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High-speed rotary joints for machine tools

ROCKY JOINT



■All specifications are subject to change without notice

CAT.No.0810

RIX, as a total manufacturer of rotary joints, contributes to the evolution of machine tools.

1

Rotary joints for machine tools Characteristics of Rocky Joints

Combining compact rotary joint design with longer strokes

Providing the smaller space required for main spindles in compact multi-function lathes and multi-spindle machines, and the longer drawbar stroke demanded for dual-face-contact tools. This feature is highly evaluated and widely adopted by many machine tool manufacturers in Japan and Asia.

2

Rotary joints for machine tools Characteristics of Rocky Joints

Support for full dry air cutting (patent pending) Support for oil mist cutting

Recently manufacturers have started to use full dry air cutting methods. In addition to the traditional dry air cutting using external lubrication, RIX has newly developed a joint that can handle multiple fluids with their "Force Optimization Technology F.O.T.". This joint will enable environmental-friendly machining by eliminating oil mist splash. RIX, as a standard, now adds oil mist compatibility to all joint types, which was once only an option, for the widely adopted oil mist machining.

3

Rotary joints for machine tools Characteristics of Rocky Joints

Rotary joint for ball screw cooling

In response to the increasing demands for more precise and efficient machining, ball screws for feeding must be hollow in order to reduce deterioration by heat generation. RIX's rotary joint for cooling ball screws enables seals to be located on one side by means of the return structure using mechanical seals for easy assembling and maintenance. Using mechanical seals with less friction reduces heat generation, thus extending the life of seals.

4

Rotary joints for machine tools

Newly developed rotary joint for lathes **New!**

In addition to our proven spindle-through rotary joint, we have developed a new rotary joint for lathe chucks. This joint has measures to properly remove chuck chips, cool machining points, and support coolant and air for mating detection. This joint has two types: one with two ports for both coolant and air and the other with one port interchangeable for either coolant or air.

Machine tools must constantly evolve and improve to meet the changing demands of the era, and the same can be said for the important components that support machine tools. As a total manufacturer of rotary joints, RIX listens carefully to what customers need, and develops new and innovative rotary joints to answer their requirements. Designs are refined through a cooperative process with users to achieve product maturity. We are committed to developing the optimal solutions cooperatively, now and tomorrow, because we believe that is the best way to contribute to the evolution of machine tools.

Bearing-less rotary joints for spindle-through coolant applications

ESX series

The ESX series of bearing-less rotary joints was developed to answer rising need for high-speed machine tool spindles, and today are the major choice for machine tool joints.

Including two stationary seals mounted on the housing, and the rotary seal on the spindle shaft, the joint itself has no bearings.

Vibration is extremely low because there are no internal bearings, and the compactness contributes to design smaller machine tools.



Selection chart of Bearing-less Rocky Joint

	Rocky Joint model	Applicable fluid (option)	Max. pressure (MPa)	Max. rotation speed (min ⁻¹)	Features and Main Usagaes	
For general machining centers and multi-tasking machine.	ESX20M-N012	For both coolant and oil mist	coolant 14	40,000	Classic type bearing-less rotary joint. Stroke: 3.5 mm. Recommended for use in general machining centers.	
	ESX20M-N016					
	ESX20M-L012					
	ESX20M-L016					
	For hollow motor	ESX20M-S012 (former 6793)	For both coolant and oil mist	oil mist 1	40,000	This compact type with long stroke of 8mm is best suited for tools with long drawbar stroke or application requiring a smaller spindle.
		ESX20M-S016 (former 6902)				
		ESX20M-E012 (former 7248)				
		ESX20M-E016 (former 7306)				
for custom machines	ESX20M-T010	For both coolant and oil mist	coolant 12 oil mist 1	40,000	This is designed for smaller size requirements for specialized machine tools including multi-spindle machining tools. Two types are available: ESX, allowing for dry running, and ES reducing drain using pressure-contact spring.	
	ES20M-T010					
Dry air applicable type	New! ESX20V-L012	These can be used for coolant, oil mists and dry air all interchangeably. For information on the usage requirements, refer to the description in the main text.			Multiple fluids can be used including dry air by our Force Optimization Technology (F.O.T.) New! that enables switching to optimal contact pressure, depending on the fluids used. This is an environmentally-friendly joint that can eliminate conventional external oil lubrication.	
	ESX20V-L016					
	ESX20J-N012					
					External lubrication of sealed surfaces will allow for use of dry air.	

Joint type

ES is an abbreviation for End Seal. This bearing-less joint is a rotary seal mounted on the spindle shaft end.

Seal size

- 20:** The standard size for spindle-through coolant designs.
- 10:** Where small size is essential in spindle-through coolant use.

First two digits indicate stationary seal specifications.

Last two digits are rotary seal specifications.

ESX20M-N012

Seal structure

- X:** Automatic open/close structure allows free running even with coolant supply halted (coolant-free rotation applicable).
- None:** A spring forces the seal into constant contact; recommended where drain reduction from the seal is required.

Types of fluids used

- M:** Also used for oil mist (semi-dry) machining
- V:** For multi-fluid (using our Force Optimization Technology F.O.T. **New!**)
- J:** For dry air (with external lubrication)
- S:** Drain reduced type (**New!** For more information, refer to the column in P. 13.)
- None:** For coolant only

Third and fourth digits show rotary seal screw size

- 10:** M10×1, left thread
- 12:** M12×1.25, left thread
- 16:** M16×1.5, left thread

Second digit is always "0" (reserved for future use)

First digit indicates stationary seal characteristics

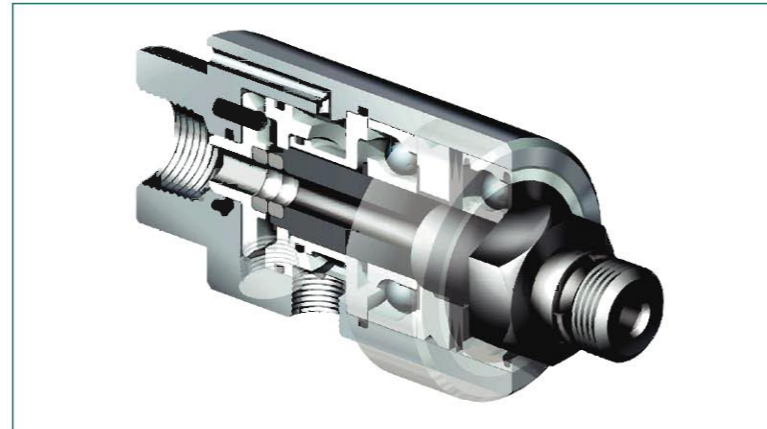
- N:** Standard type
- L:** Long-stroke type
- S:** Oil mist (semi-dry cutting) compatible type (for hollow-core motors); straight inlet
- E:** Oil mist (semi-dry cutting) compatible type (for hollow-core motors); elbow inlet
- T:** Multi-spindle machine type

Special- and custom-order products also available. Please contact us for details.

Rotary joints with built-in bearing for spindle-through coolant applications

LX and L series

The LX and L series rotary joints with built-in bearing are mounted on spindle shafts, and are single units incorporating rotor seal, housing, bearings and stationary seals. The joint is independent of the spindle, making it easy to mount and ensuring simple assembly and maintenance. These characteristics have earned it widespread use in the industry.



LX84M-234

Seal structure

X:Automatic open/close structure allows free running even with coolant supply halted (coolant-free rotation applicable).

None:A spring ensures constant seal contact.

A:Dry air applicable joint (special item), using grease for lubrication.

Options

M:Oil mist (semi-dry cutting)

None:For liquid coolant compatible type

End shape

234:Socket dia. 16 mm
Screw M16 x 1.5, left-hand thread

244:Socket dia. 18 mm
Screw M16 x 1.5, left-hand thread

Series and shape symbols

Symbol	Supply direction	Characteristics
84	Straight	Drain evacuation performance, which can cause problems in vertical mounting, has been improved. Automatic open/close mechanism on seal allows free run without coolant supply. Optional oil mist compatible type also available.
86	Elbow (90°)	
91	Straight	Ultra-high speed rotation type joint, with design optimized to minimize vibration at high speeds.
92	Elbow (90°)	
95	Straight	High-speed rotation, and long life. The standard type joint.
96	Elbow (90°)	

Joint type

L indicates a joint with internal bearings.

Selection chart for rotary joints with built-in bearing

Rocky Joint model	Applicable fluid	Max. pressure (option) (MPa)	Max. rotation speed (min ⁻¹)	Characteristics
LX84M-234, 244	For both Coolant and Oil mist	Coolant 7(12) Oil mist 1	15,000	Coolant-free rotation applicable.
LX86M-234, 244				
L91M-234, 244		Coolant 12 Oil mist 0.7	16,000	Ultra-high speed, high-pressure operation type for coolant.
L92M-234, 244				
L95M-234, 244				
L96M-234, 244	Coolant 7 Oil mist 0.7	6,000	High-speed standard type for coolant.	

Rotary Joint for Lathe Chucks

EES Type / LA Type

EES Type / LA type is a rotary joint that is attached to the driving cylinder of a lathe chuck and supplies the chuck section with coolant for cutting chips removal, or air for mating detection, blow or actuator.

Two types are available: one with 2 ports for supplying both coolant and air at the same time and the other with 1 port that is interchangeable either for air or coolant.

