

Pascal Pal-fix & Pal coupler

Reasonable price, High-accuracy, High-rigidity and Easy positioning.

Pal-fix

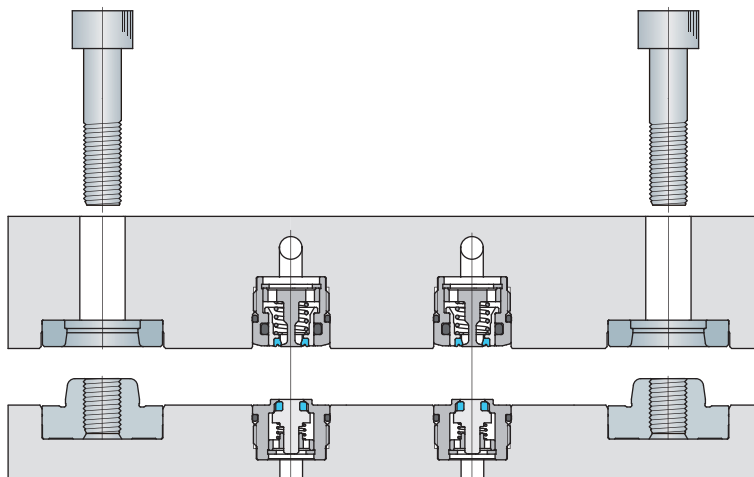


Pal coupler

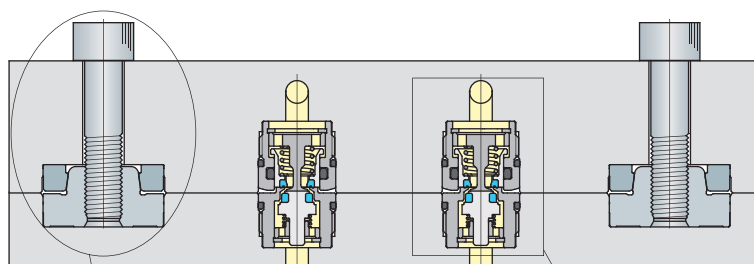


PATENT P.

Super-compact locating device makes you utilize a working space to the full.



- Easy and accurate positioning & clamping.
- Repeatability : 3 μm [※Remark]



X·Y Axes positioning

① Taper surface

Locating ring model CPR-N

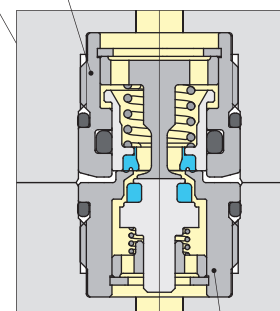
It is possible to position accurately due to the taper portion deformed elastically.

Z Axes positioning

② Seating surface

Locating base model CPR-A

Pal coupler socket model WVP-2FSL



Pal coupler plug model WVP-2FPL

It is a taper cone model with dual surface contact to position high-accuracy and high-rigidity.

※Remark : The fine finished holes and superimposed load are concerned to "Repeatability." (→ P9,10)

Locating ring model CPR-N10

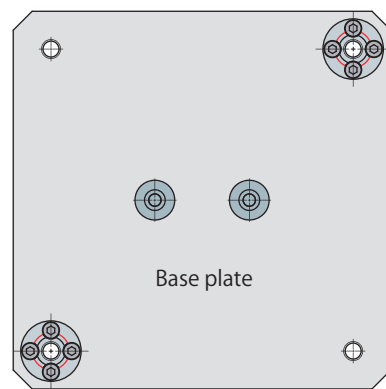
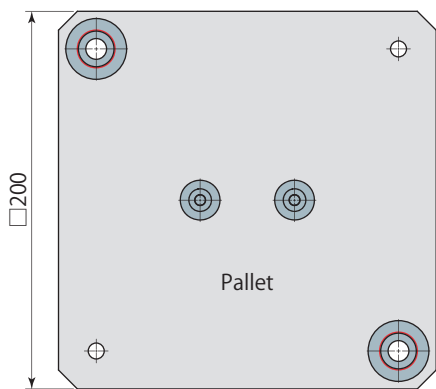
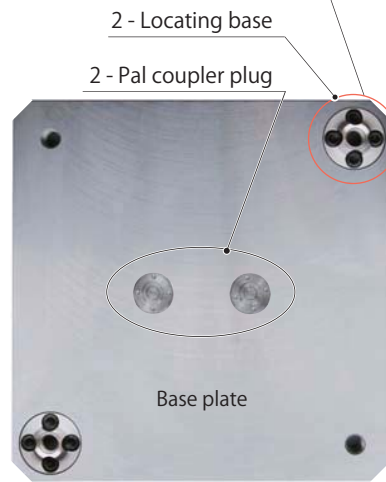
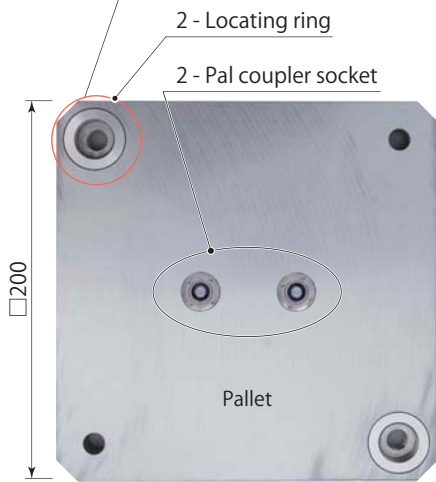


