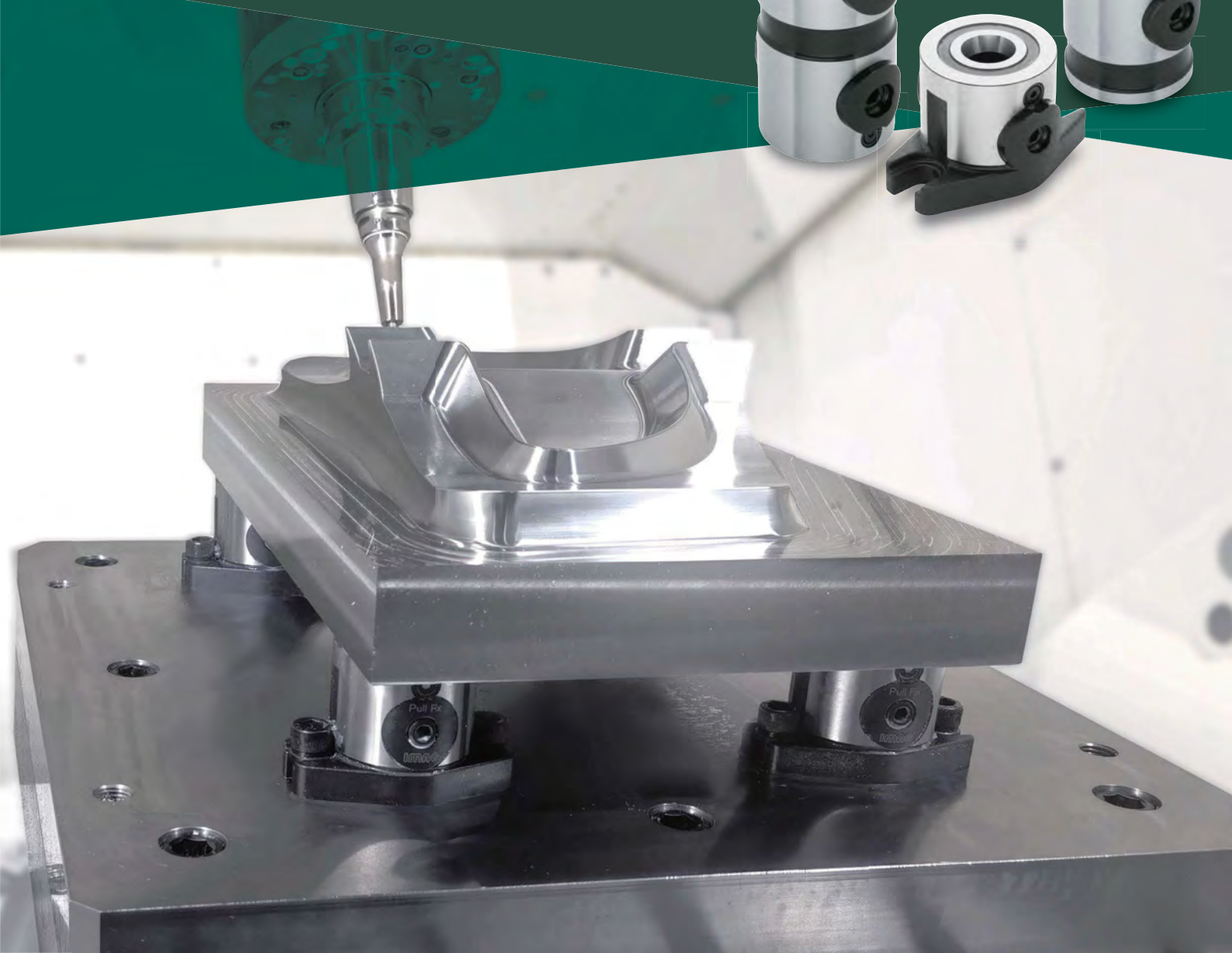
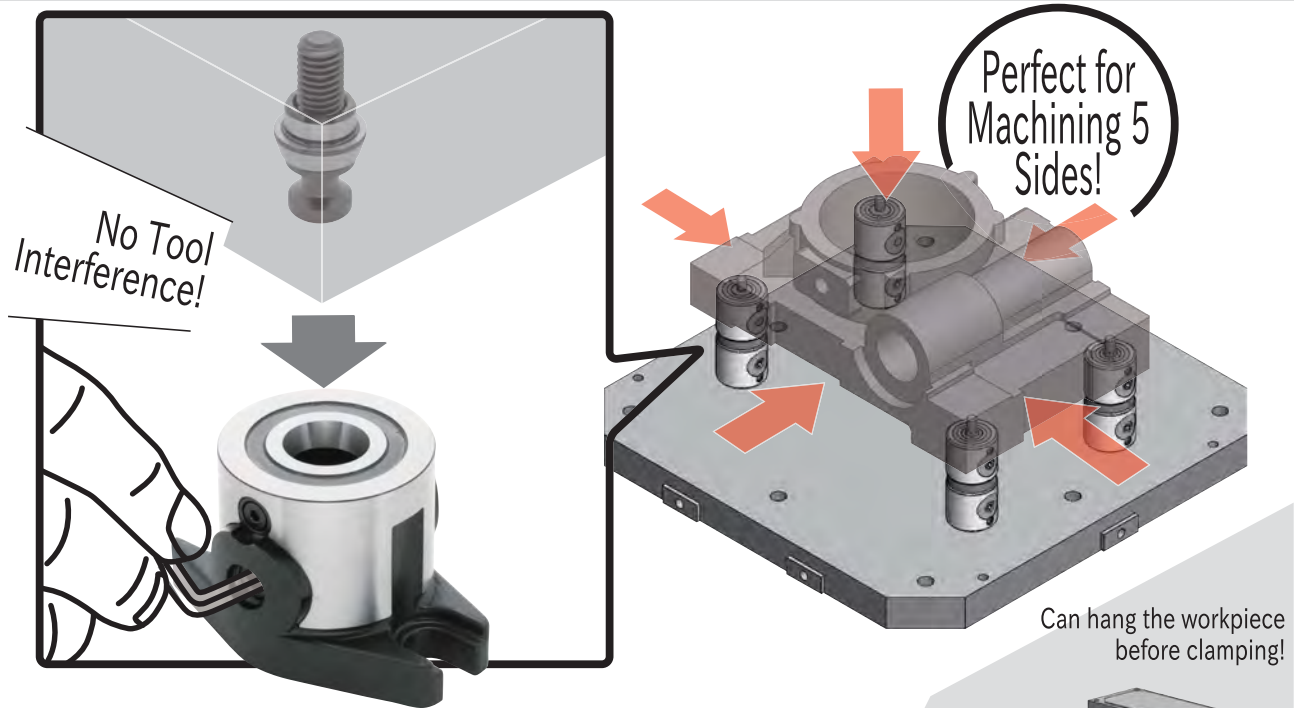




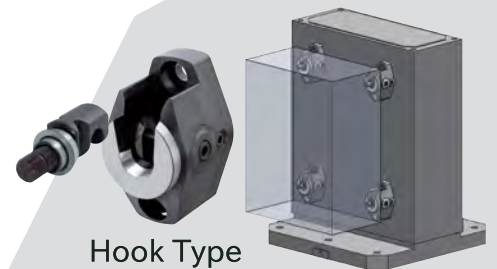
Modular Pull Clamping System



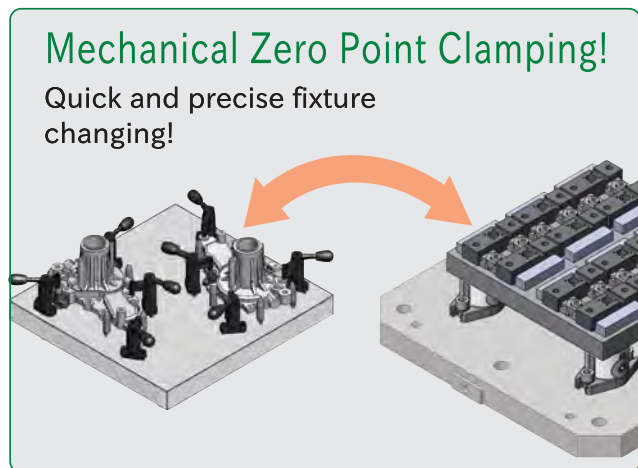
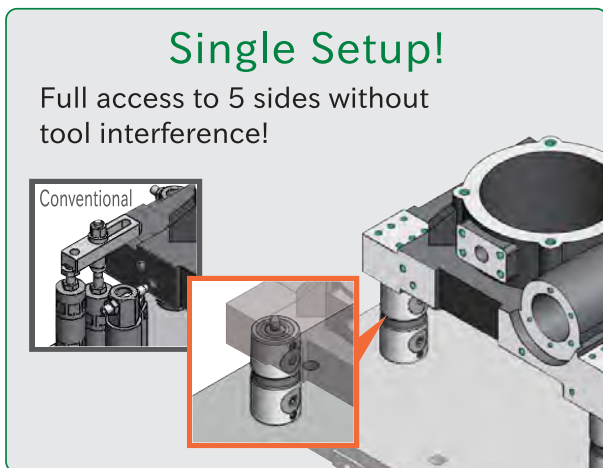
MODULAR PULL CLAMPING SYSTEM



New Style of Pull Clamps! MODULAR PULL CLAMPING SYSTEM



The cylindrical body allows machining 5 sides without tool interference!
Dual surface contact of the tapered surfaces provides 5 μm locating repeatability!



Simple workholding !

Better Machining
Accuracy

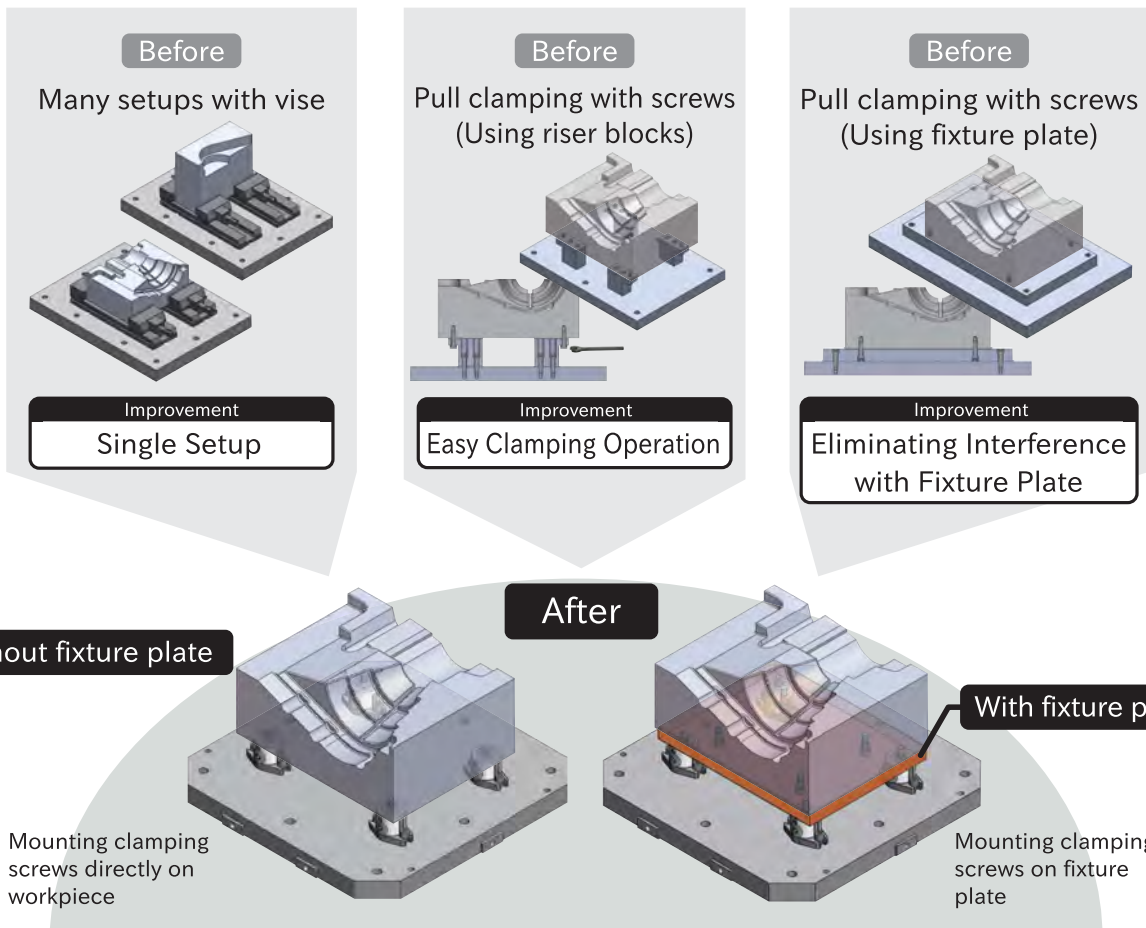
Shorter Fixture
Preparation Time

Lower Fixture
Cost

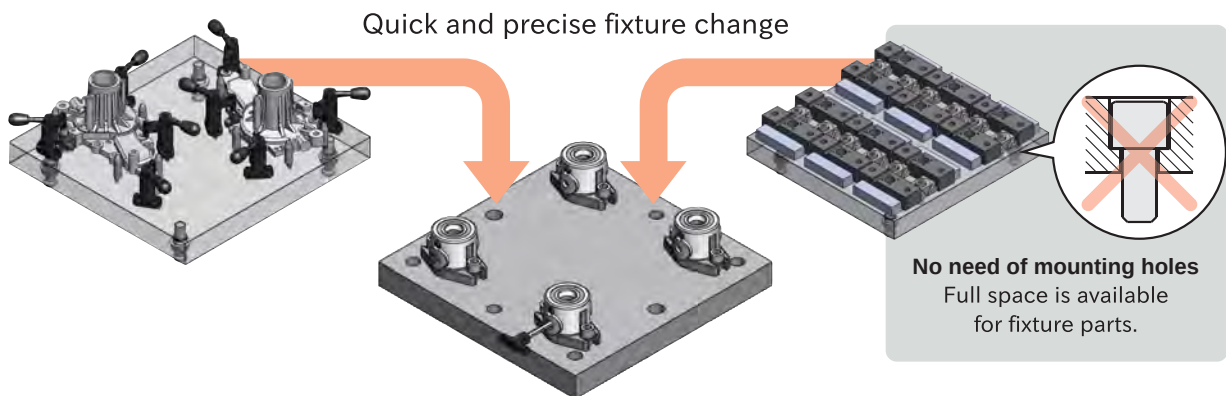
No Tool
Interference



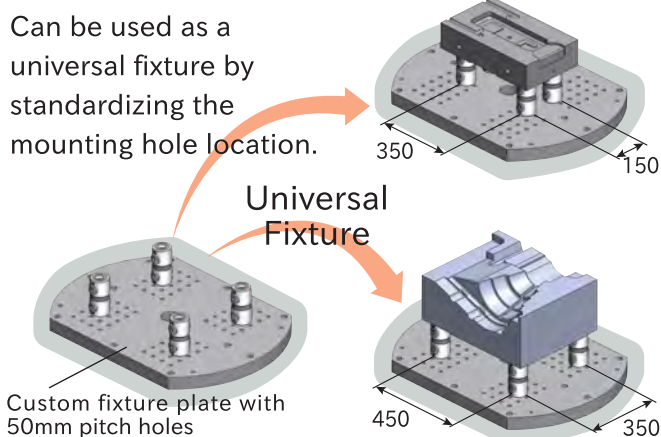
Fixture Improvement



Quick Fixture Change

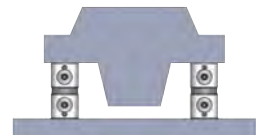


Modular Fixture



Workpiece Raising

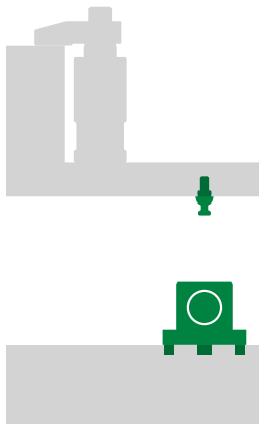
Prevent tool interference



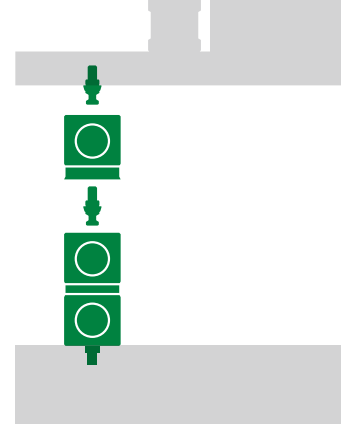
Easy chip cleaning



How To Use Modular Pull Clamping System



The Modular Pull Clamping System consists of clamping modules and clamping screws. Each module can be coupled to increase the height.



Clamping Modules



Flanged

Low profile, fixed with hexagon socket head cap screws

Part Number	Diameter (mm)	Height (mm)	Clamping Force (kN)
CP150-06025	30	25	5
CP150-08040	40	40	8
CP150-12063	60	63	15
CP150-16080	80	80	25
CP150-20100	100	100	35

Mounting on plate



Clamping Module
Locating Repeatability

Precise
Locating



5µm

Rough
Locating



0.1mm

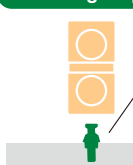


Double

Flexible type with clamping mechanism on the top and bottom

Part Number	Diameter (mm)	Height (mm)	Clamping Force (kN)
CP151-06050	30	50	5
CP151-08080	40	80	8
CP151-12125	60	125	15
CP151-16160	80	160	25

Mounting on plate



Clamping Module
Locating Repeatability

Precise
Locating



5µm

Rough
Locating



Coupling with another module



0.2mm

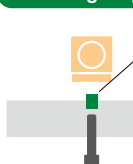


Single

For precise coupling

Part Number	Diameter (mm)	Height (mm)	Clamping Force (kN)
CP152-06032	30	32	5
CP152-08050	40	50	8
CP152-12080	60	80	15
CP152-16100	80	100	25

Mounting on plate



Clamping Module
Locating Repeatability

Precise
Locating



0.04mm

Rough
Locating

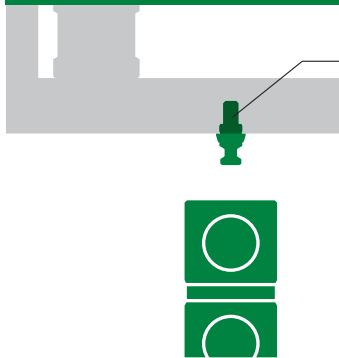
Only with socket-headcap screws

Coupling with another module



5µm

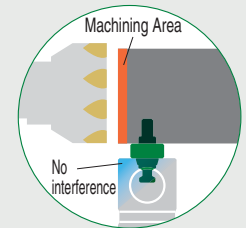
Clamping Screws



Mount to bottom of workpiece to pull it down

For machining close area to clamping module

To avoid tool interferences, raise workpieces with Riser Screws.



