



Leadshine

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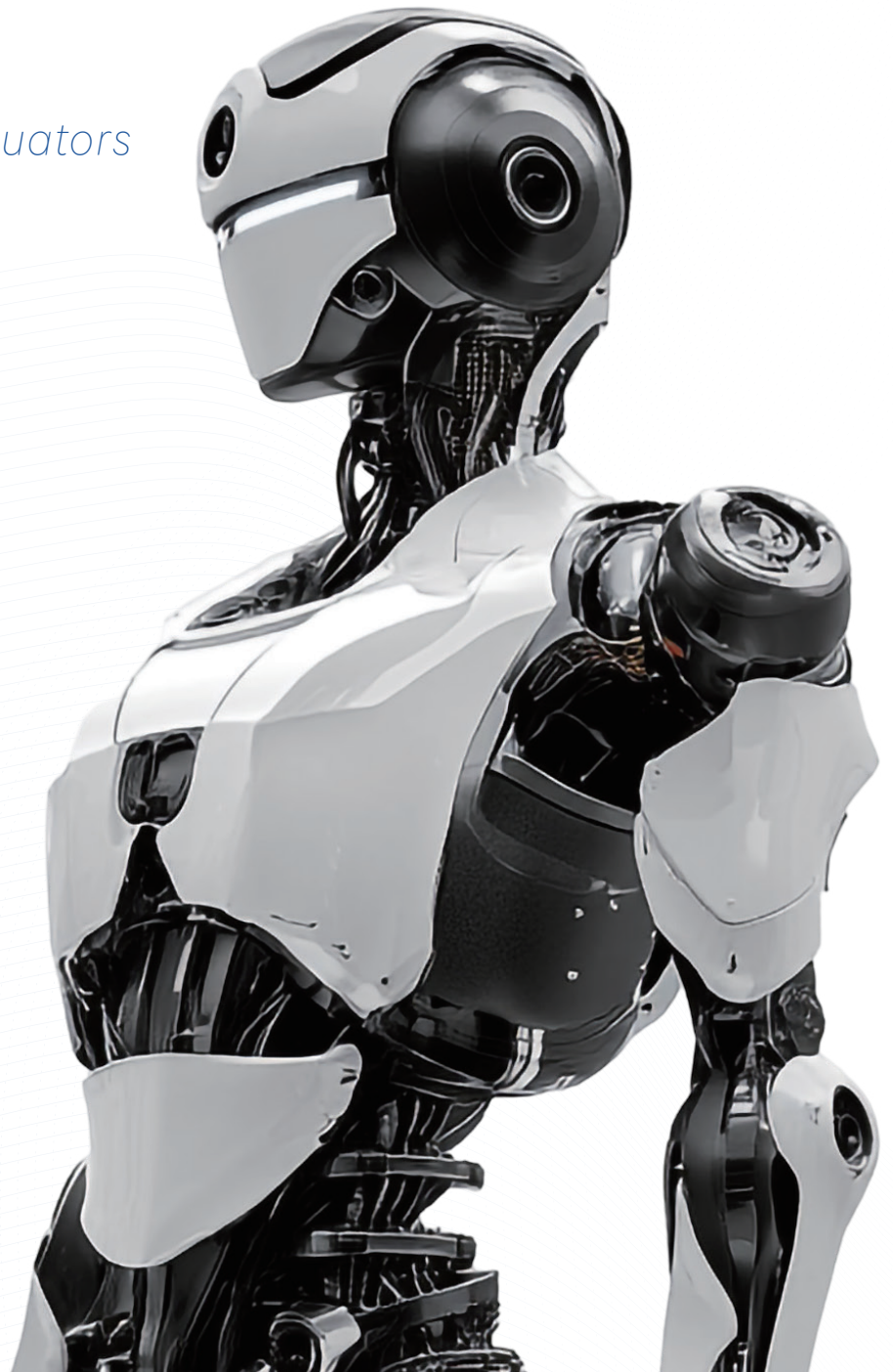
Robotic Core Components

Dexterous Hand

Frameless Motor

Robotic Integrated Actuators

Coreless Motor



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

Leadshine Motion Control Total Product System



Extreme Cost-Effectiveness
Universal Dexterous Hand



DH116 Series

- EtherCAT / CAN-FD / RS485 Support
- 30 kg maximum hand load
- Optional multi-modal tactile sensors
- Torque / Position Hybrid Control
- 11 DOF High Dexterity

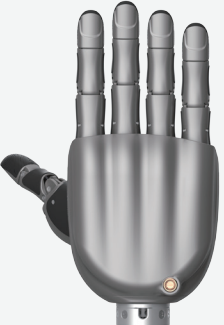
Ultra-Compact Size
The Perfect Match for Small and Medium-Sized Robots



DH116S Series

- EtherCAT / CAN-FD / RS485 Support
- Ultra-Lightweight Design(<380 g)
- Maximum Load (Hook Grip) ≥5 kg
- Customized for 1.1-1.4 m robots
- 11 DOF High Dexterity

Extended Gripping Endurance
High-DOF Dexterous Hand



DH2116 Series

- CAN / CAN-FD / RS485 Support
- 94N active grip force and 2kg fingertip thrust
- Full ecosystem SDK and open-source demo
- 21 degrees of freedom (16 active DOFs)
- Leadscrew solution provides more effective model data

Part Numbers

DH-11 6 S EC - L W 1 - S

DH	Dexterous Hand
11	11 DOF
21	21 DOF
6	6 DOA
16	16 DOA
Default	Universal
S	Ultra-light
P	Force Enhanced
Default	CANFD
EC	EtherCAT
RS	RS485

Default	Standard
S	Standard Piezoresistive
M	Multi-modal Tactile

0	Prototype
1	Gen-1 Mass Production
2	Gen-2 Mass Production

Default or G	Gray
W	White

L	Left
R	Right



Industrial Assembly



Home Service



Humanoid Robot



Dexterous Hand



Prosthesis



Human-Machine Interaction



Aerospace



Universal Dexterous Hand



Highlights

High-speed Communication

100 M EtherCAT
RS485, CAN, CAN-FD optional;

Strong Load Capacity

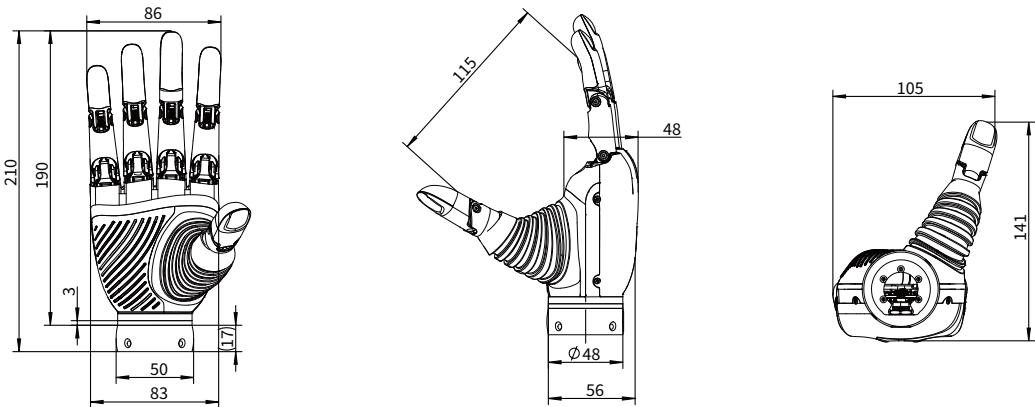
30 KG maximum hand load;
5 KG single finger maximum load;

Powerful Collaborative Capabilities

Specifically multi-finger coordination with force and position fine-tuning.

Powerful perception capability

508 dot matrix tactile sensor;
Optional multi-modal sensors or electronic skin;



DH116 Series

Extreme Cost-Effectiveness Dexterous Hand



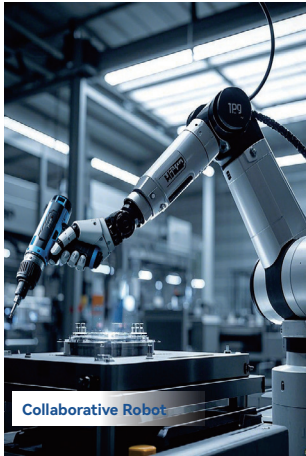
Humanoid Robot



Mobile Robots



Quadruped Robot



Collaborative Robot

Item	DH116
Weight	545 ±10 g
Number of Joints	11
Active DOF	6
Passive DOF	5
Drive Mode	Coreless Motors
Operating Voltage	12-48 VDC
Peak Current (Arms)	2.5 A
Rated Current (Arms)	0.05 A
Positioning Accuracy	±0.2 mm
Command Source	EtherCAT / CAN-FD / RS485
Whole-Hand Load Capacity (Hook)	30 kg
Single finger side swing speed	360°/s
Single finger flexion speed	360°/s
Operating temperature	-10~40℃
Operating humidity	≤ 80% RH



Ultra-light Dexterous Hand



DH116S Series

Perfect Match for Small and Medium-sized Humanoids



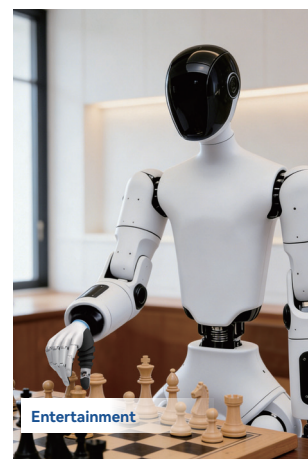
Science Education



Reception



Light-Duty Handling



Entertainment

Ultra-Slim Design

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

High Integration

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

Ultra-lightweight Design Enhances Effective Payload

Total Weight Only **379 ± 10g**

Low Power Consumption for Extended Endurance

Rated Power Only

60W

Wide Voltage Range Compatible with Various Bodies



Operating Voltage
DC12V - 48V

High Precision Execution Improves Data Quality

Repetitive Positioning Accuracy

±0.2mm



11 Degrees of Freedom 6 Active Degrees of Freedom

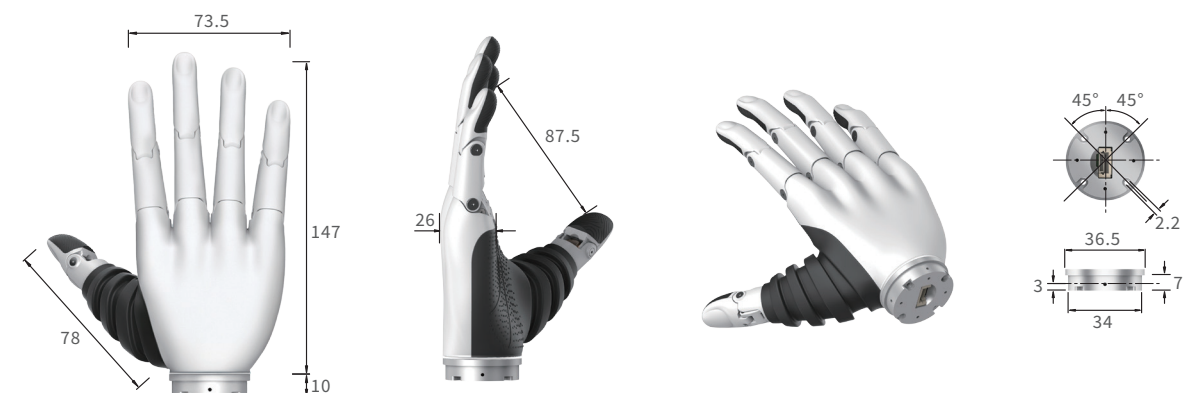
Supports Various Communication Controls

EtherCAT / CAN-FD / RS485



Full Ecosystem Coverage

C++ / Python
Windows / Linux / ROS2





CAN^{FD}

High-DOF Flagship
Dexterous Hand



Highlights

High Precision

Leadscrew solution provides more effective model data.

