



# Electric Rotary Joint

User Manual

Original Instruction





### Multi-Axis Robot

- Pick-and-Place / Assembly / Array and Packaging / Semiconductor / Electro-Optical Industry / Automotive Industry / Food Industry
- Articulated Robot
  - Delta Robot
  - SCARA Robot
  - Wafer Robot
  - Electric Gripper
  - Integrated Electric Gripper
  - Rotary Joint



### Single-Axis Robot

- Precision / Semiconductor / Medical / FPD
- KK, SK
  - KS, KA
  - KU, KE, KC



### Torque Motor Rotary Table

- Aerospace / Medical / Automotive Industry / Machine Tools / Machinery Industry
- RAB Series
  - RAS Series
  - RCV Series
  - RCH Series



### Ballscrew

- Precision Ground / Rolled
- Super S Series
  - Super T Series
  - Mini Roller
  - Ecological & Economical Lubrication Module E2
  - Rotating Nut (R1)
  - Energy-Saving & Thermal-Controlling (Cool Type)
  - Heavy Load Series (RD)
  - Ball Spline



### Linear Guideway

- Automation / Semiconductor / Medical
- Ball Type--HG, EG, WE, MG, CG
  - Quiet Type--QH, QE, QW, QR
  - Other--RG, E2, PG, SE, RC



### Bearing

- Machine Tools / Robot
- Crossed Roller Bearing
  - Ballscrew Bearing
  - Linear Bearing
  - Support Unit



### DATORKER® Robot Reducer

- Robot / Automation Equipment / Semiconductor Equipment / Machine Tools
- WUT-PO Type
  - WUI-CO Type
  - WTI-PH Type
  - WTI-AH Type



### AC Servo Motor & Drive

- Semiconductor / Packaging Machine / SMT / Food Industry / LCD
- Drives--D1, D1-N, D2T/D2T-LM
  - Motors--50W-2000W



### Medical Equipment

- Hospital / Rehabilitation Centers / Nursing Homes
- Robotic Gait Training System
  - Robotic Endoscope Holder



### Linear Motor

- Automated Transport / AOI Application / Precision / Semiconductor
- Iron-core Linear Motor
  - Coreless Linear Motor
  - Linear Turbo Motor LMT
  - Planar Servo Motor
  - Air Bearing Platform
  - X-Y Stage
  - Gantry Systems



### Torque Motor & Direct Drive Motor

- Machine Tools
- Torque Motor--TMRW Series
- Inspection / Testing Equipment / Robot
- Direct Drive Motor--DMS, DMY, DMN Series

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## 1. Precautions (Read carefully before use)

### 1-1 Safety Specifications

- The safety specifications below are provided to safely and correctly operate the product as well as protect you or other people from danger. The users must comply with ISO/IEC [Note 1], JIS [Note 2] and other regulation [Note 3].

[Note 1] ISO 10218:1992: Manipulating Industrial Robots – Safety

IEC 60204-1: Safety of Machinery -Electrical Equipment of Machine (Part1: General Requirement)

[Note 2] JIS B 9960-1: Safety of Machinery– Electrical Equipment of Machine (Part 1: General Requirement)

JIS B 8433-1993: Automatic Control for Industry - Safety

[Note 3] Labor Safety and Health and so on

- The product complies with the latest Restriction of Hazardous Substances (RoHS).
- The product is designed and manufactured for general use in machinery industries, especially manufacturing.
- The product's specifications must be chosen by system designers or by one with full understanding and experience on the subject. The product must be operated after carefully reading the "User Manual".
- When the rotary joint is installed on a system (such as a mechanical device, robot, end effector etc.), the users must obey safety regulations and operate the product correctly.
- For all situations of danger, warning and caution not collected in the this section, please jointly follow with the specifications and safety regulations above-mentioned.

### 1-2 Warranty Coverage

- The product is provided with a warranty period of 12 months or 5-million cycles (whichever comes first). The warranty coverage doesn't include any failure due to following reasons:
- Go beyond the operation, environment and storage defined by the user manual.
- Damage caused by collision and accident owing to incorrect operation or improper installation.

The following circumstances will not be included in the warranty coverage:

- The product number or the production date (month and year) can't be identified.
- Devices not supplied by HIWIN are installed on the ERJ body.
- Any components on the ERJ body are added or removed without HIWIN's permission.
- The appearance on the ERJ body is modified without HIWIN's permission, such as drill or cut.
- Any destruction or damage caused by the natural disaster, such as fire, earthquake, tsunami, lightning, windstorm and flood.
- If the product is destroyed or damaged in the circumstances above, HIWIN will not provide any warranty or compensation unless it is caused by a product defect which has been analyzed and verified by a user.
- For the information on the warranty period and clause in details, contact the product agent or technician.

## 2. Introduction

The Electric Rotary Joint (ERJ) is a passive product. Designed with a special structure, power, electric signals or air can be transmitted under infinite rotation. In ERJ series there are electric-only feed through models and electric-air feed through models. These models are suitable for robots, automatic equipment with electric grippers or pneumatic grippers.



### 2-1 Features

- Infinite rotation: passively transmit electric signals or air under infinite rotation, replacing and solving the wire deflection, space interference as well as wear and tear.
- Compact design: compact structure with lower height and minimum weight.
- High protection rating: IP54 to IP65, enhancing the durability and reliability of the product.
- Standard interface: the installed flange conforms to ISO9409-1, suitable for all kinds of robot.
- Simple assembly: embedded screws to easily assemble.