2 Port Type



EES-2P01

Joint type

EES refers to a type with joint structure that supports two types of fluids.

Number of ports

This means two types of fluids will be supported.

This refers to a variation including different fitting shape.

1 Port Type



LA-1P01

Joint type

joint with a built-in bearing and supports for both air and coolant at the same time by its grease lubrication structure.

Number of ports

This type has only one flow pathway but is interchangeable either for air or coolant.

This refers to a variation including different fitting shape.

01:234 fitting:
Socket diameter φ16
Screw: M16×1.5 left

02:244 fitting:
Socket diameter φ18
Screw: M18×1.5 left

Selection chart of Rotary Joint for Lathe Chucks

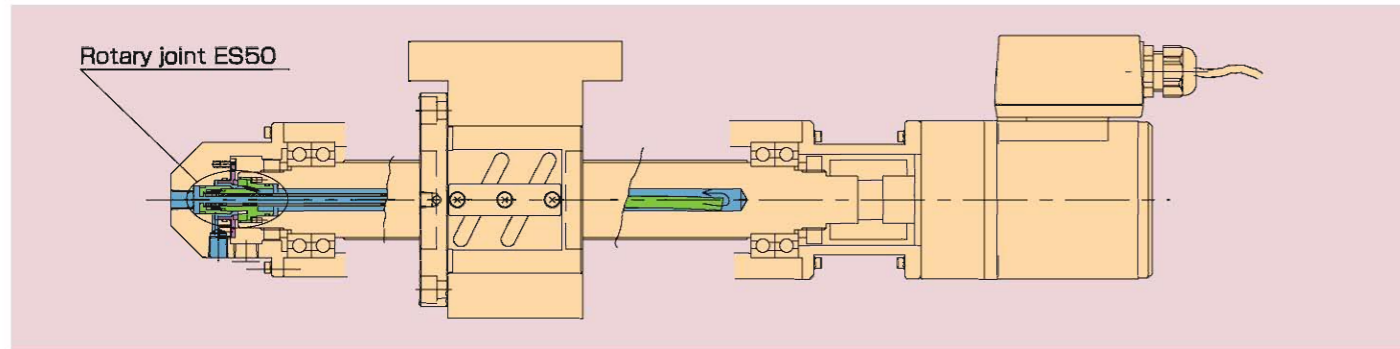
(For detailed information, please refer to respective description pages(P.17.18) and the drawings of specifications.)

Rocky joint type	No. of port	Fluid used	Max pressure (MPa)	Max. rotation speed (min ⁻¹)	Descriptions
EES-2P01	2	Air	0.6	8,000	Air and coolant can be used at the same time.
		Coolant	7		
LA-1P01,02	1	Air	1.0	6,000	Interchangeable for either air or coolant.
		Coolant	3.5		

Ball screw cooling rotary joints

ES50 series

Recent machining demands increasingly high precision and efficiency. To prevent accuracy loss caused by heat generation, ball screws require hollow-core cooling. The ES50 series of ball screw cooling joints meets these needs completely.



The ES50 is available in two specifications, for different flow rates

ES50-1600/2000

Rotor screw M16 x 1.5 low flow rate

Rotor screw M20 x 1.5 high flow rate

Selection chart for ball screw cooling rotary joints

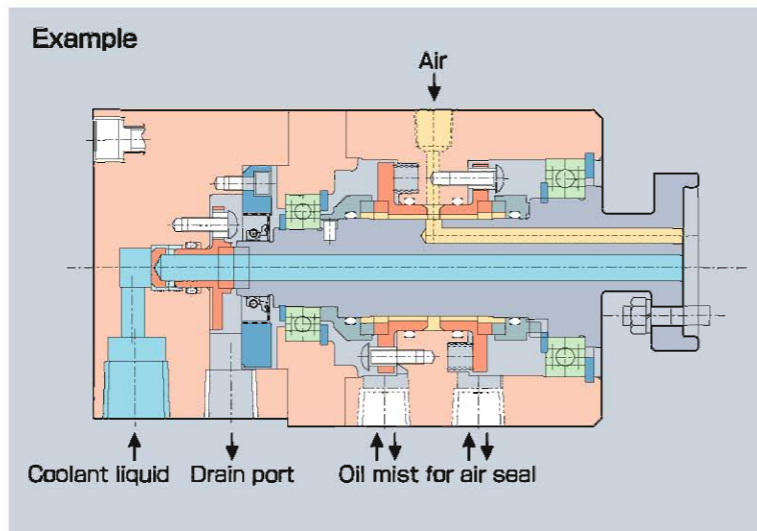
Rocky Joint type	Applicable fluid	Fluid flow rate (liters/min)	Rotation speed (min ⁻¹)	Applications
ES50-1600	Cooling oil	3	Max. 5000	Recommended for ball screws up to #40
ES50-2000		5	Typ. 3000	Recommended for ball screws over #40

Multi - port Rotary joints

In addition to spindle-through, lathe chuck and ball screw cooling applications, machine tools are required to supply multi-fluid to rotating sections.

RIX provides various multi-port rotary joints that serve for many applications required for machine tools.

See Page 20 also.



Bearing-less rotary joint Classic type

ESX20M-N012/N016



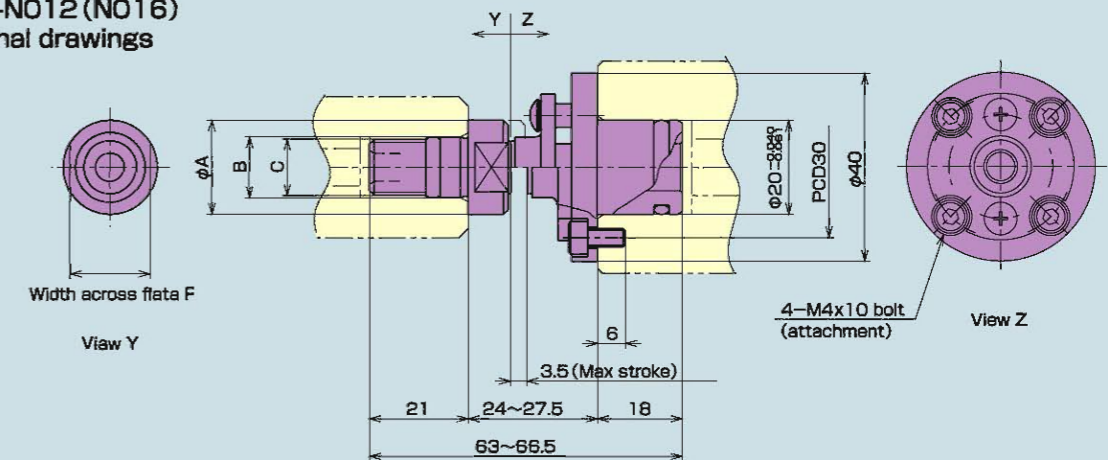
The classic design for bearing-less rotary joints.

Stable open/close performance

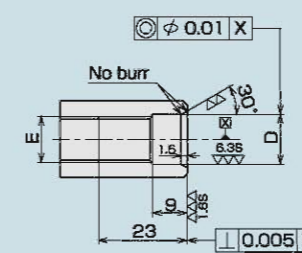
- Our unique mechanism offers minimal sliding resistance, delivering reliable seal open/close performance even when fluid flow is turned on or off. Drain is also minimized.
- Has a 3.5mm stroke, absorbing the drawbar stroke.

Usage conditions	
Fluid used	Water-soluble/ oil-based coolant, oil mist
Standard flow rate	20 liters/min.
Operating temperature	Max. 60°C
Pressure	Coolant Max. 14MPa Oil mist Max. 1MPa
Rotation speed	Max. 40,000 min ⁻¹

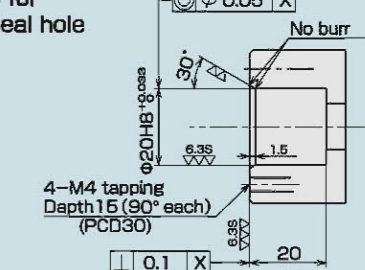
ESX20M-N012 (N016) dimensional drawings



Recommended machining dimensions for rotor seal hole



Recommended machining dimensions for stationary seal hole



ESX20M-N012 (N016) dimensions

Model	A	B	C	D	E	F
ESX20-N012	20	$\phi 13h5_{-0.008}$	M12x1.25 (left-hand thread)	$\phi 13 \pm 0.008$	M12x1.25 (left-hand thread)	17
ESX20-N016	23	$\phi 18h5_{-0.008}$	M16x1.5 (left-hand thread)	$\phi 18 \pm 0.008$	M16x1.5 (left-hand thread)	19

Bearing-less rotary joint Compact, long-stroke type

ESX20M-L012/L016



Developed specifically for use in main machining spindles on multi-function lathes or multi-function machine tools.

Compact design

●Outer diameter and length minimized to answer demand for smaller main spindles or multi-function machine tools.