Tapered Clamping Screws (Round)

For Precise Locating



CP155-L

With Riser



CP155-LS

Workpiece Locating Repeatability (μm)

5

Tapered Clamping Screws (Diamond)

For Precise Locating



CP155-D

With Riser



CP155-DS

Workpiece Locating Repeatability (μm)

5

(Should be used with round type.)

Clamping Screws

No locating function.

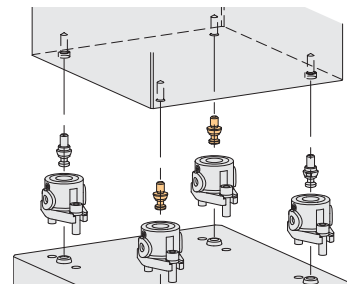


CP156

With Riser

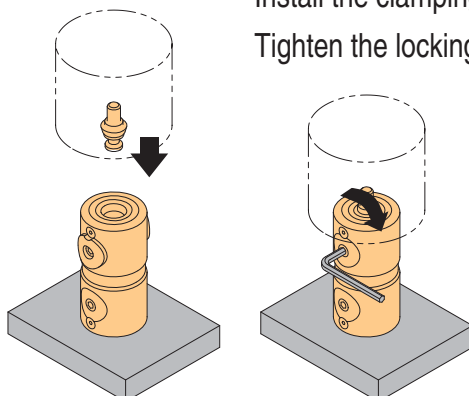


CP156-S

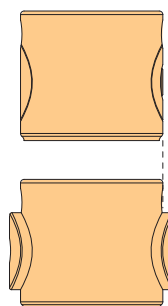


Clamping Operation

Install the clamping screw on the workpiece and mount it on the clamping module. Tighten the locking screw of the clamping module.

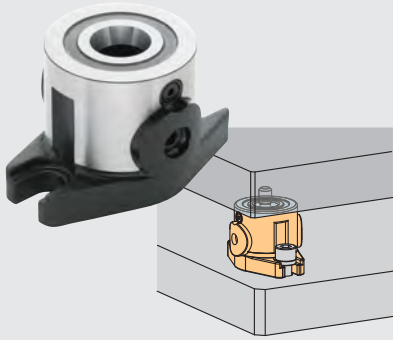


Clamping / Unclamping is visible.



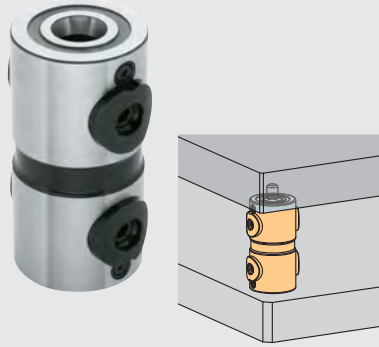
Clamping

Unclamping



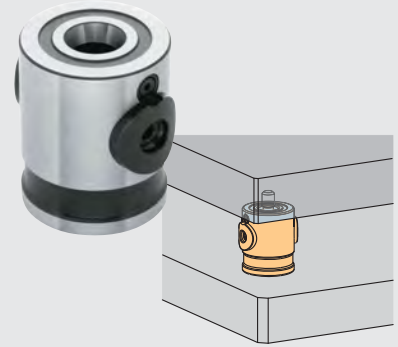
CLAMPING MODULES (Flanged)

Part No. CP150



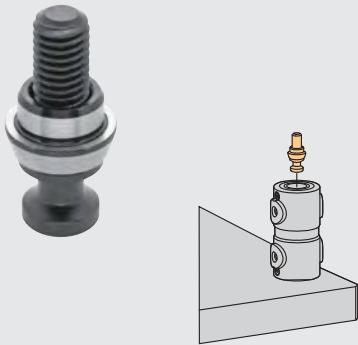
CLAMPING MODULES (Double)

Part No. CP151



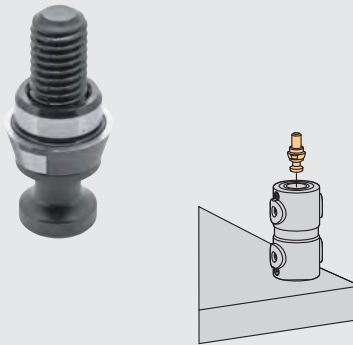
CLAMPING MODULES (Single)

Part No. CP152



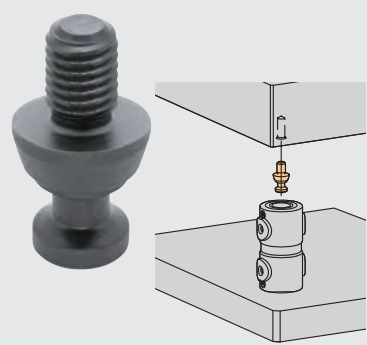
TAPERED CLAMPING SCREWS

Part No. CP155-L



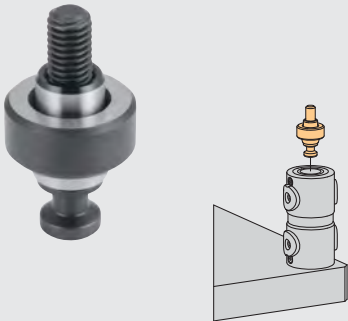
TAPERED CLAMPING SCREWS

Part No. CP155-D



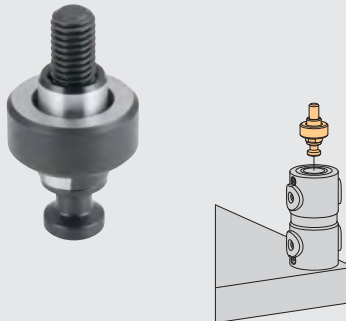
CLAMPING SCREWS

Part No. CP156



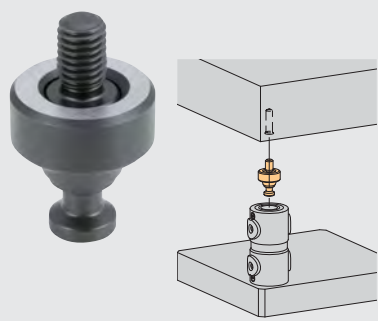
TAPERED RISER SCREWS

Part No. CP155-LS



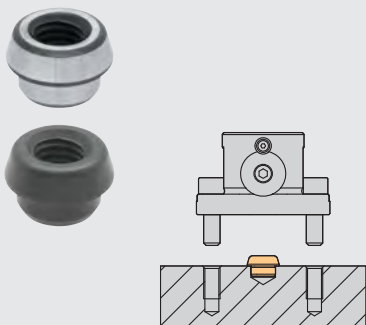
TAPERED RISER SCREWS

Part No. CP155-DS



RISER SCREWS

Part No. CP156-S



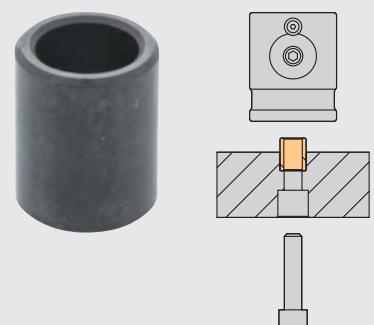
TAPERED BUSHINGS

Part No. CP157



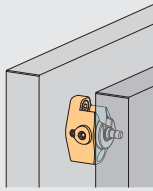
DOUBLE TAPERED CLAMPING PINS

Part No. CP158



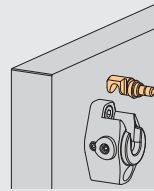
LOCATING BUSHINGS

Part No. CP159



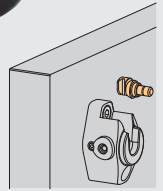
CLAMPING MODULES (Hook)

Part No. CP160



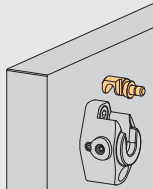
TAPERED CLAMPING SCREWS (Hook)

Part No. CP165-LH



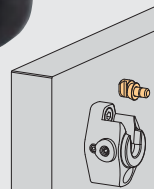
TAPERED CLAMPING SCREWS

Part No. CP165-L



CLAMPING SCREWS (Hook)

Part No. CP166-H



CLAMPING SCREWS

Part No. CP166

CP150

CLAMPING MODULES (Flanged)

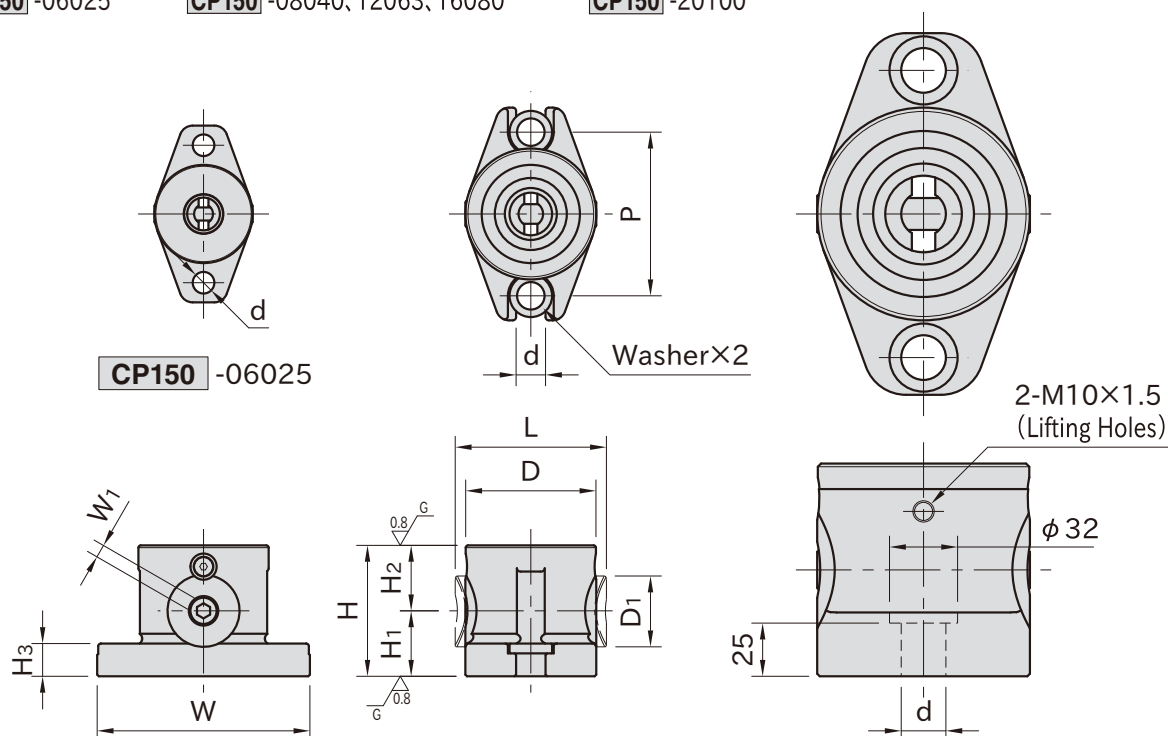


CP150 -06025

CP150 -08040, 12063, 16080

CP150 -20100

Body	
SCM440 steel Induction hardened Black oxide finished Precision ground	
Clamping Nut	Locking Screw
SCM440 steel Quenched and tempered Black oxide finished	SCM435 steel Quenched and tempered Black oxide finished



CP150 -06025

CP150 -08040, 12063, 16080

CP150 -20100

Part Number	D	H (±0.01)	D ₁	L	H ₁	H ₂	W	H ₃	d	P	W ₁
CP150-06025	30	25	15	34.5	12.5	12.5	54	7	6.6	42	3
CP150-08040	40	40	22	46	20	20	65	10	9	50	4
CP150-12063	60	63	32	69	33	30	95	15	13	75	6
CP150-16080	80	80	44	91	40	40	130	20	17	100	8
CP150-20100	100	100	55	115	50	50	170	30	21	135	10

Part Number	Clamping Force(kN)	Allowable Screw Torque (N·m)	Weight (kg)
CP150-06025	5	4	0.1
CP150-08040	8	8	0.3
CP150-12063	15	22	1.4
CP150-16080	25	50	3.3
CP150-20100	35	75	6.2

Supplied With

CP150 -08040, 12063, 16080 : 2 pcs. of flat washer

Technical Information

Allowable Cutting Force & Workpiece Weight of CLAMPING MODULES

Related Product

- **CP155-L** Tapered Clamping Screws
- **CP155-D** Tapered Clamping Screws
- **CP156** Clamping Screws
- **CP157** Tapered Pins

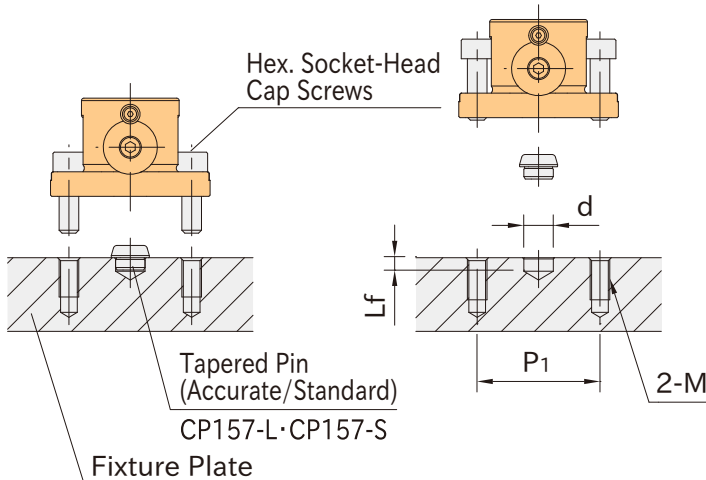
For workpiece raising

- **CP155-LS** Tapered Riser Screws
- **CP155-DS** Tapered Riser Screws
- **CP156-S** Riser Screws

How To Use

- Use **CP157-L** Tapered Pin (Accurate) for precise locating.
- Use **CP157-S** Tapered Pin (Standard) for rough locating.

Mounting-Hole Dimension



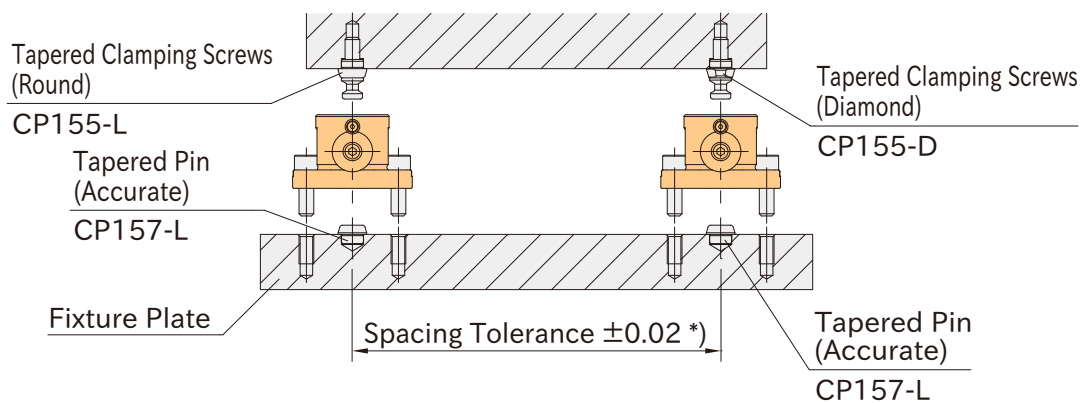
Part Number	d (H7)	Lf	M	P ₁
CP150-06025	8	5.5	M 6×1	42
CP150-08040	12	5.5	M 8×1.25	50
CP150-12063	18	6.5	M12×1.75	75
CP150-16080	22	8	M16×2	100
CP150-20100	30	8	M20×2.5	135

Note: The tolerance of dimension "d" for Tapered Pin (Standard) should be $^{+0.1}_{0}$.

Spacing Tolerance

Spacing tolerance for CP157-L Tapered Pins (Accurate) should be ± 0.02 .

*) Spacing tolerance for CP157-S Tapered Pins (Standard) should be ± 0.1 .

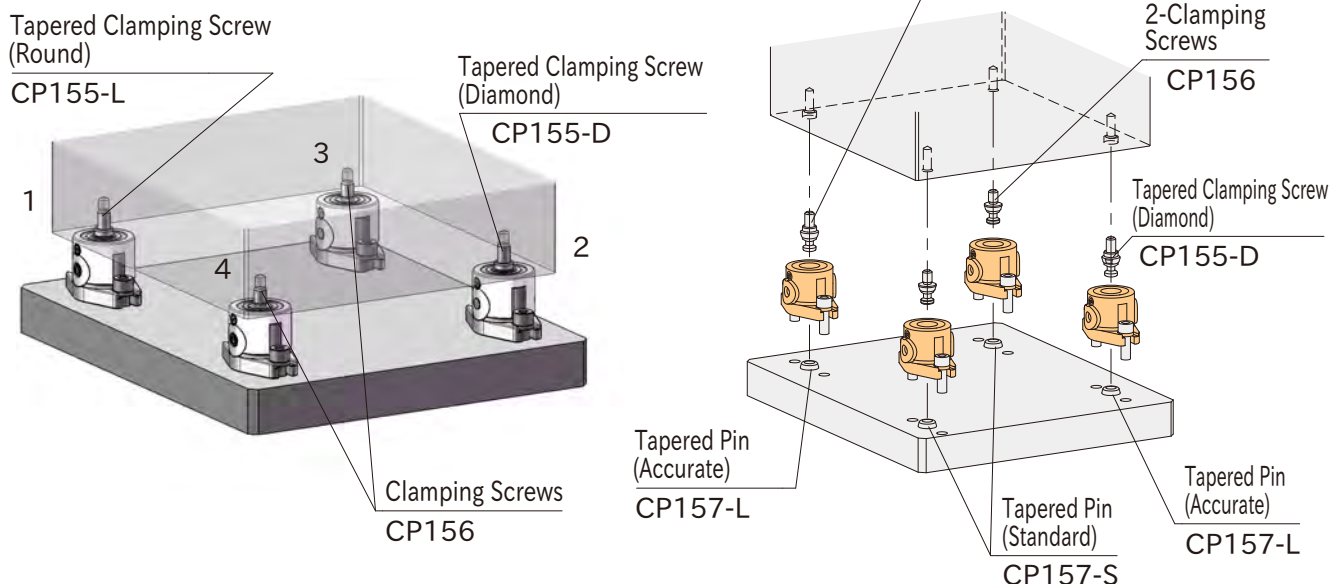


Tightening Order

Tighten the locking screws in order of 1(Round Tapered Clamping Screw)→2(Diamond Tapered Clamping Screw)→3(Clamping Screw)→4(Clamping Screw).

