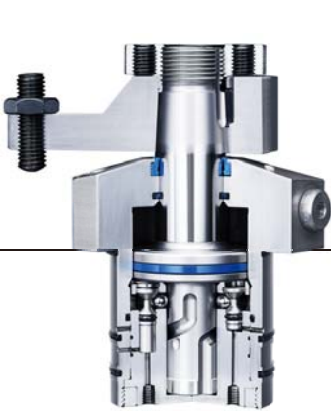


Pascal

Products Introduction

Aiming for highly efficient production



model
CTM PAT.

Built-in air sensor



model
CLM PAT.

Built-in air sensor



model
CTU

of machining — Work clamping system



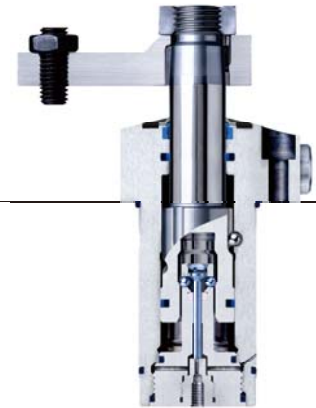
model
CTP JP PAT.

Dual cylinder



model
CLP JP PAT.

Dual cylinder

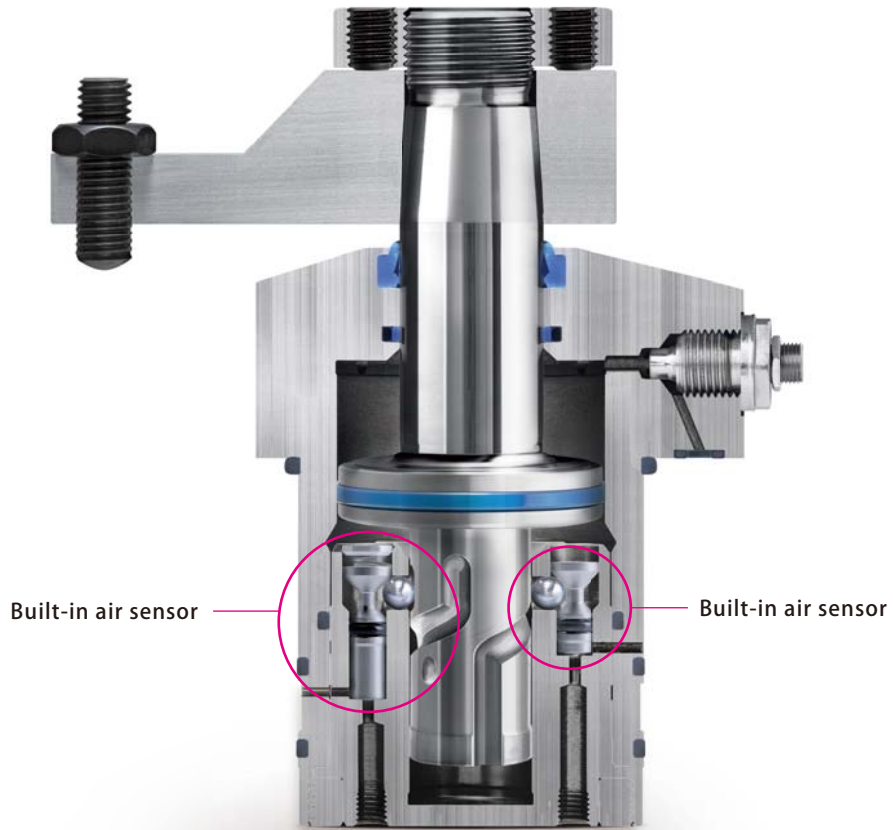


model
CTK PAT.

Built-in air sensor

Swing clamp

Built-in air sensor model



model
CTM PAT.

Link clamp

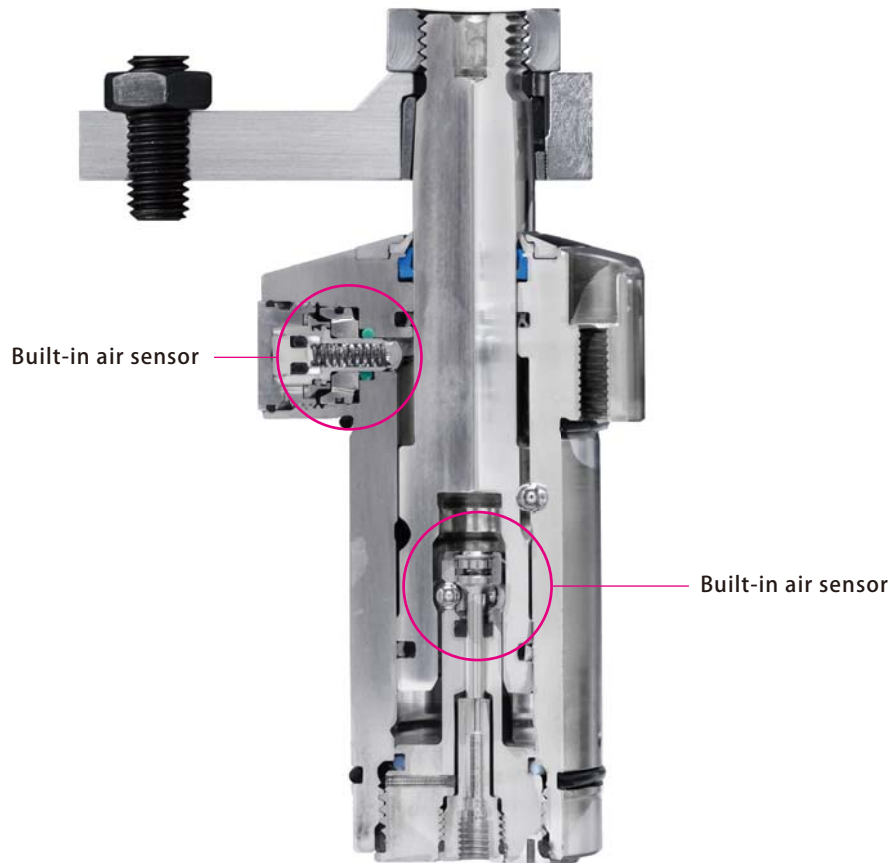
Built-in air sensor model



model
CLM PAT.

25MPa Swing clamp

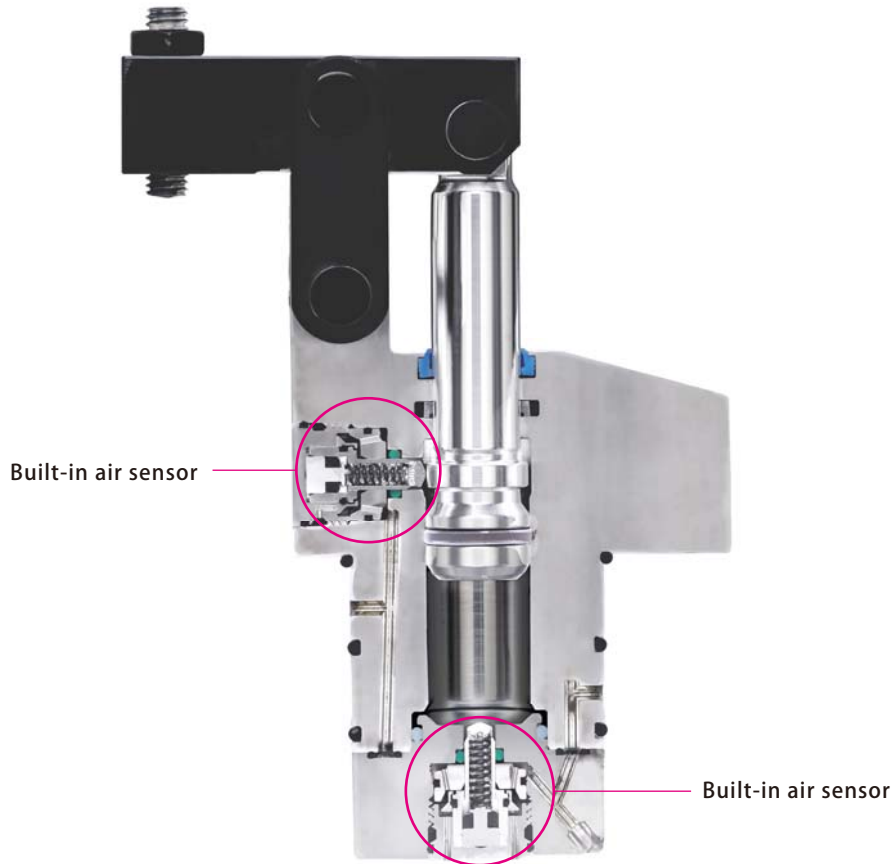
Built-in air sensor model



model
CTK-T PAT.

25MPa Link clamp

Built-in air sensor model



model
CLW-T PAT.

Work clamping system

Standard model



Work support
model
CSU



Work support
model
CST



Work support
model
CSN/CSY



Work support
model
CSK



Flow control valve
model
VCF



Air bleeding valve
model
VCE



Swing clamp
model
CTU



Link clamp
model
CLU



Push cylinder
model
CMC



Pal fix
model
CPK



Pal coupler
model
WVP-2F



Pal coupler
model
WVP-1F

Work clamping system

PAT.

Sensor model



7MPa Swing clamp
model
CTM-T



7MPa Link clamp
model
CLM-T



7MPa Work lift cylinder
model
CNB-D



25MPa Link clamp
model
CLW-T



25MPa Swing clamp
model
CTK-T



Air swing clamp
model
CTX-T



Air link clamp
model
CLX-T



Air swing clamp dual cylinder
model
CTY-T



Boost air link clamp
model
CLY-B

Air swing clamp

Dual cylinder model

The dual cylinder structure can realize high cylinder force by increasing the pressure receiving area.

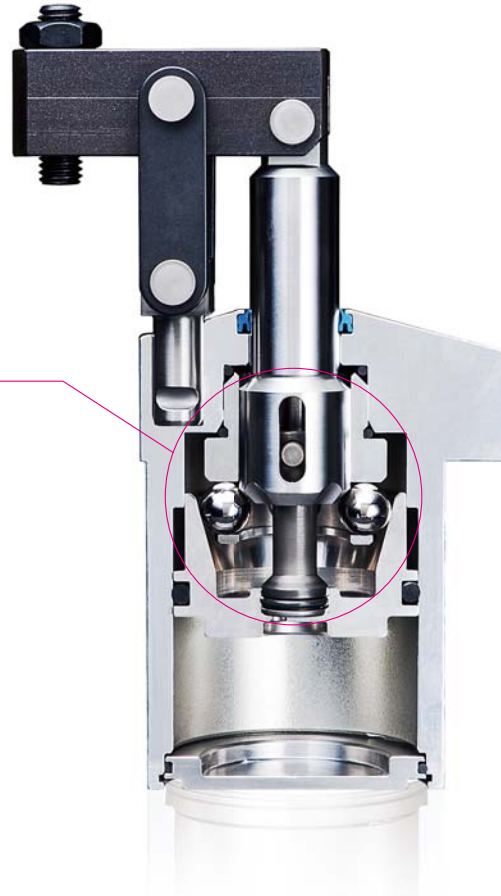


model
CTY JP PAT.

Air link clamp

Boost model

The boosting structure realizes high cylinder force.
Downsized flange takes up minimum space keeping the clamping force the same.



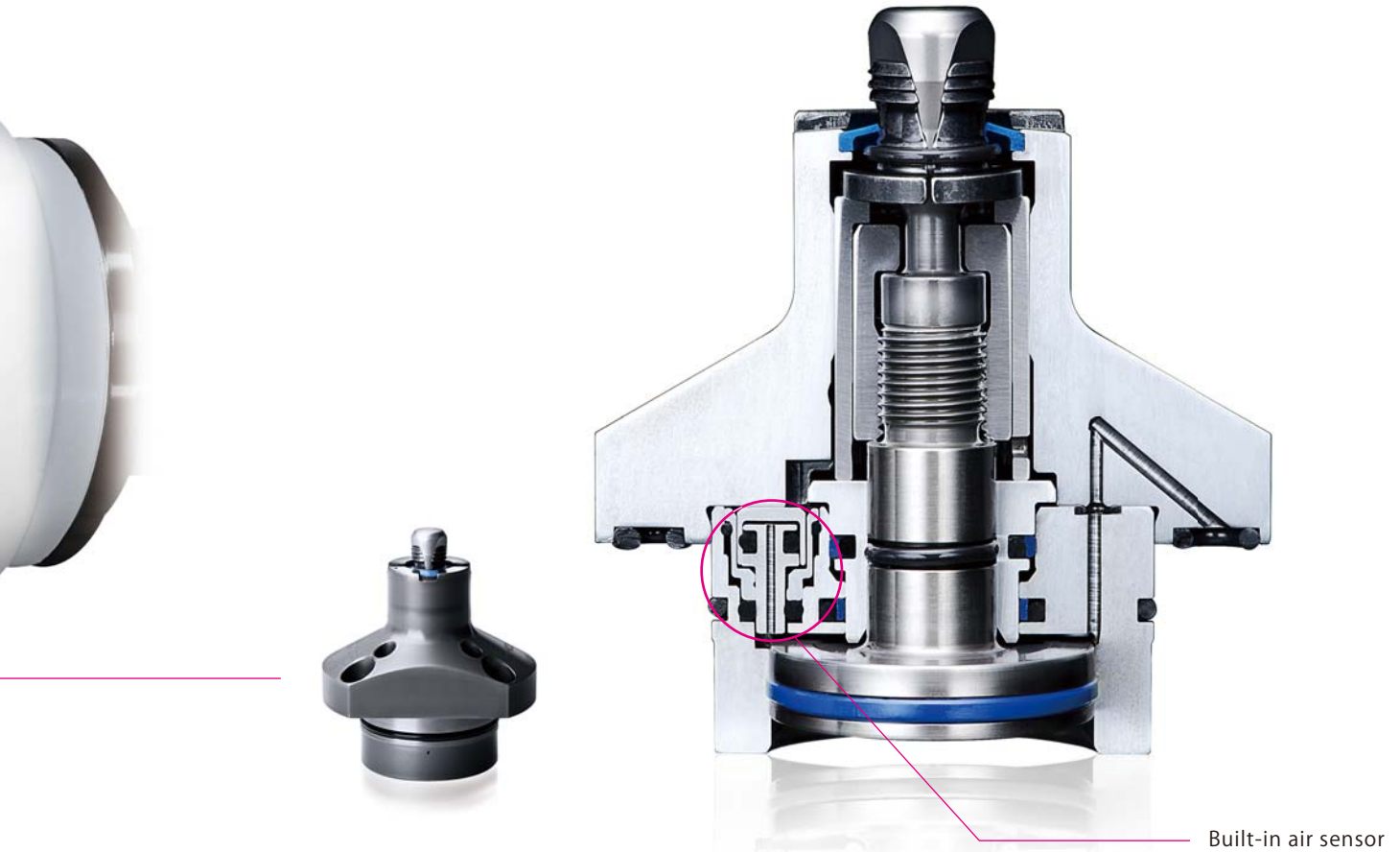
model
CLY PAT.

Enabling a jig compact by clamping at the



bottom of workpiece — Expansion clamp

model
CGC PAT.

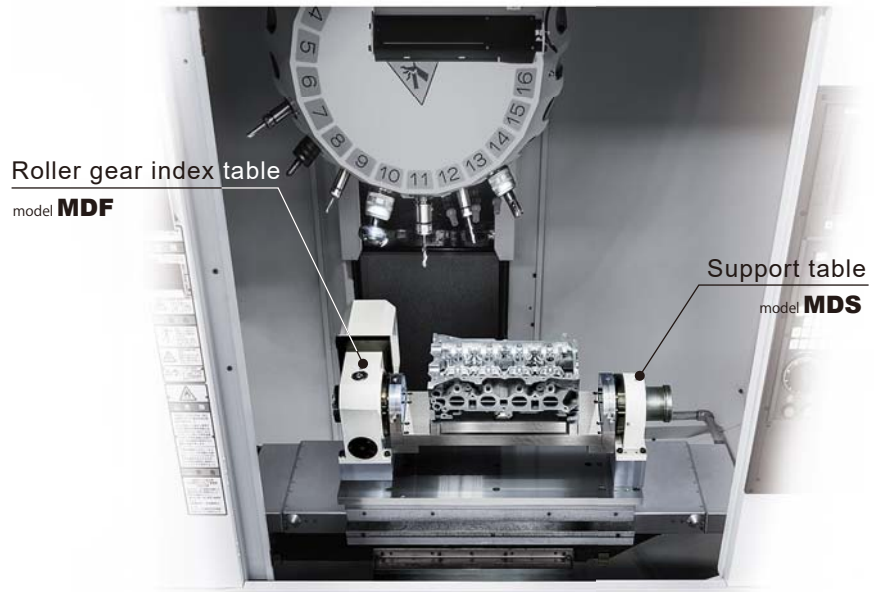


High speed, accurate and maintenance

The roller gear where the pressurization is applied by rolling transmission has few abrasive wear and maintains non-backlash for a long term.

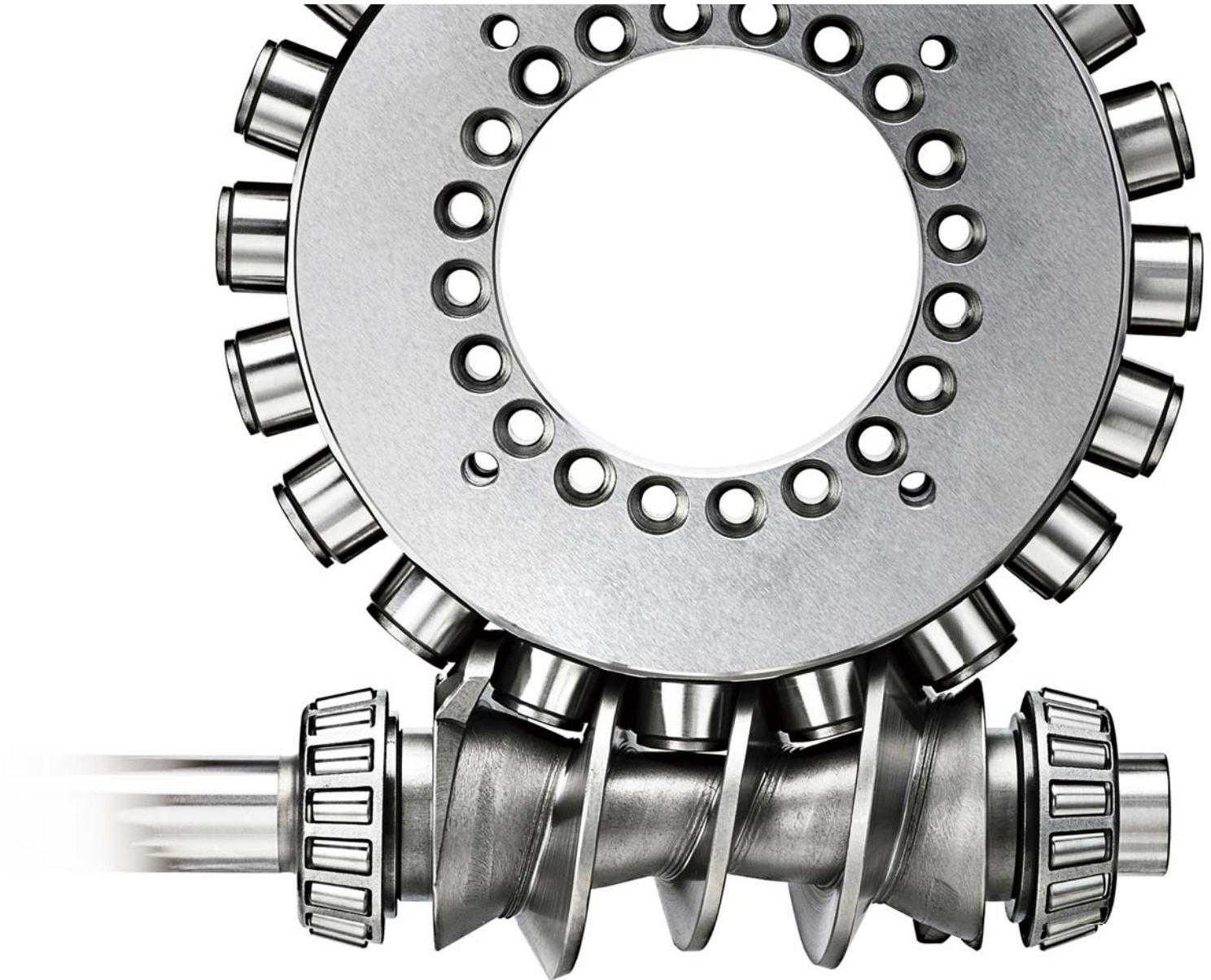
The roller gear index table employs brake-less and non-backlash mechanism and cycle time can be improved.

Hydraulic and pneumatic 9 ports & coolant 1 port are built-in. Clamp and loading operation can be confirmed with multiple circuits of rotary joint and machining line with excellent reliability can be realized.

