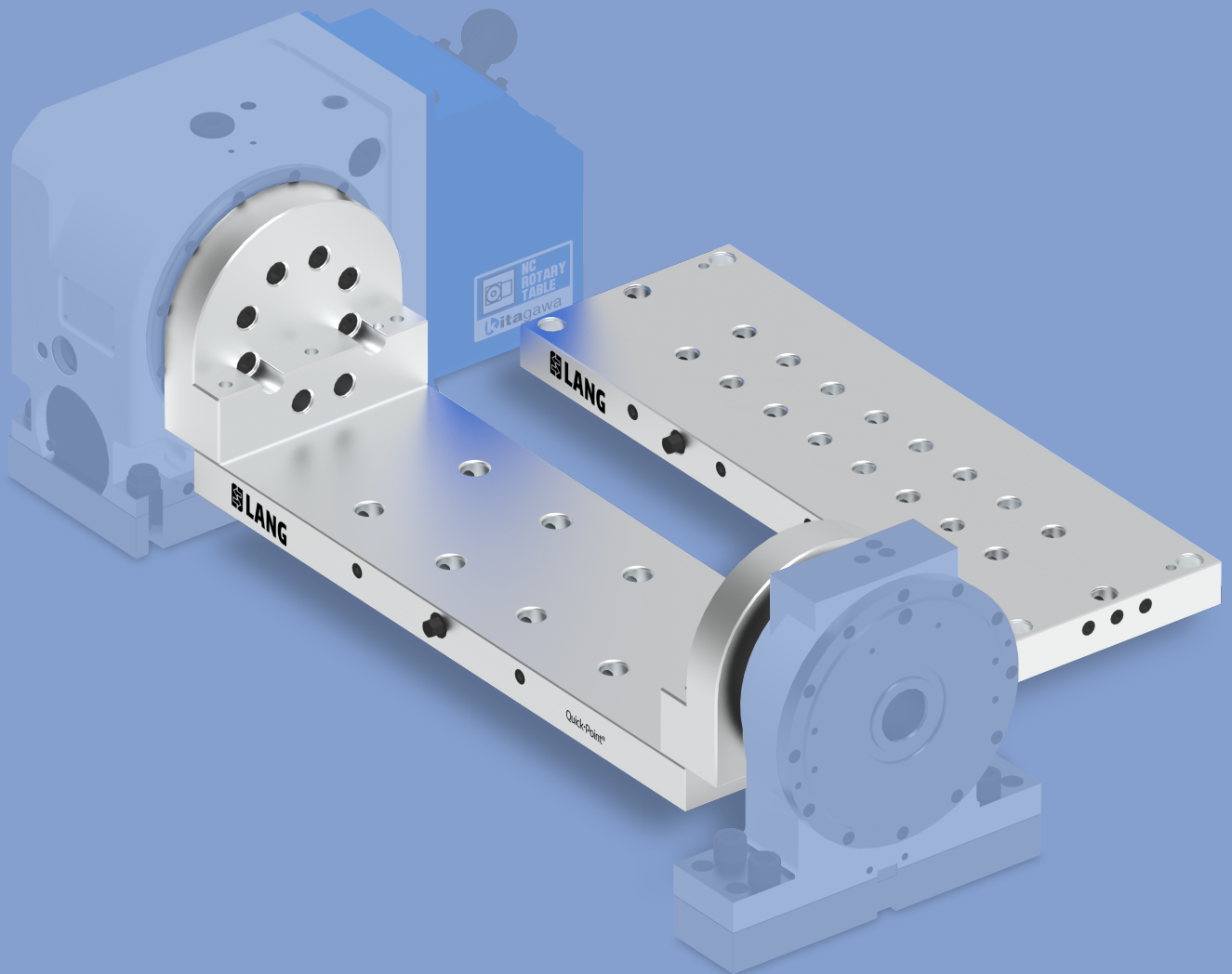


**CLAMPING
BRIDGE**

NC ROTARY TABLE CLAMPING BRIDGE PRODUCTION SYSTEM

kitagawa

ARG
APPLICATION RESEARCH GROUP



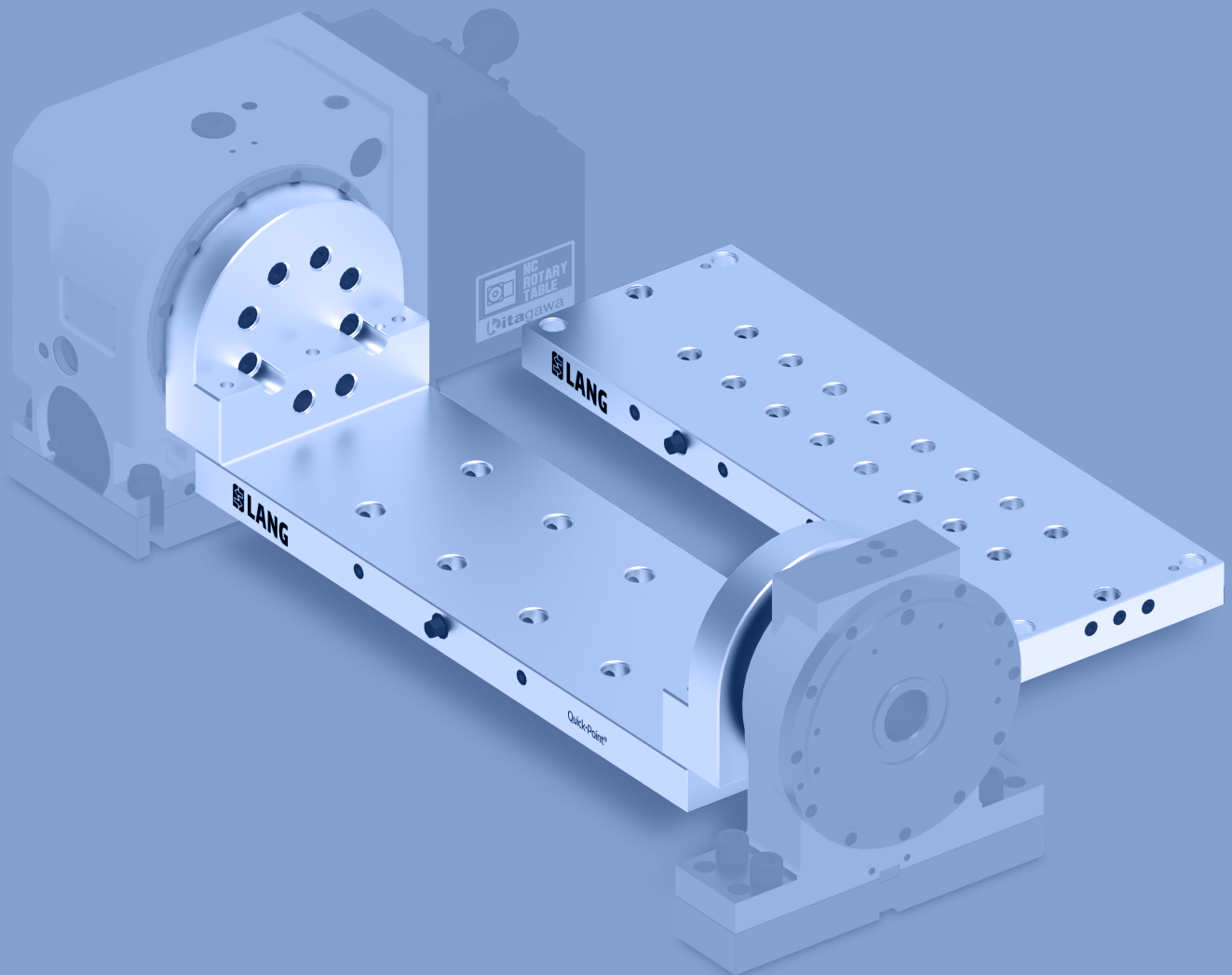
CB PRODUCTION SYSTEM

- Built-in 52mm or 96mm Quick-Point®
- Maximise your machine envelope
- Off-Centre & On-Centre types
- Cost effective

Manufactured by

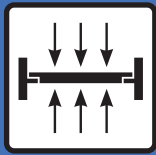


CB PRODUCTION SYSTEM



Exclusively designed trunnion system for mass production

Utilising KITAGAWA's extensive rotary table range and LANG Technik's zero-point systems the CB Production system combines excellence with performance, delivering an extremely flexible workholding platform.



