

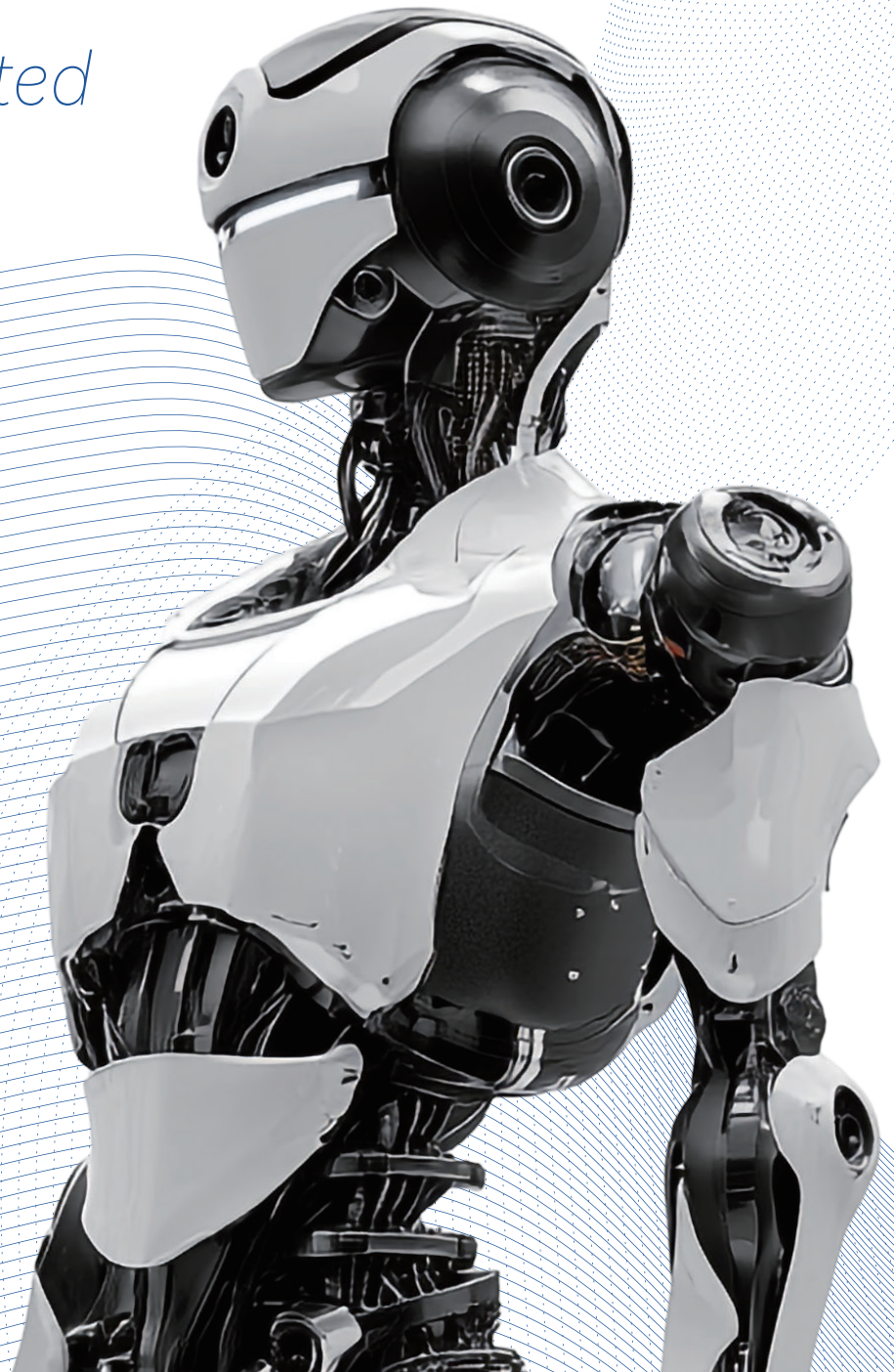


Leadshine

Stock Code: 002979

Robotic Core Components

*Robotic Integrated
Actuators*



Reliable Motion Control Partner



● Headquarters in Shenzhen



● Shanghai Intelligent Industry Park



● Production base in Shenzhen



● R&D and production base in Dongguan

- Founded in 1997
- Public Listed Company in China (002979.SZ)
- Dedication in Motion Control
Stepper / Servo systems, Motion Controllers, PLC Control systems, I/O Modules, Robotic core components, Encoders,
- A leading supplier of motion control products and solutions in the world
- Customer Oriented, Technology Oriented, Forever Improving, Sharing of Success

 **29+**
History

 **500+**
R&D Engineers

 **1400+**
Global Partners

 **200/40**
Agent Channel

 **20+**
Global Sales
Offices

 **30million+**
Installed Axes

Compact and integrated, meeting the fundamental requirements for lightweight robots.



ongoing

HJ1 Economy Series

- Slim and Lightweight: Integrated drive, harmonic reducer, and encoder for a more compact deployment.
- Flexible: Suitable for space-constrained end-execution structures.
- Worry-Free Choice: Proprietary FM motor balances quality and cost, simplifying selection with peace of mind.

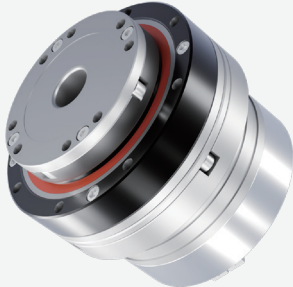
Collaborative Robots

Humanoid Robots

Industrial Turntables

Machine Tools

Comprehensive functionality, outstanding performance, efficient and convenient debugging.



HJ2 Standard Series

52 / 70 / 80 / 90 / 110 mm

- Hollow Design: Supports wire routing through the shaft, optimizing overall structure.
- Precision stability: High repeatability accuracy, suitable for complex joint motion control.
- High expandability: Supports multi-bus communication.

Collaborative Robots

Humanoid Robots

Industrial Turntables

Machine Tools

High water and dust resistance, extended service life, versatile application scenarios, multi-bus and multi-certification support.



ongoing

HJ3 Premium Series

- Ultimate integration: Embedded ring driver and high-precision magnetic ring encoder.
- Excellent dynamic response: Adaptable to frequent actions and complex posture switching requirements.