### 2-2 Type Classification

No.	Model name	Electric Rotary Joint ERJ-□	Electric Rotary Joint within Air Path ERJ-□-P
30		ERJ-30	---
40		---	ERJ-40-P

## 2-3 Application Examples

① HIWIN Articulated Robot

② Electric Rotary Joint

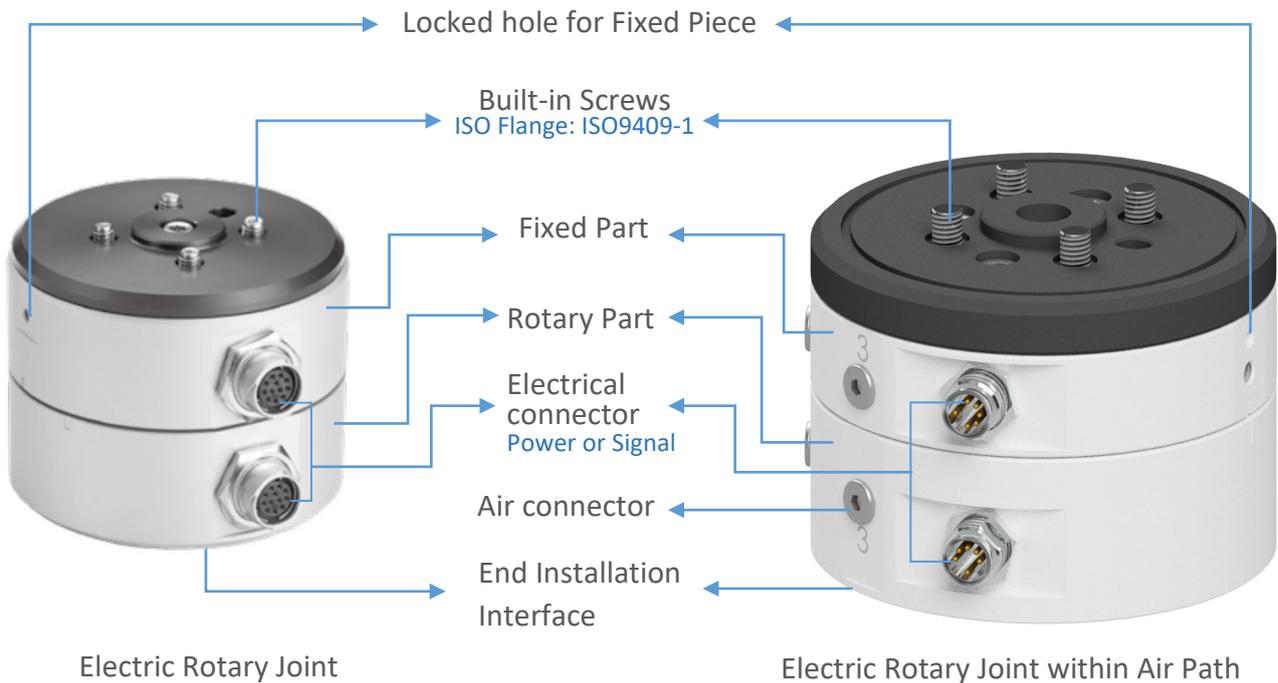
③ Fixed Piece

(It is used to connect the robot with the Electric Rotary Joint, where the type can be customized according to the robot and environment. The figure shows it is used with HIWIN Robot RA605.)

④ End Effector



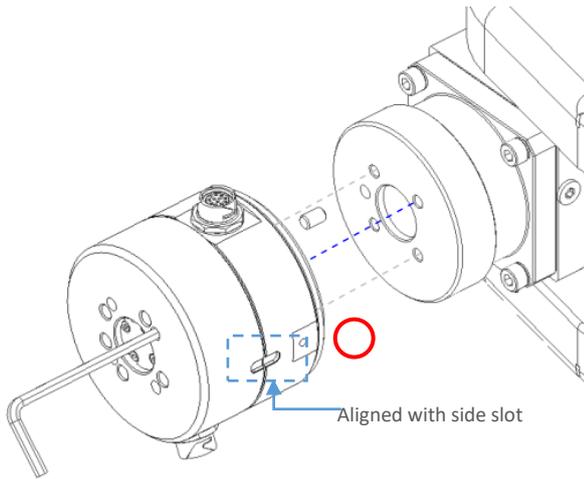
## 2-4 Product Illustration



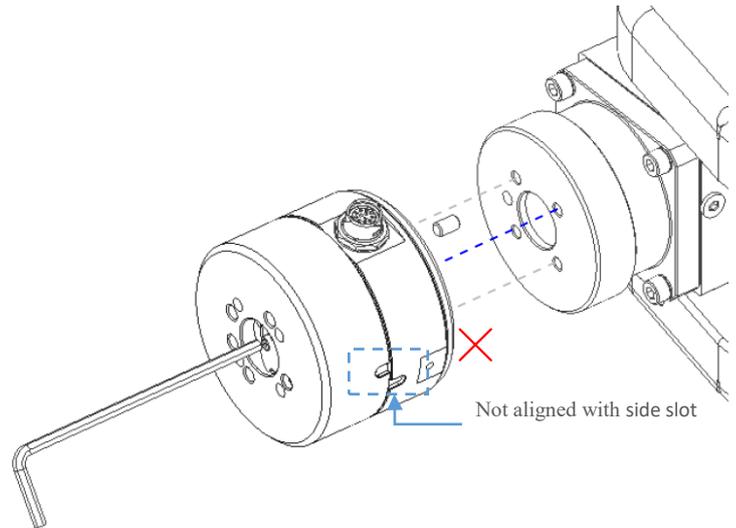
## 2-5 Installation Notice

Be sure to align the side slot of the electric rotary joint before installing the electric rotary joint to the robot, so that the hexagonal wrench can smoothly lock the built-in screw into to the end of the robot. If the side slot is not aligned, the wrench can't be extended enter the inner hole.

Correct installation



Wrong installation



### 3. Electric Rotary Joint

- Electric feed-through model.
- Suitable for use with electric grippers, electric devices and other related equipment.