ø 32, ø 40, ø 50

Locating base model CPR-A10

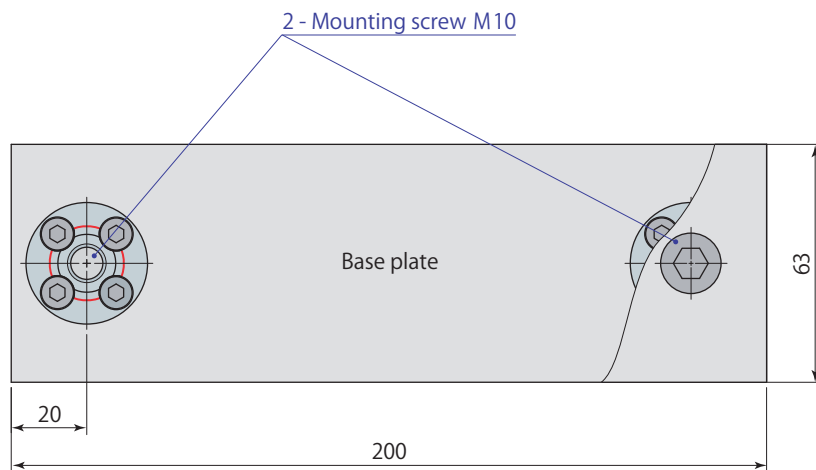
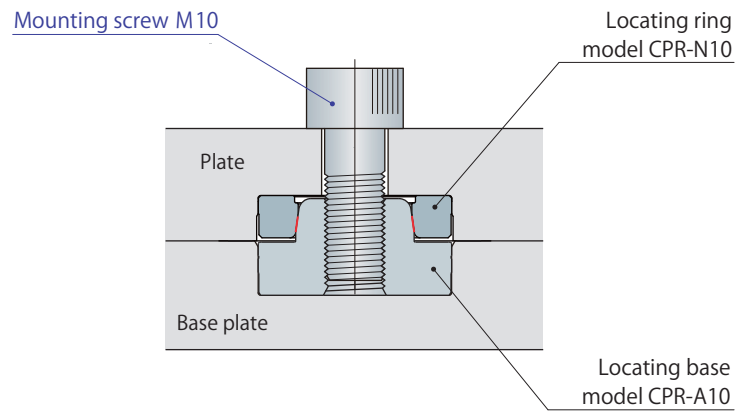


ø 32, ø 40, ø 50



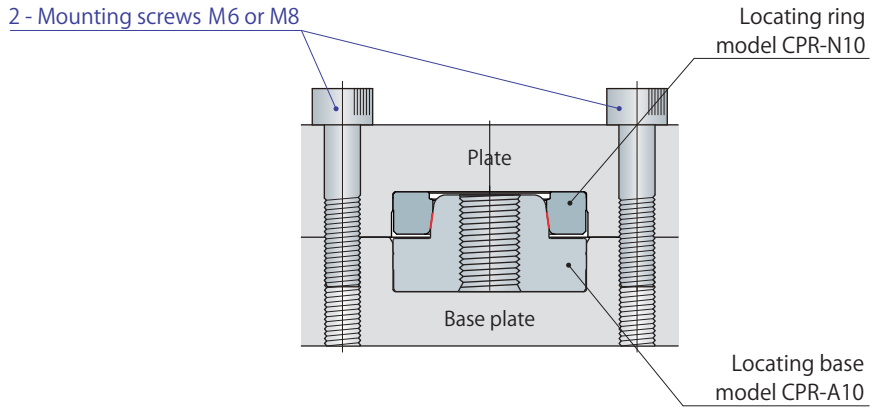
Example of mounting to 200 × 200 mm pallet / base plate

Center of Pal-fix by thread clamping



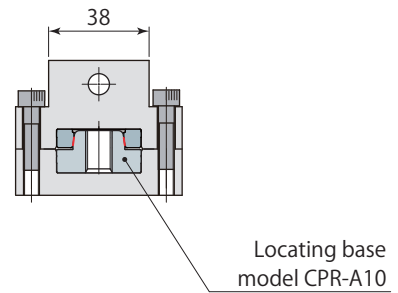
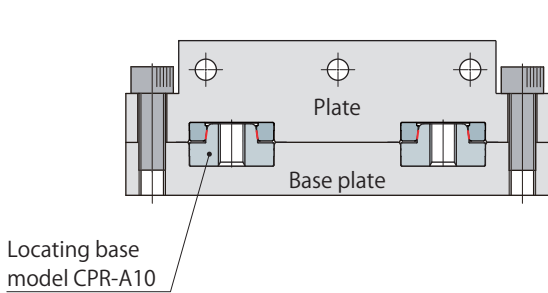
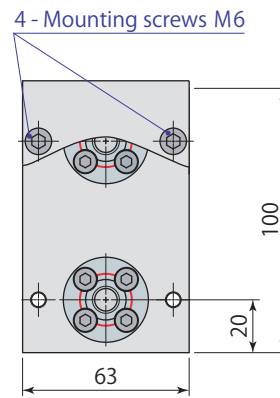
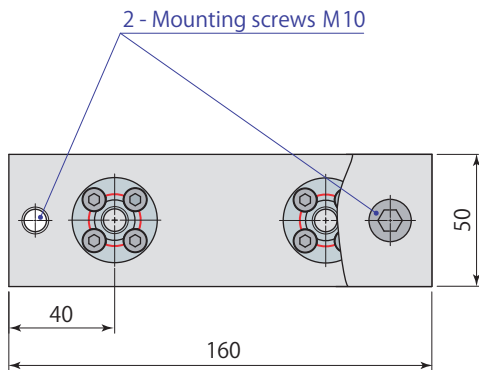
※ The drawing above shows CPR-A10 and CPR-N10 as major cases.

Thread clamping for back/forth and/or right/left of Pal-fix. (If Pal-fix center cannot be clamped.)



