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Kinco

Motion control
servo system

➔ Kinco frameless torque motor - FMC Series



Kinco® Automation

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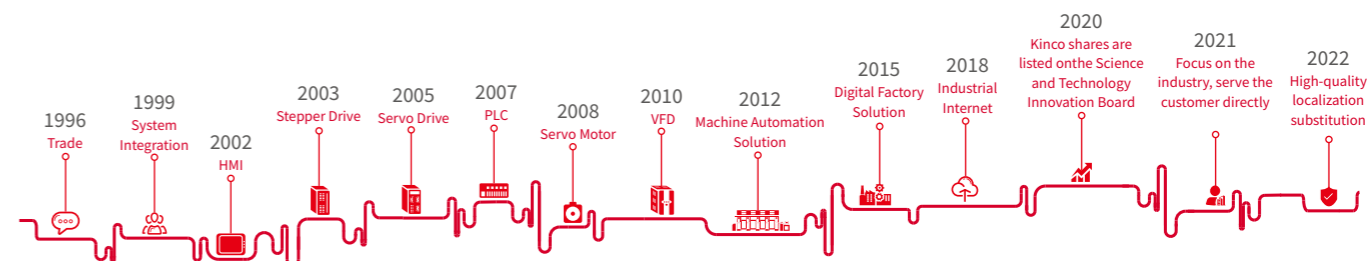
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About us



Shanghai Kinco Automation Co., Ltd. focuses on R&D, production, sales and technical services of automation standard products and intelligent hardware products, which is a leading supplier of machine automation and intelligent solutions for factories in China.

In 1996, Kinco has been providing total automation solutions for global industrial automation equipment manufacturers by relying on standard automation products such as HMI, servo system, stepping system, PLC, low-voltage inverter, etc. to penetrate into the industry, making China's automation solutions prevail all over the world. The company's HMI products have led the wave of HMI popularization in China, and its market share has maintained a leading position among local brand manufacturers for many years.

With the mission of "Making China's manufacturing become the top manufacturing in the world", Kinco company insists on investing a large amount of resources in the research and development of automated technology platforms, and sets up R&D facilities in Shanghai, Shenzhen and Changzhou. Kinco company has an automated technology platform that covers all aspects of control, drive, human-machine interaction, communication and electromechanical integration design. In the field of machine automation, Kinco focuses on the industry and has developed special solutions for logistics automation, service robots, medical instruments, professional drones, 3C machine tools, ozone and other industries.

In the field of smart factory, Kinco provides customers with the most easy-to-implement smart factory solutions for manufacturing companies at the field implementation level, PLC control and communication level, Scada and system integration level, and MES management level through its comprehensive automation technology platform and software system developed for smart factory.

With the vision of "creating a better life intelligently" and adhering to the values of "maintain conscience in growth and hold ingenuity in innovation", Kinco is a platform to help employees maximize their creative potential and a partner to help customers succeed in innovative management. We develop products and operate businesses with innovative thinking and practical spirit, adhere to ideals, and expect human creativity to make the world more wonderful.

FMC frameless torque motor

Frameless torque motors, unlike traditional servo motors, consist only of stator and rotor components. Compared to framed motors, frameless motors offer flexible configuration and easy installation. Considering the increasing trend of highly integrated drive systems, frameless motors better meet the expectations of engineers. Engineers no longer need to consider motor interfaces in system design, allowing for maximum reduction of space occupied by the power output unit in the drive system, leading to higher system integration.

