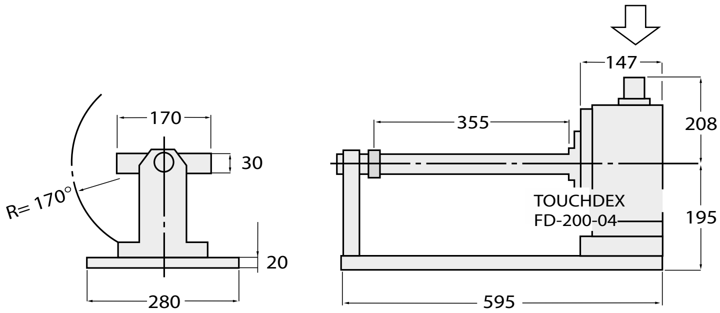
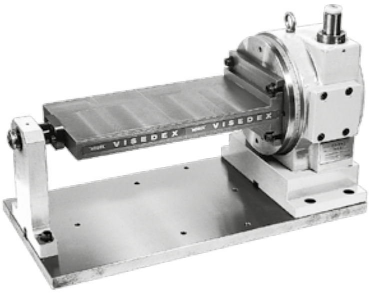
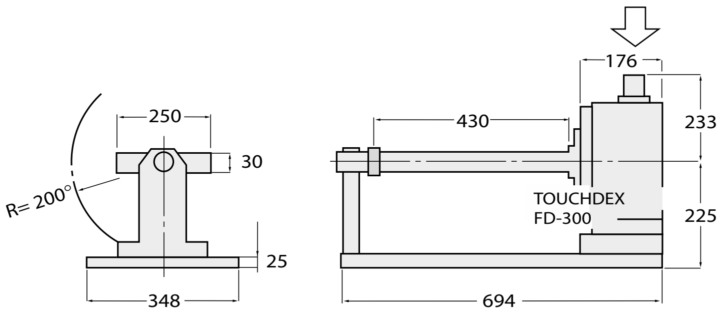
Code	Model	Indexing Angles		Pushbar Stroke	A
		Min	Max	mm	mm
51 99 13 11	**FDV-201-04**	**5°**	**90°**	**78**	**208**



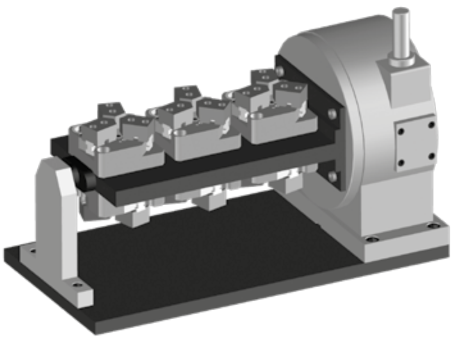


Code	Model	Indexing Angles		Pushbar Stroke	A
		Min	Max	mm	mm
51 99 13 12	**FDV-301**	**5°**	**45°**	**75**	**233**