Back/forth of Pal-fix by thread clamping

Right/left of Pal-fix by thread clamping

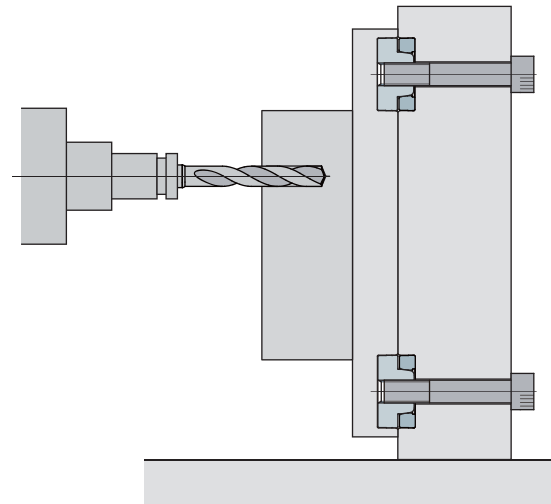
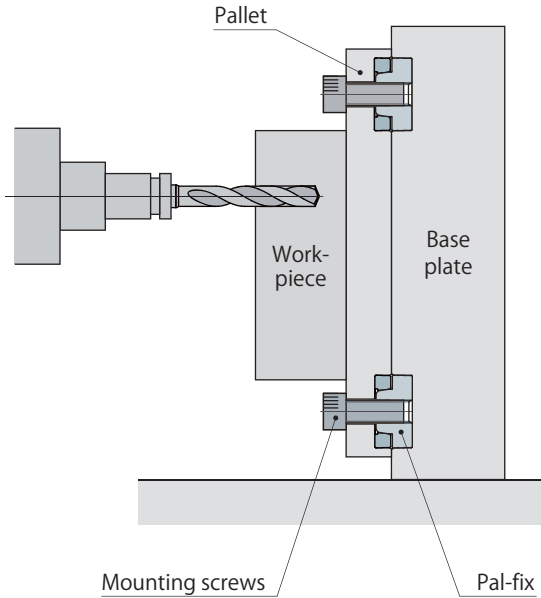


※ The drawing above shows CPR-A10 and CPR-N10 as major cases.

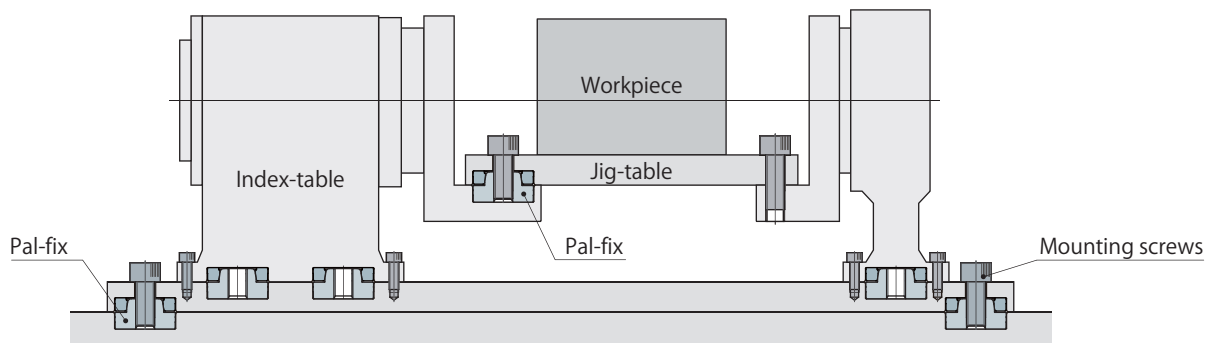
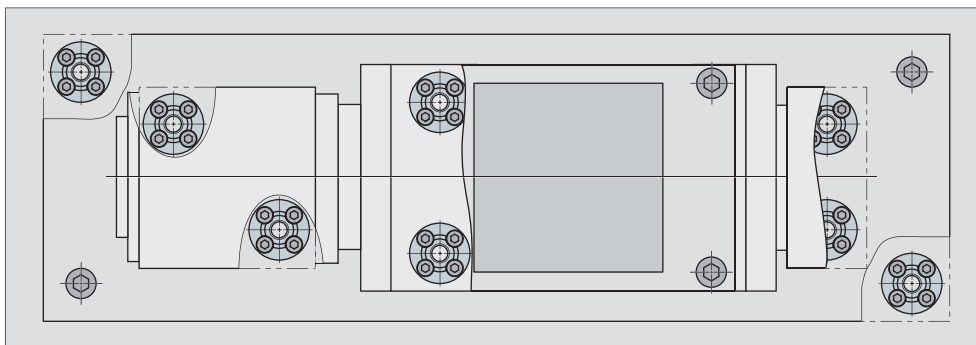
For exchange of workpiece/jig

Front mounting : Workpiece side by thread clamping

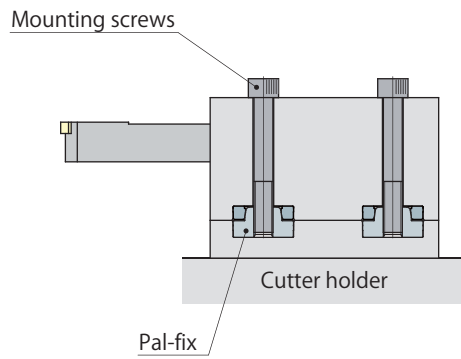
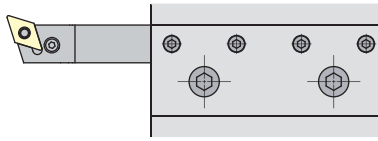
Rear mounting : Baseplate side by thread clamping



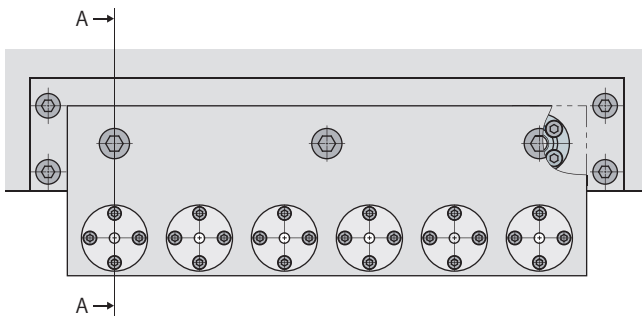
Easy, accurate and precise exchange of jig table. ♦ Easy reset when index-table maintenance.