Collaborative Robots

Humanoid Robots

Industrial Turntables

Machine Tools

HJ 2 - 52 H 101 D 24 - X K - EC

Module Categories

HJ	Harmonic Integrated Actuators
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Versions

1	Economy
2	Standard
3	Premium

Module Outer Diameter

Reducer Models	52
	70
	80
	90
	110

Length and Load Capacity

F	Flat
H	Long-tube
T	Collaborative

Communication Protocol

EC	EtherCAT
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Voltage Class

K	48 V
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Brake Types

N	No Brake
B	Permanent Magnet Brake

Encoder Bit Depth

16	17	19
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Drive Types

D	Standard (CDH series)
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Reduction Ratio

101

Selection Guide

Series	Model	Gear Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Rated Speed With 1/2 Rated Torque (RPM)
HJ2	HJ2-52H101D24-XK-EC	101	11	8.9	5	37
	HJ2-70F101D24-XK-EC	101	34	13.5	9.6	52
	HJ2-80H101D24-XK-EC	101	66	49	30	35
	HJ2-90H101D24-XK-EC	101	102	61	50	36
	HJ2-110H101D24-XK-EC	101	194	133	84	35

The entire series can be optionally equipped with brakes and communication methods.



Note: "14, 17, 20, 25, 32" correspond to harmonic drive specifications.

HJ2 Series

Harmonic Integrated Actuator

Integrates high torque density, closed-loop precision control, modular design, and open protocol compatibility. Equipped with long-life harmonic drives for stable and efficient operation. Motor, reducer, and encoder are integrated for flexible motion control. Available in 52/70/80/90/110 mm sizes.



Collaborative Robots



Humanoid Robots



Industrial Turntables



Industrial Robots



Machine Tools



Industrial Automation

Highlights

Ultra-Slim Design

Utilizes integrated construction to significantly reduce module size and weight, enabling lighter, more agile deployment.

High Torque Density

Delivers powerful torque within a compact footprint, meeting demanding dynamic response requirements under heavy loads.

Precision Control

Built-in high-accuracy encoders and optimized algorithms enable smoother humanoid motion control.

High Integration

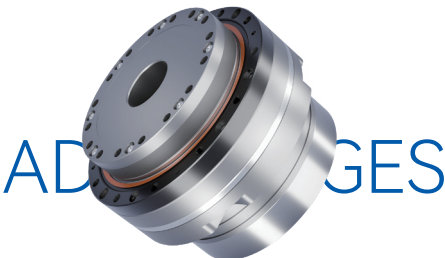
Motor, driver, and encoder are encapsulated as a single unit, simplifying overall wiring and assembly.

Energy-Efficient

Low-power design extends operational endurance, ideal for extended runtime scenarios.

Modular Compatibility

Compatible with various humanoid structures, supporting rapid deployment and multi-joint expansion.



High-Speed EtherCAT Bus

- Supports EtherCAT high-speed industrial bus for millisecond-level real-time control and multi-axis coordination, delivering faster system response.

High Torque Density

- Optimized electromagnetic design and material selection deliver greater torque per unit volume, meeting high-performance application demands.

Low Heat Generation, Extended Runtime

- Efficient energy conversion reduces system losses and temperature rise, enhancing operational stability and endurance.

Ultra-Thin Profile

- Ultra-slim form factor saves installation space, accommodates more compact equipment, and enables flexible integration.

Lightweight Design

- Combines compact structure with high-strength lightweight materials to reduce overall weight, supporting machine lightweighting and energy optimization.

Industrial Services



Robot Core Components

Frameless motors, drives, hollow-shaft encoders



Integrated Actuators Solutions & Components



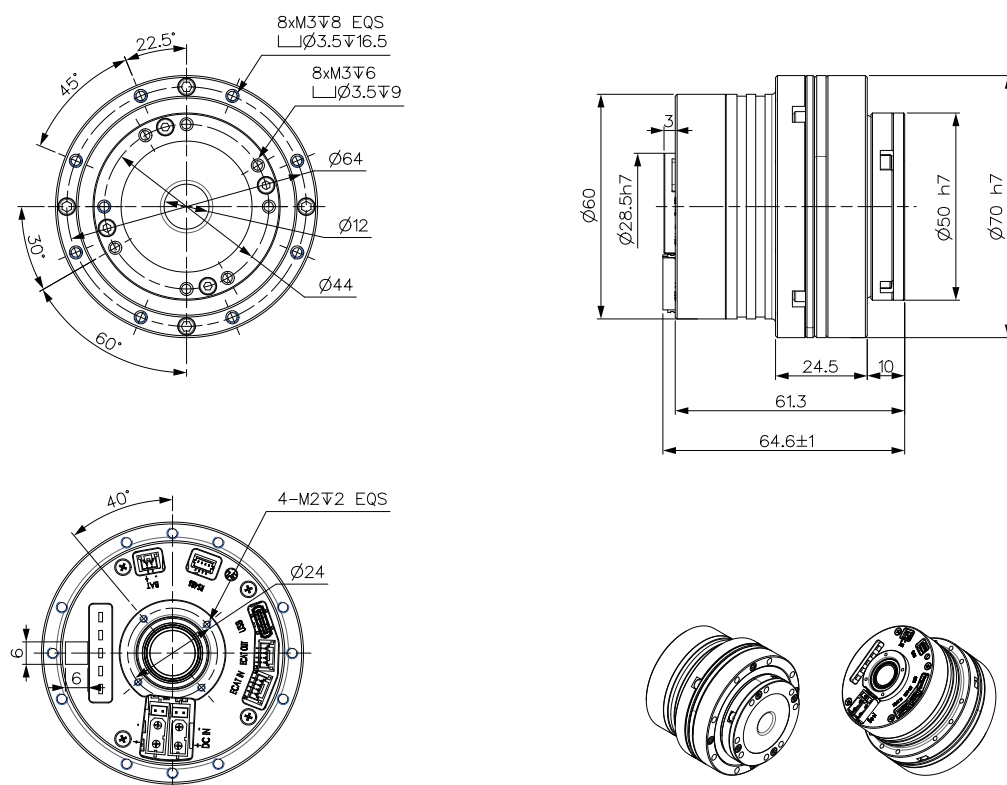
Customized Co-Development & OEM Assembly

HJ2-70F101D24-NK-EC

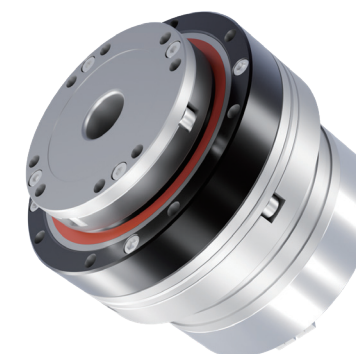


Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	34	13.5	9.6	64	52	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N·m/A)
48	8.0	2.3	0.37	0.19	10	0.056
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm²)
24	EtherCAT	Ø70	Ø12	61.3	597.6	100