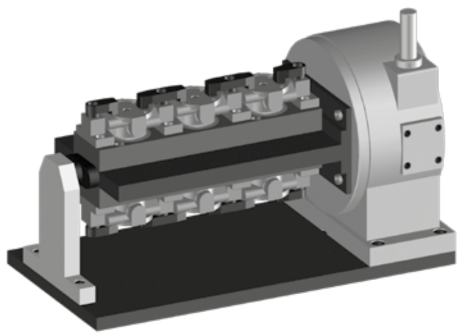




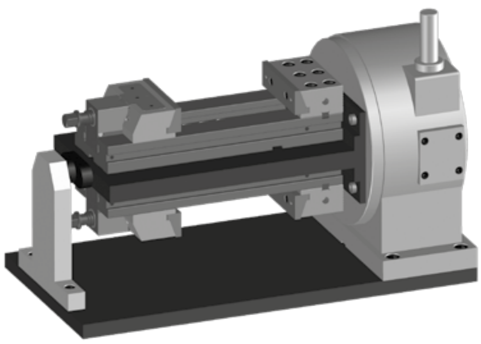
Examples



With SC square chuck



With clamping devices



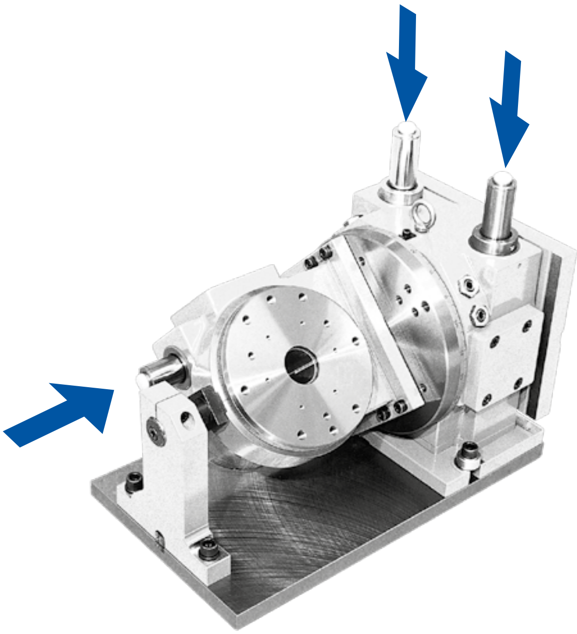
With TC-t clamping system

Code	type
51 99 13 13	TL 230-150

Code	type
51 99 13 14	TL 340-230

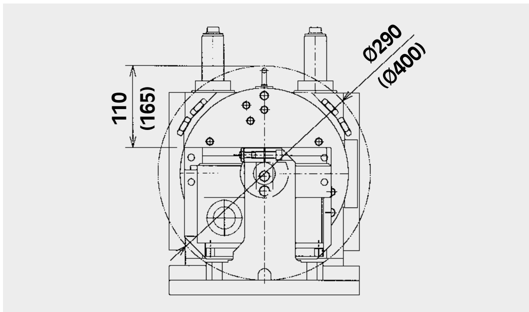
Integrates FDR-230 and FDM-150 + FDR-340 and FDM-230 for five-face machining on vertical machining centers.

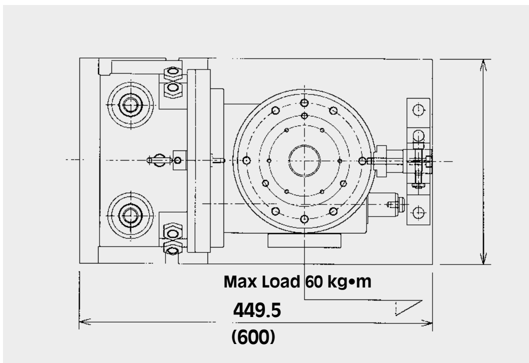
- Table inclination and rotation adjusted automatically with the pushbar of TOUCHDEX.
- Minimum indexing angle in both inclination and rotation of 5°.
- Extremely compact footprint - 450 x 260 mm.

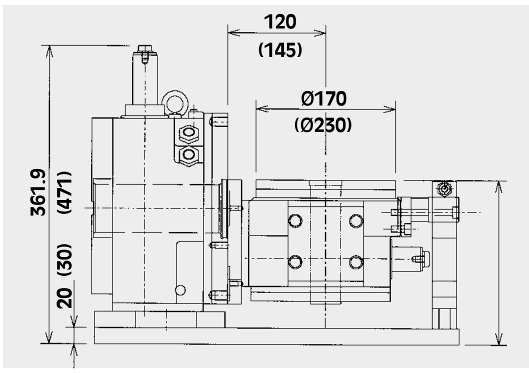


Specifications			TL 230-150	TL 340-230
Table Diameter		mm	170	230
Spindle Bore Diameter		mm	37	58
Center Height (90° Tilted)		mm	145	200
Table surface height (0 deg. tilted)		mm	200	265
Full Pushbar Stroke (Tilting)		mm	56	83
Full Pushbar Stroke (Rotation)		mm	38	56
Approx. Pushbar Load (Tilting)		N [kgf]	1470 [150]	1764 [180]
Approx. Pushbar Load (Rotation)		N [kgf]	295 [30]	1470 [150]
Loadings (0° to 90°)	W	kg	70	100
Allowable load (Table clamped)	FxL	N·m [kgf·m]	1127 [115]	1960 [200]
	FxL	N·m [kgf·m]	625 [63.8]	1.127 [115]
Accuracy	(Tilting)	sec	30	30
Accuracy	(Rotation)	sec	30	30
Repeatability	(Tilting)	sec	±3	±3
Repeatability	(Rotation)	sec	±3	±3
Weight		kg	98	215

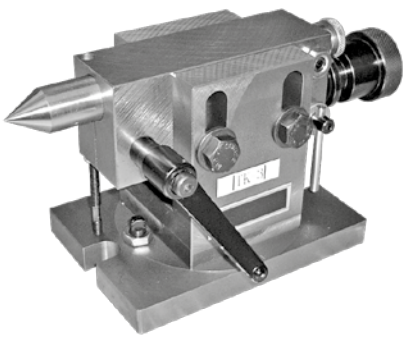
＊ A counterweight may be required for balance when machining bar-shaped workpieces etc mounted significantly off-center on the TOUCHDEX.

