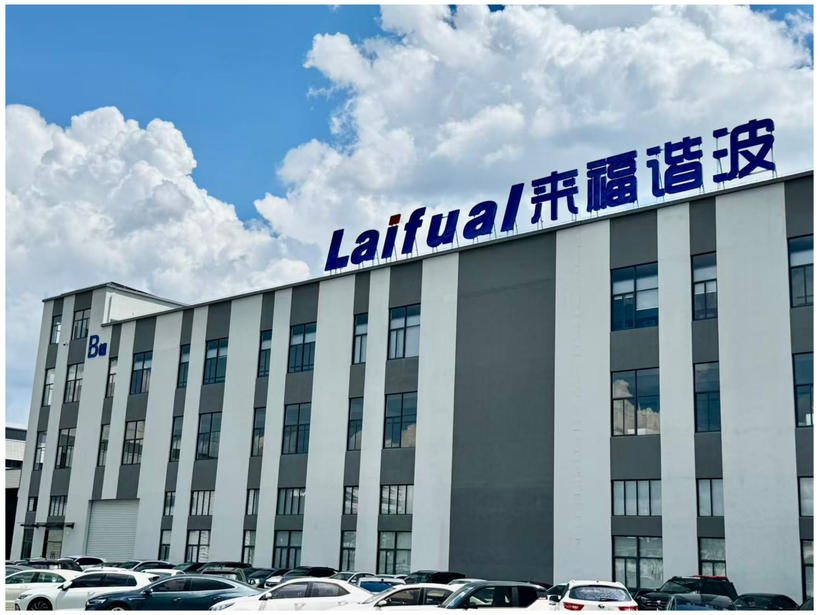
Laifual Drive®
Stock Code: 03952.HK

Rotary Actuator

Catelogue

Laifual Drive Co., Ltd.

About Us



Laifual Drive Co., Ltd. (stock code:03952.HK) is a global provider of precision transmission solutions, with fully integrated R&D and manufacturing capabilities. We focus on three core business segments: strain wave gears, joint modules, precision components, and planetary gearboxes.

Laifual offers a complete range of strain wave gears (sizes 3-58) and rotary actuators (sizes 40-190), backed by a fully integrated supply chain that spans raw materials to finished products. Our 52,000 m^2 state-ofthe-art facility is equipped with imported production and testing equipment, and we enforce rigorous quality control at every stage.

Supported by multiple R&D centers and joint university laboratories, we continuously enhance technological independence and production efficiency, driving down costs and shortening lead times. Today, our products are widely applied in high-precision sectors, including humanoid and industrial robotics, aerospace, CNC machine tools, semiconductor equipment, and precision automation systems.

An integrated rotary actuator is a highly integrated unit that combines a servo motor, strain wave gear, encoder, servo drive, brake, and torque sensor into a single unit.

It replaces the traditional separate motor + reducer setup and directly outputs rotary power.

Powerful, Stable and Reliable

· Compact size, high torque, fast dynamic response
· Integrated electromagnetic brake solution for safety and reliability

Precise Control, Smooth Interaction

· Dual absolute encoders for full closed-loop control
· Repeatability of 20 arc-seconds

Efficient Communication, Real-Time Control

· Built-in intelligent drive algorithm supports mainstream industrial buses
· Standardized interfaces support multiple assembly configurations

Easy Integration, Fast Deployment

· Integrated design for quick disassembly and installation
· Hollow-bore cable routing, compact structure, easy for series connection

IP67
High Protection Rating

15000 hours
Service Life

500 μs
Microsecond-Level Real-Time Communication Control



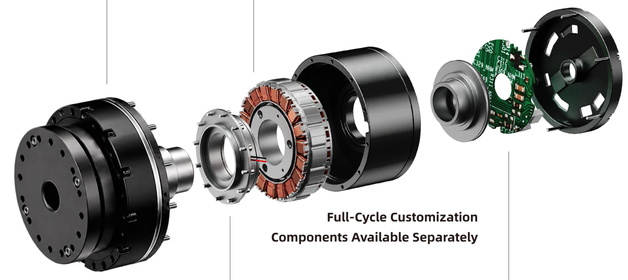
Open-Architecture Joint Module Customization