21 DOFs

21 degrees of freedom with 16 active DOFs, fully compatible with daily gestures.

High-speed Communication

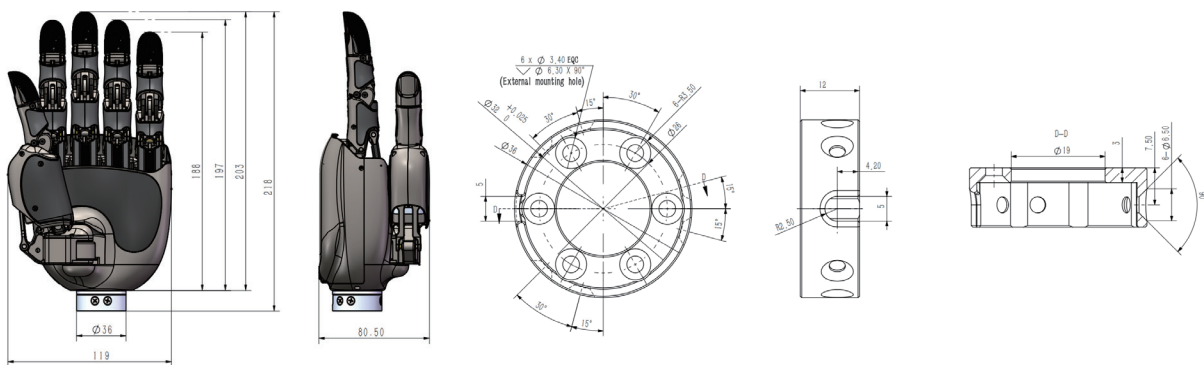
5M CANFD, 5M RS485,

Strong Load Capacity

94 N active grip force, 2 kg fingertip thrust,

Full Ecosystem

Python, C++, ROS2, full ecosystem SDK and open-source demo, ready to run out of the box.



DH2116 Series

Premium Hand



Humanoid Robot



Mobile Robots



Quadruped Robot



Collaborative Robot

Model	DH2116
Weight	870 ±10 g
Number of Joints	21
Active DOF	16
Passive DOF	5
Drive Mode	Coreless Motors
Operating Voltage	24-60 VDC
Quiescent Current	0.16 A @ 24 V
Rated Current	1 A @ 24 V
Maximum Current	5 A @ 24 V
Command Source	CAN(1 M) / CANFD(1 M + 5 M) / RS485 (5 M)
Minimum Open/Close Time	0.6 s
Single-Finger Force	20 N
Whole-Hand Load Capacity (Hook)	5 kg (Typical)
Five-finger Grip Force (Maximum)	94 N
Operating temperature	-10°-45° C
Operating humidity	10%-90% RH

Dexterous Hand Selection List

○ DH116 Series

Product Model	Communication Method	Left / Right	Color	Sensor
DH116-L1-M	CAN-FD	Left	Gray	Multi-Modal Sensor
DH116-R1-M	CAN-FD	Right	Gray	Multi-Modal Sensor
DH116-L1	CAN-FD	Left	Gray	None
DH116-R1	CAN-FD	Right	Gray	None
DH116RS-L1	RS485	Left	Gray	None
DH116RS-R1	RS485	Right	Gray	None
DH116EC-L1-M	EtherCAT	Left	Gray	Multi-Modal Sensor
DH116EC-R1-M	EtherCAT	Right	Gray	Multi-Modal Sensor
DH116EC-L1	EtherCAT	Left	Gray	None
DH116EC-R1	EtherCAT	Right	Gray	None

○ DH116S Series

Product Model	Communication Method	Left / Right	Color	Sensor
DH116S-LW1-S <i>ongoing</i>	CAN-FD	Left	White	Standard Piezoresistive
DH116S-RW1-S <i>ongoing</i>		Right	White	Standard Piezoresistive
DH116S-LG1-S <i>ongoing</i>		Left	Gray	Standard Piezoresistive
DH116S-RG1-S <i>ongoing</i>		Right	Gray	Standard Piezoresistive
DH116S-LW1		Left	White	None
DH116S-RW1		Right	White	None
DH116S-LG1		Left	Gray	None
DH116S-RG1		Right	Gray	None
DH116SEC-LW1-S <i>ongoing</i>	EtherCAT	Left	White	Standard Piezoresistive
DH116SEC-RW1-S <i>ongoing</i>		Right	White	Standard Piezoresistive
DH116SEC-LG1-S <i>ongoing</i>		Left	Gray	Standard Piezoresistive
DH116SEC-RG1-S <i>ongoing</i>		Right	Gray	Standard Piezoresistive
DH116SRS-LW1-S <i>ongoing</i>	RS485	Left	White	Standard Piezoresistive
DH116SRS-RW1-S <i>ongoing</i>		Right	White	Standard Piezoresistive
DH116SRS-LG1-S <i>ongoing</i>		Left	Gray	Standard Piezoresistive
DH116SRS-RG1-S <i>ongoing</i>		Right	Gray	Standard Piezoresistive
DH116SRS-LW1		Left	White	None
DH116SRS-RW1		Right	White	None
DH116SRS-LG1		Left	Gray	None
DH116SRS-RG1		Right	Gray	None
DH116SEC-LW1	EtherCAT	Left	White	None
DH116SEC-RW1		Right	White	None
DH116SEC-LG1		Left	Gray	None
DH116SEC-RG1		Right	Gray	None

○ DH2116 Series

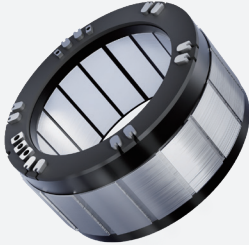
Product Model	Communication Method	Left / Right	Color	Sensor
DH2116-L1	CAN-FD	Left	Gray	None
DH2116-R1	CAN-FD	Right	Gray	None

Accessory Selection

Accessory Model	Accessory Name	Description	Pattern
KJS-1509	3~24V@2.5A Variable Power Supply	Universal Optional Accessories	
CABLE-TX0M5-BUS(V2.0)RoHS	0.5m Network Cable	Optional Accessories for EtherCAT Debugging	
MINI USB-CANFD-I	USB-CANFD Debugger	CANFD Debugging Optional Accessories	
6248XL	Super Sensing Data Gloves	Optional Accessories for Data Acquisition	

Product Portfolio

Higher Performance, More Options Adaptable



FM2 Ultra-High-Density Series

50/60/70/85/94/127 mm

- 20% lower motor loss
- 10% higher torque density vs. previous generation
- Extended endurance



Collaborative Robots Humanoid Robots Quadruped Robots Industrial Robots Medical Rehabilitation Robots

Tailored Solutions For Specialized Scenarios



Stay Tuned

FM3 Flagship Series

- Ultra-high power density
- Advanced algorithms optimize electromagnetic design for higher torque in the same volume



Collaborative Robots Humanoid Robots Quadruped Robots Industrial Robots Medical Rehabilitation Robots

Part Numbers

FM 2 - 050 14 K T N 34 6 - □□

Motor Classification	
FM	Frameless Motor

Motor Classification	
1	1st Gen Frameless Motor
2	2nd Gen Frameless Motor
3	3rd Gen Frameless Motor
*	* Gen Frameless Motor

Stator Outer Diameter	
050	050 mm
060	060 mm
070	070 mm
085	085 mm
115	115 mm
127	127 mm
***	*** mm

Stator Core Length	
08	8 mm
10	10 mm
14	14 mm
26	26 mm
**	** mm

Voltage Class	
D	380 V
E	220 V
F	110 V
G	72 V
H	60 V
K	48 V
M	36 V
N	24 V

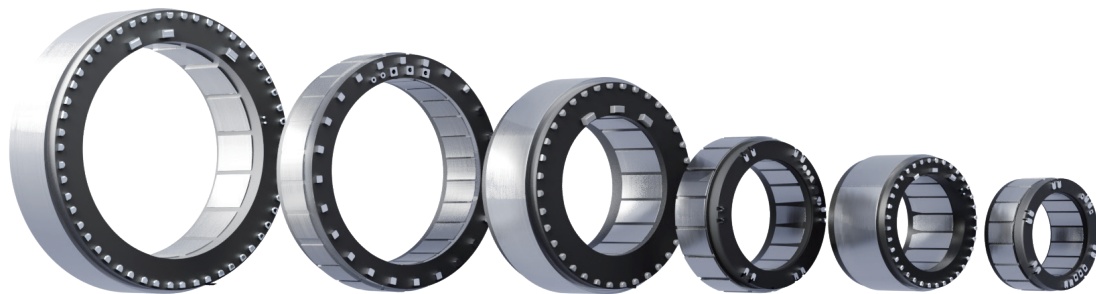
Derivatives	
□	□

Lead Wires	
5	No wires
6	Standard 200 mm wires
7	Customized wires

Rated Speed	
Example	40=40*100=4000 RPM 34=34*100=3400 RPM 3650 RPM=37 <i>Rounding to the nearest hundred</i>

Fixed Reserved	
N	Not Defined

Temperature Sensors	
T	NTC sensors
P	PTC sensors
N	No temperature sensors
S	Special



FM2 Series

Ultra-High-Density Frameless Torque Motors

New electromagnetic design with lower temperature rise, higher torque, faster response. Provides robust and stable power in compact spaces, suitable for humanoid robots, collaborative robots, etc. Available in seven standard sizes: 28/43/50/60/70/85 mm, with support for customization to meet diverse needs.



Collaborative Robots



Humanoid Robots



Industrial Robots



Quadruped Robots



Medical Rehabilitation Robots



Highlights

Ultra-High Density

10% higher torque density under the same input current, leading the industry.

Extended Endurance

Optimized magnetic circuits and materials reduce motor loss.

Ultra-Compact Structure

40–50% smaller than industry standards, ideal for high-density layouts.

Easy Integration

Flexible installation and seamless compatibility with mechanical systems.

Ultra-Low Temperature Rise

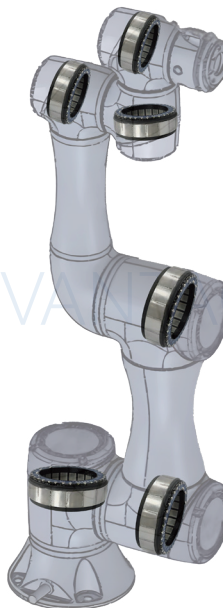
20% reduction in motor loss through optimized magnetic design.

Ultra-Low Inertia

Lightweight design and composite materials enable rapid dynamic response for frequent start-stop scenarios.



Advantages



Superior Power

- Leading torque, power density, and cogging torque performance.

Flexible Integration

- Adjustable interfaces with optional Hall, temperature, and winding sensors.

Global Service

- Digital manufacturing, global distribution, and rapid local support.

Reliability

- Fully automated production ensures consistent quality.