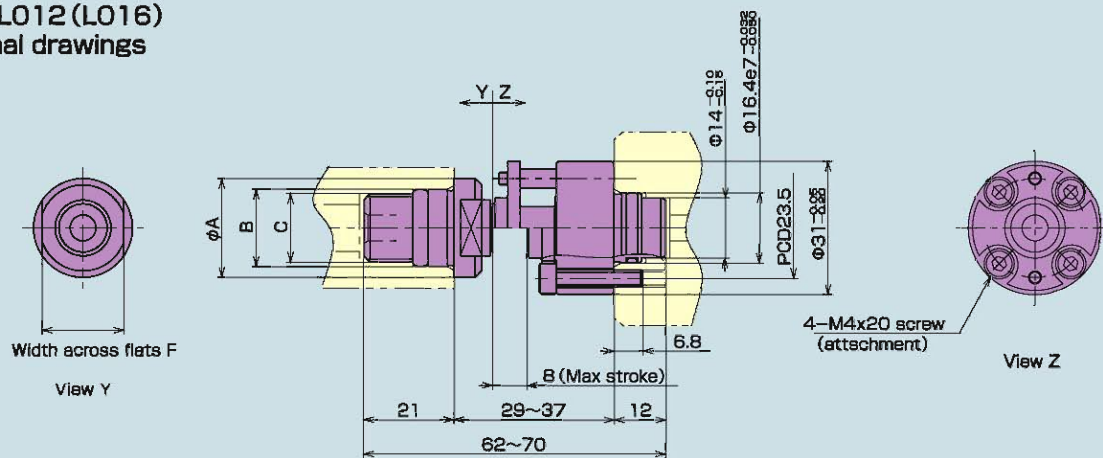
Long stroke

●In recent years, HSK, CAPTO and other dual-face-contact tools are being increasingly used, making long drawbar strokes essential. Rotary joints must be able to absorb these strokes.

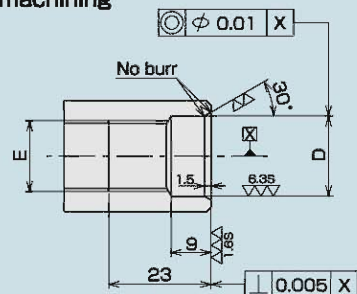
This rotary joint provides a long, 8-mm stroke, in a compact design only 31 mm outer diameter.

Usage conditions	
Fluid used	Water-soluble/ oil-based coolant, oil mist
Standard flow rate	20 liters/min.
Operating temperature	Max. 60°C
Pressure	Coolant Max. 14MPa Oil mist Max. 1MPa
Rotation speed	Max. 40,000 min ⁻¹

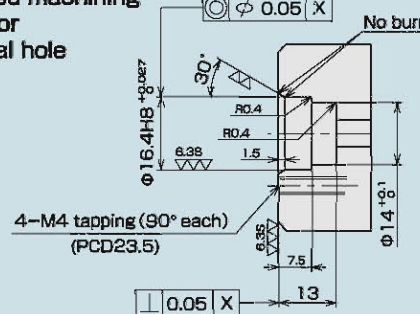
ESX20M-L012 (L016)
dimensional drawings



Recommended machining
dimensions for
rotor seal hole



Recommended machining
dimensions for
stational seal hole



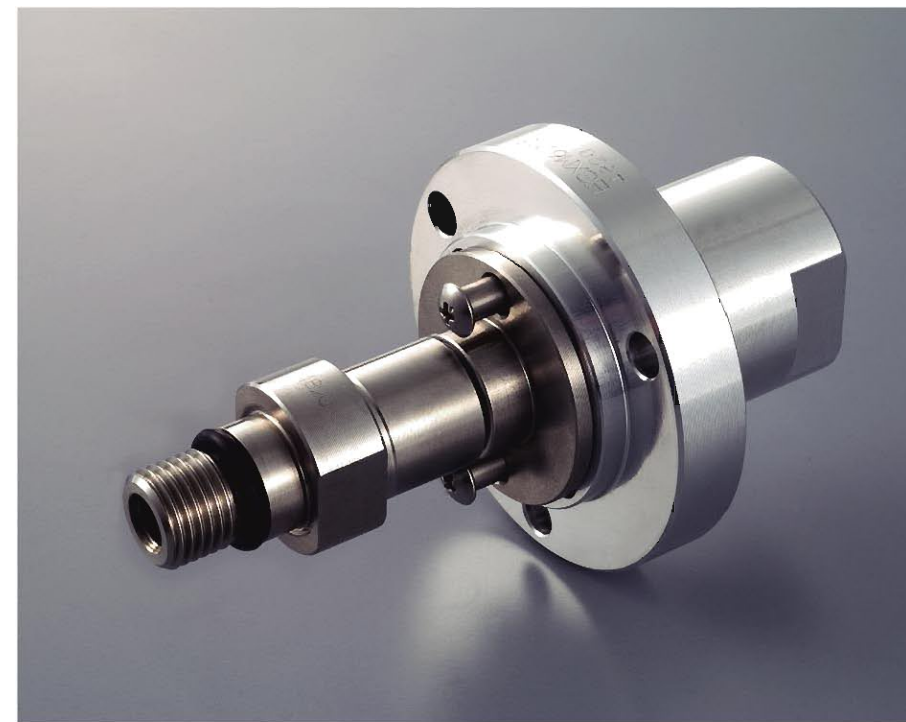
ESX20M-L012(L016) dimensions

Model	A	B	C	D	E	F
ESX20M-L012	20	$\phi 13h5 \pm 0.008$	M12×1.25 (left-hand thread)	$\phi 13 \pm 0.008$	M12×1.25 (left-hand thread)	17
ESX20M-L016	23	$\phi 18h5 \pm 0.008$	M16×1.5 (left-hand thread)	$\phi 18 \pm 0.008$	M16×1.5 (left-hand thread)	19

Bearing-less rotary joint For hollow core motors

ESX20M-S012/S016 E012/E016

(Old model nos. ESX20M-6793/6902/7248/7308)



Used with increasing frequency on hollow-core motor spindles in automotive component manufacturing lines for its excellent maintainability. Developed especially as a rotary joint for hollow-core motor spindles, with oil mist support standard.

Applicable for hollow-core motors

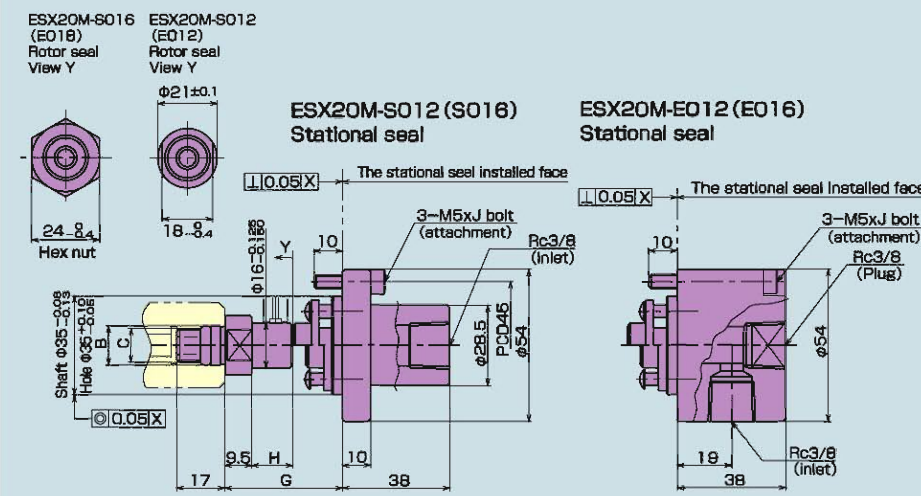
Specified as recommended for use with FANUC α T Series spindle motors.

It is highly rated by users for outstanding performance, including:

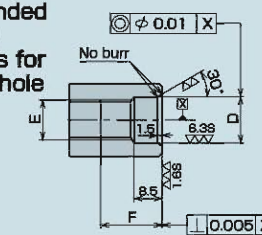
- Simple mounting.
 - Reliable seal open/close mechanism for reduced drain.
 - Sludge-resistant design
- (Can also be used with conventional built-in motor spindles.)

Usage conditions	
Fluid used	Water-soluble/ oil-based coolant, oil mist
Standard flow rate	20 liters/min. (coolant)
Operating temperature	Max. 60°C
Pressure	Coolant Max. 14MPa Oil mist Max. 1MPa
Rotation speed	Max. 40,000 min ⁻¹

ESX20M-S012 (S016/E012/E016) dimensional drawings



Recommended
machining
dimensions for
rotor seal hole



Revised model numbers

The model numbers have been changed for rotary joints, as indicated below.

Old model no.	New model no.
ESX20M-6793	ESX20M-S012
ESX20M-6902	ESX20M-S016
ESX20M-7248	ESX20M-E012
ESX20M-7308	ESX20M-E016

ESX20M-S012/S016/E012/E016 dimensions

Model	B	C	D	E	F	G	H	J
ESX20M-S012	$\phi 14 \pm 0.008$	M12×1.25 (left-hand thread)	$\phi 14 \pm 0.008$	M12×1.25 (left-hand thread)	18.5	37.1~41.6	14.5	20
ESX20M-S016	$\phi 18 \pm 0.008$	M16×1.5 (left-hand thread)	$\phi 18 \pm 0.008$	M16×1.5 (left-hand thread)	17	42~46.5	19.4	20
ESX20M-E012	$\phi 14 \pm 0.008$	M12×1.25 (left-hand thread)	$\phi 14 \pm 0.008$	M12×1.25 (left-hand thread)	18.5	37.1~41.6	14.5	40
ESX20M-E016	$\phi 18 \pm 0.008$	M16×1.5 (left-hand thread)	$\phi 18 \pm 0.008$	M16×1.5 (left-hand thread)	17	42~46.5	19.4	40

ESX20M-T010 ES20M-T010



Developed specifically for recent demand in dedicated, multi-spindle machines.