Core Transmission Self-Developed · System Solutions Flexibly Adapted

Laifual Drive offers a full suite of customized joint module solutions tailored to diverse industry requirements. Our experienced solution team works closely with customers to precisely match a wide range of application scenarios. From power rating, reduction ratio, and torque output to mounting dimensions and lightweight design — every parameter is configurable on demand.

Strain Wave Gear
Self-developed core component · standard across all models
Full-series coverage from size 3 to 58
Available in multiple reduction ratios
Adapts to diverse load requirements

Motor
Open motor architecture · customizable to match
Power, torque, and speed configurable on demand
Adapts to various diameters and installation spaces
Flexible integration for diverse system designs



Full-Cycle Customization
Components Available Separately

Brake
Flexible brake configuration · available on demand
Brake type and response time customizable
Adapts to different operating conditions
No dimensional changes required for customization

Integrated Drive & Encoder Board
Base option · supports customer-supplied solutions
Customer-supplied encoder and driver supported
Flexible integration lowers replacement costs
Avoids vendor lock-in for control components

Core Transmission	Flexible Integration	Software Customization	Mechanical Customization
· Self-developed core · High precision · High torque · High reliability	· Open interfaces · Customer-supplied encoder · Multi-brand driver compatible · Control system adaptable	· Multi-protocol support · Algorithm optimization · Custom feature development · System integration support	· Tailored dimensions · Custom mounting design · Structural optimization · Special applications

Customization scope includes but is not limited to:

· Torque Sensor (Optional)
· Customer-supplied encoder, compatible with mainstream protocols
· Customer-supplied driver, supporting multiple interface standards
· Mounting dimensions and interface
· Reduction ratio and torque
· Transmission Accuracy and Backlash
· Power and lightweight design
· Hollow bore diameter and cable routing
· Communication protocol
· Protection rating (IP class)
· Cable exit method
· Operating temperature range
· Encoder resolution and accuracy
· Brake type and configuration
· Output shaft form and interface
· Overall dimensions and mounting hole pattern

**We offer more than just standard modules —
we deliver joint solutions tailored to your application.**

Rotary Actuators AC High Voltage

The AC High Voltage Series joint module (220V power supply) features a compact design, high precision, and a large hollow bore — simplifying customer selection, design, and manufacturing processes. **The product supports BISS-C and TAMAGAWA communication protocols.**



M70

OD:70 mm
Length:87 mm
Weight:1.2 kg
Rated Torque:9-14 N·m
Max.Torque:46-70 N·m



M80

OD:80 mm
Length:91 mm
Weight:1.53 kg
Rated Torque:34-51 N·m
Max.Torque:91-112 N·m



M90

OD:90 mm
Length:95 mm
Weight:1.9 kg
Rated Torque:44-64 N·m
Max.Torque:127-191 N·m



M110

OD:110 mm
Length:100 mm
Weight:2.91 kg
Rated Torque:72-140 N·m
Max.Torque:242-395 N·m



M142

OD:142 mm
Length:125 mm
Weight:5.64 kg
Rated Torque:140-281 N·m
Max.Torque:497-892 N·m



M170

OD:170 mm
Length:149 mm
Weight:9.76 kg
Rated Torque:255-586 N·m
Max.Torque:892-1530 N·m



M190

OD:190 mm
Length:153.5 mm
Weight:13.4 kg
Rated Torque:507-806 N·m
Max.Torque:1651-2288 N·m

Encoder Interface Compatibility

Supports BISS-C and TAMAGAWA communication protocols, compatible with mainstream encoder interface standards. Suited for industrial robots, CNC machine tools, and other applications requiring high real-time performance and reliability.