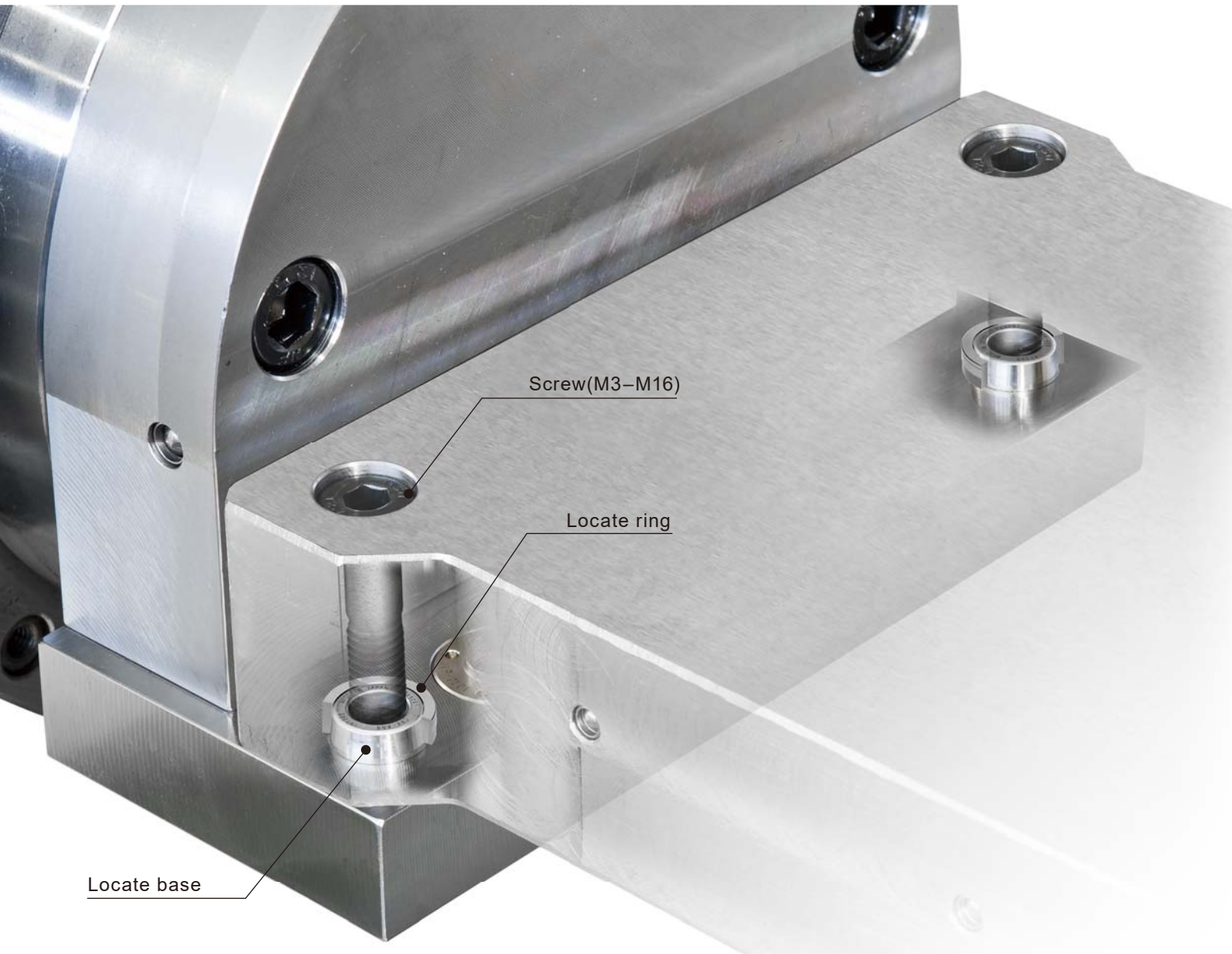


free designed — Roller gear index table

model
MDF



Super compact positioning



device — Pal fix and Pal fix mini

model **CPK** PAT.
model **RPK**

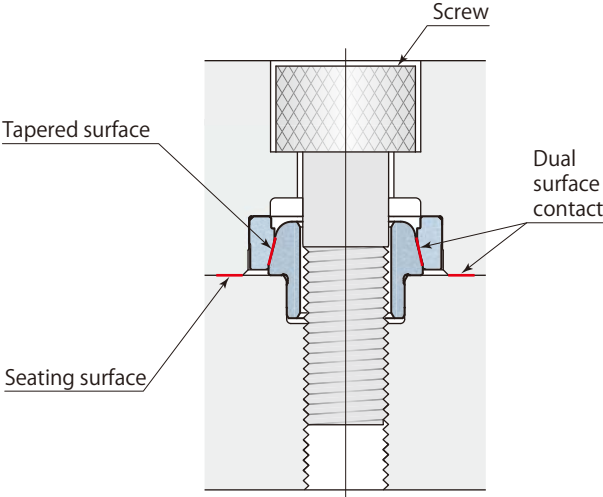
Pal fix



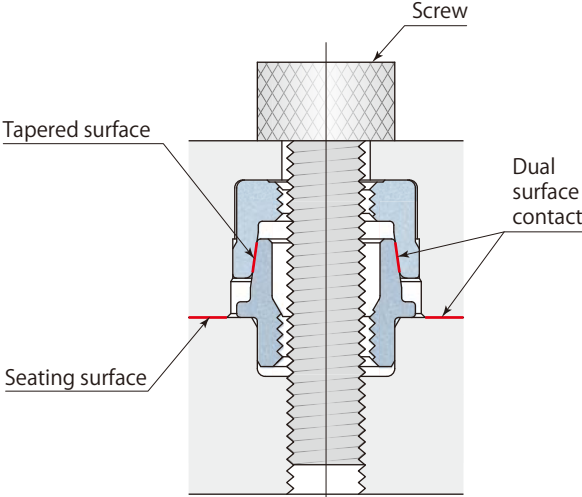
Pal fix mini



Screw size
M6, M8, M10, M12, M16



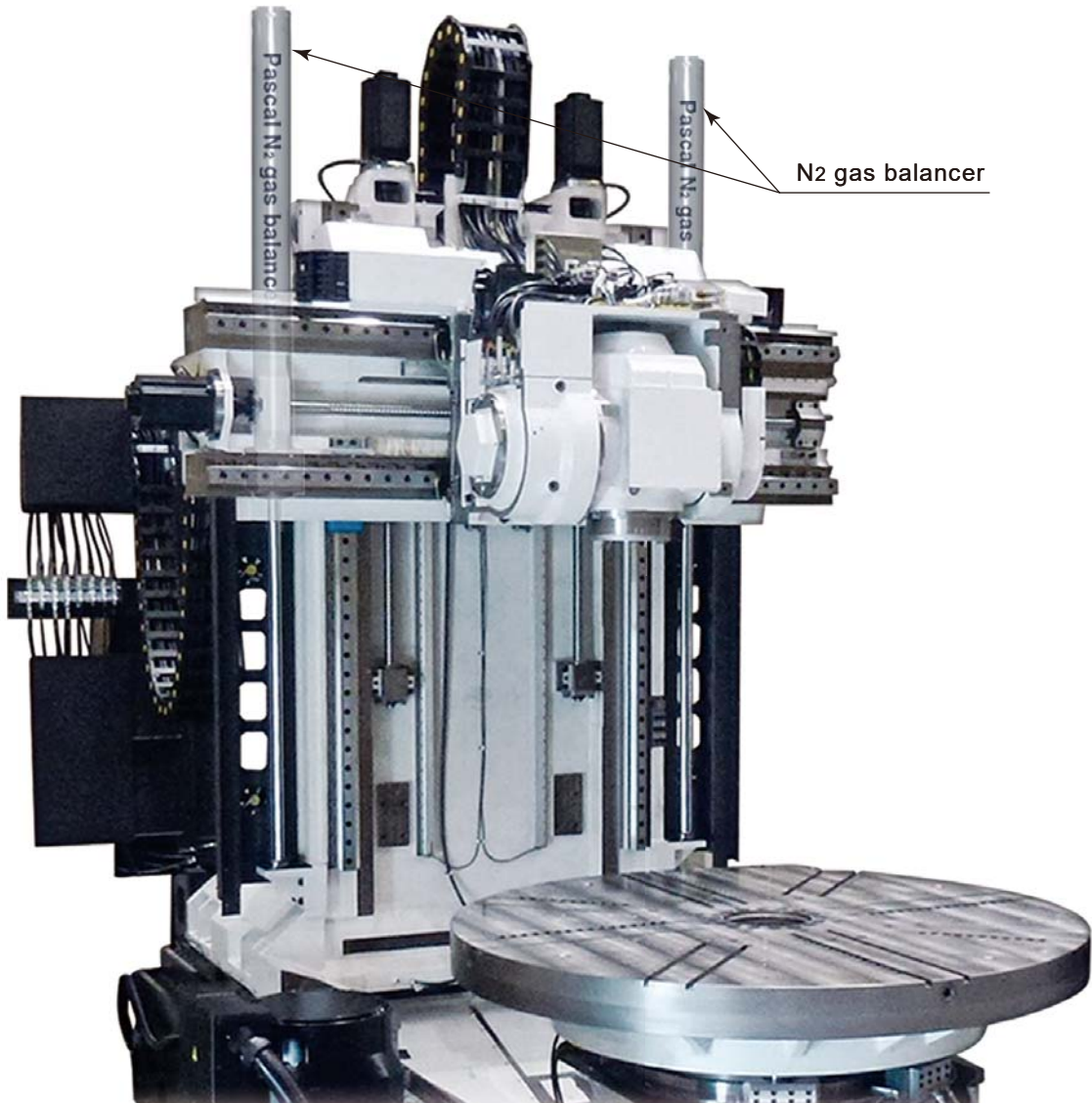
Screw size
M3, M4, M5



N2 gas balancer

model
DNG

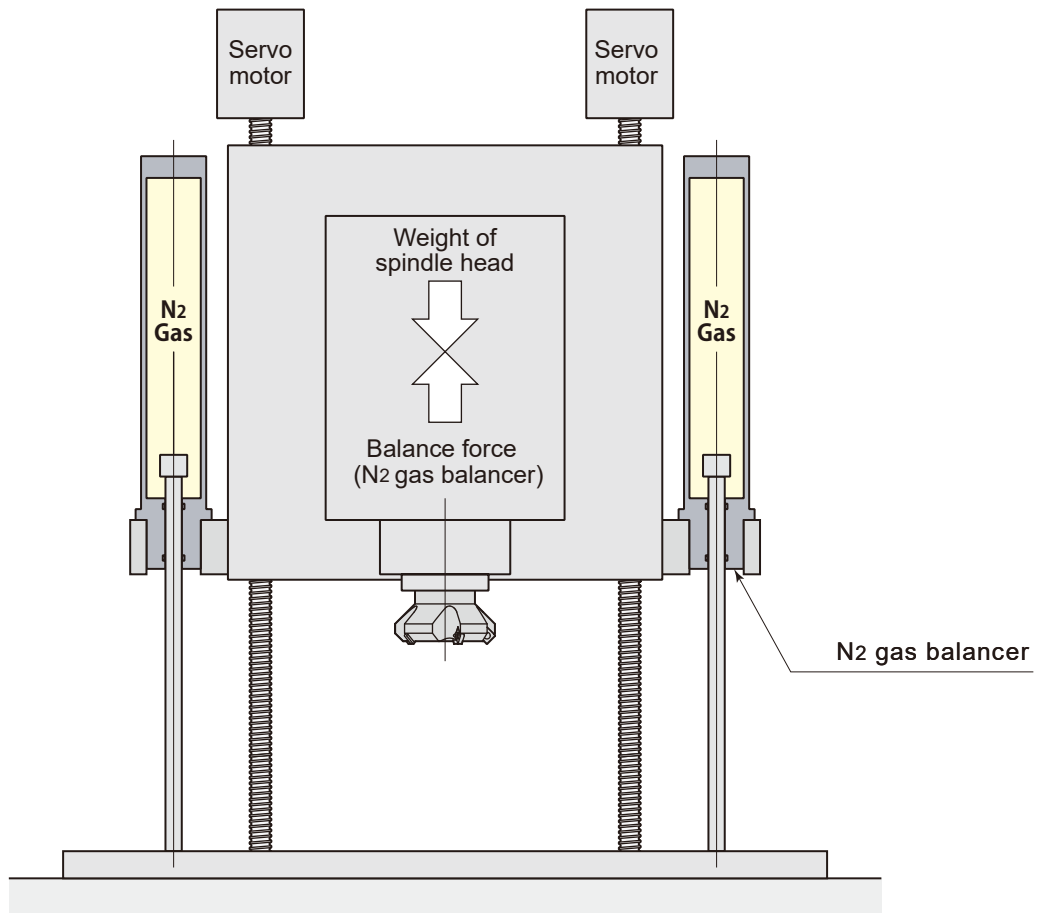
Delivery record 18,000



N2 gas balancer

model
DNG

For spindle unit of machining center



High speed, accurate, long life

Support table MDS130
Hydraulic oil /Air: 9 ports, Coolant: 1 port

W2 : 163.5mm

Base plate



Roller gear index table

model
MDF

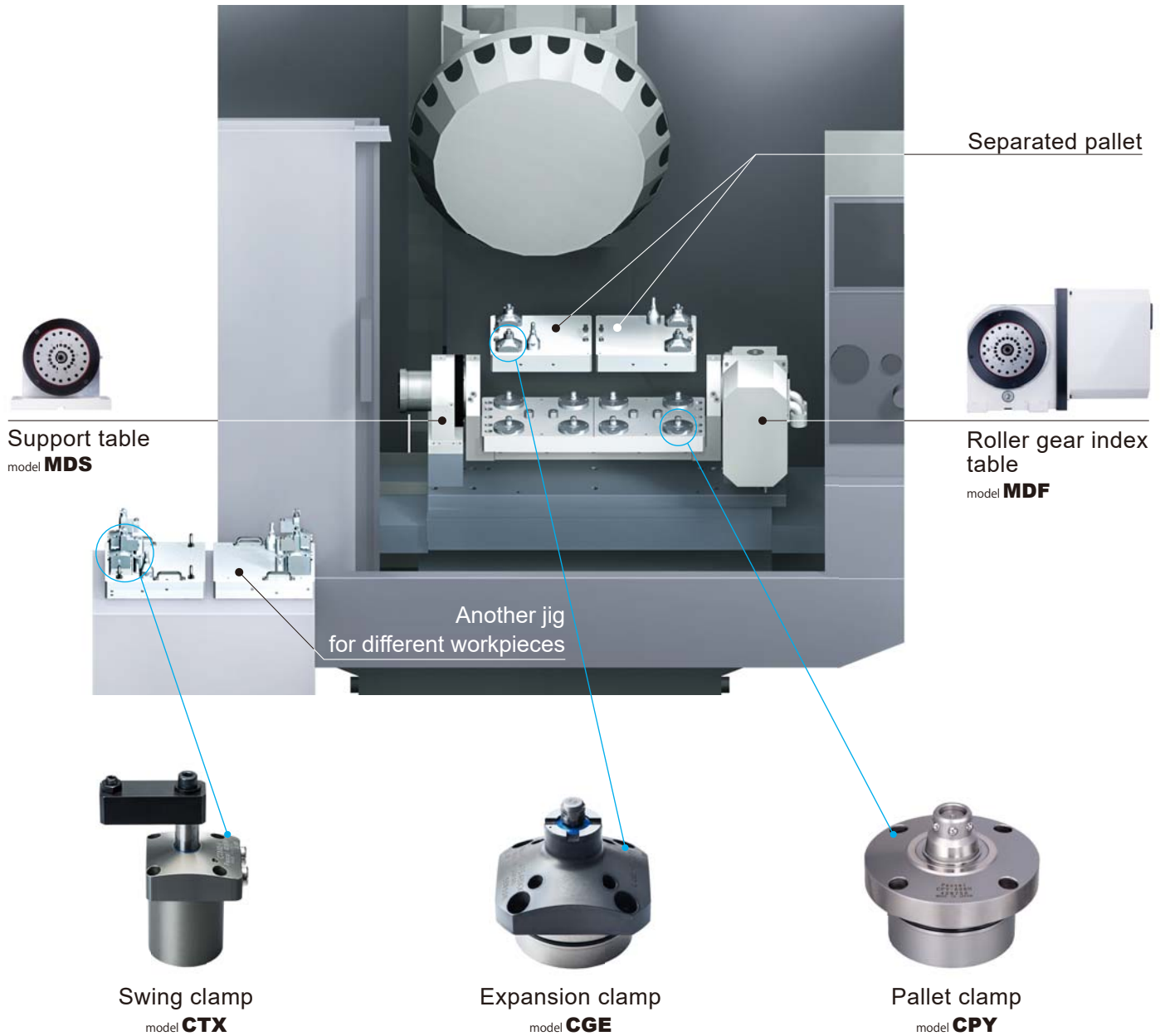
0.5 sec. for 90° indexing
is realized without a brake

Roller gear index table MDF130
Hydraulic oil /Air: 9 ports, Coolant: 1 port

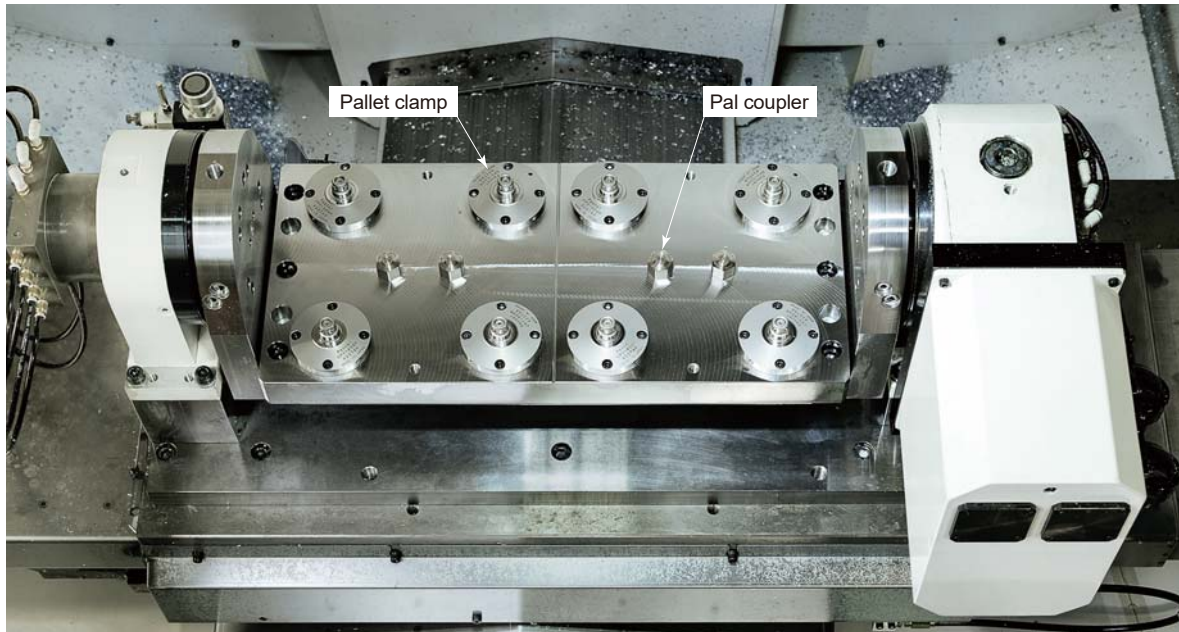
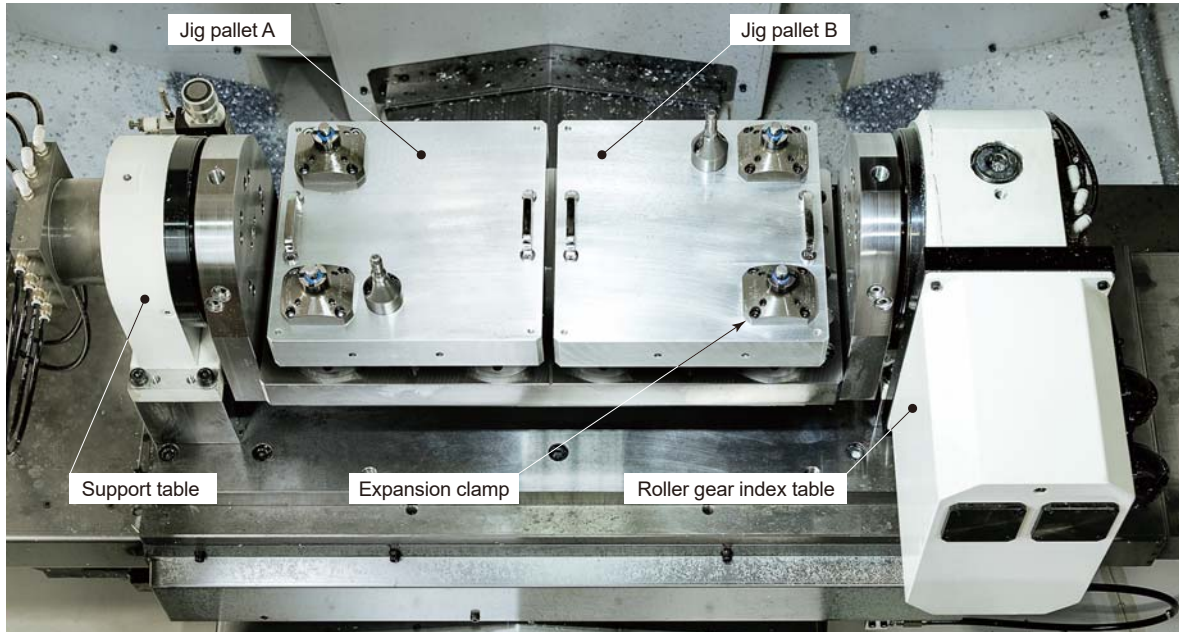
W1 : 164.5mm