**CLAMPING
BRIDGE**

CB Production System

Clamping trunnion

Typical component parts of a CB production system

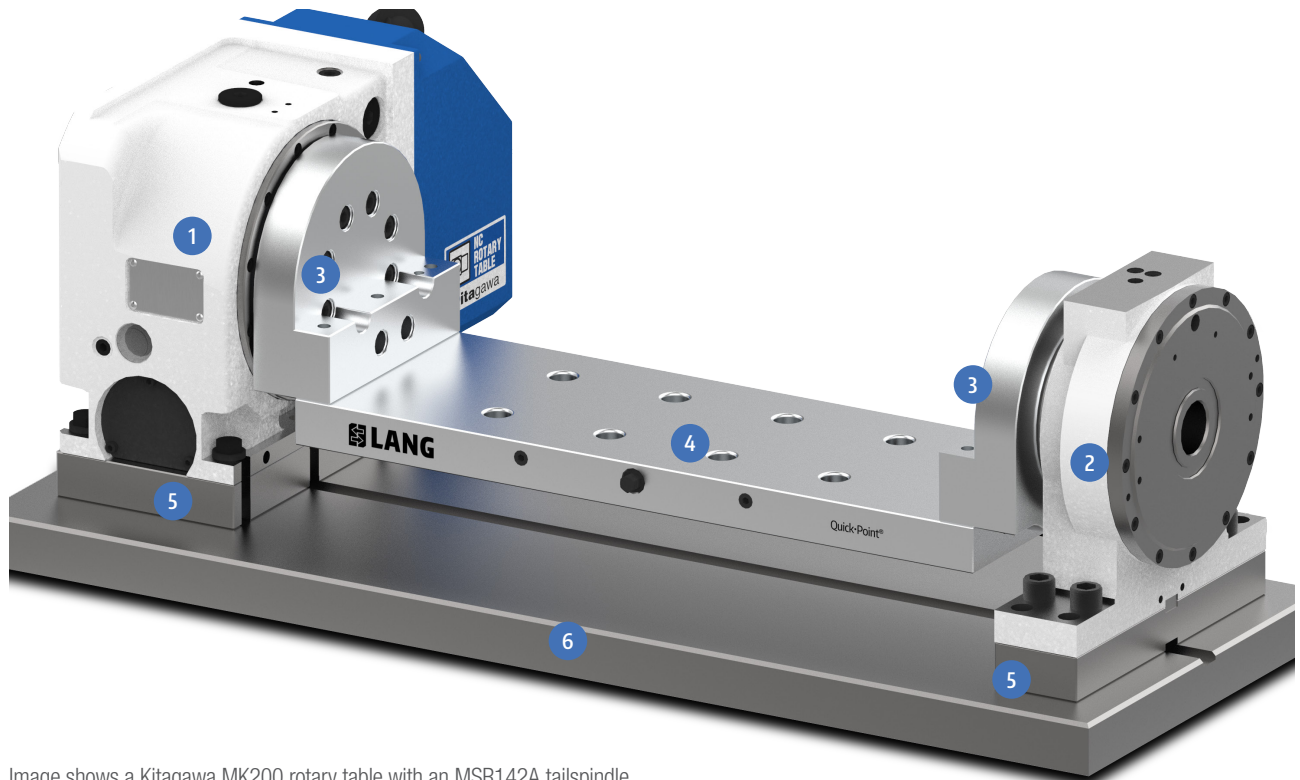


Image shows a Kitagawa MK200 rotary table with an MSR142A tailspindle with a CB-F96-580 Clamping bridge assembly. Part No: MK200.CB-F96.001A.

- 1 Kitagawa Rotary table
- 2 Kitagawa Tail Spindle
- 3 Precision ground adaptors (manufactured by LANG Technik)
- 4 Clamping Bridge (manufactured by LANG Technik)
- 5 Riser Plates
- 6 Sub-Plate

Quick•Point®

High precision manual zero-point technology

Built-in Quick•point® zero-point systems

In order to maximise your machining envelope and to reduce your setup time the CB production systems all have multiple built-in Quick•point® either on 52mm grid or 96mm grid systems manufactured by LANG Technik in Germany.

Robust, wear-free mechanism for highest longevity

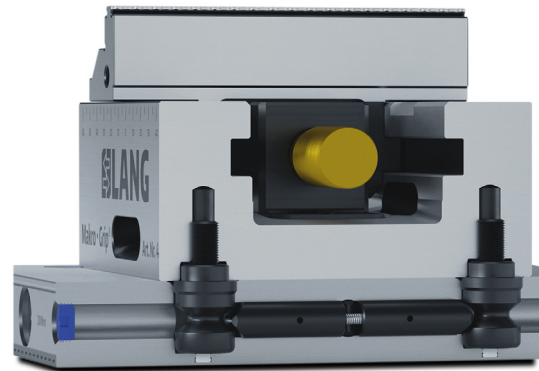
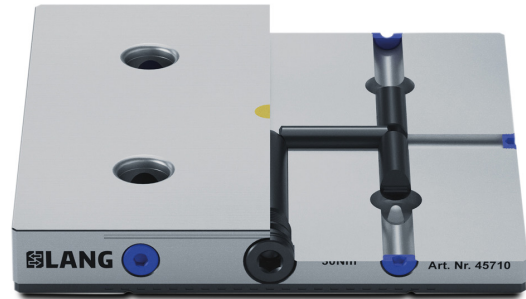
A purely mechanical zero-point system. A patented rod system inside the plate guarantees a repeatability of less than 0.005 mm. Quick•point® trunnion beds are actuated by one or two screws to ensure simple and easy operation. Due to a very small number of wear-free parts the system is reliable and virtually maintenance free.

Holding force of up to 6,000 kg

The mechanical clamping concept is very simple. The picture to the right shows a cross-section of the Quick•point® bore where the clamping studs are pulled down by lateral clamping rods. With an actuation torque of only 30 Nm a holding force of up to 1.500 kg per clamping stud is achieved. As an example, this results in a holding force of 6.000 kg when clamping four clamping studs. If more clamping studs are used (e.g. using your own or bigger fixtures), the holding force is increased accordingly.

Flexibility has no limits!

The modularity of the system allows for the expansion of existing Quick•point® fixtures at any time and guarantees fast changeovers with the highest precision.



Advantages of having built in Zero-point plate in a trunnion

Cost effective

Due to the nature of many trunnion bed applications being customised specifically to suit a customer the addition of a zero-point system being built-in to the CB clamping trunnion bed has not increased the overall cost of the entire system therefore saving you from ordering a trunnion bed AND a dedicated zero-point system.

Maximise your machine envelope

CB clamping trunnions with a built-in zero-point system means you have saved at least 27-56mm of the machining envelope in the Z-axis enabling you to have larger workpieces within a smaller area. The LANG Quick•point® is one of the lowest zero-point systems on the market but many other zero-point systems are far taller, especially if pneumatic.

Lightweight

Simply due to the built-in nature of the zero-point system there is an immediate reduction in weight of the entire assembly which reduces loading on your machining centre. This reduction in weight lowers the moment of inertia of the entire system therefore allowing you to have heavier work pieces for machining.

Interchangeable

Not only can different work holding options be changed out within a rapid timeframe with the Quick•point® zero-point systems. The entire trunnion bed can be removed and replaced with a different format of Quick•point® system or with a simple dedicated blank trunnion, making this the most versatile trunnion system on the market.

Manual Zero-point advantages

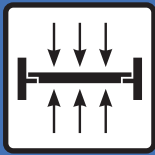
The manual nature of the Quick•point® zero-point exchange system assists in keeping your total costs to a minimum and reduces any potential problems that can occur with pneumatic or hydraulic systems.

Adaptability

Allows for greater flexibility to meet specific customer requirements and provides the capability for simultaneous machining of multiple workpieces.

Rigidity

The very nature of the design of a trunnion system gives a very rigid platform for machining.