AC High Voltage Series Ordering Guide

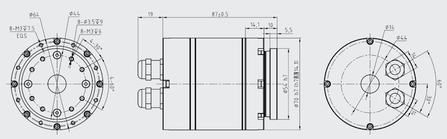
Joint Series	Outer Diameter	Communication Protocol	Reduction Ratio	Brake	Wiring Method		Encoder Type	
M	70	B	080	B	F	C	0	0
High Voltage	70 ⌀70 80 ⌀80 90 ⌀90 110 ⌀110 142 ⌀142 170 ⌀170 190 ⌀190	B BISS-C D TAMAGAWA	050 51:1 080 81:1 100 101:1 120 121:1	B With Brake F Without Brake	F Rear Outlet S Side Outlet		0 17-bit single-turn 16-bit multi-turn 1 23-bit single-turn 16-bit multi-turn (TAMAGAWA only)	

AC High Voltage Series Specifications

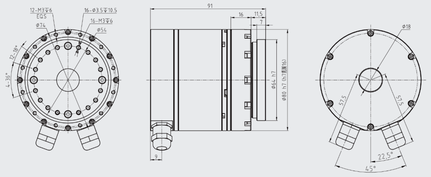
Model	Reduction Ratio	OD(mm)	Length(mm)	Weight(kg)	Rated Torque(N·m)	Max.Torque(N·m)
M70	51/81/101	70	87	1.2	9/14/14	46/61/70
M80	51/81/101/121	80	91	1.53	34/35/51/51	91/113/143/112
M90	51/81/101/121	90	95	1.9	44/61/64/64	127/165/191/191
M110	51/81/101/121	110	100	2.91	72/113/140/140	242/332/369/395
M142	51/81/101/121	142	125	5.64	140/217/281/281	497/738/841/892
M170	51/81/101/121	170	149	9.76	255/369/484/586	892/1270/1400/1530
M190	81/101/121	190	153.5	13.4kg	507/650/806	1651/2041/2288