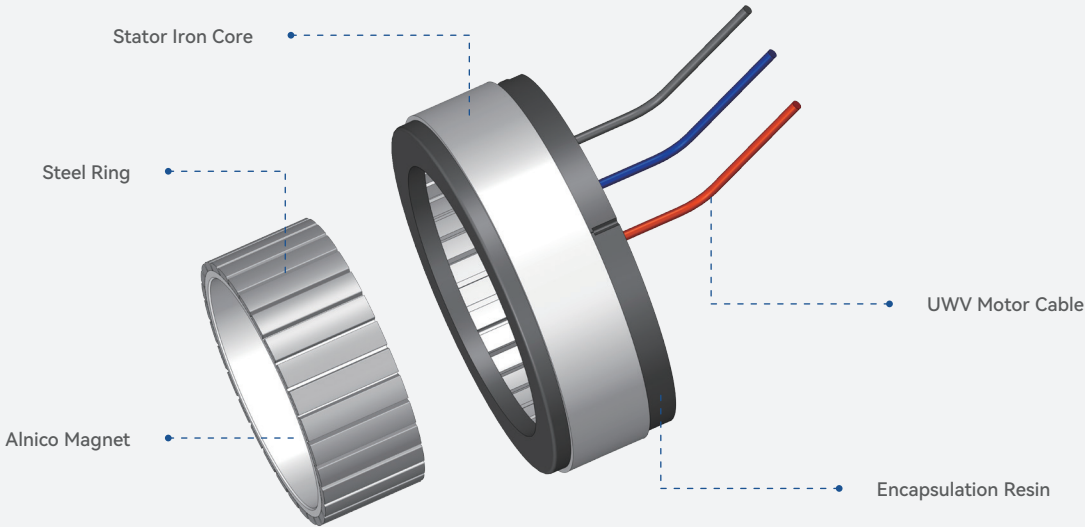
Excellent Thermal Control

- Digital manufacturing, global distribution, and rapid local support.

Selection Guide

Motor Series	Model	Rated Torque (Nm)	No-load speed (rpm)	Rated current (A)	Rated voltage range (VDC)	Rated Power (W)
Super High Density FM2	FM2-2807...	0.07	5000	0.95	24-70	40
	FM2-4308...	0.2	5500	2.20	24-70	77
	FM2-05008...	0.36	6500	4.9	24-70	207
	FM2-05014...	0.6	3970	4.6	24-70	211
	FM2-06008...	0.48	6500	7.1	24-70	440
	FM2-06011...	0.65	5000	6.5	24-70	259
	FM2-07010...	0.7	3110	4.35	24-70	183
	FM2-07013...	1	4600	9.5	24-70	272
	FM2-07018...	1.4	4000	11.3	24-70	440
	FM2-08513...	1.8	3000	11.0	24-70	471
	FM2-08523...	2.56	3550	18.7	24-70	670

Structure



Ultra-High Torque Density

FM2 Series

FM2-02807	Φ28 mm * 16 mm	0.07 Nm
FM2-04308	Φ43 mm * 15.6 mm	0.2 Nm
FM2-05008	Φ50 mm * 17.5 mm	0.36 Nm
FM2-05014	Φ50 mm * 23.3 mm	0.60 Nm
FM2-06008	Φ60 mm * 18.2 mm	0.48 Nm
FM2-06011	Φ60 mm * 21.2 mm	0.65 Nm
FM2-07010	Φ69 mm * 21.5 mm	0.70 Nm
FM2-07013	Φ69 mm * 24.6 mm	1 Nm
FM2-07018	Φ69 mm * 29.5 mm	1.40 Nm
FM2-08513	Φ85 mm * 24.8 mm	1.80 Nm
FM2-08523	Φ85 mm * 34 mm	2.56 Nm

Five Diameters

φ28-φ85 mm

Rated Speed

1800-5500 rpm

Torque Range

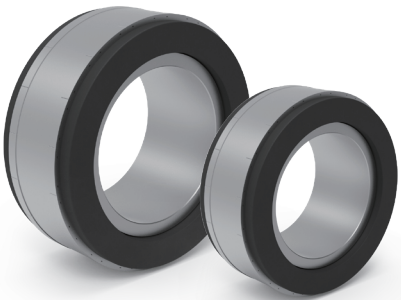
0.07-2.86 Nm

Power Range

40-670 W

Rated Voltage

24-70 V



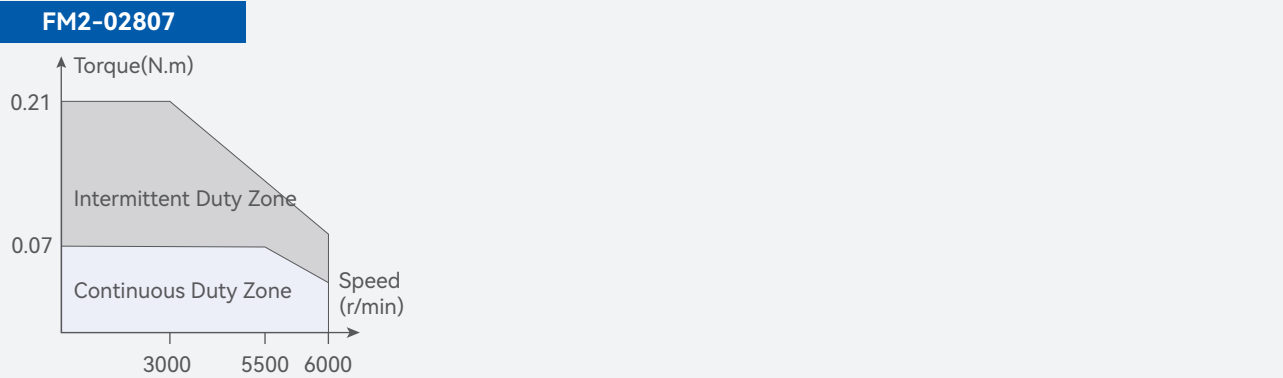
FM2-028XX



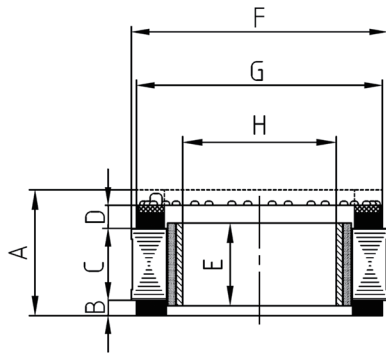
ongoing

Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm ² *10 ⁻⁴)	Weight (kg)
07	40	48	0.95	0.07	0.21	5500	4.6	0.076	0.004	0.035

Rotational Speed-Torque Characteristics



Dimensions



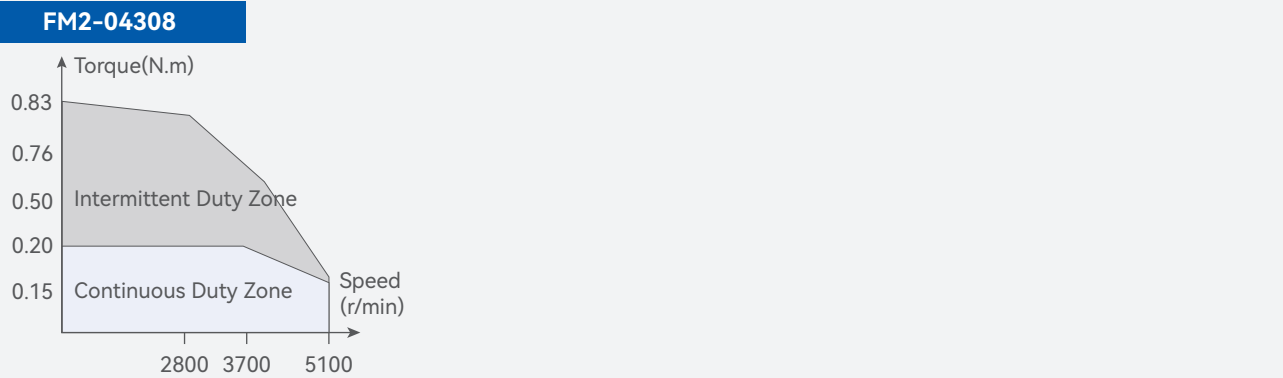
Size (mm)	07
A	16
B	2.8
C	7
D	3.8
E	9
F	28
G	27.5
H	11.6

FM2-043XX

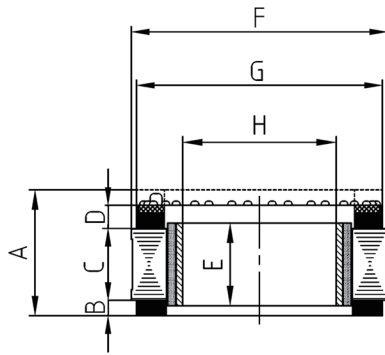


Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm ² *10 ⁻⁴)	Weight (kg)
08	77	48	2.2	0.2	0.82	3700	6	0.099	0.035	0.054

Rotational Speed-Torque Characteristics



Dimensions



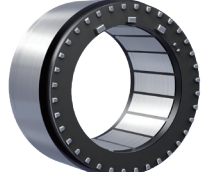
Size (mm)	08
A	15.60
B	2.8
C	8
D	4.2
E	8.5
F	43
G	41
H	27.5

FM2-050XX



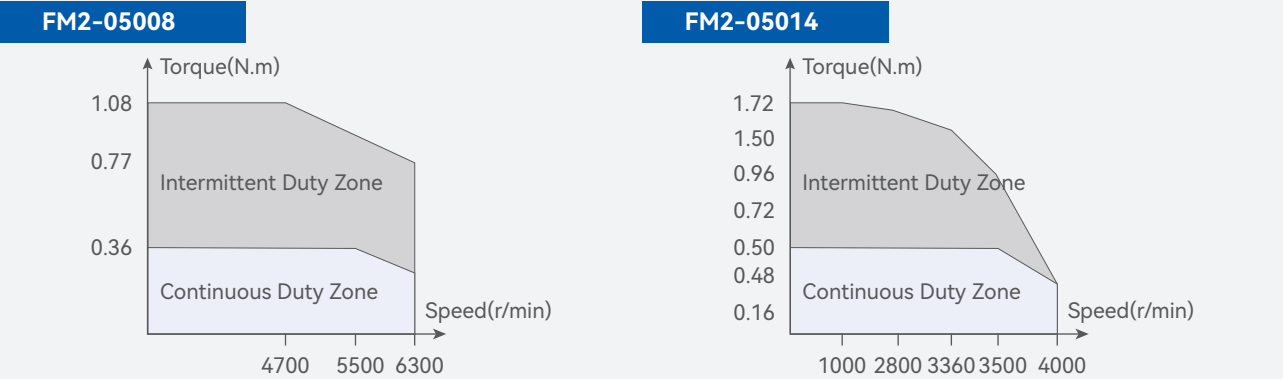
Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm ² *10 ⁻⁴)	Weight (kg)
08	207	48	4.9	0.36	1.26	5500	5	0.083	0.057	0.092
14	211	48	4.60	0.60	2.5	3360	8.5	0.141	0.083	0.136