Note: For **CP150**-06025, use 2 pieces of Round Tapered Clamping Screw.

Tighten these 2 screws in the same order to maintain the locating repeatability.



CP151

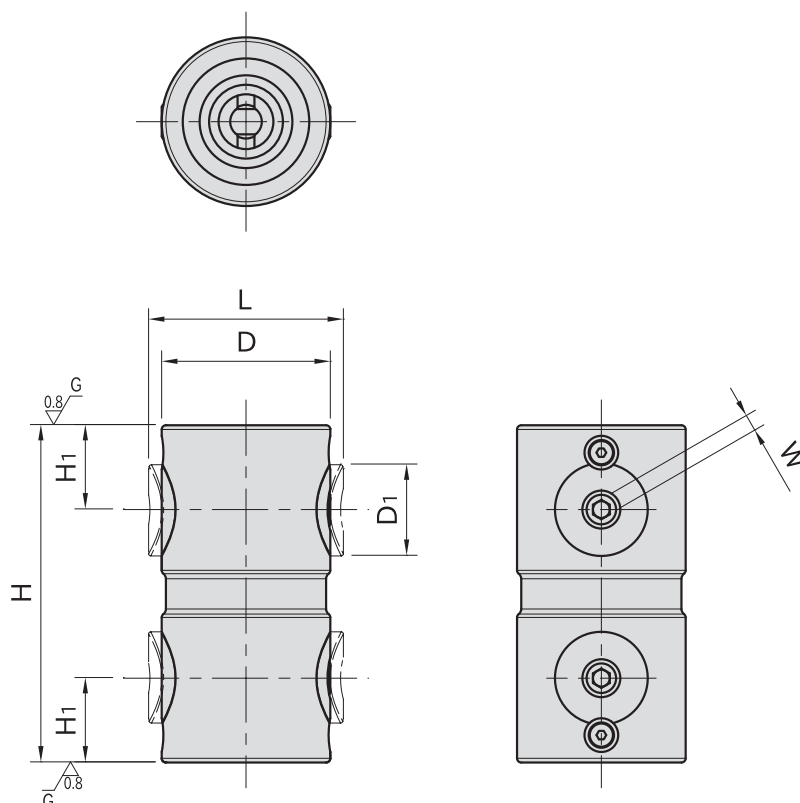
CLAMPING MODULES (Double)



CP151 -06050



CP151 -08080, 12125, 16160



Body	Clamping Nut	Locking Screw
SCM440 steel Induction hardened Black oxide finished Precision ground	SCM440 steel Quenched and tempered Black oxide finished	SCM435 steel Quenched and tempered Black oxide finished

Part Number	D	H (±0.01)	D ₁	L	H ₁	W	Clamping Force (kN)	Allowable Screw Torque (N·m)	Weight (kg)
CP151-06050	30	50	15	34.5	12.5	3	5	4	0.2
CP151-08080	40	80	22	46	20	4	8	8	0.7
CP151-12125	60	125	32	69	30	6	15	22	2.6
CP151-16160	80	160	44	91	40	8	25	50	5.8

Related Product

- **CP150** Clamping Modules (Flanged)
 - **CP152** Clamping Modules (Single)
 - **CP155-L** Tapered Clamping Screws
 - **CP155-D** Tapered Clamping Screws
 - **CP156** Clamping Screws
- For workpiece raising
- **CP155-LS** Tapered Riser Screws
 - **CP155-DS** Tapered Riser Screws
 - **CP156-S** Riser Screws

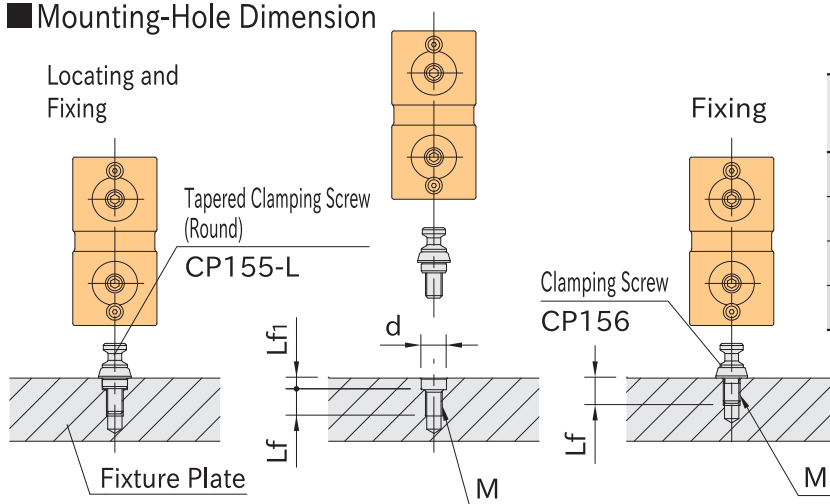
Technical Information

Allowable Cutting Force & Workpiece Weight of
CLAMPING MODULES

How To Use

- Use **CP155-L** Tapered Clamping Screw (Round) for precise locating.
- Use **CP156** Clamping Screw just for fixing.

Mounting-Hole Dimension



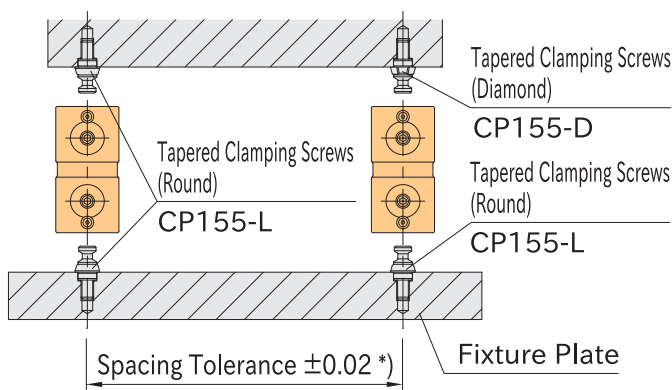
Part Number	d (H7)	Lf	Lf ₁	M
CP151-06050	8	9	5.5	M 6×1
CP151-08080	12	13	5.5	M 8×1.25
CP151-12125	18	19	6.5	M12×1.75
CP151-16160	22	23	8	M16×2

Note: Only tapped hole is required for CP156 Clamping Screw.

Spacing Tolerance

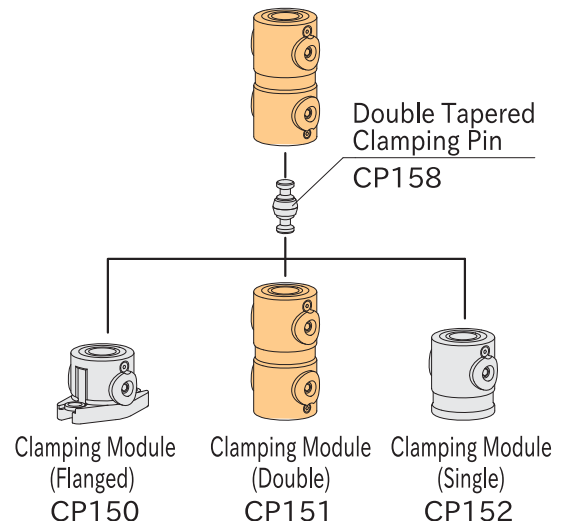
Spacing tolerance for CP155-L Tapered Clamping Screws (Accurate) should be ± 0.02 .

*) Spacing tolerance for CP156 Clamping Screws should be ± 0.2 .



Coupling with Other Clamping Modules

Can be coupled with each Clamping Module.
〈Locating Repeatability is 0.2〉

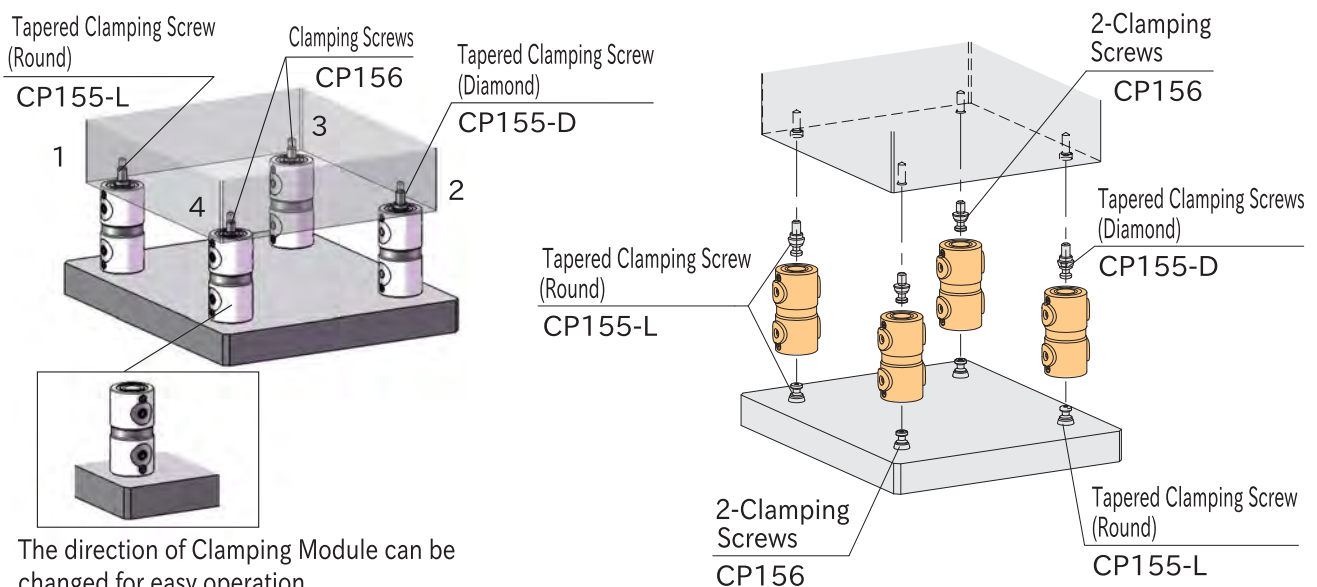


Tightening Order

Tighten the locking screws in order of 1(Round Tapered Clamping Screw)→2(Diamond Tapered Clamping Screw)→3(Clamping Screw)→4(Clamping Screw).

Note: For **CP151**-06050, use 2 pieces of Round Tapered Clamping Screw.

Tighten these 2 screws in the same order to maintain the locating repeatability.

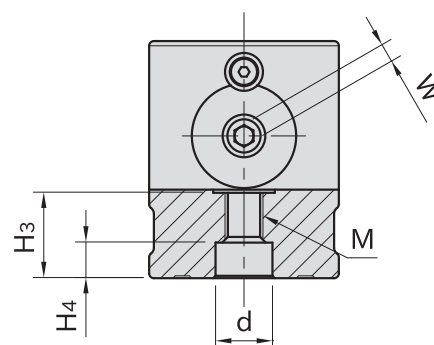
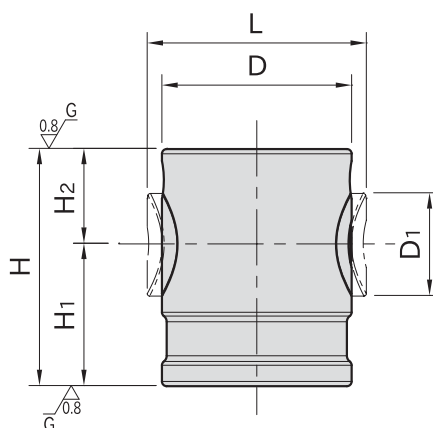
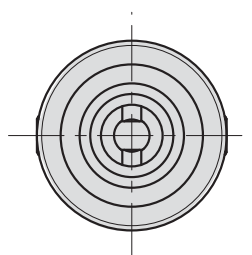


CP152

CLAMPING MODULES (Single)



CP152-06032



CP152-08050, 12080, 16100

Body	Clamping Nut	Locking Screw
SCM440 steel Induction hardened Black oxide finished Precision ground	SCM440 steel Quenched and tempered Black oxide finished	SCM435 steel Quenched and tempered Black oxide finished

Part Number	D	H (±0.01)	D ₁	L	H ₁	H ₂	H ₃	d (H7)	H ₄	M	W
CP152-06032	30	32	15	34.5	19.5	12.5	11.5	8	5	M 6X1	3
CP152-08050	40	50	22	46	30	20	18	12	7.5	M 8X1.25	4
CP152-12080	60	80	32	69	50	30	25	18	10.5	M12X1.75	6
CP152-16100	80	100	44	91	60	40	31	22	12.5	M16X2	8

Part Number	Clamping Force (kN)	Allowable Screw Torque (N·m)	Weight (kg)
CP152-06032	5	4	0.2
CP152-08050	8	8	0.5
CP152-12080	15	22	1.6
CP152-16100	25	50	3.8

Technical Information

Allowable Cutting Force &
Workpiece Weight of CLAMPING
MODULES

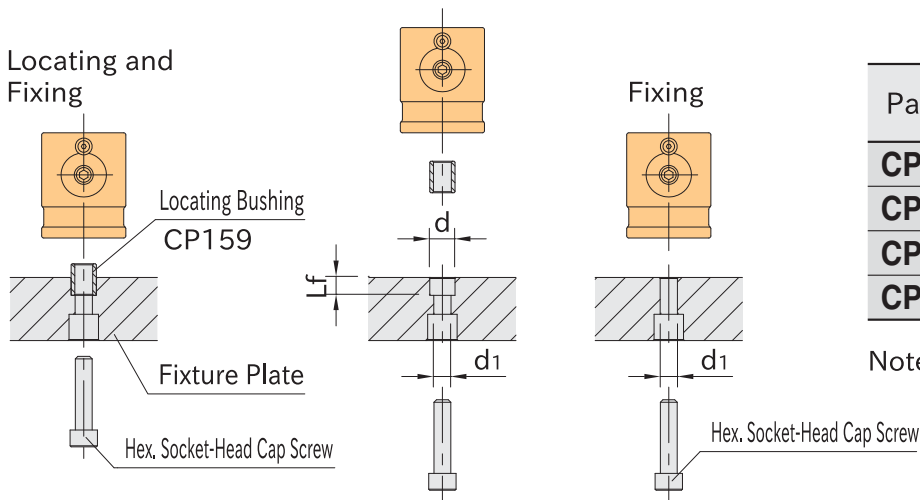
Related Product

- **CP150** Clamping Modules (Flanged)
 - **CP151** Clamping Modules (Double)
 - **CP159** Locating Bushings
 - **CP155-L** Tapered Clamping Screws
 - **CP155-D** Tapered Clamping Screws
 - **CP156** Clamping Screws
- For workpiece raising
- **CP155-LS** Tapered Riser Screws
 - **CP155-DS** Tapered Riser Screws
 - **CP156-S** Riser Screws

How To Use

- Use **CP159** Locating Bushing for precise locating.
- Use only hex. socket-head cap screw just for fixing.

■ Mounting-Hole Dimension



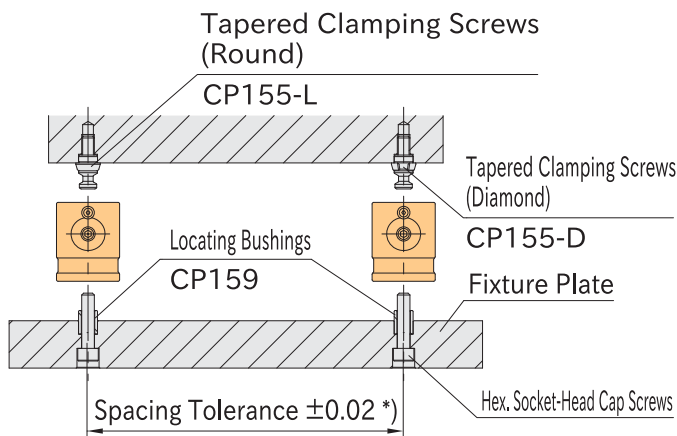
Part Number	d (H7)	L_f	d_1 ($+0.2$ 0)
CP152-06032	8	6.5	6
CP152-08050	12	8.5	8
CP152-12080	18	12.5	12
CP152-16100	22	16.5	16

Note: Only c'bored hole is required just for fixing.

■ Spacing Tolerance

Spacing tolerance for CP159 Locating Bushings should be ± 0.02 .

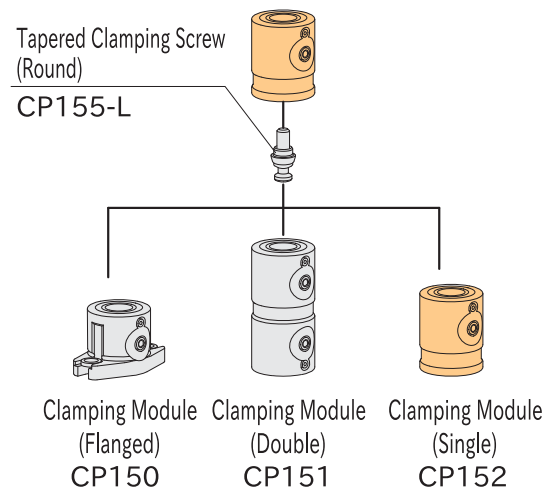
*) Spacing tolerance for hex. socket-head cap screw should be ± 0.1 .



■ Coupling with Other Clamping Modules

Can be coupled with each Clamping Module.

〈Locating Repeatability is $5 \mu m$ 〉

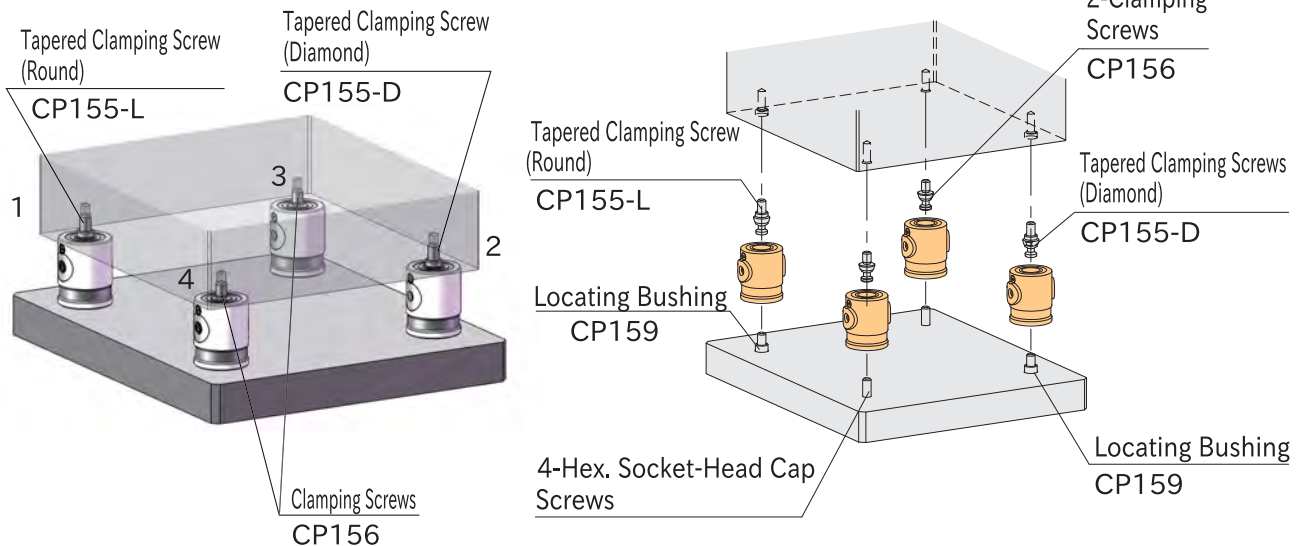


■ Tightening Order

Tighten the locking screws in order of 1(Round Tapered Clamping Screw)→2(Diamond Tapered Clamping Screw)→3(Clamping Screw)→4(Clamping Screw).