Compact

- Smaller outer diameter contributes to reduced shaft separation distance.
- Shorter in the axial dimension as well to help resolve need for more compact spindles and reduced volume.

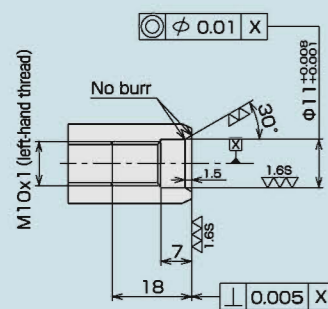
Simple assembly

- The rotor seal screws in, and the stationary seals mount quickly with two bolts. No need for time-consuming spring assembly.

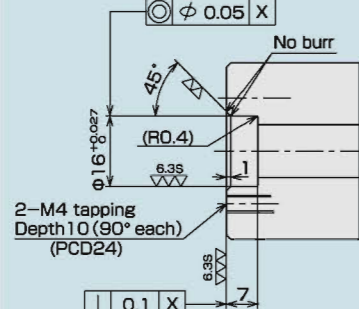
Two models for different applications

- ① ESX20M-T010
→ Allows free running even with coolant supply halted. Recommended if coolant-free rotating operation exists.
 - ② ES20M-T010
→ Recommended where drain must be minimized. Spring maintains seal is contact, reducing drain to the minimum.
- ※ The two models are completely compatible and can be swapped freely.

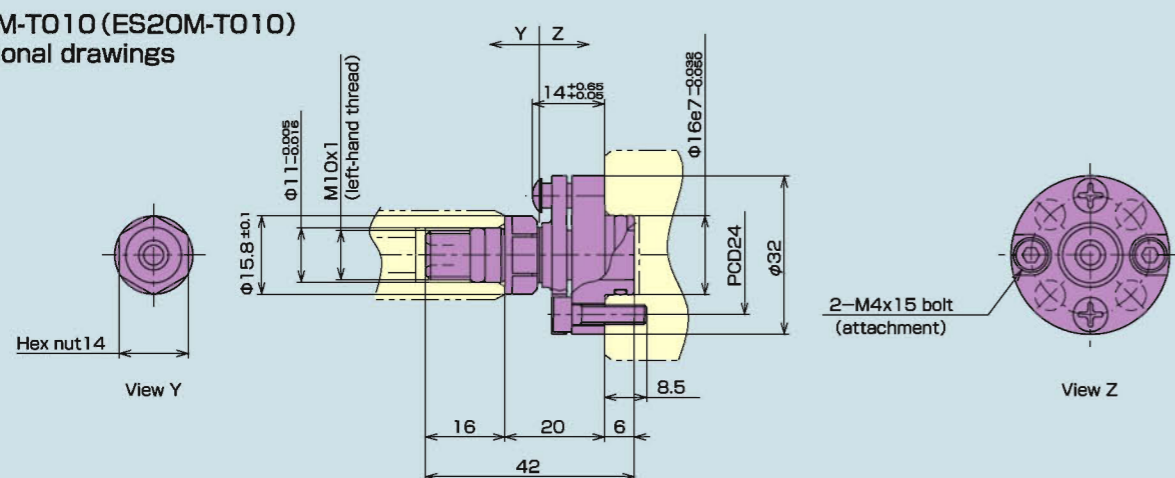
Recommended machining dimensions for rotor seal hole



Recommended machining dimensions for stationary seal hole



ESX20M-T010 (ES20M-T010) dimensional drawings



Usage conditions	
Fluid used	Water-soluble/oil-based coolant, oil mist
Standard flow rate	20 liters/min.(coolant)
Operating temperature	Max. 60°C
Pressure	Coolant Max. 1.2MPa Oil mist Max. 1MPa
Rotation speed	Max. 40,000 min ⁻¹

ESX20V-L012 ESX20V-L016

patent-pending

New!



These joints are designed as rotary joints that can handle multiple fluids used for spindle-through, including coolant, oil mists and dry air.

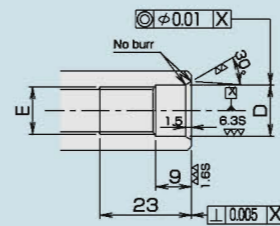
Force Optimization Technology(F.O.T)

- The technology optimizes contact pressure on ceramic seals of lubricant coolant, oil mists/non-lubricant dry air. These joints succeeded in achieving non-leaking and high sealing performance and stability against coolant and oil mist.

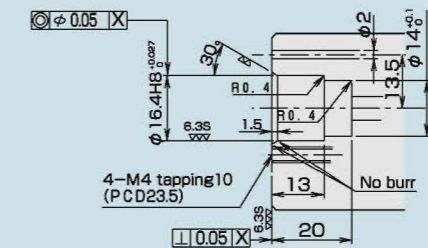
No need for external lubrication

- Our Force Optimization Technology successfully eliminated external lubrication that was conventionally required for non lubricant dry air applications. Our joints support oil-less, mist-less spindle applications as part of recent environmental measures. More compact type is also available. Contact us for details.

Recommended machining dimensions for rotor seal hole



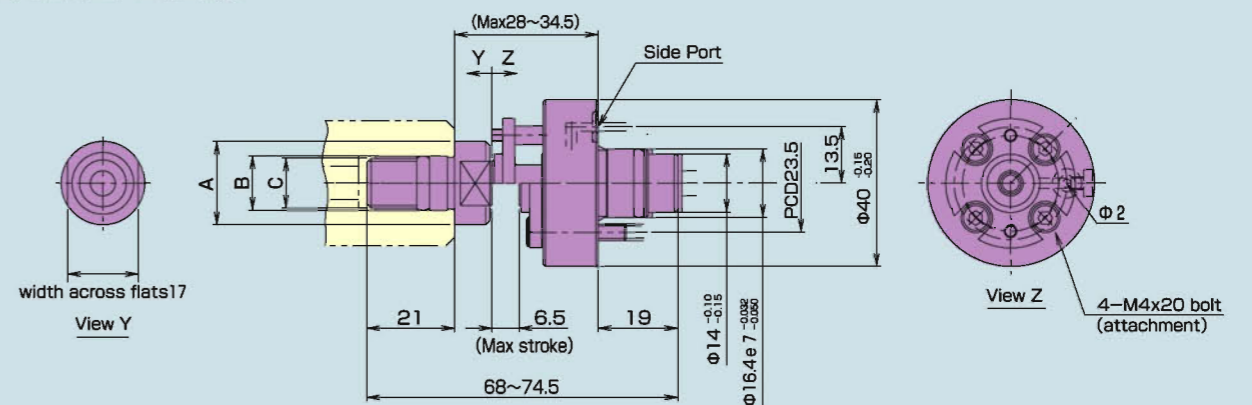
Recommended machining dimensions for stationary seal hole



Usage conditions

Fluid used	Water-soluble/oil-based coolant, oil mist, dry air
Standard flow rate	20 liters/min.(coolant)
Operating temperature	Max. 60°C
Pressure	Coolant Max. 1.4MPa Oil mist Max. 1MPa Dry air Max. 1MPa
Rotation speed	Max. 40,000 min ⁻¹

ESX20V-L012/L016 dimensional drawings



ESX20V-L012/L016 dimensions

型式	A	B	C	D	E	F
ESX20V-L012	20	φ13h5 -0.008	M12×1.25 (left-hand thread)	φ13±0.008	M12×1.25 (left-hand thread)	17
ESX20V-L016	23	φ18h5 -0.008	M16×1.5 (left-hand thread)	φ18±0.008	M16×1.5 (left-hand thread)	19

Product Line of Rotary Joints for Dry Air Cutting

In addition to the ESX20V series mentioned in the previous pages that adopt our "Force Optimization Technology", RIX has a variety of rotary joints for dry air cutting, including traditional "external lubrication type" and "enclosed-grease lubrication type".

ESX20J - N012

This is a bearing-less rotary joint used for dry air cutting. The sealed surface has a special lubrication slot that receives forced lubrication from outside thereby enabling non-lubricant dry air spindle-through application. This allows for combined use of coolant and oil mists at the same time. The maximum rotation of 35,000 min⁻¹ is available for dry air cutting.



L84J

This is a rotary joint for dry air cutting with built-in bearing. Like ESX20J type, this allows for dry air cutting by means of forced lubrication on the sealed surface. This allows for combined use of both coolant and oil mists. The maximum rotation of 15,000 min⁻¹ is available.



LA95 and LA96 series

Grease filled-in around the sealing sections of the L95 and L96 rotary joints with the built-in bearing mentioned on Page 16 for lubrication will enable it to use dry air. This allows for combined use of coolant and oil mists. The maximum rotation of 6,000 min⁻¹ is available.

For more information on these rotary joints, please contact us.

Patent

Drain-less Rotary Joint

The rotating sections and the fixed sections are completely separated in this bearing-less rotary joint. This structure contributes to a higher speed spindle. RIX's long stroke rotary joint enables the stroke of the drawbar to be absorbed into the joint, thus contributing to a smaller spindle.

