



MAGRON

Specialized magnetic material

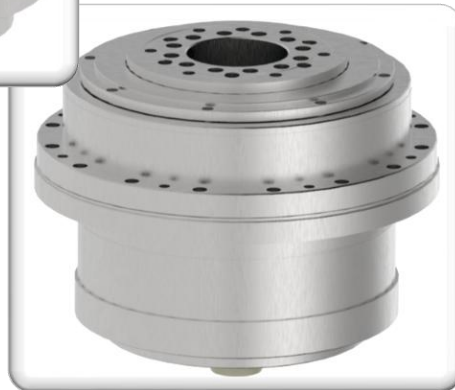
※ Ferrofuid Seal Optimized for high-temperature environments

➤ What is Ferrofuid Seal?

- 1) A sealing technology that seals the rotating shaft without contact by using magnetic force.
- 2) Unlike conventional mechanical seals, it has almost no wear or abrasion, and demonstrates stable performance in high-temperature and high-vacuum environments.
- 3) Used to transmit power from the atmospheric environment(ATM) into vacuum environments.
- 4) Maintains vacuum inside chambers even during robot operations.



Arm-Theta J2



Arm-Theta J1

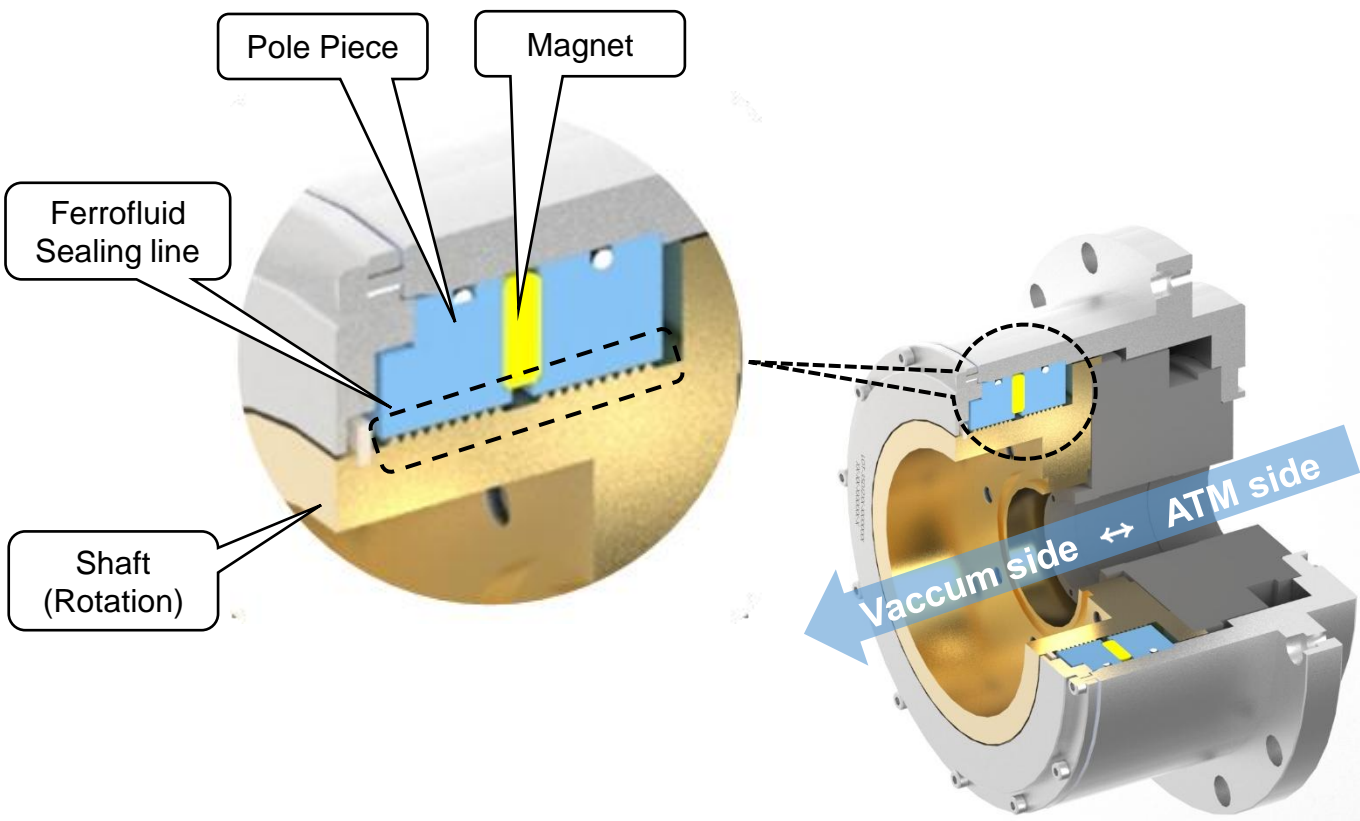


Theta-Axis

Ferrofluid Seal Structure Features

※ A key component of semiconductor vacuum equipment used in OLED and other manufacturing

- 1) Can be applied to multi-axis systems with two or more axes depending on equipment specifications.
- 2) Has a longer lifespan compared to previous sealing technologies (Mechanical Seal, O-Ring, etc.).
- 3) Suitable for ultra-high vacuum and high-speed rotation applications with minimal particle generation.



※ Reference

NO	Category	Ferrofluid Seal	Oil Seal	O-ring Seal
1	Vacuum Range	Ultra-high vacuum	High vacuum	High vacuum