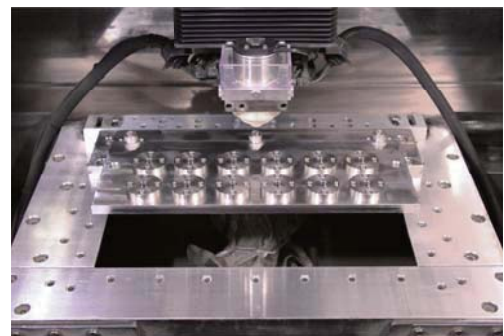
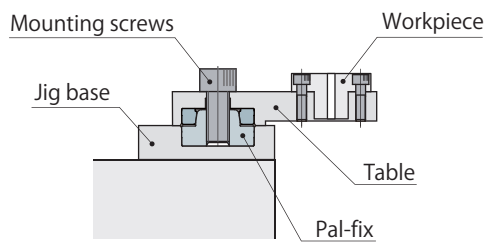
Tool holder for cteno-blade lathe



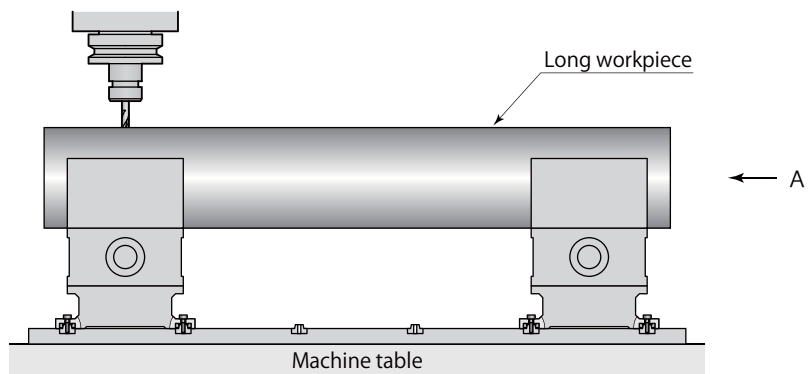
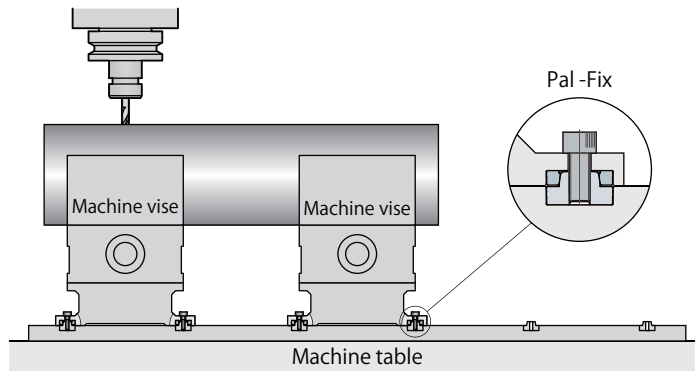
Pre-set and quick-change for workpieces of EDM wire-cut machine



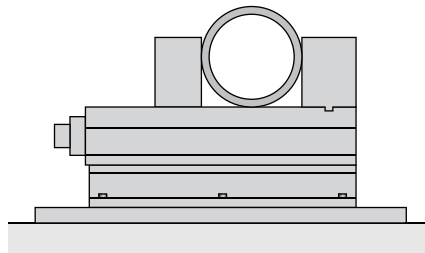
Section drawing A—A



Positioning for removable machine vises



View A



Positioning accuracy

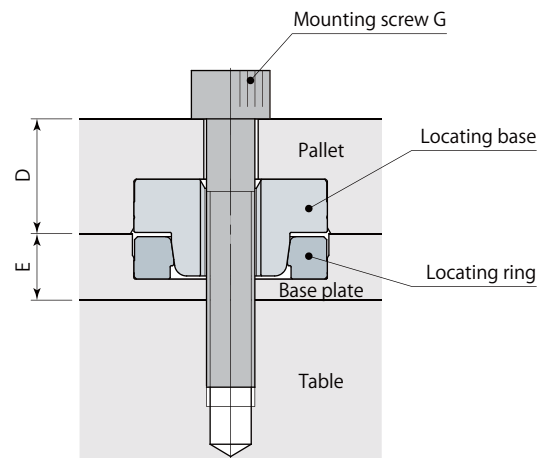
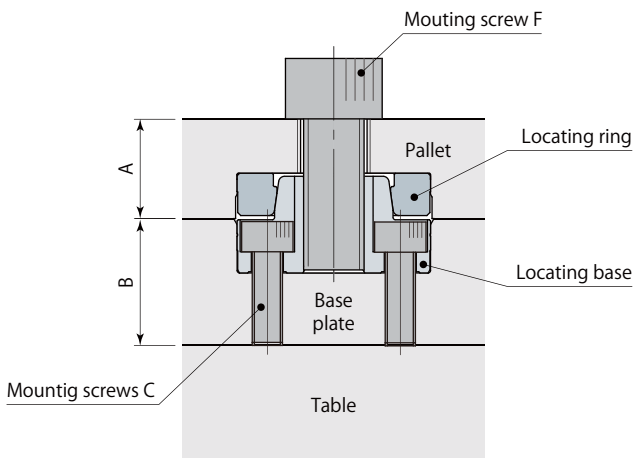
Model			CPR-A10	CPR-A12	CPR-A16	
Max. allowable load	Positioning accuracy 3 μm	Horizontal mount (kN)	1.0	1.8	2.4	
		Vertical mount (kN)	0.11	0.18	0.23	
	Positioning accuracy 5 μm	Horizontal mount (kN)	4.0	6.0	9.0	
		Vertical mount (kN)	0.4	0.6	0.9	
	Positioning accuracy 10 μm	Horizontal mount (kN)	10.0	17.0	26.0	
		Vertical mount (kN)	1.0	1.7	2.8	
Min. deformed axial tension ※1			(kN)	8.0	10.0	15.0
Min. deformed torque ※2			(N·m)	15	22	44