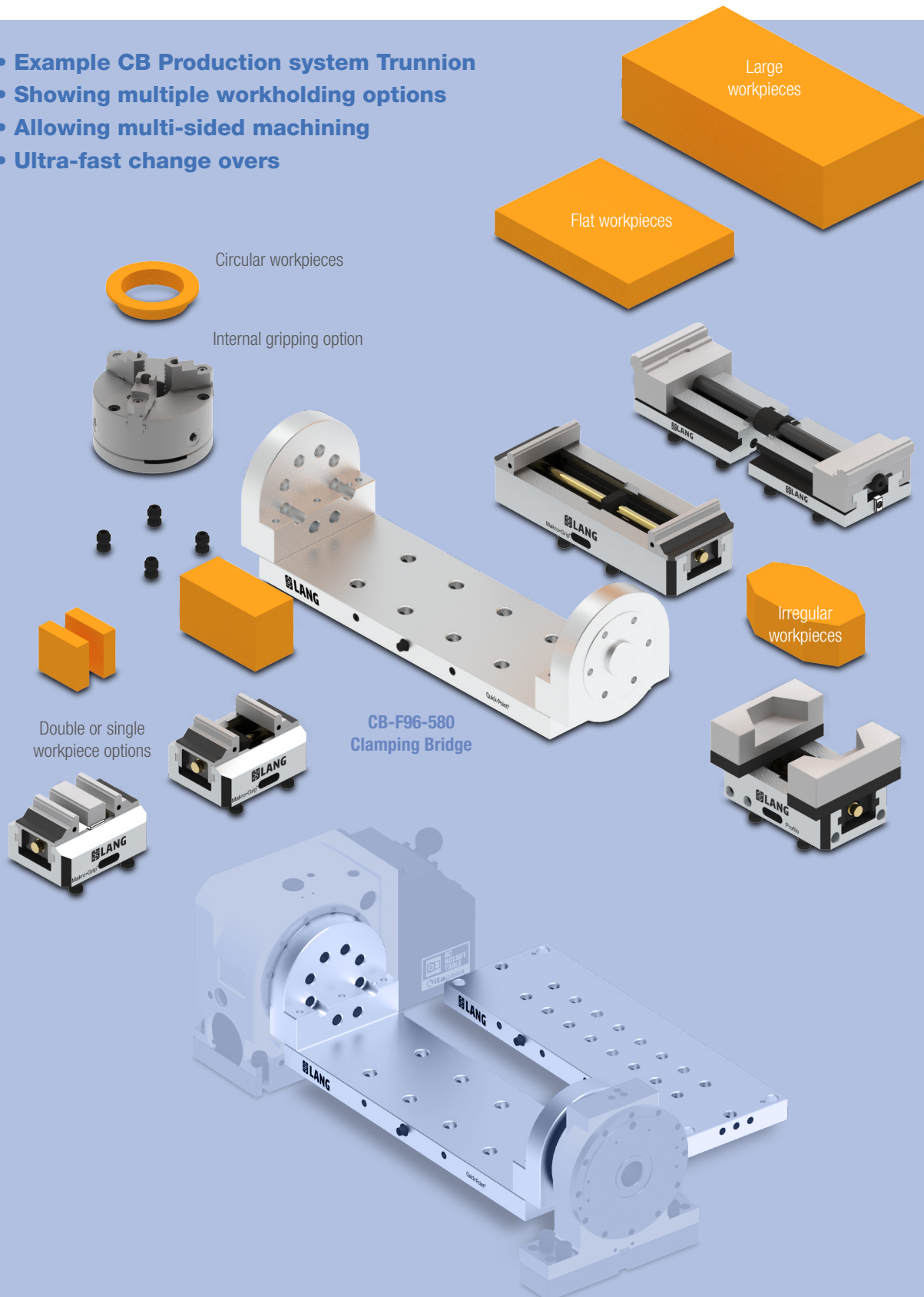


CLAMPING BRIDGE

Quick-Point®

Flexible system

- Example CB Production system Trunnion
- Showing multiple workholding options
- Allowing multi-sided machining
- Ultra-fast change overs



Note: LANG Makro-Grip® Vices, KITAGAWA Manual chucks and workpieces are not included in the scope of supply.

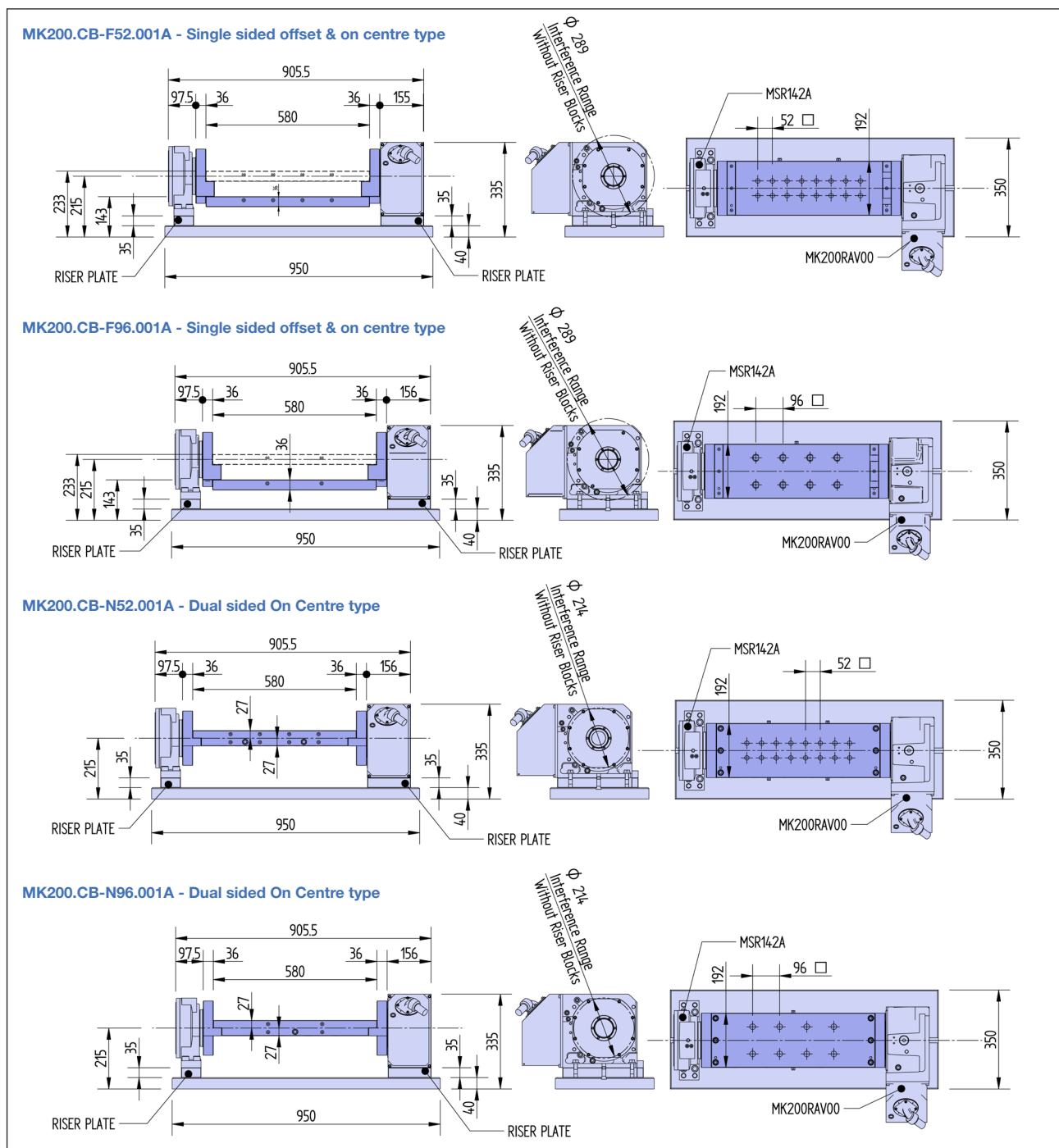
CB Production System

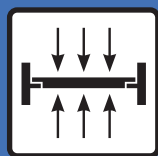
Typical CB Production system setup - NC Rotary table, tail Spindle & trunnion assembly
 Many other production system setups available upon request

Specifications

Model	MK200.CB-F52.001A	MK200.CB-F96.001A	MK200.CB-N52.001A	MK200.CB-N96.001A
1 Plate Length (mm)	580			580
2 Plate Width (mm)	200			200
3 Plate height above datum plane (mm)	143/233			242
4 Allowable rotating radius (mm)	289			214
5 Allowable load (kg)	350			342
6 Allowable work inertia (kg.m ²)	1			1
7 Mass of product (kg)	232			240