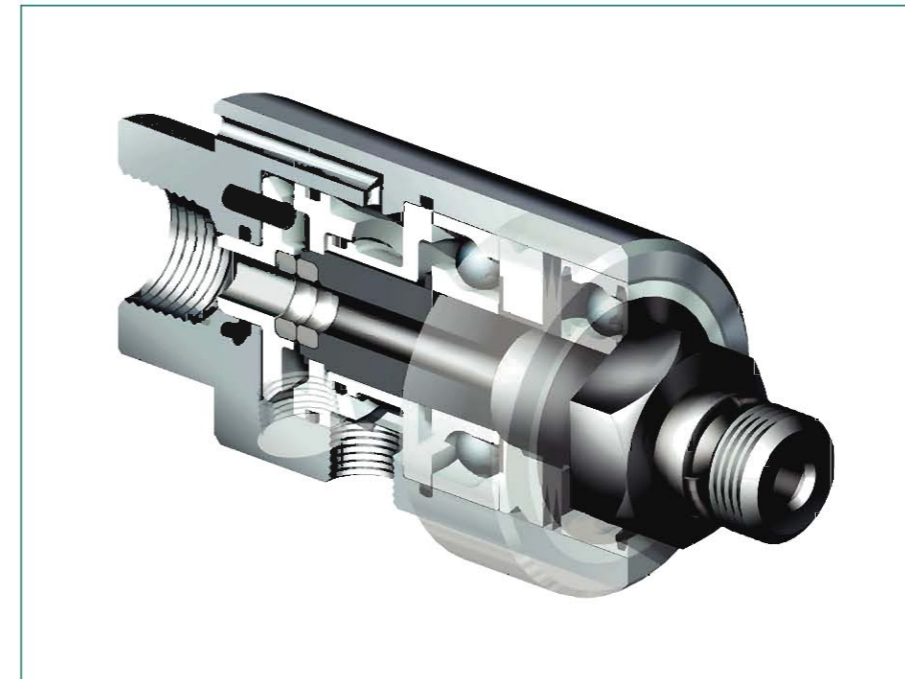
On the other hand, this complete separation and stroke structure of the bearing-less rotary joint results in a minute drain of coolant flow at the beginning.

For more information on this technology, please contact us.

The unique design of our drain-less rotary joint not only reduces drain nearly to zero at the beginning of coolant flow, but also prevents residual coolant in the pipe connected to the rotary joint from leaking from the sealed surface.

Rotary joint with built-in bearing Can be used in vertical position coolant-free rotation applicable

LX84M·LX86M Patent



Coolant-free rotation applicable

●Resistance at the seal has been minimized, ensuring rotation even when there is no coolant lubrication effect.

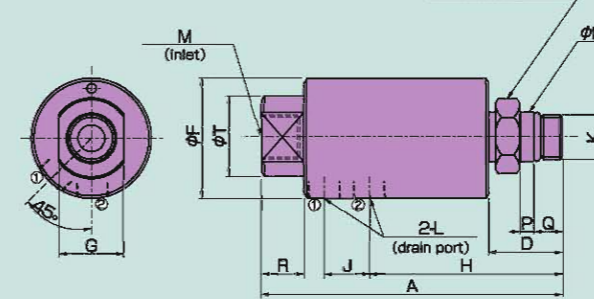
Vertical mounting applicable

- New mechanism dramatically improves drain evacuation performance, providing improved durability even in vertical mounting.
- The LX84 has a straight inlet, the LX86 an elbow.
- The 234 has a 16-mm diameter socket using M16 x 1.5 (left-hand) screws.
- The 244 has an 18-mm diameter socket, also using M16 x 1.5 (left-hand) screws. (See drawings below for mounting details.)

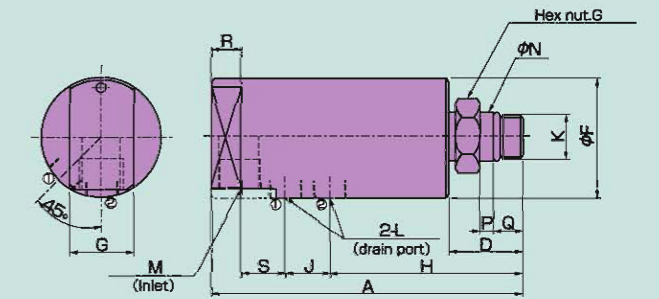
Usage conditions

Fluid	Water- or oil-based coolant, oil mist
Standard flow rate	20 liters/min. (coolant)
Operating temperature	Max. 60°C
Pressure	Coolant: Max. 7 MPa (option 12 MPa)
	Oil mist: Max. 1 MPa
Rotation speed	Max. 15,000 min ⁻¹

LX84M dimensional drawings

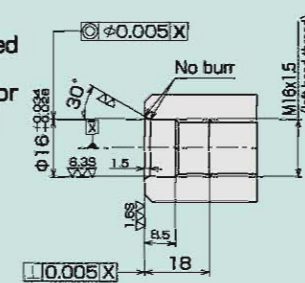


LX86M dimensional drawings



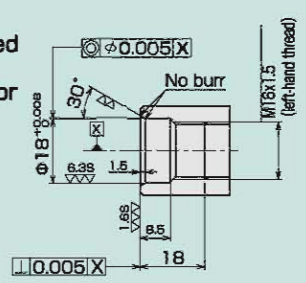
-234

Recommended machining dimensions for spindle hole



-244

Recommended machining dimensions for spindle hole



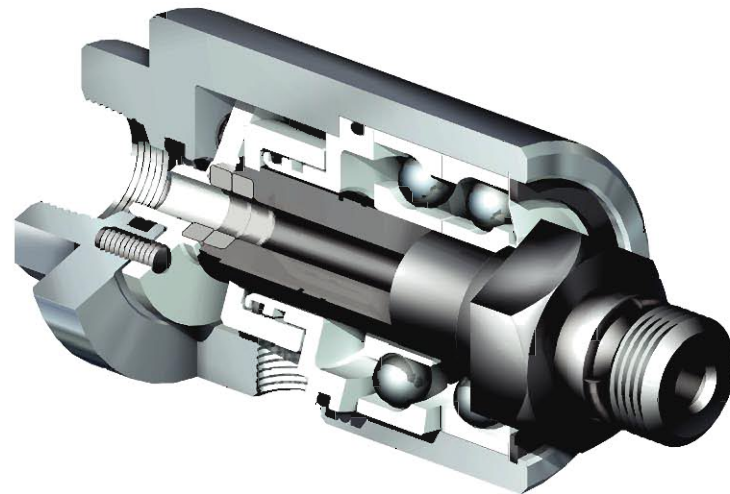
LX84M dimensions

Model	K	M	N	A	D	F	G	H	L	J	P	Q	R	T	weight (kg)
LX84M-234	M16x1.5LH	Rc 3%	16.025 16.017	113	27.5	44	24	72.5	Rc 1/4	17	5	11	16	30	0.43
LX84M-244	M16x1.5LH	Rc 3%	17.999 17.991	113	27.5	44	24	72.5	Rc 1/4	17	5	11	16	30	0.43

LX86M dimensions

Model	K	M	N	A	D	F	G	H	L	J	S	P	Q	R	weight (kg)
LX86M-234	M16x1.5LH	Rc 3%	16.025 16.017	117	27.5	44	24	72.5	Rc 1/4	17	16.5	5	11	11	0.46
LX86M-244	M16x1.5LH	Rc 3%	17.999 17.991	117	27.5	44	24	72.5	Rc 1/4	17	16.5	5	11	11	0.46

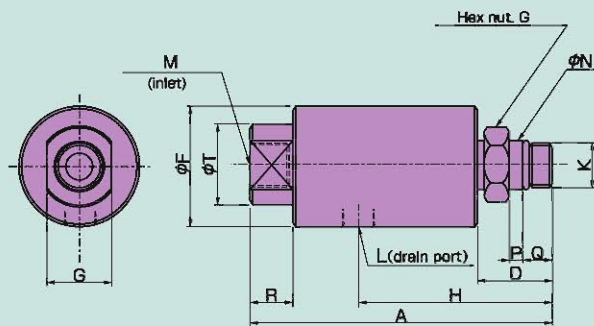
L91M·L92M



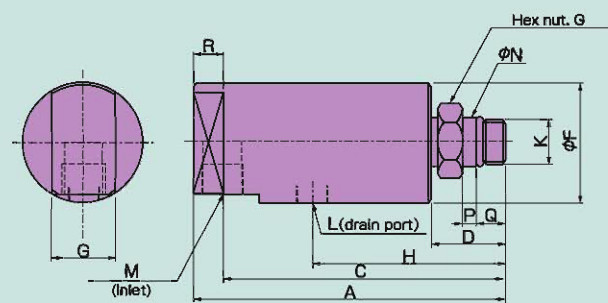
- Rotating shaft has been highly finished for the absolute minimum vibration in ultra high-speed operation, supported by pre-pressurized bearings and other design features.
- The L91 has a straight inlet, and the L92 an elbow.
- The 234 has a 16-mm diameter socket using M16 x 1.5 (left-hand) screws.
- The 244 has an 18-mm diameter socket, also using M16 x 1.5 (left-hand) screws. (See drawings P.12 for mounting details.)
- Vertical mount applicable