FM2-060XX

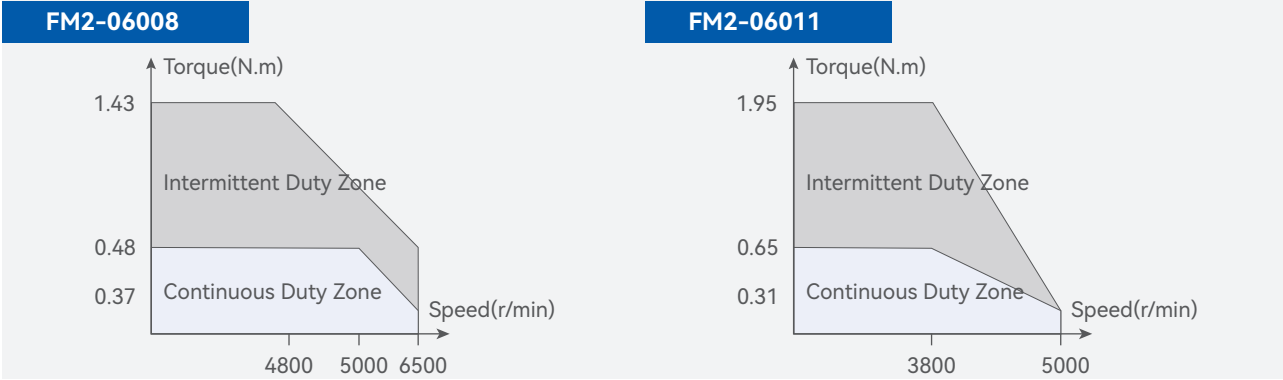


Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm ² *10 ⁻⁴)	Weight (kg)
08	251	48	7.1	0.48	1.43	5000	4.8	0.079	0.12	0.135
11	259	48	6.5	0.65	1.95	3800	6.5	0.108	0.17	0.175

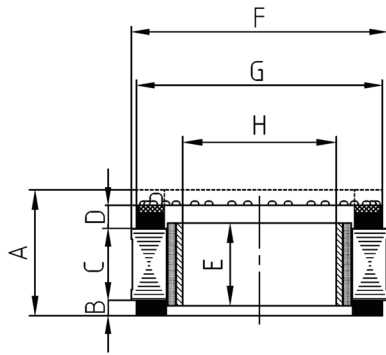
Rotational Speed-Torque Characteristics



Rotational Speed-Torque Characteristics

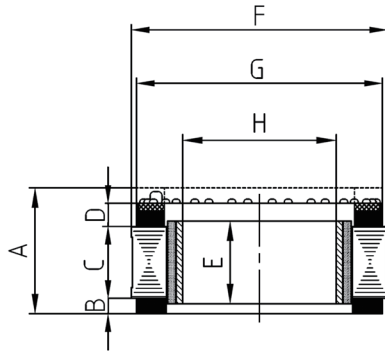


Dimensions



Size (mm)	08	14
A	17.5	23.3
B	3.3	3.3
C	8.20	14
D	4.6	5.1
E	9.9	14.6
F	50	50
G	48	48
H	30	14.6

Dimensions



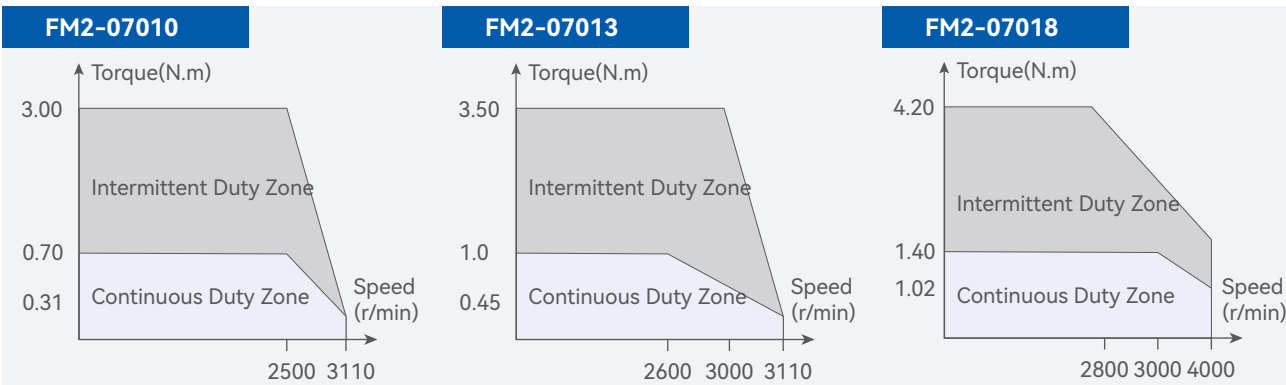
Size (mm)	08	11
A	18.2	21.2
B	3.5	3.5
C	8.2	11.2
D	5.3	5.3
E	10.2	14.7
F	60	60
G	58	58
H	36	36

FM2-070XX

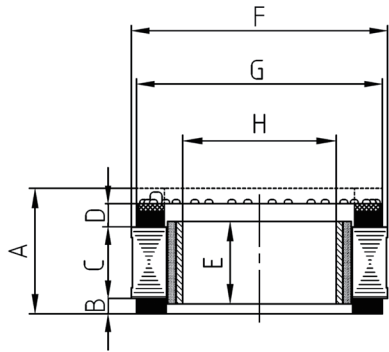


Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm ² *10 ⁻⁴)	Weight (kg)
10	183	48	4.35	0.70	3.00	2500	10.5	0.174	0.221	0.211
13	272	48	9.5	1	3.5	2600	7.30	0.121	0.28	0.211
18	440	48	11.3	1.4	4.90	3000	8.10	0.135	0.49	0.33

Rotational Speed-Torque Characteristics



Dimensions



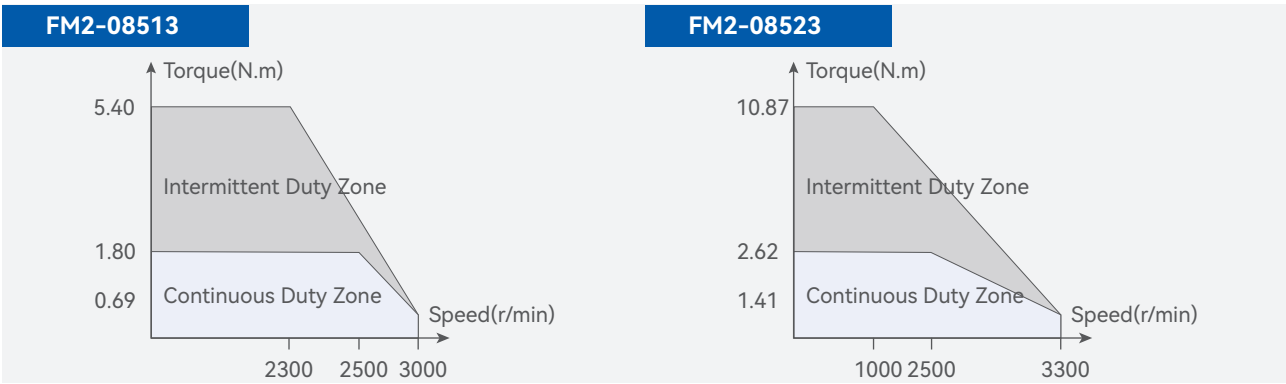
Size (mm)	10	13	18
A	21.50	24.6	29.6
B	4.0	4.1	4.1
C	10	13	18
D	6.3	6.3	6.3
E	10.5	13.5	20.7
F	69	69	69
G	66.2	66.2	66.2
H	42	42	42

FM2-085XX

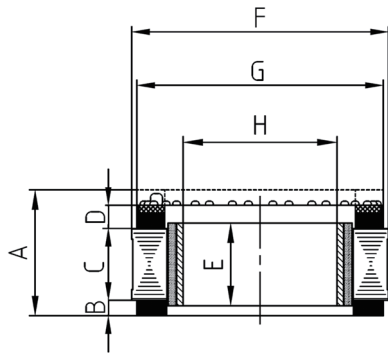


Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm ² *10 ⁻⁴)	Weight (kg)
13	481	48	11.0	1.8	7	2500	10.8	0.179	0.606	0.33
23	670	48	18.7	2.56	10.8	2500	9.0	0.149	1.19	0.499

Rotational Speed-Torque Characteristics



Dimensions



Size (mm)	13	23
A	24.8	34
B	4.0	4.2
C	13	22
D	6	6
E	13.5	13.5
F	85	85
G	82.6	82.6
H	58.5	58.5

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.

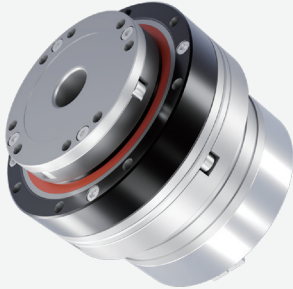
Collaborative Robots

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
----	-------------------------------

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
----	----------

Voltage Class

K	48 V
---	------

Brake Types

N	No Brake
B	Permanent Magnet Brake

Encoder Bit Depth

21	23	24
----	----	----

Drive Types

D	Standard (CDH series)
---	-----------------------

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.



EtherCAT



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

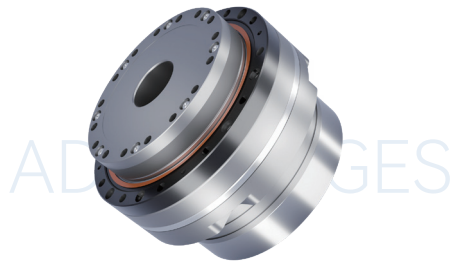
Motor, driver, and encoder are encapsulated as a single unit, simplifying overall wiring and assembly.

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



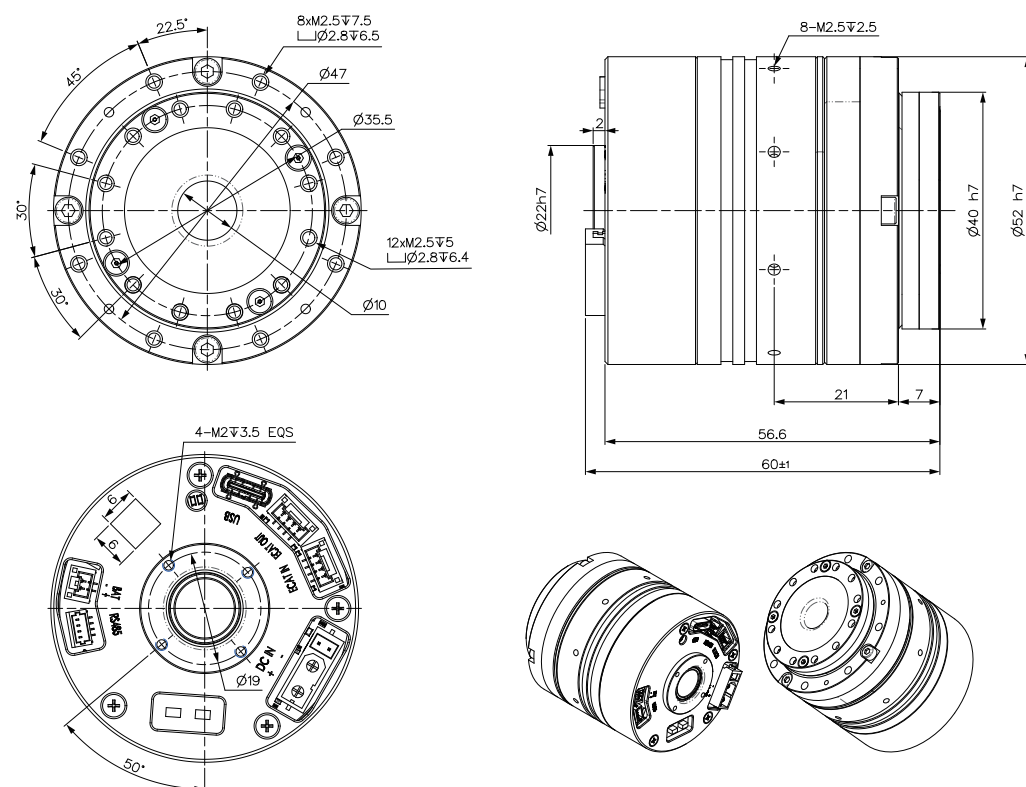
Customized Co-Development & OEM Assembly

