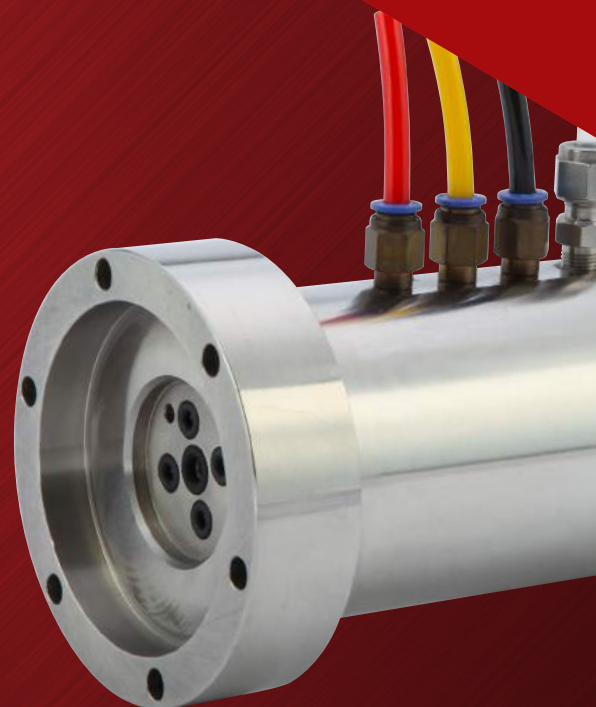
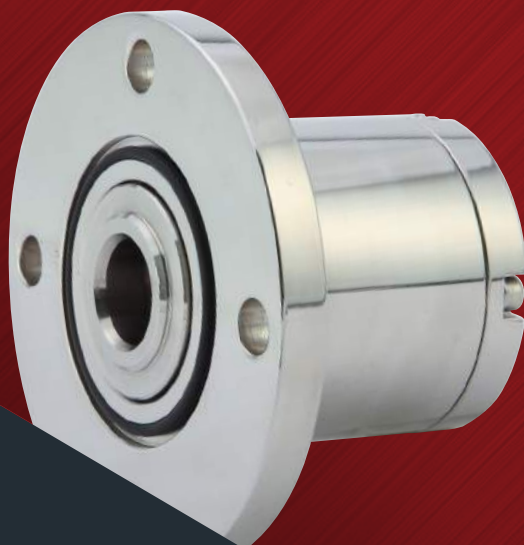


# HIGH VACUUM & PRESSURE ROTARY SEALING UNIT



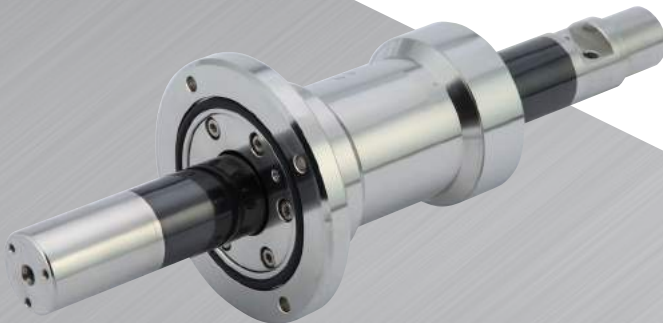


Sealink Corp. is one of the world's leading companies specialized in designing, manufacturing and marketing rotary sealing solutions for vacuum and pressure .

These solutions include rotary feedthroughs, linear feedthroughs, double acting - rotary & linear motion - feedthroughs and rotary unions applied to high vacuum or high pressure process lines. These simplify and further improve the conventional magnetic and mechanical sealing units.

We offer customized sealing units to meet customer's application requirements as well as standard sealing units for a wide range of industries including semiconductor, LCD and OLED industries, pharmaceutical and chemical processing Industries, etc.

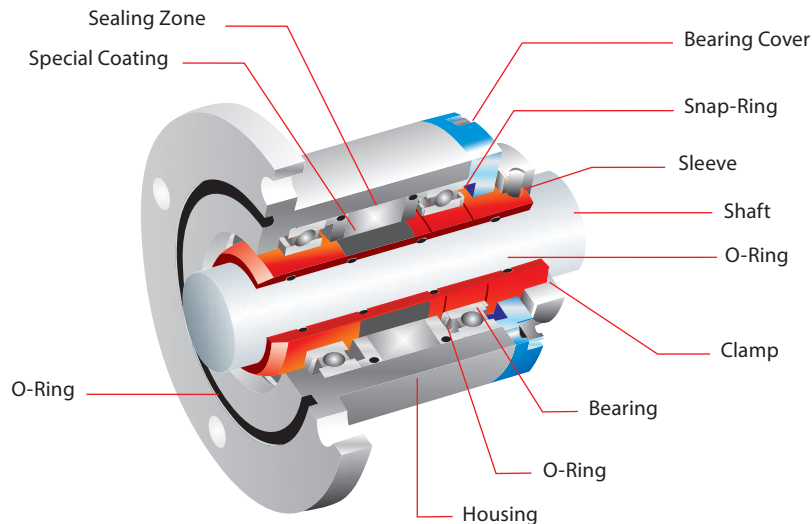
All our products are manufactured under strict quality control and in ISO 9001 / ISO 14001 certified manufacturing facility in Korea and we will always continue to improve our present products and technology for further customer satisfaction.



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## Sealink Technology : *Sealing Mechanism*



In a successful rotary seal, a thin continuous liquid film, on the order of  $1\mu\text{m}$  thick and approximately  $0.05 \sim 0.1\text{mm}$  in axial length, exists between the seal and the rotating shaft. This film prevents mechanical and thermal damage to the seal, and reduces wear and heat generation. Thus, a central objective of a seal design must be the creation of a fluid film with desirable characteristics. The film is kept intact by elevated pressures within the film, which provide the load support necessary to lift the seal off of the shaft. These pressures are hydrodynamically generated by asperities on the seal surface, acting in conjunction with the rotating shaft, which drags fluid past the asperities in the circumferential direction. The asperities therefore act as miniature slide bearings.

It is also well known that the asperities on the seal surface play a dominant role in preventing leakage of fluid through the film. When the shaft rotates, it induces circumferential shear stresses in the film and the seal surface, which deform the seal surface and the asperities. If the seal macro-geometry is designed properly, the deformed asperities act like a shear pump and produce reverse pumping from the air-side of the seal towards the air-side, and prevents leakage. The micro-geometry of the seal surface in the sealing zone is very important. If the surface is very smooth, with very few asperities, then the reverse pumping rate will be insufficient and the seal will not perform well. The macro-geometry of the seal, i.e. the seal cross-section, is another important factor. Asperities on the shaft surface play a secondary role, since the shaft surface becomes polished during the running-in period, and is much smoother than the seal.

The load support mechanism and the reverse pumping mechanism of rotary seal can be modeled by utilizing an elastohydrodynamic analysis which requires a hydrodynamic analysis of the flow in the lubricating film and a deformation analysis of the seal. These two analysis must be coupled since the hydrodynamic analysis yields the pressure and shear stress distribution, which affects the hydrodynamics. This coupling is handled by means of an interactive computation procedure.

The hydrodynamic analysis consists of a numerical solution following the Reynolds equation which governs the flow field in the fluid film, using a mass-conserving algorithm that accounts for cavitation.



$$\frac{\partial}{\partial x} \left( -\frac{h^3}{12} \frac{\partial p}{\partial x} \right) + \lambda^2 \frac{\partial}{\partial y} \left( -\frac{h^3}{12} \frac{\partial p}{\partial y} \right) = \Lambda \frac{\partial \rho}{\partial x}$$

The film thickness  $h$  can be expressed as :

$$h = \delta + h_n + h_s$$

Where  $\delta$  denotes average film thickness,  $h_n$  and  $h_s$  are film thickness due to normal and shear deformation of seal surface.

The Reynolds equation can be solved using a finite difference scheme and the radial and circumferential seal deformations are computed through a coefficient approach. The couplings between the governing equations are handled by an interactive computational procedure.