AC High Voltage Series
Product Structural Diagram

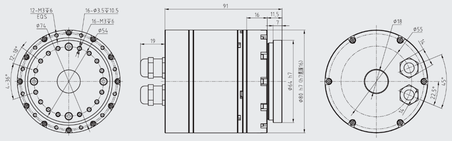
M70D / M70B Structure-End Outlet



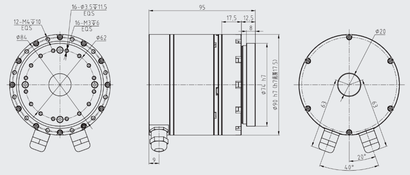
M80D / M80B Structure-Side Outlet



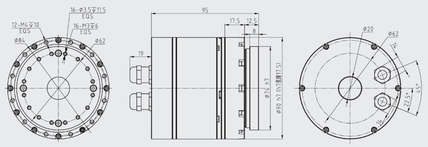
M80D / M80B Structure-End Outlet



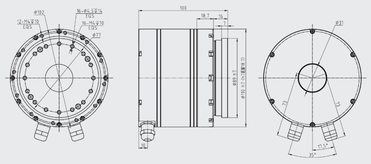
M90D / M90B Structure-Side Outlet



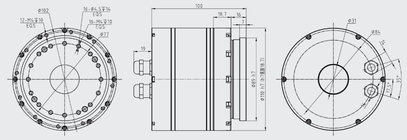
M90D / M90B Structure-End Outlet



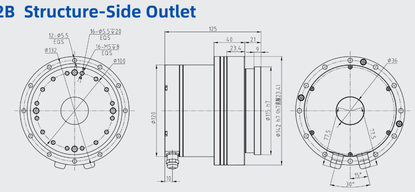
M110D / M110B Structure-Side Outlet



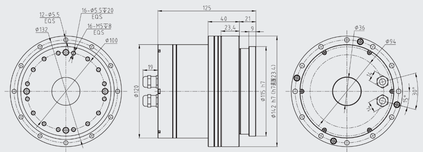
M110D / M110B Structure-End Outlet



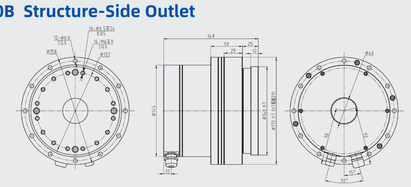
M142D / M142B Structure-Side Outlet



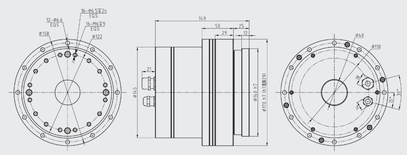
M142D / M142B Structure-End Outlet



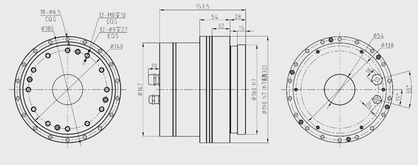
M170D / M170B Structure-Side Outlet



M170D / M170B Structure-End Outlet



M190D / M190B Structure-End Outlet



Rotary Actuators DC Low Voltage

The DC Low Voltage Series joint module (48V power supply) integrates a servo motor, brake, strain wave gear, servo drive, absolute encoder, and other core components. **The product supports CANopen, CAN FD, EtherCAT, and Modbus communication protocols.**



L40I

OD:40 mm
Length:52 mm
Weight:0.2 kg
Rated Torque:1.6-2.3 N·m
Max.Torque:4.6-6.3 N·m



L52I

OD:52 mm
Length:70 mm
Weight:0.44 kg
Rated Torque:5.5-8.9 N·m
Max.Torque:17-25 N·m



L60I

OD:60 mm
Length:64 mm
Weight:0.54 kg
Rated Torque:5.5-8.9 N·m
Max.Torque:17-25 N·m



L70I

OD:70 mm
Length:75.2 mm
Weight:1.01 kg
Rated Torque:9-14 N·m
Max.Torque:46-70 N·m



L80I

OD:80 mm
Length:81 mm
Weight:1.36 kg
Rated Torque:34-51 N·m
Max.Torque:91-112 N·m



L90I

OD:90 mm
Length:88.9 mm
Weight:1.86 kg
Rated Torque:44-64 N·m
Max.Torque:127-191 N·m



L110I

OD:110 mm
Length:80 mm
Weight:2.7 kg
Rated Torque:72-140 N·m
Max.Torque:242-395 N·m



L142I

OD:142 mm
Length:97.5 mm
Weight:5.15 kg
Rated Torque:140-281 N·m
Max.Torque:497-892 N·m



L170I

OD:170 mm
Length:134 mm
Weight:9.48 kg
Rated Torque:255-586 N·m
Max.Torque:892-1530 N·m



L190I

OD:190 mm
Length:149 mm
Weight:13.6 kg
Rated Torque:507-806 N·m
Max.Torque:1651-2288 N·m

Multi-Protocol Industrial Bus Support

Supports CANopen, CAN FD, EtherCAT, and Modbus communication protocols. Suited for humanoid robots, collaborative robots, and other applications requiring high dynamic response and flexible control.



DC Low Voltage Series Ordering Guide

Joint Series	Joint Model	Joint Structure	Torque Sensor	Communication Protocol	Reduction Ratio	Brake	Wiring Method		Encoder Type	
L	70	I	F	C	080	B	F	C	2	0