Collaborative Robots



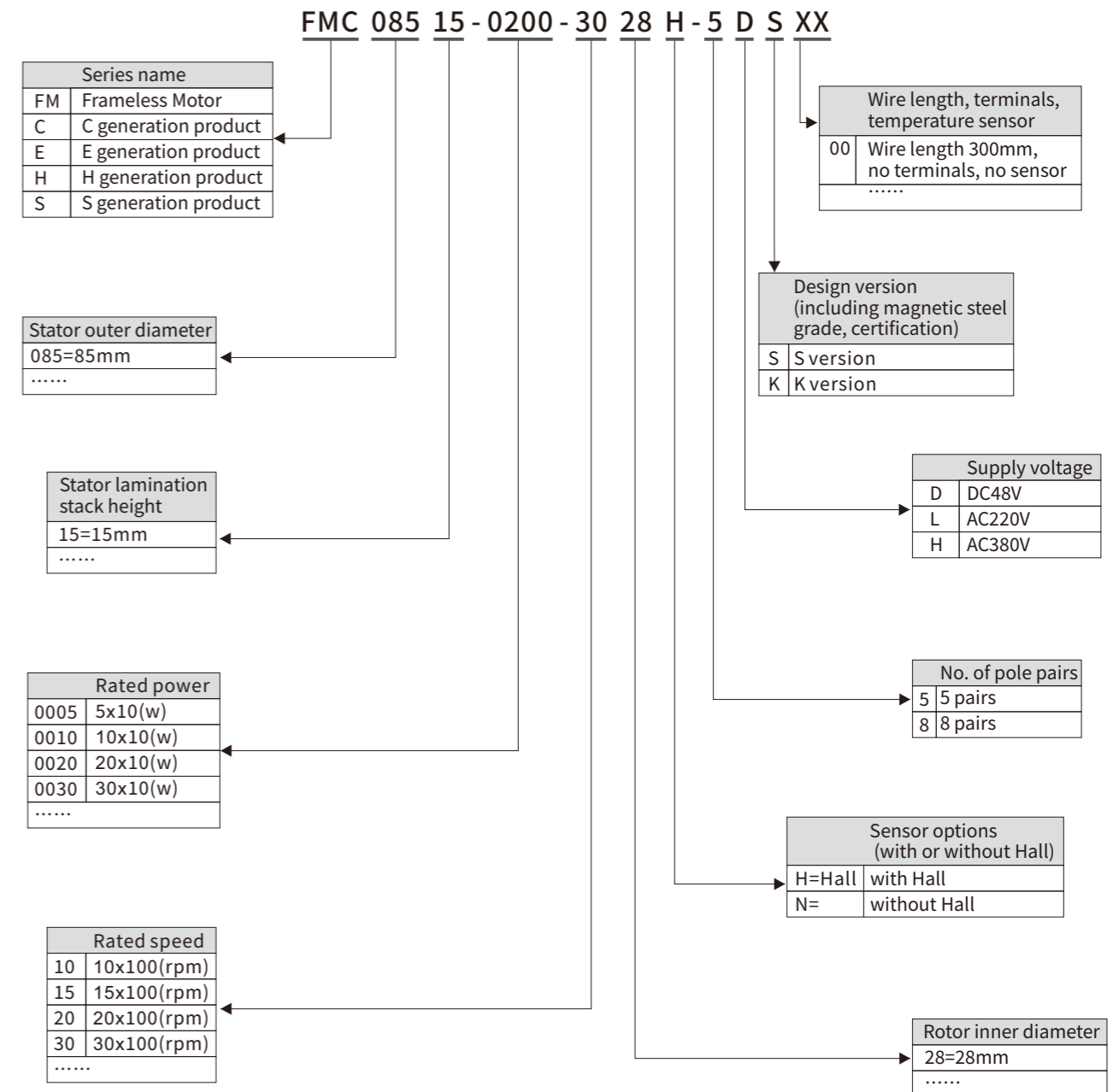
Advantages and Features of FMC Frameless Torque Motors

Independent research and development, with better performance compared to second-generation products:

- Slimmer body thanks to new lightweight design, providing faster and smoother motion as well as smaller size and lower temperature rise under same torque performance.
- Higher torque density achieved through optimization of electromagnetic solutions, with smaller cogging torque thanks to increased pole pairs.
- Easy replacement of mainstream foreign products thanks to compatible product dimensions, also wide compatibility to common harmonic reducers in the market.
- Various frame sizes, larger hollow inner diameter to meet diverse threading requirements, covering loads of 3-25Kg.
- Customizable options: optional Hall sensors, temperature sensors, etc., with noticeable cost advantages.
- Digital factory for continuous and stable production, with multiple global / local distribution and offices providing support and services.