#### 3-1 Models Definition

- Models Definition

#### **ERJ – 30**

Model		Flange Interface	Electric Channel	Radical load (N)	Axial load (N)	Max. Dynamic Torque Mxy (N-m)	Max. Dynamic Torque Mz (N-m)	IP
Series	No.	Pitch Diameter (mm)						
ERJ	30	31.5	12	20	50	5	2	54

- Connector configuration

#### **ERJ-30 – S1**

A

Model		Code	Description
Series	No.	A	Cable Connector type
ERJ	30	S□	straight type
		L□	L type
		M□	straight type and L type

Note: 1. If the Code A is not filled, no connector is needed.

2. When selecting the connector type, fill the quantity in "□".

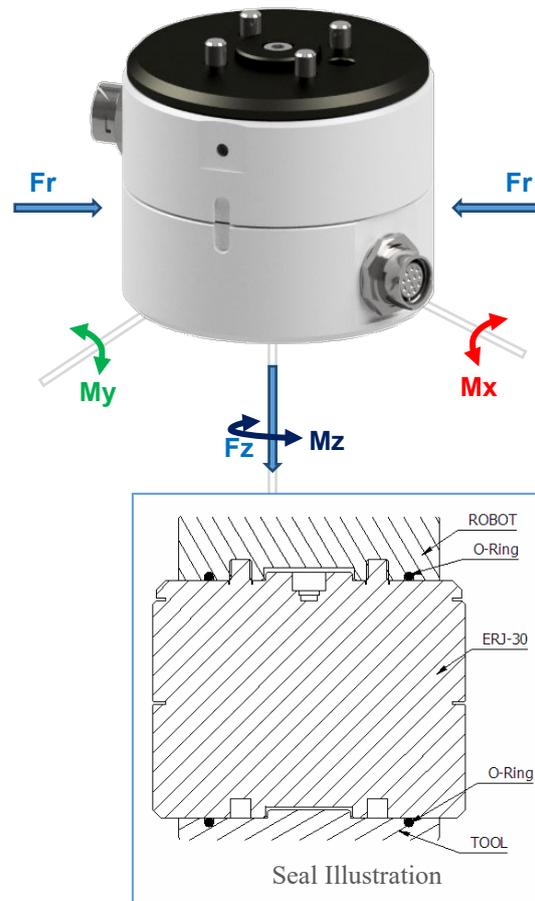
3. If the number of M□ type is 1, it means that the number of each connector is 1.

4. If you have HIWIN robot and end effector products, you don't need to fill in the code A, and you can refer to Appendix 5-1 Accessory kit.

## 3-2 ERJ-30

### ■ Specifications

Model	ERJ-30	
Item	Value	Unit
Rotation Angle	unlimited	°
Max. speed	150	rpm
Max. Voltage	24	V
Max. Current	2	A
Electric Channel	12	-
Start Torque	0.5	N-m
Max. Dynamic Torque Mxy	5	N-m
Max. Dynamic Torque Mz	2	N-m
Max. Static Torque Mxy	10	N-m
Radical load Fr	20	N
Axial load Fz	50	N
Weight	0.6	kg
Protection Level	IP54 [Note 1]	-
Operating Temperature	5-60	° C
Operating Humidity	<85	%RH
Storage Temperature	0-60	° C
Rotation Radius	R45	mm
Product Height	55	mm
Flange Interface	ISO9409-1-31.5-4-M5	-