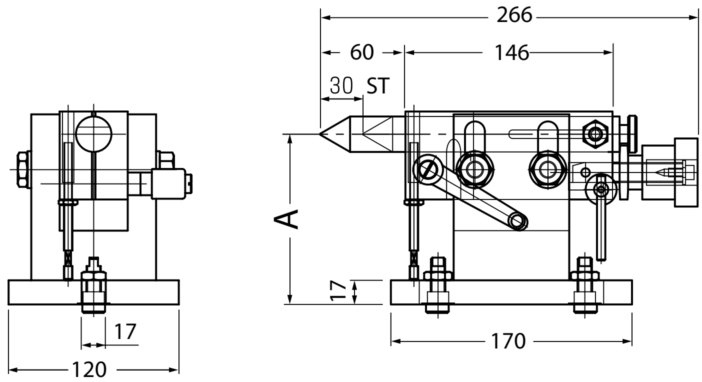






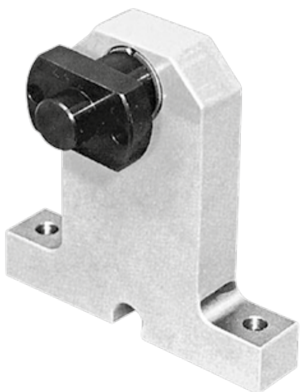
TAIL STOCK TK3

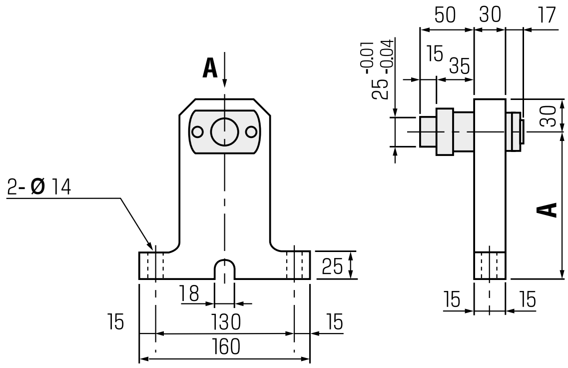




Code	type	A (mm)
51 99 13 21	TK-3	120 - 145
51 99 13 22	TK-3 HI	160 - 185

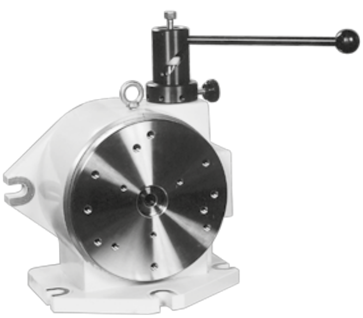
END SUPPORT

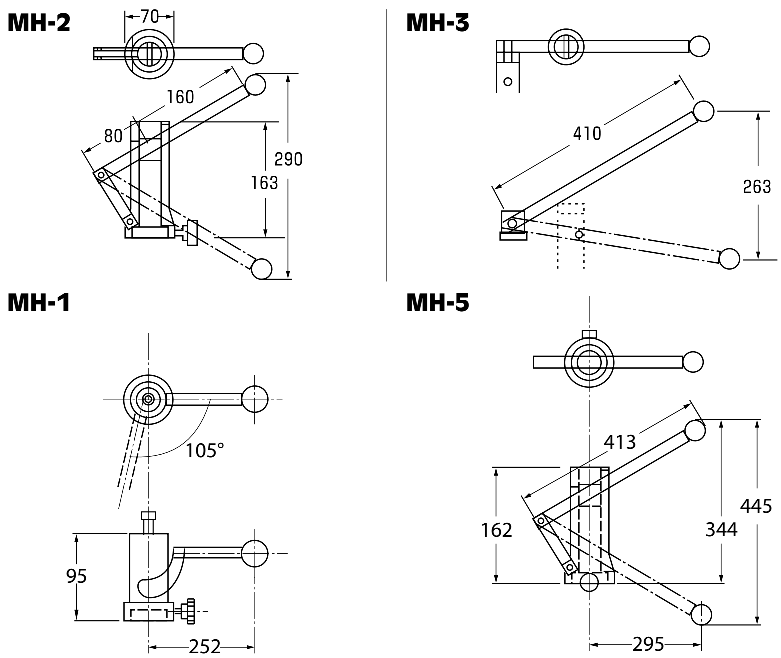




Code	type	A (mm)
51 99 13 23	FES-120	120
51 99 13 24	FES-135	135
51 99 13 25	FES-145	145
51 99 13 26	FES-175	175
51 99 13 27	FES-185	185
51 99 13 28	FES-200	200