Dimensions

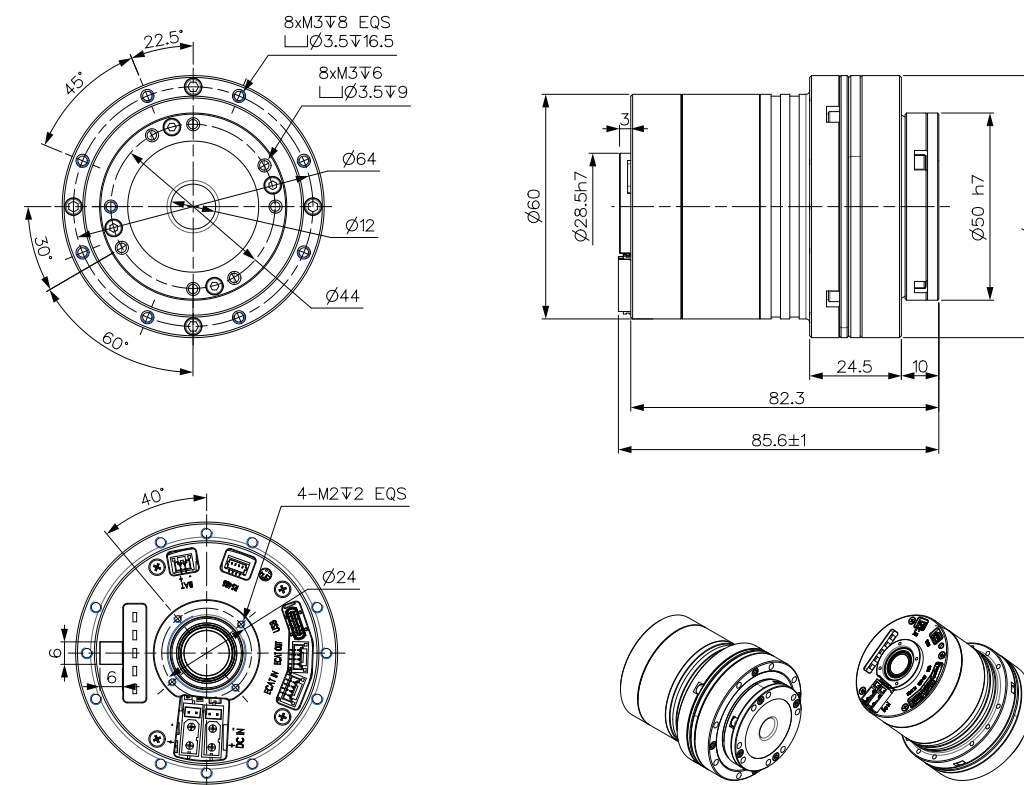


HJ2-70F101D24-BK-EC



Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	34	13.5	9.6	49	37	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N · m/A)
48	5	3.6	0.47	0.215	10	0.089
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm²)
24	EtherCAT	Ø70	Ø12	82.3	800	125

Dimensions



HJ2-80F101D24-NK-EC



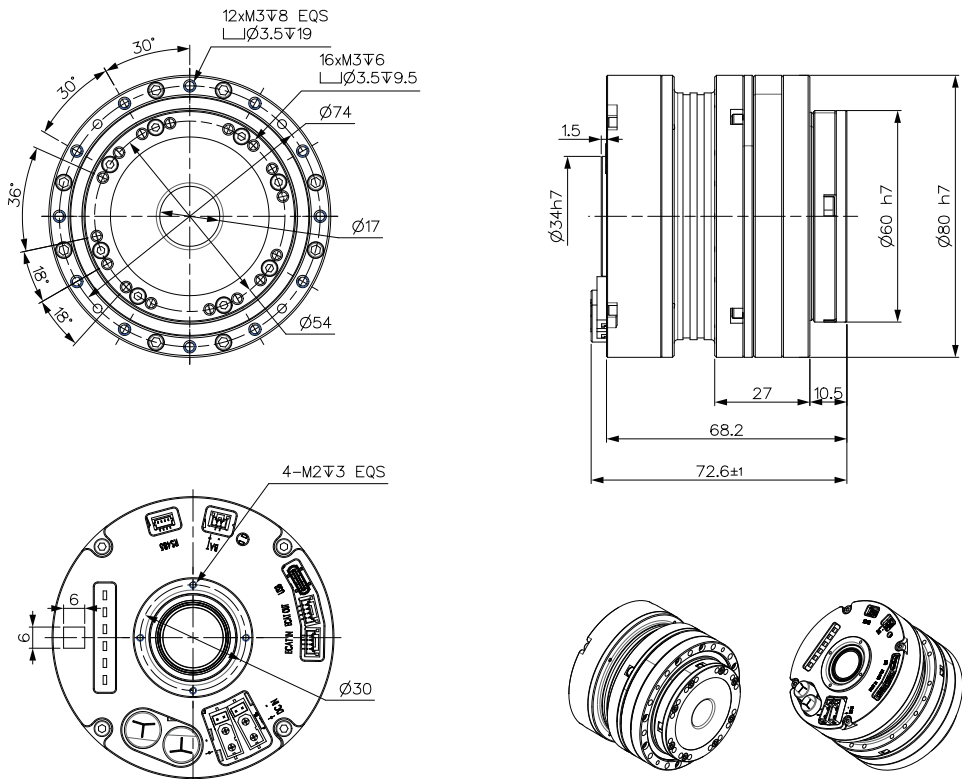
Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	66	49	30	48	36	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N·m/A)
48	8.0	3.7	0.26	0.19	10	0.108
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm ²)
24	EtherCAT	Ø80	Ø17	68.2	958.2	240