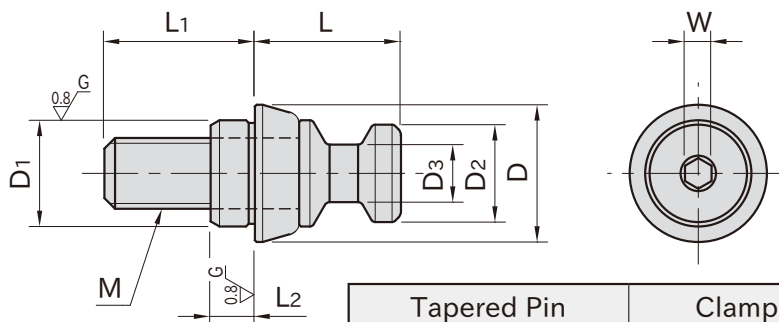
Note: For **CP152** -06032, use 2 pieces of Round Tapered Clamping Screw.

Tighten these 2 screws in the same order to maintain the locating repeatability.



CP155-L

TAPERED CLAMPING SCREWS

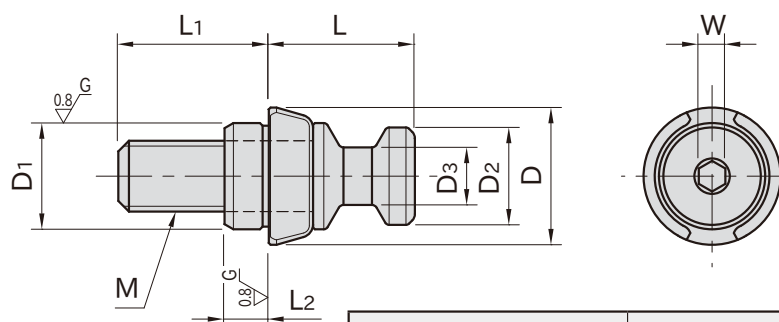


Tapered Pin	Clamping Screw
S45C steel Black oxide finished Precision ground	SCM435 steel Quenched and tempered Black oxide finished

Part Number	M	D ₁ (g6)	L ₂	L ₁	D	L	D ₂	D ₃	W	Weight (g)	CLAMPING MODULES
CP155-06001L	M 6X1	8	5	13	11.5	10	8	4.8	2.5	6	CP150-06025, CP151-06050 CP152-06032
CP155-08061L	M 6X1	10	5	17	15.5	16.5	11	6.5	3	17	CP150-08040, CP151-08080
CP155-08001L	M 8X1.25	12	5	17	24.5	25	16	9.5	5	20	CP152-08050
CP155-12081L	M 8X1.25	12	5	17	31.5	33	21	13	6	52	CP150-12063, CP151-12125
CP155-12001L	M12X1.75	18	6	24	44.2	41.5	29.5	18	8	70	CP152-12080
CP155-16121L	M12X1.75	18	6	24	31.5	33	21	13	6	125	CP150-16080, CP151-16160
CP155-16001L	M16X2	22	7.5	30	44.2	41.5	29.5	18	8	150	CP152-16100
CP155-20001L	M20X2.5	30	7.5	37	44.2	41.5	29.5	18	8	354	CP150-20100
CP155-20241L	M24X3	34	7.5	42	44.2	41.5	29.5	18	8	414	

CP155-D

TAPERED CLAMPING SCREWS



Tapered Pin	Clamping Screw
S45C steel Black oxide finished Precision ground	SCM435 steel Quenched and tempered Black oxide finished

Part Number	M	D ₁ (g6)	L ₂	L ₁	D	L	D ₂	D ₃	W	Weight (g)	CLAMPING MODULES
CP155-08061D	M 6X1	10	5	17	15.5	16.5	11	6.5	3	17	CP150-08040, CP151-08080
CP155-08001D	M 8X1.25	12	5	17	24.5	25	16	9.5	5	20	CP152-08050
CP155-12081D	M 8X1.25	12	5	17	31.5	33	21	13	6	51	CP150-12063, CP151-12125
CP155-12001D	M12X1.75	18	6	24	44.2	41.5	29.5	18	8	70	CP152-12080
CP155-16121D	M12X1.75	18	6	24	31.5	33	21	13	6	123	CP150-16080, CP151-16160
CP155-16001D	M16X2	22	7.5	30	44.2	41.5	29.5	18	8	150	CP152-16100
CP155-20001D	M20X2.5	30	7.5	37	44.2	41.5	29.5	18	8	354	CP150-20100
CP155-20241D	M24X3	34	7.5	42	44.2	41.5	29.5	18	8	413	

How To Use

Round Type

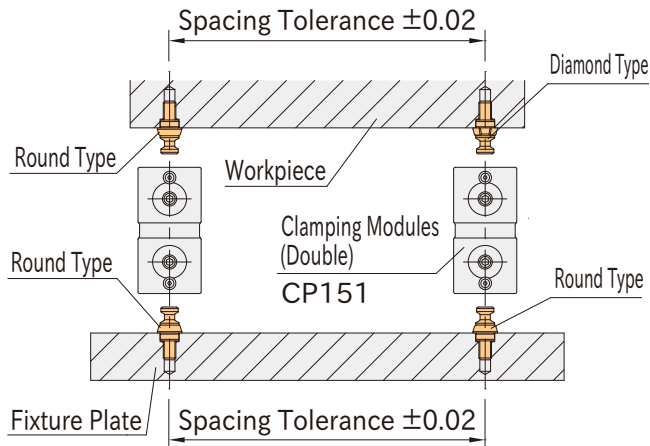
- Can be used for locating **CP151** Clamping Module (Double).
- Can be used for locating a workpiece with diamond type.

Diamond Type

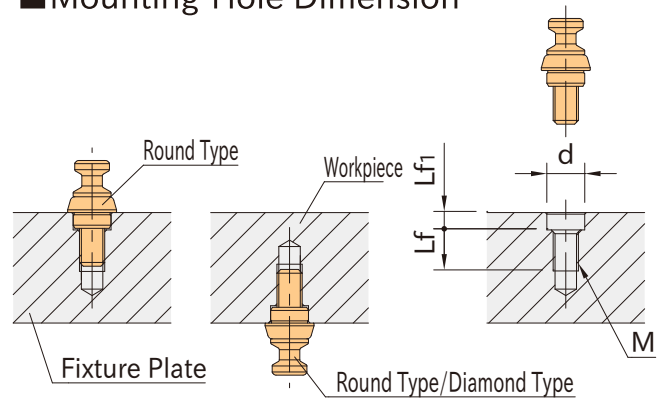
- Can be used for locating a workpiece with round type.
- Fix the tapered pin of diamond type after deciding the direction.

Note: For **CP150**-06025, **CP151**-06050 or **CP152**-06032, use 2 pieces of Round Type.

Spacing Tolerance

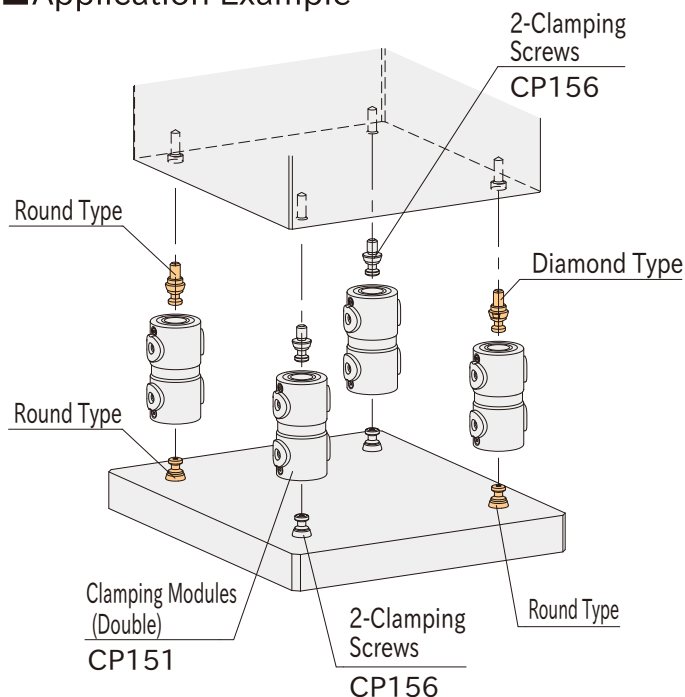


Mounting-Hole Dimension



Size	d (H7)	Lf	Lf ₁	M
CP155-06001	8	9	5.5	M 6×1
CP155-08061	10	13	5.5	M 6×1
CP155-08001	12	13	5.5	M 8×1.25
CP155-12081	12	13	5.5	M 8×1.25
CP155-12001	18	19	6.5	M12×1.75
CP155-16121	18	19	6.5	M12×1.75
CP155-16001	22	23	8	M16×2
CP155-20001	30	30	8	M20×2.5
CP155-20241	34	35	8	M24×3

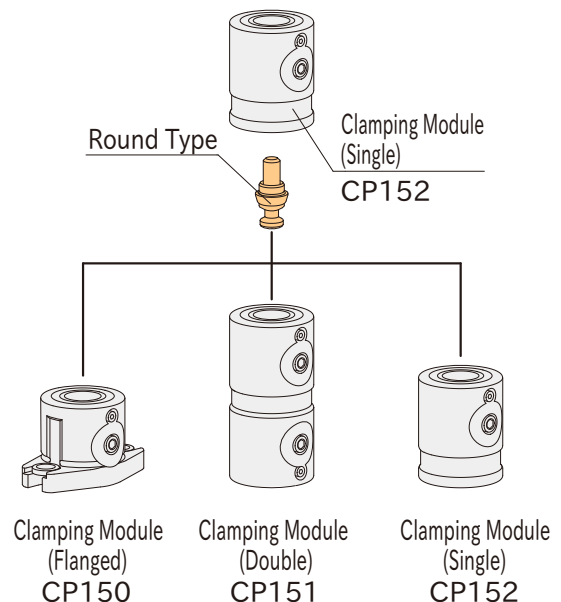
Application Example



Coupling of Clamping Module (Single)

Round type can be used as a coupling for Clamping Module (Single).

〈Locating Repeatability is 5 μm〉

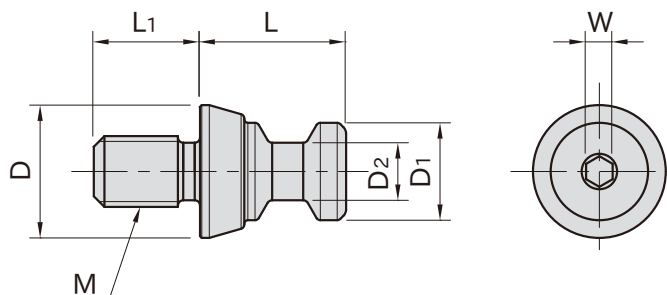


Related Product

- **CP150** Clamping Modules (Flanged)
- **CP151** Clamping Modules (Double)
- **CP152** Clamping Modules (Single)
- **CP156** Clamping Screws

CP156

CLAMPING SCREWS

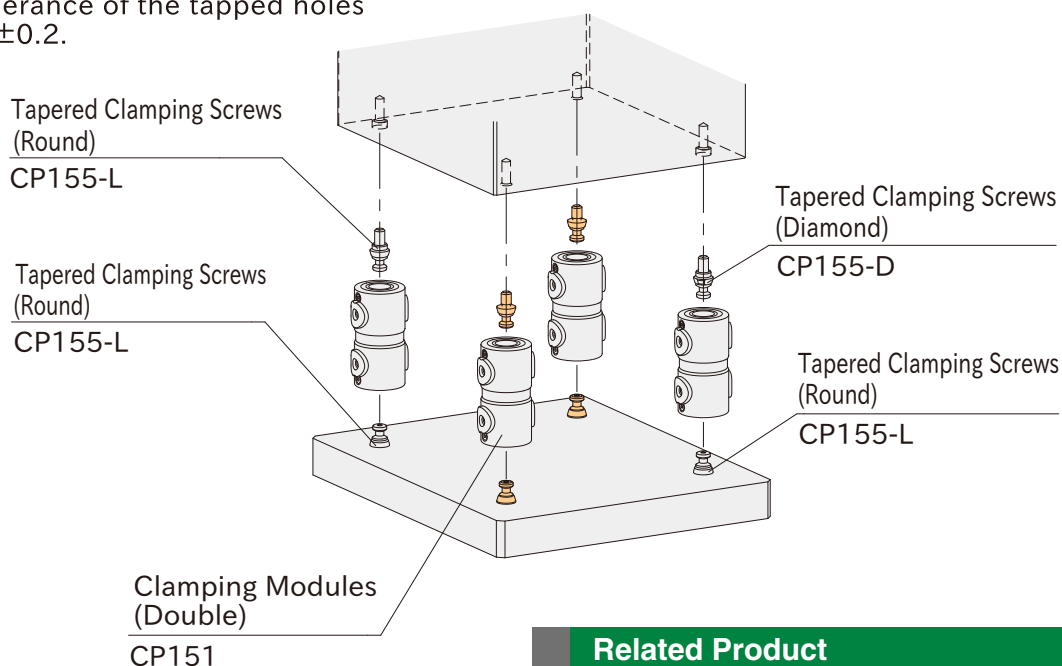


Body
SCM435 steel Quenched and tempered Black oxide finished

Part Number	M	L ₁	D	L	D ₁	D ₂	W	Weight (g)	CLAMPING MODULES
CP156-06001	M 6×1	8	11	10	8	4.8	2.5	5	CP150-06025, CP151-06050 CP152-06032
CP156-08061	M 6×1	9	15	16.5	11	6.5	3	13	CP150-08040, CP151-08080 CP152-08050
CP156-08001	M 8×1.25	12						16	
CP156-12081	M 8×1.25	12	24	25	16	9.5	5	46	CP150-12063, CP151-12125 CP152-12080
CP156-12101	M10×1.5	15						51	
CP156-12001	M12×1.75	18						57	
CP156-16101	M10×1.5	15	31	33	21	13	6	102	CP150-16080, CP151-16160 CP152-16100
CP156-16121	M12×1.75	18						108	
CP156-16001	M16×2	22						125	
CP156-20001	M20×2.5	30	44	41.5	29.5	18	8	310	CP150-20100
CP156-20241	M24×3	35						355	

How To Use

- Can be used for mounting **CP151** Clamping Module (Double) on the fixture plate.
- Can be installed on the workpiece.
- No locating function.
- Spacing tolerance of the tapped holes should be ± 0.2 .



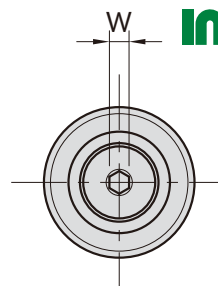
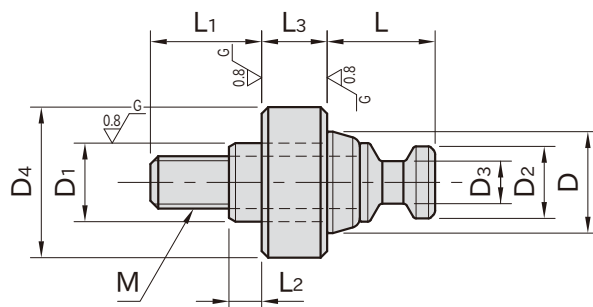
Related Product

- **CP150** Clamping Modules (Flanged)
- **CP151** Clamping Modules (Double)
- **CP152** Clamping Modules (Single)
- **CP155-L** Tapered Clamping Screws
- **CP155-D** Tapered Clamping Screws



CP155-LS

TAPERED RISER SCREWS



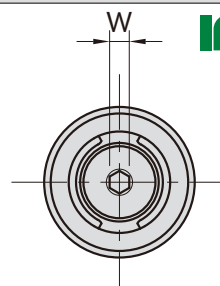
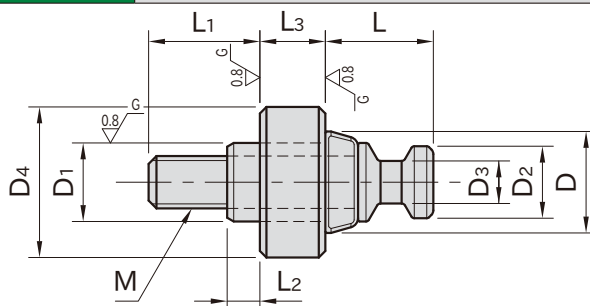
★Key Point
To avoid tool
interference!

Tapered Pin	Clamping Screw	Riser
S45C steel Black oxide finished Precision ground	SCM435 steel Quenched and tempered Black oxide finished	S45C steel Quenched and tempered Black oxide finished Precision ground

Part Number	M	D ₁ (g6)	L ₂	L ₁	D	L	D ₂	D ₃	L ₃ (±0.01)	D ₄	W	Weight (g)	CLAMPING MODULES
CP155-08001LS	M 8×1.25	12	5	17	15.5	16.5	11	6.5	10	23	3	53	CP150-08040, CP151-08080 CP152-08050
CP155-12001LS	M12×1.75	18	6	24	24.5	25	16	9.5	17	34	5	190	CP150-12063, CP151-12125 CP152-12080
CP155-16001LS	M16×2	22	7.5	30	31.5	33	21	13	20	45	6	402	CP150-16080, CP151-16160 CP152-16100
CP155-20001LS	M20×2.5	30	7.5	37	44.2	41.5	29.5	18	30	63	8	1080	CP150-20100
CP155-20241LS	M24×3	34		42								1139	

CP155-DS

TAPERED RISER SCREWS



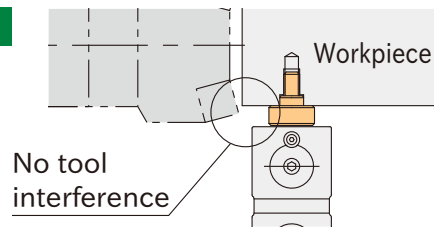
★Key Point
To avoid tool
interference!