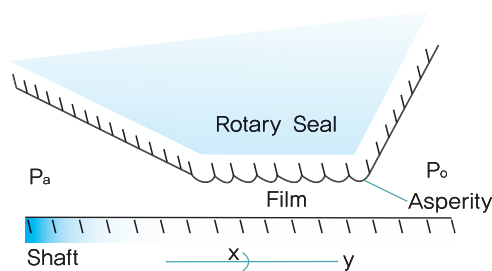
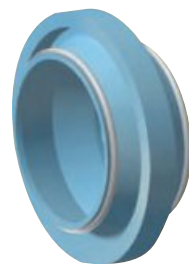
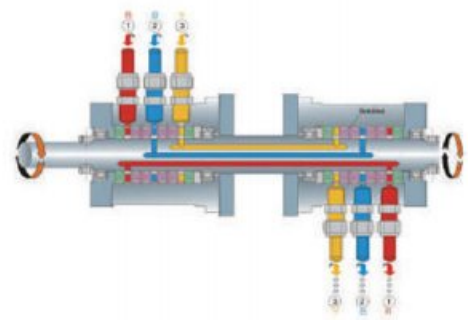


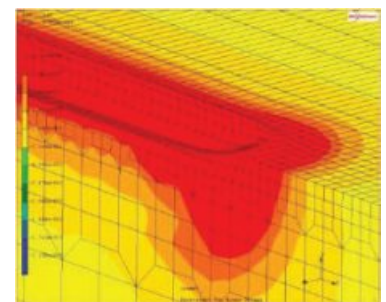
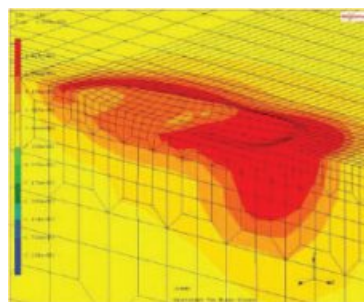
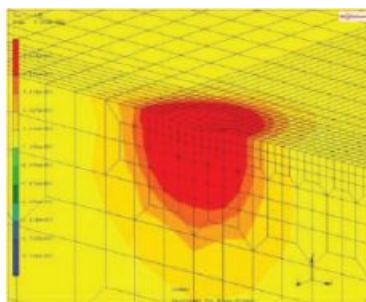
Fig. Schematic diagram of sealing zone



(1) A sample of nonlinear seal profile

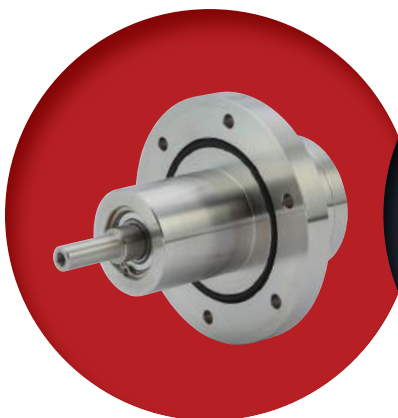


(2) 3D shape with shaft

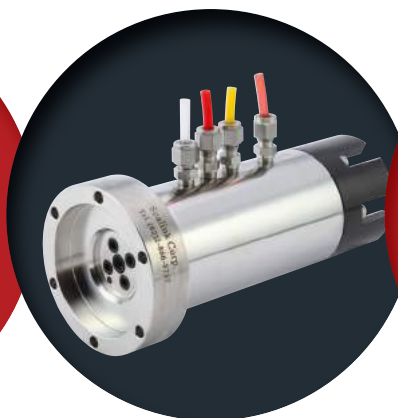


(3) Stress distribution

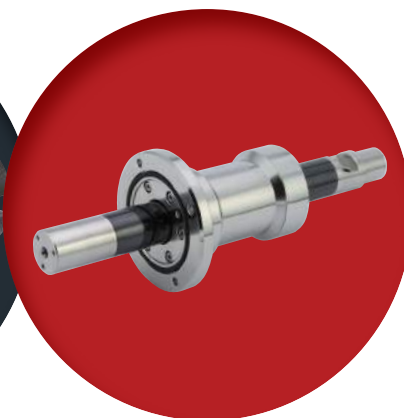
## Sealink Products



**Rotary Feedthrough**  
(RF Type)



**Rotary Union**  
(RU Type)



**Rotary & Linear Feedthrough**  
(RL Type)

### Condition

- High Vacuum
- High Pressure

### Media to be sealed

- Reactive Gas & Liquid
- Inert Gas & Liquid
- Water
- Oil, etc

## Specifications

<b>Motion</b>	Rotary, Linear, Rotary & Linear, Co-Axial, Multi-Axial
<b>Media</b>	Reactive Gas, Inert Gas, Water, Oil and other Liquids
<b>Temperature Range</b>	-20 ~ 150°C (-4 ~ +300°F) without cooling system -20 ~ 400°C (-4 ~ +750°F) with optional cooling system
<b>Leakage Rate in Vacuum</b>	Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /s by Helium Leakage Detector
<b>Leakage Rate in Pressure</b>	Up to $3.5 \times 10^{-2}$ bar/min, 0.5 psi/min by Nitrogen gas
<b>Vacuum</b>	Max. $10^{-8}$ Torr, Max. $10^{-6}$ Pa
<b>Pressure</b>	Max. 50 bar (PV Limits : Max. 50)
<b>Speed</b>	Max. 15 m/s
<b>Shaft Diameter</b>	ø6 ~ ø1,800 mm
<b>Torque</b>	Depending on the type and customer's application requirements

*Sealink also provides customized products to meet the operating conditions of your devices.*

## Comparison of Three Types of Sealing Units

Seal Type	Mechanical Seal	Magnetic Seal	Sealink Seal
Theory	Face Contact	Ferrofluid	Nonlinear Contact
Vacuum	X	O	O
Pressure	O	X	O
Gas	X	O	O
Liquid	O	X	O
Lubricant	Required	Not Required	Not Required

All our products are hermetically sealed by our unique sealing technology and operated in dry running condition without buffer fluid reservoir for the lubricants and cooling systems below 150°C/300°F (operable up to 400°C/750°F with optional cooling systems).

And our linear sealing systems do NOT use metallic bellows which result in saving space and cost.

## We have **PATENTS!**

### Applications

#### Semiconductor Equipment, LCD and OLED Industries

CVD, MOCVD, LPCVD, PECVD, PCD, ALD, CMP, OLED, LCD device, FPD device, Wafer handling device, Vacuum deposition system, Ion Implanter, Etcher, Asher, Edge Grinder, Scrubber, RTP, Sputter, Lamp device, Autoclave, Wafer robot, etc.

#### Petrochemical, Fine Chemical, Marine, Steel and General Machinery Industries

Mixer, Agitator, Reactor Vessel, etc.

## 1.

## Sealink Unit : Rotary Feedthrough, RF Type

A rotary feedthrough is a precision mechanical device which allows to transfer rotational motion from atmosphere into vacuum or differential pressure environments.

The rotating components of our rotary feedthroughs are hermetically sealed by our unique sealing technology with nonlinear contact, unlike a face contact of conventional mechanical seals which need lubricant for lowering the friction. Therefore, Sealink Seals don't need lubricant supplying system and eliminate the risk of explosion caused by a leak of lubricant.

We provide standard rotary feedthroughs with solid or hollow shaft and customized products with various options such as pressure, vacuum, speed, and temperature requirements. Therefore, you can retrofit conventional feedthroughs with Sealink's products without extra equipment.

Our hollow shaft type rotary feedthroughs are suitable for applications that require the use of a non-magnetic shaft or a shaft having a special shape such as tube, drive shaft or the like.

### ● Advantages

- Hermetically sealed with our unique and most advanced sealing technology
- Being able to operate under both high vacuum and high pressure environments
- A variety of media to be sealed: Both gas and liquid such as reactive gas, inert gas, chemical, oil, water and coolants, etc.
- No Cooling Unit required up to 150°C/300°F (Operable up to 400°C/750°F with cooling system).
- No Lubricant Supply required, resulting in eliminating explosion accidents by leaks of lubricating oil
- Compact and Simple Construction
- Solid shaft and Hollow shaft types available
- Customized design available
- Optional Real-time Leakage Monitoring system available

### ● Typical Applications

#### Semiconductor Equipment, LCD and OLED Industries

CVD, MOCVD, LPCVD, PECVD, PCD, ALD, CMP, OLED, LCD device, FPD device, Wafer handling device  
Vacuum deposition system, Ion Implanter, Etcher, Asher, Edge Grinder, Scrubber, RTP, Sputter, Lamp device, Autoclave, Wafer robot, etc.

#### Petrochemical, Fine Chemical, Marine, Steel and General Machinery Industries

Mixer, Agitator, Reactor Vessel, etc.