Usage conditions	
Fluid	Water- or oil-based coolant, Oil mist
Standard flow rate	20 liters/min. (coolant)
Operating temperature	Max. 60°C
Pressure	Coolant : Max. 12 MPa
	Oil mist : Max. 0.7 MPa
Rotation speed	Max. 16,000 min ⁻¹ (9 MPa) 12,000 min ⁻¹ (12 MPa)

L91M dimensional drawings



L92M dimensional drawings



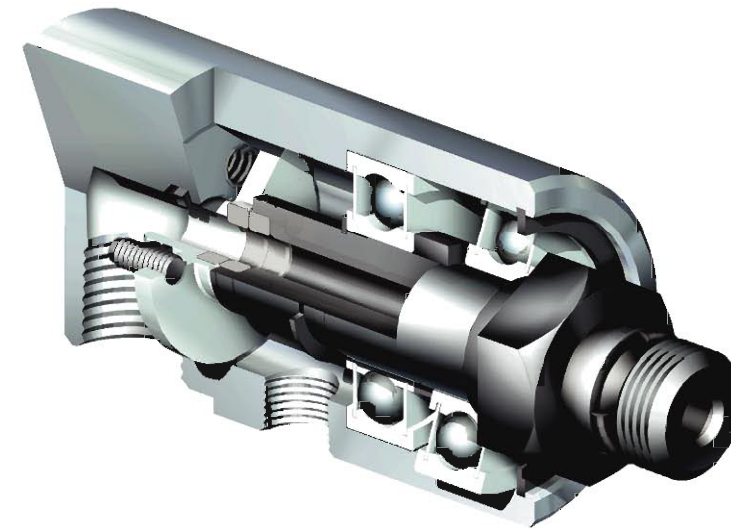
L91M dimensions

Model	K	M	N	A	D	F	G	H	L	P	Q	R	T	Weight (kg)
L91M-234	M16×1.5LH	Rc 3/8	16.025 16.017	102	27.5	43	24	65	Rc 1/4	5	11	11	30	0.34
L91M-244	M16×1.5LH	Rc 3/8	17.999 17.991	102	27.5	43	24	65	Rc 1/4	5	11	11	30	0.34

L92M dimensions

Model	K	M	N	A	C	D	F	G	H	L	L	P	Q	R	Weight (kg)
L92M-234	M16×1.5LH	Rc 3/8	16.025 16.017	106	94	27.5	43	24	65	Rc 1/4	19	5	11	11	0.37
L92M-244	M16×1.5LH	Rc 3/8	17.999 17.991	106	94	27.5	43	24	65	Rc 1/4	19	5	11	11	0.37

L95M·L96M

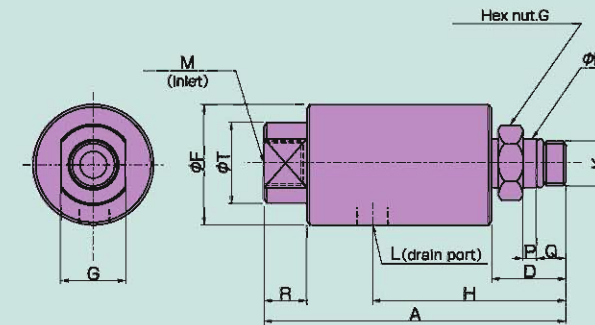


Standard type

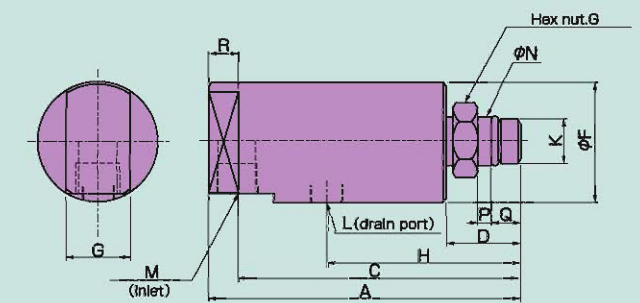
- The standard design for a rotary joint with bearings, combining high-speed rotation, and a long service life.
- The L95 has a straight inlet, and the L96 an elbow.
- The 234 has a 16-mm diameter socket using M16 x 1.5 (left-hand) screws.
- The 244 has an 18-mm diameter socket, also using M16 x 1.5 (left-hand) screws. (See drawings P.12 for mounting details.)
- Horizontal mount only
- Fill-in grease type. LA95 and 96 series are also available for dry air cutting. See Page 13.

Usage conditions	
Fluid	Water- or oil-based coolant, Oil mist
Standard flow rate	20 liters/min. (coolant)
Operating temperature	Max. 80°C
Pressure	Coolant : Max. 7 MPa
	Oil mist : Max. 0.7 MPa
Rotation speed	Max. 6,000 min ⁻¹

L95M dimensional drawings



L96M dimensional drawings



L95M dimensions

Model	K	M	N	A	D	F	G	H	L	P	Q	R	T	Weight (kg)
L95M-234	M16×1.5 LH	Rc 3/8	16.025 16.017	102	27.5	43	24	65	Rc 1/4	5	11	11	30	0.34
L95M-244	M16×1.5 LH	Rc 3/8	17.999 17.991	102	27.5	43	24	65	Rc 1/4	5	11	11	30	0.34

L96M dimensions

Model	K	M	N	A	C	D	F	G	H	L	S	P	Q	R	Weight (kg)
L96M-234	M16×1.5 LH	Rc 3/8	16.025 16.017	106	94	27.5	43	24	65	Rc 1/4	19	5	11	11	0.37
L96M-244	M16×1.5 LH	Rc 3/8	17.999 17.991	106	94	27.5	43	24	65	Rc 1/4	19	5	11	11	0.37

EES-2P01

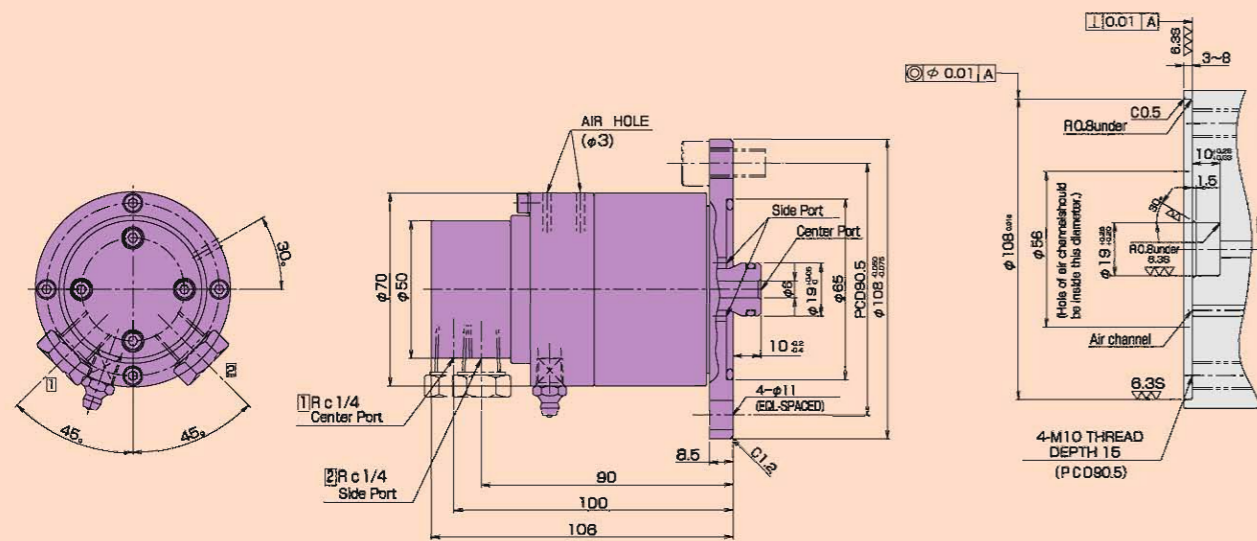


This is a rotary joint to supply fluids to the lathe chuck section. 2 ports for fluid pathway can supply two types of fluids such as coolant and dry air at the same time.

Usage conditions	
Fluid used	Water-soluble/oil-based coolant, dry air and oil air.
Pressure	Coolant Max.7MPa
	Dry air Max.0.2MPa Oil air Max.0.6MPa
Rotation Speed	Max. 8,000 min ⁻¹
Weight	1.8kg

For combination of fluids to be used and their conditions, please contact us.

EES-2P01 dimensional drawings



LA-1P01/1P02



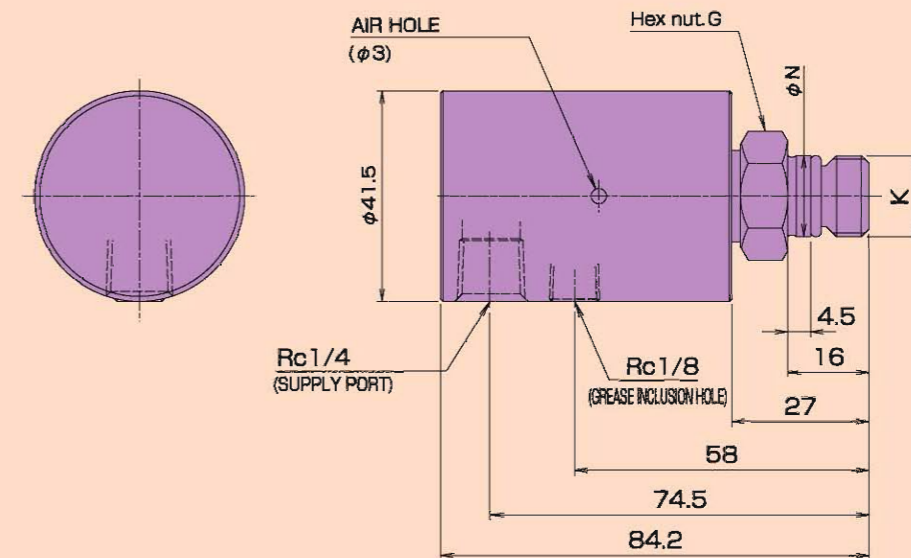
This is a rotary joint to supply fluid to the lathe chuck section. It is designed to filled-in grease around the sealing section to allow for switching to either coolant or dry air.