2	Rotation Speed	High-speed rotation	Low-speed rotation	Low-speed rotation
3	Particle Generation	Low	High	High
4	Service Life	Long	Short	Short

Ferrofluid Seal Specification

※ Model 35D, 95D Optimized for High-Temperature Applications

1) Ferrofluid Seal specifications can be customized.

NO	Category		Spec	
1	Operating Temperature (°C)		Temperature inside the deposition chamber	1350°C
			End effector	100°C ~ 200°C
			Ferrofluid Seal	100°C ~ 120°C
2	He Leak Test	Helium Leak Test	$\leq 1.0 \times 10^{-8}$ mbar·l/s	
3	Vacuum Test	High Vacuum Test	$\leq 1.0 \times 10^{-5}$ Pa	
4	Shaft runout	Without Load	Dial gauge measurement	≤ 0.03 mm
		With Load		≤ 0.05 mm

Dimension (Mass Production Models)

Model	95D	Theta-Axis	Ø374 X 320H
		Arm-Theta J1	Ø319 X 260H
		Arm-Theta J2	Ø319 X 234H
	35D	Theta-Axis	327W X 509L X 316H
		Arm-Theta J1	Ø268 X 110H
		Arm-Theta J2	Ø216 X 120H

※ Image of the models



Arm-Theta J1



Arm-Theta J2



Theta-Axis

Ferrofluid Seal Specification

※ Single-Axis Model 10S

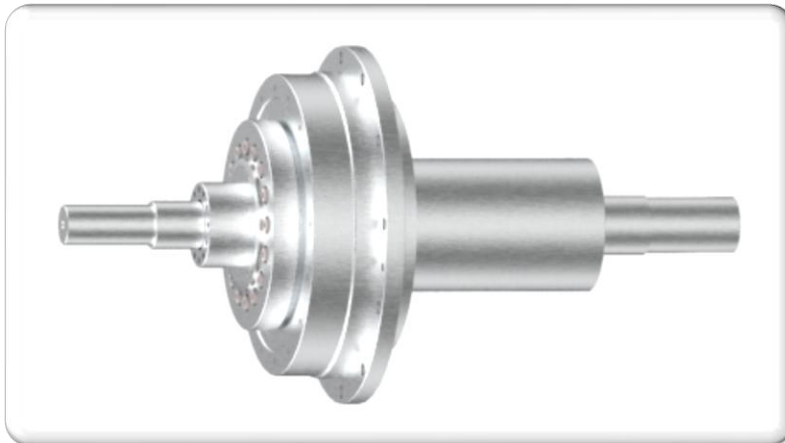
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Dimension

Model	10S	Main Theta + Arm-Theta
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※ Image of the product