Dimensions





CLAMPING BRIDGE

CB-F Type

Off/On-Centre Single-Sided Clamping Trunnion System

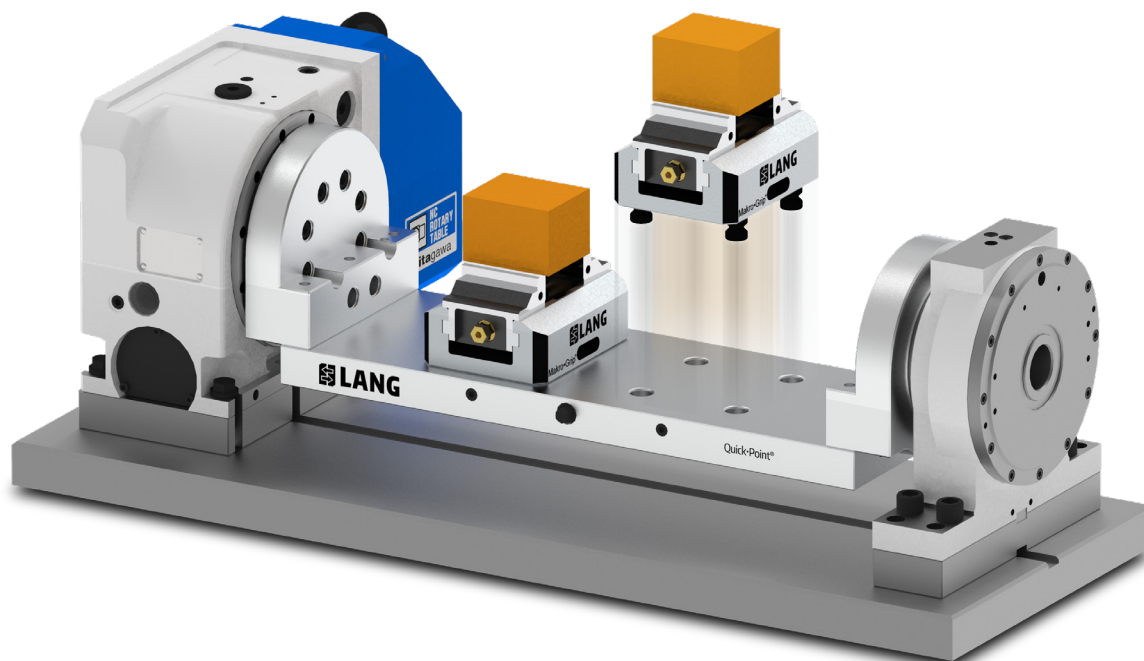


Image shows a Kitagawa MK200 rotary table with an MSR142A tailspindle with a CB-F96-580 Clamping bridge assembly. Part No: MK200.CB-F96.001A.

Note: LANG Makro-Grip® Vices and workpieces are not included in the scope of supply.

- 1 Very rigid system with a total assembly rotary clamping torque of 1,020Nm.
- 2 High cutting torque of 270Nm allows for rapid machining of complex shapes
- 3 Quick-point® holding force up to 6,000kgs ensures your work holding is secure.
- 4 Built in Quick-point® reduces the overall weight therefore lowering the moment of inertia.
- 5 Clamping trunnion allows for excellent tooling access and multiple workholding options.
- 6 Precision ground adaptors ensures high repeatability and for multiple trunnion positions or types

A clever single-sided trunnion designed for flexible work holding

The CB-F production system unites the rigidity and strength of KITAGAWA rotary tables with the rapid change flexibility of LANG Quick-point® zero-point products, to produce the ultimate single-sided trunnion solution for modern manufacturing. LANG Quick-point® is the lowest manually actuated zero-point system on the market thus building this technology directly into the 'bridge' of the trunnion system provides an immediate advantage over a traditional trunnion system.

The reduced height in the Z-Axis maximises the machining envelope and allows for many more work holding options when compared to a standard 'blank' trunnion specification with multiple plates fixed on top of each other.

The CB-F production system also has the option to be transformed from an off-centre position to an on-centre position which allows for work pieces to be presented to the machine spindle with a different aspect. If necessary the reverse side can be utilised by drilling and tapping mounting holes for further workholding to be mounted.

Also the 'bridge' can be quickly changed from a 96mm grid Quick-point® to a 52mm grid Quick-point® and back again as required. This provides you with multiple work holding options to either ensure a large work piece is securely gripped or provide multiple small workpieces to be machined at the same time.

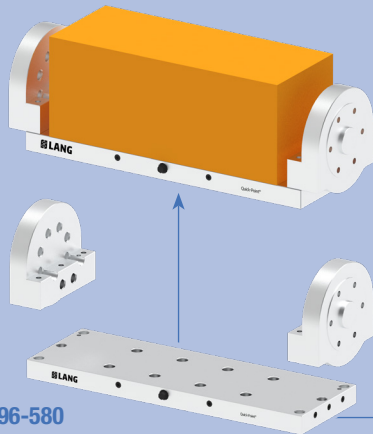
CB-F Type

Optional usage

Option: Change clamping bridge from Off-Centre to On-Centre

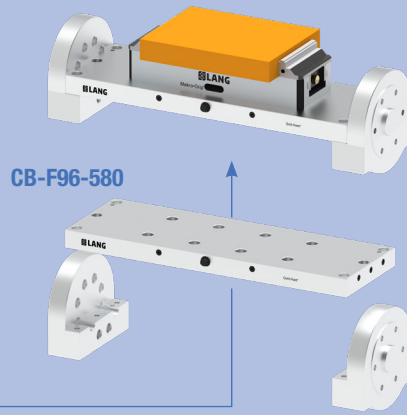
Maximum 480mm x 192mm x 165mm Work Piece*

Allows for flat workpieces to be machined



CB-F96-580

Detach clamping bridge from base of adaptor flanges



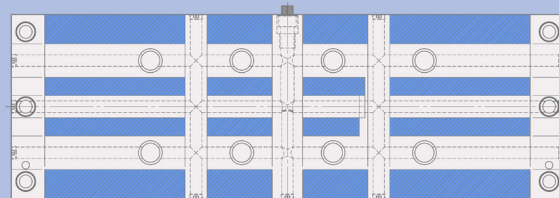
CB-F96-580

Attach clamping bridge on top of adaptor flanges

* this is for an Aluminium work piece, for a S45C Steel billet the maximum size would be 340mm x 112mm x 165mm, but other shapes can be used.

Option: With the clamping bridge on-centre the the reverse side can be modified yourself to take additional workholding