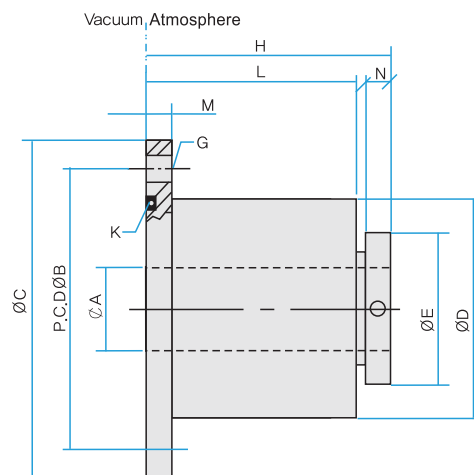
## ● Specifications

<b>Vacuum</b>		Max. $10^{-8}$ Torr, Max. $10^{-6}$ Pa
<b>Pressure</b>		Max. 50 bar (PV Limits : Max. 50)
<b>Leakage Rate</b>	<b>Vacuum</b>	Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /s by Helium Leak Detector
	<b>Pressure</b>	Up to 0.5 psi/min by Nitrogen Gas
<b>Temperature Range</b>		-20 ~ 150°C (-4 ~ +300°F) without cooling system -20 ~ 400°C (-4 ~ +750°F) with optional cooling system
<b>Media Type</b>		Gas and Liquid (Reactive Gas, Inert Gas, Water, Oil, Steam, Air, Chemical, Coolant, and a variety of other media)
<b>Speed</b>		Max. 15 m/s
<b>Shaft Diameter</b>		ø6 ~ ø1,200mm
<b>Material</b>	<b>Housing</b>	304 or 316L Stainless Steel or others
	<b>Shaft</b>	304 or 316L Stainless Steel or others
	<b>Bearing</b>	SUJ2 High Carbon Chrome Bearing Steel or others

## ● Model Numbers of Rotary Feedthroughs

<b>RF</b>	—	<b>HS</b>	—	<b>010</b>	<b>F</b>	<b>N</b>
<b>Product</b> <b>RF:</b> Rotary Feedthrough  <b>RU:</b> Rotary Union <b>RL:</b> Rotary & Linear Feedthrough		<b>Shaft Type</b> <b>SS:</b> Solid Shaft <b>HS:</b> Hollow Shaft		<b>Shaft Diameter</b> <b>Metric Size:</b> mm <b>Inch Size:</b> inch <b>010</b> = 10 mm <b>250</b> = 0.250 inch		<b>Media Compatibility</b> <b>N:</b> Inert Gas <b>R:</b> Reactive Gas <b>C:</b> Chemical <b>W:</b> Water <b>O:</b> Oil
				<b>Mounting Type</b> <b>F:</b> Flange mount <b>T:</b> Threaded mount <b>N:</b> Nut mount <b>C:</b> Cartridge mount		

## RF-HS-F series Hollow Shaft Rotary Feedthrough (Flange Mount)



### Inch Sizes

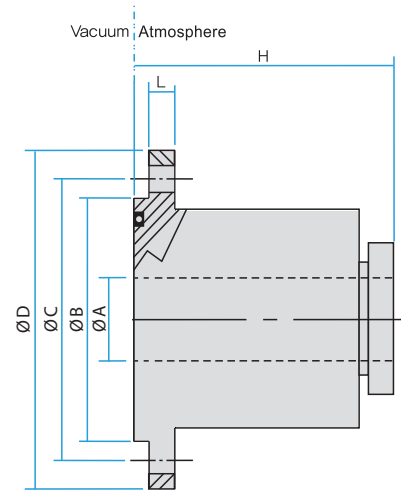
Model No.	ØA	ØB	ØC	ØD	H	L	M	N	G	K
RF-HS-250FN	0.250	2.312	2.73	1.50	4.06	2.56	0.5	0.75	0.265	O-Ring
RF-HS-375FN	0.375	2.312	2.73	1.50	4.56	3.06	0.50	0.75	0.265	O-Ring
RF-HS-500FN	0.500	4.750	6.00	2.87	6.03	3.56	0.38	1.25	0.750	O-Ring
RF-HS-750FN	0.750	4.750	6.00	2.87	6.03	3.562	0.38	1.218	0.750	O-Ring

### Metric Sizes

Model No.	ØA	ØB	ØC	ØD	ØE	H	L	M	N	G	K
RF-HS-010FN	10	70	90	51	34	78	64	10	10	4- Ø10	O-Ring
RF-HS-020FN	20	85	105	63	44	82.5	68.5	10	10	4- Ø10	O-Ring
RF-HS-025FN	25	100	120	71	49	88	74	10	10	4- Ø10	O-Ring
RF-HS-030FN	30	100	120	78	54	93	79	10	10	4- Ø10	O-Ring
RF-HS-040FN	40	120	145	90	69	96	80	10	10	4- Ø12	O-Ring
RF-HS-050FN	50	135	160	103	79	98	82	12	12	4- Ø12	O-Ring
RF-HS-075FN	75	185	210	143	109	115	96	12	12	4- Ø12	O-Ring

\* Shaft tolerance is h8 by ISO 286 / BS 4500

## RF-HS-F series

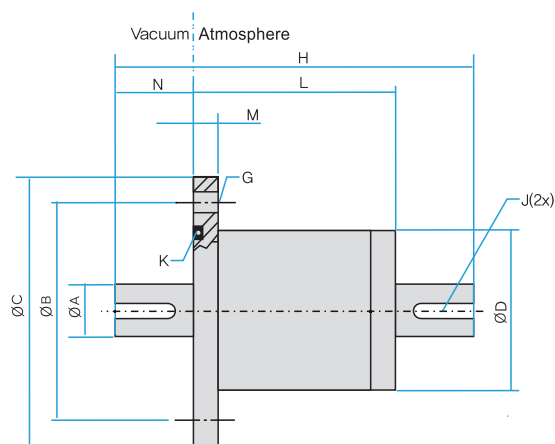


### Metric Sizes

Model No.	ØA	ØB	ØC	ØD	L	H
RF-HS-040FN	40	91	110	175	115	165
RF-HS-050FN	50	107	176	240	115	175
RF-HS-060FN	60	120	176	240	125	195
RF-HS-080FN	80	149	204	275	140	215
RF-HS-100FN	100	174	234	305	140	230
RF-HS-125FN	125	199	260	330	160	255
RF-HS-140FN	140	218	313	395	170	275
RF-HS-160FN	160	237	313	395	170	275
RF-HS-180FN	180	263	364	445	190	300
RF-HS-200FN	200	288	364	445	190	320
RF-HS-220FN	220	326	422	505	200	335



## RF-SS-F series Solid Shaft Rotary Feedthrough (Flange Mount)



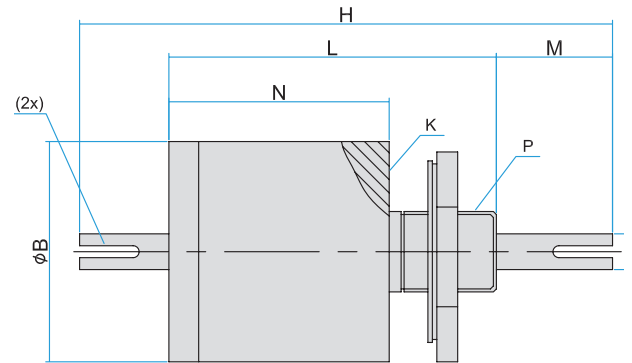
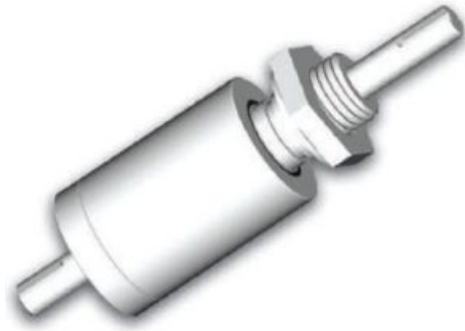
### Inch Sizes

Model No.	ØA	ØB	ØC	ØD	H	L	M	N	G	J	K
RF-SS-250FN	0.250	2.312	2.73	1.50	4.06	2.56	0.5	0.75	0.265	0.030dx40L(flat)	O-Ring
RF-SS-375FN	0.375	2.312	2.73	1.50	4.56	3.06	0.50	0.75	0.265	0.030dx40L(flat)	O-Ring
RF-SS-500FN	0.500	4.750	6.00	2.87	6.03	3.56	0.38	1.25	0.750	0.126wx0.77dx1.0L	O-Ring
RF-SS-750FN	0.750	4.750	6.00	2.87	6.03	3.562	0.38	1.218	0.750	0.188wx0.114dx10L	O-Ring

### Metric Sizes

Model No.	ØA	ØB	ØC	ØD	H	L	M	N	G	J	K
RF-SS-006FN	6	60	80	38	97.5	57.5	10	20	4- Ø 10	0.5d x 12L(Flat)	O-Ring
RF-SS-010FN	10	60	80	44	119.5	69.5	10	25	4- Ø 10	3w x 1.8d x 14L	O-Ring
RF-SS-012FN	12	70	90	48	133.5	73.5	10	30	4- Ø 10	4W x 2.5d x 20L	O-Ring
RF-SS-020FN	20	85	105	63	151.5	81.5	10	35	4- Ø 10	6W x 3.5d x 25L	O-Ring
RF-SS-030FN	30	135	160	105	220	140	20	40	4- Ø 12	10w x 5d x 30L	O-Ring
RF-SS-040FN	40	156	188	116	312.5	152.5	20	80	6- Ø 12	12W x 5d x 40L	O-Ring
RF-SS-050FN	50	185	225	145	373.5	173.5	20	100	6- Ø 12	15w x 5d x 50L	O-Ring