w 550mm × d 250mm

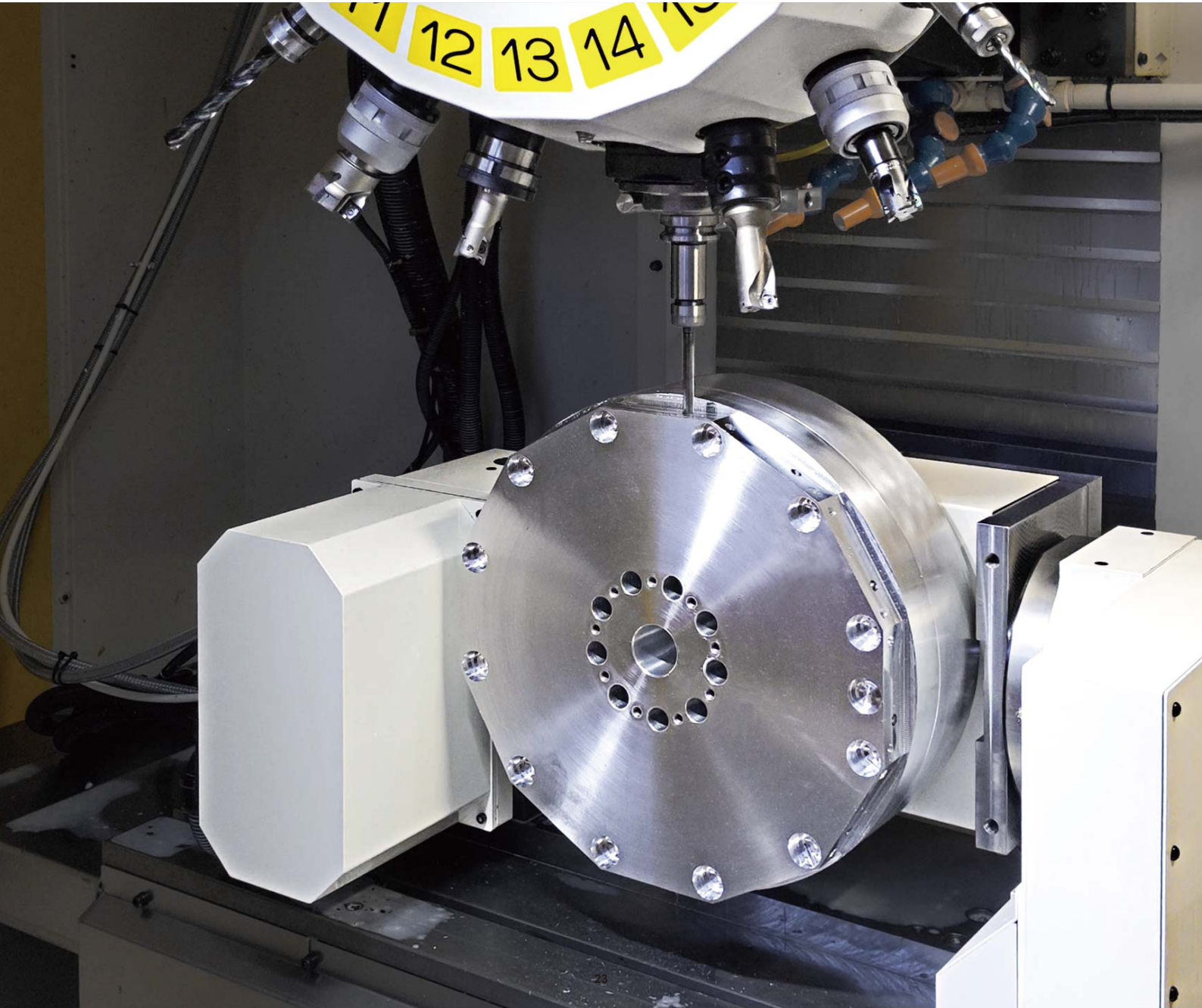
Quick jig change system



Pallet-change quick and comfortable model **MDF**



Compact, high performance



2-axis Roller gear index table

model
MDT

It helps improve the productivity significantly by reducing takt time to 0.8 seconds per index with non-braking and high-speed rotation.



- Applicable for large workpieces with a max. diameter of 400mm
- Suitable for small size machining centers (Weight 220kg)
- A compact 2-axis index table with a width of 865mm
- The high-precision roller gear maintains stable and accurate positioning.
- 9 built-in rotary joint ports for hydraulic and air +1 coolant port ensures flexibility and optimizes the workstation for workholding components.
- Its biaxial driving mechanism enables process integration so workpiece transferring can be reduced.
- The biaxial driving mechanism provides flexibility for design changes as well as slant hole drilling.

Same workpiece, Equal clamping force

Hyd.

Expansion clamp



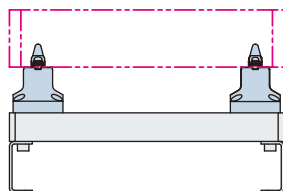
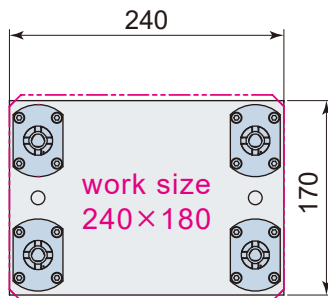
CGC-N22E

59%

Jig area
408cm²

Jig mass
14.5kg

Clamping force
1.77kN (3.5MPa)



Hyd.

Dual cylinder model



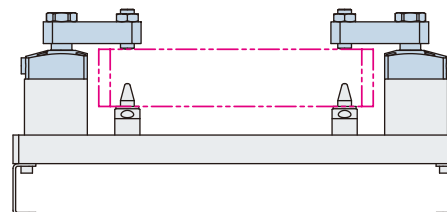
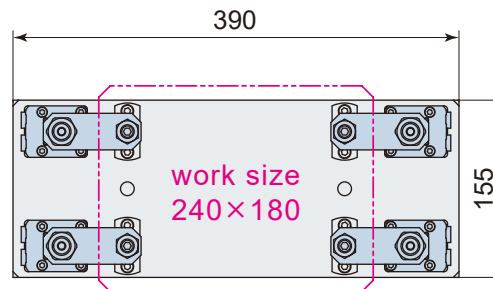
CTP04

87%

Jig area
604.5cm²

Jig mass
24.8kg

Clamping force
2.52kN (3.5MPa)

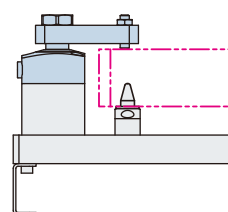
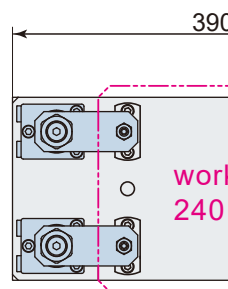


Hyd.

Standard



CTK06U



Comparison of jig size

Standard model

Hyd. Standard model

Air Dual cylinder model

90%

Jig area
624cm²
Jig mass
26.5kg
Clamping force
2.63kN (15MPa)



CTU06

100%

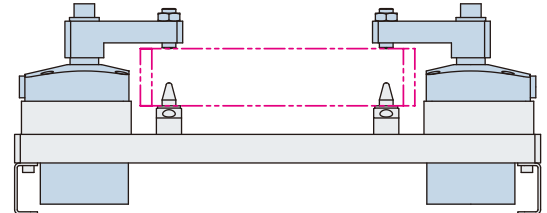
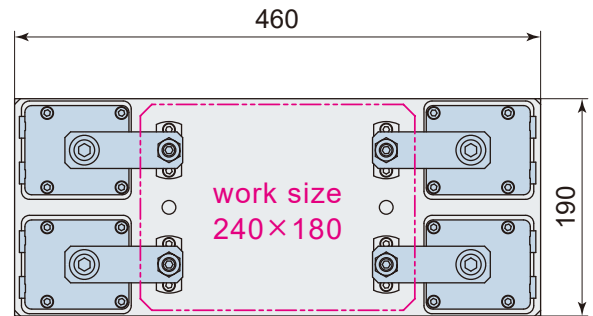
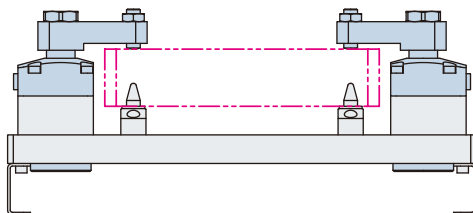
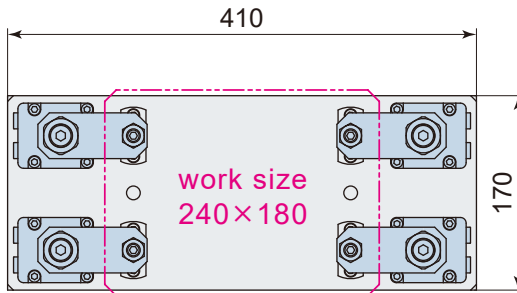
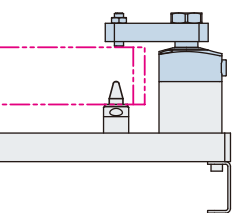
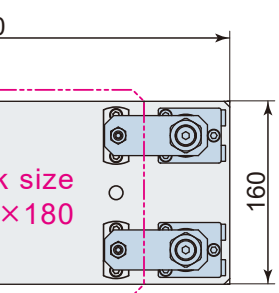
Jig area
697cm²
Jig mass
31.6kg
Clamping force
2.52kN (3.5MPa)



CTY63

125%

Jig area
874cm²
Jig mass
37.5kg
Clamping force
2.41kN (0.5MPa)



*Jig plate material : Steel, Thickness : 40mm

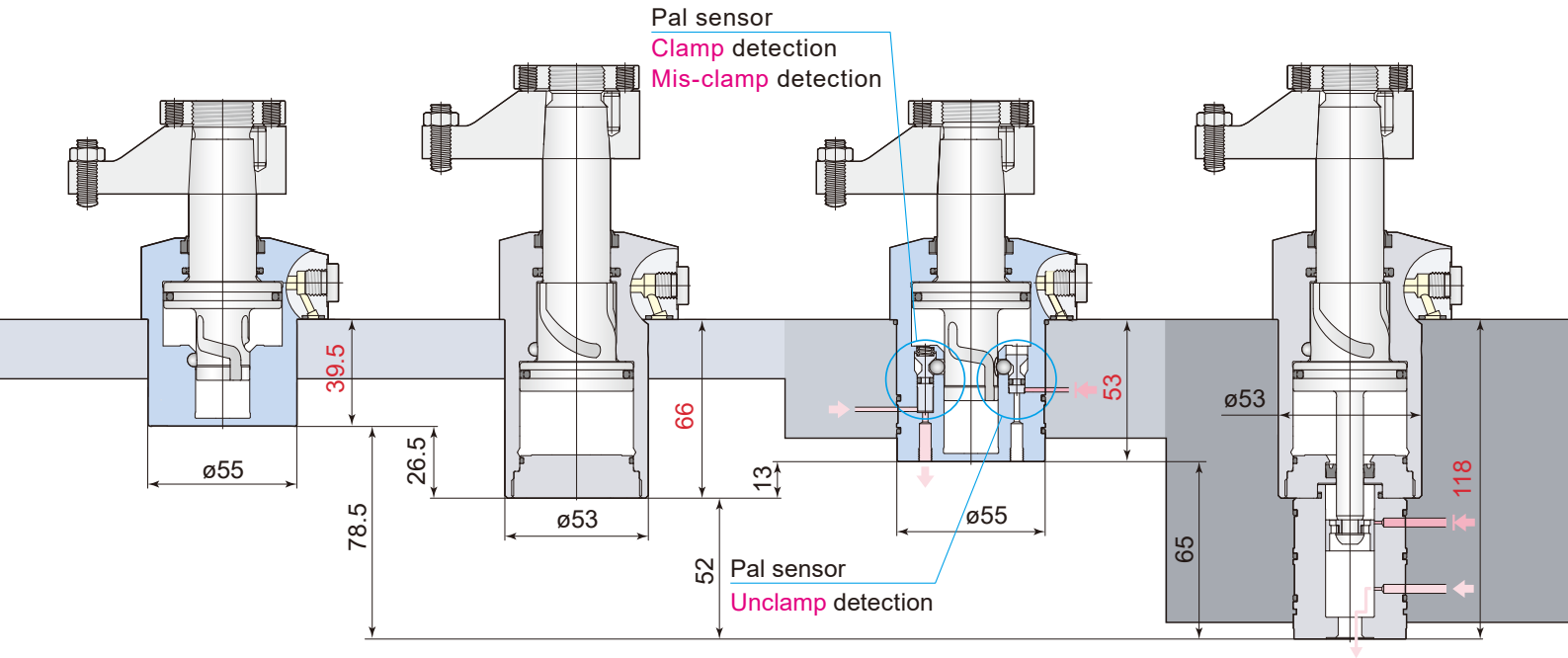
Swing clamp

model **CTM06-N PAT.**
Compact model
 (without sensor)

model **CTU06**
Standard model
 (without sensor)

model **CTM06-T PAT.**
Three point sensor model
 Clamp, Unclamp, Mis-clamp detection

model **CTU06-A**
Rod sensor model



Link clamp

model **CLM06-FN**

Compact model
(without sensor)

model **CLU06-F**

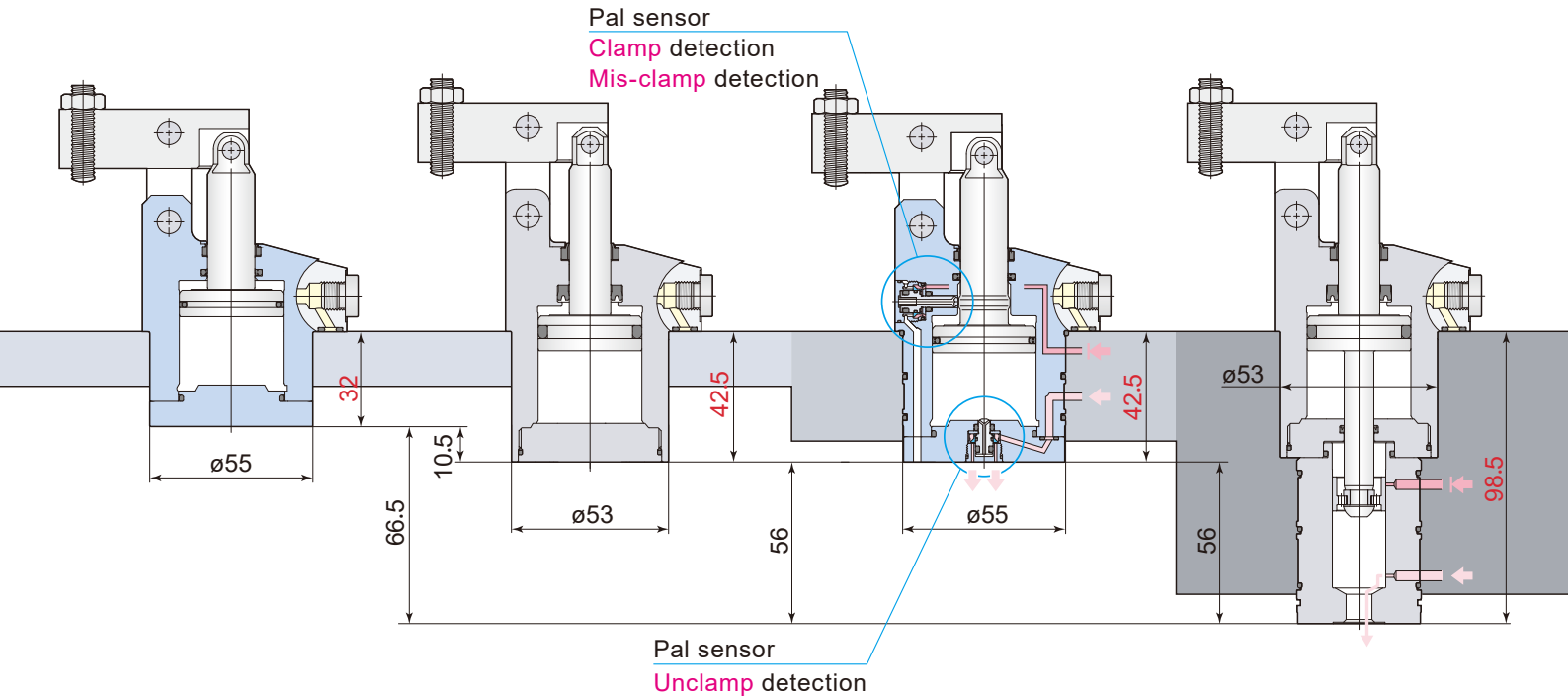
Standard model
(without sensor)

model **CLM06-FT PAT.**

Three point sensor model
Clamp, Unclamp, Mis-clamp detection

model **CLU06-FA**

Rod sensor model



Work lift cylinder

model **CNB02-15TN**

Compact model
(without sensor)

model **CNB02-15TB PAT.**

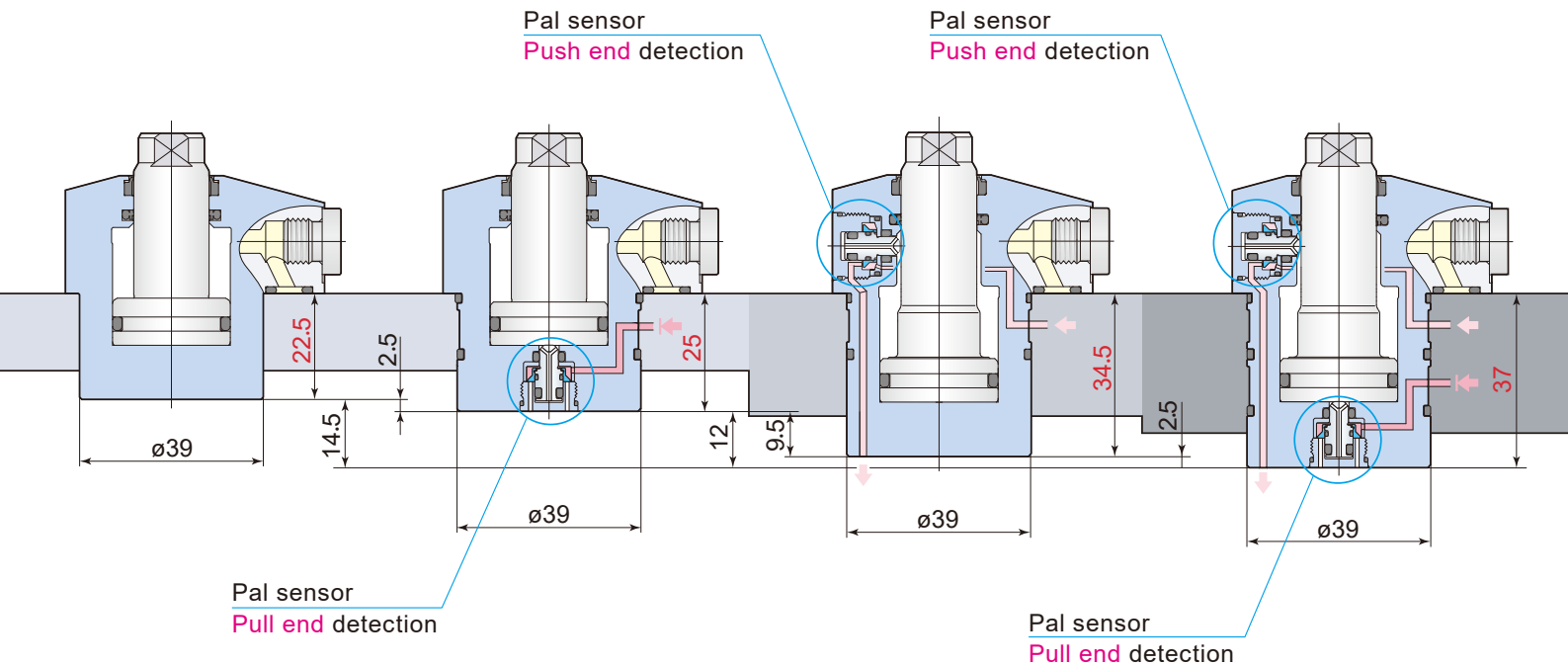
Pull sensor model

model **CNB02-15TU PAT.**

Push sensor model

model **CNB02-15TD PAT.**

Push / Pull sensor model



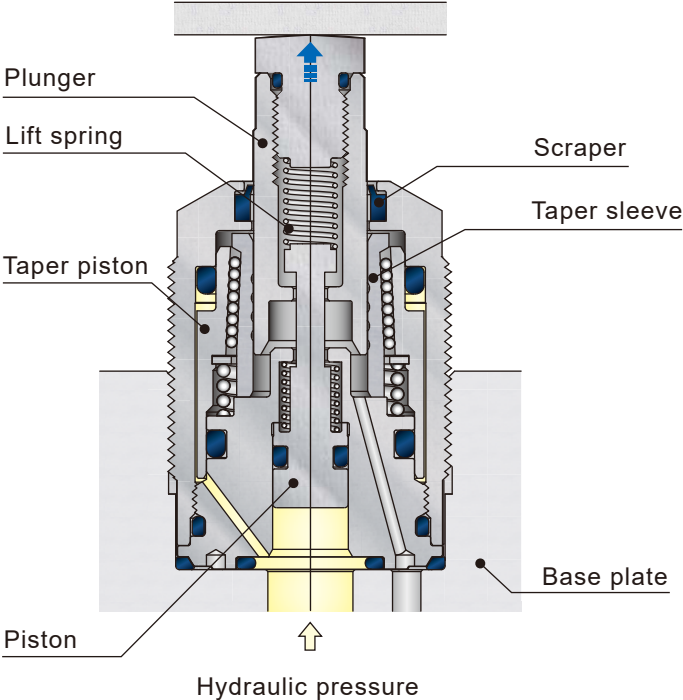
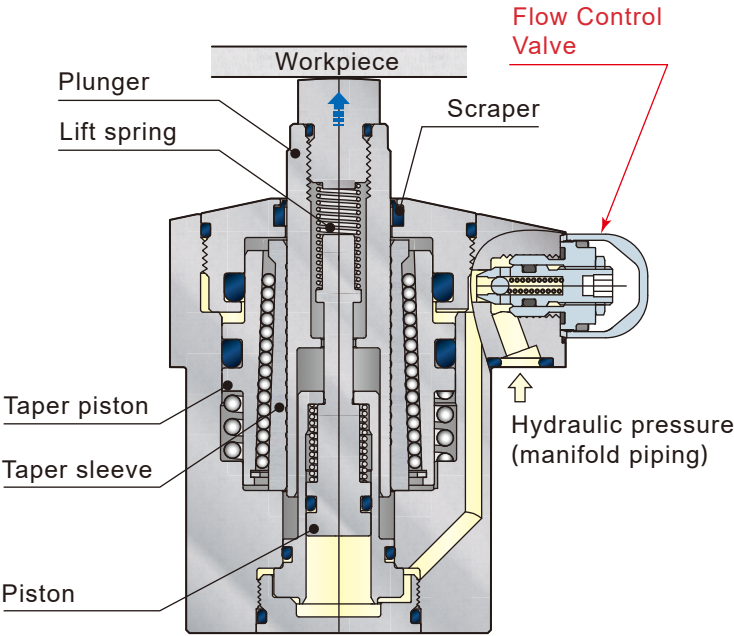
Work support



model
CSU



model
CSN

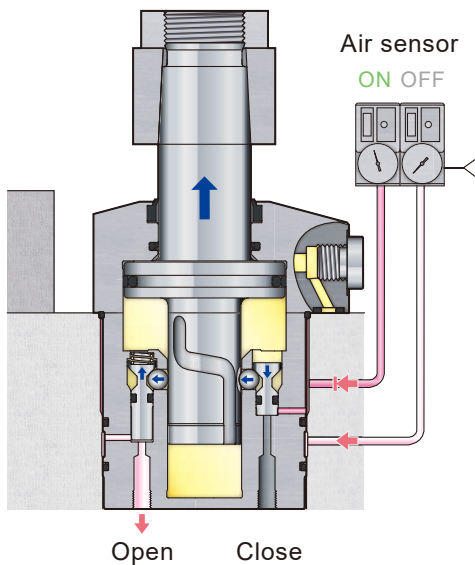


Unclamp / Clamp / Mis-clamp detection

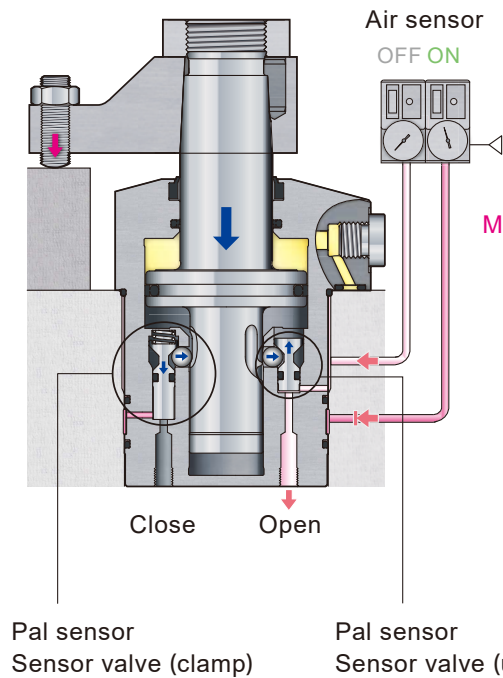
PAT.