Blue hatched areas show where tapped holes can be positioned

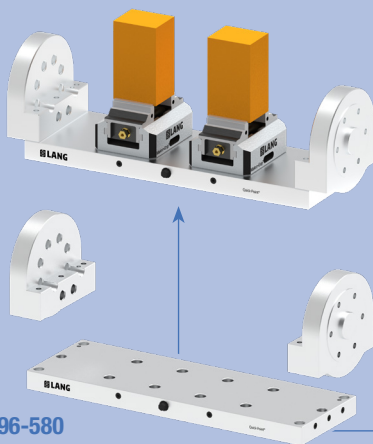


Cross-sectional view of CB-F96-580

Option: Change clamping bridge from a 96mm Quick-Point® to a 52mm Quick-Point®

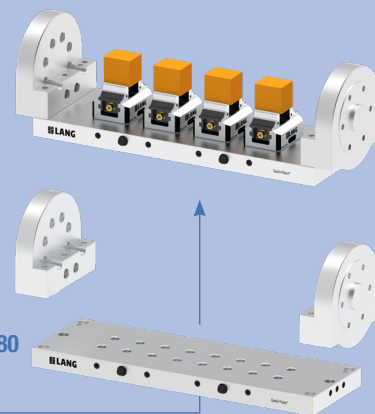
Two large workpieces

Four workpieces with 52mm Quick-point® Clamping bridge



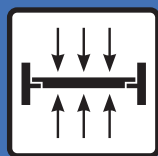
CB-F96-580

Detach 96mm Quick-point® clamping bridge from base of adaptor flanges



CB-F52-580

Attach 52mm Quick-point® clamping bridge to base of adaptor flanges



**CLAMPING
BRIDGE**

CB-N Type

On-Centre Dual-Sided Clamping Trunnion System

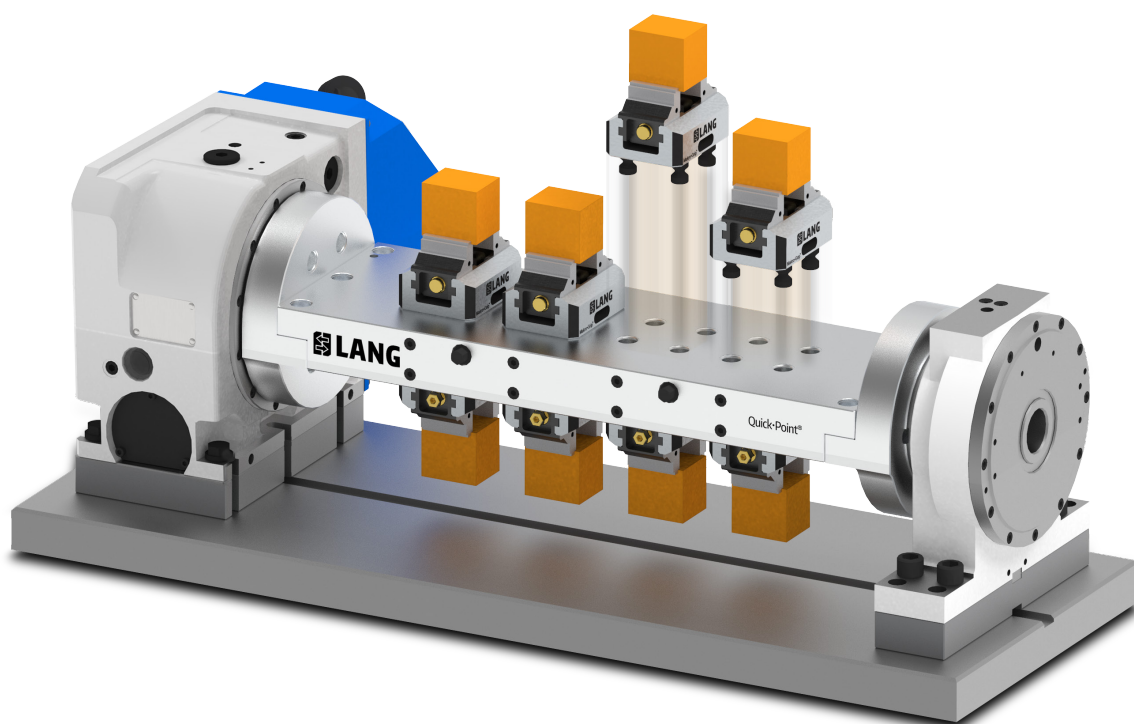


Image shows a Kitagawa MK200 rotary table with an MSR142A tailspindle with a CB-N52-580 Clamping bridge assembly. Part No: MK200.CB-N52.001A

Note: LANG Makro•Grip® Vices and workpieces are not included in the scope of supply.

- 1 Very rigid system with a total assembly rotary clamping torque of 1,020Nm.
- 2 High cutting torque of 270Nm allows for rapid machining of complex shapes
- 3 Quick•point® holding force up to 6,000kgs ensures your work holding is secure.
- 4 Built in Quick•point® reduces the overall weight therefore lowering the moment of inertia.
- 5 Clamping trunnion allows for excellent tooling access and multiple workholding options.
- 6 Precision ground adaptors ensures high repeatability and for multiple trunnion types

A clever dual-sided trunnion designed for flexible work holding

The CB-N production system unites the rigidity and strength of KITAGAWA rotary tables with the rapid change flexibility of LANG Quick•point® zero-point products to produce the ultimate double-sided trunnion solution for modern manufacturing. LANG Quick•point® is the lowest manually actuated zero-point system on the market thus building this technology directly into the 'bridge' of the trunnion system provides an immediate advantage over a traditional trunnion system.

The reduced height in the Z-Axis maximises the machining envelope and allows for many more work holding options when compared to a standard 'blank' trunnion specification with multiple plates fixed on top of each other.

The CB-N Production system is a dedicated double sided zero-point trunnion to maximise the amount of work peices you are able to present to the machine spindle. However low-profile our zero-point system is, there is often a requirement for dual sided systems that the rotary table and tail stock are raised to allow for larger work pieces. We can provide various heights of precision ground riser plates to accomodate your workpeice requirements.

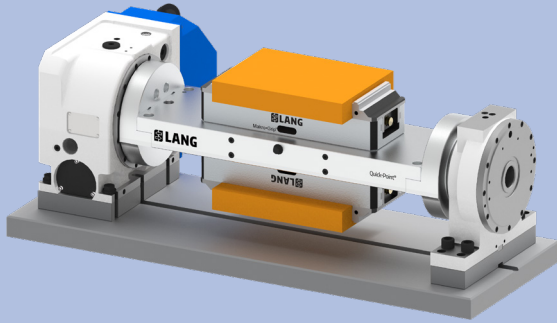
The CB-N production system also has the ability for the 'bridge' to be exchanged allowing for alternative LANG Quick•point® solutions, either using 96mm grid Quick•point® or the 52mm grid Quick•point®. This provides you with multiple work holding options to either ensure a large work piece is securely gripped or provide multiple small work pieces to be machined at the same time.

CB-N Type

Optional usage

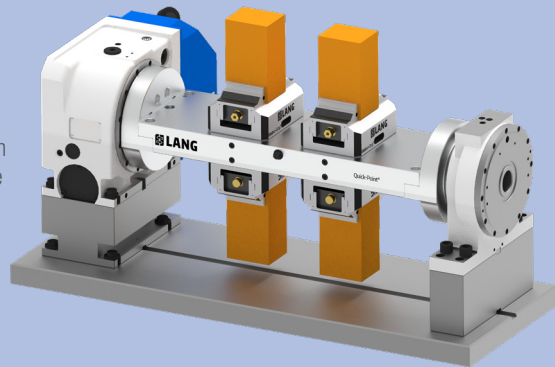
Option: Centre height to suit your machine and work pieces

Riser blocks can be designed and produced to suit your specific machine, workpiece and tooling requirements.



Low riser blocks under the rotary table and tail spindle allow the trunnion and part assembly to turn a complete revolution without interference with the sub-plate. Keeping the centre height low allows more room in the Z axis for longer tools to be used.

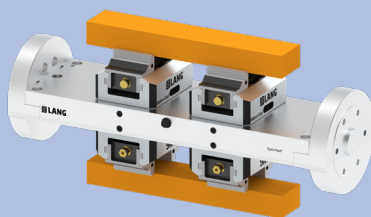
Higher riser blocks under the rotary table and tail spindle can enable taller workpieces to be machined but may restrict the tools that can be used.



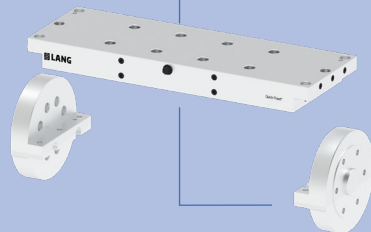
It is always important to consider the total weight and inertia of the trunnion and part assembly then ensure it is within the allowable limits of the rotary table. Working closely with you the Kitagawa ARG team can consider all of the part, work holding and machine details to calculate and design the correct setup to suit your requirements.

Option: Change clamping bridge from a 96mm Quick-Point® to a 52mm Quick-Point®

Two large workpieces

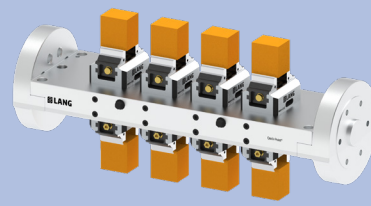


CB-N96-580

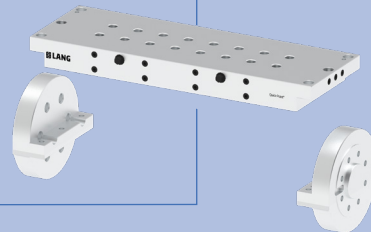


Detach 96mm Quick-point® clamping bridge from base of adaptor flanges

Eight workpieces with 52mm Quick-point® Clamping bridge



CB-N52-580



Attach 52mm Quick-point® clamping bridge to base of adaptor flanges

Designed trunnion production systems to suit your needs

Kitagawa Europe's application research group (ARG) is a team of experienced technical engineers based within our offices throughout Europe and India, co-operating and meeting with their Kitagawa American and Japanese counterparts on a regular basis.

The main purpose of the ARG is to provide designed workholding solutions to customers wanting to increase the productivity of their manufacturing process.

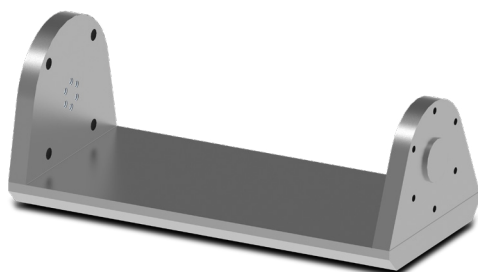
Installing a trunnion production system is one of the best ways to increase your manufacturing output and the effectiveness of your machining envelope without incurring punitive costs or having to invest in new machines.

No matter what the size of machine bed or what control system your machine has, the ARG can design a trunnion production system to suit your needs.