HJ2-52H101D24-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	11	8.9	5	50	37	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N·m/A)
48	3	2	1.9	0.6	10	0.086
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm²)
24	EtherCAT	Ø52	Ø10	56.6	325.9	60

Dimensions

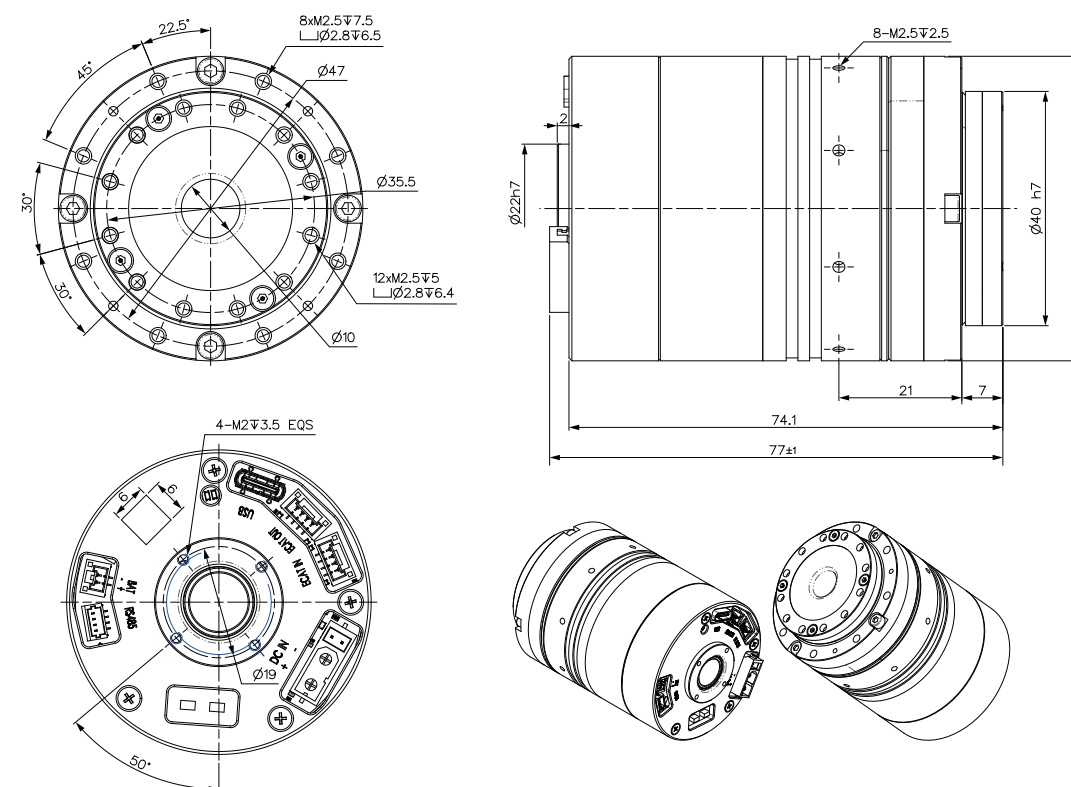


HJ2-52H101D24-BK-EC



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	11	8.9	6.5	59	40	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (N·m/A)
48	3	2	1.96	0.788	10	0.05
Encoder Resolution (bit)	Field Bus	Outer Diameter (mm)	Inner Diameter (mm)	Length (mm)	Mass (g)	Inertia (g.cm²)
24	EtherCAT	Ø52	Ø10	74.1	380	80

Dimensions

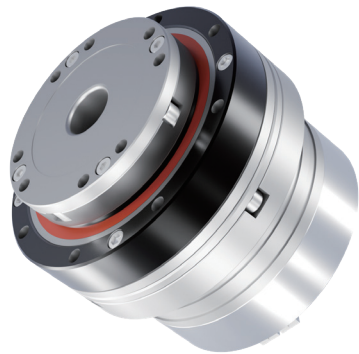


HJ2-70F101D24-NK-EC



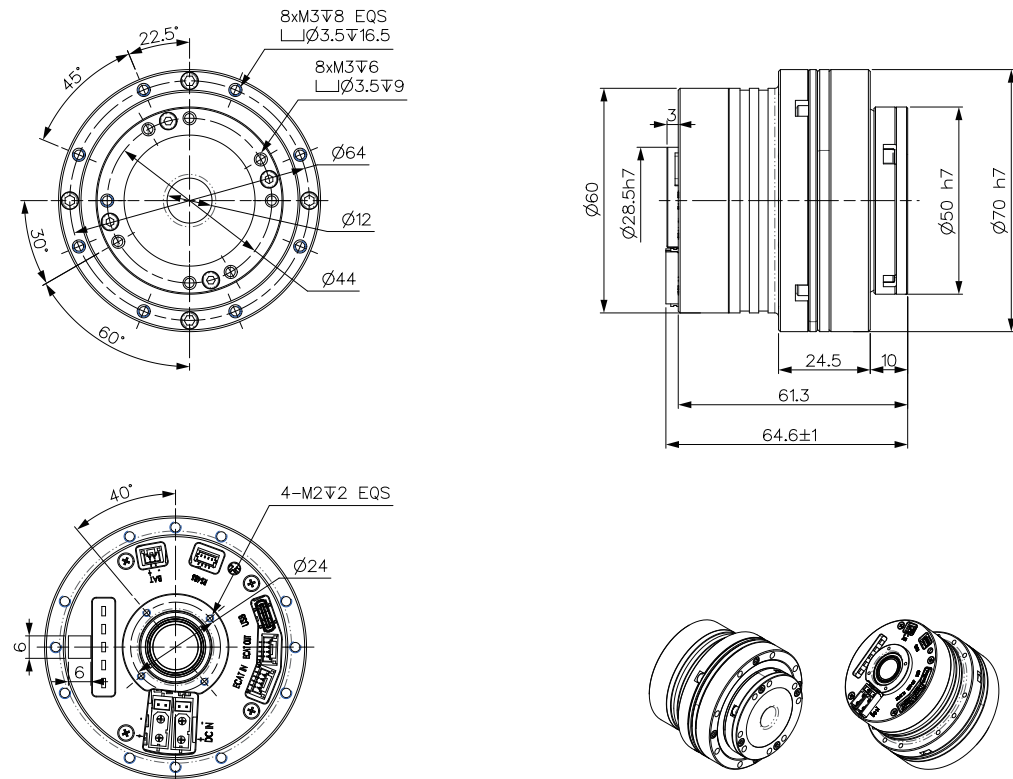
Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	34	13.5	9.6	64	52	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (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·cm ²)
24	EtherCAT	Ø70	Ø12	61.3	597.6	100

HJ2-70F101D24-BK-EC

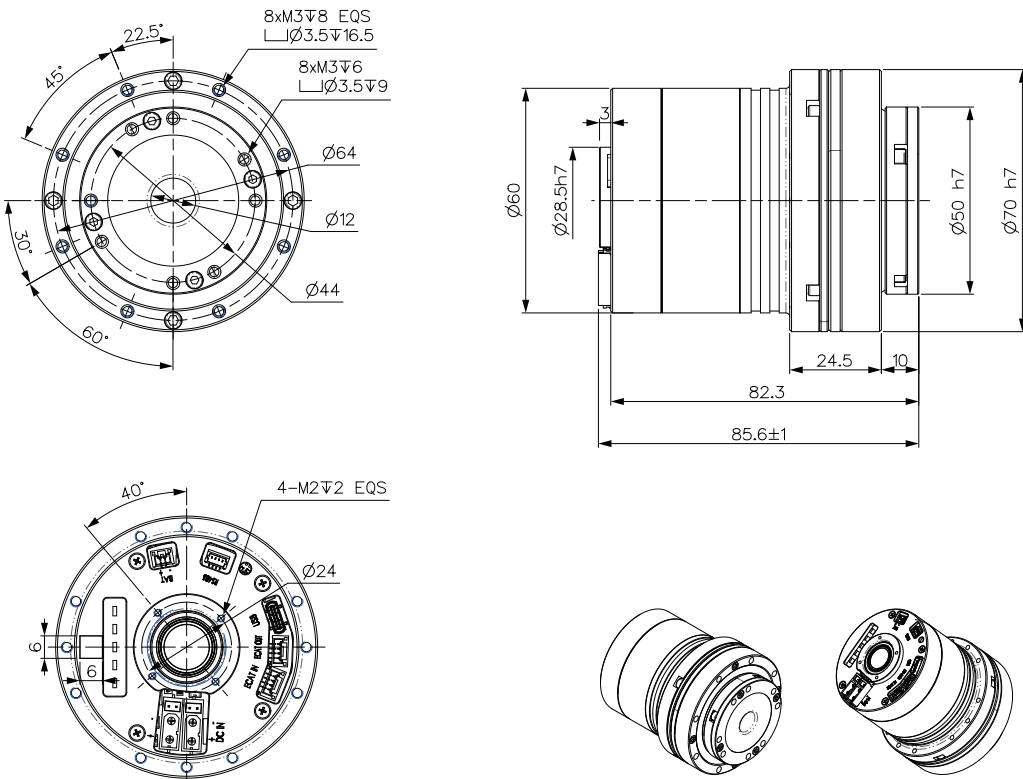


Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	34	13.5	9.6	49	37	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (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·cm ²)
24	EtherCAT	Ø70	Ø12	82.3	800	125