MANUAL HANDLE





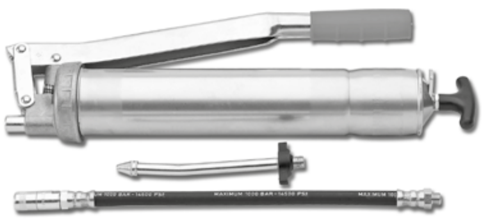
Code	type	stroke
51 99 13 30	MH-1	35
51 99 13 31	MH-2	88
51 99 13 32	MH-3	38
51 99 13 48	MH-5	95

Type	Tailstok	Manual handle	End support
FDM-150	TK-3	MH-3	FES-120
FDR-150-04 (MK)	TK-3	MH-2	FES-120
FD (M)-200 (-360)	TK-3	MH-1	FES-135
FD (M)-200-04	TK-3	MH-2	FES-135
FD (M,R)-230 (-360) (MK)	TK-3	MH-2	FES-145
FDR-230-04 (-360) (MK)	TK-3-HI	MH-2	FES-175
FDM-300	TK-3-HI	MH-2	FES-185
FDMK-340 (-360)	-----------	MH-5	FES-200
FDK-450	-----------	MH-6	----------

K67

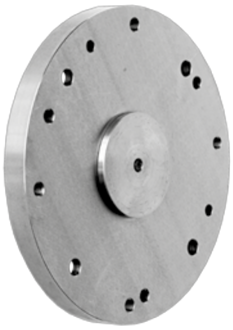
Code		
10 73 12 23	Cartridge 500 g	Grease K67
10 73 12 24	Can 1000 g	Grease K67

GREASING KIT



Code
08 37 26

MOUNTING FLANGE FOR MANUAL CHUCK



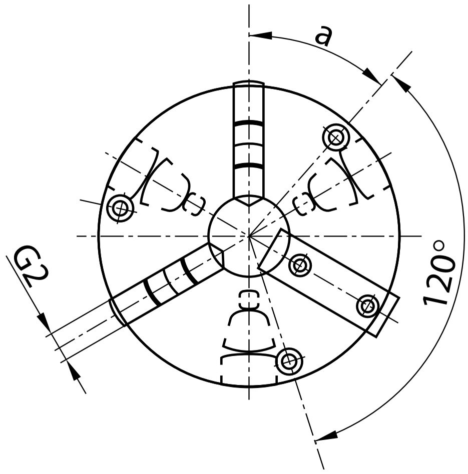
Codice	for type	for chuck	D (mm)
51 99 13 41	FDM-150	SGSF 160-42	170
51 99 13 42	FD-200-04 / FD-200-360 FDM-230 / FDM-230-360 / FDR-230	SGSF 200-55	210
51 99 13 43	FD-300 / FD-300-360 FDMK-340 / FDMK-340-360	SGSF 315-103	310
51 99 13 47	FDK-450	SGSF 400-136	450

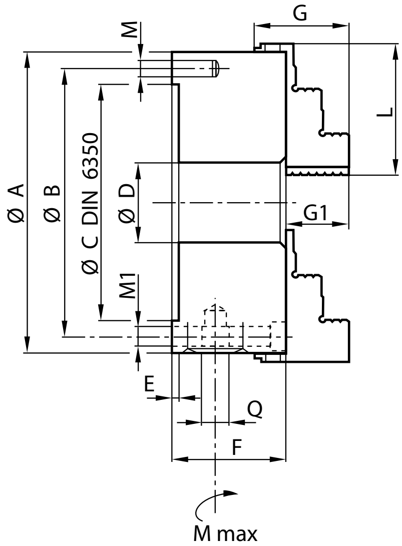
PAIR OF KEYS

Code	mm
51 99 13 51	16 x 14
51 99 13 52	16 x 16
51 99 13 53	16 x 18
51 99 13 54	18 x 14
51 99 13 55	18 x 16
51 99 13 56	18 x 18