## ■ RF-SS-T Series Solid Shaft Rotary Feedthrough (Threaded Mount)



### Inch Sizes

Model No.	ØA	ØB	H	L	M	N	P	J	K
RF-SS-188TN	0.1875	0.63	2.562	1.58	0.50	1.3	5/16-24 UNF-2A	0.030dx0.37L(flat)	O-Ring
RF-SS-250TN	0.250	0.75	3.437	1.937	0.75	1.562	7/16-20 UNF-2A	0.030dx0.40L(flat)	O-Ring
RF-SS-500TN	0.500	2.87	8.812	5.072	2.49	3.562	1"-14 UNS-2A*	0.126wx0.77dx1.0L	O-Ring
RF-SS-750TN	0.75	2.87	8.812	5.072	2.49	3.562	1"-14 UNS-2A*	0.188wx0.114dx1.0L	O-Ring

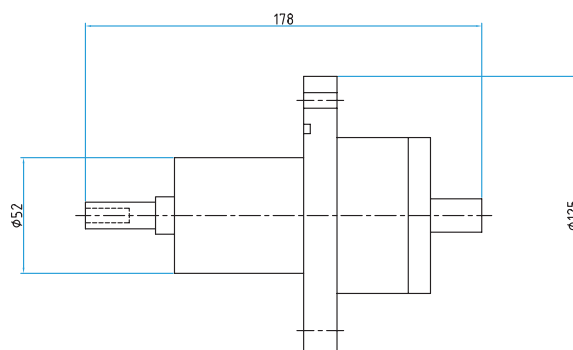
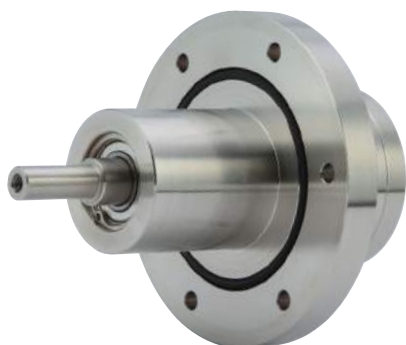
### Metric Sizes

Model No.	ØA	ØB	H	L	M	N	P	J	K
RF-SS-004TN	4	21	76.5	46.5	15	36.5	M12x1.5	0.5dx10L(flat)	O-Ring
RF-SS-005TN	5	21	76.5	46.5	15	36.5	M12x1.5	0.5dx10L(flat)	O-Ring
RF-SS-006TN	6	21	76.5	46.5	15	36.5	M12x1.5	0.5dx10L(flat)	O-Ring
RF-SS-012TN	12	48	179	109	40	74	M25x1.5	4Wx2.5dx20L	O-Ring
RF-SS-020TN	20	63	211	121	55	82	M30x1.5	6Wx3.5dx25L	O-Ring

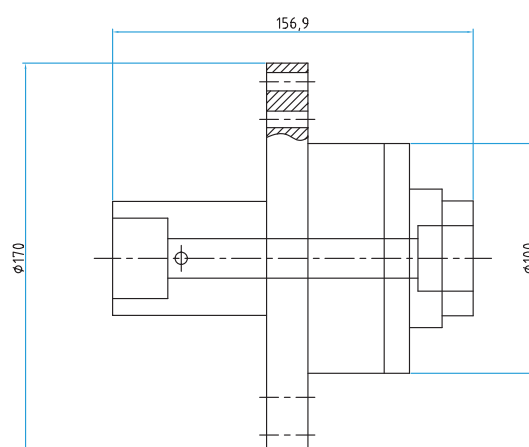


## ■ New Products

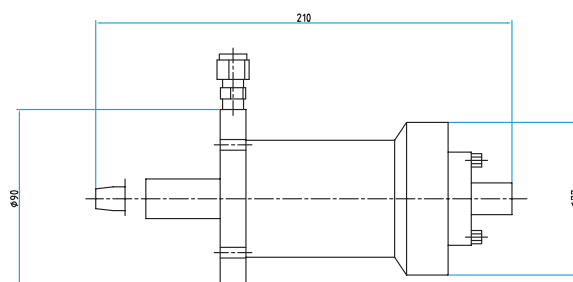
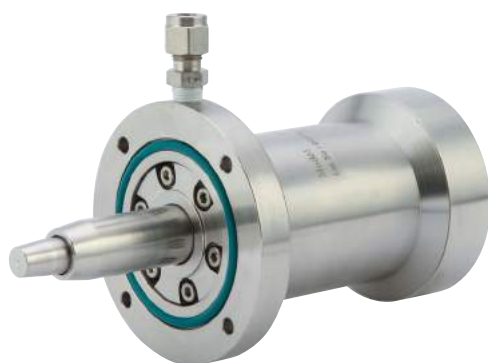
### ● RF-SS-F Series



### ● RF-HS-F Series

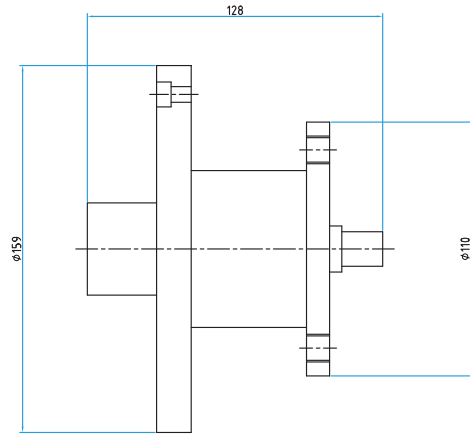


### ● RF-SS-F Series



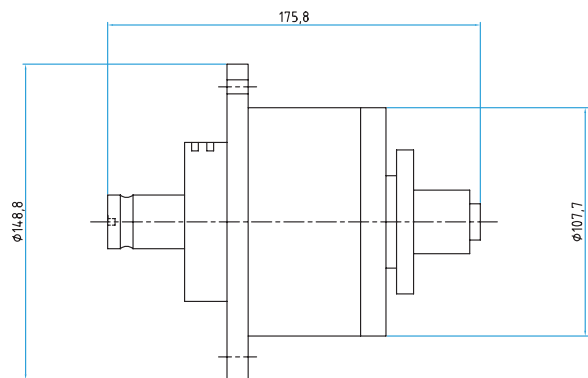
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● RF-SS-F Special



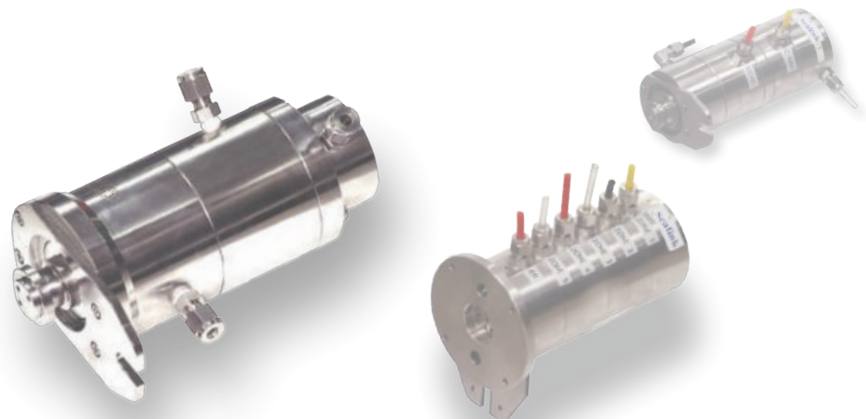
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● RF-SS-F Special



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For CMP



## 2.

## Rotary Union : RU Type

A rotary union is a precision mechanical device which allows to transfer fluid (liquid or gaseous media) under vacuum or differential pressure environments from a stationary source to a rotating part of machinery, preserving and isolating the fluid connection.

The rotating components of our rotary unions are hermetically sealed by our unique sealing technology with nonlinear contact for low friction, unlike a face contact of conventional mechanical seals which need lubricating oil for lowering the friction. Therefore, Sealink Seals don't need lubricant supplying systems and eliminate the risk of explosion caused by a leak of lubricant.

We provide standard rotary unions with single- or multiple-independent flow channels and transfer different type of media-both liquid and gases-simultaneously. We also provide customized products with various options such as pressure, vacuum, speed, number of ports and temperature requirements. Therefore, you can retrofit conventional feedthroughs with Sealink's products without extra equipment.