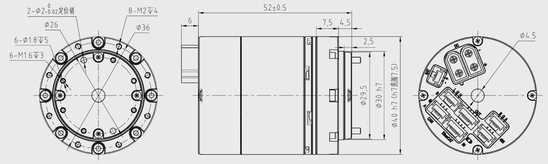
- **Joint Series**: L — Low Voltage
- **Joint Model**: 40 (⌀ 40), 52 (⌀ 52), 60 (⌀ 60), 70 (⌀ 70), 80 (⌀ 80), 90 (⌀ 90), 110 (⌀ 110), 142 (⌀ 142), 170 (⌀ 170), 190 (⌀ 190)
- **Joint Structure**: I — I Joint; T — T Joint
- **Torque Sensor**: F — Torque Sensor; / — Without Torque Sensor
- **Communication Protocol**: C — CANopen; F — CAN FD; E — EtherCAT; M — Modbus
- **Reduction Ratio**: 050 — 51:1; 080 — 81:1; 100 — 101:1; 120 — 121:1
- **Brake**: B — With Brake; F — Without Brake
- **Wiring Method**: F — End Outlet
- **Encoder Type**: 0 — 17-bit single-turn, 16-bit multi-turn (single encoder); 2 — 17-bit single-turn, no multi-turn (dual encoder); 3 — 17-bit single-turn, 16-bit multi-turn (dual encoder)

DC Low Voltage Series Specifications

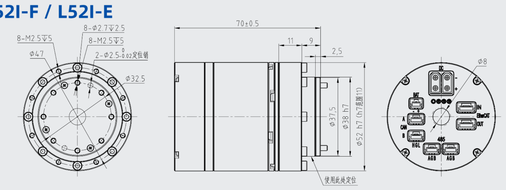
Model	Reduction Ratio	OD(mm)	Length(mm)	Weight(kg)	Rated Torque(N·m)	Max.Torque(N·m)
L40I	51/101	40	52	0.2	1.6/2.3	4.6/6.3
L52I	51/101	52	70	0.44	5.5/8.9	17/25
L60I	51/101	60	64	0.54	5.5/8.9	17/25
L70I	51/81/101	70	75.2	1.0	9/14/14	46/61/70
L80I	51/81/101/121	80	81	1.36	34/35/51/51	91/113/143/112
L90I	51/81/101/121	90	88.9	1.86	44/61/64/64	127/165/191/191
L110I	51/81/101/121	110	80	2.7	72/113/140/140	242/332/369/395
L142I	51/81/101/121	142	97.5	5.15	140/217/281/281	497/738/841/892
L170I	51/81/101/121	170	134	9.48	255/369/484/586	892/1270/1400/1530
L190I	81/101/121	190	149	13.6	507/650/806	1651/2041/2288