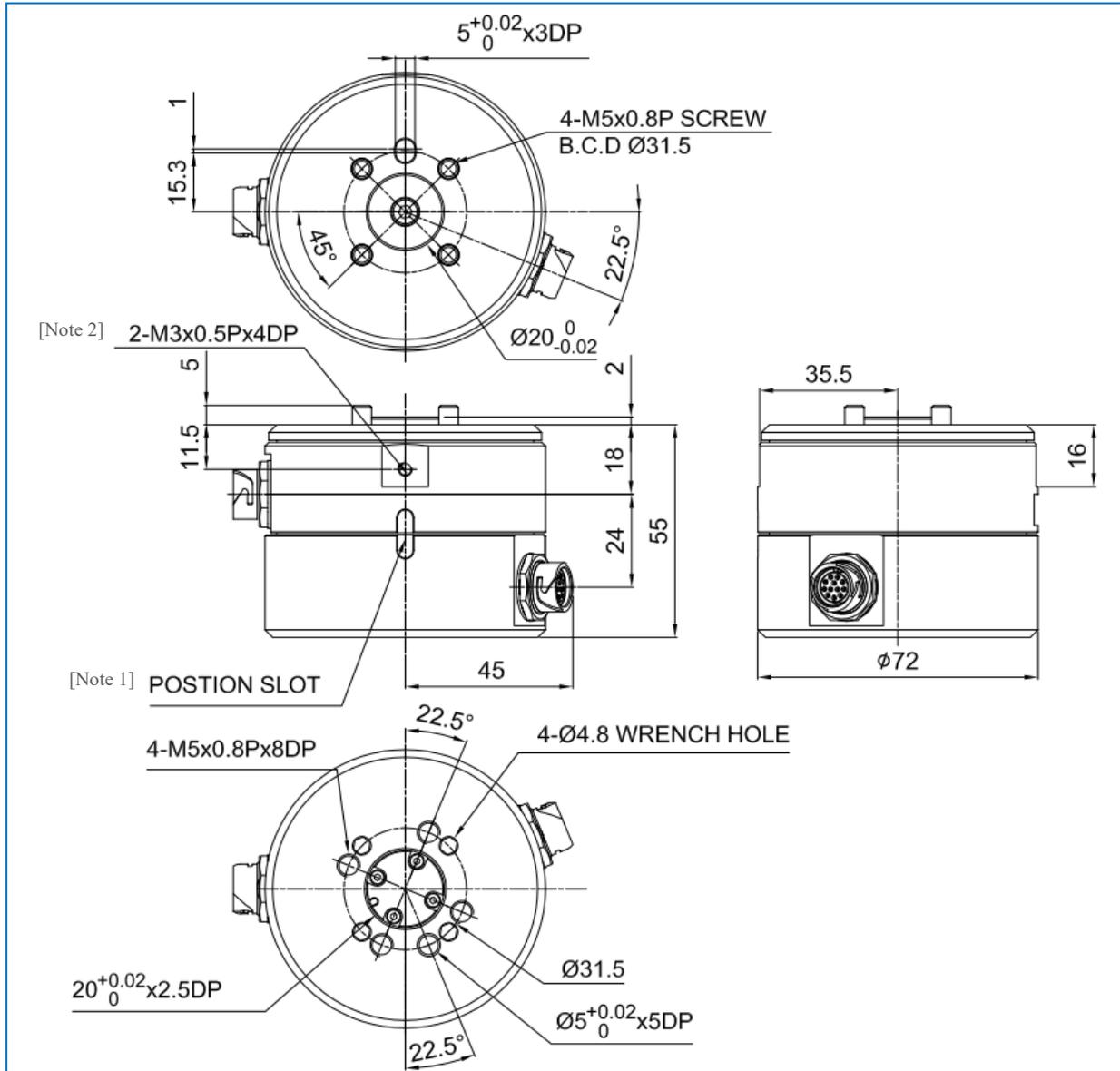


[Note 1] The robot end and tool part must be completely sealed at the front and rear ends of the product. As shown above. It is recommended to use O-Ring or components with leak-proof protection as a seal medium.

### ■ Accessories

Name-Quantity	Fixed Piece - 1	Cable Connector - 2
Figure		
Remark	Customized piece	straight-straight type, L-L type and straight-L type

■ Dimensions Drawing



[Note 1] The screws can be locked after aligning the slot.

[Note 2] If the electric rotary joint is not mounted onto the HIWIN robot, the fixed piece must be manufactured according to the screw hole in the dimensions drawing. One end of the fixed piece is connected to the fixed part of driving source, so that the fixed piece for the rotary joint will not rotate together with the driving source. It is recommended the fixed piece to be made of steel.

## 4. Electric Rotary Joint within Air Path

- Electric-air rotary joint.
- An odd number of air channels has been designed, so that two channels can be used for the operation of pneumatic gripper, and one can be used for cleaning purposes.
- Suitable for use in scenarios with pneumatic grippers, pneumatic devices and other related equipment.



### 4-1 Models Definition

- Models Definition

#### **ERJ – 40 – P3**

Model			Flange Interface	Electric Channel	air Channel	Radical load (N)	Axial load (N)	Max. Dynamic Torque Mxy (N-m)	Max. Dynamic Torque Mz (N-m)	IP
Series	No.	With air path Type	Pitch Diameter (mm)							
ERJ	40	P3	40	6	3	200	400	55	45	65

■ Connector Configuration

**ERJ-40-P3 - S1 - PS1**

A B

Model			Code	Description
Series	No.	With air path Type	A	Cable Connector type
ERJ	40	P3	S <input type="checkbox"/>	straight type (including 1M line)
			L <input type="checkbox"/>	L type (including 1M line)
			M <input type="checkbox"/>	straight type and L type (including 1M line each)

- Note: 1. If the Code A is not filled, no connector is needed.  
 2. When you select the connector type, fill the quantity in “”.  
 3. If the number of M  types is 1, it means that the number of each connector is 1.  
 4. If you have HIWIN robot and end effector products, you don't need to fill in the code A, and you can refer to Appendix 5-1 Accessory kit.

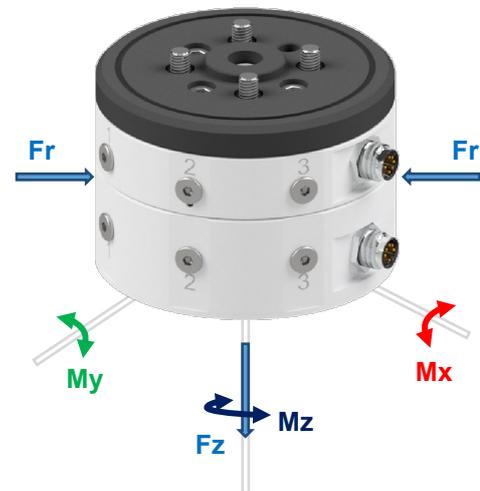
Model			Code	Description
Series	No.	With air path Type	B	Quick-Fitting Joint type
ERJ	40	P3	PS <input type="checkbox"/>	∅6-M5 straight type
			PL <input type="checkbox"/>	∅6-M5 L type
			PM <input type="checkbox"/>	∅6-M5 straight type and L type

- Note: 1. If the Code B is not filled, no quick-fitting joint is needed.  
 2. When you select the connector type, fill the quantity in “”.  
 3. If the number of PM  type is 1, it means that the number of each connector is 1.  
 4. If you have HIWIN robot and end effector products, you need to fill in the code B, as well as you can refer to Appendix 5-1 Accessory kit.