Dimensions



Dimensions



HJ2-80F101D24-NK-EC



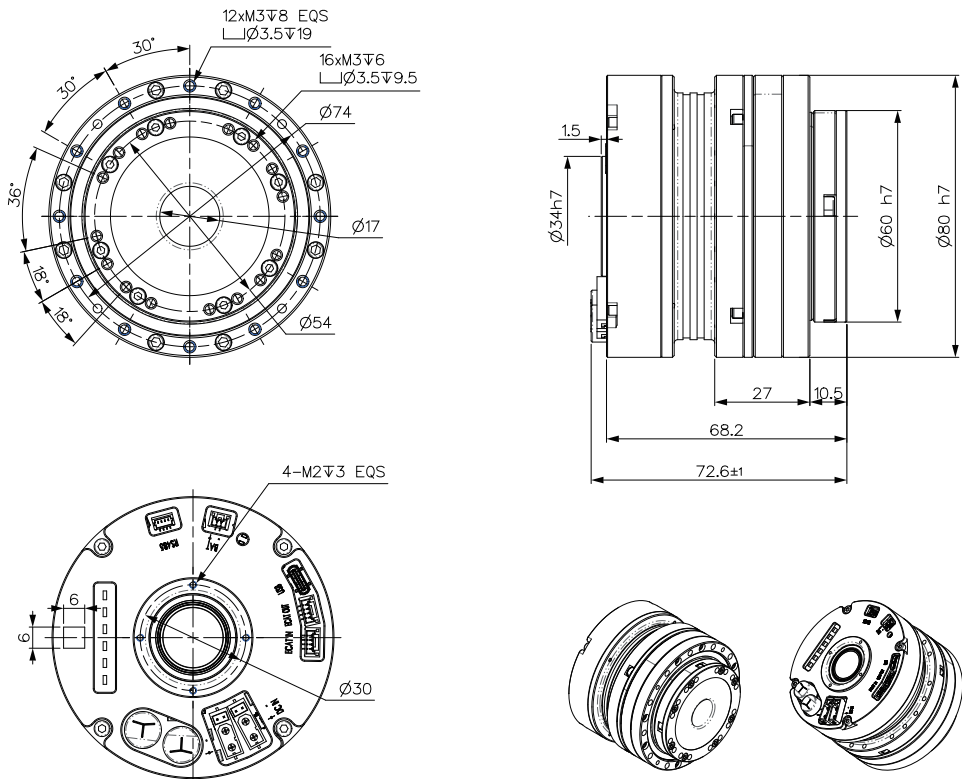
Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	66	49	30	48	36	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (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

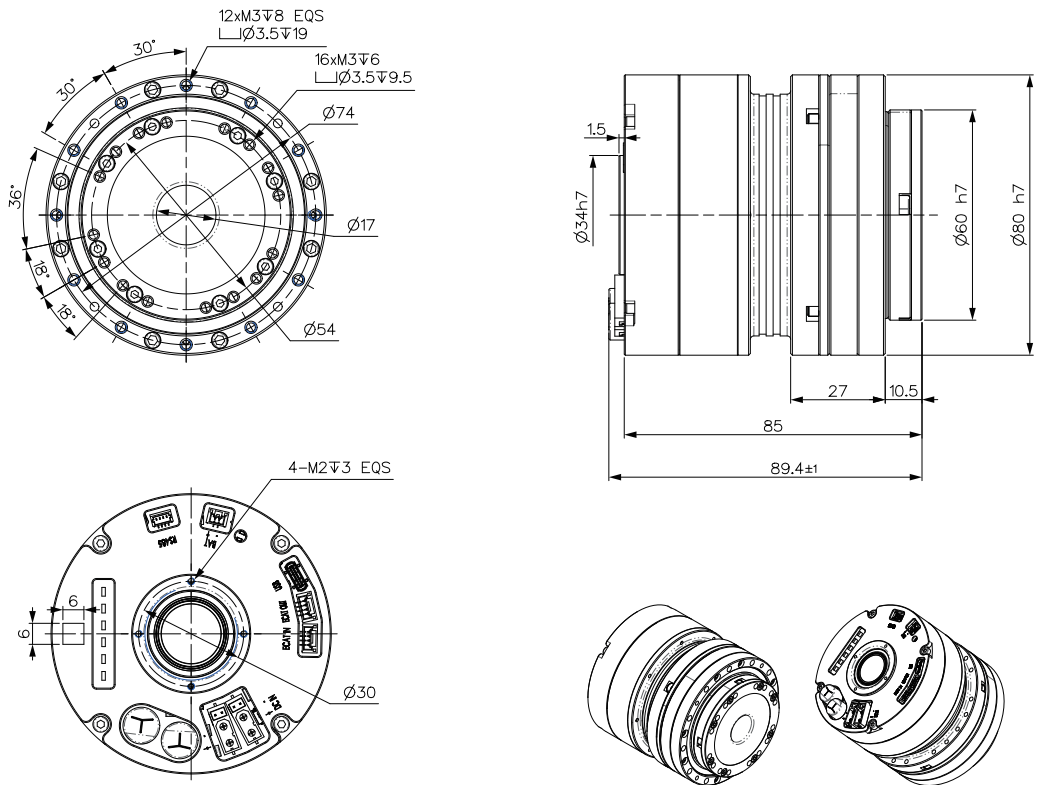


Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	66	49	30	41	34	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (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



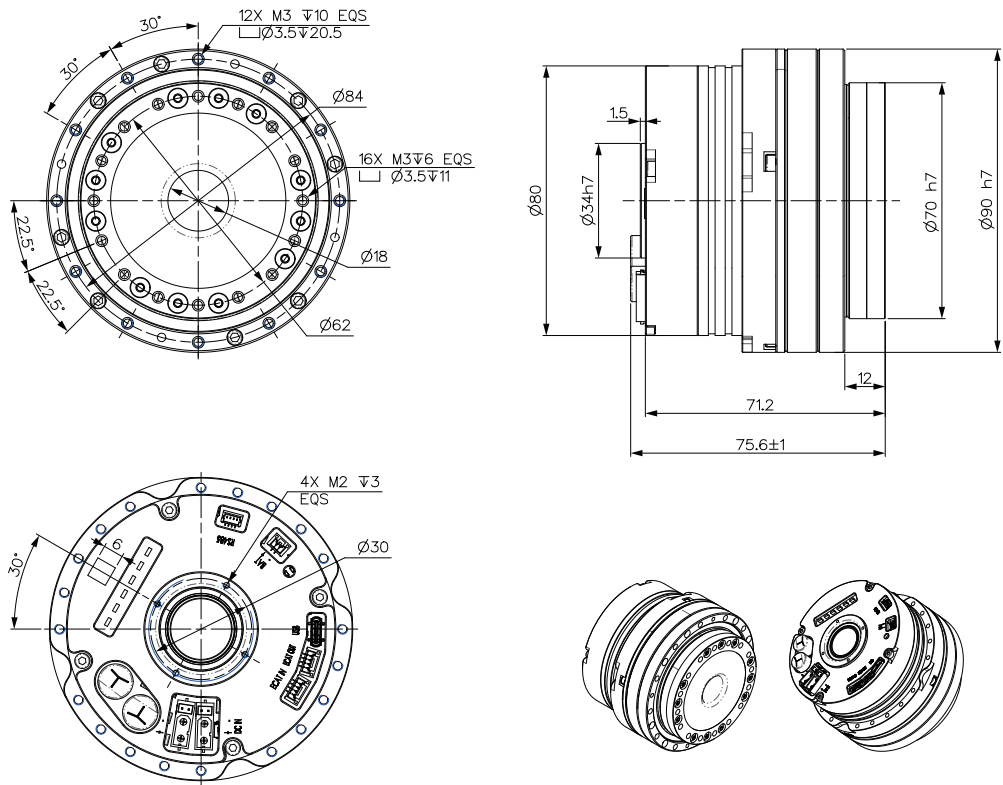
Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	102	61	50	50	36	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (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

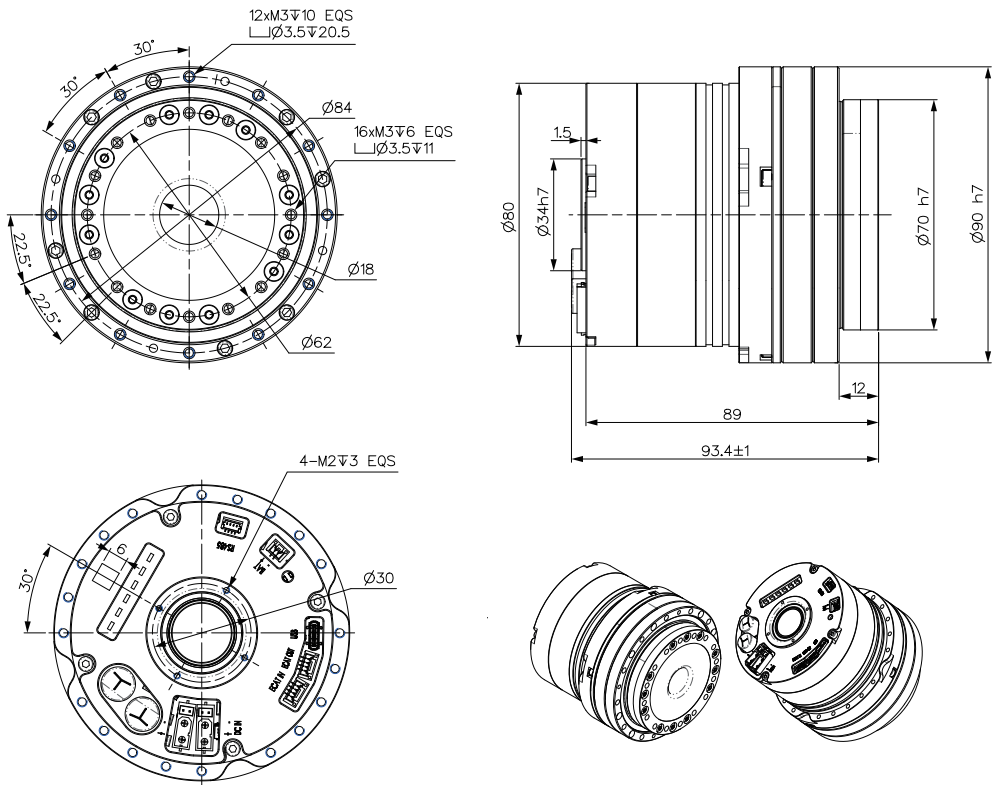


Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	102	61	50	40	30	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (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

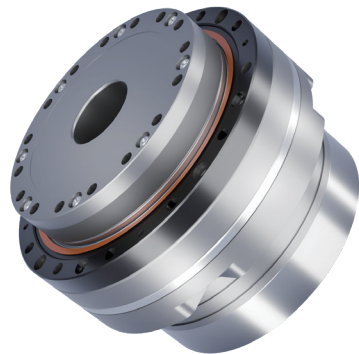
Dimensions



Dimensions

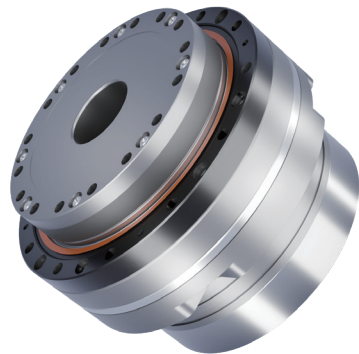


HJ2-110F101D24-NK-EC



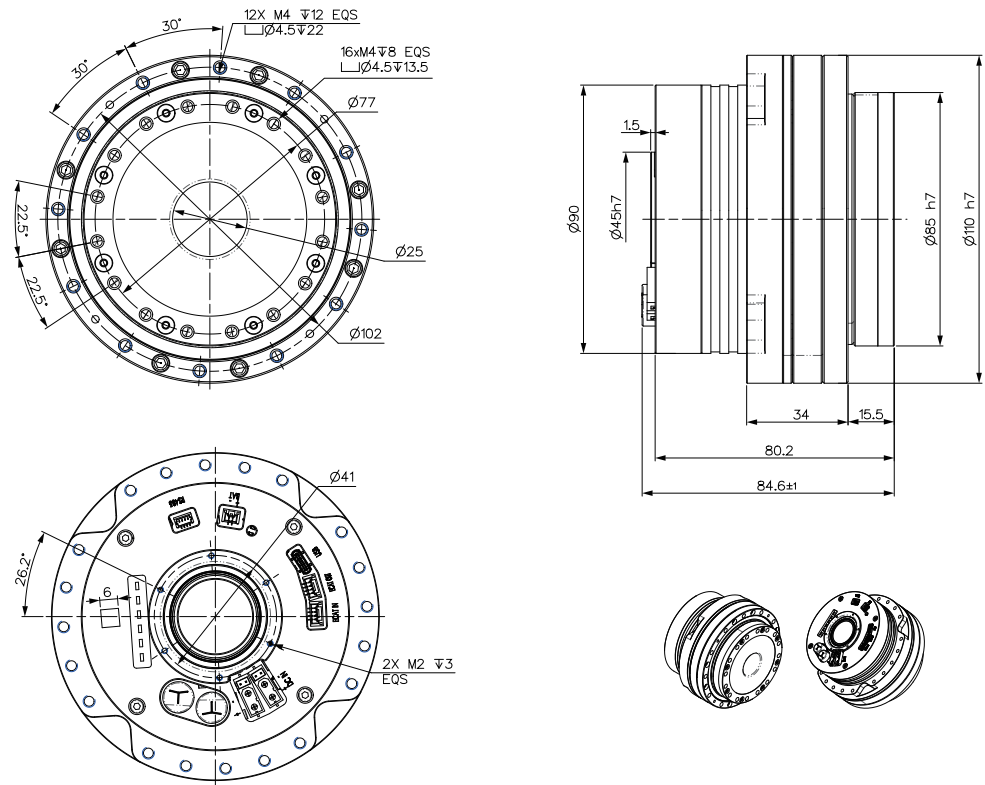
Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	194	133	84	40	31	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (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