HJ2-80F101D24-BK-EC

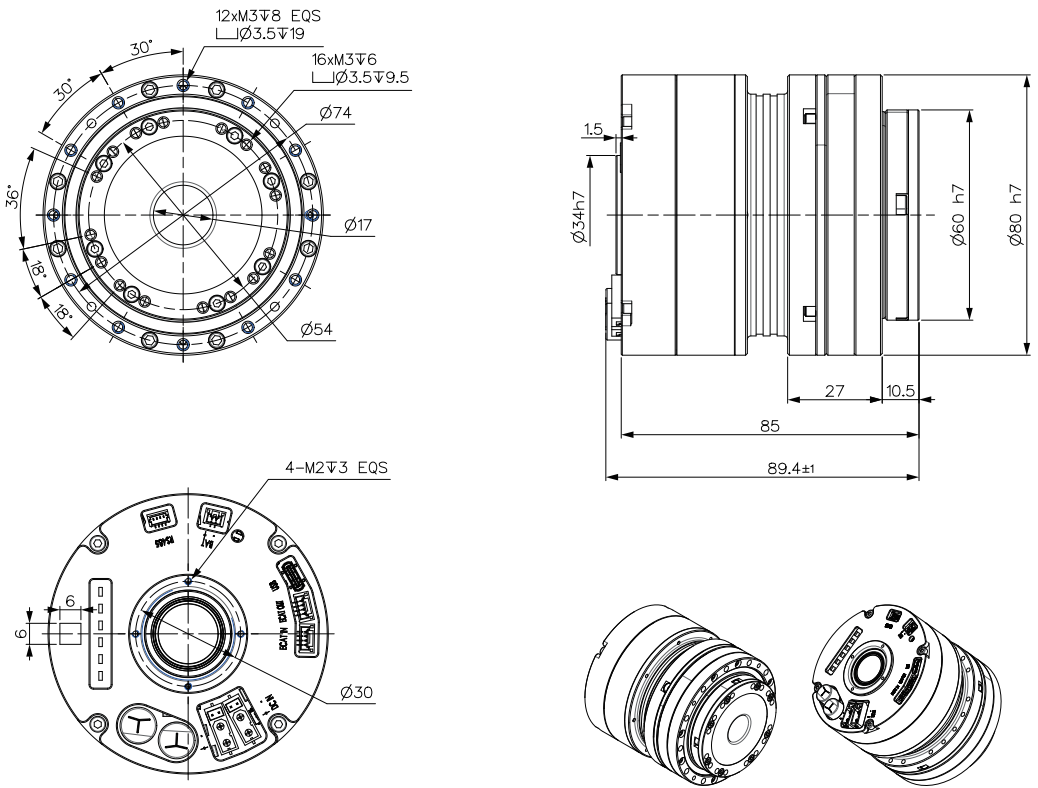


Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	66	49	30	41	34	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N·m/A)
48	6.7	5	0.33	0.074	10	0.096
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm ²)
24	EtherCAT	Ø80	Ø17	84.2	1170	400

Dimensions



Dimensions



HJ2-90F101D24-NK-EC



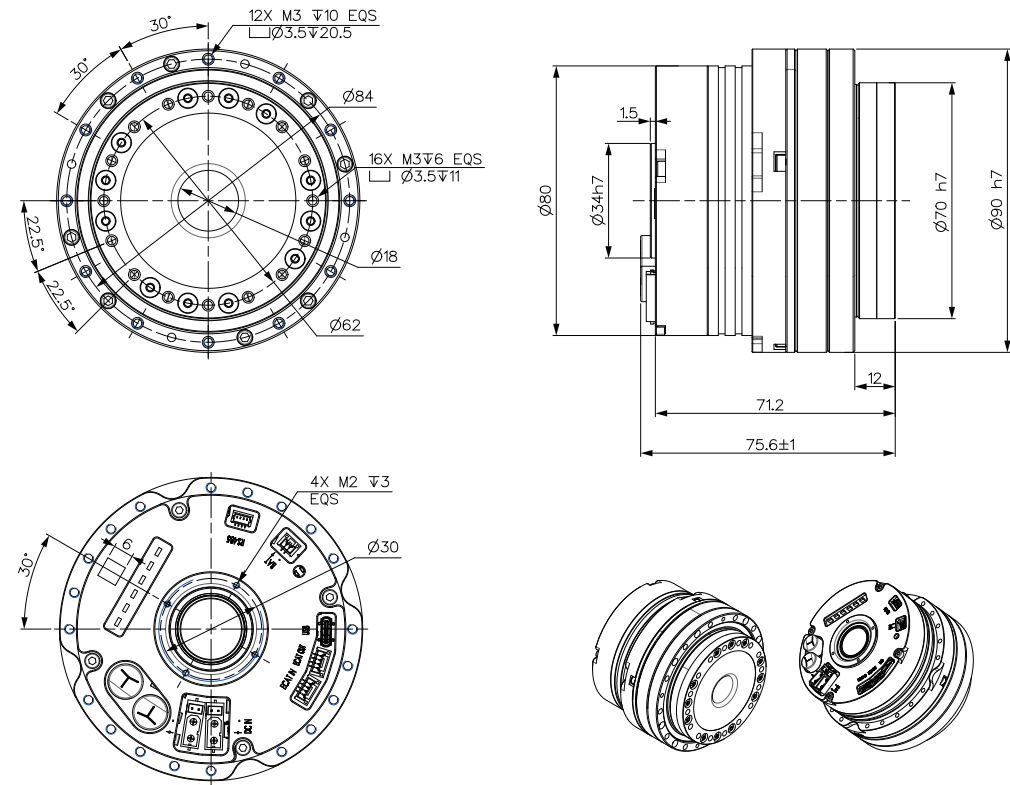
Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	102	61	50	50	36	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N·m/A)
48	12.4	6.1	0.27	0.31	10	0.108
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm ²)
24	EtherCAT	Ø90	Ø18	71.2	1229.4	370

HJ2-90F101D24-BK-EC

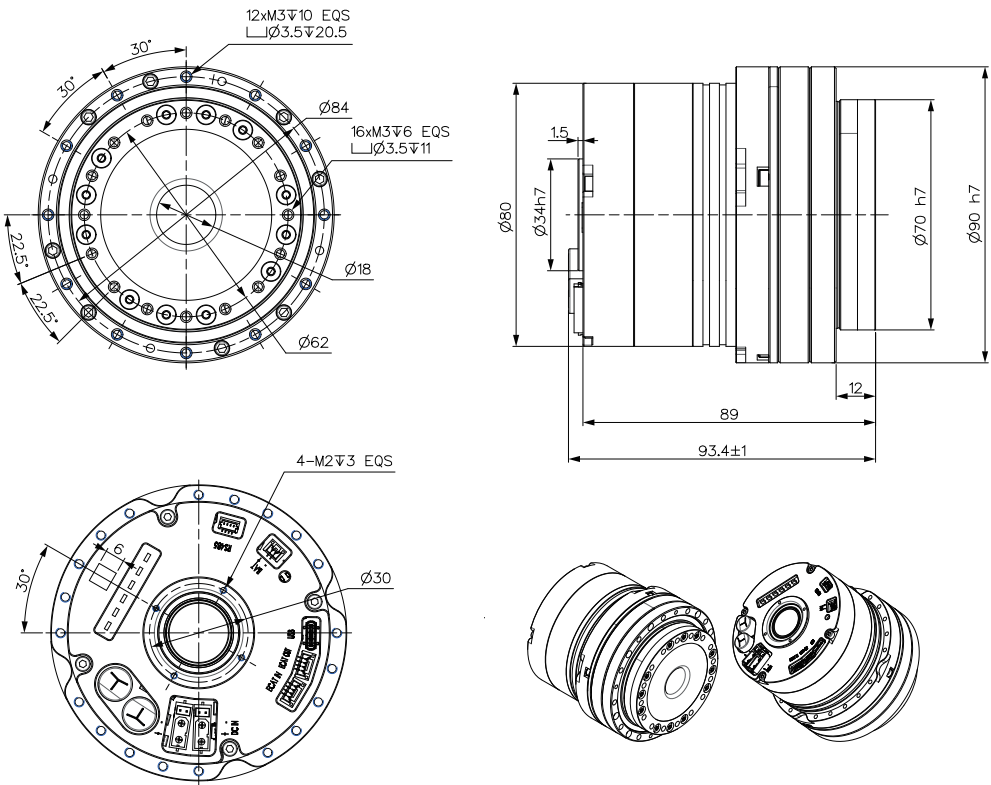


Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	102	61	50	40	30	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N·m/A)
48	8.4	6.1	0.38	0.33	10	0.118
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm ²)
24	EtherCAT	Ø90	Ø18	88.3	1600	635