### ● Advantages

- Hermetically sealed with our unique non-linear contact technology
- Being able to operate under both high vacuum and high pressure environments
- A Variety of media to be sealed : Both gas and liquid such as reactive gas, inert gas, chemical, oil, water and coolants, etc.
- No Cooling Unit required up to 150°C/300°F (Operable up to 400°C/750°F with cooling system).
- No Lubricant Supply required, resulting in eliminating explosion accidents by leaks of lubricating oil
- Compact and Simplified Construction - Easy machining and maintenance, long service life and installation space saved
- Solid shaft and Hollow shaft types available
- Customized design available
- Optional Real-time Leakage Monitoring system available

### ● Typical Applications

#### Semiconductor Equipment, LCD and OLED Industries

CVD, MOCVD, LPCVD, PECVD, PCD, ALD, CMP, OLED, LCD device, FPD device, Wafer handling device, Vacuum deposition system, Ion Implanter, Etcher, Asher, Edge Grinder, Scrubber, RTP, Sputter, Lamp device, Autoclave, Wafer robot, etc.

#### Petrochemical, Fine Chemical, Marine, Steel and General Machinery Industries

Mixer, Agitator, Reactor Vessel, etc.

## ● Specifications

<b>Vacuum</b>	Max. $10^{-8}$ Torr, Max. $10^{-6}$ Pa
<b>Pressure</b>	Max. 50 bar (PV Limits : Max. 50)
<b>Leakage Rate</b>	<b>Vacuum</b> Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /s by Helium Leak Detector <b>Pressure</b> Up to 0.5 psi/min by Nitrogen Gas
<b>Number of Ports</b>	1 ~ 14 ports
<b>Temperature Range</b>	-20 ~ 150°C (-4 ~ +300°F) without cooling system -20 ~ 400°C (-4 ~ +750°F) with optional cooling system
<b>Media Type</b>	Gas and Liquid (Reactive Gas, Inert Gas, Water, Oil, Steam, Air, Chemical, Coolant, and a variety of other media)
<b>Speed</b>	Max. 15 m/s
<b>Shaft Diameter</b>	ø15 ~ ø1,100mm
<b>Material</b>	<b>Housing</b> 304 or 316L Stainless Steel or others
	<b>Shaft</b> 304 or 316L Stainless Steel or others
	<b>Bearing</b> SUJ2 High Carbon Chrome Bearing Steel or others

\* Applications with operating temperatures above 150°C require a cooling system

## ● Model Numbers of Rotary Unions

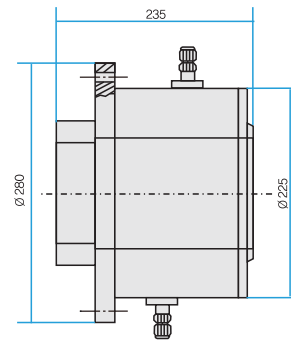
RU	—	HS	—	160	—	02	N
<b>Product</b> <b>RU:</b> Rotary Union  <b>RF:</b> Rotary Feedthrough <b>RL:</b> Rotary & Linear Feedthrough		<b>Shaft Type</b> <b>SS:</b> Solid Shaft <b>HS:</b> Hollow Shaft		<b>Shaft Diameter</b> <b>Metric Size:</b> mm <b>Inch Size:</b> inch <b>010</b> = 10 mm <b>250</b> = 0.250 inch		<b># of Ports</b>  <b>Media Compatibility</b> <b>N:</b> Inert Gas <b>R:</b> Reactive Gas <b>C:</b> Chemical <b>W:</b> Water <b>O:</b> Oil	

## ■ RU-HS Series Hollow Shaft Rotary Union

### ● RU-HS-160-02N/C/W/O

#### 2-Passage Hollow Shaft Rotary Union

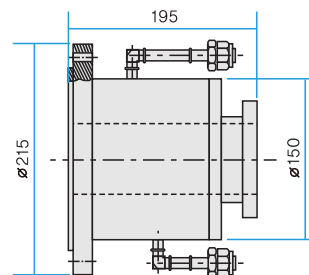
<b>Number of Port</b>	2 Ports
<b>Media</b>	Inert Gas, Chemical, Oil, Water, etc
<b>Temperature</b>	-20°C ~ 150°C (-4°F ~ 300°F)
<b>Speed</b>	100 rpm
<b>Pressure</b>	12 Bar
<b>Leakage Rate</b>	0.5 psi/min by Nitrogen Gas
<b>Connection Size</b>	1/2" NPT. Other sizes available upon request



### ● RU-HS-080-02N/C/W/O

#### 2-Passage Hollow Shaft Rotary Union

<b>Number of Port</b>	2 Ports
<b>Media</b>	Inert Gas, Chemical, Oil, Water, etc
<b>Temperature</b>	-20°C ~ 150°C (-4°F ~ 300°F)
<b>Speed</b>	50 rpm
<b>Pressure</b>	10 Bar
<b>Leakage Rate</b>	0.5 psi/min by Nitrogen Gas
<b>Connection Size</b>	1/4" NPT. Other sizes available upon request



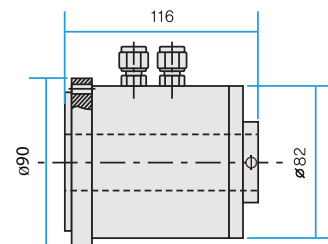


### ● RU-HS-030-02N/C/W/O



#### 2-Passage Hollow Shaft Rotary Union

<b>Number of Port</b>	2 Ports
<b>Media</b>	Inert Gas, Chemical, Oil, Water, etc
<b>Temperature</b>	0°C ~ 150°C (32°F ~ 300°F)
<b>Speed</b>	100 rpm
<b>Pressure</b>	30 psi
<b>Leakage Rate</b>	0.5 psi/min by Nitrogen Gas
<b>Connection Size</b>	1/4" NPT. Other sizes available upon request

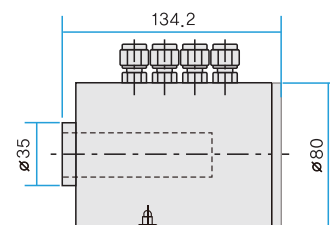


### ● RU-HS-035-04N/R/W/O



#### 4-Passage Hollow Shaft Rotary Union

<b>Number of Port</b>	4 Ports
<b>Media</b>	Inert Gas, Reactive Gas, Oil, Water, etc
<b>Temperature</b>	-20°C ~ 150°C (-4°F ~ 300°F)
<b>Speed</b>	350 rpm
<b>Pressure</b>	150 psi
<b>Leakage Rate</b>	0.5 psi/min by Nitrogen Gas
<b>Connection Size</b>	1/4" NPT. Other sizes available upon request

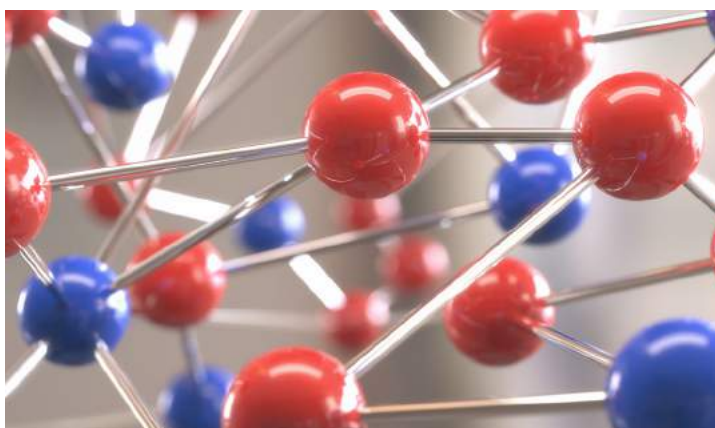
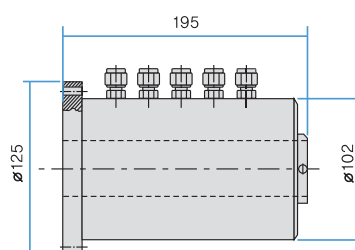


## ● RU-HS-050-05R/N/W/O

## 5-passage Hollow Shaft Rotary Union



<b>Number of Port</b>	5 Ports
<b>Media</b>	Inert Gas, Reactive Gas, Oil, Water, etc
<b>Temperature</b>	0°C~ 120°C (32°F ~ 250°F)
<b>Speed</b>	350 rpm
<b>Vacuum</b>	$1 \times 10^{-3}$ Torr
<b>Pressure</b>	35 psi
<b>Leakage Rate</b>	0.5 psi/min by Nitrogen Gas
<b>Connection Size</b>	1/4" NPT. Other sizes available upon request