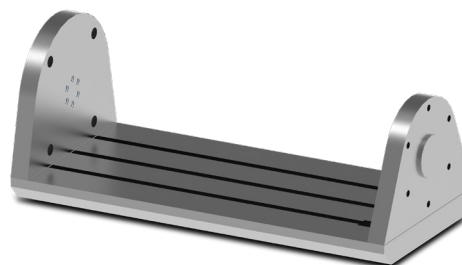
Whilst we feel that the CB Production system is perhaps the most flexible, cost effective and advanced trunnion system available to the market, we recognise that you may well want something designed to suit your specific requirements.

Our trunnion production systems can be supplied as simple blank trunnion, or a fully automated pneumatic or hydraulically actuated trunnion system, with electronic sensors to communicate with your machine that workpieces are loaded correctly. Please see some of the examples below.

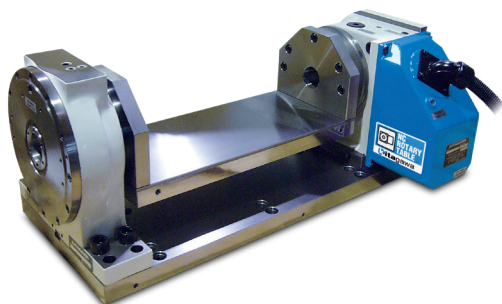
Filling in the Trunnion data sheet on the opposite page provides us with all the data we need to provide you with a quote for a trunnion production system to suit your purposes. Engineer **YOUR** Future!



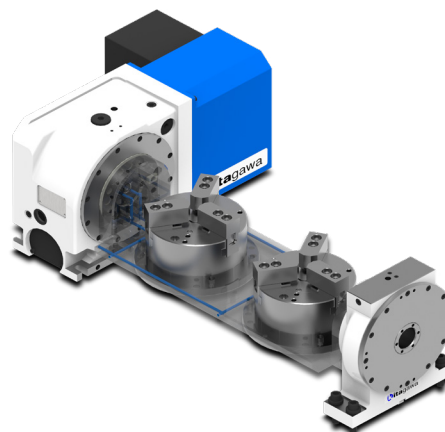
Simple Blank Trunnion system
(Specify Length and width)



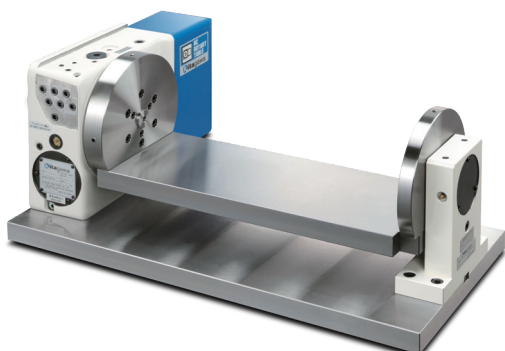
Trunnion system with T-slots
(Specify Length, width & T-slot specifications)



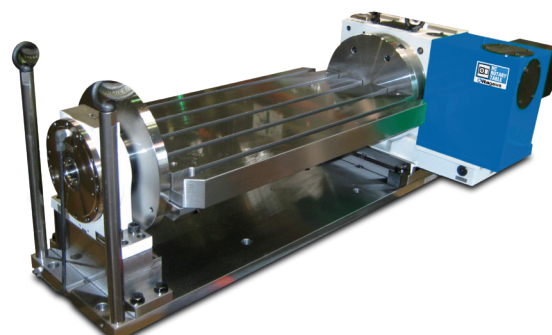
Blank trunnion production system set-up with a Kitagawa MR160 Rotary Table and TSR142A tail spindle



Pneumatic trunnion production system set-up with a Kitagawa MK200 Rotary table and TSR142A tail spindle. A built-in rotary joint supplies air via cross drilled holes within the trunnion to operate the three jaw chucks



Blank trunnion production system set-up with a ultra-compact Kitagawa CK160 Rotary table and TSR140Z tail spindle to maximise machining area



Dual-sided trunnion production system with T-slots set-up with a high accuracy Kitagawa TMX320 Rotary Table and TSR181A tail spindle

Trunnion Data Sheet

Specify exactly how you want your trunnion

Step One - Your machine and Rotary Table information (if you already have a Rotary table)

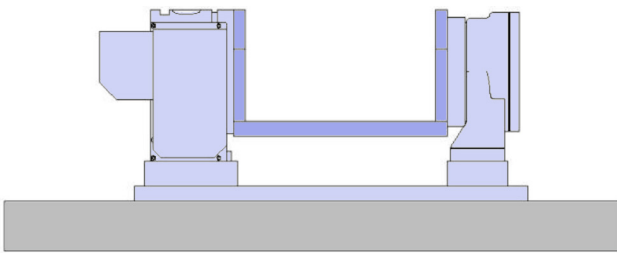
Machine type:

Rotary table model:

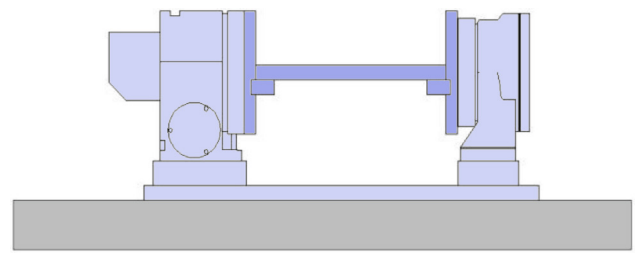
Machine control system:

Tail spindle model:

Step Two - Specify which type of Trunnion System you require

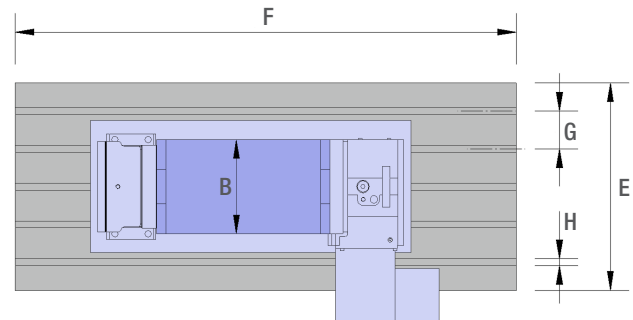
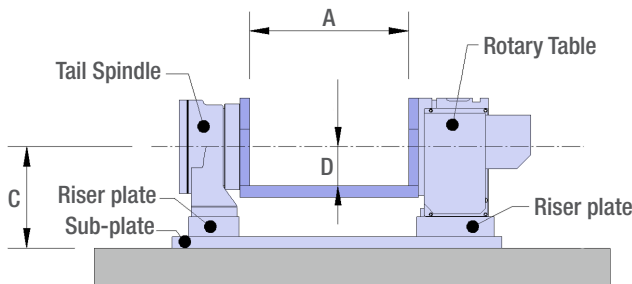


Off-set Type (tick box)



On-centre Type (tick box)

Step Three - Specify essential dimensions



A Trunnion length	<input type="text"/>
B Trunnion width	<input type="text"/>
C Required centre height	<input type="text"/>
D Distance from centre	<input type="text"/>

E Machine table width	<input type="text"/>
F Machine table length	<input type="text"/>
G Distance between machine table slots	<input type="text"/>
H Machine table slot size	<input type="text"/>

Step Four - Specify essential specifications

Trunnion bed LANG Quick-point® required	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	<input type="checkbox"/> 52 grid <input type="checkbox"/> 96 grid	
Trunnion bed T-slots required	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Riser blocks required	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Sub-Plate required	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Rotary joint required	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Weight of workpiece	<input type="text"/>	
Length of workpiece	<input type="text"/>	
Width of workpiece	<input type="text"/>	