Tapered Pin	Clamping Screw	Riser
S45C steel Black oxide finished Precision ground	SCM435 steel Quenched and tempered Black oxide finished	S45C steel Quenched and tempered Black oxide finished Precision ground

Part Number	M	D ₁ (g6)	L ₂	L ₁	D	L	D ₂	D ₃	L ₃ (±0.01)	D ₄	W	Weight (g)	CLAMPING MODULES
CP155-08001DS	M 8×1.25	12	5	17	15.5	16.5	11	6.5	10	23	3	53	CP150-08040, CP151-08080 CP152-08050
CP155-12001DS	M12×1.75	18	6	24	24.5	25	16	9.5	17	34	5	190	CP150-12063, CP151-12125 CP152-12080
CP155-16001DS	M16×2	22	7.5	30	31.5	33	21	13	20	45	6	402	CP150-16080, CP151-16160 CP152-16100
CP155-20001DS	M20×2.5	30	7.5	37	44.2	41.5	29.5	18	30	63	8	1079	CP150-20100
CP155-20241DS	M24×3	34		42								1139	

Feature

The workpiece can be raised to avoid tool interference with Clamping Module.



How To Use

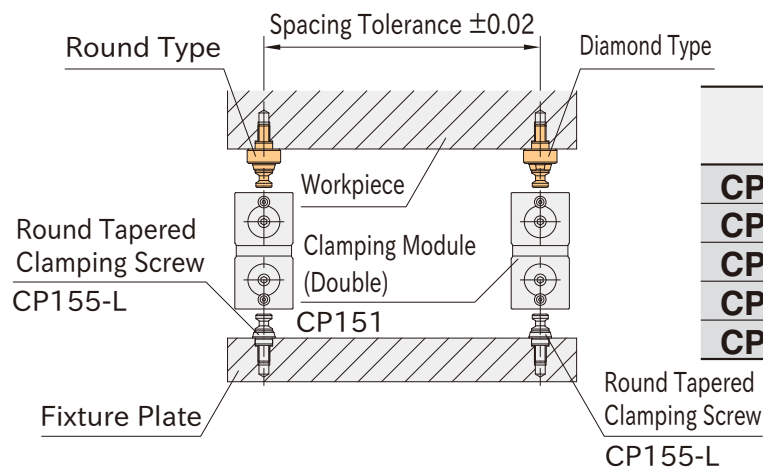
Round Type

- Use together with diamond type for workpiece locating.

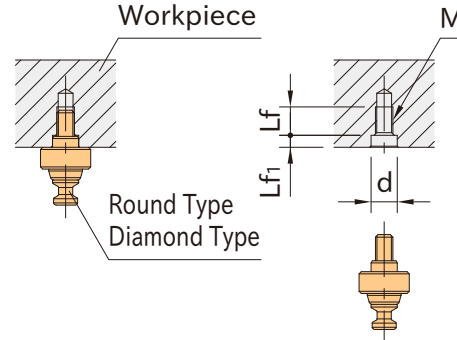
Diamond Type

- Use together with round type for workpiece locating.
- Fix diamond screws after deciding the orientation of the reference surfaces.

Spacing Tolerance

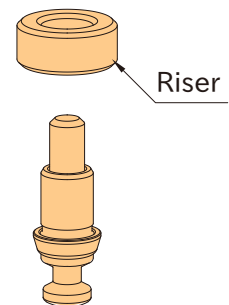
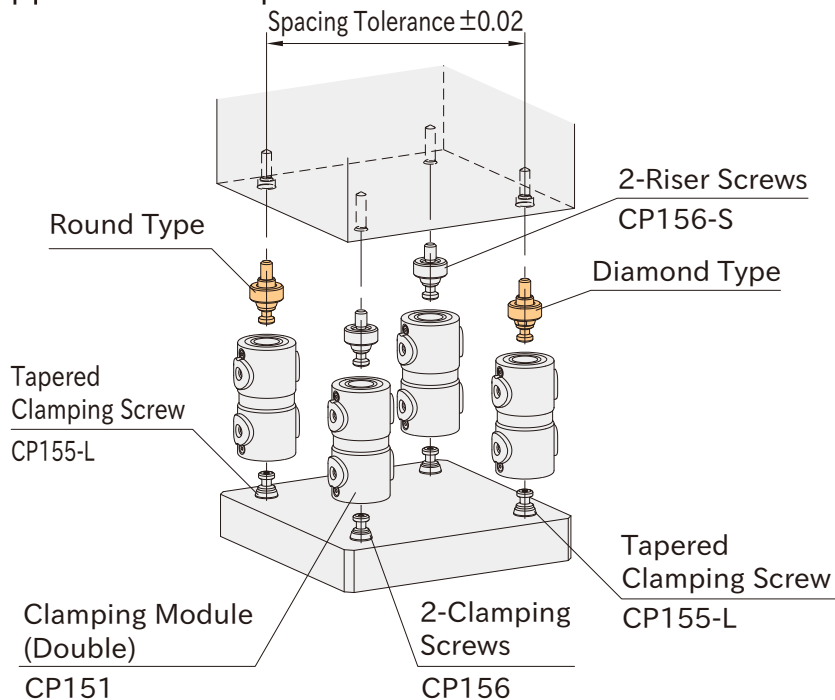


Mounting Hole Dimension



Size	d (H7)	Lf	Lf1	M
CP155-08001	12	13	5.5	M 8×1.25
CP155-12001	18	19	6.5	M12×1.75
CP155-16001	22	23	8	M16×2
CP155-20001	30	30	8	M20×2.5
CP155-20241	34	35		M24×3

Application Example



Riser is removable.

Clean the top and bottom surfaces regularly.

Note: Riser may drop from the body of clamping screw.

Note

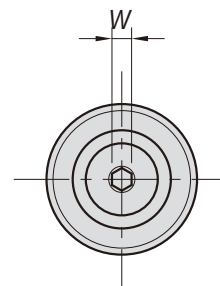
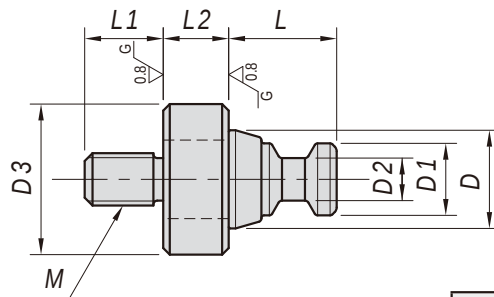
Please check Allowable Cutting Force & Workpiece Weight of CLAMPING MODULES before using.

Related Products

- CP150 Clamping Modules (Flanged)
- CP151 Clamping Modules (Double)
- CP152 Clamping Modules (Single)
- CP156-S Riser Screws

CP156-S

RISER SCREWS



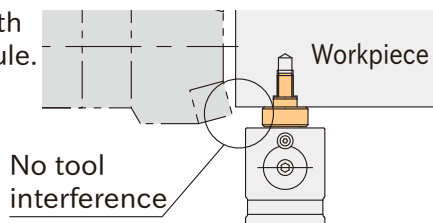
★Key Point
To avoid tool interference!

Clamping Screw	Riser
SCM435 steel Quenched and tempered Black oxide finished	S45C steel Quenched and tempered Black oxide finished Precision ground

Part Number	M	L ₁	D	L	D ₁	D ₂	L ₂ (±0.01)	D ₃	W	Weight (g)	CLAMPING MODULES
CP156-08061S	M 6×1	9	15	16.5	11	6.5	10	23	3	45	CP150-08040, CP151-08080
CP156-08001S	M 8×1.25	12								47	CP152-08050
CP156-12081S	M 8×1.25	12	24	25	16	9.5	17	34	5	165	CP150-12063, CP151-12125
CP156-12101S	M10×1.5	15								170	CP152-12080
CP156-12001S	M12×1.75	18								176	
CP156-16101S	M10×1.5	15	31	33	21	13	20	45	6	348	CP150-16080, CP151-16160
CP156-16121S	M12×1.75	18								354	CP152-16100
CP156-16001S	M16×2	22								372	
CP156-20001S	M20×2.5	30	44	41.5	29.5	18	30	63	8	1033	CP150-20100
CP156-20241S	M24×3	35								1077	

Feature

The workpiece can be raised to avoid tool interference with Clamping Module.

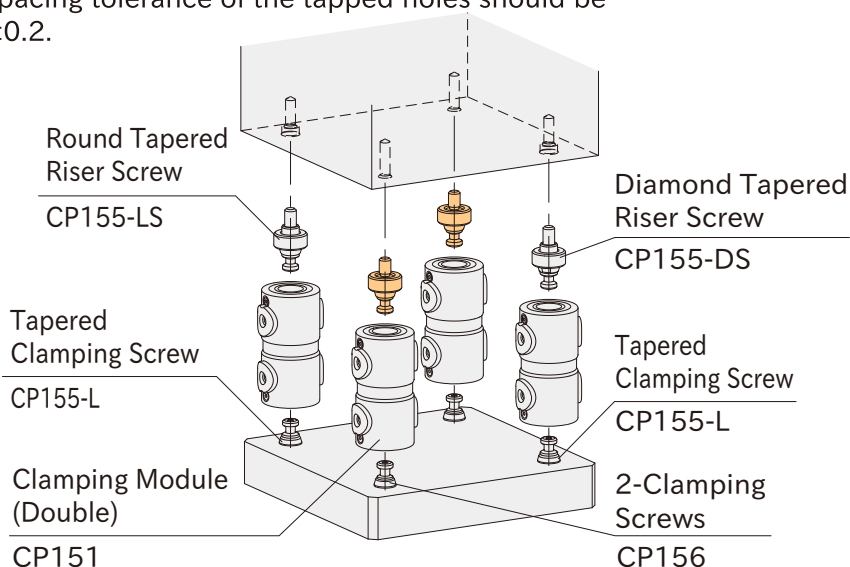


Related Products

- CP150 Clamping Modules (Flanged)
- CP151 Clamping Modules (Double)
- CP152 Clamping Modules (Single)
- CP155-LS Round Tapered Riser Screws
- CP155-DS Diamond Tapered Riser Screws

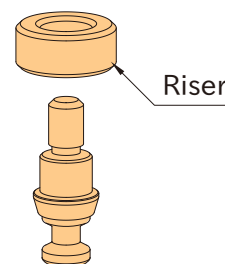
How To Use

- Can be installed on the workpiece.
- No locating function
- Spacing tolerance of the tapped holes should be ± 0.2 .



Note

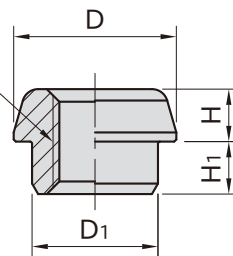
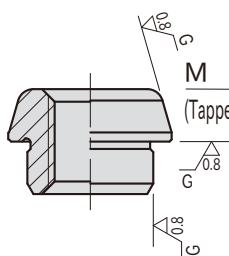
Please check Allowable Cutting Force & Workpiece Weight of CLAMPING MODULES before using.



Riser is removable.
Clean the top and bottom surfaces regularly.
Note: Riser may drop from the body of clamping screw.

CP157

TAPERED PINS



Body
S45C steel
Black oxide finished
Precision ground (only for Accurate type)

CP157-L

(Accurate)

CP157-S

(Standard)

CP157-L

(Accurate)

CP157-S

(Standard)

Accurate		Standard		D	H	H ₁	M	Weight (g)	CLAMPING MODULES
Part Number	D ₁ (g6)	Part Number	D ₁ (-0.02/-0.05)						
CP157-06001L	8	CP157-06001S	8	11.5	4	5	M 6×1	4	CP150-06025
CP157-08001L	12	CP157-08001S	12	15.5	5	5	M 8×1.25	8	CP150-08040, CP160-08040*
CP157-12001L	18	CP157-12001S	18	24.5	8	6	M12×1.75	27	CP150-12063, CP160-12063*
CP157-16001L	22	CP157-16001S	22	31.5	10	7.5	M16×2	51	CP150-16080, CP160-16080*
CP157-20001L	30	CP157-20001S	30	44.2	13	7.5	M20×2.5	134	CP150-20100

How To Use

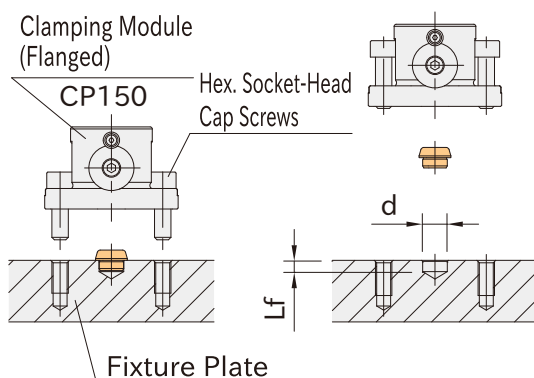
- Can be used for mounting **CP150** Clamping Module (Flanged) on the fixture plate.
- Use Accurate Type for precise locating of a clamping module.
- Use Standard Type for rough locating of a clamping module.

Spacing Tolerance

Spacing tolerance for Accurate Type should be ± 0.02 .

*) Spacing tolerance for Standard Type should be ± 0.1 .

Mounting-Hole Dimension

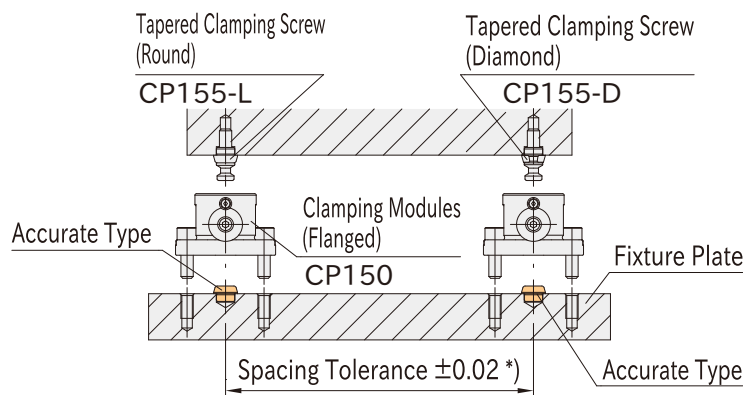


Size		d (H7)	Lf
CP157	06001	8	5.5
	08001	12	5.5
	12001	18	6.5
	16001	22	8
	20001	30	8

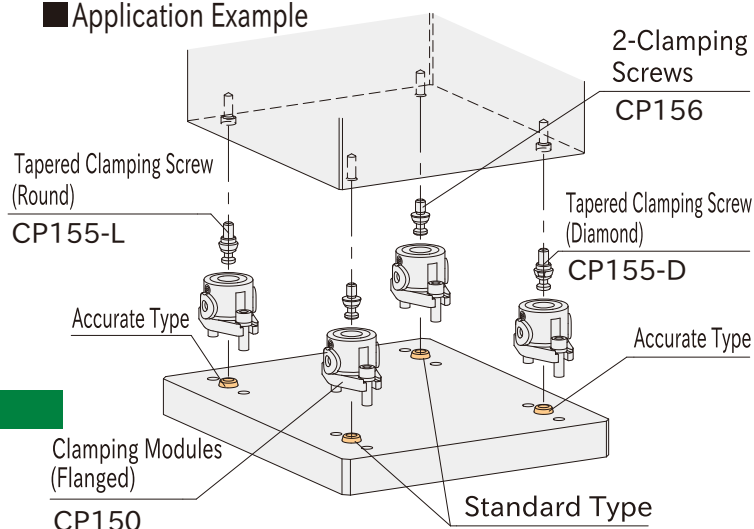
Note: The tolerance of dimension "d" for Standard Type should be $^{+0.1}_0$.

Related Product

- CP150** Clamping Modules (Flanged)
- CP155-L** Tapered Clamping Screws
- CP155-D** Tapered Clamping Screws
- CP156** Clamping Screws
- CP160** Clamping Modules (Hook)

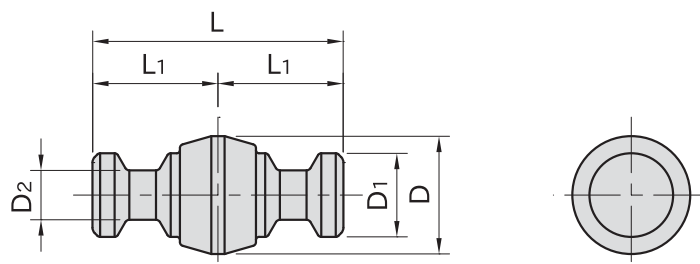


Application Example



CP158

DOUBLE TAPERED CLAMPING PINS



Body

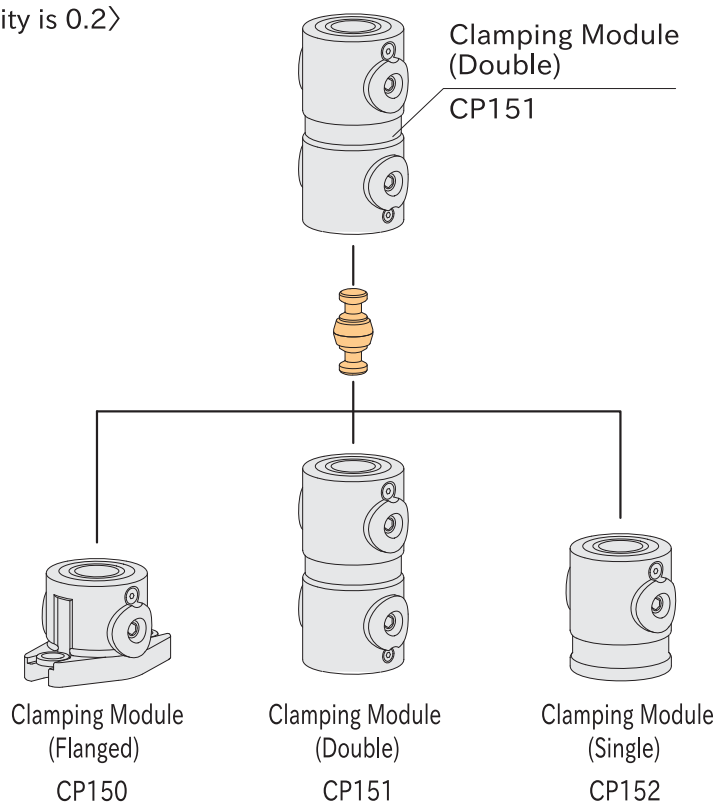
SCM435 steel
Quenched and tempered
Black oxide finished

Part Number	D	L	D ₁	D ₂	L ₁	Weight (g)	CLAMPING MODULES
CP158-08001	15.5	33	11	6.5	16.5	24	CP150-08040, CP151-08080, CP152-08050
CP158-12001	24.5	50	16	9.5	25	85	CP150-12063, CP151-12125, CP152-12080
CP158-16001	31.5	66	21	13	33	190	CP150-16080, CP151-16160, CP152-16100

How To Use

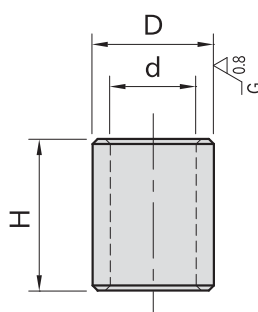
Can be used as a coupling for **CP151** Clamping Module (Double).

