Leadshine

Stock Code: 002979

Robotic Core Compoents

Fram eless

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+ Years History

500+ R&D Engineers

1400+ Global Partners

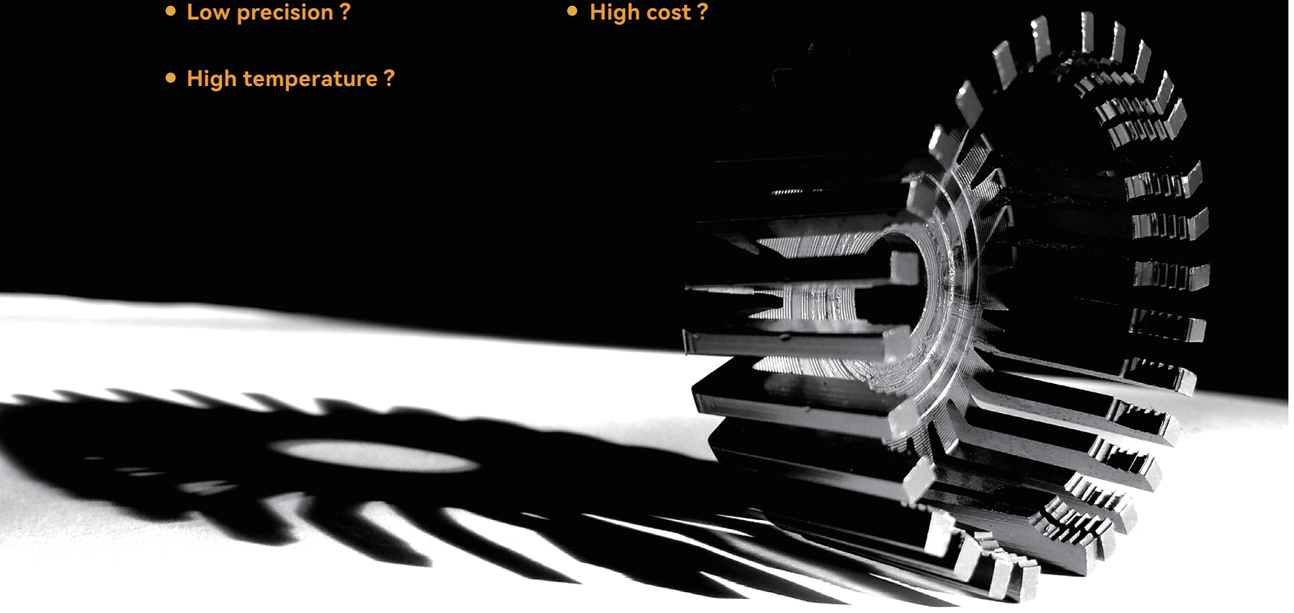
200/40 Global / Overseas Agent Channel

20+ Global Sales Offices

30 million+ Installed Axes

INDUSTRY
PAIN POINTS

- Large volume ?
- Low efficiency ?
- High self-weight ?
- Low precision ?
- High temperature ?
- Low smoothness ?
- Low degree of freedom ?
- High consumption ?
- High cost ?

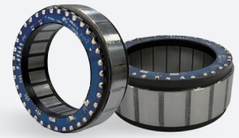


Component Solutions

Ultra-high density	Precise control	Compact design
Full protocol compatibility	Long-lasting durability	High cost efficiency

Frameless Motor Solutions

- Dimensions: 28/43/50/60/70/85 mm
- Rated Speed: 1800–5500 rpm
- Torque Range: 0.07–2.86 N·m
- Power Range: 40–1048 W
- Voltage Range: 24–70 V



- **Low Temperature Rise**
  20% reduction in motor loss
- **High Density**
  10% increase in torque density
- **Extended Endurance**
  Longer operational lifespan

Drive Solutions

- Dimensions: 50/60/70/85/115 mm
- Voltage Range: 48V ±10%

- **High Integration**
- **Low Noise**
- **High Precision**

Encoder Solutions

- Compatibility: 14/17/20/25/32mm sizes
- Max Operating Speed: 6000 rpm
- Operating Temperature: -40° C to 105° C

- **High Precision**
  15" repeatability
- **Compact Design**
  Dual encoder thickness <0.9 mm; total height <1 mm with nested code disc
- **Multi-Turn**
  Up to 23-bit absolute resolution +16-bit counter

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

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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

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

Fixed Reserved	
N	Not Defined

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

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

Derivatives

Leadshine

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.