Model Description

FMC Frameless torque motor naming rules



Note: Design version S stands for the 3rd generation electromagnetic design with high power density, design version K is the 2nd generation electromagnetic design.

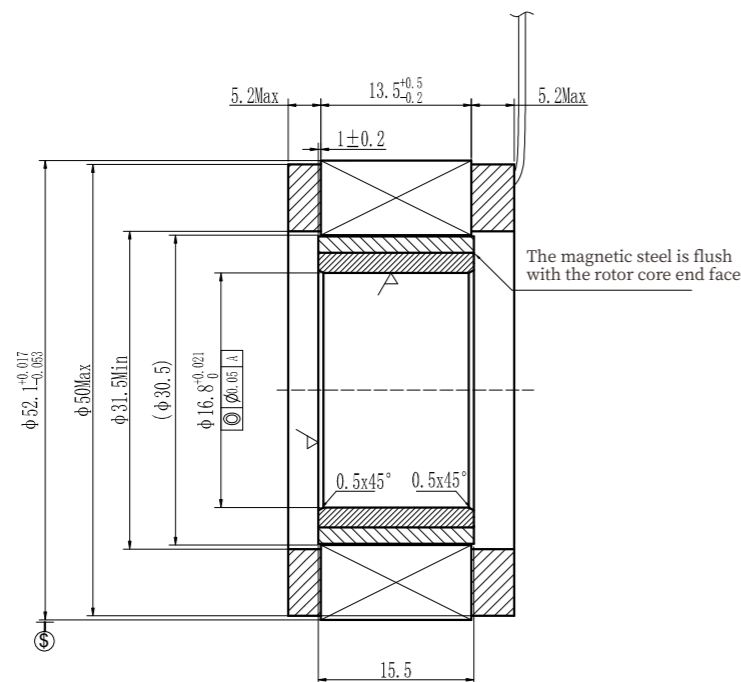
FMC05213 Frameless torque motor technical performance

Servo Motor Model	FMC05213-0015-3716N-5DK00	
Rated Power Pn(W)	159	
Rated Torque Tn(N.m)	0.4	
Rated Speed Nn(rpm)	3790	
Rated Current In(A)	4.4	
Maximum Torque Tm(N.m)	1.2	
Maximum Current Im(A)	13.6	
Standstill Torque Ts(N.m)	0.44	
Standstill current Is(A)	4.84	
Drive DC Link Voltage UDC(V)	48	
Resistance line-line Rl(Ω)	0.904	
Inductance line-line Ll(mH)	0.94	
Electrical time constant τe(ms)	1.04	
Mechanical time constant τm(ms)	1.127	
Voltage constant Ke(V/krpm)	6.13	
Torque constant Kt(Nm/A)	0.1014	
Rotor moment of inertia Jm(Kg.cm ²)	0.074	
No. of poles	10	
Insulation class	F	
Weight (Kg)	0.22	
Position Feedback Device	None	
Temperature Sensor	None	
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m asl: No derating; 1000m to 4000m asl: 1.5% derating per 100m