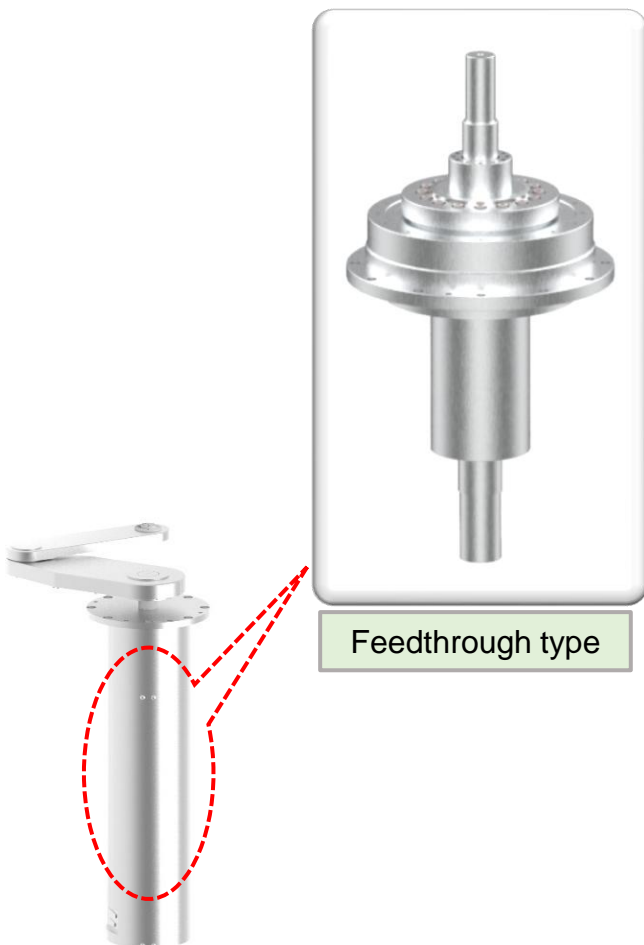
Feedthrough type

Ferrofluid Seal Application Case

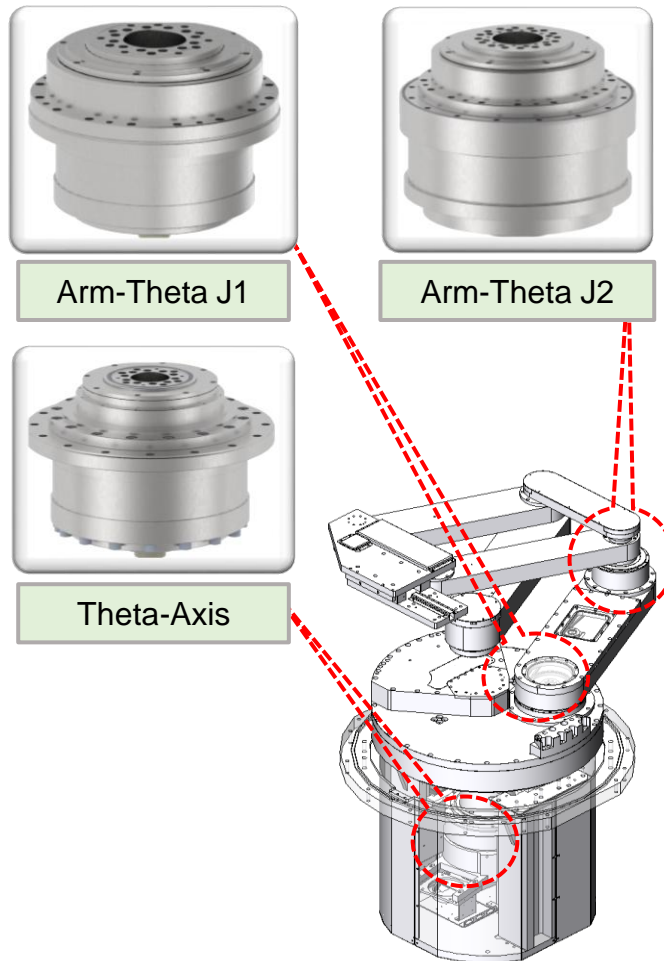
※ Supplied to SDC(Samsung display CO.,LTD).

- 1) Applied to OLED deposition equipment
- 2) Robots from Yaskawa and Canon Tokki can be continuously used by replacing only the ferrofluid seal during overhaul.

※ Image of application case



[Transfer Robot for room-temperature environments]



[Transfer Robot for high-temperature environments]