NC ROTARY TABLE

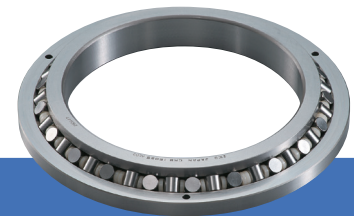
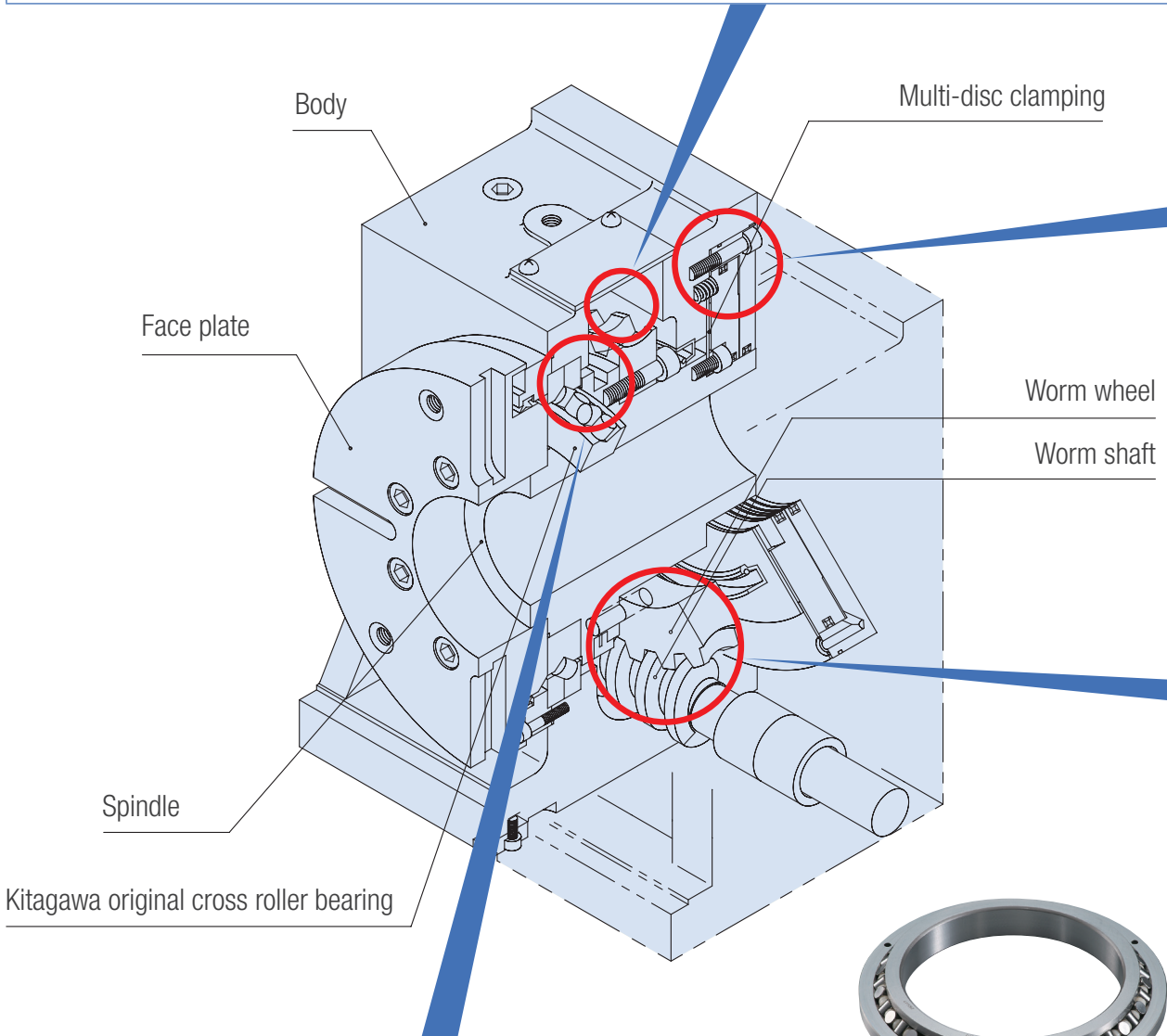
NC Rotary Table Features

High clamping torque, high accuracy and high rigidity

Kitagawa NC Rotary Tables feature proven technology

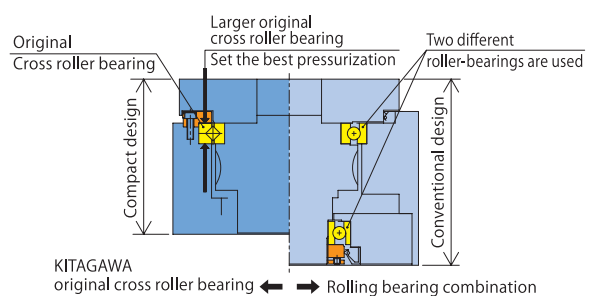
Special material to eliminate worm wheel wear

Kitagawa's special material contains hard inter-metallic compounds to give improved wear characteristics over conventional models.



Original Kitagawa cross roller bearing

KITAGAWA original cross roller bearing supports the main spindle. Construction of the original bearing has high rigidity compared with conventional types, and the original bearing allows the body design to be compact. With over 30 years experience using the original bearing the best pressurization is set meaning high accuracy and high rigidity.



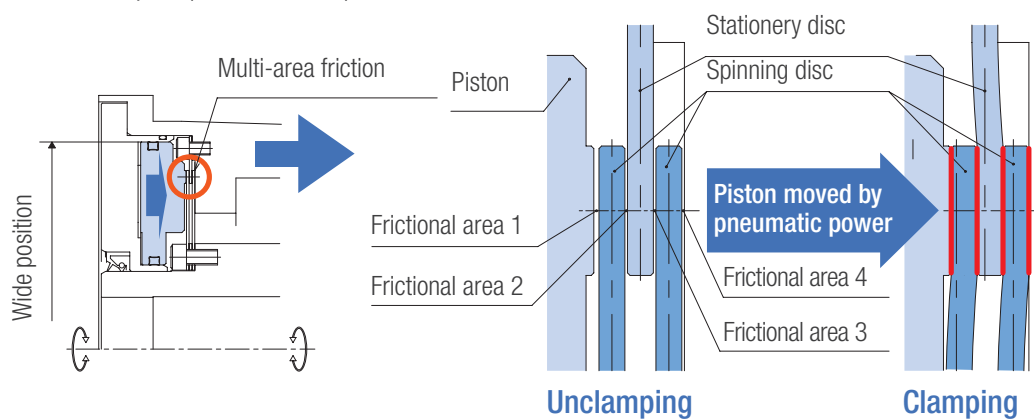
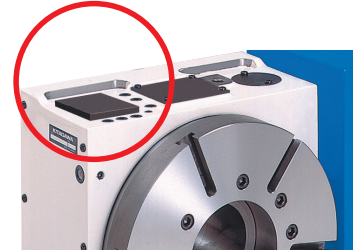
High clamping torque mechanism

- **Air-hydro high clamping system (TX series)**

Powerful clamping torque can be achieved within a compact design using integrated air-hydraulic booster.

- **Multi-disc clamping system (MR series/CK series)**

Multi-disc clamping system with multi-friction surfaces enables increased clamping torque when compared to conventional air clamped models. Patented in Japan (No. 4328060)

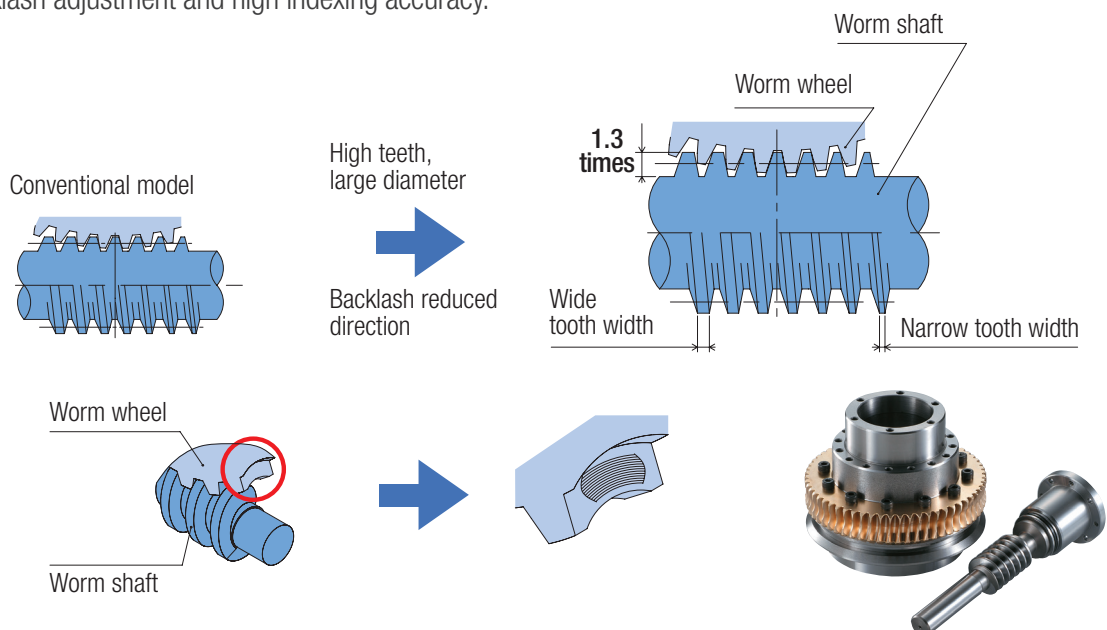


Large diameter gear with high teeth offering increased strength

Large diameter worm wheel and high gear teeth reduces the pressure on the teeth surfaces. This achieves high accuracy with reduced processing load and wear.