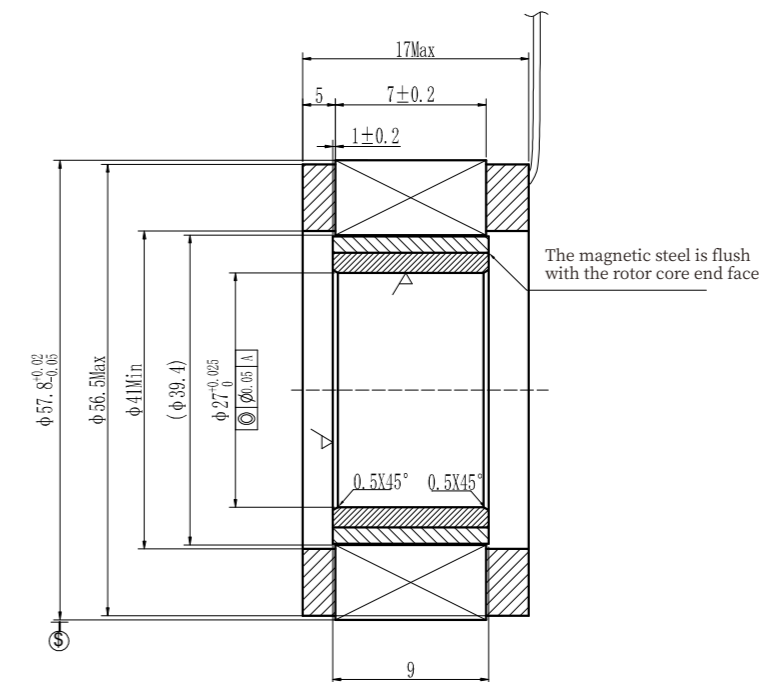
FMC05707 Frameless torque motor technical performance

Servo Motor Model	FMC05707-0010-3027N-8DS00	
Rated Power Pn(W)	100	
Rated Torque Tn(N.m)	0.32	
Rated Speed Nn(rpm)	3000	
Rated Current In(A)	2.55	
Maximum Torque Tm(N.m)	0.96	
Maximum Current Im(A)	11	
Standstill Torque Ts(N.m)	0.36	
Standstill current Is(A)	3.3	
Drive DC Link Voltage UDC(V)	48	
Resistance line-line Rl(Ω)	1.93	
Inductance line-line Ll(mH)	1.79	
Electrical time constant τe(ms)	0.93	
Mechanical time constant τm(ms)	1.83	
Voltage constant Ke(V/krpm)	8	
Torque constant Kt(Nm/A)	0.132	
Rotor moment of inertia Jm(Kg.cm ²)	0.096	
No. of poles	16	
Insulation class	F	
Weight (Kg)	0.11	
Position Feedback Device	None	
Temperature Sensor	None	
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m asl: No derating; 1000m to 4000m asl: 1.5% derating per 100m

FMC05213 Frameless torque motor Outline Mounting dimensions (unit: mm)



FMC05707 Frameless torque motor Outline Mounting dimensions (unit: mm)



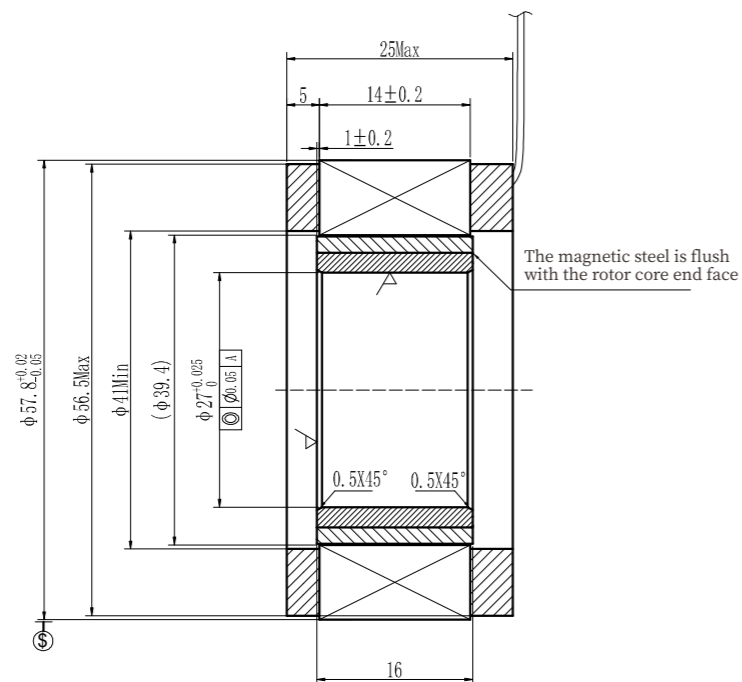
FMC05714 Frameless torque motor technical performance