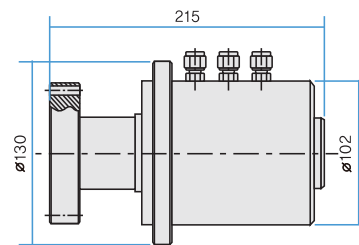


## ■ RU-SS Series Solid Shaft Rotary Union

### ● RU-SS-050-03R/N

#### 3-Passage Solid Shaft Rotary Union

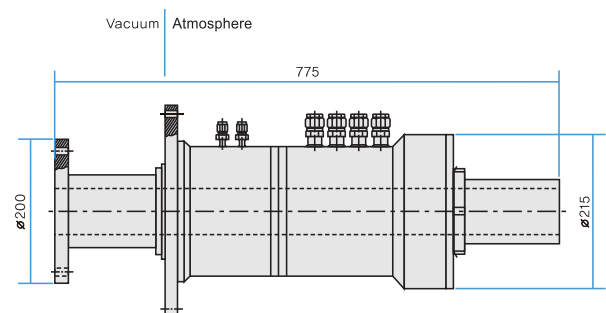
<b>Number of Port</b>	3 Ports
<b>Media</b>	Reactive Gas, Inert Gas
<b>Temperature</b>	-20°C ~ 150°C (-4 °F ~ 300°F)
<b>Speed</b>	200 rpm
<b>Vacuum</b>	$1 \times 10^{-3}$ Torr
<b>Pressure</b>	35 psi
<b>Leakage Rate</b>	Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /s
<b>Connection Size</b>	1/2" NPT. Other sizes available upon request



### ● RU-HS-110-06N/W

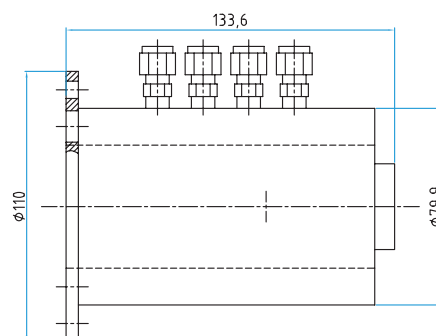
#### 6-Passage Hollow Shaft Rotary Union

<b>Number of Port</b>	6 Ports
<b>Media</b>	Inert Gas, Water
<b>Temperature</b>	0°C ~ 150°C (32°F ~ 300°F)
<b>Speed</b>	20 rpm
<b>Vacuum</b>	$1 \times 10^{-3}$ Torr
<b>Pressure</b>	10 Bar
<b>Leakage Rate (Pressure)</b>	0.5 psi/min by Nitrogen gas
<b>Leakage Rate (Vacuum)</b>	Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /s
<b>Connection Size</b>	1/4" & 1/2" NPT. Other sizes available upon request

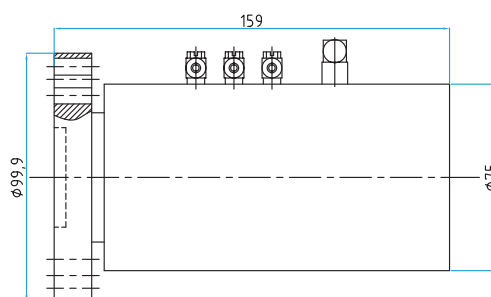


## ■ New Products

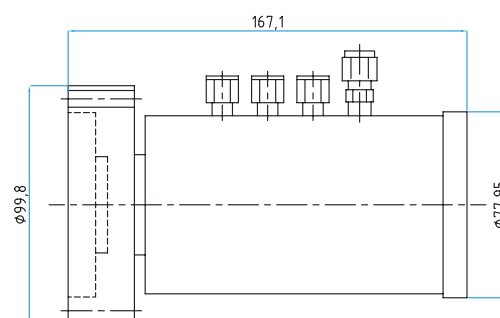
### ● RU-SS-030-04W



### ● RU-SS-030-04N/W/C

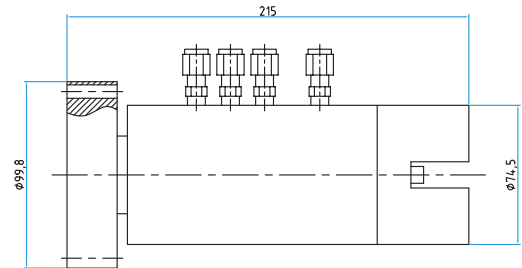


### ● RU-SS-030-04N/W/O



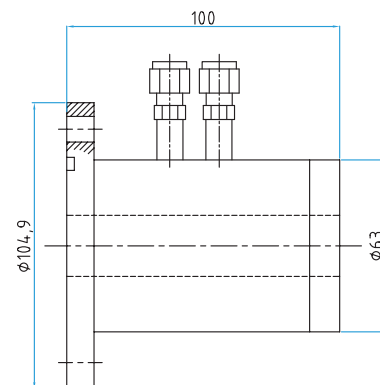
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● RU-SS-030-04N/W



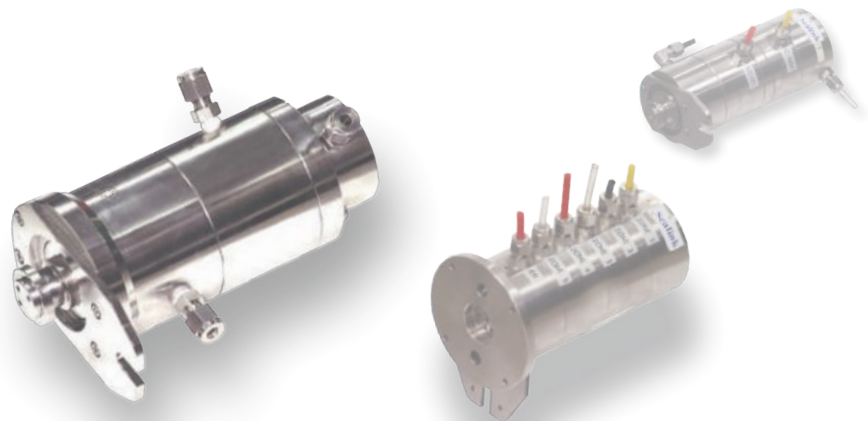
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● RU-HS-025-02N/R



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For CMP





## 3.

## Rotary & Linear Feedthrough : RL Type

A rotary & linear feedthrough is a precision mechanical device which allows to transfer both linear and rotational motions at same time from atmosphere into vacuum or differential pressure environments.

The rotary & linear feedthroughs are hermetically sealed by our unique sealing technology with nonlinear contact for low friction, unlike a face contact of conventional mechanical seal which need lubricating oil for lowering the friction. Therefore, Sealink Seals don't need lubricant supplying systems and eliminate the risk of explosion caused by a leak of lubricant.

We provide standard rotary & linear feedthroughs and customized products with various options such as pressure, vacuum, stroke, speed, and temperature requirements. Therefore, you can retrofit conventional feedthroughs with Sealink's products without extra equipment.

### ● Advantages

- Hermetically sealed with our unique nonlinear contact technology with no bellows
- Being able to operate under both high vacuum and high pressure environments
- A variety of media to be sealed: Both gas and liquid such as reactive gas, inert gas, chemical, oil, water and coolants, etc.
- 360° continuous rotating and up to 4,000mm linear travel
- No Cooling Unit required up to 150°C/300°F (operable up to 400°C/750°F with cooling system)
- No Lubricant Supply required, resulting in eliminating explosion accidents by leaks of lubricating oil
- Compact and Simplified Construction - Easy machining and maintenance, long service life and installation space saved
- Customized design available
- Optional Real-time Leakage Monitoring system available

### ● Typical Applications

#### Semiconductor Equipment, LCD and OLED Industries

CVD, MOCVD, LPCVD, PECVD, PCD, ALD, CMP, OLED, LCD device, FPD device, Wafer handling device, Vacuum deposition system, Ion Implanter, Etcher, Asher, Edge grinder, Scrubber, RTP, Sputter, Lamp device, Autoclave, Wafer robot, etc.