Easy Integration

Flexible installation and seamless compatibility with mechanical systems.

Extended Endurance

Optimized magnetic circuits and materials reduce motor loss.

Ultra-Low Temperature Rise

20% reduction in motor loss through optimized magnetic design.

Ultra-Compact Structure

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

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.

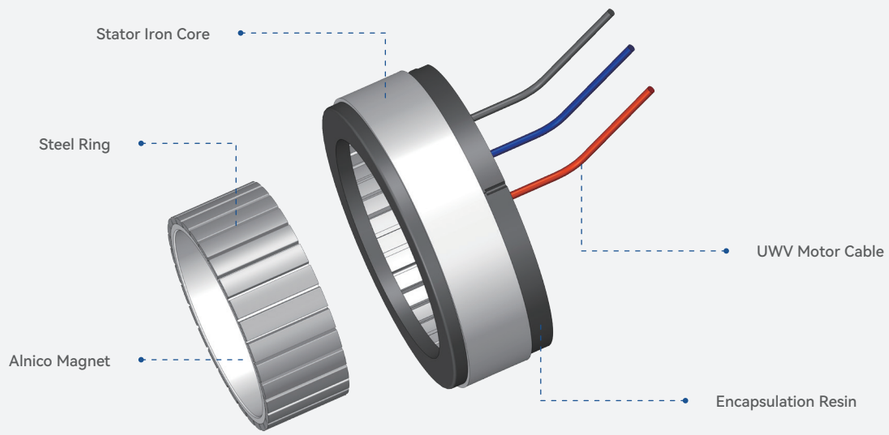
Excellent Thermal Control

- 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

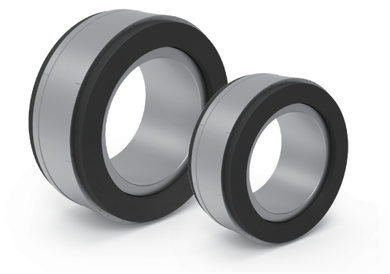
Five Diameters
ϕ28-ϕ85 mm

Rated Speed
1800-5500 rpm

Torque Range
0.07-2.86 Nm

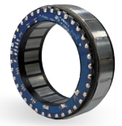
Power Range
40-670 W

Rated Voltage
24-70 V



FM2-028XX

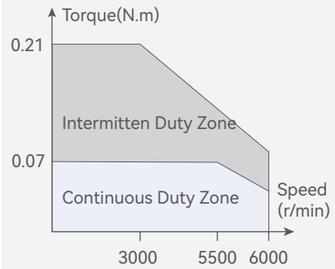
ongoing



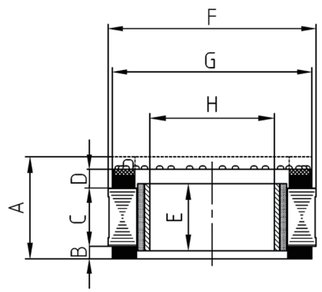
Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm^2*10^{-4})	Weight (kg)
07	40	48	0.95	0.07	0.21	5500	4.6	0.076	0.004	0.035