## 4-2 ERJ-40-P3

### ■ Specifications

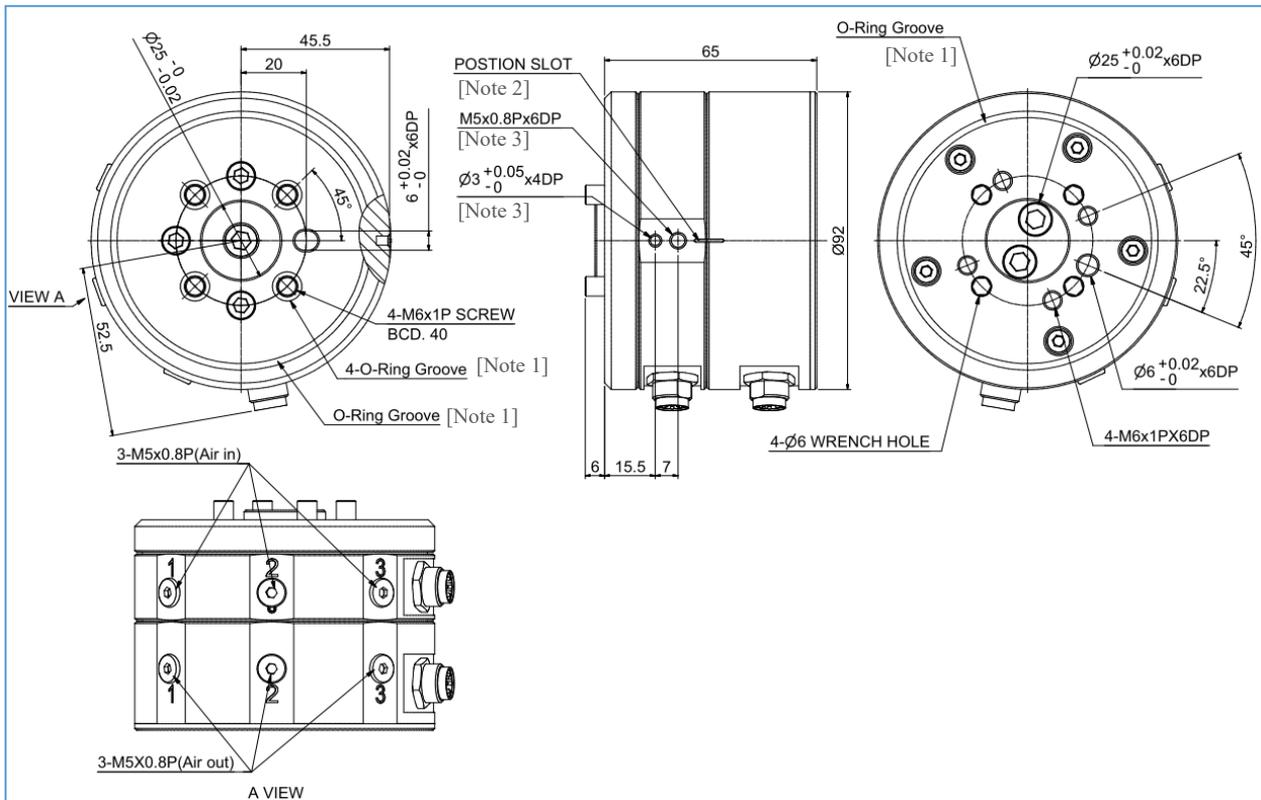
Model	ERJ-40-P3	
Item	Value	Unit
Rotation Angle	Infinite rotation	°
Max. Speed	120	rpm
Max. Voltage	24	V
Max. Current	Max 1	A
Electric Channel	6	-
Pneumatic Channel	3	-
Pressure Joint	6-M5	-
Maximum Pressure	8	bar
Start Torque	4.5	N-m
Max. Dynamic Torque Mxy	55	N-m
Max. Dynamic Torque Mz	45	N-m
Max. Static Torque Mxy	75	N-m
Radical load Fr	200	N
Axial load Fz	400	N
Weight	1.1	kg
Protection Level	IP65	-
Operating Temperature	5-60	° C
Operating Humidity	<85	%RH
Storage Temperature	0-60	° C
Rotation Radius	R52.5	mm
Product Height	65	mm
Flange Interface	ISO9409-1-40-4-M6	-



### ■ Accessories

	<b>Fixed Piece - 1</b>
Illustration	
Remark	Customized piece
Name-Quantity	<b>Cable Connector - 2</b>
Illustration	
Remark	straight - straight type, L-L type and straight -L type
Name-Quantity	<b>Quick-Fitting Joint - 6</b>
Illustration	
Remark	straight - straight type, L-L type and straight -L type

## ■ Dimensions Drawing

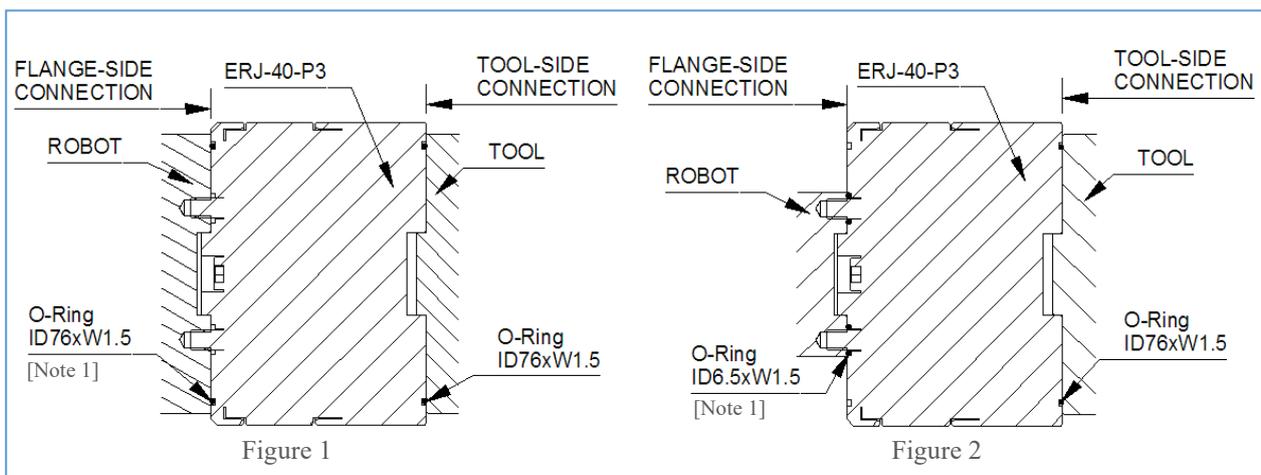


[Note 1] An O-ring is installed in the groove to conform to IP65. For the installation method, please refer to the O-ring installation drawing below.