Pal sensor (Built-in air sensor)

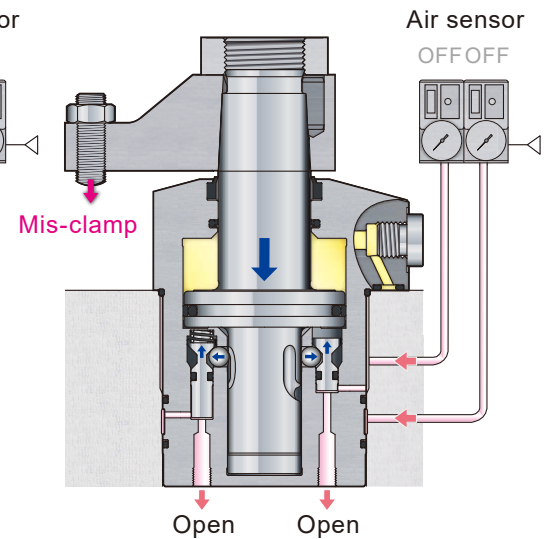
Unclamp detection



Clamp detection



Mis-clamp detection



Sensor signal Unclamp	ON
Sensor signal Clamp	OFF

Sensor signal Unclamp	OFF
Sensor signal Clamp	ON

Sensor signal Unclamp	OFF
Sensor signal Clamp	OFF

Detected mis-clamp

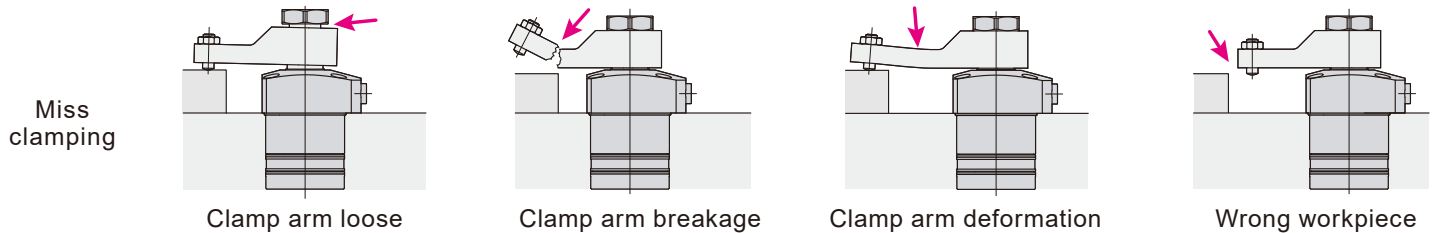
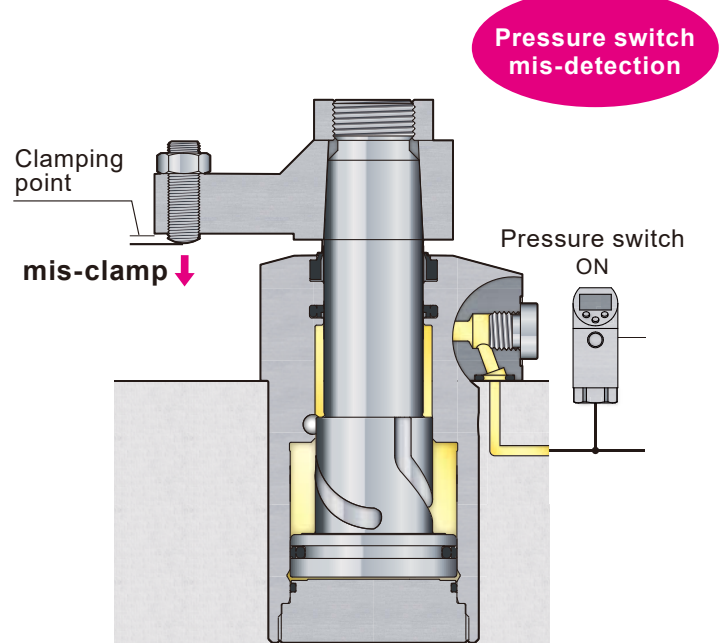
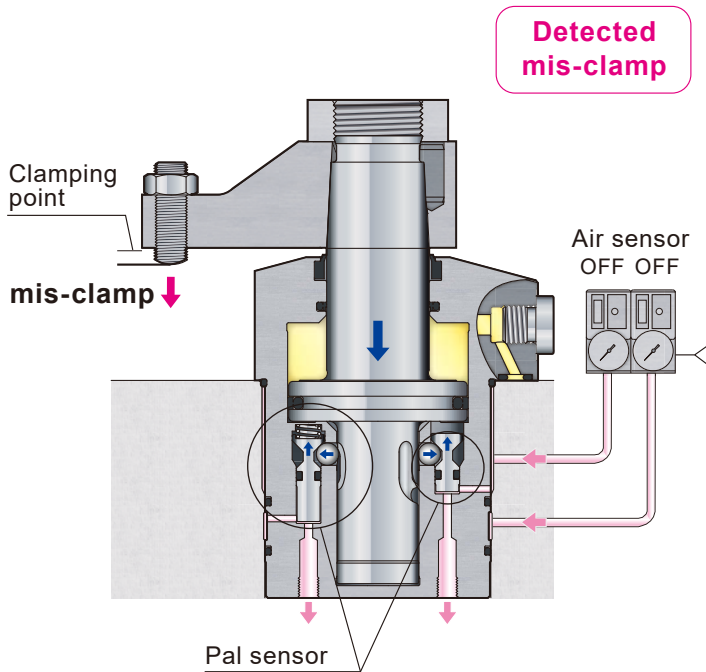
PAT.

Pal sensor (Built-in air sensor)

Sensor model can prevent tool breakage and defective machining due to incomplete clamp

Pressure switch

May not be able to prevent machining defects perfectly



Swing clamp Dual cylinder model

model
CTP JP PAT.

Flange area **approx. 59%** 2 size smaller ↓

Dual cylinder model **CTP04**



Compact model model **CTM06**



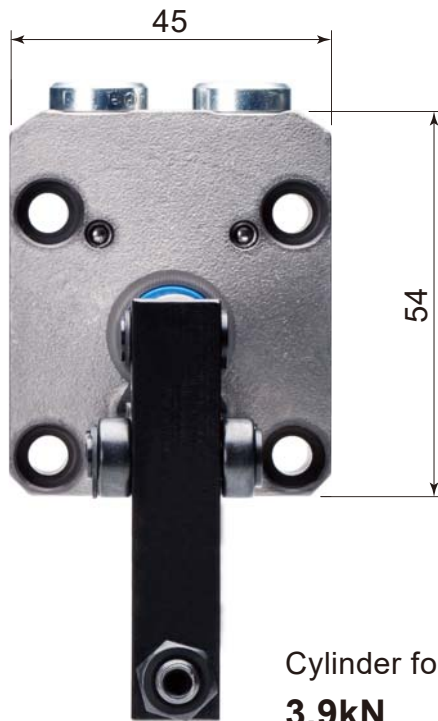
*Hydraulic pressure 3.5MPa

Link clamp Dual cylinder model

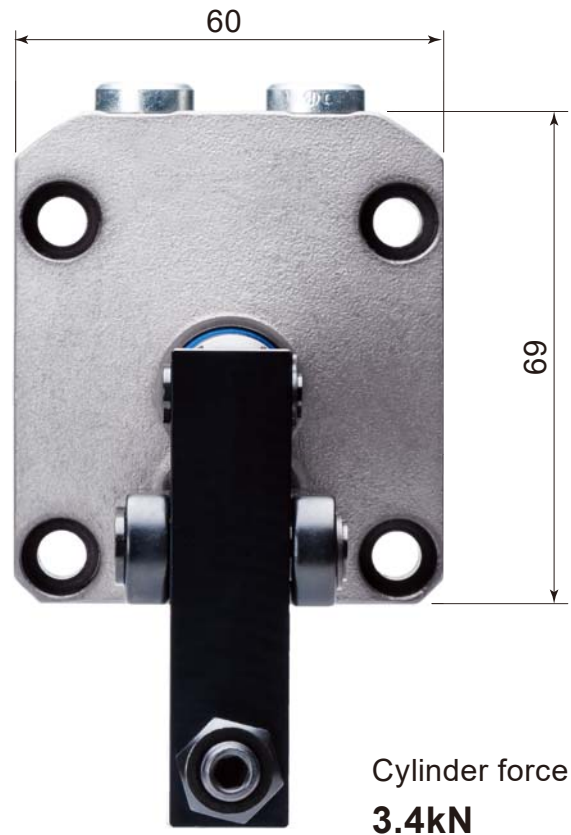
model
CLP JP PAT.

Flange area **approx. 59%** 2 size smaller ↓

Dual cylinder model **CLP04**



Compact model model **CLM06**

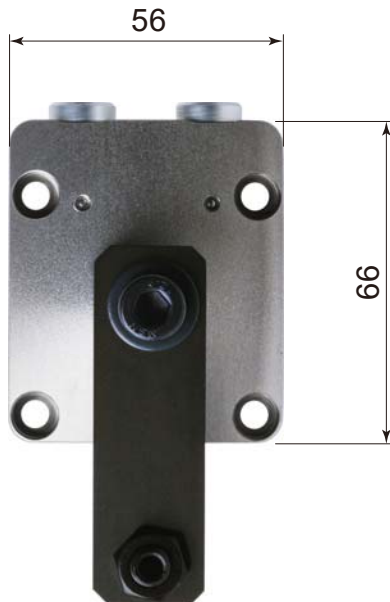


*Hydraulic pressure 3.5MPa

Air swing clamp Dual cylinder model ^{model}CTY ^{JP PAT.}

Flange area **approx. 52%** 2 size smaller ↓

Dual cylinder ^{model}CTY40



Cylinder force
1430N

Standard model ^{model}CTX63



Cylinder force
1310N

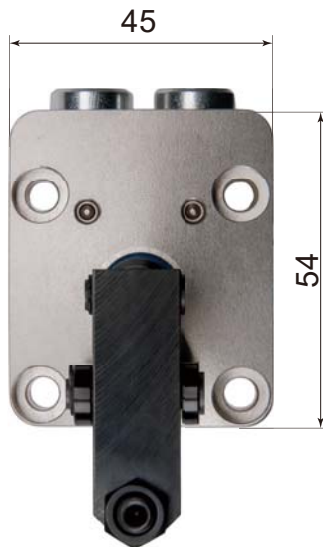
*Air pressure 0.5MPa

Air link clamp Dual cylinder model

model **CLZ** JP PAT.

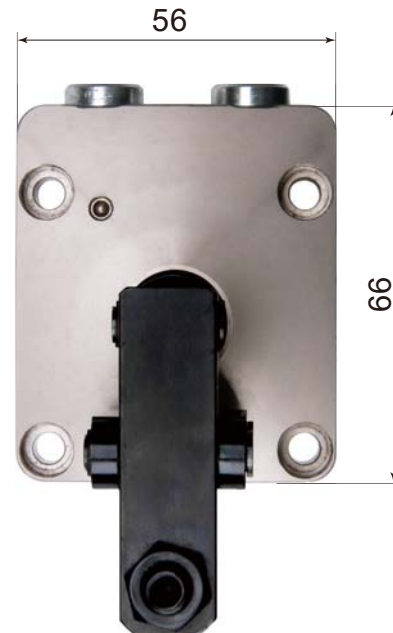
Flange area **approx. 65%** 2 size smaller ↓

Dual cylinder model **CLZ25**



Cylinder force
590N

Standard model model **CLX40**



Cylinder force
630N

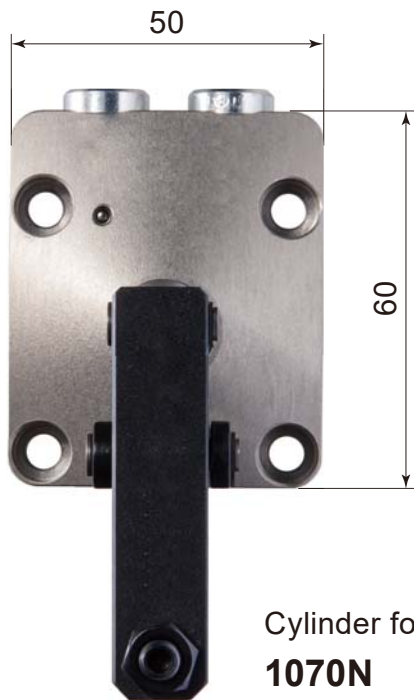
*Air pressure 0.5MPa

Boost **air** link clamp

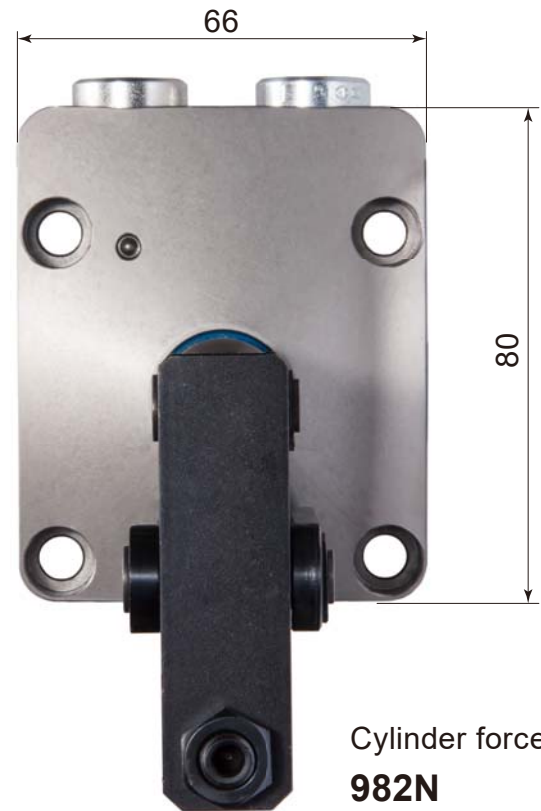
model
CLY PAT.

Flange area **approx. 57%** 2 size smaller ↓

Boost model model **CLY32**



Standard model model **CLX50**



*Air pressure 0.5MPa

Boost air link clamp

model
CLY PAT.

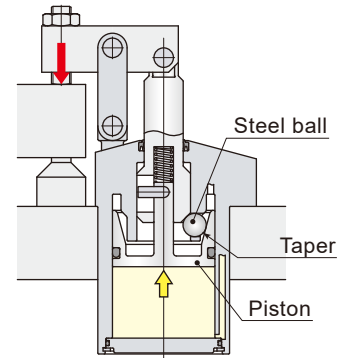
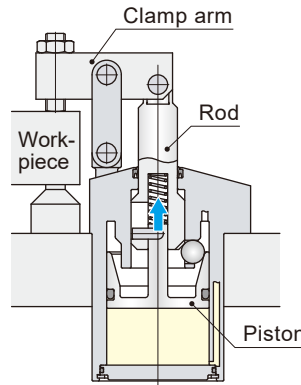
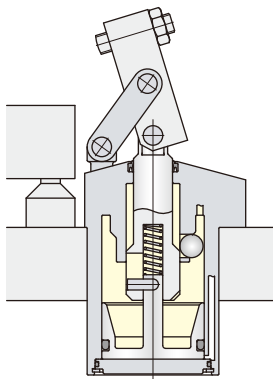
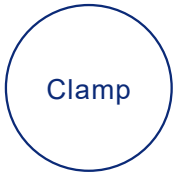
① Unclamp



② Clamp position



③ Clamping force boosted



The rod and piston go up at the same time until a clamp arm contacts workpiece.

Steel balls and taper can boost clamping force by the upward movement of piston.

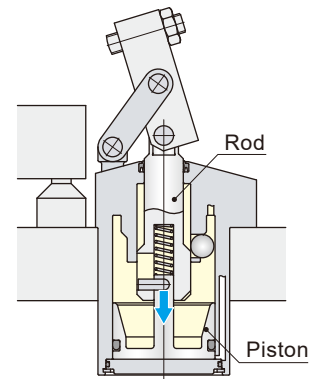
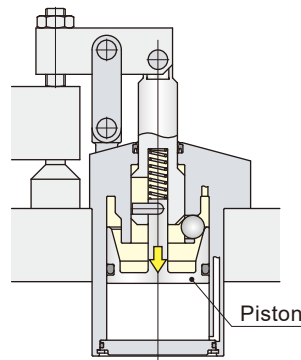
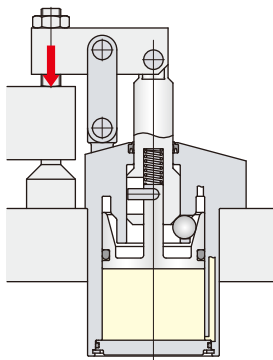
① Clamping force boosted



② Taper-lock released



③ Unclamp



Taper lock is securely unlocked by the downward movement of piston

The rod and piston go down at the same time.

Swing clamp Flat mount model

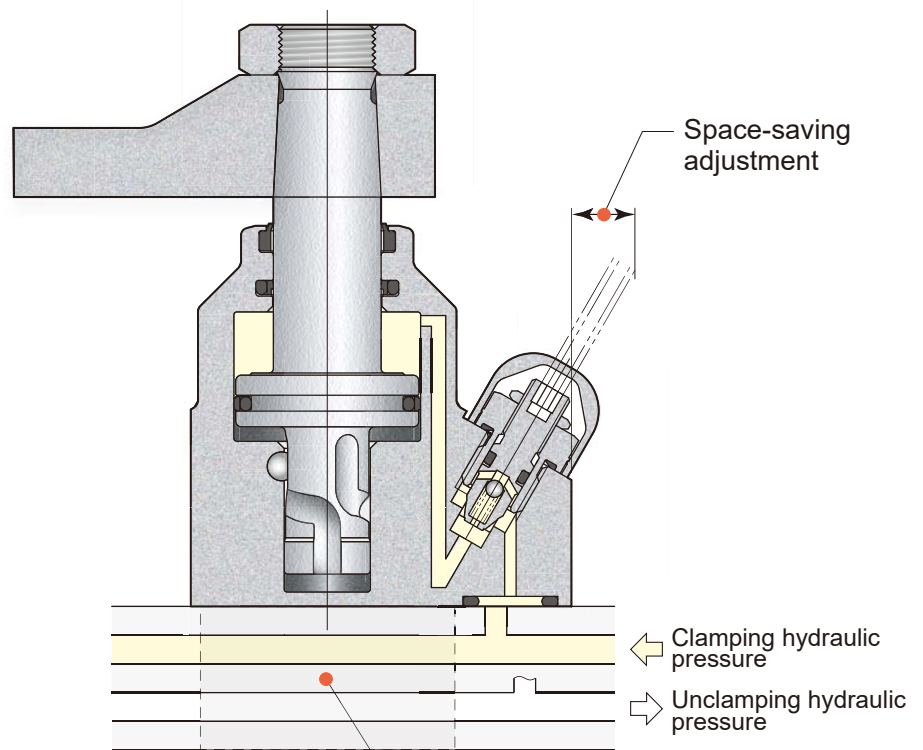
model
CTJ JP PAT.