Rotational Speed-Torque Characteristics

FM2-02807



Dimensions



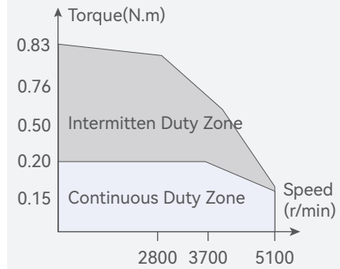
Size (mm)	07
A	16
B	2.8
C	7
D	3.8
E	9
F	28
G	27.5
H	11.6

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

FM2-04308



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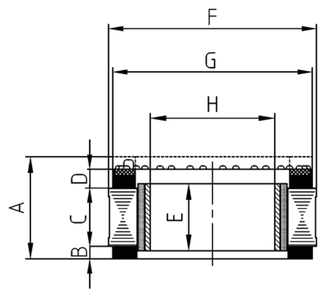


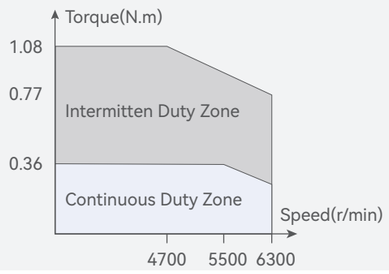
Size (mm)	08
A	15.60
B	2.8
C	8
D	4.2
E	8.5
F	43
G	41
H	27.5

FM2-050XX

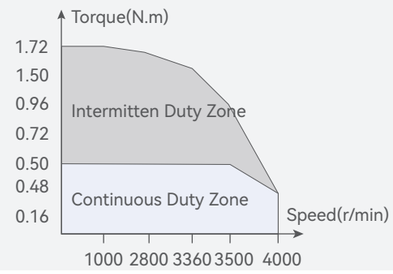
Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm^2*10^{-4})	Weight (kg)
08	207	48	4.9	0.36	1.26	5500	5	0.083	0.057	0.092
14	211	48	4.60	0.60	2.5	3360	8.5	0.141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

Rotational Speed-Torque Characteristics

FM2-05008



FM2-05014



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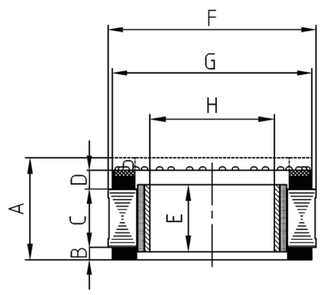


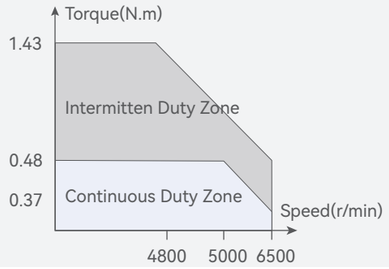
Size (mm)	08	14
A	17.5	23.3
B	3.3	3.3
C	8.20	14
D	4.6	5.1
E	9.9	14.6
F	50	50
G	48	48
H	30	14.6

FM2-060XX

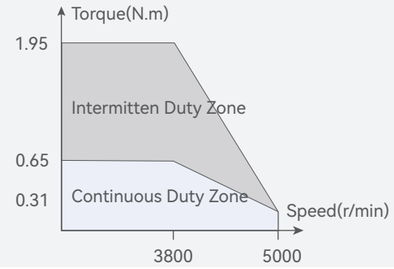
Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm^2*10^{-4})	Weight (kg)
08	251	48	7.1	0.48	1.43	5000	4.8	0.079	0.12	0.135
11	259	48	6.5	0.65	1.95	3800	6.5	0.108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

Rotational Speed-Torque Characteristics

FM2-06008



FM2-06011



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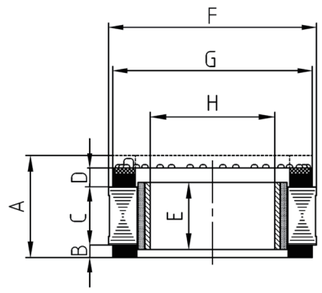