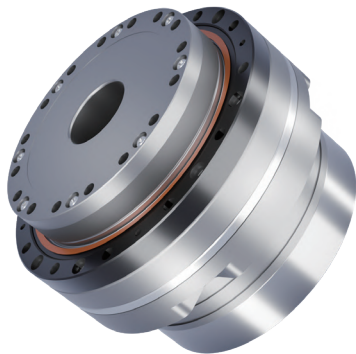
Dimensions



Dimensions

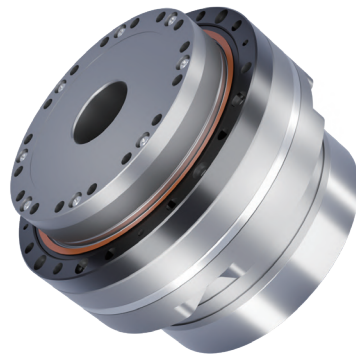


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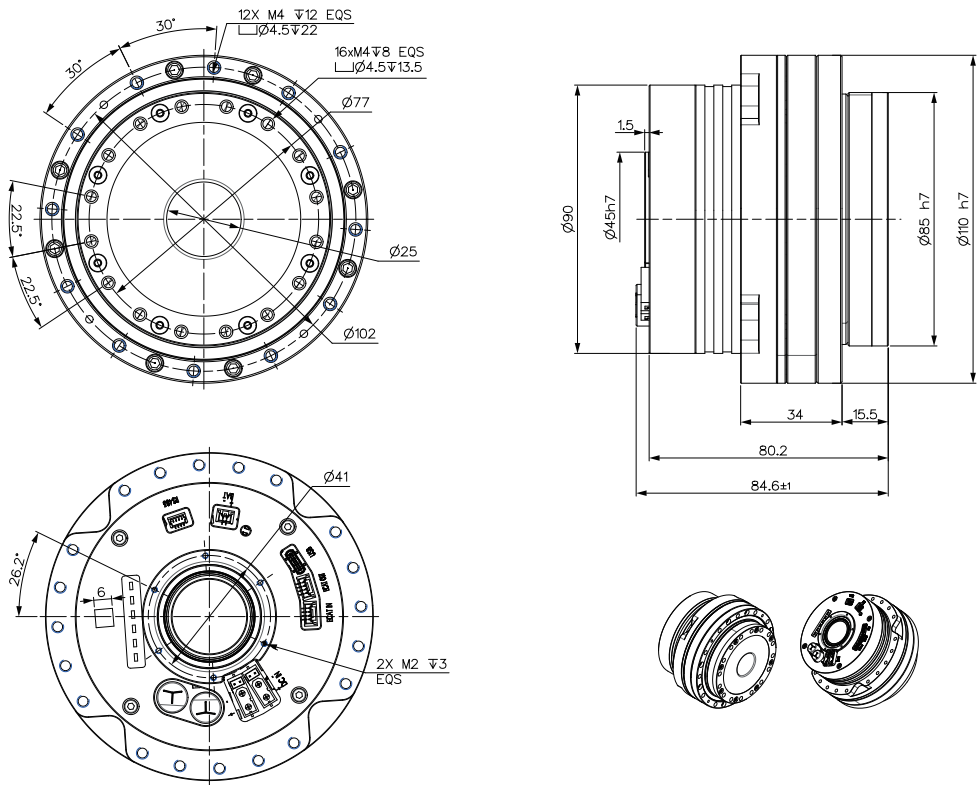
Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	194	133	84	40	31	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N·m/A)
48	19.9	8.6	0.13	0.22	10	0.128
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm ²)
24	EtherCAT	Ø110	Ø25	80.2	1981.2	1010

HJ2-110F101D24-BK-EC

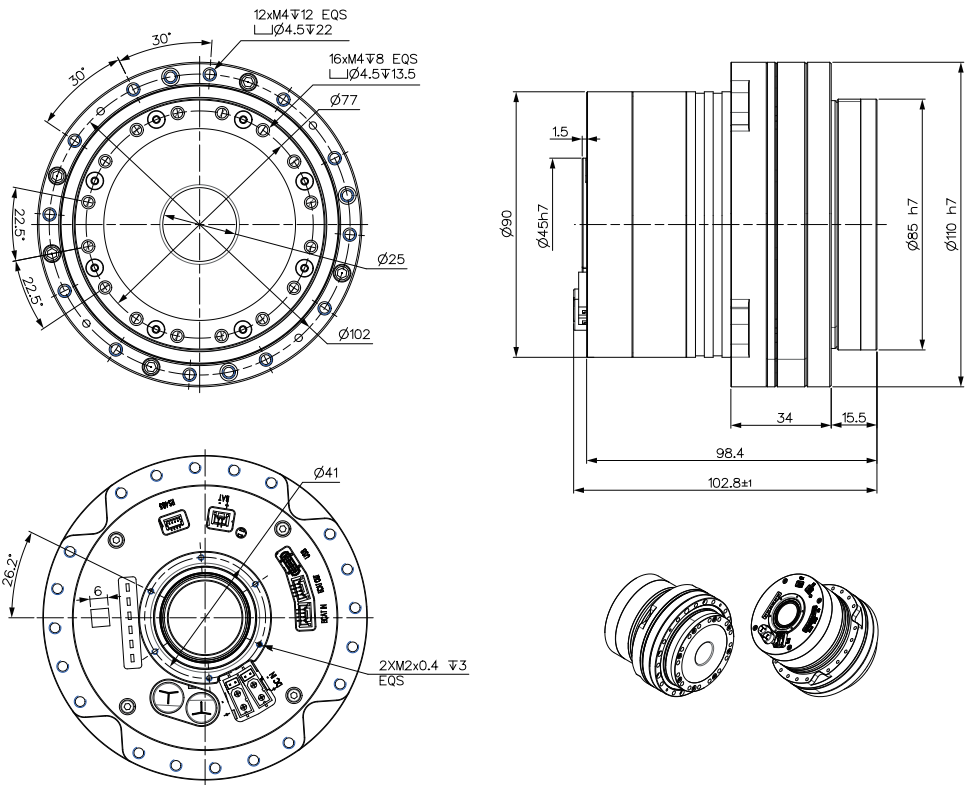


Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	194	133	84	36	13	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N·m/A)
48	10.4	9	0.13	0.25	10	0.143
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm ²)
24	EtherCAT	Ø110	Ø25	97.6	2600	1550

Dimensions



Dimensions



Greater torque, lower temperature rise, meeting the performance upgrade needs of robot dogs and small-sized humanoid robots.



ongoing

PJ2 Standard Series (Internal Rotor)

- Low temperature rise: paired with internal rotor frameless motor for better heat dissipation.
- High response: lower moment of inertia, faster response speed.
- Multiple buses: supports CAN, CANFD, EtherCAT, etc.