Servo Motor Model	FMC05714-0020-3027N-8DS00	
Rated Power Pn(W)		200
Rated Torque Tn(N.m)		0.64
Rated Speed Nn(rpm)		3000
Rated Current In(A)		5.1
Maximum Torque Tm(N.m)		1.92
Maximum Current Im(A)		15.6
Standstill Torque Ts(N.m)		0.72
Standstill current Is(A)		5.74
Drive DC Link Voltage UDC(V)		48
Resistance line-line Rl(Ω)		0.72
Inductance line-line Ll(mH)		0.85
Electrical time constant τe(ms)		1.18
Mechanical time constant τm(ms)		1.47
Voltage constant Ke(V/krpm)		8
Torque constant Kt(Nm/A)		0.132
Rotor moment of inertia Jm(Kg.cm ²)		0.206
No. of poles		16
Insulation class		F
Weight (Kg)		0.21
Position Feedback Device		None
Temperature Sensor		None
Cooling method		Full coating, self-cooling
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m amsl: No derating; 1000m to 4000m amsl: 1.5% derating per 100m

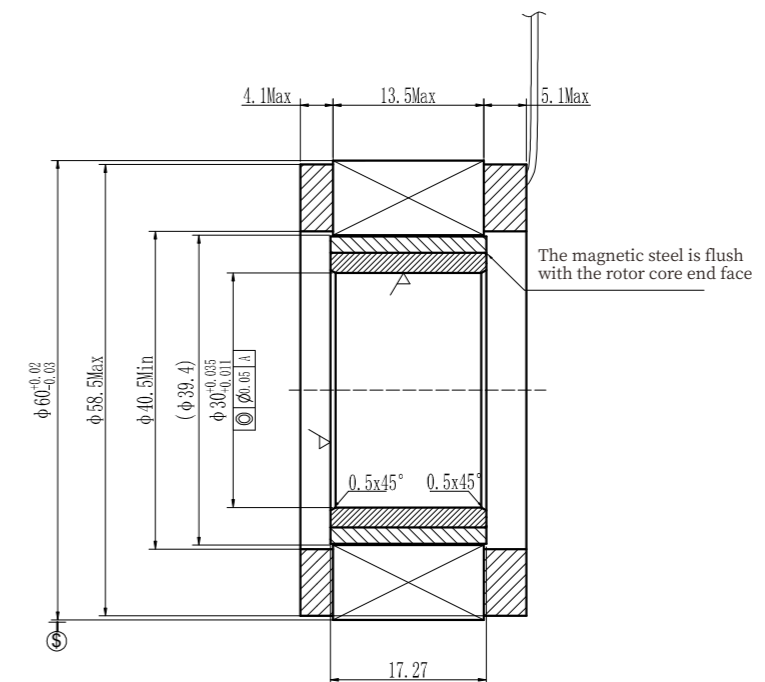
FMC06013 Frameless torque motor technical performance

Servo Motor Model	FMC06013-0014-3130N-8DK00	
Rated Power Pn(W)		146
Rated Torque Tn(N.m)		0.45
Rated Speed Nn(rpm)		3100
Rated Current In(A)		4.2
Maximum Torque Tm(N.m)		1.35
Maximum Current Im(A)		13.4
Standstill Torque Ts(N.m)		0.55
Standstill current Is(A)		4.62
Drive DC Link Voltage UDC(V)		48
Resistance line-line Rl(Ω)		0.51
Inductance line-line Ll(mH)		0.497
Electrical time constant τe(ms)		0.957
Mechanical time constant τm(ms)		0.9
Voltage constant Ke(V/krpm)		7.1
Torque constant Kt(Nm/A)		0.117
Rotor moment of inertia Jm(Kg.cm ²)		0.141
No. of poles		16
Insulation class		F
Weight (Kg)		0.24
Position Feedback Device		None
Temperature Sensor		None
Cooling method		Full coating, self-cooling
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m amsl: No derating; 1000m to 4000m amsl: 1.5% derating per 100m