DC Low Voltage Series
Product Structural Diagram

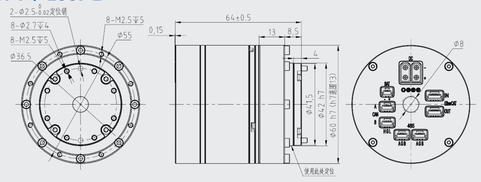
L40I-C / L40I-F / L40I-E



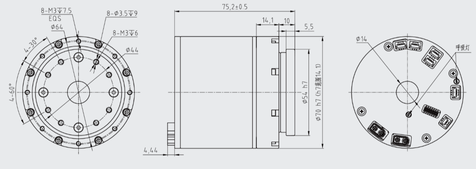
L52I-C / L52I-F / L52I-E



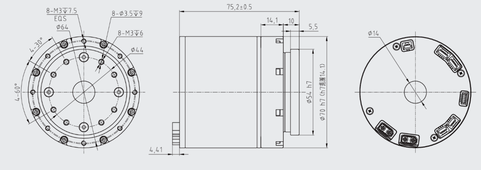
L60I-C / L60I-F / L60I-E



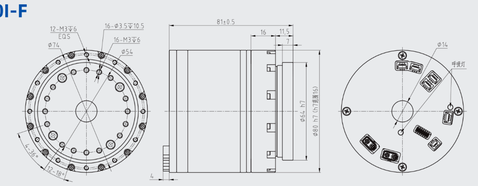
L70I-C / L70I-F



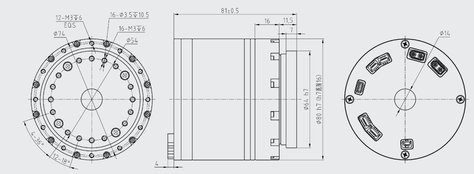
L70I-E



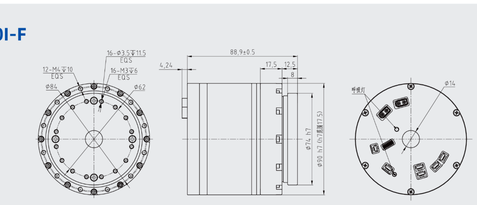
L80I-C / L80I-F



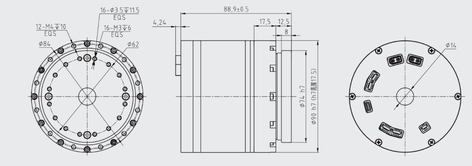
L80I-E



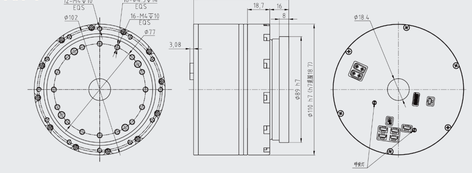
L90I-C / L90I-F



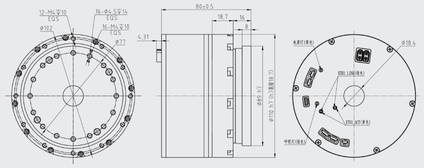
L90I-E



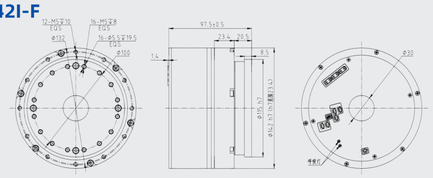
L110I-C / L110I-F



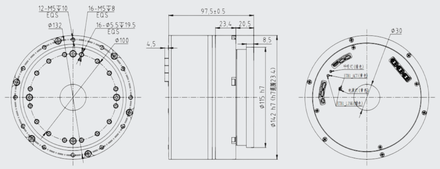
L110I-E



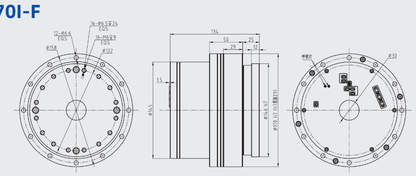
L142I-C / L142I-F



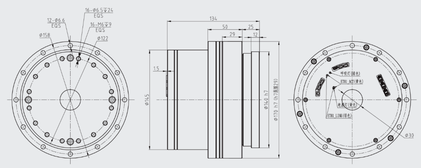
L142I-E



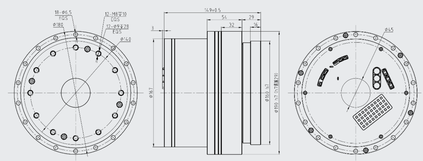
L170I-C / L170I-F



L170I-E



L190I-E



Applications





Head · Neck Pitch & Yaw



Arm · Elbow



Waist · Rotation (Yaw)



Waist · Pitch & Lateral Bend



Arm · Wrist & Forearm Rotation



Dexterous Hand



Quadruped Robot



Dual-Arm Robot

Applications



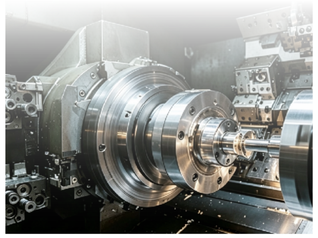
Machine Tool
Trunnion



Radar Antenna
Rotary Mechanism



Collaborative Robot
(Cobot)



Machine Tool Cutting
& Milling



Industrial Robot



Medical Devices



Industrial
Automation



Vehicle-Mounted
Gimbal



Semiconductor
Equipment

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