Double-lead worm shaft

Double-lead worm shaft creates ideal contact between the worm shaft and worm wheel. This allows for simple backlash adjustment and high indexing accuracy.





NC ROTARY TABLE

MK Series

Strong and compact rotary table

The strong and compact NC rotary table MK series now has a full line up.

Performance improved

Powerful clamping torque

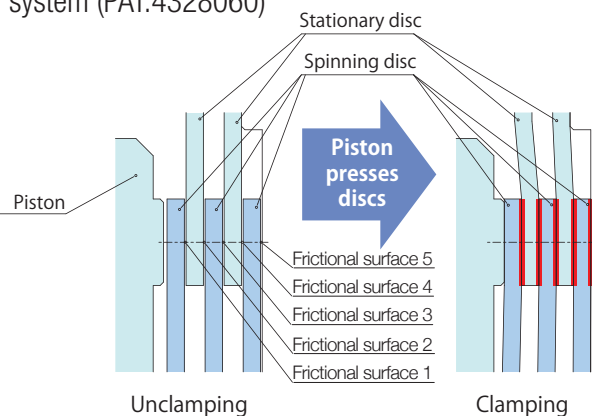
Large capacity provides the highest specification in it's class

MK350: 6000Nm

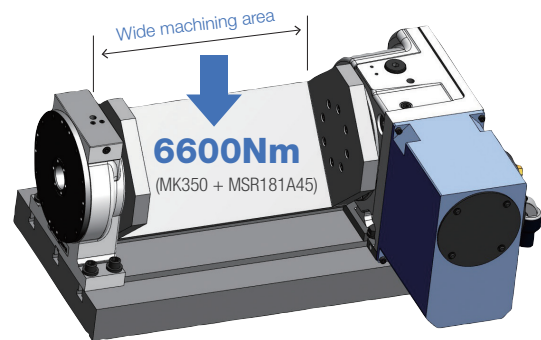
MK250: 1000Nm

MK200: 570Nm

Strong clamp by multi-disc clamping system (PAT.4328060)



Jig space and clamping torque are boosted by the design of the MK Series and tail spindle



Series becomes more powerful when used with a Tail Spindle

MK350 + Tail Spindle MSR181A45
6000Nm + 600Nm = 6,600Nm

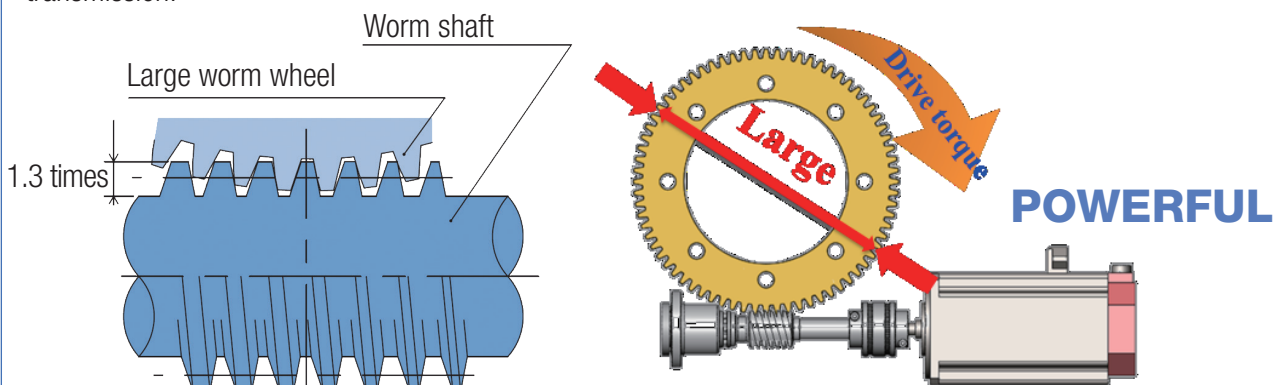
MK250 + Tail Spindle MSR181A
1000Nm + 600Nm = 1,600Nm

MK200 + Tail Spindle MSR142A
570Nm + 450Nm = 1,020Nm

High cutting torque

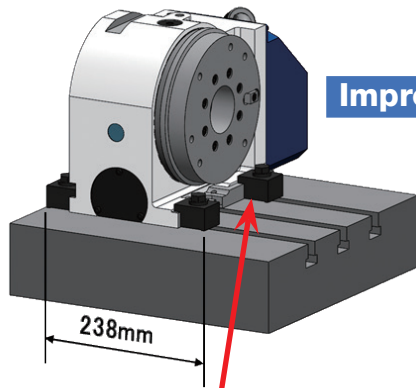
Large worm wheel design allows for powerful lead cutting

The high-tooth large diameter worm wheel keeps the tooth surface pressure low and enables high torque transmission.



Improved mounting

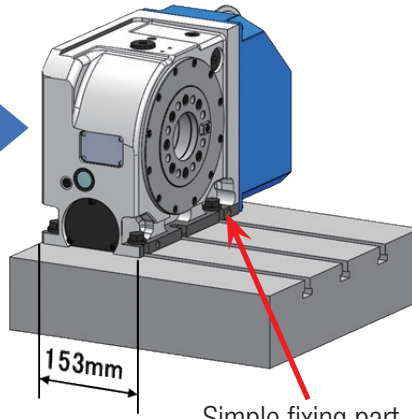
Our existing product



Cutting chips accumulate at the toe clamps and interfere with the fixture.

Improved

MK200



Simple fixing part

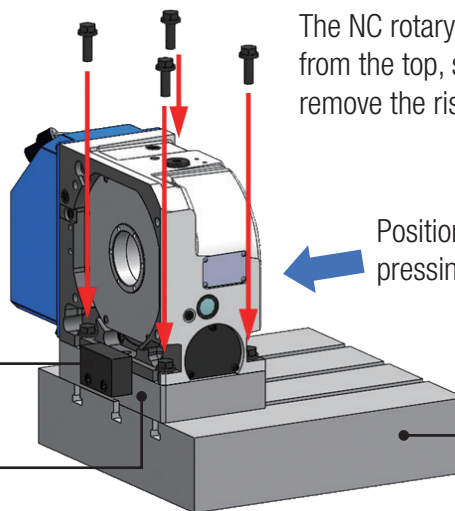
MK Series can be directly installed by inserting bolts from the top without toe clamps.



Reducing the effective thickness and chip flow is improved.

The locator on riser block helps retain locating accuracy and assists with maintenance

Locator
Riser block



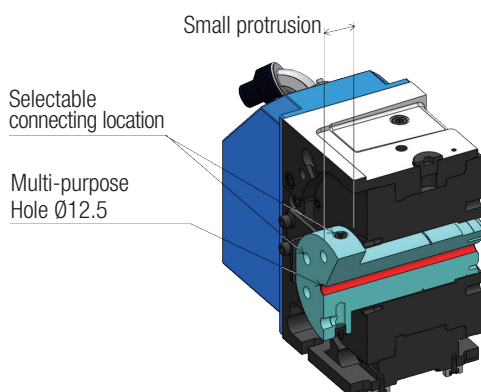
The NC rotary table can be bolted from the top, so there is no need to remove the riser block

Positioning in X-Axis direction by pressing against the locator

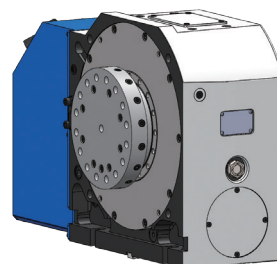
Machine table

Wide selection of rotary joints

Compact built-in rotary joints can be selected from 4, 5 and (6+1) port types. The centre port of (6+1) port types has a $\varnothing 12.5$ mm multi-purpose hole for high-pressure coolant, work seating detection sensor, etc. 25MPa high-pressure rotary joints (4-port or 6 port) are also available for miniaturization of fixtures and fast actuation.

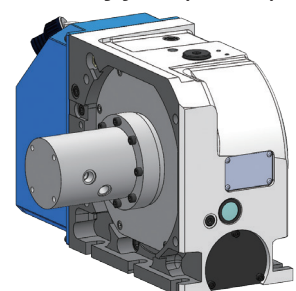


Built-in rotary joint (7MPa)



4 ports / 5 ports /
6+1 ports/16+1 ports

High pressure rotary joint (25MPa)



4 ports / 6 ports

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