〈Locating Repeatability is 0.2〉



CP159

LOCATING BUSHINGS



Body

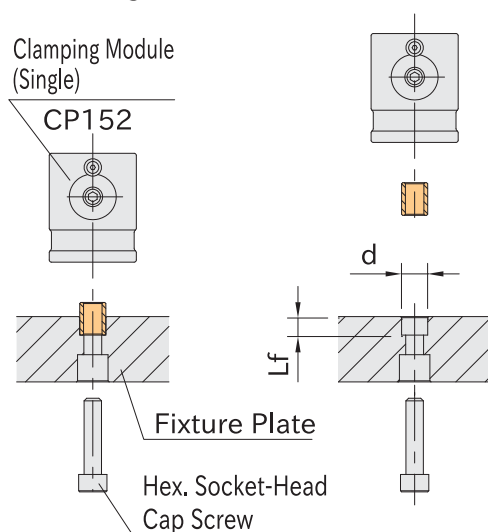
SK95 steel
Quenched and tempered
Black oxide finished
Precision ground

Part Number	d	D (h6)	H	Weight (g)	CLAMPING MODULES
CP159-06001	6	8	11	2	CP152-06032
CP159-08001	8.5	12	15	7	CP152-08050
CP159-12001	12.5	18	22	22	CP152-12080
CP159-16001	16.5	22	28	35	CP152-16100

How To Use

Can be used for locating **CP152** Clamping Module (Single) on the fixture plate.

■ Mounting-Hole Dimension

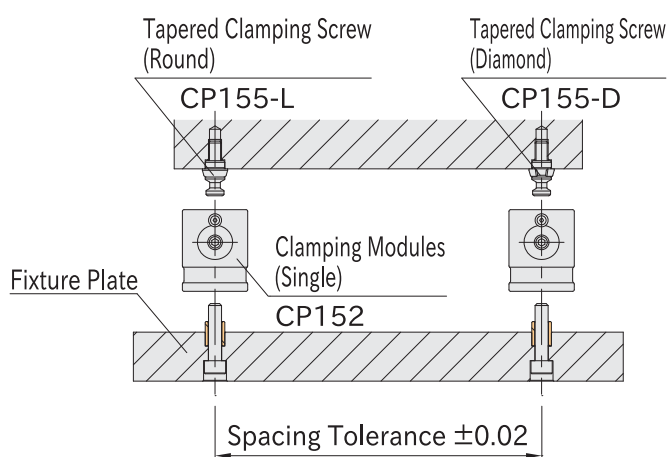


Part Number	d (H7)	Lf
CP159-06001	8	6.5
CP159-08001	12	8.5
CP159-12001	18	12.5
CP159-16001	22	16.5

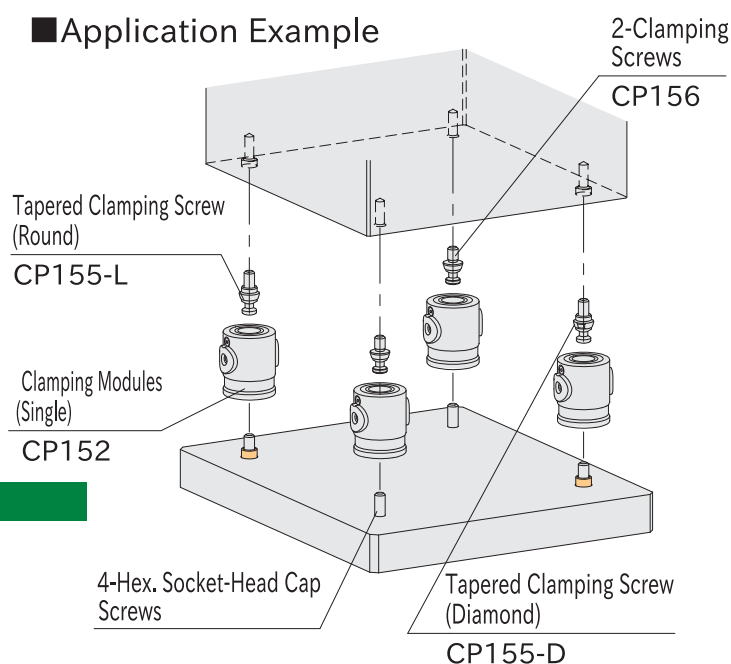
Related Product

- **CP152** Clamping Modules (Single)
- **CP155-L** Tapered Clamping Screws
- **CP155-D** Tapered Clamping Screws
- **CP156** Clamping Screws

■ Spacing Tolerance



■ Application Example

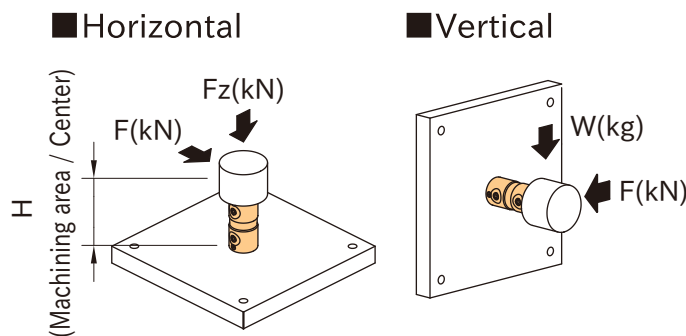


Allowable Cutting Force & Workpiece Weight of CLAMPING MODULES

Ensure the cutting force and the workpiece weight are within the allowable level.
The values below are only the strength of the body of clamping modules.
The rigidity of the whole fixtures and the workpiece are not considered.
Use the values as a guide for setting appropriate machining conditions.

1 Module

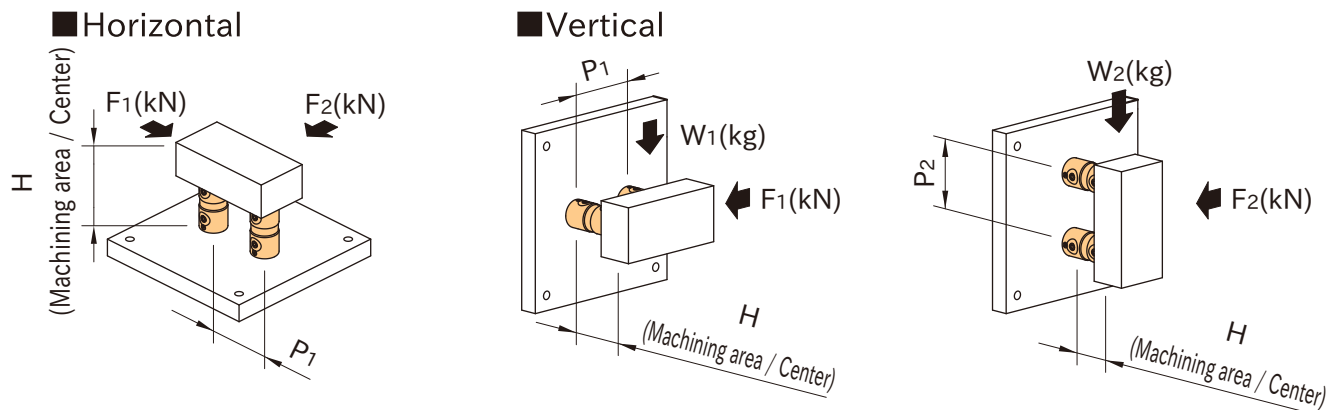
- *) Prepare a locator when the workpiece gets big rotating force.
**) The use of Riser Screw is not recommended because allowable cutting force and allowable workpiece weight will be decreased.



Part Number	Allowable Cutting Force		Allowable Workpiece Weight W(kg)
	F(kN)	Fz(kN)	
CP150-06025	50/H	1.5	50×100/H
CP151-06050	25/H		25×100/H
CP152-06032	25/H		25×100/H
CP150-08040	120/H	2.5	120×100/H
CP151-08080	70/H		70×100/H
CP152-08050	70/H		70×100/H
CP150-12063	250/H	7.5	250×100/H
CP151-12125	150/H		150×100/H
CP152-12080	150/H		150×100/H
CP150-16080	500/H	15	500×100/H
CP151-16160	300/H		300×100/H
CP152-16100	300/H		300×100/H
CP150-20100	1000/H	25	1000×100/H

2 Modules

- ***) The use of Riser Screw is not recommended because allowable cutting force and allowable workpiece weight will be decreased.

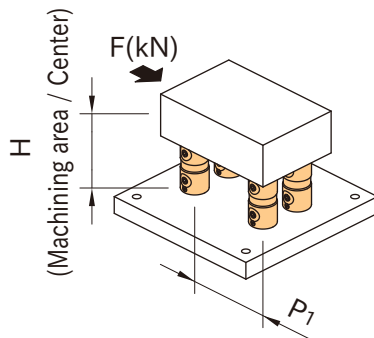


Part Number	Allowable Cutting Force			Allowable Workpiece Weight		
	F ₁ (kN)	F ₂ (kN)	Max(kN)	W ₁ (kg)	W ₂ (kg)	Max(kg)
CP150-06025	(0.10P ₁ + 180)/H	100/H	1.8	100×100/H	(0.10P ₂ + 180) ×100/H	180
CP151-06050	(0.05P ₁ + 90)/H	50/H		50×100/H	(0.05P ₂ + 90) ×100/H	
CP152-06032	(0.05P ₁ + 90)/H	50/H		50×100/H	(0.05P ₂ + 90) ×100/H	
CP150-08040	(0.24P ₁ + 432)/H	240/H	3.2	240×100/H	(0.24P ₂ + 432) ×100/H	320
CP151-08080	(0.14P ₁ + 252)/H	140/H		140×100/H	(0.14P ₂ + 252) ×100/H	
CP152-08050	(0.14P ₁ + 252)/H	140/H		140×100/H	(0.14P ₂ + 252) ×100/H	
CP150-12063	(0.50P ₁ + 900)/H	500/H	6	500×100/H	(0.50P ₂ + 900) ×100/H	600
CP151-12125	(0.30P ₁ + 540)/H	300/H		300×100/H	(0.30P ₂ + 540) ×100/H	
CP152-12080	(0.30P ₁ + 540)/H	300/H		300×100/H	(0.30P ₂ + 540) ×100/H	
CP150-16080	(1.00P ₁ +1800)/H	1000/H	10	1000×100/H	(1.00P ₂ +1800) ×100/H	1000
CP151-16160	(0.60P ₁ +1080)/H	600/H		600×100/H	(0.60P ₂ +1080) ×100/H	
CP152-16100	(0.60P ₁ +1080)/H	600/H		600×100/H	(0.60P ₂ +1080) ×100/H	
CP150-20100	(2.00P ₁ +3600)/H	2000/H	20	2000×100/H	(2.00P ₂ +3600) ×100/H	2000

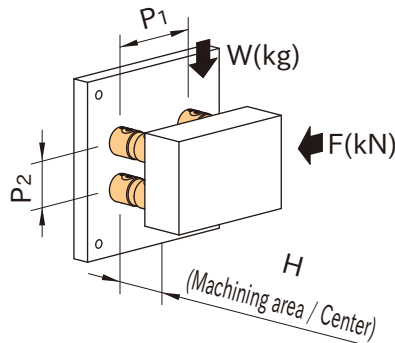
4 Modules

****) Allowable cutting force and allowable workpiece weight are significantly decreased when using Riser Screws. Please see the table below as a guide.

■ Horizontal

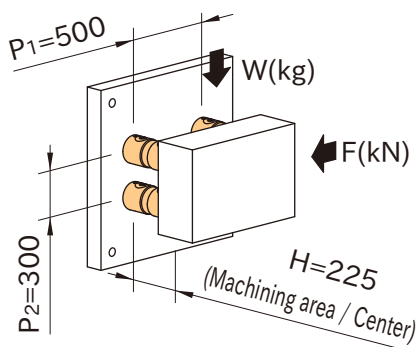


■ Vertical



Part Number	Allowable Cutting Force		Allowable Workpiece Weight		When using Riser Screws ****)
	F(kN)	Max(kN)	W(kg)	Max(kg)	
CP150-06025	$2 \times (0.10P_1 + 180) / H$	3.6	$2 \times (0.10P_2 + 180) \times 100 / H$	360	—
CP151-06050	$2 \times (0.05P_1 + 90) / H$		$2 \times (0.05P_2 + 90) \times 100 / H$		
CP152-06032	$2 \times (0.05P_1 + 90) / H$		$2 \times (0.05P_2 + 90) \times 100 / H$		
CP150-08040	$2 \times (0.24P_1 + 432) / H$	6.4	$2 \times (0.24P_2 + 432) \times 100 / H$	640	Allowable Cutting Force ×50%
CP151-08080	$2 \times (0.14P_1 + 252) / H$		$2 \times (0.14P_2 + 252) \times 100 / H$		
CP152-08050	$2 \times (0.14P_1 + 252) / H$		$2 \times (0.14P_2 + 252) \times 100 / H$		
CP150-12063	$2 \times (0.50P_1 + 900) / H$	12	$2 \times (0.50P_2 + 900) \times 100 / H$	1200	Allowable Workpiece Weight ×60%
CP151-12125	$2 \times (0.30P_1 + 540) / H$		$2 \times (0.30P_2 + 540) \times 100 / H$		
CP152-12080	$2 \times (0.30P_1 + 540) / H$		$2 \times (0.30P_2 + 540) \times 100 / H$		
CP150-16080	$2 \times (1.00P_1 + 1800) / H$	20	$2 \times (1.00P_2 + 1800) \times 100 / H$	2000	×70%
CP151-16160	$2 \times (0.60P_1 + 1080) / H$		$2 \times (0.60P_2 + 1080) \times 100 / H$		
CP152-16100	$2 \times (0.60P_1 + 1080) / H$		$2 \times (0.60P_2 + 1080) \times 100 / H$		
CP150-20100	$2 \times (2.00P_1 + 3600) / H$	40	$2 \times (2.00P_2 + 3600) \times 100 / H$	4000	

Calculation Example



- Vertical mounting
- 4 pcs of CP151-12125 (height 125mm)
- Pitch:
P₁=500mm
P₂=300mm
- Workpiece center: H=225mm
- F direction cutting force: 3kN
- Workpiece weight: 375kg

Related Product

Hook type for horizontal machining center is available.

<Allowable Cutting Force F>

$$F = 2 \times (0.3 \times P_1 + 540) / H \\ = 2 \times (0.3 \times 500 + 540) / 225 \\ = 6.13 \text{ kN}$$

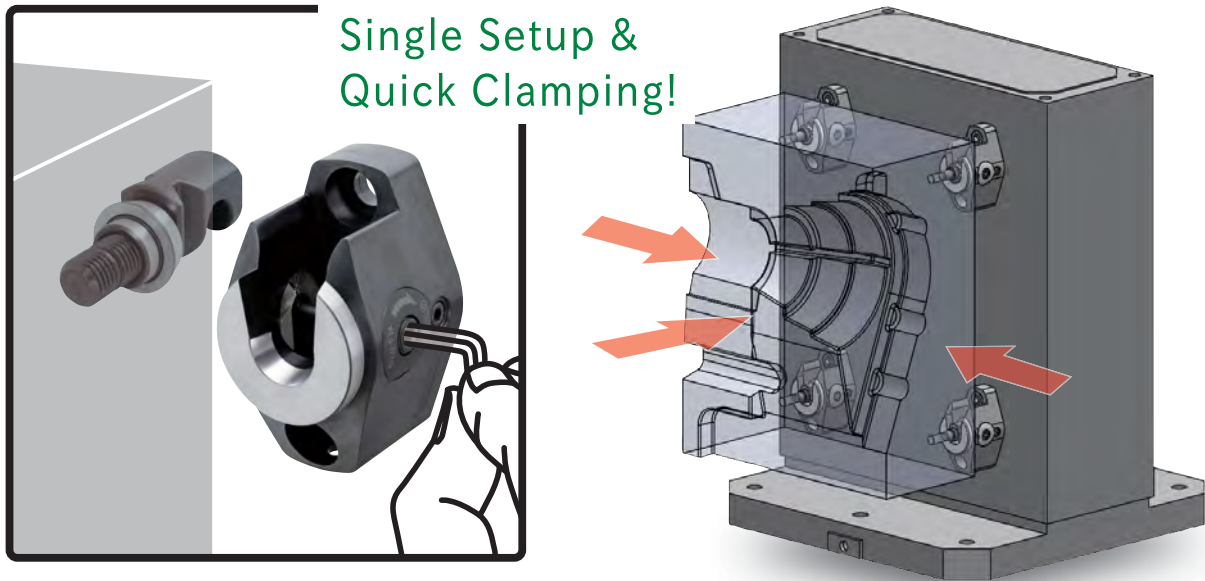
*) Cutting force 3kN is within allowable value (6.13kN).