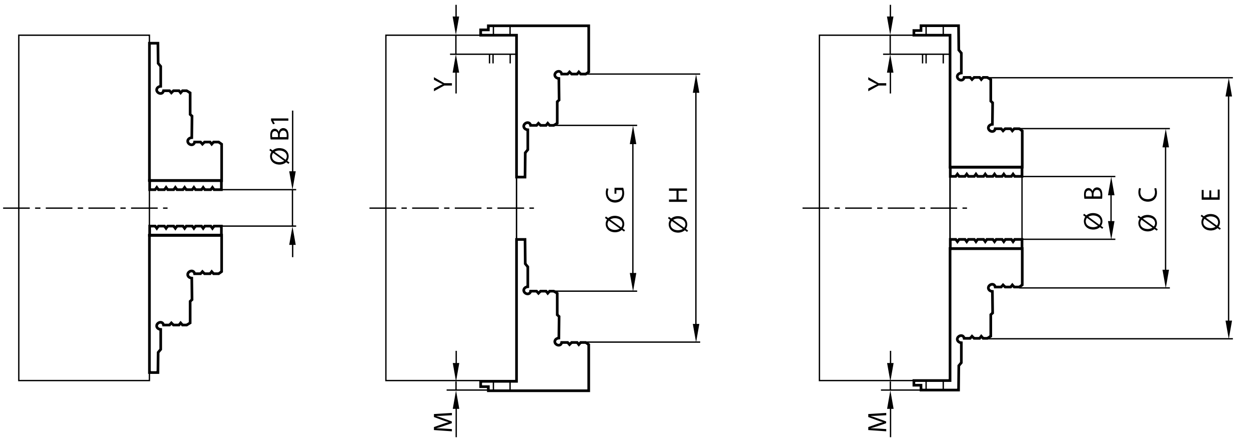
SGSF MANUAL CHUCK (frontal mounting)

SMW self-centering manual chuck, steel body





Code		33 03 12 16	33 03 12 20	33 03 12 31	33 03 12 40
Chuck		**SGSF 160-42**	**SGSF 200-55**	**SGSF 315-103**	**SGSF 400-136**
Attachement DIN 6350	Dim.	**FL125**	**FL160**	**FL260**	**FL330**
	A mm	**160**	**200**	**315**	**400**
	B mm	**140**	**176**	**286**	**362**
H6	C mm	**125**	**160**	**260**	**330**
	D mm	**42**	**55**	**103**	**136**
	E mm	**4**	**4**	**5**	**5**
	F mm	**68**	**78**	**96,2**	**108**
	G mm	**53**	**54**	**73**	**92**
	G_1 mm	**32**	**29**	**41**	**55**
	G_2 mm	**20**	**25**	**32**	**36**
	L mm	**70**	**85**	**125**	**145**
Front mounting	M_1 mm	**3xM10**	**3xM10**	**3xM16**	**3xM16**
	Q mm	**11**	**11**	**14**	**17**
	a °	**102°**	**42°**	**42°**	**45°**
Max speed	giri/min.	**4500**	**4000**	**2800**	**2000**
Torque M max	N•m	**120**	**160**	**200**	**280**
Weight (w. jaws)	kg	**11,2**	**20**	**50**	**90**
Moment of inertia	kgm^2	**0,03**	**0,10**	**0,60**	**1,80**