#### Petrochemical/Fine Chemical, Marine, Steel and General Machinery Industries

Mixer, Agitator, Reactor Vessel, etc

## ● Specifications

<b>Vacuum</b>		Max. $10^{-8}$ Torr, Max. $10^{-6}$ Pa
<b>Pressure</b>		Max. 50 bar (PV Limits : Max. 50)
<b>Leakage Rate</b>	<b>Vacuum</b>	Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /s by Helium Leak Detector
	<b>Pressure</b>	Up to 0.5 psi/min by Nitrogen Gas
<b>Stroke of Shaft</b>		0 to 4,000mm
<b>Temperature Range</b>		-20 ~ 150°C (-4 ~ +300°F) without cooling system -20 ~ 400°C (-4 ~ +750°F) with optional cooling system
<b>Media Type</b>		Gas and Liquid (Reactive Gas, Inert Gas, Water, Oil, Steam, Air, Chemical, Coolant, and a variety of other media)
<b>Speed</b>		Max. 15 m/s
<b>Shaft Diameter</b>		ø6 ~ ø1,100mm
<b>Material</b>	<b>Housing</b>	304 / 316L Stainless Steel or others
	<b>Shaft</b>	304 / 316L Stainless Steel or others
	<b>Bearing</b>	SUJ2 High carbon Chrome Bearing Steel or others

## ● Model Names of Rotary & Linear Feedthroughs

<b>RL</b>	—	<b>025</b>	—	<b>0150</b>	<b>N</b>				
		<b>Shaft Diameter</b> <b>Metric Size:</b> mm <b>Inch Size:</b> inch <b>010</b> = 10 mm <b>250</b> = 0.250 inch			<b>Stroke</b> (mm)				
				<b>Media Compatibility</b> <b>N:</b> Inert Gas <b>R:</b> Reactive Gas <b>C:</b> Chemical <b>W:</b> Water <b>O:</b> Oil					
<b>Product</b>									
<b>RL:</b> Rotary & Linear Feedthrough									
<b>RF:</b> Rotary Feedthrough									
<b>RU:</b> Rotary Union									

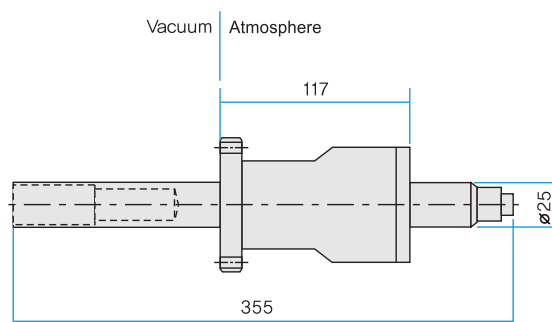
## ■ Rotary & Linear Feedthrough

### ● RL-025-0150R/N

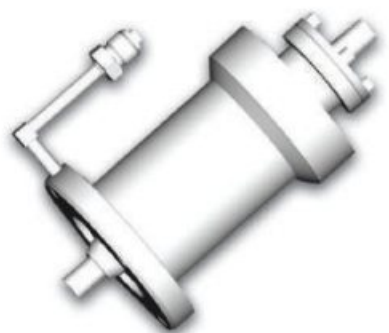


#### Rotary & Linear Feedthrough

<b>Gas Compatibility</b>	Reactive Gas, Inert Gas
<b>Rotating Speed</b>	120 rpm
<b>Linear Speed</b>	20 mm/s
<b>Stroke</b>	150 mm
<b>Temperature</b>	0°C ~ 150°C (32°F ~ 300°F) without cooling system, up to 400°C (750°F) with optional cooling system
<b>Leakage Rate</b>	Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /sec

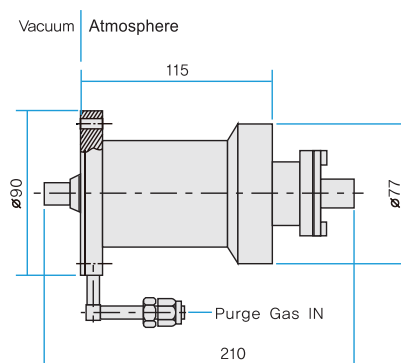


### ● RL-012-0050R/N



#### Rotary & Linear Feedthrough

<b>Gas Compatibility</b>	Reactive Gas, Inert Gas
<b>Rotating Speed</b>	60 rpm
<b>Linear Speed</b>	5 mm/s
<b>Stroke</b>	50 mm
<b>Temperature</b>	0°C ~ 150°C (32°F ~ 300°F) without cooling system, up to 400°C (750°F) with optional cooling system
<b>Leakage Rate</b>	Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /sec

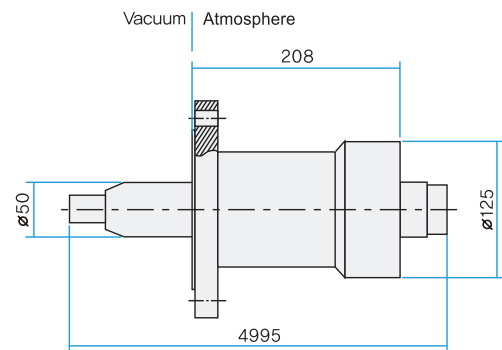


### ● RL-050-4000R/N



#### Rotary & Linear Feedthrough

<b>Gas Compatibility</b>	Reactive Gas, Inert Gas
<b>Rotating Speed</b>	120 rpm
<b>Linear Speed</b>	50 mm/s
<b>Stroke</b>	4,000 mm
<b>Temperature</b>	0°C ~ 150°C (32°F ~ 300°F) without cooling system, up to 400°C (750°F) with optional cooling system
<b>Leakage Rate</b>	Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /sec

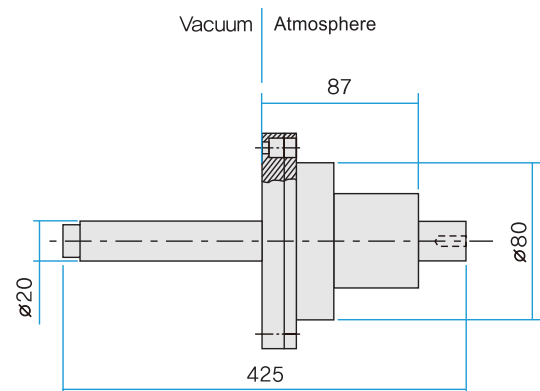


### ● RL-020-0250R/N



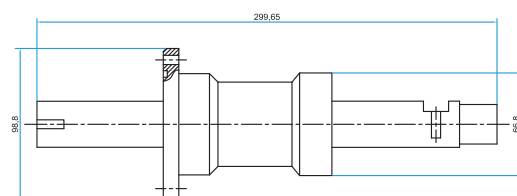
#### Rotary & Linear Feedthrough

<b>Gas Compatibility</b>	Reactive Gas, Inert Gas
<b>Rotating Speed</b>	50 rpm
<b>Linear Speed</b>	50 mm/s
<b>Stroke</b>	250 mm
<b>Temperature</b>	0°C ~ 150°C (32°F ~ 300°F) without cooling system, up to 400°C (750°F) with optional cooling system
<b>Leakage Rate</b>	Up to $7.5 \times 10^{-10}$ Pa·m <sup>3</sup> /sec

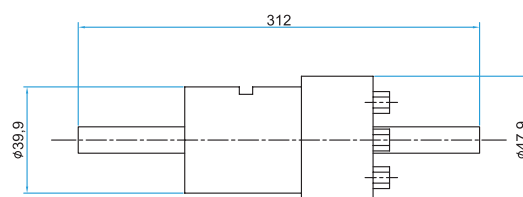


## ■ New Products

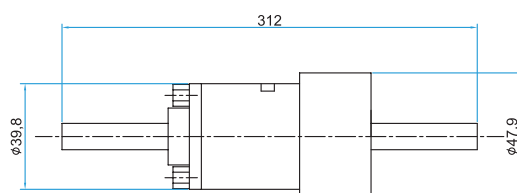
### ● RL-SS-030-0150C



### ● RL-SS-010-0250N



### ● RL-SS-010-0250N/R





## Request for Quotation

Please complete the form below. We will get back to you shortly with sealing solutions that are suitable to your application.

### Customer Contact Information

Company			
Contact Name		Title/Department	
Address			
Phone Number			
Fax Number		Email Address	

#### A. Information on your equipment to use mechanical feedthroughs or rotary unions

Equipment			
Manufacturer		Model / Type	

#### B. Mechanical Feedthroughs and Rotary Unions being used now (if known)

Manufacturer			
Model / Type		Quantity used now	
If any problem, please describe :			

### Operational Conditions

Product Type	<input type="checkbox"/> Rotary Union <input type="checkbox"/> Rotary Feedthrough <input type="checkbox"/> Linear Feedthrough <input type="checkbox"/> Rotary & Linear			
Sealing Condition	<input type="checkbox"/> Vacuum <input type="checkbox"/> Pressure			
Media	<input type="checkbox"/> Inert Gas <input type="checkbox"/> Reactive Gas <input type="checkbox"/> Water <input type="checkbox"/> Steam <input type="checkbox"/> Hydraulic Oil <input type="checkbox"/> Hot Oil <input type="checkbox"/> Other (specify: )			
Shaft	<input type="checkbox"/> Solid Shaft <input type="checkbox"/> Hollow Shaft			
Mounting	<input type="checkbox"/> Flange mount <input type="checkbox"/> Threaded(Nose) mount <input type="checkbox"/> Threaded Body(Nut) mount <input type="checkbox"/> Other			
Mounting Direction	<input type="checkbox"/> Vertical Top <input type="checkbox"/> Vertical Bottom <input type="checkbox"/> Vertical <input type="checkbox"/> Horizontal <input type="checkbox"/> Angle( degree)			
# of Flow Passage	Total # of Ports	Gas Ports	Liquid Ports	Other Ports
Stroke (Linear)	( ) <input type="checkbox"/> mm <input type="checkbox"/> inch			
Vacuum	Minimum	Operating	Maximum	Unit
				<input type="checkbox"/> Torr <input type="checkbox"/> Pa <input type="checkbox"/> psi
Pressure				<input type="checkbox"/> Bar <input type="checkbox"/> Pa <input type="checkbox"/> psi
Temperature				<input type="checkbox"/> °C <input type="checkbox"/> °F
Speed (Rotation)	( ) rpm			
Speed (Linear)	( ) mm/s			