Suitable for the long-term operation requirements of humanoid robots and large robot dogs, suitable for heavy-load, high-precision applications.



NEW

PJ3 High-End Series (Internal Rotor)

- High torque: continuous output capability under heavy loads
- High rigidity: magnesium-aluminum alloy housing provides lightweight construction while enhancing overall rigidity
- Intelligent monitoring: vibration suppression, real-time temperature monitoring and protection

Highlights

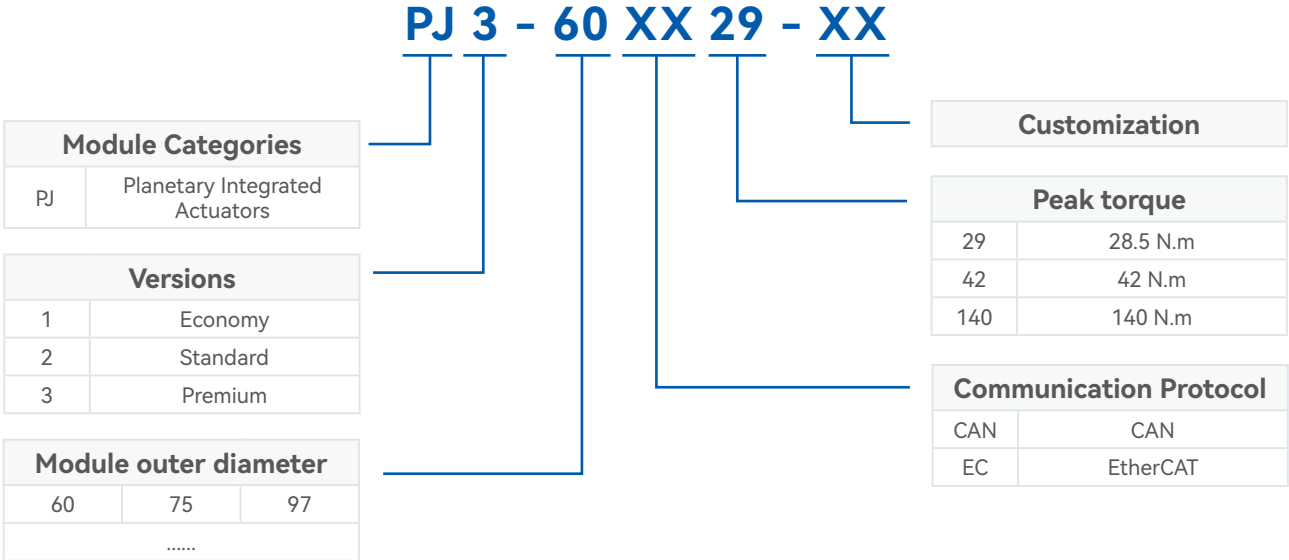
- No Inflated Torque Ratings

The torque is not overstated; output capability is designed based on real working conditions to meet the high-dynamic motion requirements of humanoid robots such as running, jumping, and flipping.
- Lightweight Structural Design

The mechanical structure is designed with lightweight principles, using hollowing out to reduce weight, achieving a 15% weight reduction.
- Highly Reliable Mounting Structure

Through an innovative clamp connection method, intermediate links are reduced, improving structural rigidity and torque transmission efficiency.
- Hollow Design

The hollow planetary module design simplifies robot wiring, making EtherCAT/CAN cabling more convenient.



Selection Guide

Series	Model	Voltage Input (VDC)	Gear Ratio	Peak Torque (N.m)	Maximum Speed (RPM)	Size of Actuator (mm)	Mass (g)
PJ3	PJ3-60CAN29	24-48	19.5	28.5	200	Ø61.2 * 60	530
	PJ3-60EC29						
	PJ3-75CAN42	24-48	20	42	155	Ø61.1 * 75	800
	PJ3-75EC42						
	PJ3-97CAN140	24-48	22	140	130	Ø61.1 * 97	1200
	PJ3-97EC140						

PJ3-75XX42



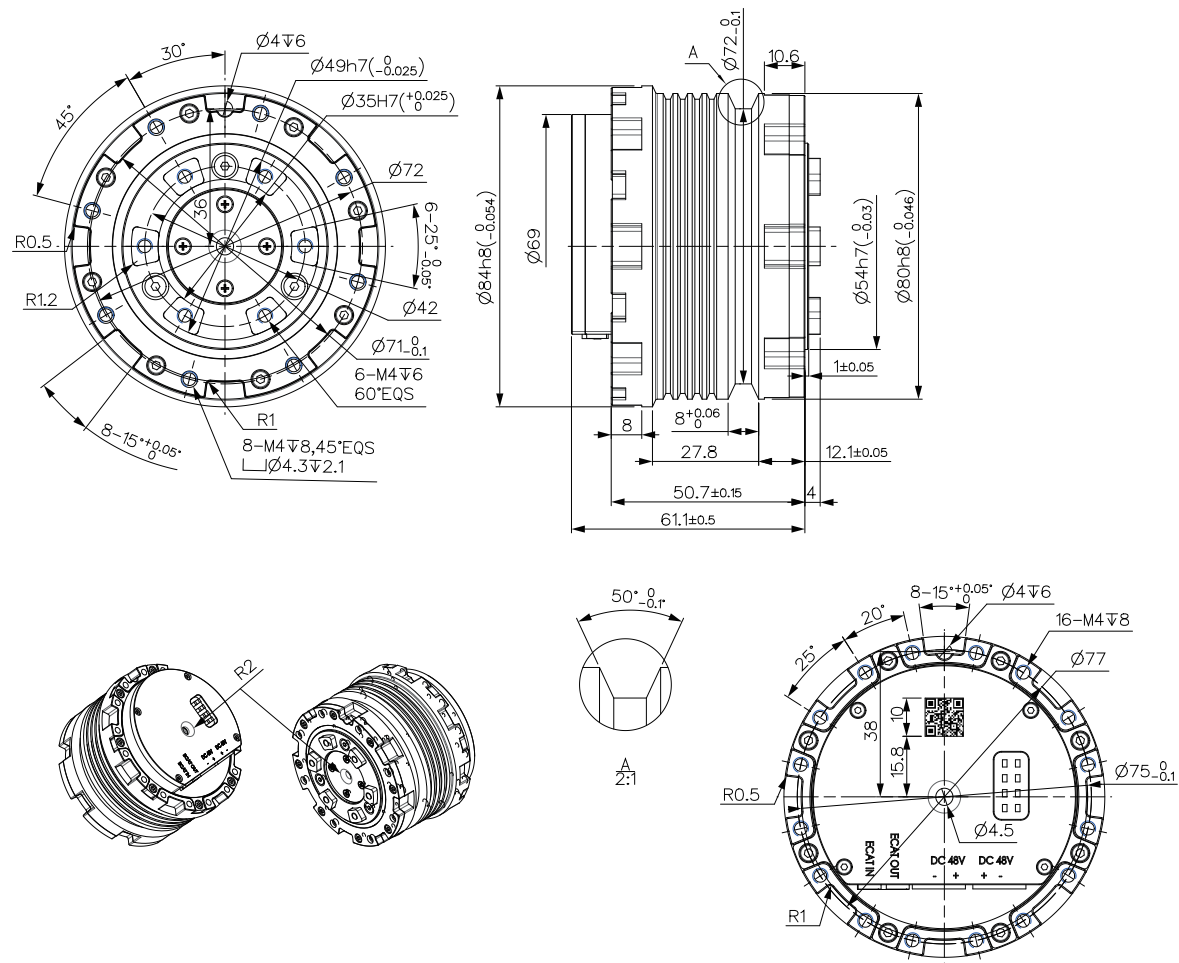
Gear Ratio	Rated Torque (Nm)	Rated Speed (Nm)	Instantaneous Maximum Torque (N.m)	Maximum Speed (RPM)	IP Level
20	14	60	42	155	IP54
Supply Voltage (VDC)	Through Hole (mm)	Length (mm)	Weight (g)	Communication Mode	
24-48	4.5	61.1 ± 0.5	800	CAN / EtherCAT	