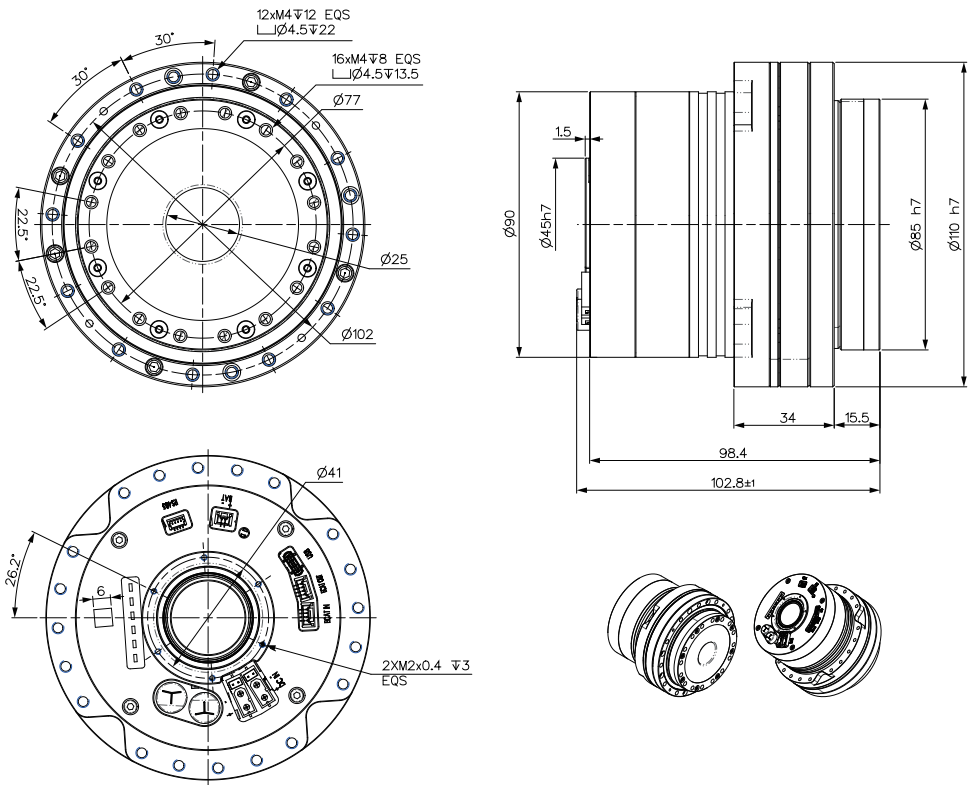


Ratio	Peak Torque (Nm)	Max Allowable Torque At Average Load (Nm)	Rated Torque @2000 rpm (Nm)	Peak Speed (RPM)	Rated Speed With 1/2 Rated Torque (RPM)	Backlash (arcsec)
101	194	133	84	36	13	≤ 10
Supply Voltage (VDC)	Max Current (A)	Rated Current (A)	Resistance (Ω)	Inductance (mH)	Pole-pairs	Torque Constant (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

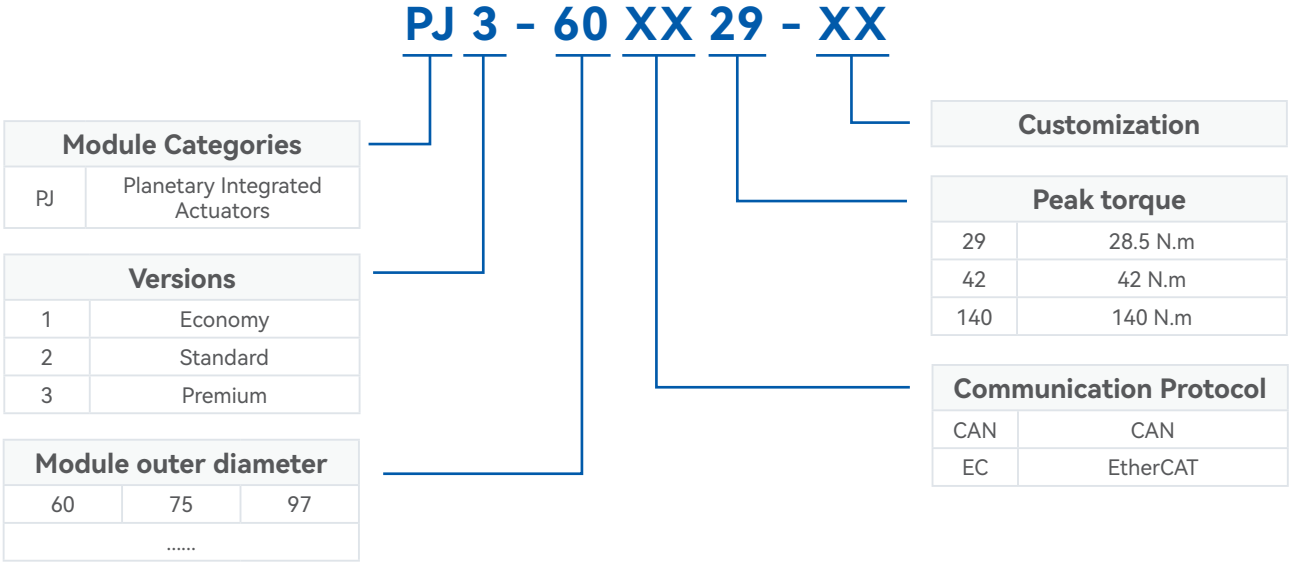
- No Inflated Torque Ratings

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

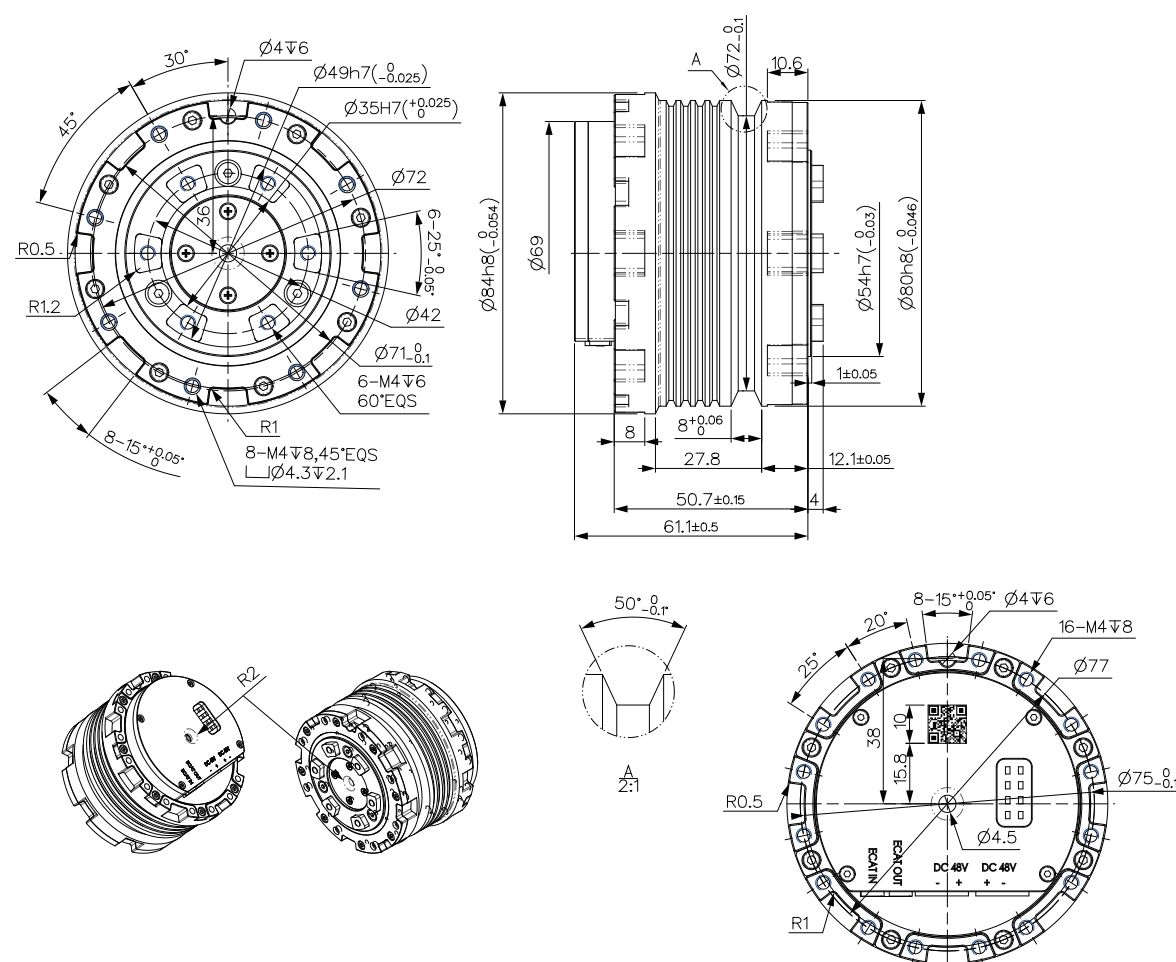
Series	Model	Voltage Input (VDC)	Gear Ratio	Peak Torque (N.m)	Maximum Speed (RPM)	Size of Actuator (mm)	Mass (g)
PJ3	PJ3-60CAN29	24-48	19.5	28.5	200	Ø61.2 * 60	530
	PJ3-60EC29						
	PJ3-75CAN42	24-48	20	42	155	Ø61.1 * 75	800
	PJ3-75EC42						
	PJ3-97CAN140	24-48	22	140	130	Ø61.1 * 97	1200
	PJ3-97EC140						