Eliminating the embedding of the main body makes it easier to process the jig plate.



Swing clamp
Flat mount model

model **CTJ**



Since the embedded hole is not machined, the piping design under the clamp is easy and the jig plate can be made thin.

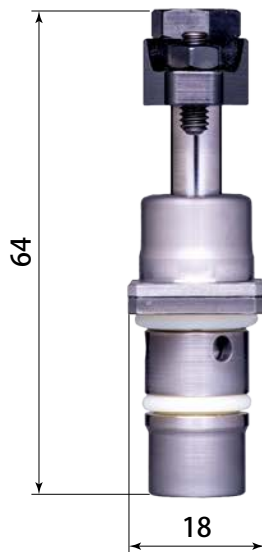
15 MPa

Swing clamp Cartridge model

model
CUC

Achieving an unprecedented compact design with portless G-thread piping.

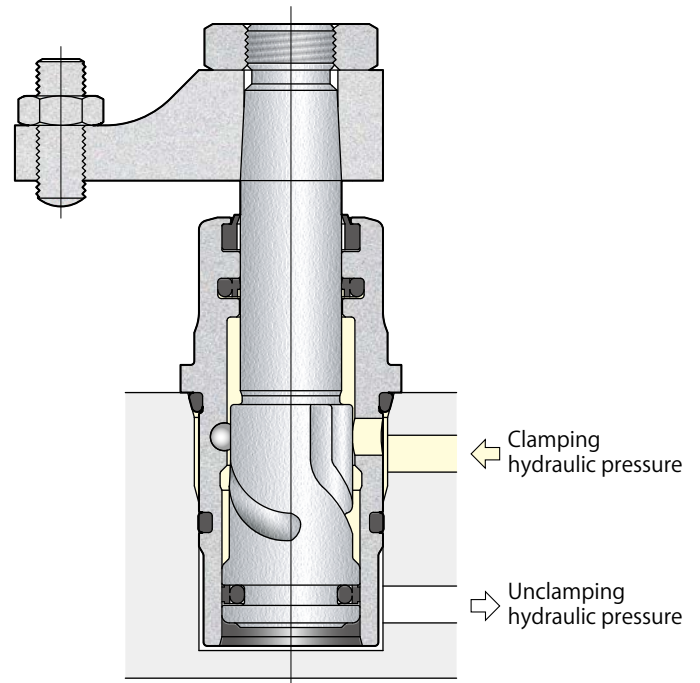
model **CUC04-L**



Unclamp



Clamp



Perfect nut & release nut

Helps to improve the workability on the machine table or the jig

Mounting with Perfect nut



Dismounting with Perfect release nut



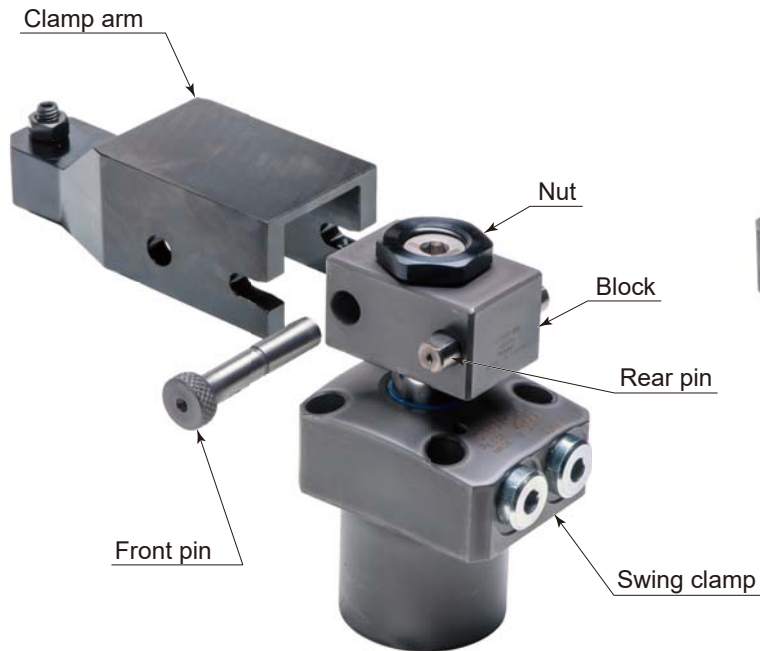
The clamp arm can be mounted/dismounted easily and securely with a small torque.

Quick arm change

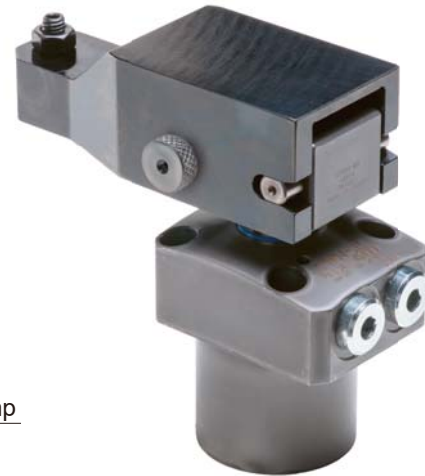
PAT.

Clamp arm is replaceable quickly with toolless

Dismounting of clamp arm



Mounting of clamp arm



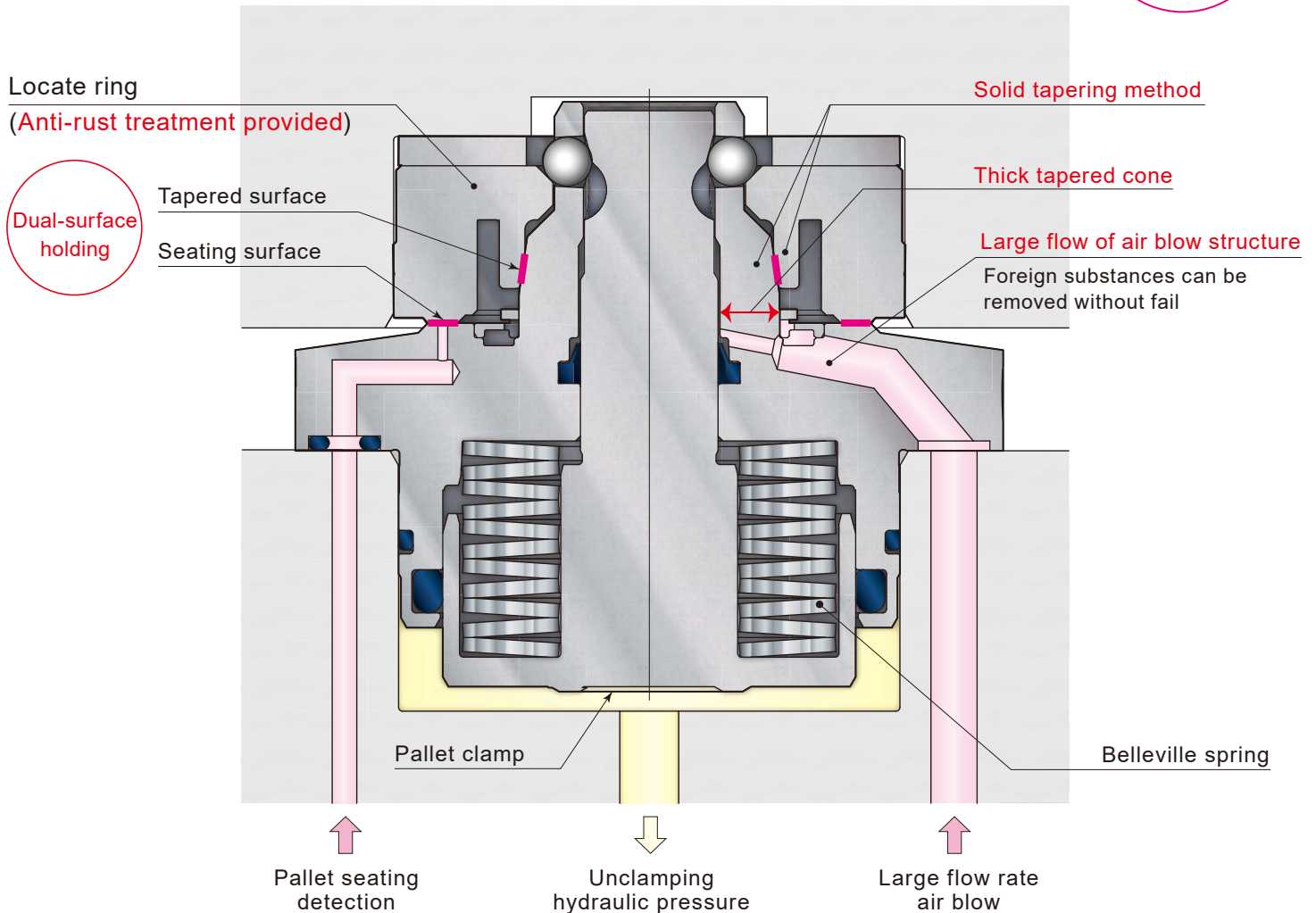
The arm makes the clamp versatile for many kinds of the workpiece and productivity increases.

Pallet clamp

model
CPC US PAT.

High rigidity, high accuracy and high durability of pallet clamp ensured by dual-surface holding of solid tapering structure

Repeatability
3 μm



Air pallet clamp Dual cylinder model ^{model} CPY

Dual cylinder ^{model} CPY-A04H

Repeatability
3 μ m



Clamping force : **3.4kN**

Flange area
approx. **68%**

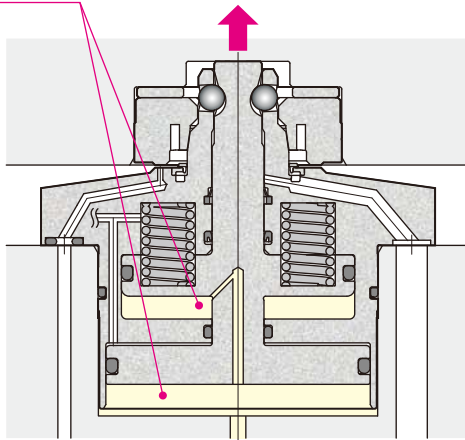
size
smaller

Conventional ^{model} CPL-A63H



Clamping force : **3.4kN**

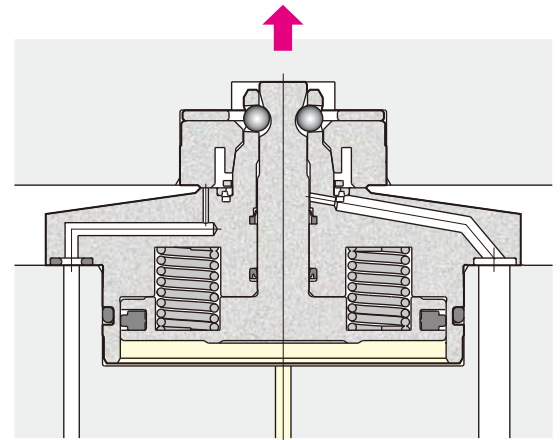
Dual cylinder
structure



Lifting force : **0.7kN**

Lifting force
1.8 times

Lifting
force
increase



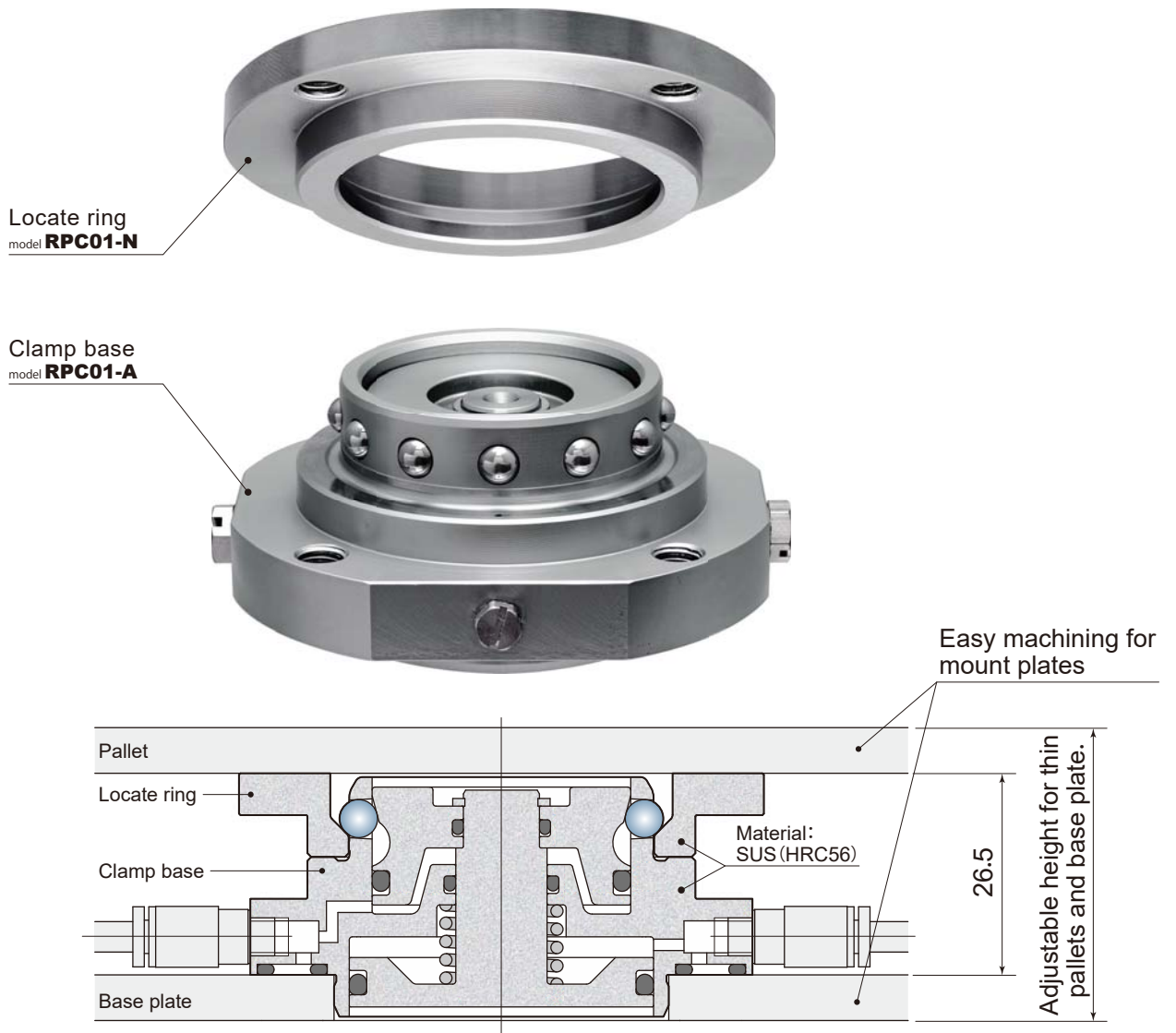
Lifting force : **0.4kN**

*Air pressure 0.4MPa

Air pallet clamp

model
RPC PAT. P.

Easily programmable for assembly and transport



Coupler module

Typ **WVP-2BSH** Typ **WVP-2BPH**



25MPa Pal coupler Oil, air

Typ **WVP-3DSN** Typ **WVP-3DPN**



1MPa Pal coupler Air, coolant

Typ **WVP-2FSL** Typ **WVP-2FPL**



7MPa Pal coupler Oil, air

Typ **WVP-3GSN** Typ **WVP-3GPN**



1MPa Pal coupler Air, coolant

Typ **WVP-1FSN** Typ **WVP-1FPN**



1MPa Pal coupler Air

Typ **WVP-2HS_H** Typ **WVP-2HP_H**



7MPa / 35MPa Non-leak coupler Oil (Plug hydraulic pressure source)
 Connect / disconnect under pressure capable

Typ **WVP-2SS_H** Typ **WVP-2SP_H**



7MPa / 35MPa Non-leak coupler Oil (Socket hydraulic pressure source)
 Connect / disconnect under pressure capable

Typ **WVP-2ESL** Typ **WVP-2EPL**



7MPa Pilot coupler Secondary pressure retainable Oil

Typ **WVP-2VSH** Typ **WVP-2VPH**

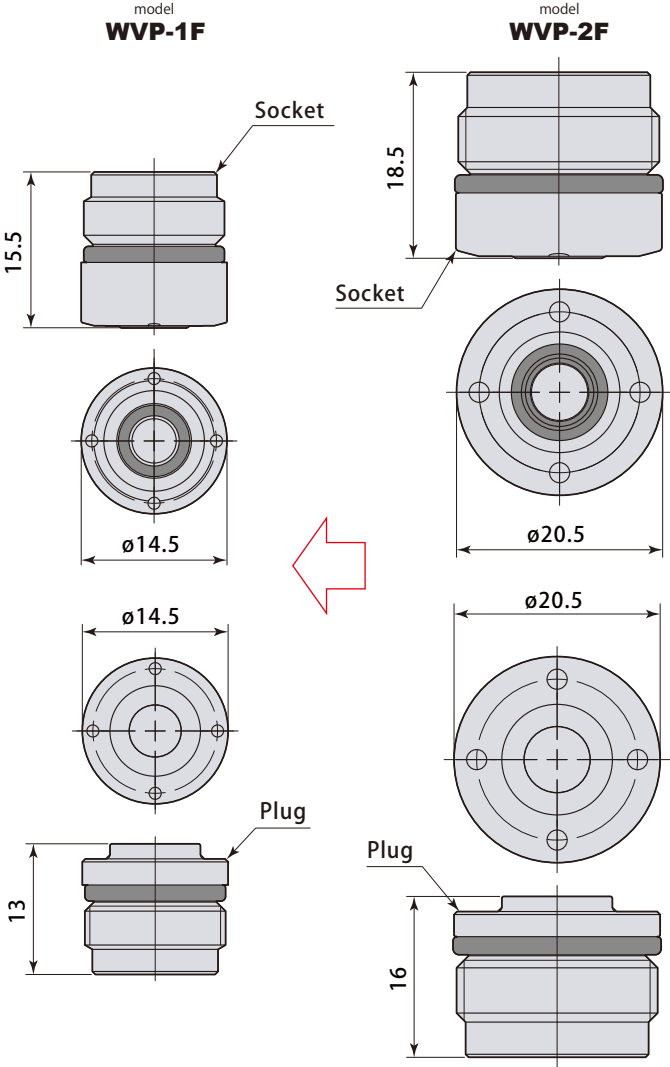


25MPa Pal coupler Oil, air, vacuum

Pal coupler

model
WVP-1F

Area 50%, Volume 40% smaller Flow characteristic is improved

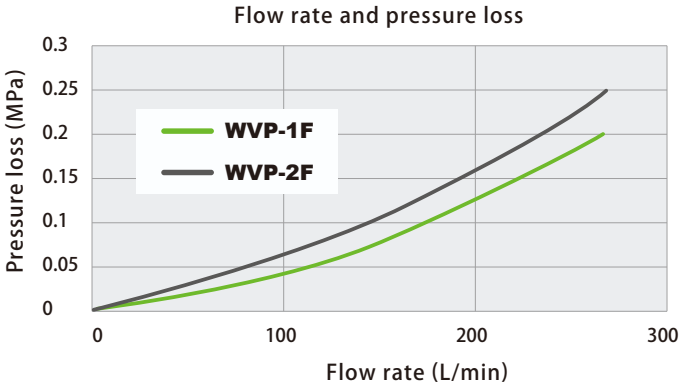
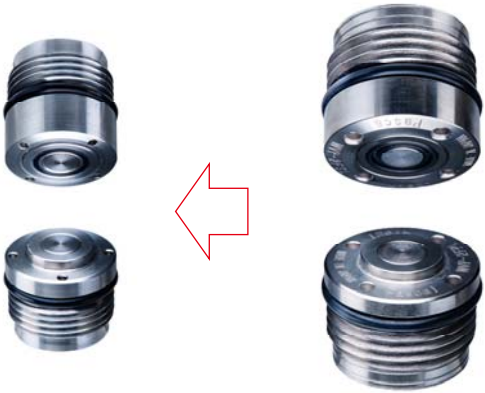


Pal coupler
Coupler only for air

Pal coupler
Common coupler
for hydraulic pressure and air

model
WVP-1F

model
WVP-2F



Pilot coupler

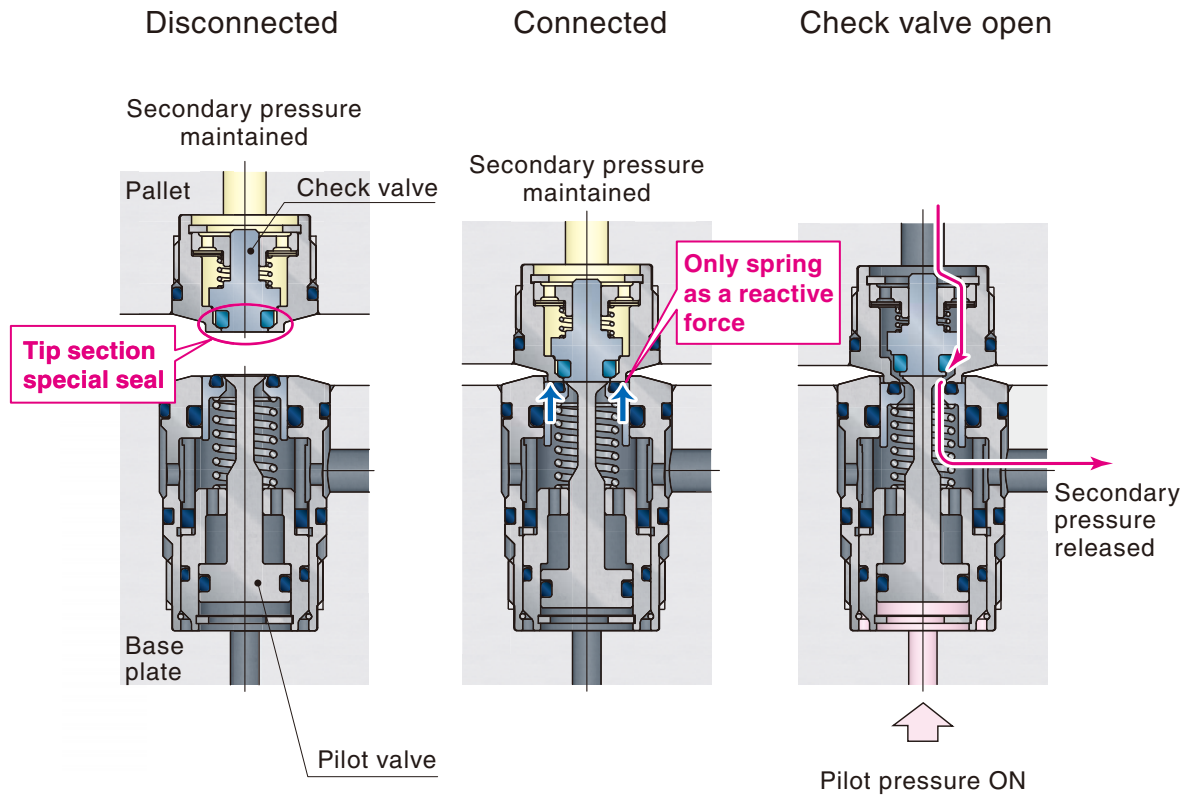
model
WVP-2E

Adopting pilot check mechanism enables the reactive force when connecting lower and the even lightweight jig pallets under hydraulic pressure can be replaced without pull-down structure.