FMC05714 Frameless torque motor Outline Mounting dimensions (unit: mm)



FMC06013 Frameless torque motor Outline Mounting dimensions (unit: mm)



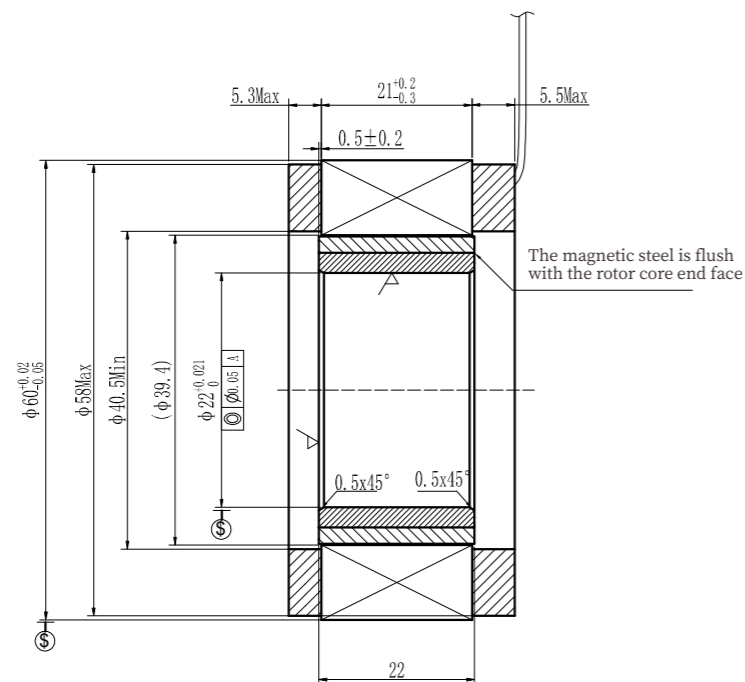
FMC06021 Frameless torque motor technical performance

Servo Motor Model	FMC06021-0025-3722N-8DK00	
Rated Power Pn(W)		258
Rated Torque Tn(N.m)		0.65
Rated Speed Nn(rpm)		3790
Rated Current In(A)		7.2
Maximum Torque Tm(N.m)		1.57
Maximum Current Im(A)		17.4
Standstill Torque Ts(N.m)		0.81
Standstill current Is(A)		9
Drive DC Link Voltage UDC(V)		48
Resistance line-line Rl(Ω)		0.241
Inductance line-line Ll(mH)		0.275
Electrical time constant τe(ms)		1.14
Mechanical time constant τm(ms)		1.36
Voltage constant Ke(V/krpm)		6.05
Torque constant Kt(Nm/A)		1
Rotor moment of inertia Jm(Kg.cm ²)		0.328
No. of poles		16
Insulation class		F
Weight (Kg)		0.35
Position Feedback Device		None
Temperature Sensor		None
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m amsl: No derating; 1000m to 4000m amsl: 1.5% derating per 100m

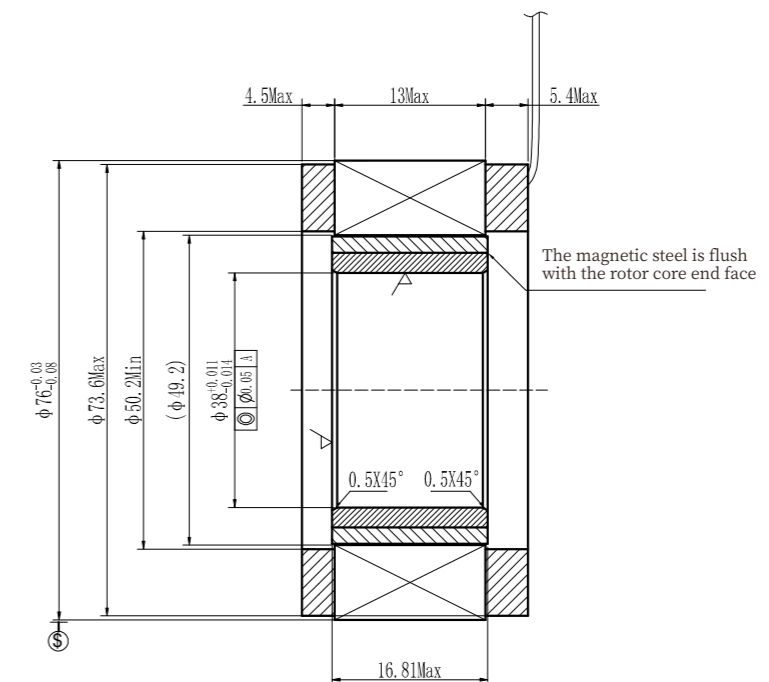
FMC07612 Frameless torque motor technical performance