PJ3-97XX140

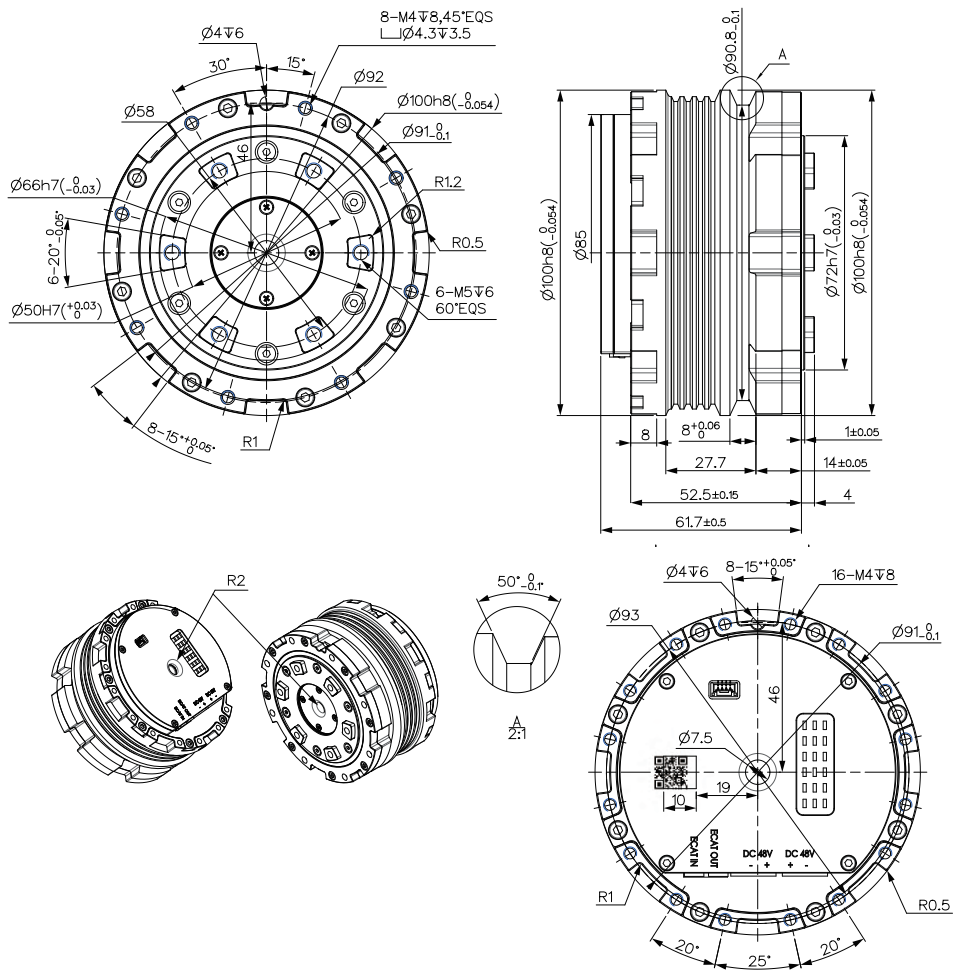


Gear Ratio	Rated Torque (Nm)	Rated Speed (Nm)	Instantaneous Maximum Torque (N.m)	Maximum Speed (RPM)	IP Level
22	44	80	140	130	IP54
Supply Voltage (VDC)	Through Hole (mm)	Length (mm)	Weight (g)	Communication Mode	
24-48	7.5	61.7 ± 0.5	1200	CAN / EtherCAT	