[Note 2] The screws can be locked after aligning the slot.

[Note 3] If the electric rotary joint is not mounted onto the HIWIN robot, the fixed piece must be manufactured according to the screws and pin holes in the dimensions drawing. One end of the fixed piece is connected to the fixed part of the driving source, so that the fixed piece for the rotary joint will not rotate with the drive source. It is recommended that the fixed piece be made of steel.

## O-ring Installation Drawing



[Note 1] We provide seals for mounting to the flange surface, which can be installed according to the size of the mating parts, as shown in Figures 1 and 2.

## 5. Appendix

### 5-1 Accessory Kit

#### ■ Electric Rotary Joint mounted on HIWIN Robots and End Effectors.

The Electric Rotary Joint can be mounted on HIWIN Robots and/or End Effectors. The following table provides the related accessory kits required when installing the Electric Rotary Joint to a HIWIN Robot and End Effectors. The customers can purchase the Accessory Kit, not including ERJ or the Accessory Kit, including ERJ according to the following form.

Ordering Method:

#### Accessory Kit, not including ERJ:

##### Accessory Number – Code C

Ordering Example: RRJ00Z001-3.D → purchase XEG-16 Accessory Kit, not including ERJ

#### Accessory Kit, including ERJ:

##### Model Number – Accessory Number – Code C

Ordering Example: ERJ-30-RRJ00Z001-3.D → purchase XEG-16 Accessory Kit, including ERJ-30

Model	Accessory Number	Description
	RRJ00Z001	
	Code C	
ERJ-30	1.A.K	605 Accessory Kit
	3.D	XEG-16 Accessory Kit
	4.E	XEG-32 Accessory Kit
	7.G	SEG-24 Accessory Kit
	8.H	STG-16 Accessory Kit

Note: 1. The electric rotary joint with HIWIN robot manipulator accessory kit, including the wire and fixed piece from the HIWIN robot to the electric rotary joint.  
 2. The electric rotary joint with HIWIN end effector accessory kit, including the wire and adaptor plates from the electric gripper to the electric rotary joint.  
 3. If you purchase the accessory kit (including ERJ), please refer to 3-1. Model Number for the specifications.  
 4. If you need other accessories, please contact HIWIN service staff.

■ **Electric Rotary Joint within Air Path mounted on HIWIN Robots**

The Electric Rotary Joint within air path can be mounted on HIWIN Robots. The following table provides the related accessory kits required when installing the Electric Rotary Joint to a HIWIN Robot. The customers can purchase the Accessory Kit, not including ERJ within air path or the Accessory Kit, including ERJ within air path according to the following form.

Ordering Method:

**Accessory Kit, not including ERJ within air path:**

**Accessory Number – Code C**

Ordering Example: RRJ00Z001-2.J → purchase RA620 Accessory Kit, not including ERJ within air path

**Accessory Kit, including ERJ within air path:**

**Model Number – Code B - Accessory Number – Code C**

Ordering Example: ERJ-40-P3-PS6- RRJ00Z001-2.J → purchase RA620 Accessory Kit, including ERJ-40-P3 and six Quick-Fitting Joint with Ø6-M5 straight type

Model	Accessory Number RRJ00Z001	Description
	Code C	Accessory Kit Type
ERJ-40-P3	2.J	RA620Accessory Kit