<Allowable Workpiece Weight W>

$$W = 2 \times (0.3 \times P_2 + 540) \times 100 / H \\ = 2 \times (0.3 \times 300 + 540) \times 100 / 225 \\ = 560 \text{ kg}$$

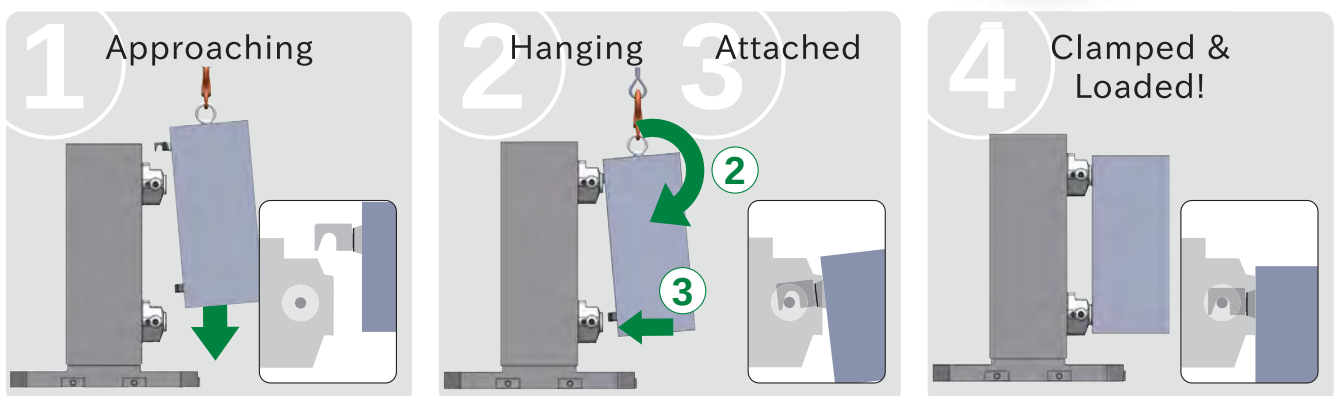
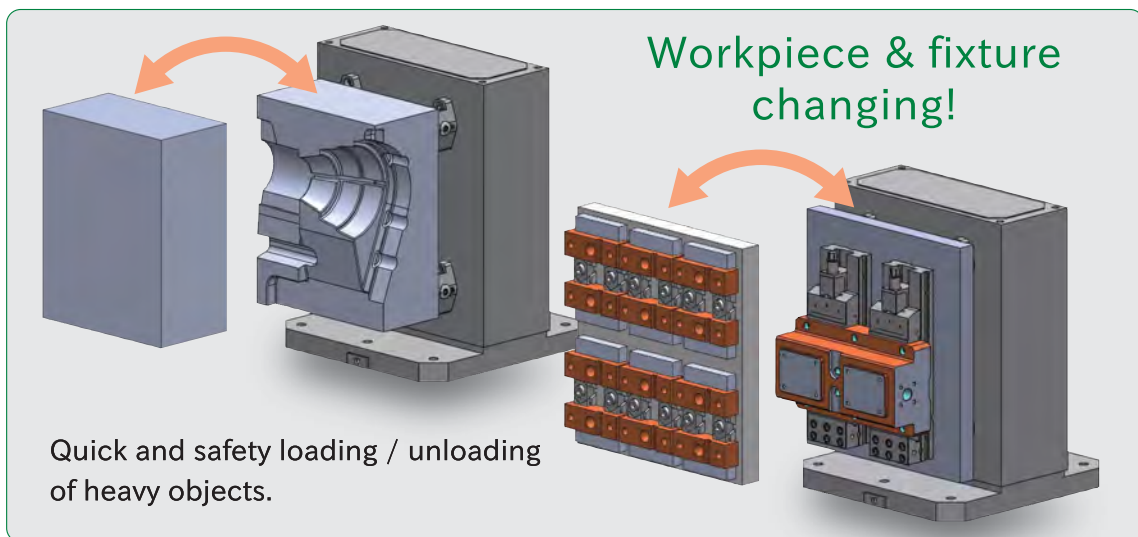
*) Workpiece weight 375kg is within allowable value (560kg).

MODULAR PULL CLAMPING SYSTEM HOOK TYPE



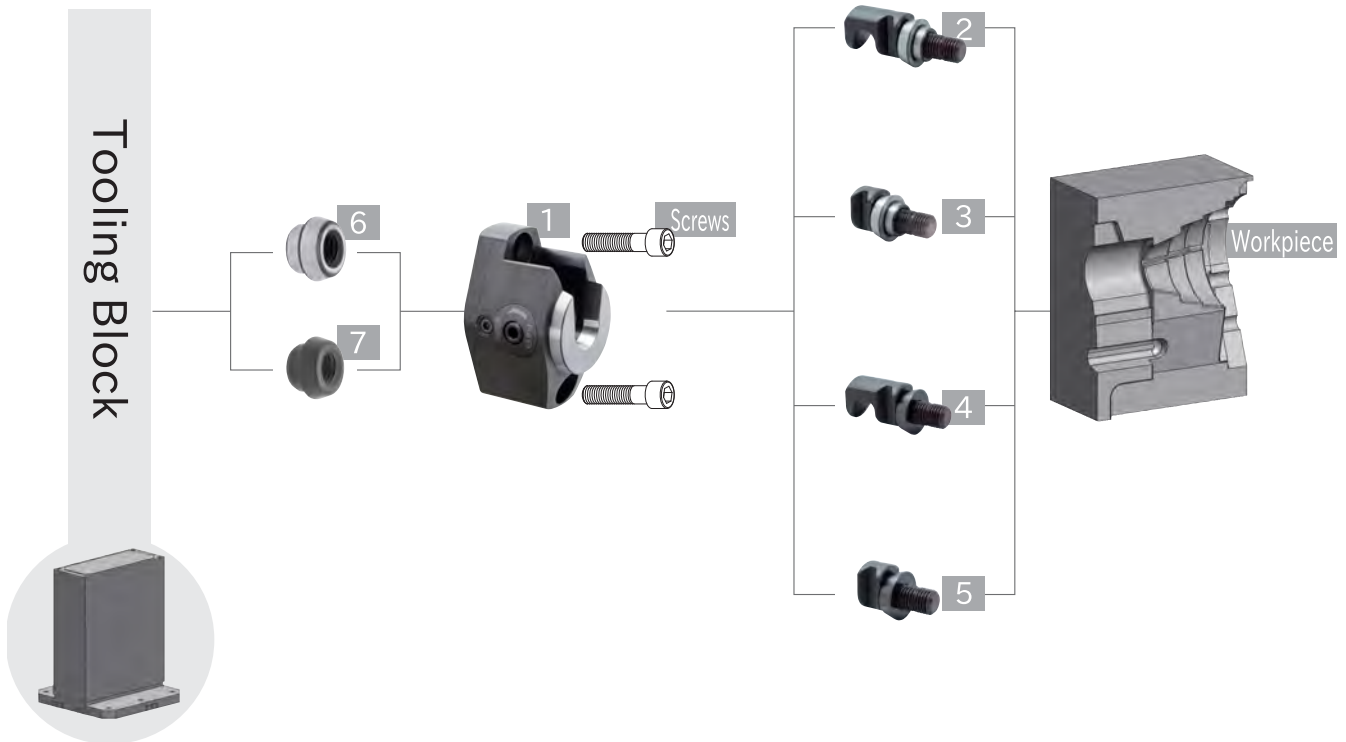
For Horizontal Machining Center MODULAR PULL CLAMPING SYSTEM HOOK TYPE

Hook-shaped clamping screws enable to hang the workpiece before clamping!
Quick and safety workpiece setup in vertical workholding.



How To Use Modular Pull Clamping System Hook Type

Assembly Chart



Clamping Modules

1 Hook



Part Number		Height (mm)	Clamping Force (kN)
CP160-08040R	CP160-08040L	40	8
CP160-12063R	CP160-12063L	63	15
CP160-16080R	CP160-16080L	80	25

Tapered Clamping Screws

2 With Hook



Part Number	Thread Size	Workpiece Locating Repeatability
CP165-08001LH	M 8	5µm
CP165-12001LH	M12	
CP165-16001LH	M16	

3 Without Hook



Part Number	Thread Size	Workpiece Locating Repeatability
CP165-08001L	M 8	5µm
CP165-12001L	M12	
CP165-16001L	M16	

Clamping Screws

4 With Hook



Part Number	Thread Size
CP166-08001H	M 8
CP166-12001H	M12
CP166-16001H	M16

5 Without Hook



Part Number	Thread Size
CP166-08001	M 8
CP166-12001	M12
CP166-16001	M16

Tapered Bushings

6 Accurate



Part Number	Clamping Module Locating Repeatability
CP157-08001L	5µm
CP157-12001L	
CP157-16001L	

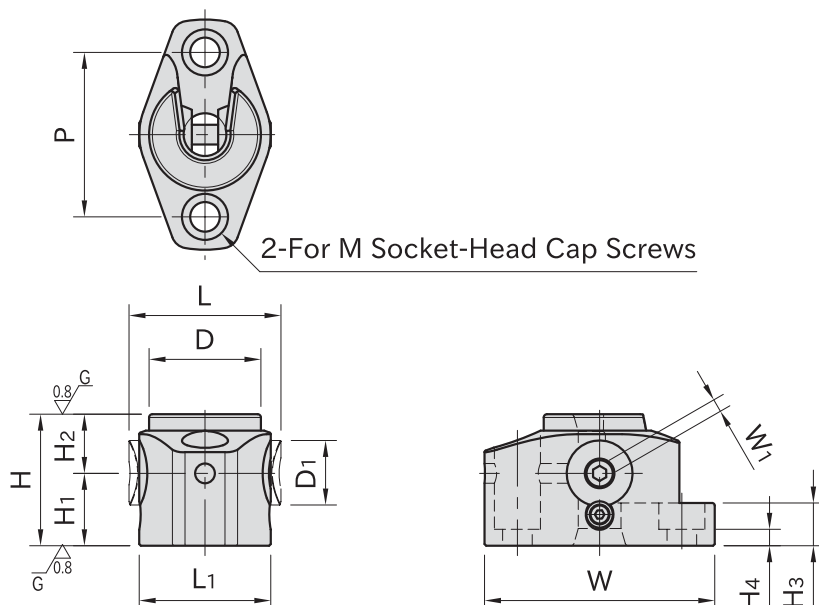
7 Standard



Part Number	Clamping Module Locating Repeatability
CP157-08001S	0.1mm
CP157-12001S	
CP157-16001S	

CP160

CLAMPING MODULES (Hook)



Note: The drawing shows CP160-R. The hex. socket for locking screw (W_1) is on the other side in CP160-L.

Body	Clamping Nut	Locking Screw
SCM440 steel Induction hardened Black oxide finished Precision ground	SCM440 steel Quenched and tempered Black oxide finished	SCM435 steel Quenched and tempered Black oxide finished

Part Number	D	H (± 0.01)	D ₁	L	H ₁	H ₂	W	L ₁	H ₃
CP160-08040R	34	40	20	46	22	18	70	40	13
CP160-08040L									
CP160-12063R	52	63	30	69	35	28	100	60	20
CP160-12063L									
CP160-16080R	70	80	40	93	44	36	140	80	26
CP160-16080L									

Part Number	M	P	H ₄	W ₁	Clamping Force (kN)	Allowable Screw Torque (N·m)	Weight (kg)
CP160-08040R	M 8	50	5	4	8	8	0.4
CP160-08040L							
CP160-12063R	M12	75	8	6	15	22	1.4
CP160-12063L							
CP160-16080R	M16	100	10	8	25	50	3.2
CP160-16080L							

Technical Information

Allowable Cutting Force & Workpiece Weight of CLAMPING MODULES (Hook)

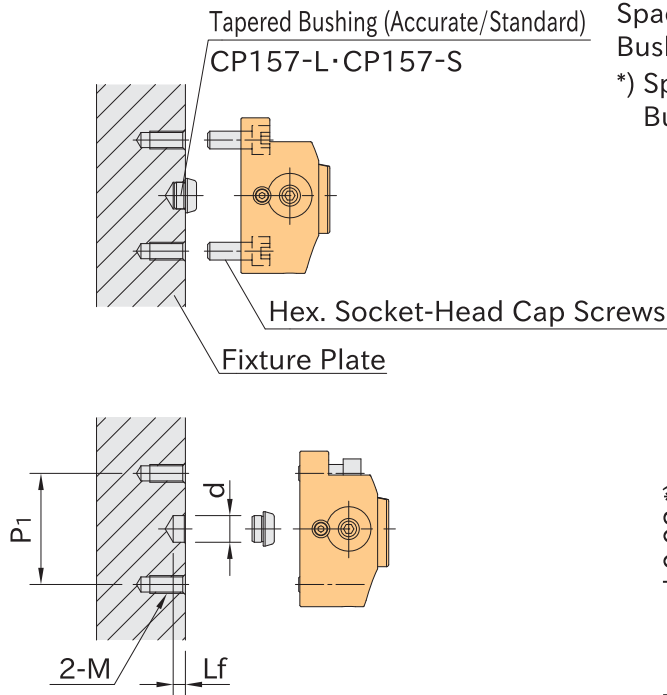
Related Product

- [CP157](#) Tapered Bushings
- [CP165-LH](#) Tapered Clamping Screws (Hook)
- [CP165-L](#) Tapered Clamping Screws
- [CP166-H](#) Clamping Screws (Hook)
- [CP166](#) Clamping Screws

How To Use

- Use **CP157-L** Tapered Bushing (Accurate) for precise locating.
- Use **CP157-S** Tapered Bushing (Standard) for rough locating.

■ Mounting-Hole Dimension



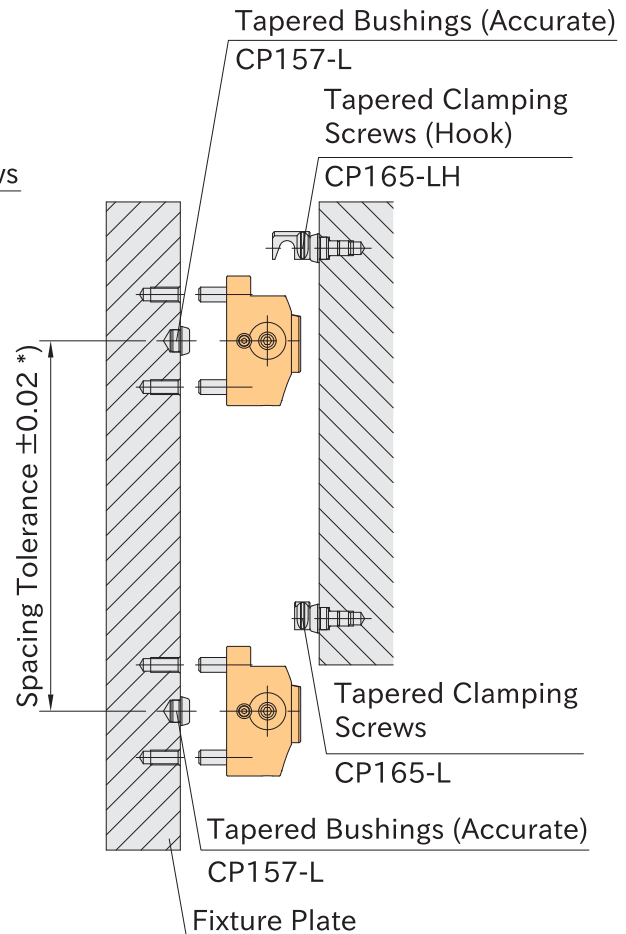
Size	d (H7)	Lf	M	P ₁
CP160-08040	12	5.5	M 8×1.25	50
CP160-12063	18	6.5	M12×1.75	75
CP160-16080	22	8	M16×2	100

Note: The tolerance of dimension "d" for Tapered Bushings (Standard) should be $^{+0.1}_0$.

■ Spacing Tolerance

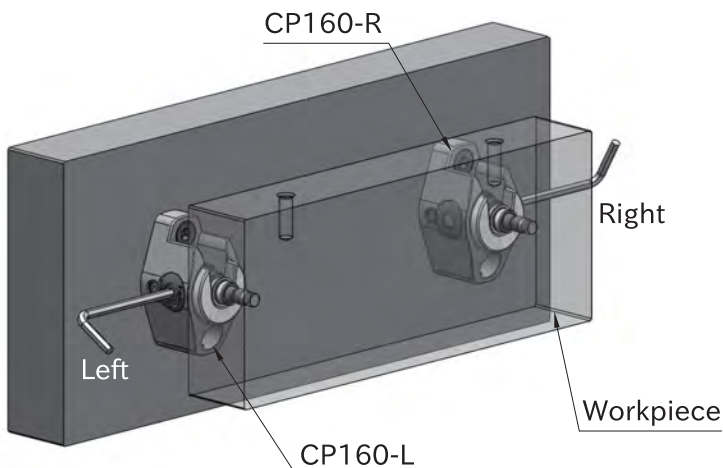
Spacing tolerance should be ± 0.02 for Tapered Bushings (Accurate).

*) Spacing tolerance should be ± 0.1 for Tapered Bushings (Standard).



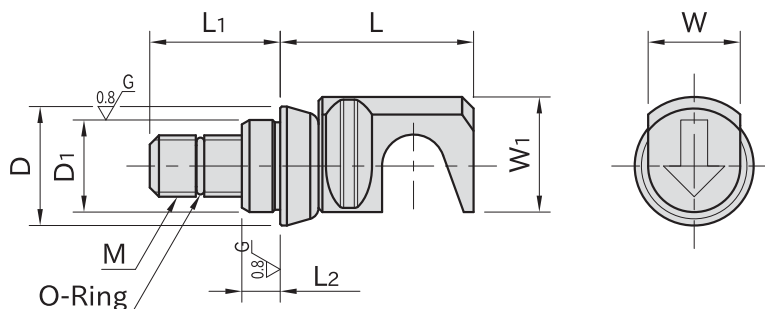
■ Layout

Use CP160-R for tightening from right side,
CP160-L for left side.