For the fitting section:
1P01 for 234 fitting, socket diameter φ16
Screw: M16×1.5 (left)
1P02 for 244 fitting, socket diameter φ18
Screw: M16×1.5 left
(For the shape of the fitting section, refer to Page 14.)

This can also be used for the spindle of a machining center.

Usage conditions	
Fluid used	Water-soluble/oil-based coolant, dry air and oil air.
Pressure	Coolant Max.7MPa
	Dry air Max.1.0MPa
Rotation Speed	Max. 6,000 min ⁻¹

LA-1P01/LA-1P02 dimensional drawings



LA-1P01/LA-1P02 dimensions

Model	K	N	G	Weight (kg)
LA-1P01	M16×1.5 (left-hand thread)	16.026~16.008	22	0.33
LA-1P02	M16×1.5 (left-hand thread)	17.999~17.991	22	0.33

Rotary joint for ball screw cooling

ES50-1600/2000

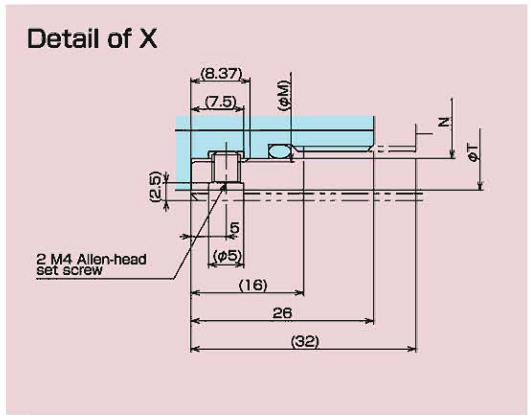
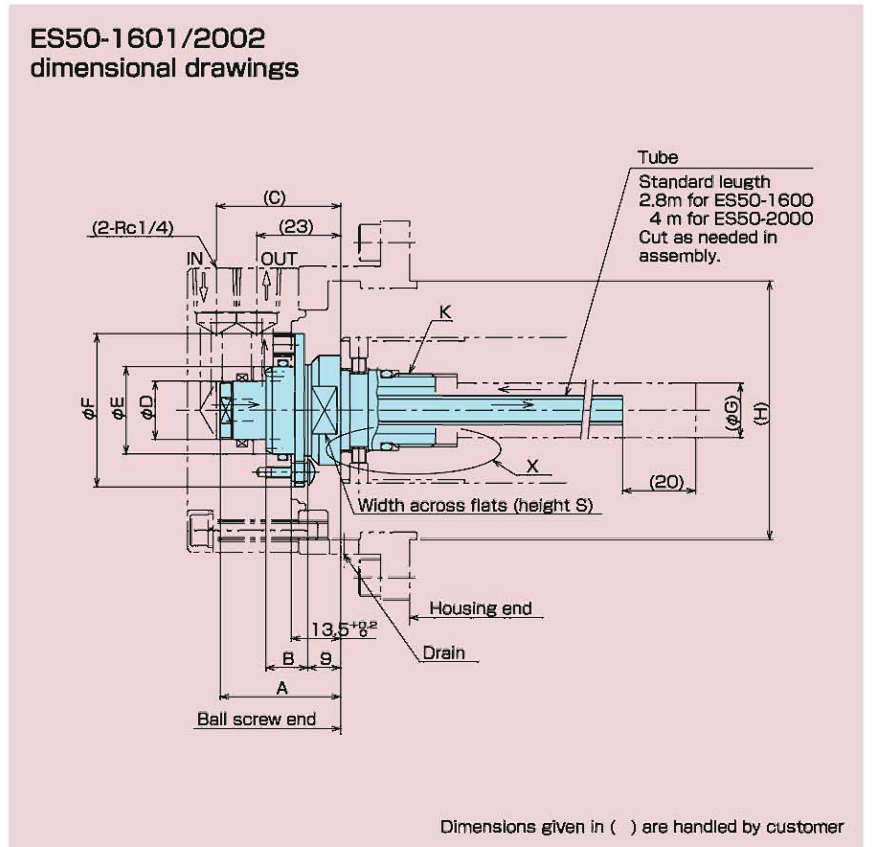


Recent machining demands increasingly high precision and efficiency. To prevent accuracy loss caused by heat generation, ball screws require hollow-core cooling. The ES50 uses a raturm-type joint design to resolve the problems of the traditional oil seal method.

Long life, low friction, excellent maintainability

- Long life: Low-friction mechanical seal assures long oil seal service life.
- Low torque and low heat generation: Low-friction mechanical seal reduces torque to only a tenth that of oil seal designs.
- Excellent maintainability: Return structure makes it possible to replace joints without removing other components.

Usage conditions	
Fluid	Cooling oil
Standard flow rate	ES50-1600:3 liters/min ES50-2000:5 liters/min
Operating temperature	Max. 60°C
Pressure	Max. 1 MPa
Rotation speed	Max. 5,000 min ⁻¹ Typ. 3,000 min ⁻¹



ES50-1600 (2000) dimensions

Model	A	B	C	D	E	F	G	H	K	L	M	N	T	S
ES50-1600	32	11	33	14	20	38	12	φ61h5 (H7)	M16×1.5 (right-hand thread)	2.8m	19	φ18f7 (H7)	27	24
ES50-2000	33	11.5	34	16	24	42	15	φ71h5 (H7)	M20×1.5 (right-hand thread)	4m	23	φ22g6 (H7)	34	27

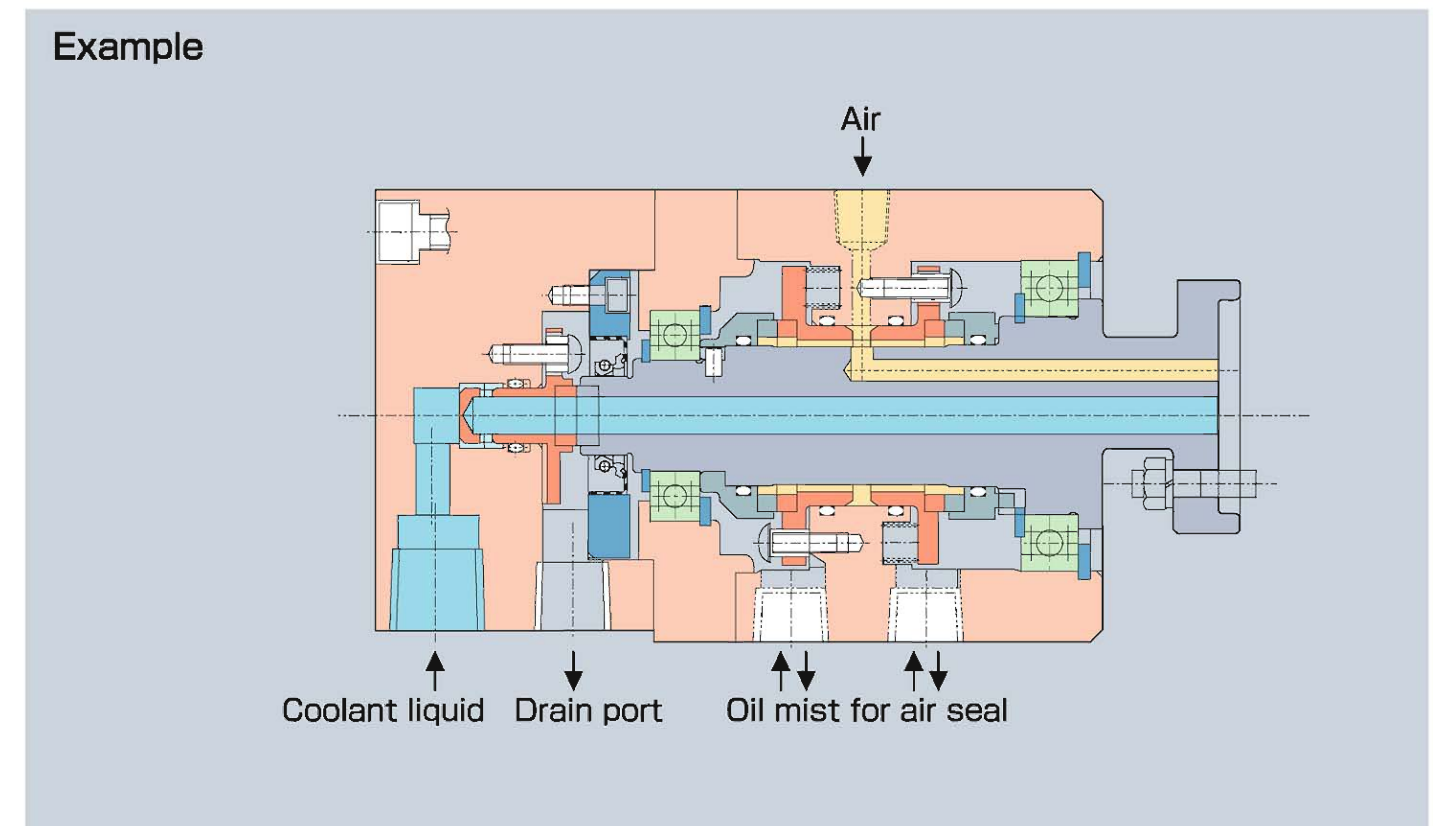
Multi-port Rotary Joint

In addition to spindle-through, lathe chuck and ball screw cooling applications, machine tools are required to supply multiple fluids to rotating sections.