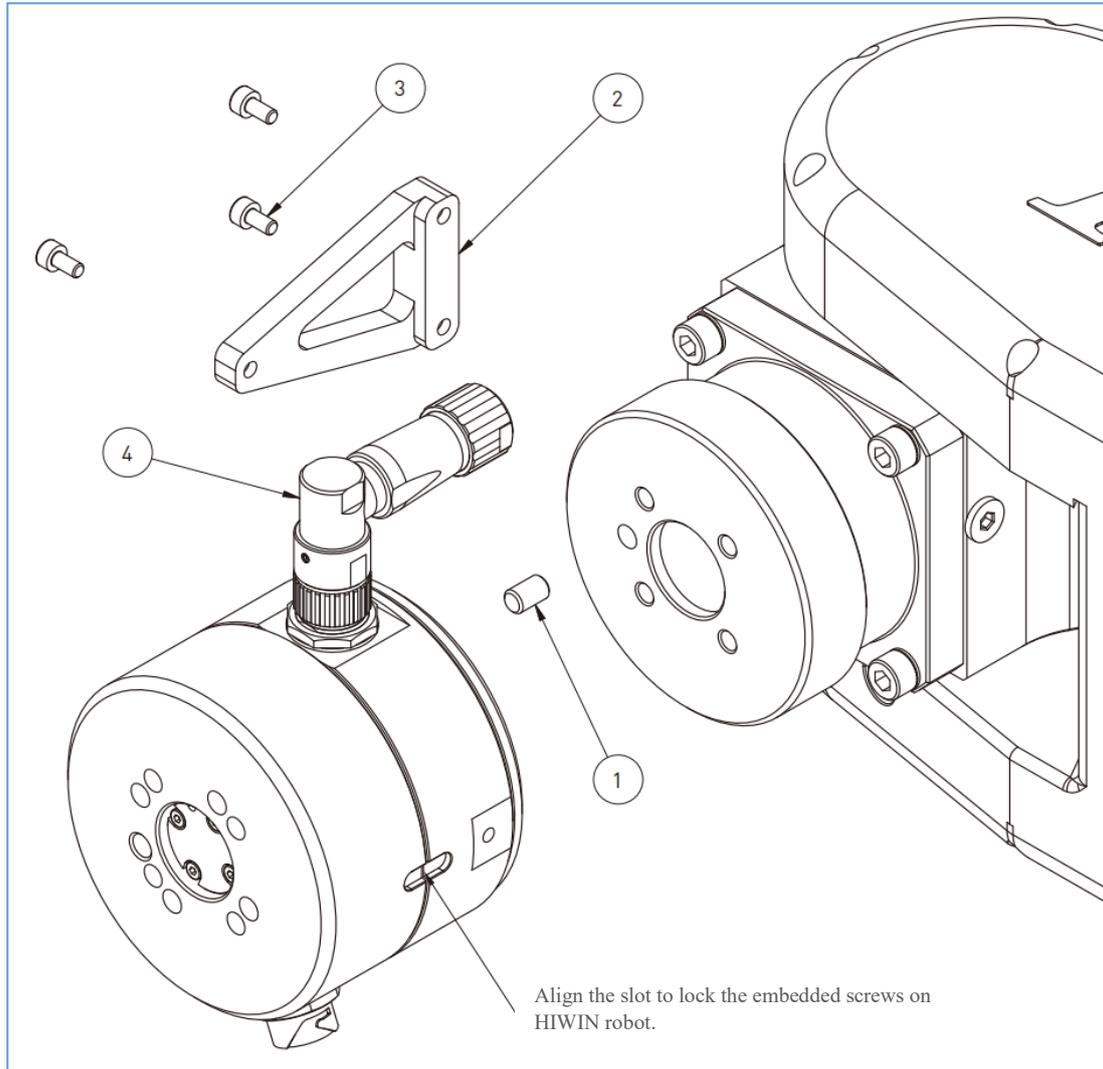
Note: 1. The electric rotary joint with HIWIN robot manipulator accessory kit, including the wire and fixed piece from the HIWIN robot to the electric rotary joint.