- Min. deformed axial tension is necessary tightening force in order to position the locating ring by elastic deformation. (※1)
- Min. deformed torque is necessary tightening force in order to generate the min. deformed axial tension. (※2)

Pallet / Baseplate thickness (Reference)

In case to mount the locating ring with the pallet.

In case to mount the locating base with the pallet.



(mm)

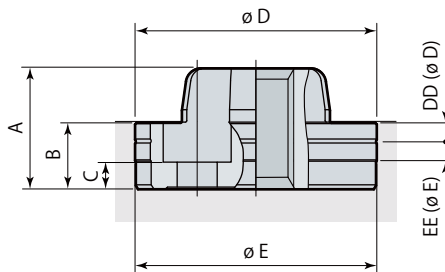
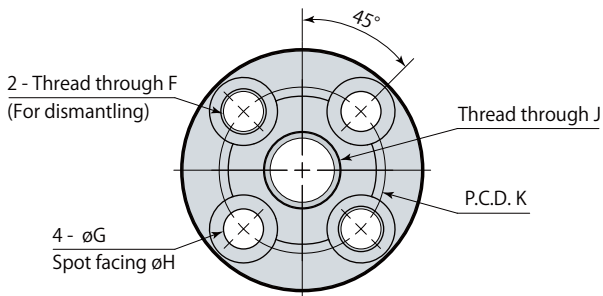
Model	CPR-A10			CPR-A12			CPR-A16		
	Cast iron Equivalent to FC200	Steel Equivalent to S45C	Aluminum Equivalent to A6000	Cast iron Equivalent to FC200	Steel Equivalent to S45C	Aluminum Equivalent to A6000	Cast iron Equivalent to FC200	Steel Equivalent to S45C	Aluminum Equivalent to A6000
A	20	20	25	25	25	30	30	30	35
B	26	22	31	32	27	37	40	35	50
C	M5 x 20	M5 x 16	M5 x 25	M6 x 25	M6 x 20	M6 x 30	M8 x 30	M8 x 25	M8 x 35
D	20	20	25	25	25	30	30	30	35
E	7.5			9			11		
F	M10			M12			M16		
G	M8			M10			M12		

- Mounting screws are not included.

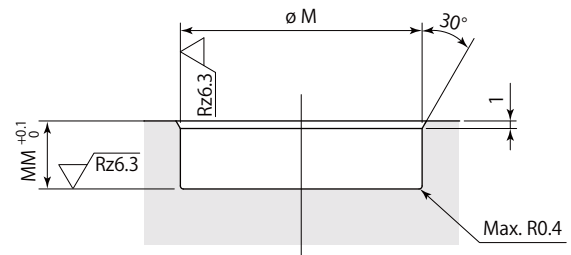
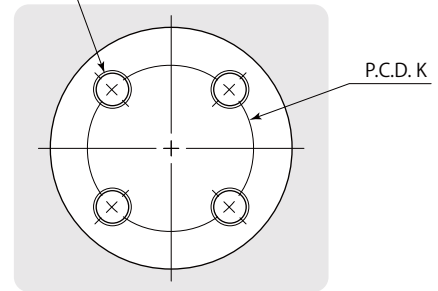
Outline dimensions of Locating base

Mounting details of Locating base

model CPR-A



4 - Tapped hole L Depth LL



Make sure the pitch tolerance between mounting holes. (Refer to the table below) ※1

(mm)

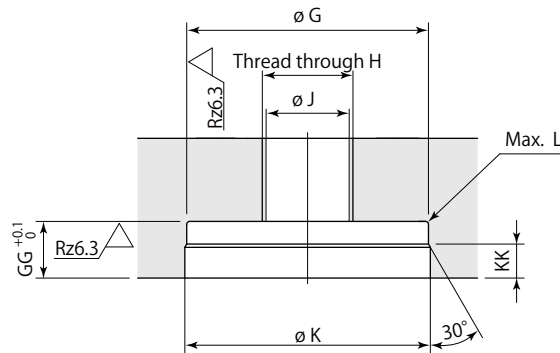
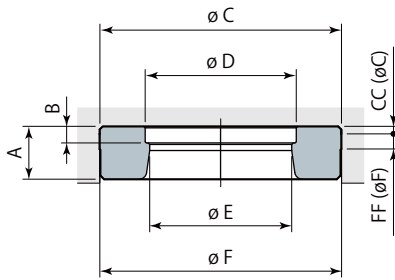
Model	CPR-A10	CPR-A12	CPR-A16
Pitch tolerance	±0.01	±0.01	±0.01
A	16	19.5	24
B	8.8	10.8	13.3
C	3.5	4.5	5
D	ø32 p6 ^{+0.042} / _{+0.026}	ø40 p6 ^{+0.042} / _{+0.026}	ø50 p6 ^{+0.042} / _{+0.026}
DD	2.5	3	3.5
E	ø32 f7 ^{-0.025} / _{-0.050}	ø40 f7 ^{-0.025} / _{-0.050}	ø50 f7 ^{-0.025} / _{-0.050}
EE	2.5	3	3.5
F	M6 x 1	M8 x 1.25	M10 x 1.5
G	ø5.3	ø6.8	ø9
H	ø9	ø11	ø14
J	M10 x 1.5	M12 x 1.75	M16 x 2.0
K	22	28	35
L	M5 x 0.8	M6 x 1.0	M8 x 1.25
LL ※2	13 over	16 over	21 over
M	ø32 H7 ^{+0.025} / ₀	ø40 H7 ^{+0.025} / ₀	ø50 H7 ^{+0.025} / ₀
MM	9	11	13.5
Mass (g)	50	90	170