RIX provides various multi-port rotary joints that serve the many applications required for machine tools, including mating detection (coolant/air), internal mixing MQL (oil/air), spindle cooling (coolant/cooling oil) and rotating table control (hydraulic oil).

These multi-port rotary joints are all tailor-made based on the specifications given by the customers.

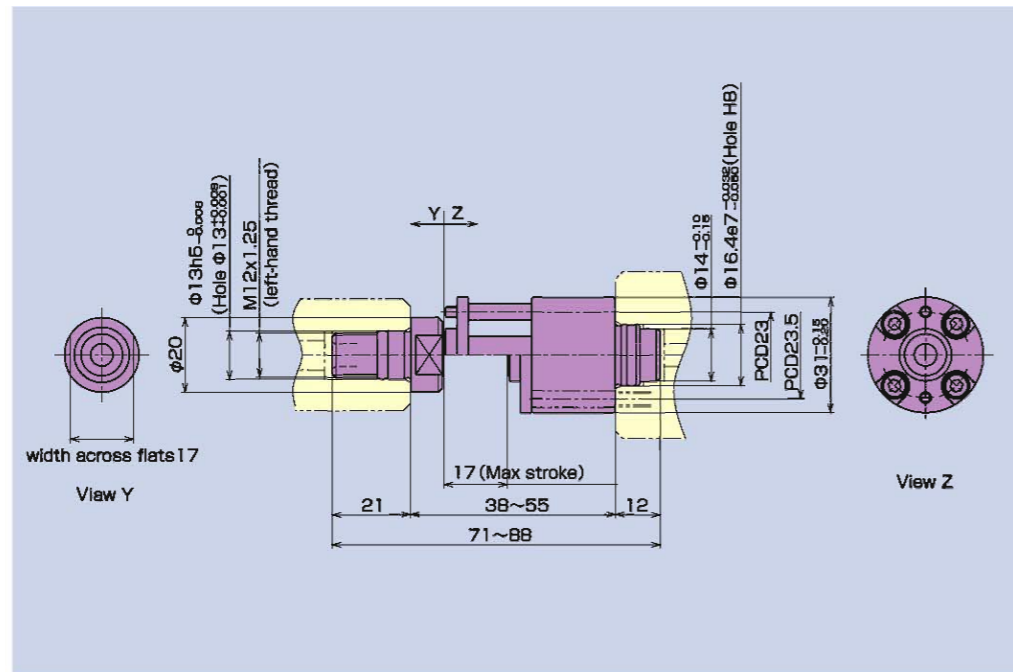
For more information, please contact us.



Ultra-long stroke rotary joint

ESX20-8834

It is possible for the rotary joint to completely absorb long strokes from HSK, CAPTO and other shanks. While still in a compact design, with dimensions unchanged, this rotary joint offers an astonishing 17-mm stroke.

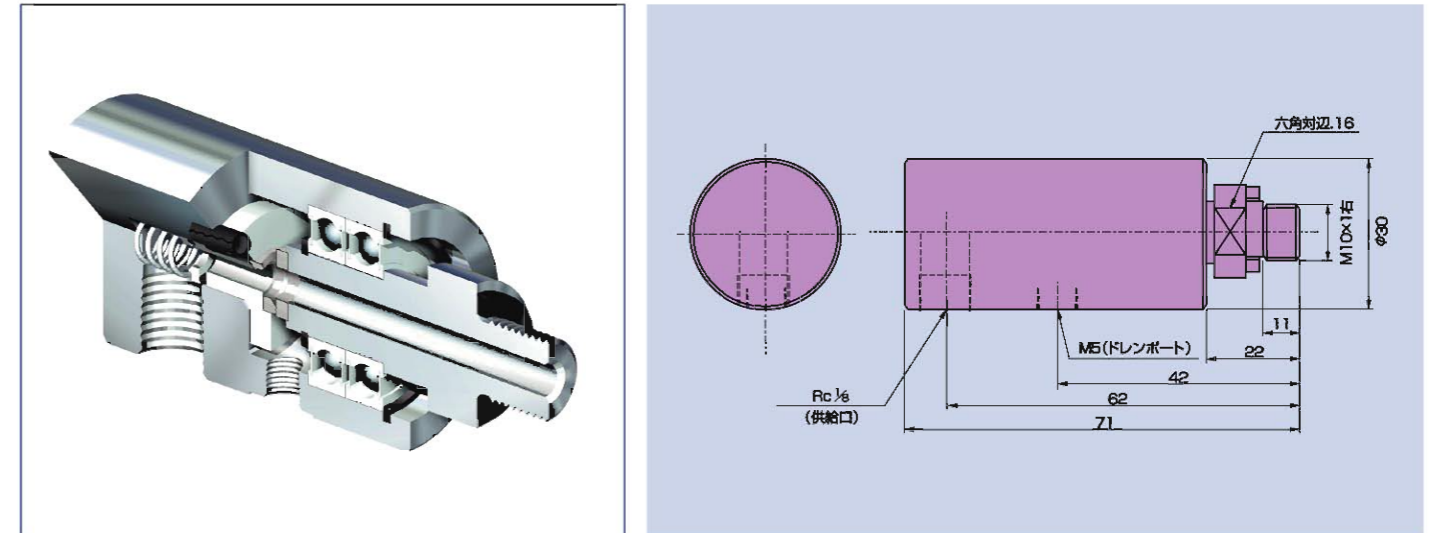


Rotary joint with built-in bearing Compact, high-pressure type

L60

High pressure specification in a compact body

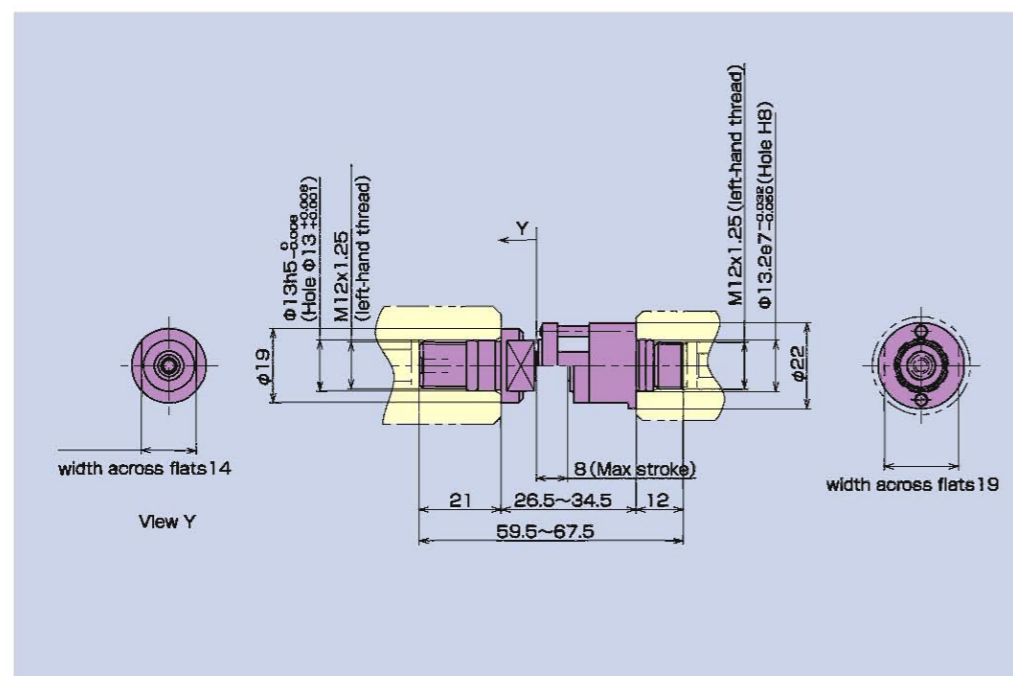
Designed for high pressure, small volume applications. The compact body is recommended for applications where space is restricted.



Ultra-compact, long-stroke rotary joint (22-mm outer diameter)

ESX10-8678

To meet strong demand for even smaller models, this compact design offers an outer diameter of only 22 mm while providing a long 8-mm stroke. Recommended for developing small multi-function machines.



Rotary joint with built-in bearing Polygonal joint fitting, externally-supported type.

LX88M-9801

The rotary joint with built-in bearing will firmly support the joint body and transmit rotation with polygon shape (hexagonal and octagonal) to achieve high speed rotation.