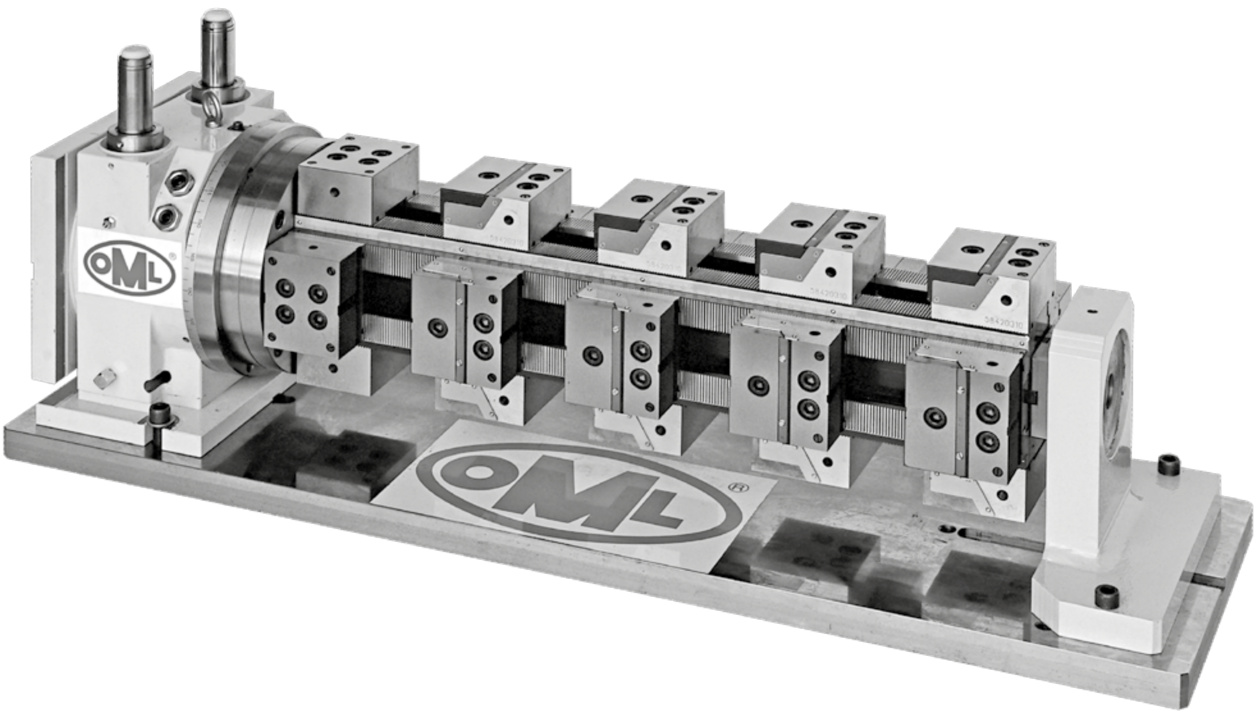


Chuck		SGSF 160-42	SGSF 200-55	SGSF 315-103	SGSF 400-136
Suggested clamping diameters at max. clamping force					
Monoblock jaws	B mm	**19-56**	**22-75**	**58-115**	**77-162**
	G mm	**64-101**	**78-130**	**129-199**	**169-254**
	H mm	**113-150**	**146-198**	**226-296**	**295-380**
	C mm	**57-94**	**68-121**	**128-184**	**149-234**
	E mm	**109-146**	**136-189**	**212-281**	**275-360**
	Y mm	**0**	**4**	**9**	**16**
	M mm	**18**	**22**	**25**	**26**
Min. clamping diameters with clamping force reduced by 40%					
		3	**4**	**10**	**10**

	SGSF 160-42	SGSF 200-55	SGSF 315-103	SGSF 400-136
No. of scroll teeth	**2**	**3**	**5**	**5**
No. of meshing scroll teets for safety clamping	**2**	**3**	**5**	**5**

- For max. speed and max. clamping, all teeth shall be meshing.
- For meshing teeth control towards outside dimension (M) toward inside dimension (Y).
- For features exceeding these limits ±16 mm on diameter, shall be reduced by 25%.
- ATTENTION: CLAMPING DIAMETERS HAVE BEEN CALCULATED WITH A.M. MESHING TEETH.

Chuck	SGSF 160-42	SGSF 200-55	SGSF 315-103	SGSF 400-136
Accessories	Codici			
Set-3 GRC	**03 65 16 30**	**03 65 20 30**	**03 65 31 30**	**03 65 40 30**
Set-3 Soft jaws	**03 60 16 30**	**03 60 20 30**	**03 60 31 30**	**03 60 40 30**
Set-3 ins. jaws Dx	**03 55 16 30**	**03 55 20 30**	**03 55 31 30**	**03 55 40 30**
Set-3 ins. jaws Sx	**03 56 16 30**	**03 56 20 30**	**03 56 31 30**	**0356 40 30**
Set-3 Rev. jaws	**03 63 16 30**	**03 63 20 30**	**03 63 31 30**	**03 63 40 30**
Key	**02 71 17 00**		**02 71 31 00**	**02 71 40 00**



The example shows:

- TOUCHDEX table
- Column CIVI 2000 (General catalogue OML group 6)
- Moveable jaws set CIVI 2000 (General catalogue OML group 6)

The example shows:

- TOUCHDEX table with manual chuck

NOTES

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MODULAR CLAMPING SYSTEMS

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