2. If you purchase the accessory kit including ERJ, please refer to 4-1. Models Definition for the specifications.

3. If you need other accessories, please contact HIWIN service staff.

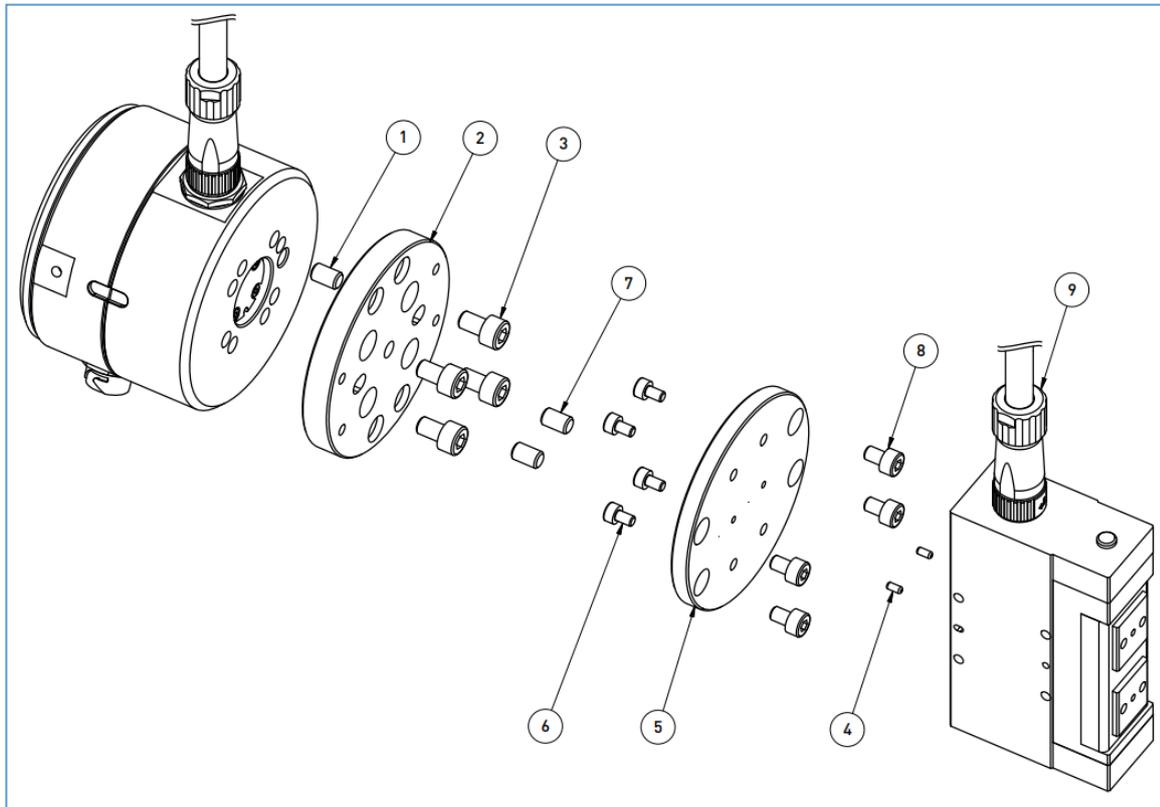
## 5-2 Installation Examples

### ■ ERJ with HIWIN Robot



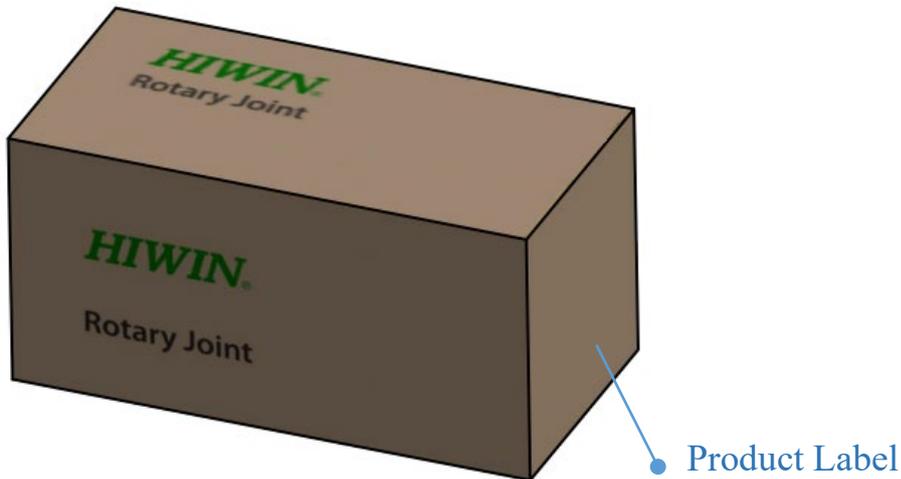
Item	Name
1	Pin
2	Fixed Piece
3	Hexagonal Head Screw
4	Control Cable

■ ERJ with Electric Gripper



No.	Name
1	Position Pin
2	Adapter Board (robot end)
3	Hexagonal Head Screw
4	Position Pin
5	Adapter Board (gripper end)
6	Hexagonal Head Screw
7	Position Pin
8	Hexagonal Head Screw
9	Control Cable

## 5-3 Shipment Illustration



### ■ Shipment Contents

1. Electric Rotary Joint
2. Product Approval

### ■ Product Label



## 5-4 Demand Form

Customer Name		Date	
Contact		TEL	
E-Mail		FAX	
Address			

1. Model Number for Electric Rotary Joint	
2. Rotation Angle (° )	
3. Rotation Speed (mm/s)	
4. Rotation Acceleration (mm/s <sup>2</sup> )	
5. Workpiece Weight (kg)	
6. Lateral Torque (N-m)	
7. Special Use Environment	<input type="checkbox"/> Clean Room <input type="checkbox"/> Powder Dust <input type="checkbox"/> High Temperature ___°C <input type="checkbox"/> Low Temperature ___°C <input type="checkbox"/> Vibration <input type="checkbox"/> Grease <input type="checkbox"/> Water <input type="checkbox"/> Humidity <input type="checkbox"/> Chemical Corrosion <input type="checkbox"/> Others_____
8. Carrier Model Number	
9. Carrier Payload (kg)	
10. Carrier Speed (mm/s)	
11. Life Cycle (s)	

12. Special Use	
13. Industry Purpose	<input type="checkbox"/> Polish <input type="checkbox"/> Grind <input type="checkbox"/> Blur Removal <input type="checkbox"/> Assembly <input type="checkbox"/> Machine Tool <input type="checkbox"/> Others _____
14. Remark:	

## **Electric Rotary Joint (Original Instruction) User Manual**

Publication Date : March 2020, first edition

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## Subsidiaries / Research Center

### HIWIN GmbH

OFFENBURG, GERMANY  
[www.hiwin.de](http://www.hiwin.de)  
[www.hiwin.eu](http://www.hiwin.eu)  
[info@hiwin.de](mailto:info@hiwin.de)

### HIWIN Schweiz GmbH

JONA, SWITZERLAND  
[www.hiwin.ch](http://www.hiwin.ch)  
[info@hiwin.ch](mailto:info@hiwin.ch)

### HIWIN KOREA

SUWON · CHANGWON, KOREA  
[www.hiwin.kr](http://www.hiwin.kr)  
[info@hiwin.kr](mailto:info@hiwin.kr)

### HIWIN JAPAN

KOBE · TOKYO · NAGOYA · NAGANO ·  
TOHOKU · SHIZUOKA · HOKURIKU ·  
HIROSHIMA · FUKUOKA · KUMAMOTO,  
JAPAN  
[www.hiwin.co.jp](http://www.hiwin.co.jp)  
[info@hiwin.co.jp](mailto:info@hiwin.co.jp)

### HIWIN s.r.o.

BRNO, CZECH REPUBLIC  
[www.hiwin.cz](http://www.hiwin.cz)  
[info@hiwin.cz](mailto:info@hiwin.cz)

### HIWIN CHINA

SUZHOU, CHINA  
[www.hiwin.cn](http://www.hiwin.cn)  
[info@hiwin.cn](mailto:info@hiwin.cn)

### HIWIN USA

CHICAGO, U.S.A.  
[www.hiwin.com](http://www.hiwin.com)  
[info@hiwin.com](mailto:info@hiwin.com)

### HIWIN SINGAPORE

SINGAPORE  
[www.hiwin.sg](http://www.hiwin.sg)  
[info@hiwin.sg](mailto:info@hiwin.sg)

### Mega-Fabs Motion Systems, Ltd.

HAIFA, ISRAEL  
[www.mega-fabs.com](http://www.mega-fabs.com)  
[info@mega-fabs.com](mailto:info@mega-fabs.com)

### HIWIN Srl

BRUGHERIO, ITALY  
[www.hiwin.it](http://www.hiwin.it)  
[info@hiwin.it](mailto:info@hiwin.it)

### HIWIN TECHNOLOGIES CORP.

No. 7, Jingke Road,  
Taichung Precision Machinery Park,  
Taichung 40852, Taiwan  
Tel: +886-4-23594510  
Fax: +886-4-23594420  
[www.hiwin.tw](http://www.hiwin.tw)  
[business@hiwin.tw](mailto:business@hiwin.tw)