Dimensions



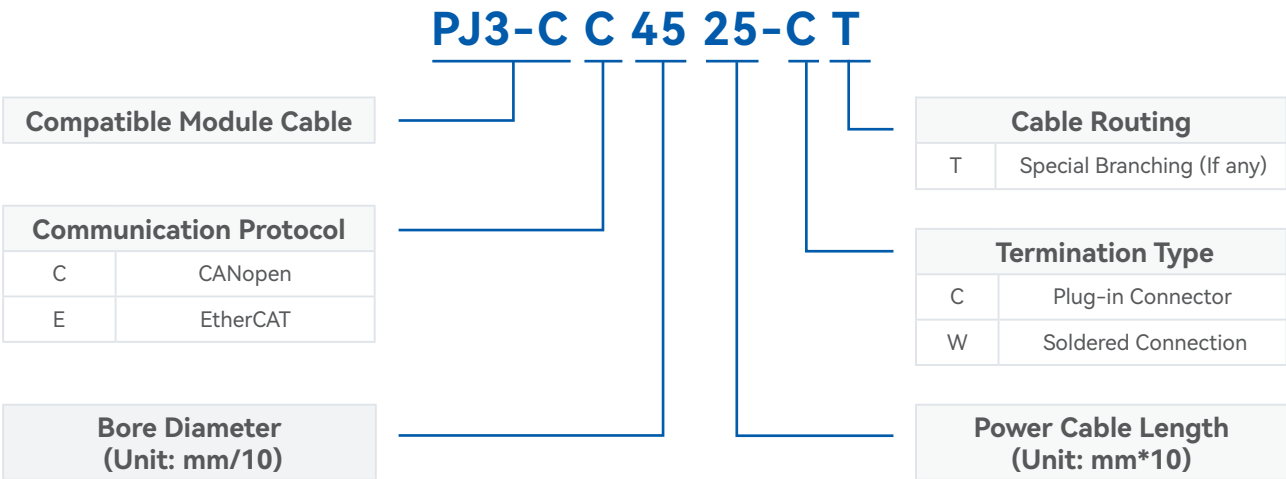
Dimensions



Cable Routing

PJ3 internal rotor planetary joint

Part Numbers



Selection Guide

Product Series	Model	Compatible Integrated Actuators	Communication Protocol	Termination Type	Special Branching	Total Cable Length
PJ3 Series Cable	PJ3-CC4535-C	PJ3-60CAN PJ3-75CAN	CAN	Plug-in Connector		350 mm
	PJ3-CC7535-C	PJ3-97CAN	CAN	Plug-in Connector		350 mm
	PJ3-CC7545-CT	PJ3-97CAN	CAN	Plug-in Connector	Waist joint cable branching	450 mm
	PJ3-CE4528-C	PJ3-60EC PJ3-75EC	EtherCAT	Plug-in Connector		280 mm
	PJ3-CE7529-C	PJ3-97EC	EtherCAT	Plug-in Connector		290 mm
	PJ3-CE7532-CT	PJ3-97EC	EtherCAT	Plug-in Connector	Waist joint cable branching	320 mm

Wire Material



Jacketed Cable



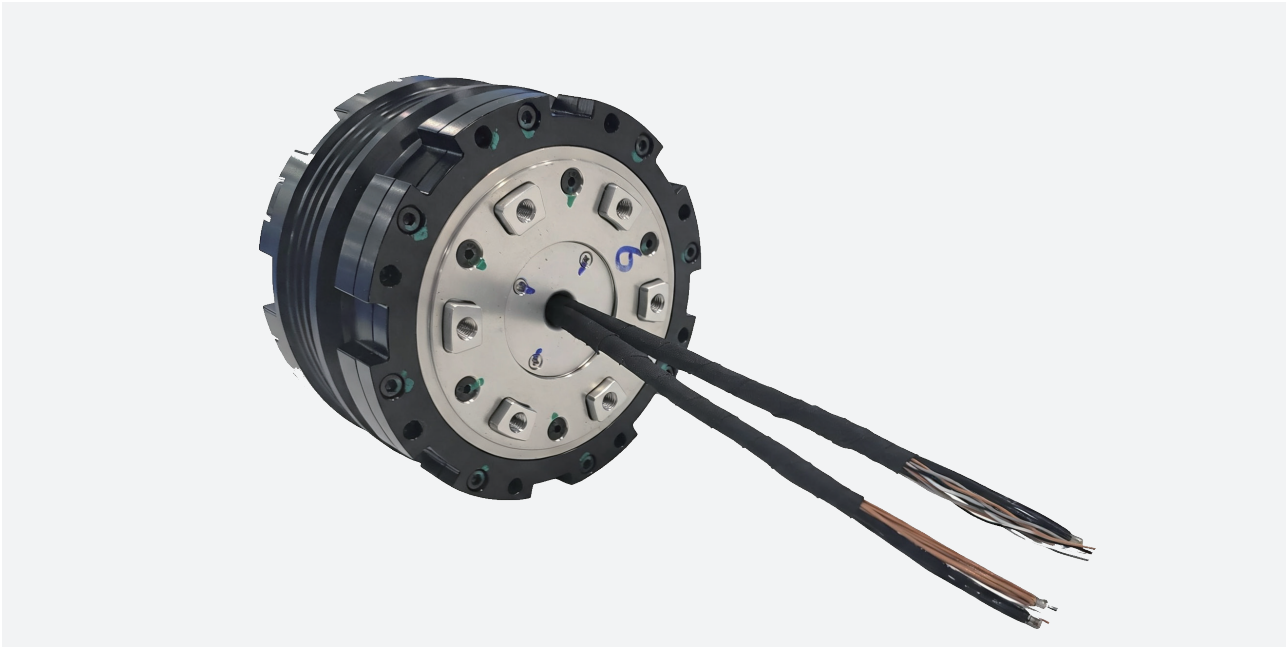
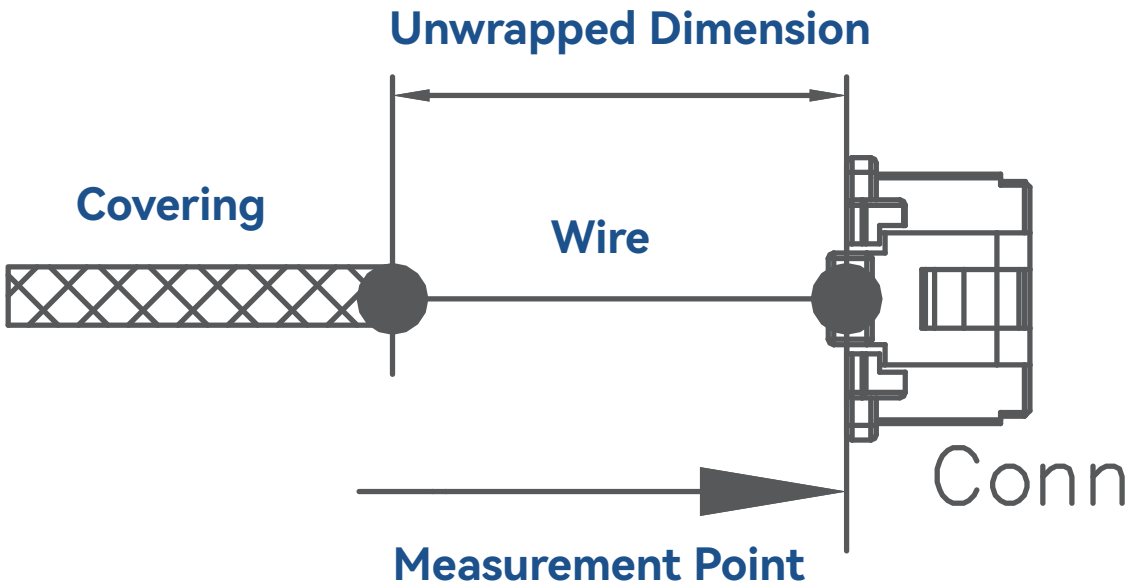
Cloth Tape



Self-wrapping
Braided Sleeve



PVDF Heat
Shrink Tubing





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