CP165-LH

TAPERED CLAMPING SCREWS (Hook)



Tapered Bushing	Clamping Screw	O-Ring
S45C steel Black oxide finished Precision ground	SCM435 steel Quenched and tempered Black oxide finished	Nitrile rubber (NBR)

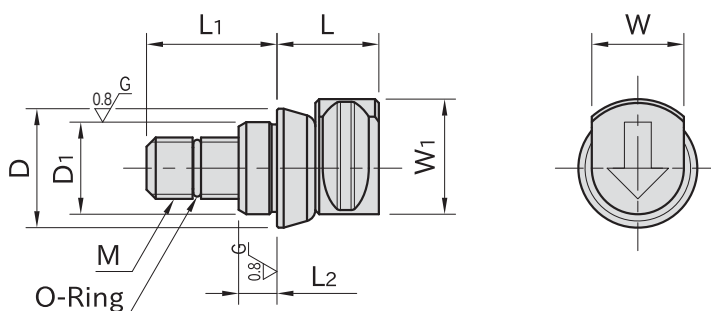
Part Number	M	D ₁ (g6)	L ₂	L ₁	D	L	W ₁	W	Proper O-Ring Size	Weight (g)	Proper Clamping Module
CP165-08001LH	M 8x1.25	12	5	17	15.5	25	15	12	SS050(CS1 /ID 5)	30	CP160-08040R,CP160-08040L
CP165-12001LH	M12x1.75	18	6	24	24.5	40	23.5	19	S 8 (CS1.5/ID 7.5)	115	CP160-12063R,CP160-12063L
CP165-16001LH	M16x2	22	7.5	30	31.5	51	30	24	S 12 (CS1.5/ID11.5)	235	CP160-16080R,CP160-16080L

Reference

Feature and How To Use in later page

CP165-L

TAPERED CLAMPING SCREWS



Tapered Bushing	Clamping Screw	O-Ring
S45C steel Black oxide finished Precision ground	SCM435 steel Quenched and tempered Black oxide finished	Nitrile rubber (NBR)

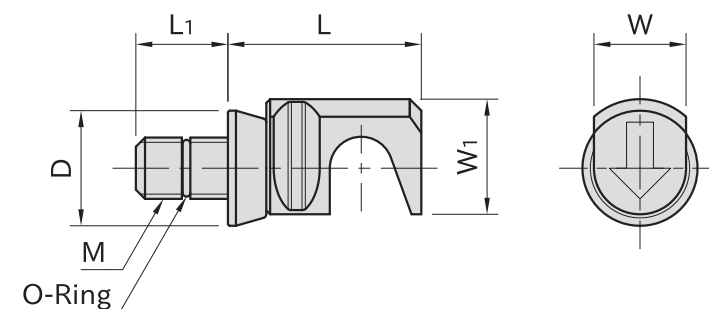
Part Number	M	D ₁ (g6)	L ₂	L ₁	D	L	W ₁	W	Proper O-Ring Size	Weight (g)	Proper Clamping Module
CP165-08001L	M 8x1.25	12	5	17	15.5	13	15	12	SS050(CS1 /ID 5)	22	CP160-08040R,CP160-08040L
CP165-12001L	M12x1.75	18	6	24	24.5	21.5	23.5	19	S 8 (CS1.5/ID 7.5)	81	CP160-12063R,CP160-12063L
CP165-16001L	M16x2	22	7.5	30	31.5	27	30	24	S 12 (CS1.5/ID11.5)	170	CP160-16080R,CP160-16080L

Reference

Feature and How To Use in later page

CP166-H

CLAMPING SCREWS (Hook)



Tapered Bushing	Clamping Screw	O-Ring
S45C steel Black oxide finished	SCM435 steel Quenched and tempered Black oxide finished	Nitrile rubber (NBR)

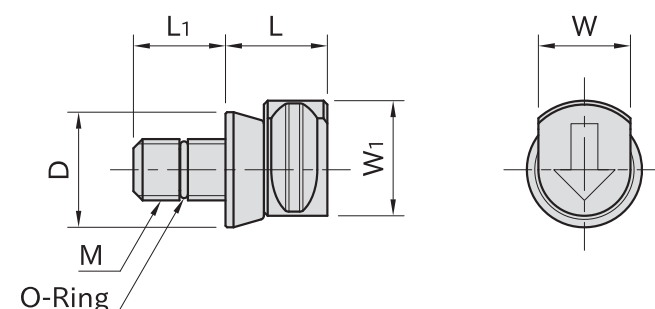
Part Number	M	L ₁	D	L	W ₁	W	Proper O-Ring Size	Weight (g)	Proper Clamping Module
CP166-08001H	M 8X1.25	12	15	25	15	12	SS050(CS1 / ID 5)	26	CP160-08040R,CP160-08040L
CP166-12001H	M12X1.75	18	24	40	23.5	19	S 8 (CS1.5 / ID 7.5)	103	CP160-12063R,CP160-12063L
CP166-16001H	M16X2	22	31	51	30	24	S 12 (CS1.5 / ID11.5)	213	CP160-16080R,CP160-16080L

Reference

Feature and How To Use in later page

CP166

CLAMPING SCREWS



Tapered Bushing	Clamping Screw	O-Ring
S45C steel Black oxide finished	SCM435 steel Quenched and tempered Black oxide finished	Nitrile rubber (NBR)

Part Number	M	L ₁	D	L	W ₁	W	Proper O-Ring Size	Weight (g)	Proper Clamping Module
CP166-08001	M 8X1.25	12	15	13	15	12	SS050(CS1 / ID 5)	18	CP160-08040R,CP160-08040L
CP166-12001	M12X1.75	18	24	21.5	23.5	19	S 8 (CS1.5 / ID 7.5)	69	CP160-12063R,CP160-12063L
CP166-16001	M16X2	22	31	27	30	24	S 12 (CS1.5 / ID11.5)	147	CP160-16080R,CP160-16080L

Reference

Feature and How To Use in later page

Feature

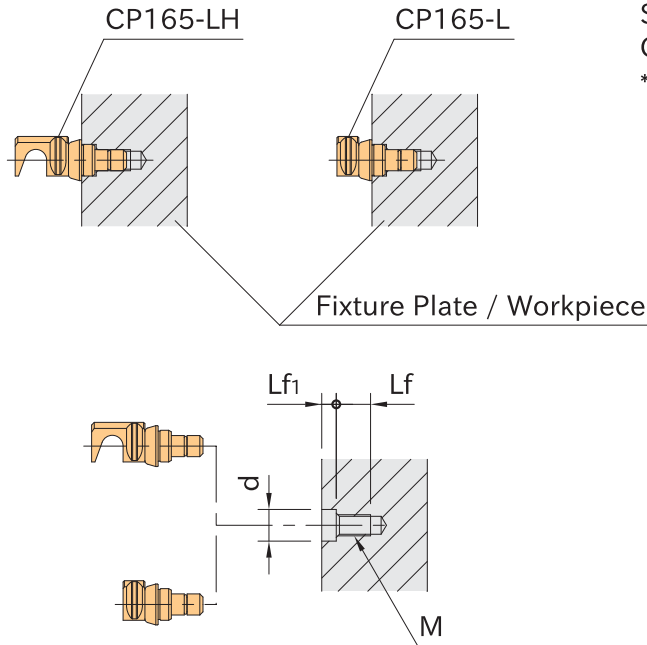
- Each clamping screw has commercially available O-ring to prevent rotation and keep the direction of arrow marking.
- O-ring should be replaced by the customer when it is worn.

How To Use

Tapered Clamping Screws

Can be used for locating fixture plate or workpiece.

■ Mounting-Hole Dimension



Size	d)	Lf	Lf ₁	M
CP165-08001	12	13	5.5	M 8×1.25
CP165-12001	18	19	6.5	M12×1.75
CP165-16001	22	23	8	M16×2

- *) The hole tolerance should be $\begin{smallmatrix} -0.010 \\ -0.025 \end{smallmatrix}$ when Tapered Clamping Screws are always mounted on the fixture plate. Fixture plate and tapered bushing fit tightly and keep the repeatability without chip incursion.
- The hole tolerance should be H7 when mounting on workpiece. Tapered bushing can be easily mounted / removed.

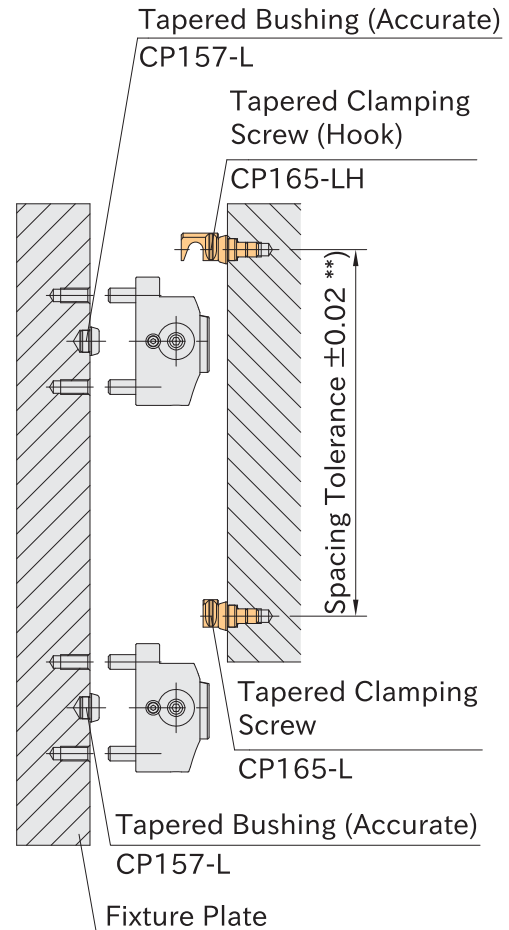
Clamping Screws

Can be used for just clamping.

■ Spacing Tolerance

Spacing tolerance should be ± 0.02 for Tapered Clamping Screws.

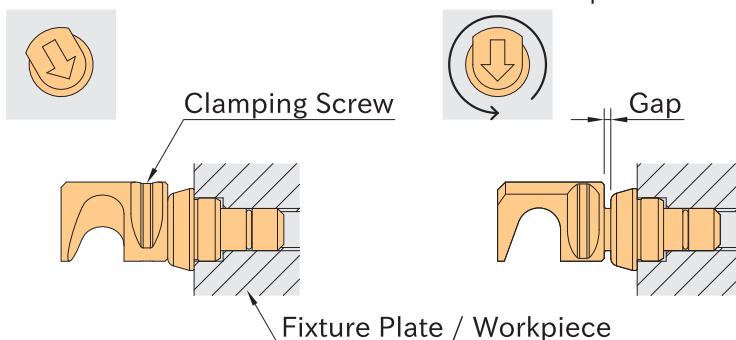
**) Spacing tolerance should be ± 0.2 for Clamping Screws.



Note: Refer to the next page for the layout of the products.

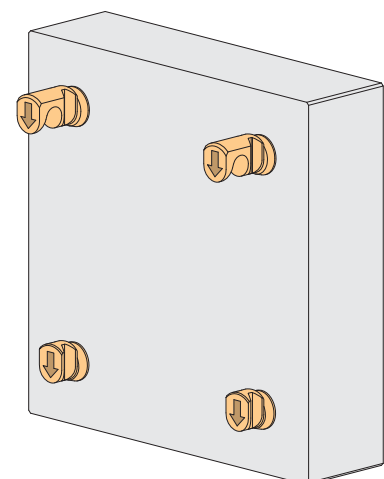
■ Installation

1. Fully tighten the clamping screw on fixture plate or workpiece.



2. Turn the screw counterclockwise within one turn until the arrow marking points downward. (There is a gap between clamping screw and tapered bushing.)

3. Install the clamping screws into the clamping modules.



■ Application Example

Tighten the hook type clamping screw firstly.

The first one becomes the reference.

The products should be positioned as shown below.

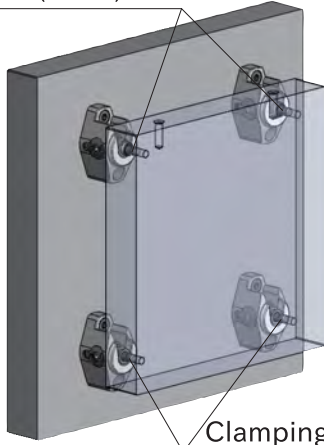
[CP165-LH](#) [CP165-L](#) Tapered Clamping Screws and [CP157-L](#) Tapered Bushings (Accurate) should be used together, and [CP166-H](#) [CP166](#) Clamping Screws and [CP157-S](#) Tapered Bushings (Standard) are also.

🔧 Note

Do not remove the hoists until the unit fully clamped.

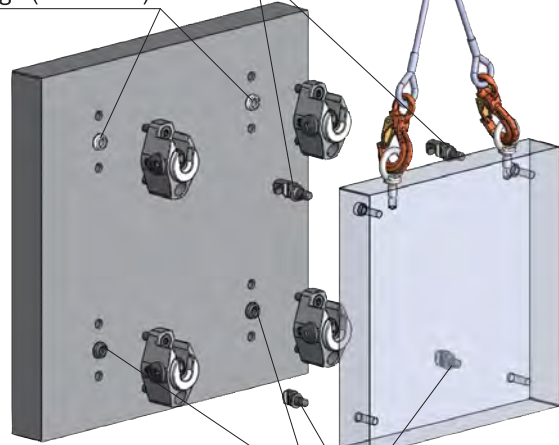
Example 1

Tapered Clamping Screws (Hook)



Clamping Screws

Tapered Clamping Screws (Hook)
Tapered Bushings (Accurate)

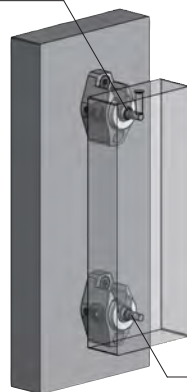


Tapered Bushings (Standard)

Clamping Screws

Example 2

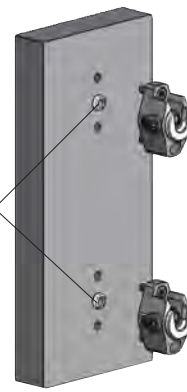
Tapered Clamping Screws (Hook)



Tapered Clamping Screws

Tapered Clamping Screws (Hook)

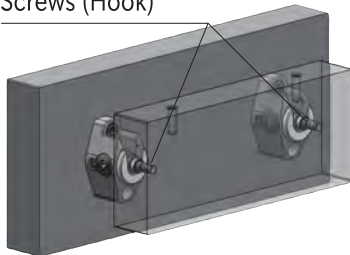
Tapered Bushings (Accurate)



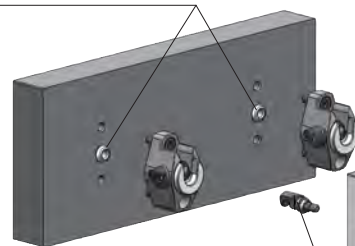
Tapered Clamping Screws

Example 3

Tapered Clamping Screws (Hook)



Tapered Bushings (Accurate)



Tapered Clamping Screws (Hook)

Note: Use [CP166-H](#) [CP166](#) Clamping Screws when locating of workpiece is not necessary.

Related Product

- [CP160](#) Clamping Modules (Hook)
- [CP165-LH](#) Tapered Clamping Screws (Hook)

- [CP165-L](#) Tapered Clamping Screws
- [CP166-H](#) Clamping Screws (Hook)
- [CP166](#) Clamping Screws

Allowable Cutting Force & Workpiece Weight of CLAMPING MODULES (Hook)

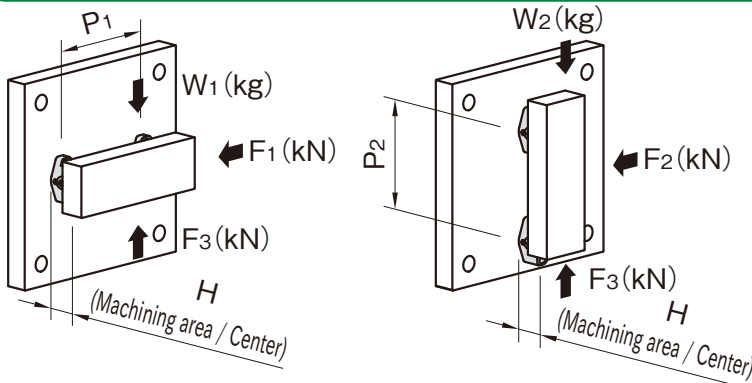
Ensure the cutting force and the workpiece weight are within the allowable level.

The values below are only the strength of the body of clamping modules.

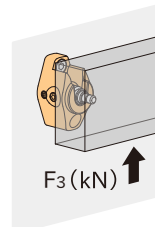
The rigidity of the whole fixtures and the workpiece are not considered.

Use the values as a guide for setting appropriate machining conditions.

2 Modules



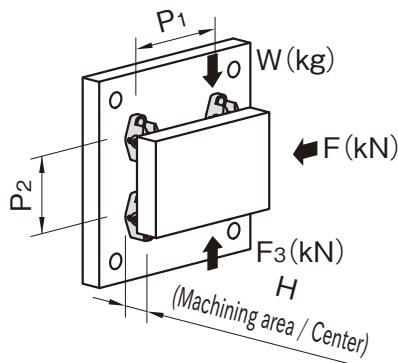
Note



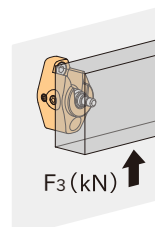
Heavy cutting force in the open direction may cause workpiece move.

Size	Allowable Cutting Force				Allowable Workpiece Weight		
	F ₁ (kN)	F ₂ (kN)	F ₃ (kN)	Max (kN)	W ₁ (kg)	W ₂ (kg)	Max (kg)
CP160-08040	$(0.24P_1 + 432)/H$	240/H	$(0.9 \times 2) + (W_1 \text{ or } W_2 \times 0.01)$	3.2	$240 \times 100/H$	$(0.24P_2 + 432) \times 100/H$	320
CP160-12063	$(0.50P_1 + 900)/H$	500/H	$(1.7 \times 2) + (W_1 \text{ or } W_2 \times 0.01)$	6	$500 \times 100/H$	$(0.50P_2 + 900) \times 100/H$	600
CP160-16080	$(1.00P_1 + 1800)/H$	1000/H	$(3.6 \times 2) + (W_1 \text{ or } W_2 \times 0.01)$	10	$1000 \times 100/H$	$(1.00P_2 + 1800) \times 100/H$	1000

4 Modules



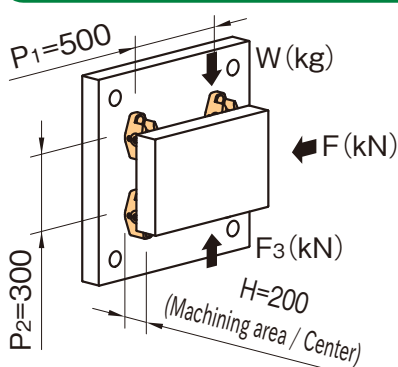
Caution



Heavy cutting force in the open direction may cause workpiece move.

Size	Allowable Cutting Force			Allowable Workpiece Weight	
	F (kN)	F ₃ (kN)	Max (kN)	W (kg)	Max (kg)
CP160-08040	$2 \times (0.24P_1 + 432)/H$	$(0.9 \times 4) + (W \times 0.01)$	6.4	$2 \times (0.24P_2 + 432) \times 100/H$	640
CP160-12063	$2 \times (0.50P_1 + 900)/H$	$(1.7 \times 4) + (W \times 0.01)$	12	$2 \times (0.50P_2 + 900) \times 100/H$	1200
CP160-16080	$2 \times (1.00P_1 + 1800)/H$	$(3.6 \times 4) + (W \times 0.01)$	20	$2 \times (1.00P_2 + 1800) \times 100/H$	2000

Calculation Example



- 4 pcs of CP160-12063R/L (height 63mm)
- Pitch:
P₁=500mm
P₂=300mm
- Workpiece center: H=200mm
- F direction cutting force: 5kN
- F₃ direction cutting force: 5kN
- Workpiece weight: 500kg

<Allowable Cutting Force F>

$$F = 2 \times (0.5 \times P_1 + 900) / H \\ = 2 \times (0.5 \times 500 + 900) / 200 \\ = 11.5 \text{ kN}$$

*) Cutting force 5kN is within allowable value (11.5kN).

<Allowable Cutting Force F₃>

$$F_3 = (1.7 \times 4) + (W \times 0.01) \\ = (1.7 \times 4) + (500 \times 0.01) \\ = 11.8 \text{ kN}$$

*) Cutting force 5kN is within allowable value (11.8kN).

<Allowable Workpiece Weight W>

$$W = 2 \times (0.5 \times P_2 + 900) \times 100 / H \\ = 2 \times (0.5 \times 300 + 900) \times 100 / 200 \\ = 1050 \text{ kg}$$

*) Workpiece weight 500kg is within allowable value (1050kg).



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