- If the finish is out of precision, Locating ring is deformed large then it might be broken. (※1)
- The depth of tapped hole (LL) is based on steel. (equivalent to S45C) (※2)
- Mounting screws are not included. Refer to Pallet/Baseplate thickness on page 8 for screw length.

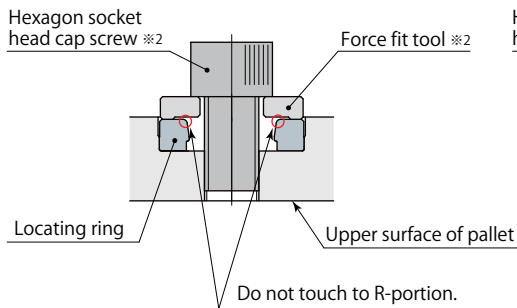
Outline dimensions of Locating ring

Mounting details of Locating ring

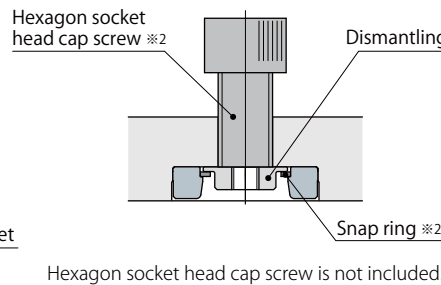
model CPR-N



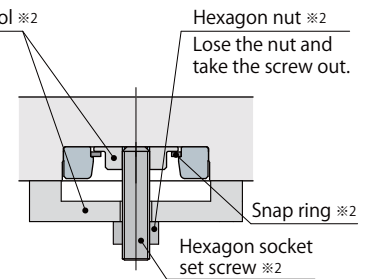
Fitting way (Force fit)



Dismantling way 1



Dismantling way 2



Make sure the pitch tolerance between mounting holes.(Refer to the table below) ※1

Model	CPR-N10	CPR-N12	CPR-N16
Pitch tolerance	± 0.01	± 0.01	± 0.01
A	7	8.5	10.5
B	2.2	2.6	2.9
C	$\phi 32 \text{ f7} \begin{smallmatrix} -0.025 \\ -0.050 \end{smallmatrix}$	$\phi 40 \text{ f7} \begin{smallmatrix} -0.025 \\ -0.050 \end{smallmatrix}$	$\phi 50 \text{ f7} \begin{smallmatrix} -0.025 \\ -0.050 \end{smallmatrix}$
CC	1	1.5	2
D	$\phi 20$	$\phi 23.6$	$\phi 29.4$
E	$\phi 18.8$	$\phi 22.6$	$\phi 28.5$
F	$\phi 32 \text{ p6} \begin{smallmatrix} +0.042 \\ +0.026 \end{smallmatrix}$	$\phi 40 \text{ p6} \begin{smallmatrix} +0.042 \\ +0.026 \end{smallmatrix}$	$\phi 50 \text{ p6} \begin{smallmatrix} +0.042 \\ +0.026 \end{smallmatrix}$
FF	2	2	2.5
G	$\phi 32 \text{ H7} \begin{smallmatrix} +0.025 \\ 0 \end{smallmatrix}$	$\phi 40 \text{ H7} \begin{smallmatrix} +0.025 \\ 0 \end{smallmatrix}$	$\phi 50 \text{ H7} \begin{smallmatrix} +0.025 \\ 0 \end{smallmatrix}$
GG	7.5	9	11
H	M12 x 1.75	M16 x 2.0	M20 x 2.5
J	$\phi 11$	$\phi 14$	$\phi 18$
K	$\phi 32.5$	$\phi 40.5$	$\phi 50.5$
KK	4	5	6
L	MAX. R0.2	MAX. R0.4	MAX. R0.4
Mass (g)	30	50	110
Force fit tool	CPR-T10	CPR-T12	CPR-T16
Dismantling tool	CPR-U10	CPR-U12	CPR-U16

- If the finish is out of precision, Locating ring is deformed large then it might be broken. (※1)
- Ask us when you need a force fit tool (Accessory : Hexagon socket head cap screw) and/or dismantling tool (Accessories : Hexagon socket set screw, Hexagon nut and/or Snap ring). It is free. (※2)

Screws for tightening torque and clamping force

Calculation (Torque Control Method)

- Allowable axial tension

$$F_r = 0.6^{※1} \times \sigma_y \times A_s$$

- Tightening torque

$$T = 0.5 \times K \times (1 + 1/Q) \times F_r \times d / 1000$$

- Clamping force^{※2}

$$F = \frac{T}{K \times d}$$

σ_y : Yield strength (1100N/mm² at property class 12.9)

A_s : Stress area (mm²)

Q : Clamping coefficient

d : Threaded nominal diameter (mm)

K : Torque coefficient

- Allowable axial tension for screw at tightening holds normally 70% of the yield strength at max., but Pascal sets 60%. (※1)
- Clamping force is calculated under practical tightening. (※2)

Calculation example (Reference)

Threaded nominal diameter	M10		M12		M16	
	Steel / Cast iron	Aluminum ^{※3} (with flat washer)	Steel / Cast iron	Aluminum ^{※3} (with flat washer)	Steel / Cast iron	Aluminum ^{※3} (with flat washer)
Tightening torque (N·m)	57.4	46.0	100.2	80.6	248.7	161.2
Clamping force (kN)	31.9	25.6	46.4	37.3	86.4	56.0

- It is calculated as Clamping coefficient, $Q = 1.5$ and Torque coefficient, $K = 0.18$.
- Make sure to calculate without fault for depressed seating surface on clamped part. (※3)
- The above is brief calculation. Calculation should be based on JIS B 1083 and/or JIS B 1084 due to get proper tightening torque.