Pilot coupler
Plug
model
WVP-2EPL

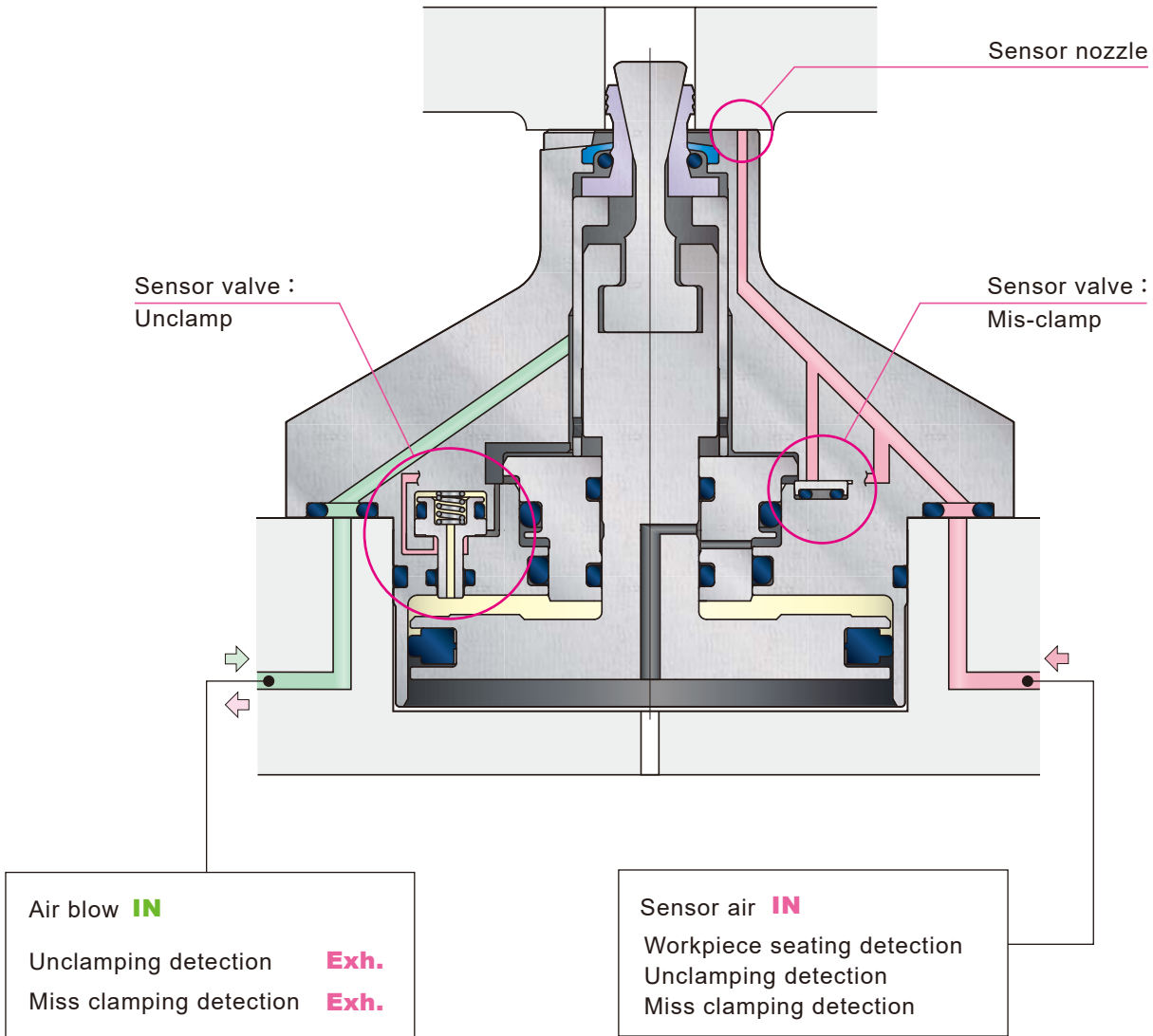


Pilot coupler
Socket
model
WVP-2ESL



Air expansion clamp

model
CGE PAT.

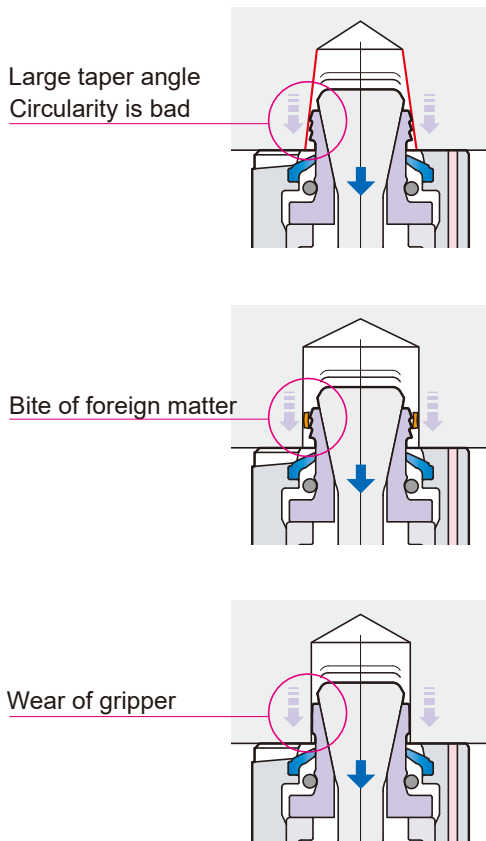


Expansion clamp

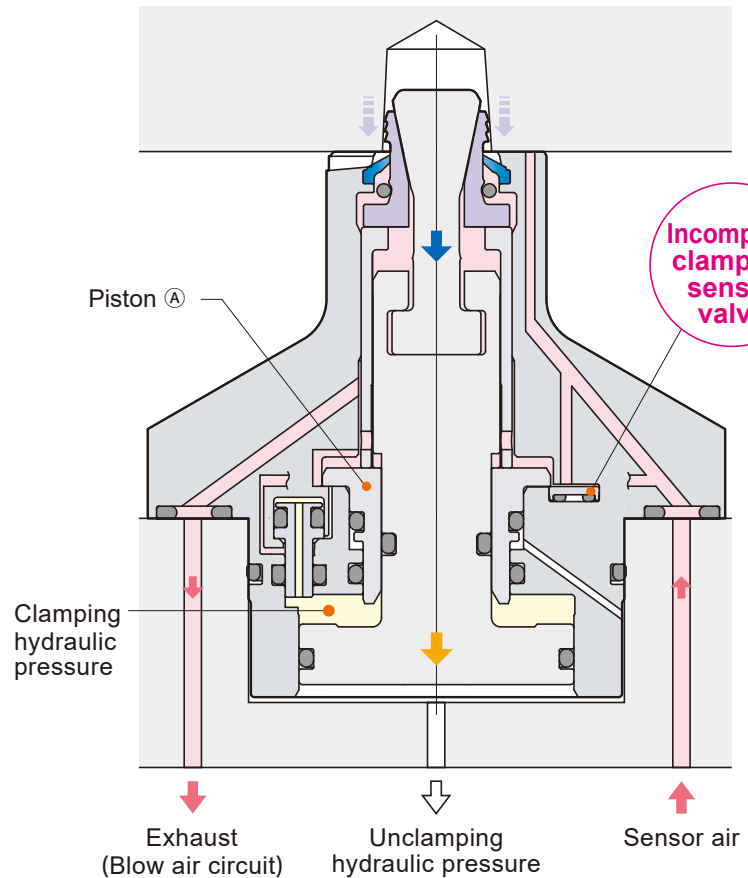
PAT.

Reliable slipping of gripper detection

Factors of Slipping of gripper



You can monitor incomplete clamping that happens even at invisible place. Mis-clamp detection is necessary.

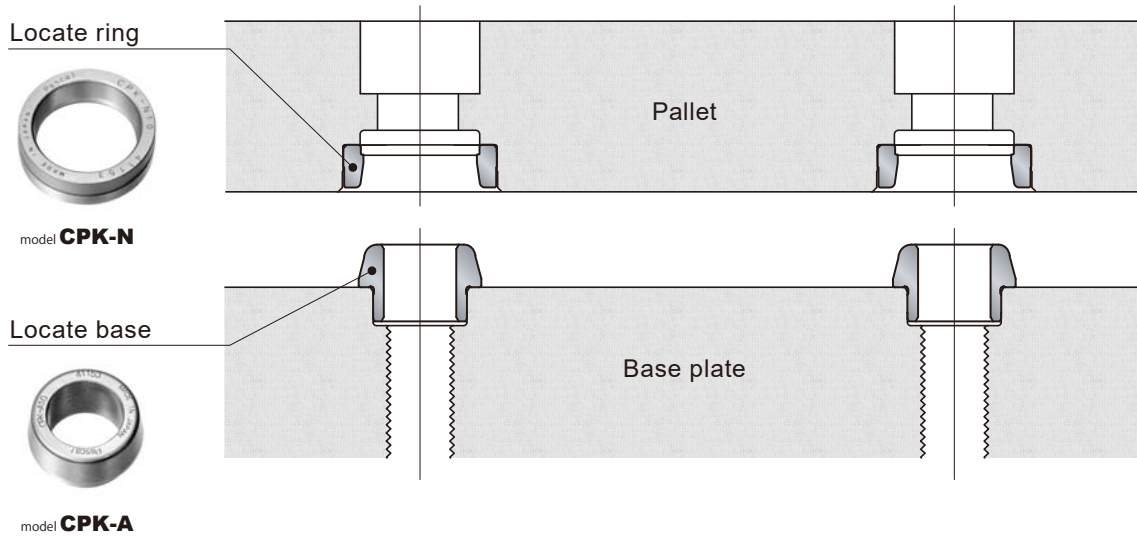


Pal fix

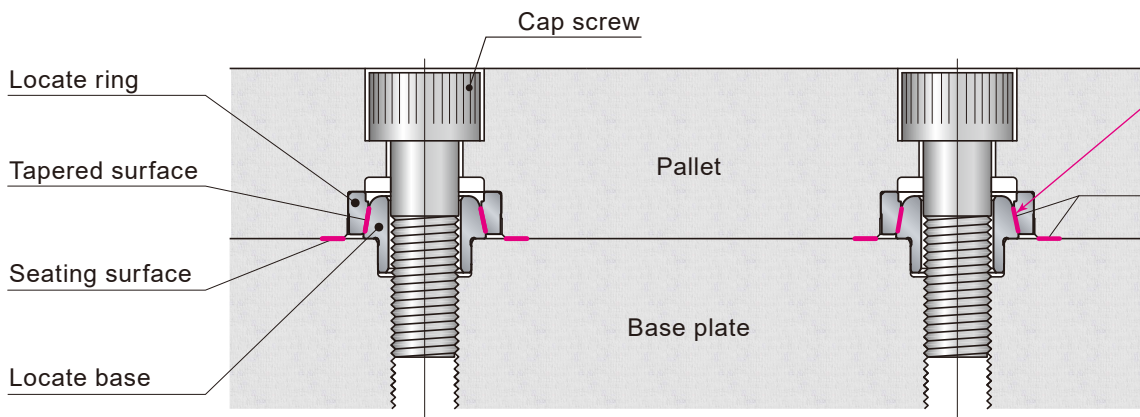
model
CPK PAT.

Super compact positioning device to get the most out of the jig space

Pallet changed



Pallet clamped

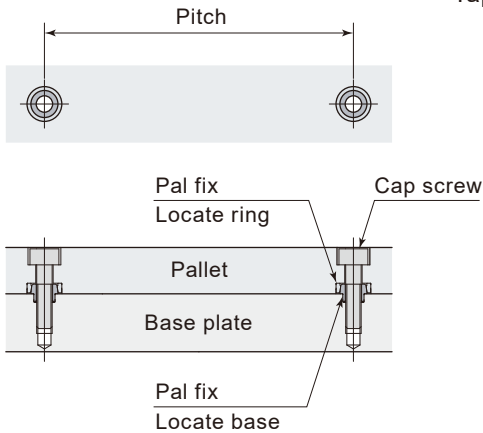


Repeatability
3 μm

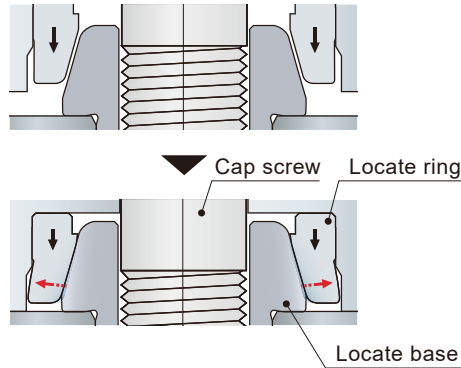
Dual-surface
holding

Comparison with Positioning pin

Pal fix



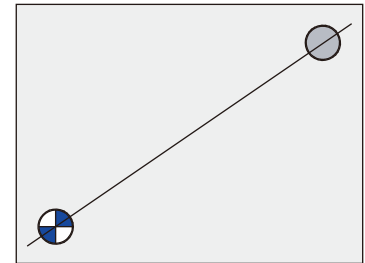
Taper cone makes attaching / detaching easy



By means of elastic deformation

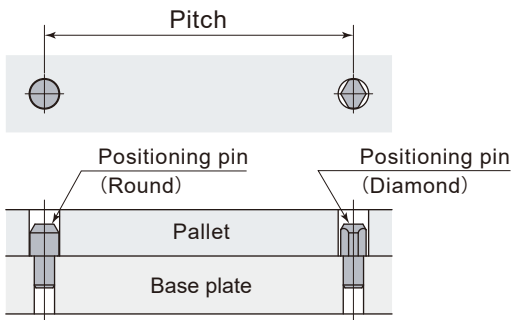
(Positioning repeatability : **Within 3 μ m**)
Pitch tolerance allowance : **± 0.02 mm**)

Round and Round



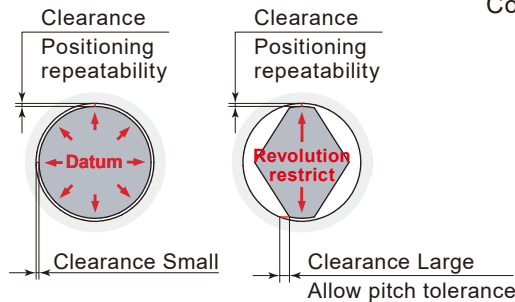
Pal fix only keeps pitch accuracy.

Positioning pin

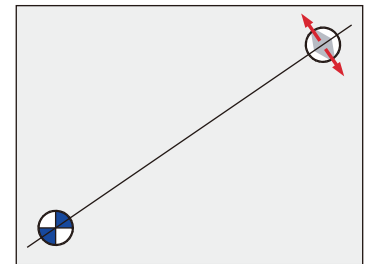


Round

Diamond



Combination of round and diamond pin



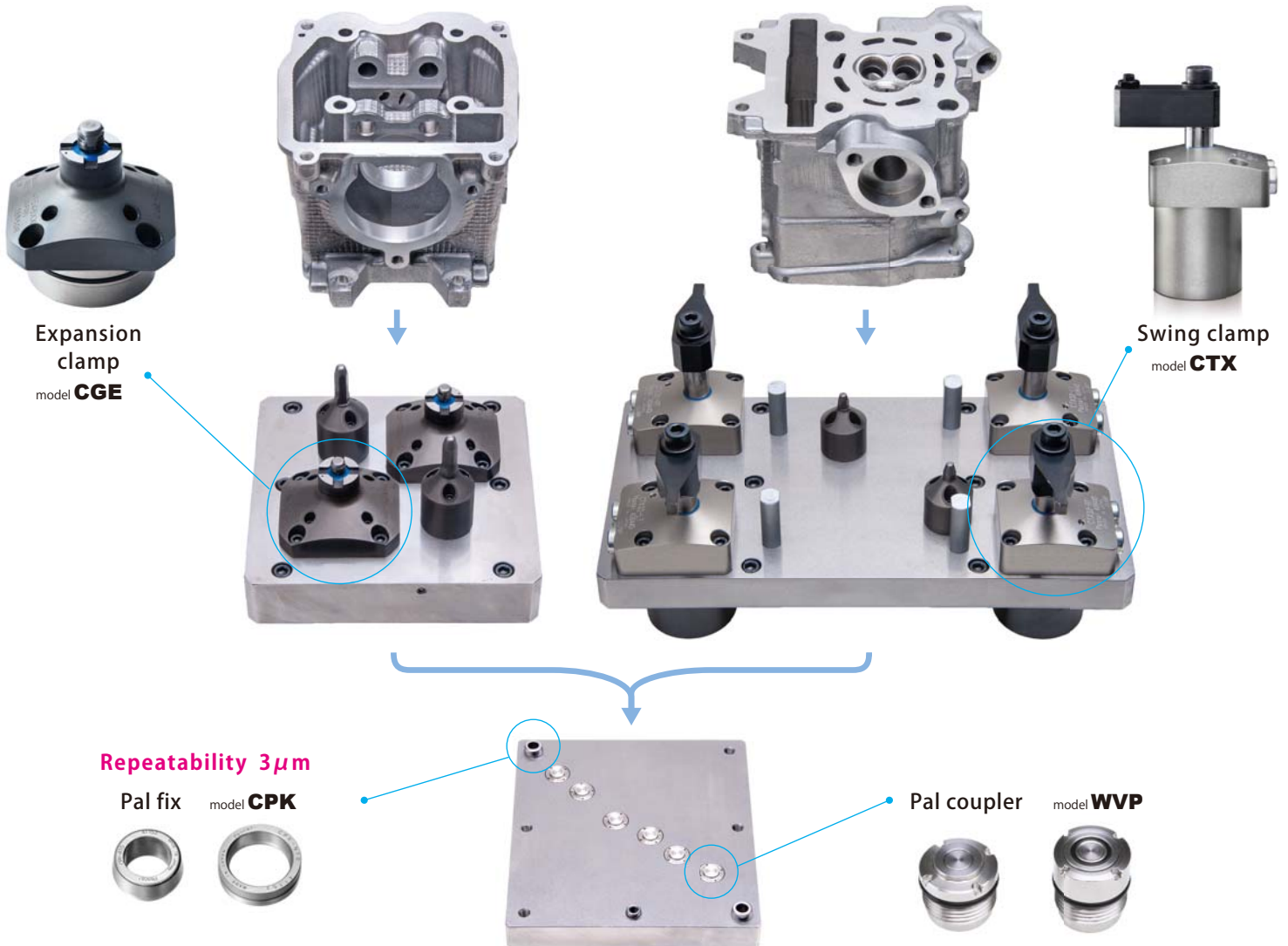
Positioning can be achieved by combination of round and diamond pin to accommodate pitch tolerance.

The positioning repeatability spoils when providing a large clearance.
A small clearance impairs the operability.

The diamond pin must be mounted perpendicularly toward round pin in addition to keeping the pitch accuracy between the two.