### Limits

Shaft Diameter	Solid Shaft : ( ) mm	
	Hollow Shaft : Outer - ( ) mm, Inner - ( ) mm	
Max. Torque Capacity	( ) N.m	
Leakage Rate	Vacuum	( ) Pa·m <sup>3</sup> /s
	Pressure	( ) psi/min
Shaft Friction		
Gland Length	( ) mm	

### Performance

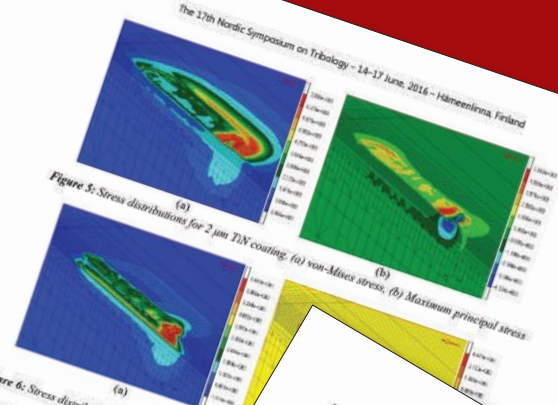
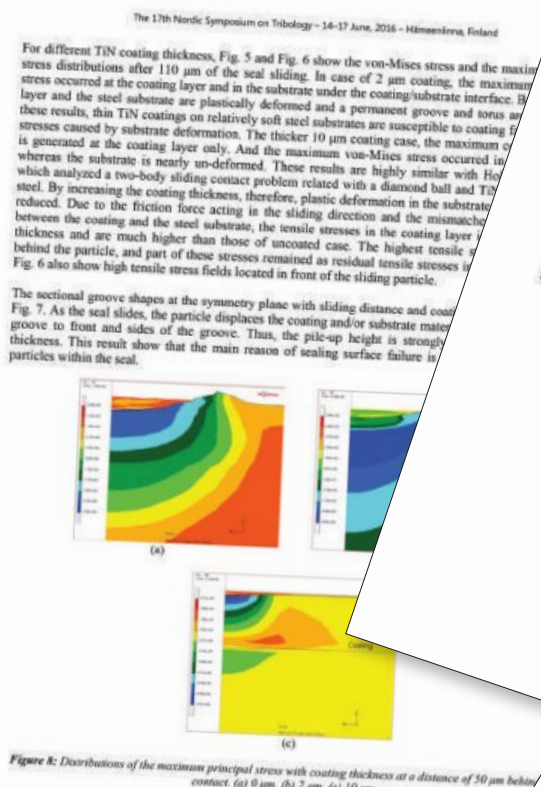
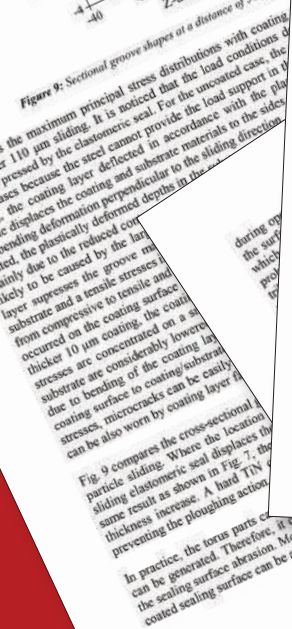
Life Cycle			
Shaft Runout		Eccentricity	

\* If you have, please attach drawing or layout design and send to **Sealink Corp. Fax +82-2-866-8757 / e-mail : info@esealink.com**

## The 17th Nordic Symposium on Tribology, 2016 - Hämeenlinna, Finland

## T.J. Park, M.G. Kim, H.J. Rhee\*

School of Mechanical Engineering, ERI, Gyeongsang National University, Jinju, Gyeongnam, Korea.  
\*Sealink Corp., Gasandigital 2-ro 14, Keumcheon-qu, Seoul, Korea



respectively. The coefficients of friction for all the steel substrates, three TiN coating thicknesses have been measured. The TiN coating thicknesses have been the uncoated substrate) 2  $\mu\text{m}$  and 10  $\mu\text{m}$ .

The 17th Nordic Symposium on Tribology

**Table 1: Material properties**

Component	Material	Young's modulus, GPa
Particle	TiN	400
Coating	TiN	400
Substrate	Steel	200
Seal	PTFE	—

Young's modulus, GPa

61.37

Mooney-Rivlin

purpose three-dimensional nonlinear finite element code

type is 3D Het Full integration 7 and the number of elements

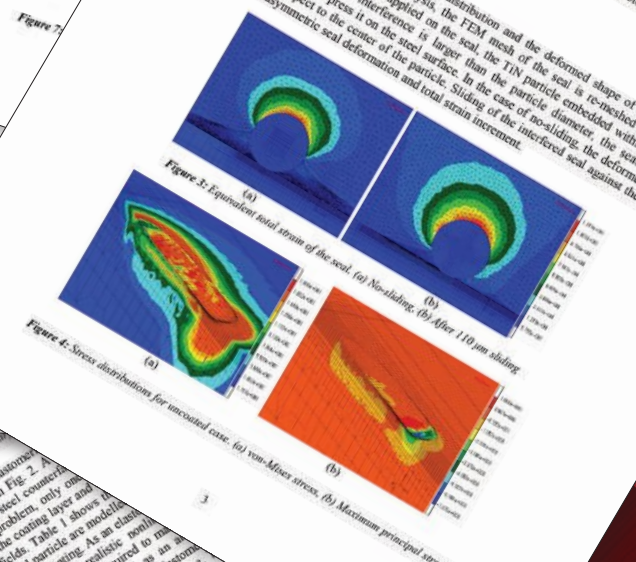
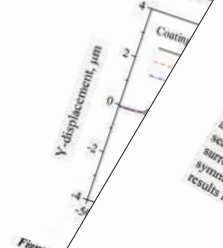
function and time table for elastomeric seal are given in

deformation.

**DISCUSSIONS**

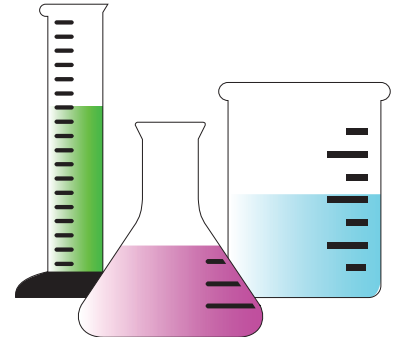
equivalent

in a



## ■ Chemical Resistance Test Results of Sealink Seal

No.	Chemicals	% <sup>(1)</sup>	No.	Chemicals	%
1	Sulfuric Acid, 75%	0.77	9	Toluene, 99.5%	1.36
2	Sulfuric Acid, 10%	0.12	10	Methanol, 99.5%	0.96
3	Nitric Acid, 40%	0.17	11	Ethanol, 96%	0.75
4	Hydrochloric Acid, 10%	0.17	12	Sodium Carbonate, 20%	0.30
5	Acetic Acid, 99.5%	2.18	13	Sodium Chloride, 10%	0.20
6	Sodium Hydroxide, 40%	0.54	14	Diethyl Ether, 100%	0.66
7	Sodium Hydroxide, 1%	0.63	15	Hydrogen Peroxide, 30%	0.23
8	Acetone, 100%	2.02			



<sup>(1)</sup>% : Weight Change Ratio

This data was measured by KSM ISO 175:2011 for 168hrs(7days) at Korea Testing & Research Institute.



**Note**

[illegible]





**Sealink Corp.** #704, 14 Gasandigital 2-ro, Keumcheon-Gu, Seoul 08592, Korea  
**Tel** +82-2-866-8737 **Fax** +82-2-866-8757 **E-mail** info@esealink.com **www** .esealink.com



The applications, suggestions and recommendations contained in this catalogue are meant to be used as a professional guide only. Because no two situations or installations are the same, these comments, suggestions, and recommendations are necessarily general and should not be relied upon by any purchase without independent verification based on the particular installation or use. We strongly recommend that sealing unit you select be rigorously tested in the actual application prior to production use.