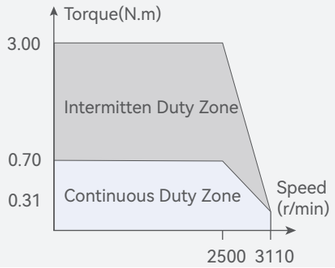
Size (mm)	08	11
A	18.2	21.2
B	3.5	3.5
C	8.2	11.2
D	5.3	5.3
E	10.2	14.7
F	60	60
G	58	58
H	36	36

FM2-070XX

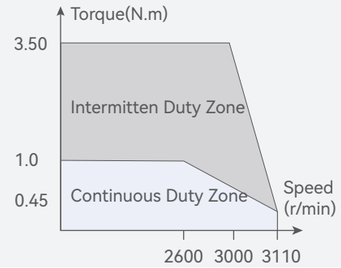
Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm^2*10^{-4})	Weight (kg)
10	183	48	4.35	0.70	3.00	2500	10.5	0.174	0.221	0.211
13	272	48	9.5	1	3.5	2600	7.30	0.121	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

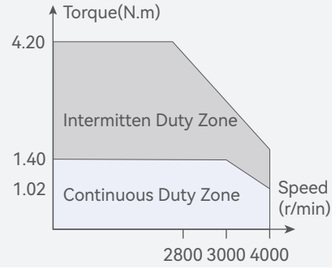
FM2-07010



FM2-07013



FM2-07018



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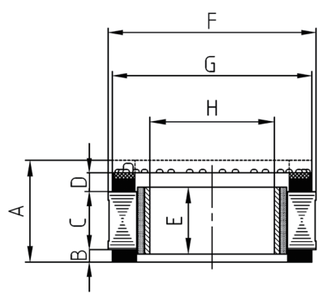


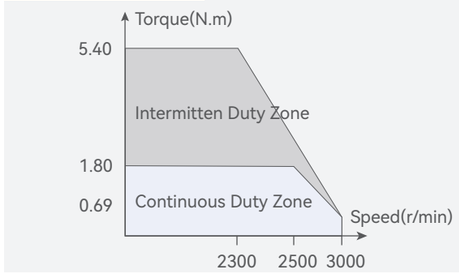
Size (mm)	10	13	18
A	21.50	24.6	29.6
B	4.0	4.1	4.1
C	10	13	18
D	6.3	6.3	6.3
E	10.5	13.5	20.7
F	69	69	69
G	66.2	66.2	66.2
H	42	42	42

FM2-085XX

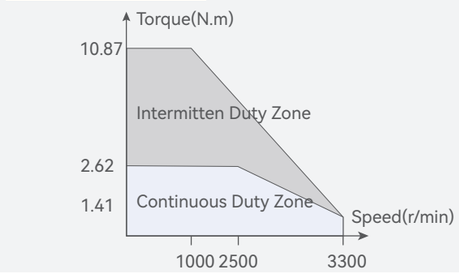
Product Specification	Rated Power (w)	Rated Voltage (VDC)	Rated Current (A)	Rated Torque (Nm)	Maximum Torque (Nm)	Rated Speed (rpm)	Voltage Constant (V/krpm)	Torque Constant (Nm/A)	Inertia (kgm^2*10^{-4})	Weight (kg)
13	481	48	11.0	1.8	7	2500	10.8	0.179	0.606	0.33
23	670	48	18.7	2.56	10.8	2500	9.0	0.149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

Rotational Speed-Torque Characteristics

FM2-08513



FM2-08523



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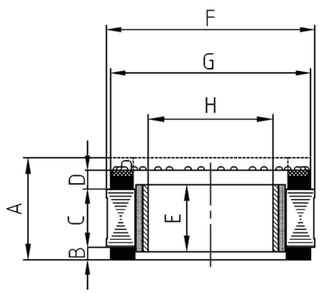

Size (mm)	13	23
A	24.8	34
B	4.0	4.2
C	13	22
D	6	6
E	13.5	13.5
F	85	85
G	82.6	82.6
H	58.5	58.5

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