Quick jig change system

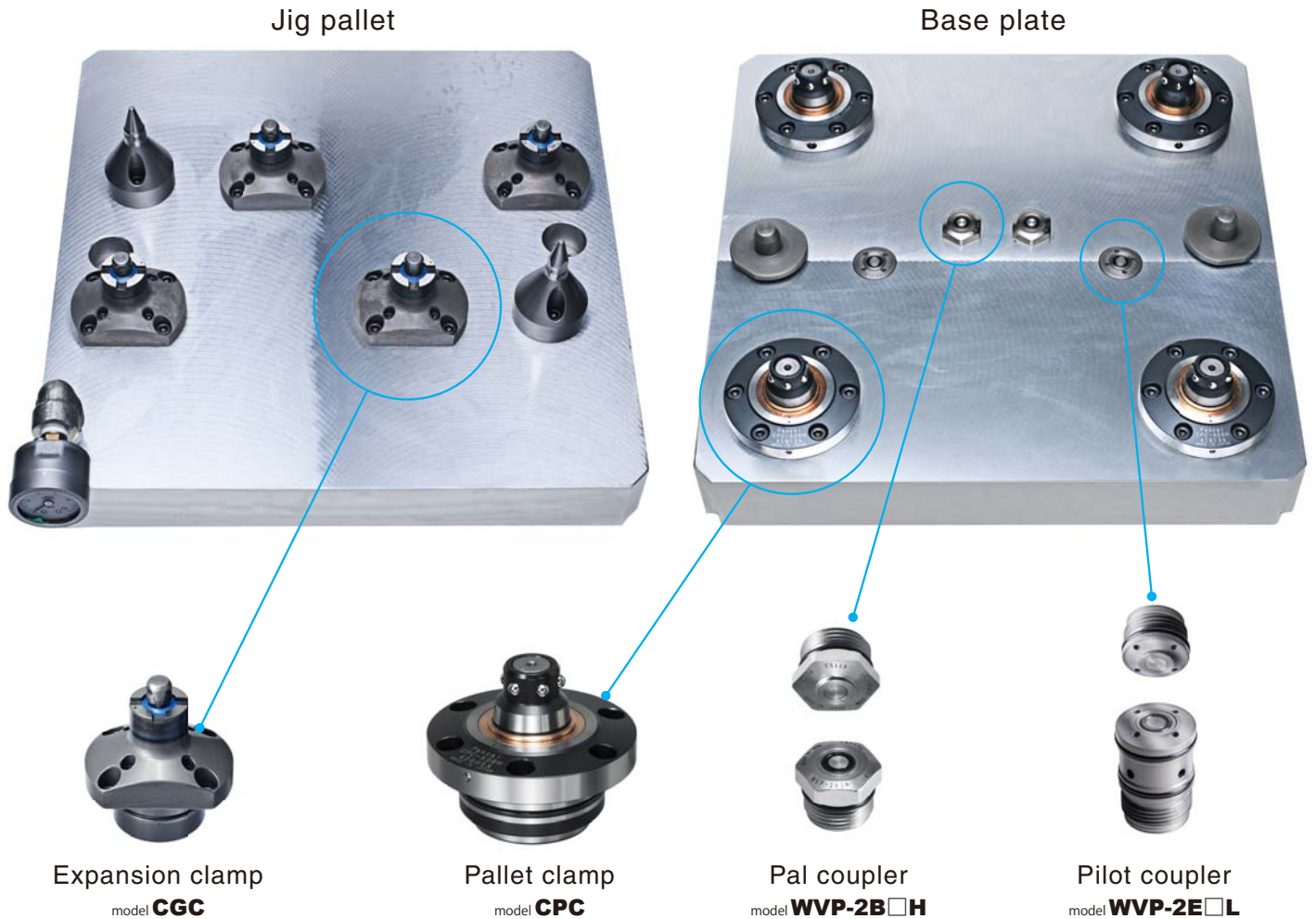
High accuracy positioning of plate can be performed easily and jig can be replaced for short time.



Quick jig change system

The pallet can be locked securely with pallet clamp and the pressure can be maintained by pilot coupler.

It is best suited for pallet change while clamping the work piece.



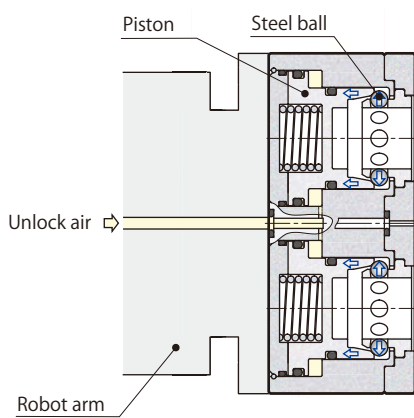
air Pallet gripper

model
RPG PAT. P.

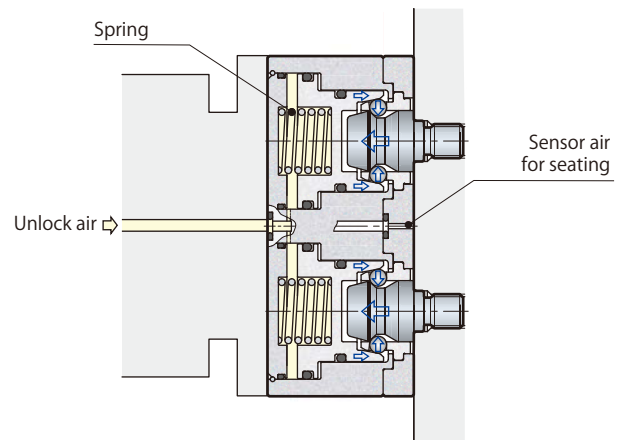
Locks a pallet firmly by 2 grippers



Unlock



Lock



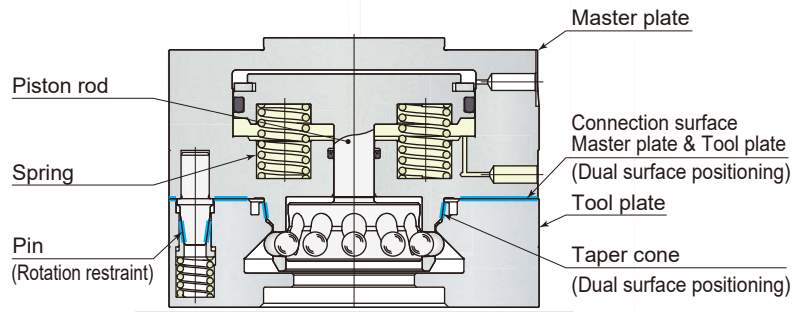
air Robot tool changer

model
RHA

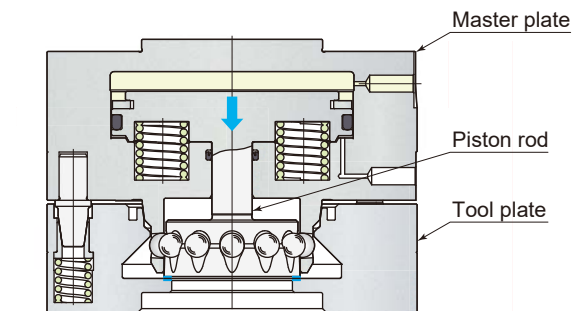
The tool plate is securely held in close contact by means of the dual surface positioning (taper cone and connection surface) and the rotation restraint by the pin.



The tool plate is held by the spring force even if air supply is stopped.



The tool plate can be securely detached by the piston rod.

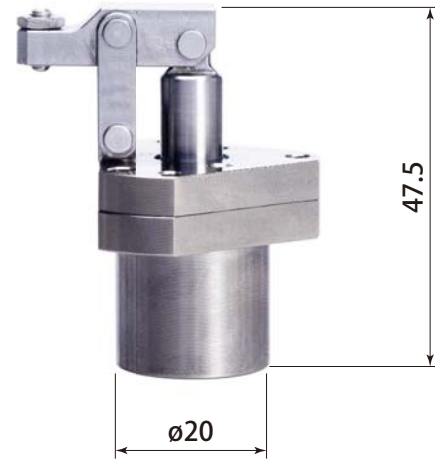


Air swing clamp mini & Air link clamp mini

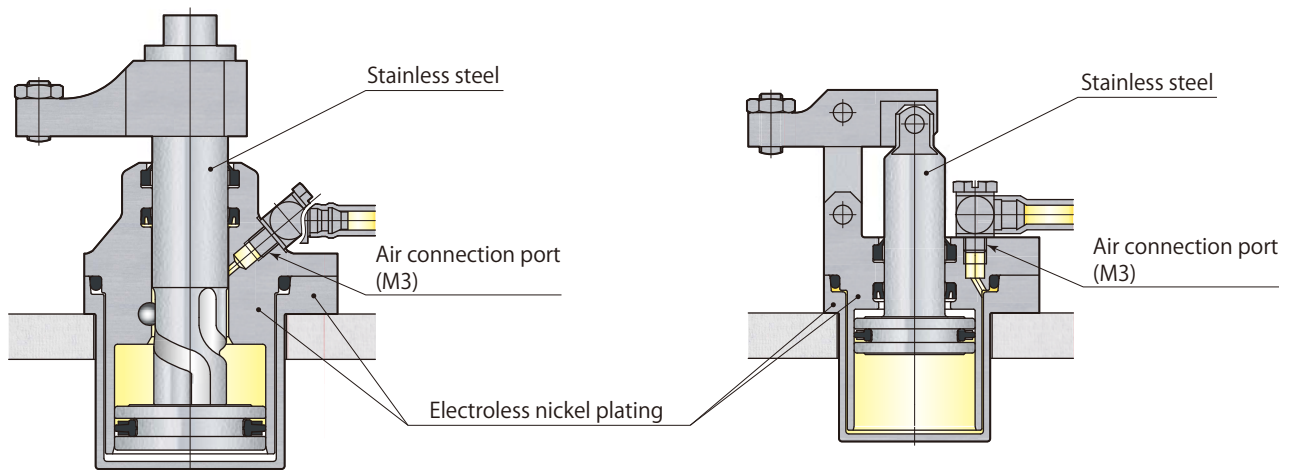
model
RTC PAT. P.



model
RLC PAT. P.



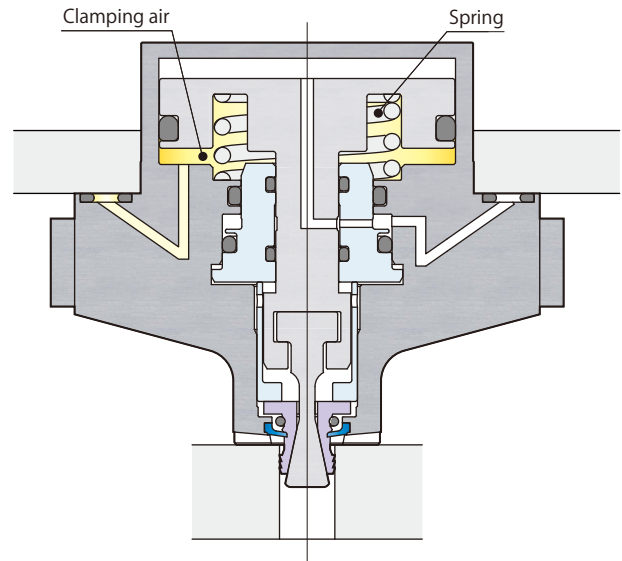
Full-scale photo



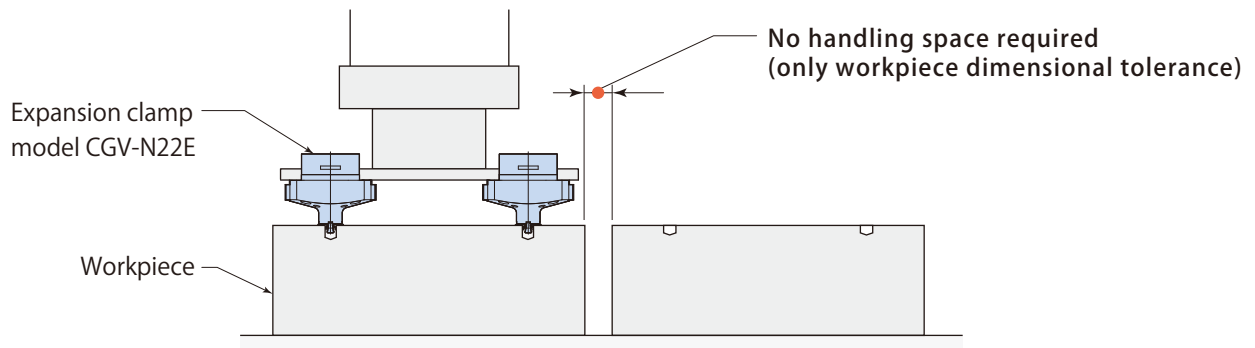
Air expansion clamp

model
CGV PAT.

Lightweight and compact transport device



Even if the air stops,
the spring force prevents the workpiece from falling.



Work positioning cylinder

model
CEK PAT.

The workpiece can be set up with high accuracy.

Work positioning cylinder

X&Y axes positioning

model **CEK-A**

Repeatability $5\ \mu\text{m}$

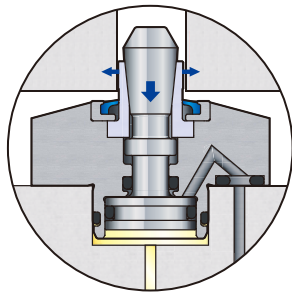


Work positioning cylinder

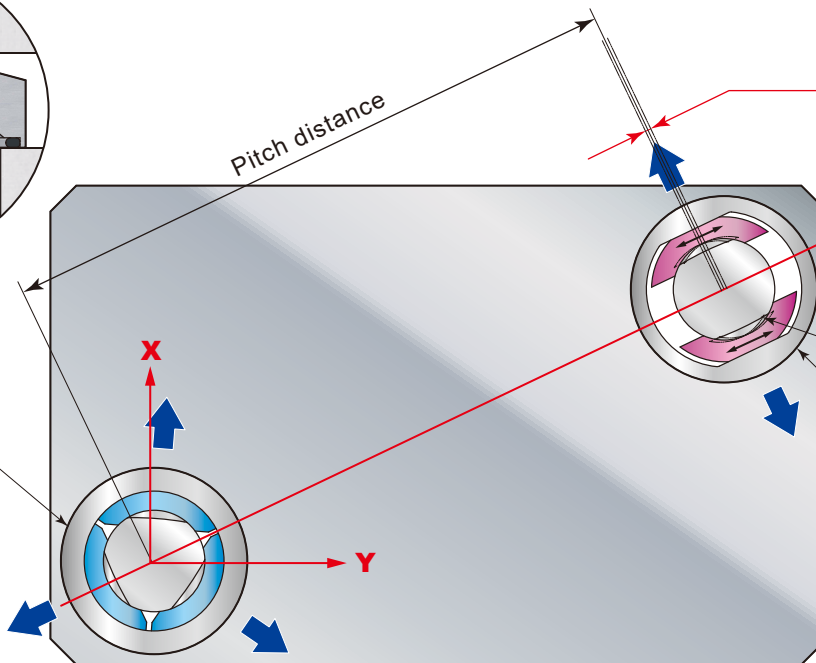
θ axis positioning

model **CEK-B**

Repeatability $5\ \mu\text{m}$



model **CEK-A**



Allowable distance error
: $\pm 0.1\text{mm}$

Gripper tolerates the distance error sliding in the direction of a red arrow.

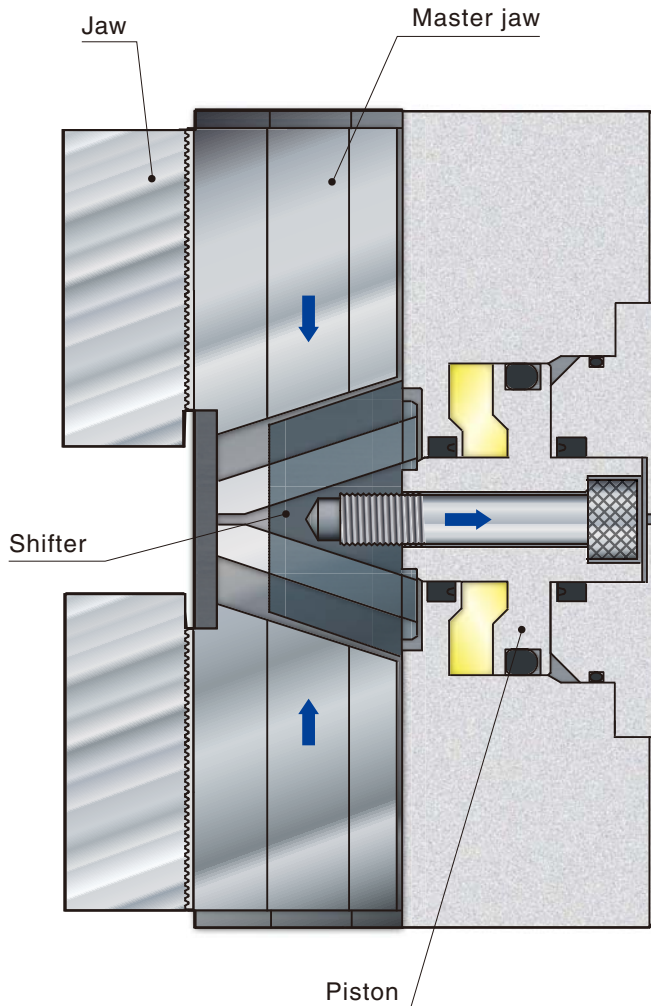
Gripper

model **CEK-B**

Centering vise

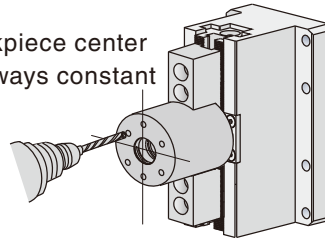
model
CVH

Ideal for milling after lathe turning

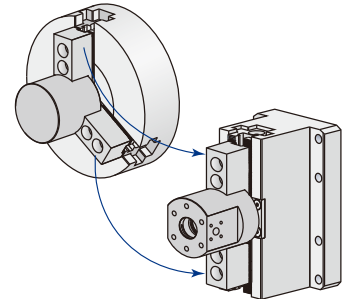


For centering clamp

Workpiece center
is always constant

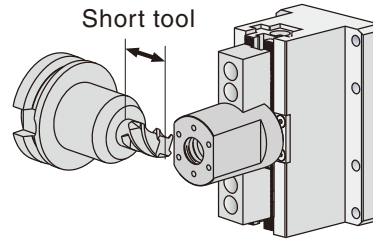


**Common use of jaws
is available.**

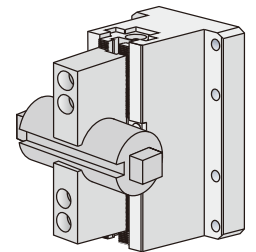


Improve tool accessibility.