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	

Dimensions

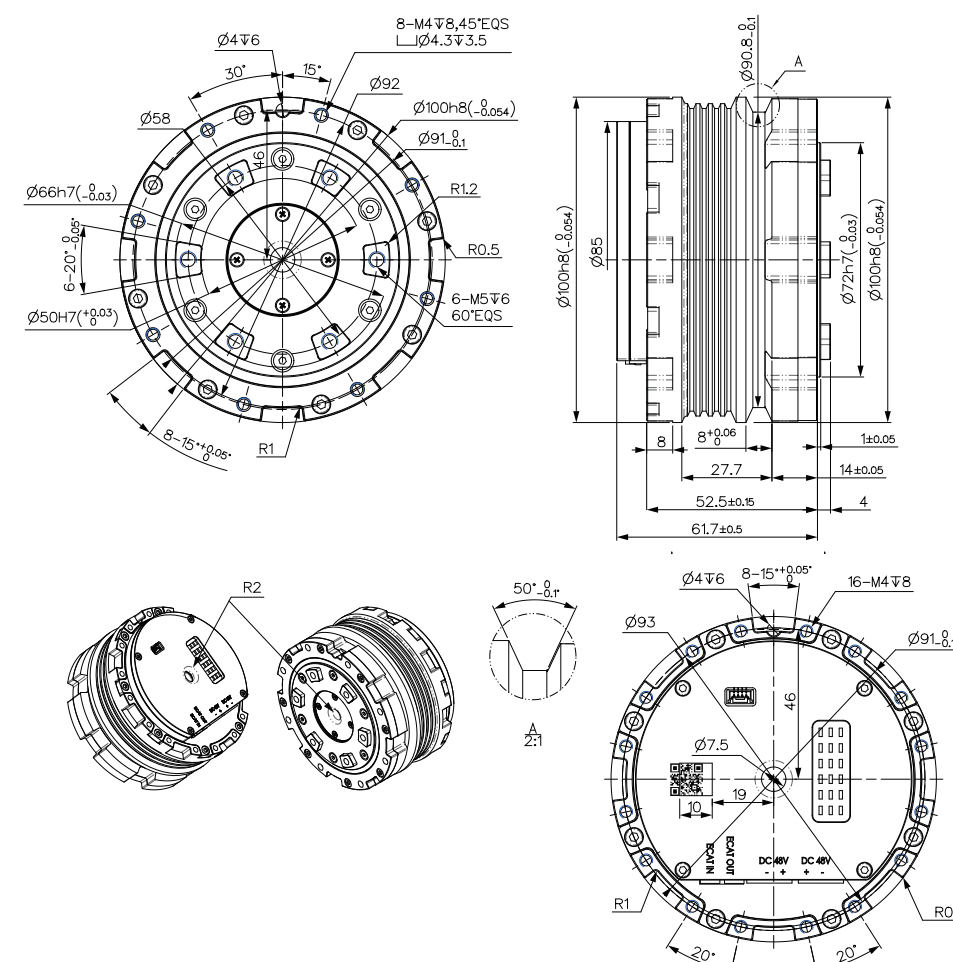


PJ3-97XX140



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	

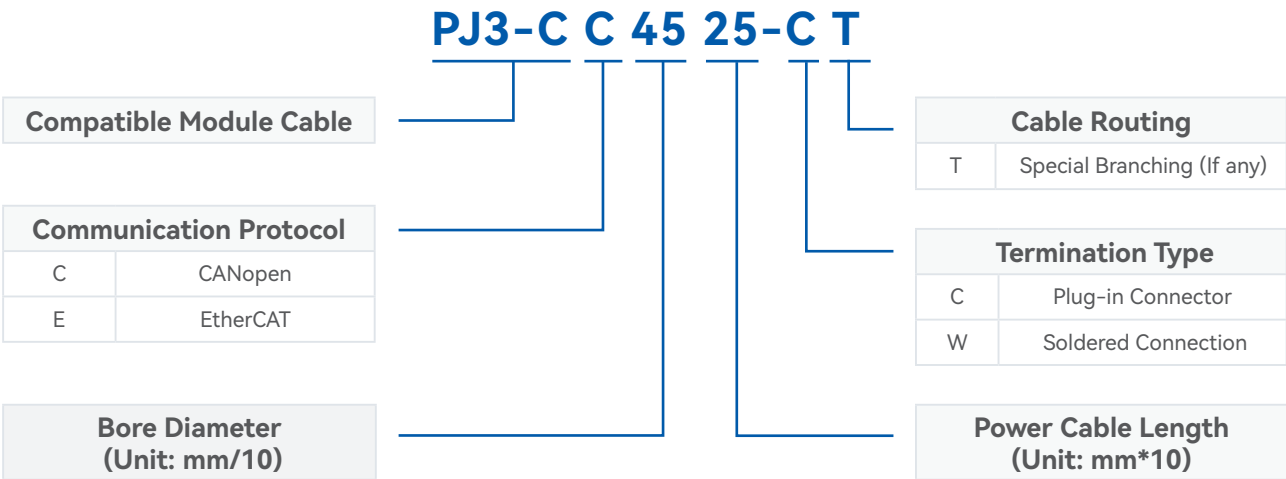
Dimensions



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



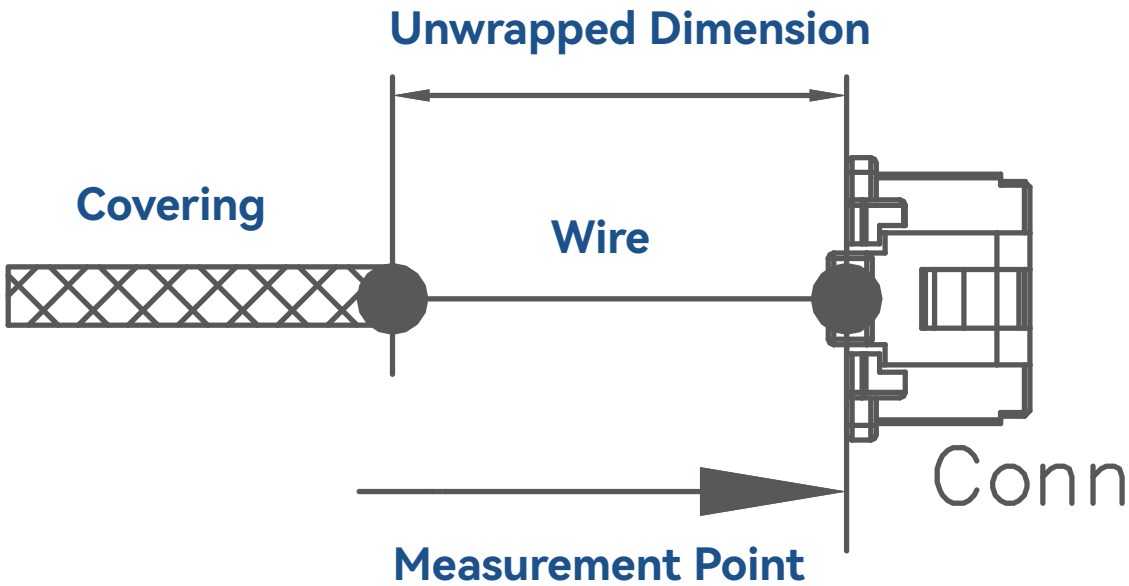
Cloth Tape



Self-wrapping
Braided Sleeve



PVDF Heat
Shrink Tubing





● Coreless Motor Part Numbers

Series Num

	Blank	Standard series
EC	H	High speed series
	T	High torque series

Frame Size

06	6 mm	08	8 mm
10	10 mm	12	12 mm
13	13 mm	16	16 mm
22	22 mm	30	30 mm
40	40 mm		

Feedback

H	Hall
Blank	Without Feedback

Rated Voltage

06	6 V	09	9 V
12	12 V	18	18 V
24	24 V	36	36 V
48	48 V		

Motor Length

20	20 mm	23	23 mm
28	28 mm		
88	88 mm		

ECH - 13 37 18 - H

EC Series Coreless Motor
GX Series Planetary Gear

○ High efficiency and responsiveness

High motor efficiency with low energy consumption.
High responsiveness with low inertia.

○ Low vibration & noise

Coreless Motor with more stable motion and lower operation noise.

○ Application ready

Can matched with hall sensors, ABZ/Biss-C encoder, planetary gear.

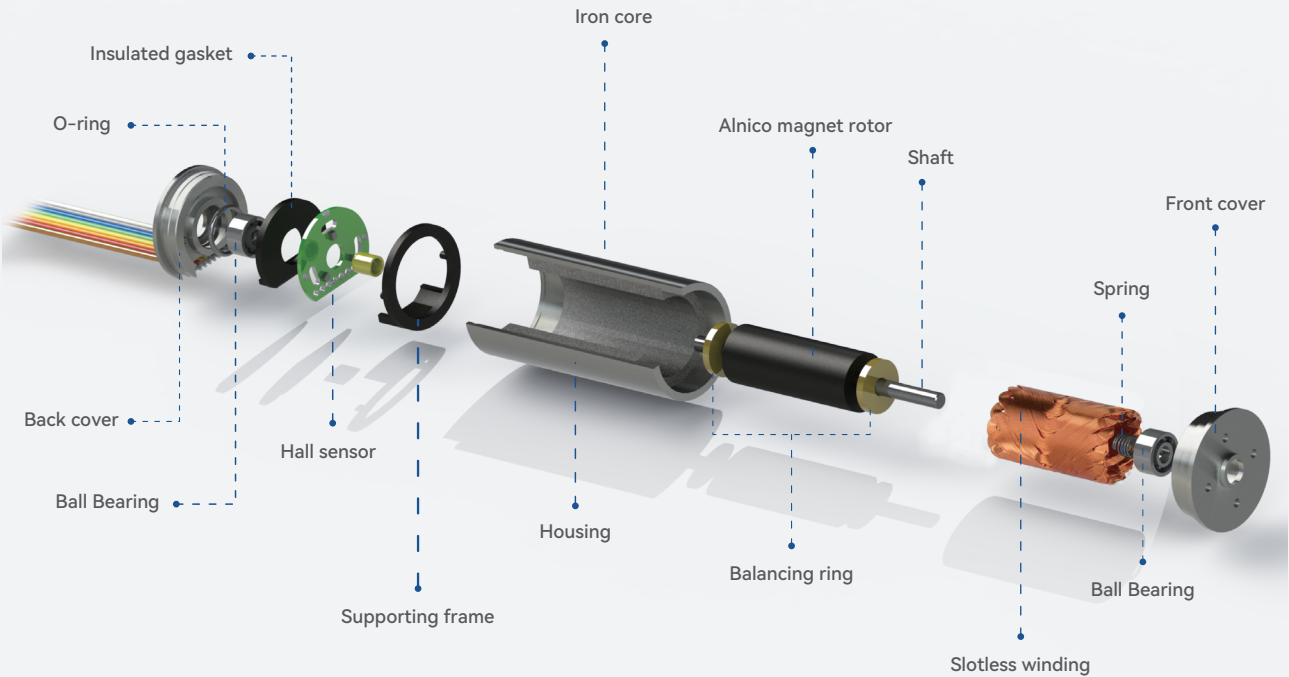
○ Reliable

Brushless motors with long life span even under harsh conditions.

○ Great motor performance

Optimized for higher torque and cooling to ensure optimal performance under any conditions.

Structure





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