Tightening turn for screws

- ① Tighten the screw lightly by hand, then do it up until the seating surface of screw holding to other.
- ② Make sure in turn to tighten the screws on the right drawing under the min. deformed torque. (Refer to the positioning accuracy on Page 8)
- ③ Make sure in turn to tighten the screws on the right drawing under the proper tightening torque.

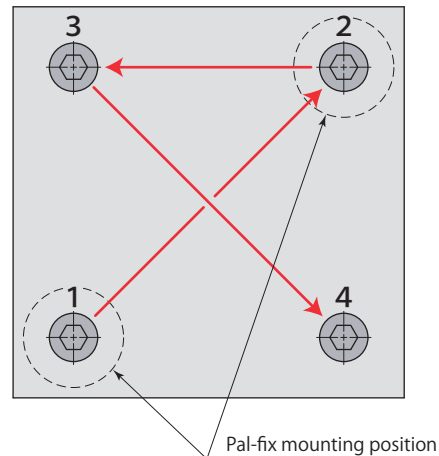
* Note

Make sure to tighten all screws evenly.

Make sure not to give extra force only one or two screws on the same side.

(e.c. : 1 and 3 on the right drawing.)

Tightening turn for screws

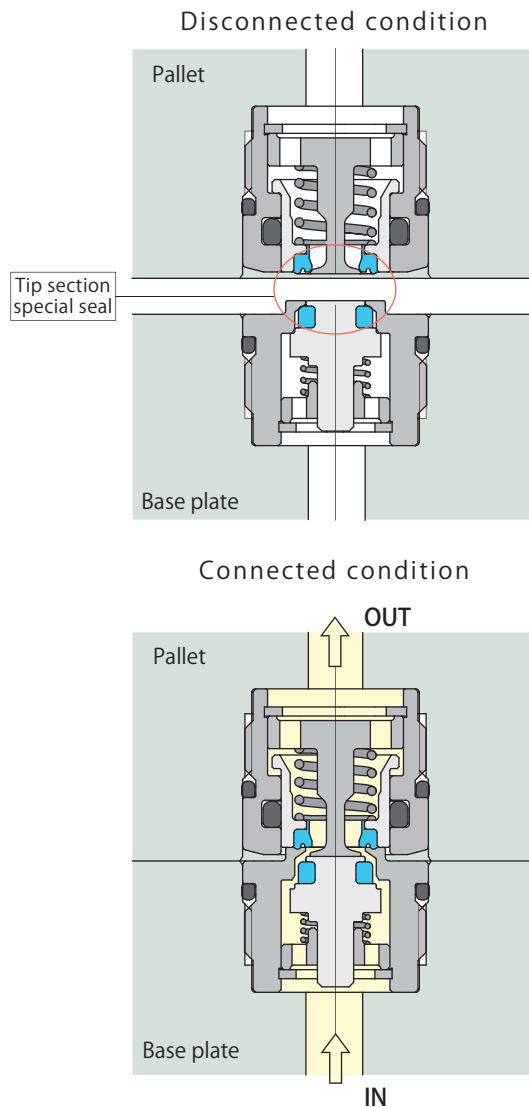


Hydraulic and air coupler with zero hydraulic oil leak with special seal at tip section

Pal coupler socket
Hydraulic pressure 7 MPa·Air
model **WVP-2FSL**



Pal coupler plug
Hydraulic pressure 7 MPa·Air
model **WVP-2FPL**



- Special soft seal at tip makes it possible to Specifications apply pressure on plug (WVP-2FPL) in disconnected condition. Socket (WVP-2FSL) can retain residual pressure of up to 0.3 MPa.
- Special seal installed on the tip of coupler socket and coupler plug can minimize the intrusion of air and spill of working fluid during connection and disconnection, furthermore, it prevents corruption of coolant by being miscible with spilled working fluid and air contamination of clamp circuit.
- Height of coupler is maintained low in order to reduce thickness of pallet.
- Oil and air can be used, since stainless or plating process has been implemented as rustproofing measure on part.