Short tool



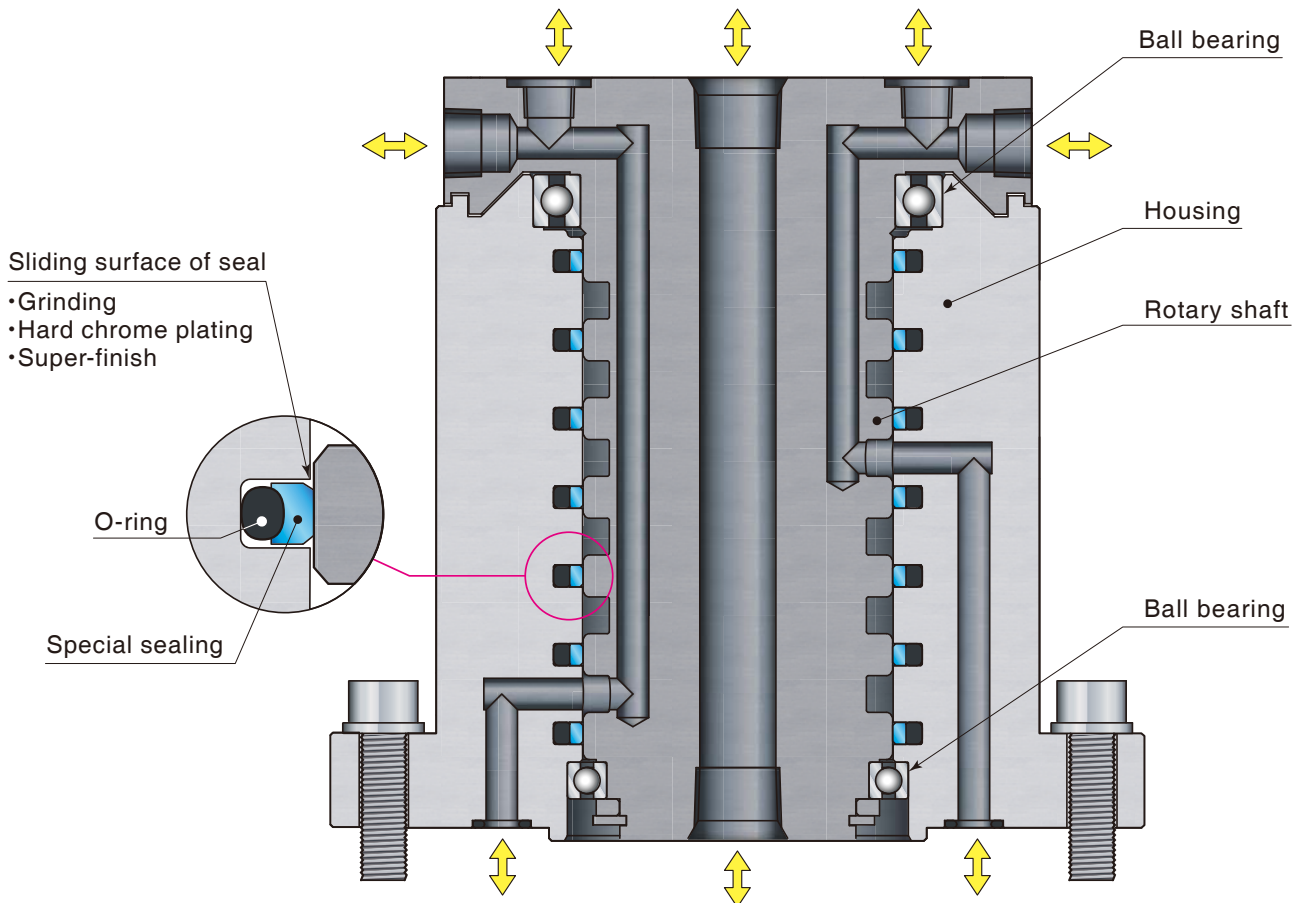
**Clamping example
(round bar)**



Rotary joint

model
WRB

2 million rotations with excellent durability 2, 4, 6, 8 ports



90° index table

model
MDX

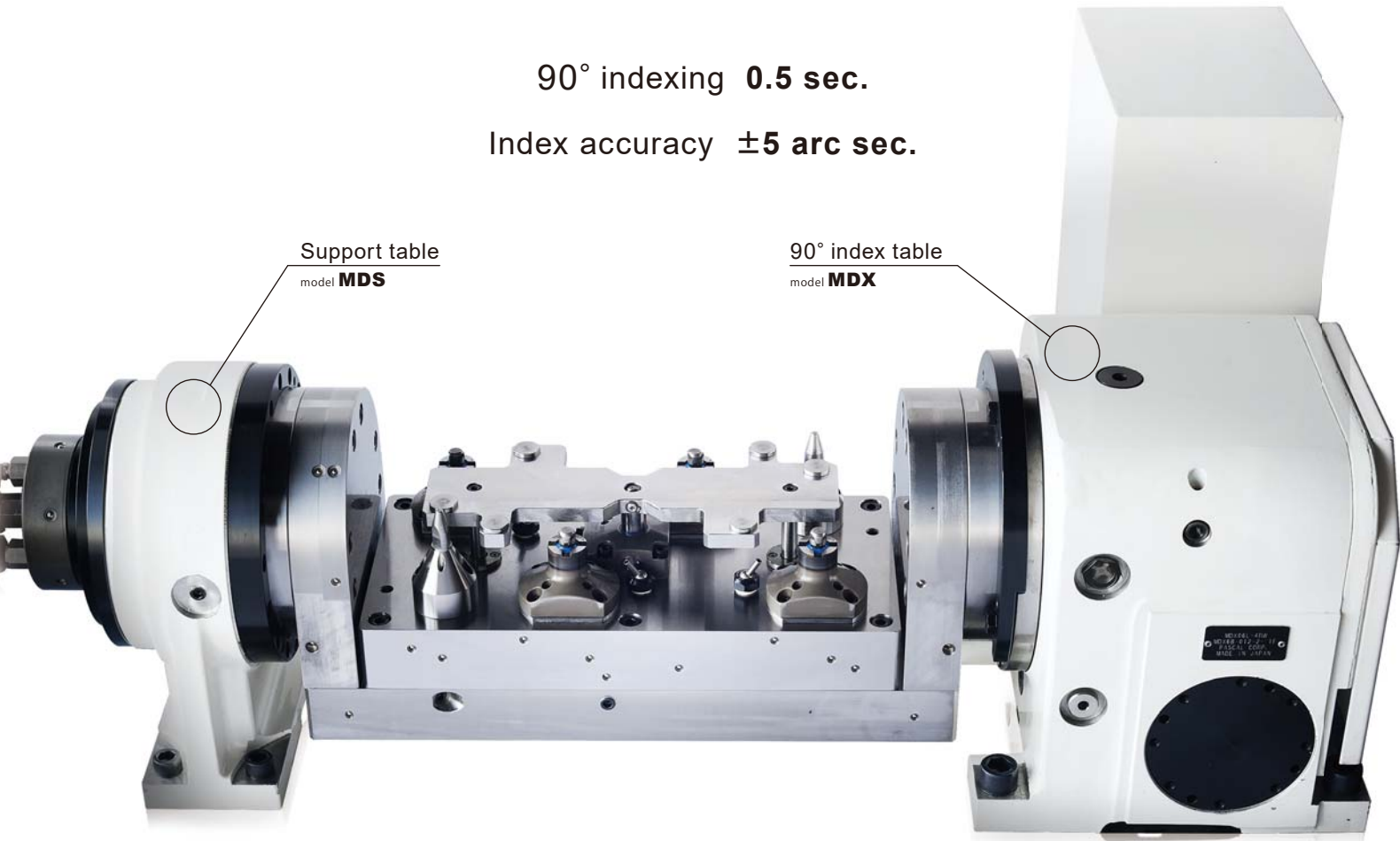
10 years without maintenance

90° indexing **0.5 sec.**

Index accuracy **±5 arc sec.**

Support table
model **MDS**

90° index table
model **MDX**



Roller gear cam drive & Hirth coupling ^{model} MDX

Quick, Accurate, Durable

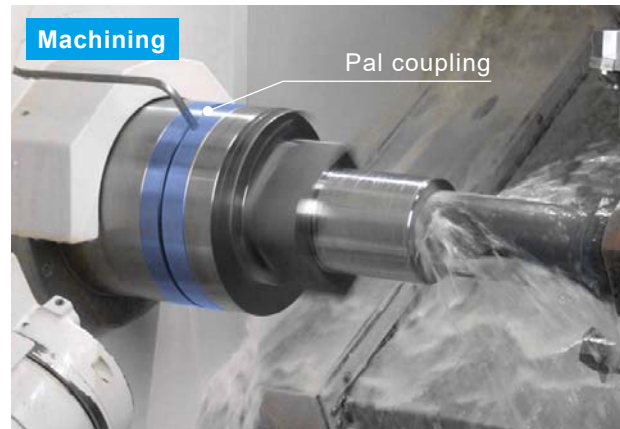


Pal coupling

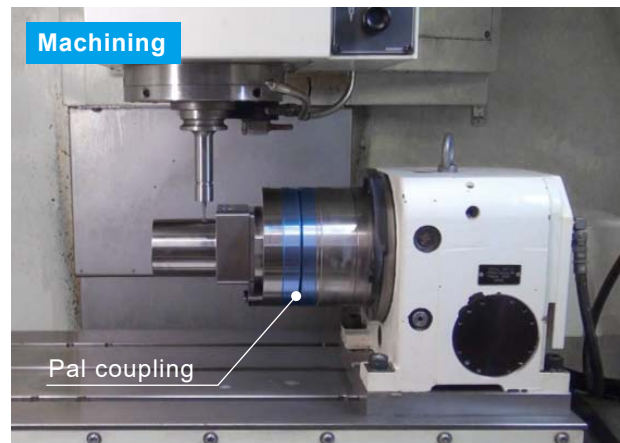
model
CPM PAT.

For combined machining of small and medium-sized parts

Process 1 Lathe machining



Process 2 Machining 4-side of workpiece with 90° index table.

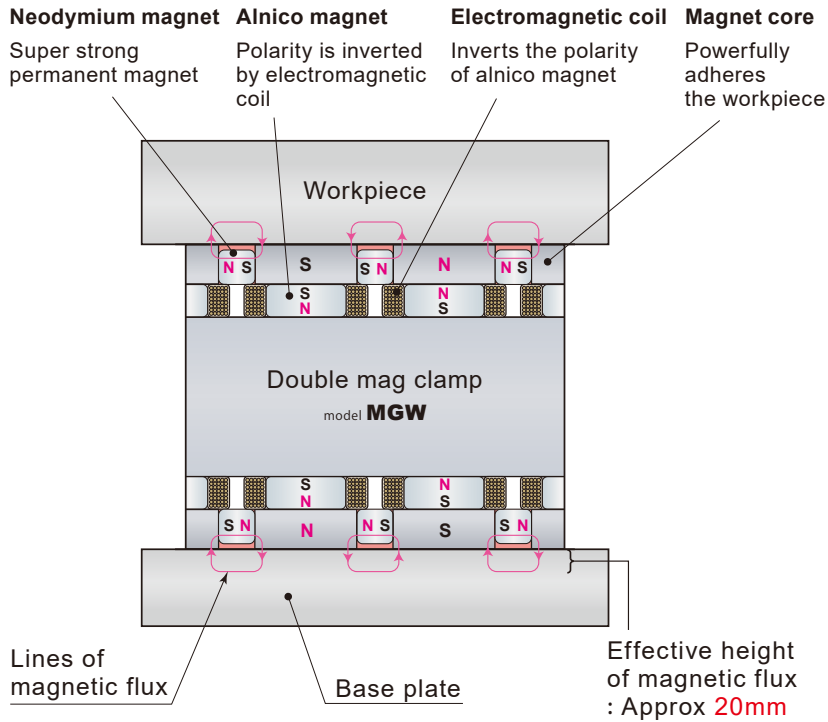


Double mag clamp

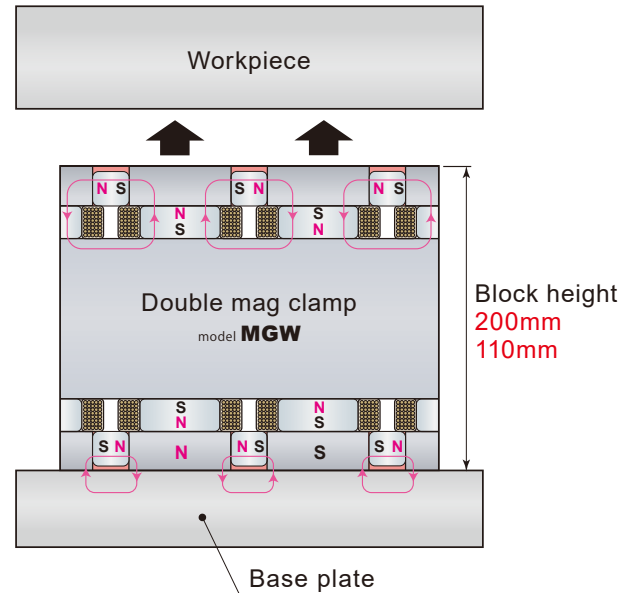
model
MGW

For machining the side face, drilling a through-hole of large-sized workpiece

Clamp (Magnetized)



Unclamp (Demagnetized)



- ① Electromagnetic coil is energized for 0.5 sec.
- ② Polarity of alnico magnet is inverted.
- ③ Neodymium magnet and alnico magnet become homopolar.
- ④ Magnet core becomes a strong magnet to clamp the work.

- ① Electromagnetic coil is energized for 0.5 sec.
- ② Polarity of alnico magnet is inverted.
- ③ Magnetic flux of neodymium magnet and alnico magnet is not emitted from the surface of the magnet core so that the work can be unclamped.

Mini N2 gas springs

model
DSD

High initial force and excellent durability



Pascal DSD38-38 Cylinder diameter ø38mm Stroke 38mm

Outer diameter ø38mm Initial force 1ton

Model		DSD32	DSD38	DSD50
Cylinder diameter	mm	ø32	ø38	ø50
Initial force	kN	6.6	10.3	20.2
Stroke	mm	10 15 20 25 32 38 45 50 56 63 80		

- The initial force is at 21MPa(20°C) for gas charging pressure.
- The initial force is approx.1.25 times larger than the model DSA.

Robot N2 gas balancer

model
DNA

Realization of considerably lightweight and compact robot

Robot
**Weight
reduction
&
High speed**

Robot
Downsizing

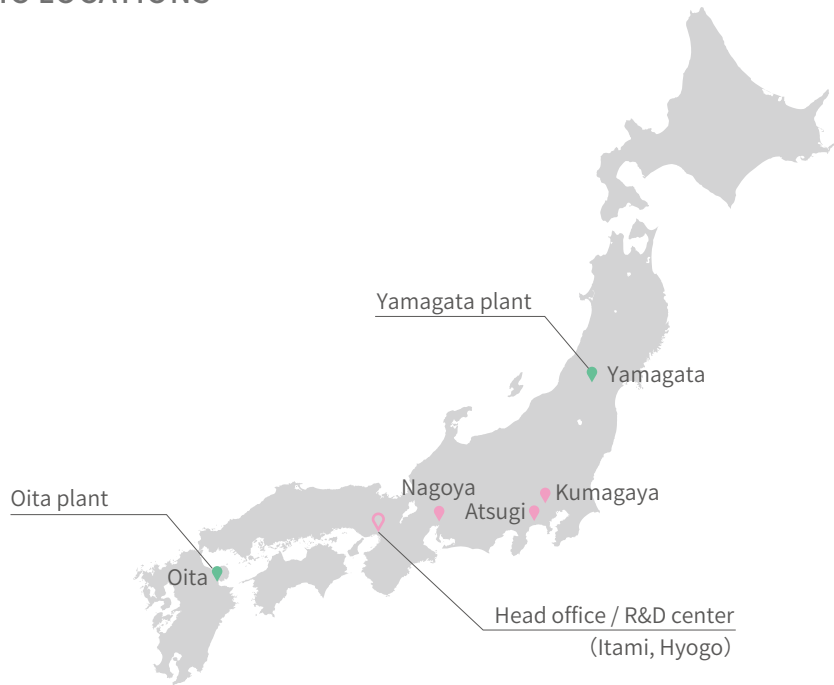


Robot N2 gas balancer

Model		DNA3000-200
Max. charging pressure	bar	150
Operating temperature	°C	0–70
Compression ratio		1.62
Mass	kg	12.6

The introduction of Gas balancer allows the downsize the robot and design a free stroke length and capacity. The gas balancer with low spring constant reduces the burden on machine.

DOMESTIC LOCATIONS



Head office / R&D center

14-7, Konoike 2-chome, Itami,
Hyogo, 664-8502, Japan

Oita plant

200 Akimachi-Shimobaru,
Kunisaki, Oita, 873-0231, Japan

Yamagata plant

5800-5 Higashine-kou, Higashine,
Yamagata, 999-3701, Japan

Osaka

14-7, Konoike 2-chome, Itami,
Hyogo, 664-8502, Japan

Kumagaya

3-446-1 Kagoharaminami, Kumagaya,
Saitama, 360-0015, Japan

Atsugi

1-21-14 Asahi-machi, Atsugi,
Kanagawa, 243-0014, Japan

Nagoya

307 Ihori, Nagakute,
Aichi, 480-1143, Japan

Yamagata

5800-5 Higashine-kou, Higashine,
Yamagata, 999-3701, Japan



Head office / R&D center



Oita plant



Yamagata plant

GLOBAL NETWORK

EUROPE

Stuttgart | Germany

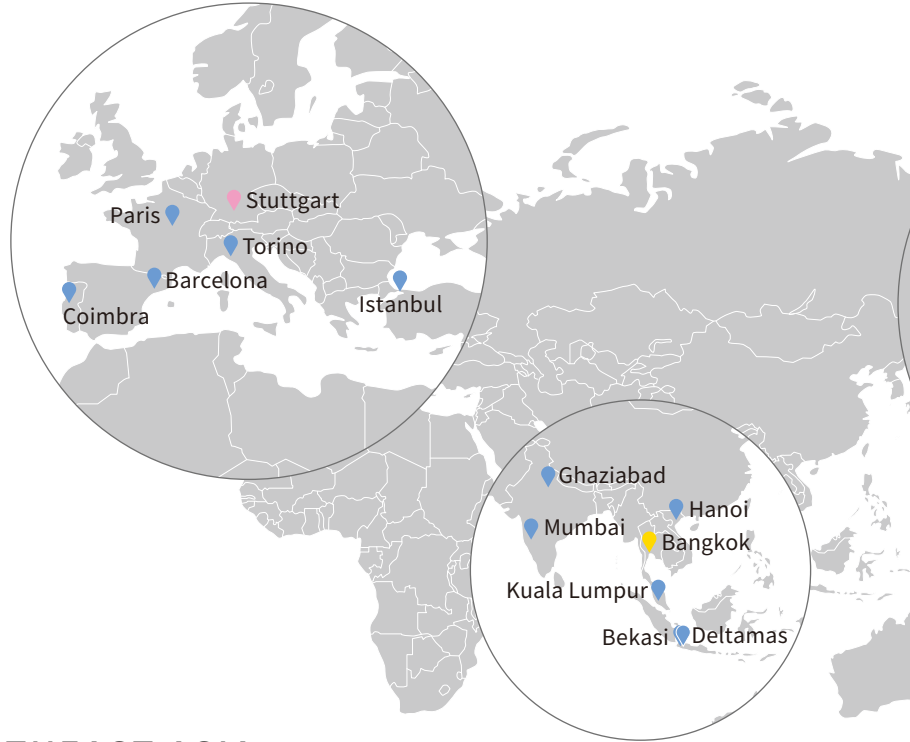
Paris | France
Supratec Enomax

Coimbra | Portugal
Sirmaf

Torino | Italy
AG TECHNIK S.r.l.

Barcelona | Spain
Daunert Maquinas-Herramientas, S.A.

Istanbul | Turkey
UZ-TEK Metal Danışmanlık Makina
San. ve Tic. Ltd. Şti.



SOUTHEAST ASIA

Bangkok | Thailand
OKAYA(THAILAND)Co.,Ltd.

Kuala Lumpur | Malaysia
DAB TECHNOLOGY Sdn.Bhd (Malaysia)
OKAYA INTERNATIONAL (MALAYSIA) SDN. BHD

Deltamas | Indonesia
PT. OKAYA INDONESIA Deltamas Office

Hanoi | Vietnam
VINA OKAYA INTERNATIONAL CO., LTD.
HASON TECHNOLOGY AND TRADING CO., LTD.

Mumbai | India
Gemini Power Hydraulics Pvt. Ltd.

Ghaziabad | India
XLAR Enterprises

Melbourne | Australia
Corridor Connections P/L.



EAST ASIA

〈 China 〉

Dalian
 Shanghai
 Changchun
 Wuhan
 Tianjin
 Chongqing
 Guangzhou

Taichung | Taiwan
 Kaohsiung | Taiwan
 Modesty Enterprise Co.,Ltd.
 Changwon | Korea

AMERICA

Chicago | U.S.A.

Lexington | U.S.A.
 Honeston America Corp.

Toronto | Canada
 Hydra-Fab Fluid Power Inc.

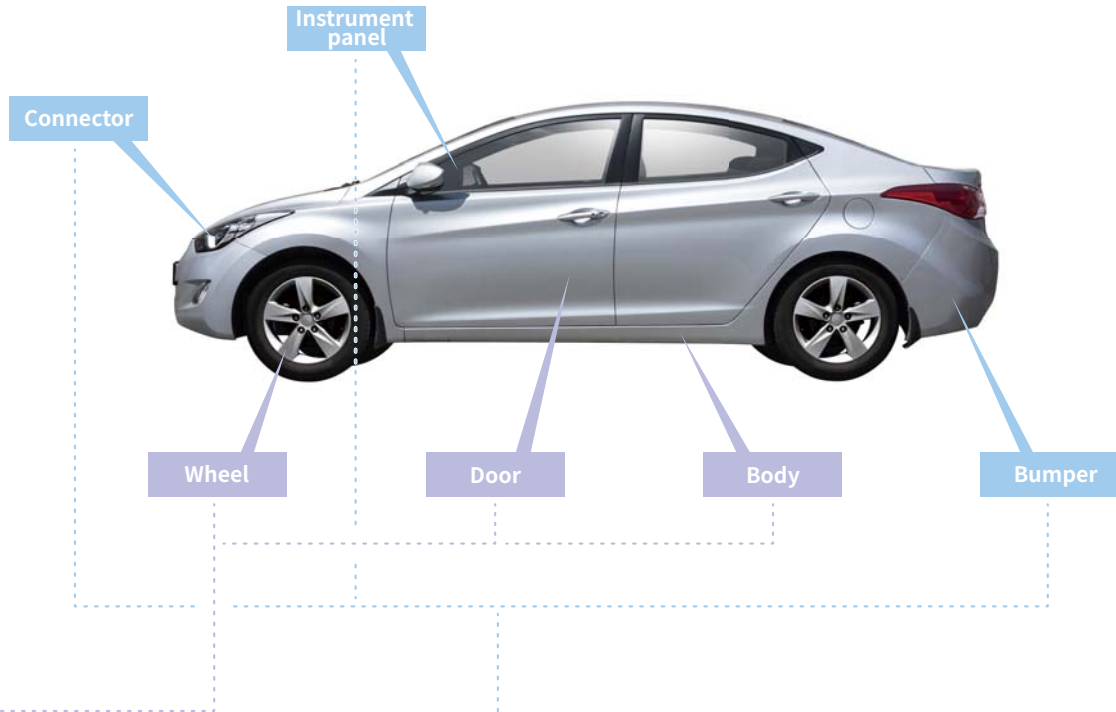
León | Mexico
 OKAYA MEXICO, S.A. DE C.V.

Queretaro | Mexico
 Hummingbird Colibri Corp.

Sao Paulo | Brazil
 DAIICHI JITSUGYO do BRASIL
 Comercio de Maquinas Ltda.

- ◆ Sales office
- ◆ Liaison office
- ◆ Plant
- ◆ Agent

Pascal products are supporting automotive production lines in the world.



For sheetmetal stamping

For plastic molding



Traveling clamp



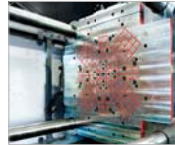
Die clamping system



Die changer



Slide lock



Magnetic clamp



Mold die changer



Hydraulic / Air clamp



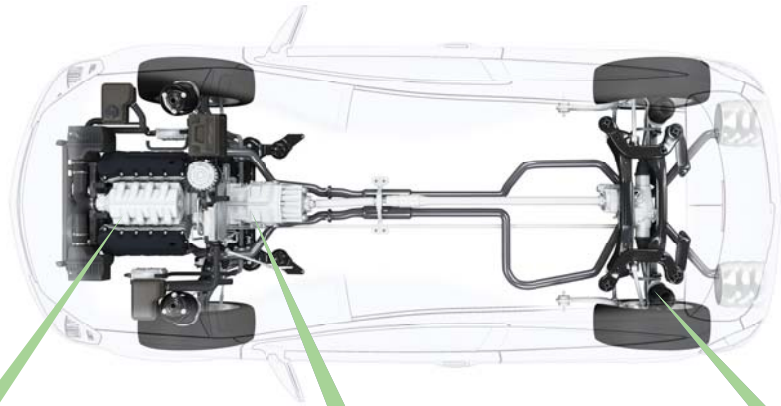
Auto coupling



Die



Mold



Engine

Transmission

Axle

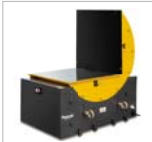
For die and mold

For die cast machine

For metal cutting machine line



N2 Gas springs



Rotator



Die clamp



C-plate
Mag clamp



Expansion
clamp



Work
clamp



Index
table



Pallet
clamp



N2 Gas
balancer

Pascal



CERTIFICATE OF APPROVAL ISO9001