Specifications

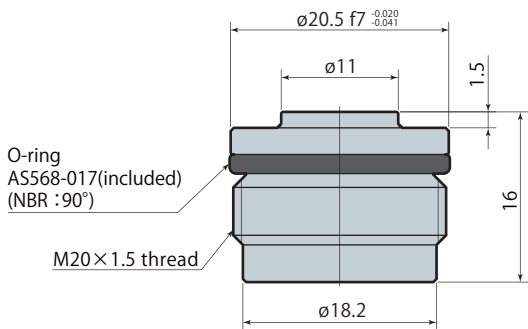
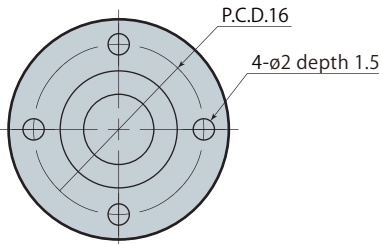
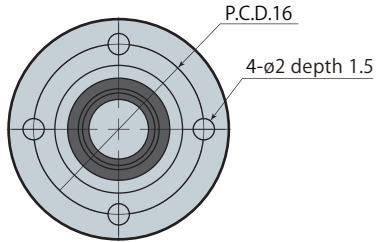
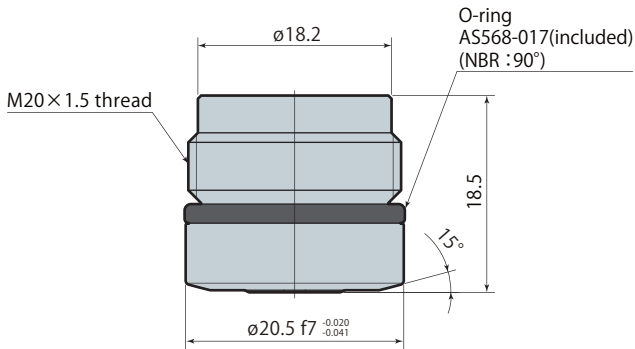
Maximum working pressure	7 MPa	Circuit symbol
Proof pressure	10.5 MPa	
Orifice area	10.2 mm ²	
Fluid used	Normal operating oil and air	
Allowable eccentricity	±0.5 mm	
Allowable inclination	0.3° or below	
Reactive force ※1	Hydraulic pressure 1 MPa	113 N
	Maximum spring force when connected	40 N
Operating temperature	0 ~ 70 °C	
Mass	WVP-2FPL : 29g WVP-2FSL : 31g	

※1 : Reactive force when connecting (N) = Fluid pressure (MPa) × 113 + 40

Outline dimensions • Mounting details

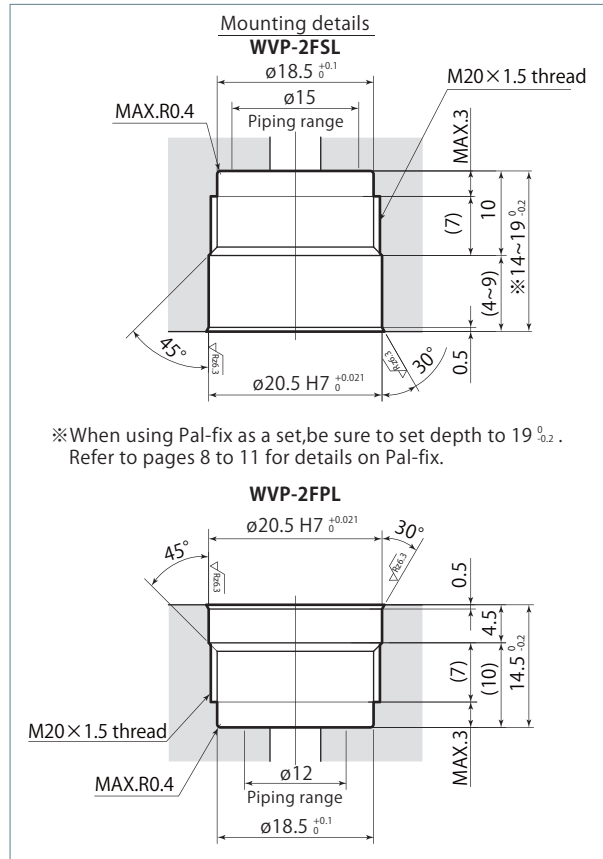
WVP-2FSL

Hydraulic pressure 7MPa•Air socket
Recommended tightening torque : 15 N•m

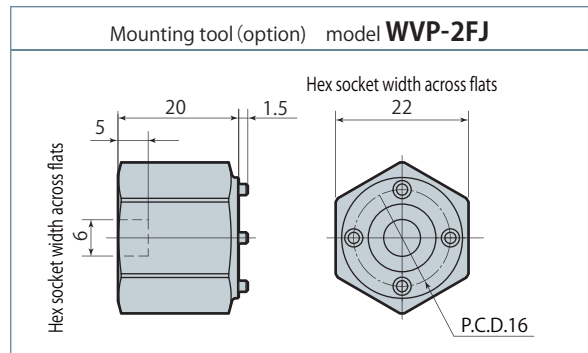


WVP-2FPL

Hydraulic pressure 7MPa•Air plug
Recommended tightening torque : 15 N•m

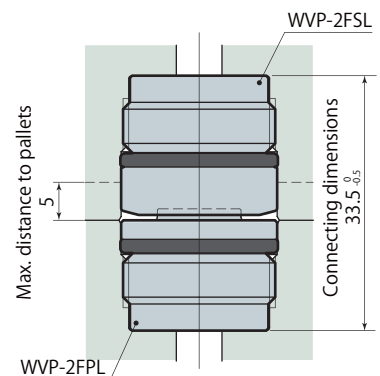


※When using Pal-fix as a set, be sure to set depth to 19. Refer to pages 8 to 11 for details on Pal-fix.



Note1. Stop fluid during disconnection and connection operations as disconnecting or connecting coupler while fluid is flowing results in leaking of fluid.

- Coupler has no built in filter.
Ensure that foreign matter on connecting surfaces are removed by blowing air before connecting to prevent foreign matter from entering into piping.
- Ensure thorough bleeding of air from hydraulic circuit is performed during mounting.
- If Pal-fix is not used as a set, mount a guide and stopper to ensure that connecting dimensions remains within tolerance (0 to -0.5) when connecting.
- Tighten with torque of 15 N•m for mounting.



Pascal

corporation

Itami, Hyogo, Japan 664-8502
TEL.(072)777-3333 FAX.(072)777-3520



CERTIFICATE OF APPROVAL ISO 9001