Servo Motor Model	FMC07612-0029-3338N-8DK00	
Rated Power Pn(W)		293
Rated Torque Tn(N.m)		0.85
Rated Speed Nn(rpm)		3300
Rated Current In(A)		6.7
Maximum Torque Tm(N.m)		2.55
Maximum Current Im(A)		21.44
Standstill Torque Ts(N.m)		1.1
Standstill current Is(A)		7.37
Drive DC Link Voltage UDC(V)		48
Resistance line-line Rl(Ω)		0.31
Inductance line-line Ll(mH)		0.86
Electrical time constant τe(ms)		2.81
Mechanical time constant τm(ms)		2.4
Voltage constant Ke(V/krpm)		8.3
Torque constant Kt(Nm/A)		0.14
Rotor moment of inertia Jm(Kg.cm ²)		0.847
No. of poles		16
Insulation class		F
Weight (Kg)		0.35
Position Feedback Device		None
Temperature Sensor		None
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m amsl: No derating; 1000m to 4000m amsl: 1.5% derating per 100m

FMC06021 Frameless torque motor Outline Mounting dimensions (unit: mm)



FMC07612 Frameless torque motor Outline Mounting dimensions (unit: mm)



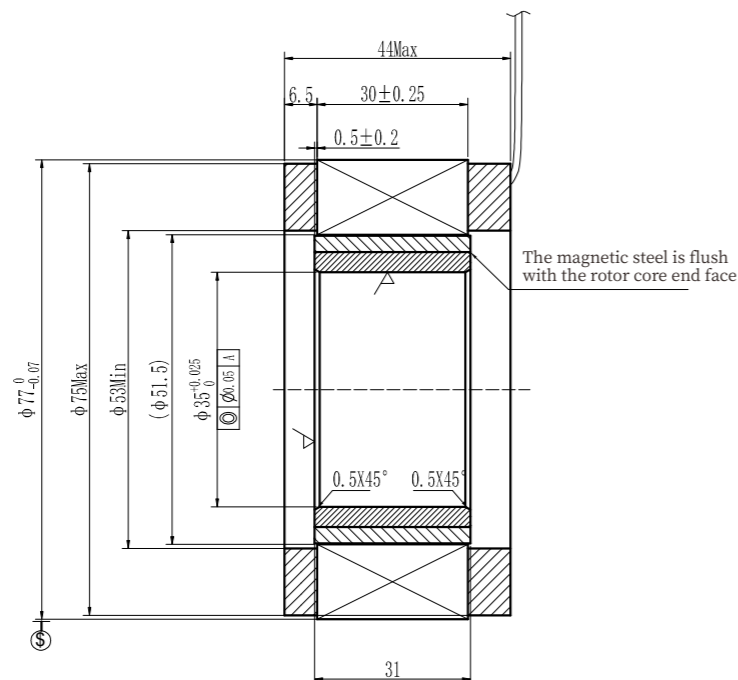
FMC07730 Frameless torque motor technical performance

Servo Motor Model	FMC07730-0075-3035N-8DS00	
Rated Power Pn(W)		750
Rated Torque Tn(N.m)		2.39
Rated Speed Nn(rpm)		3000
Rated Current In(A)		18.6
Maximum Torque Tm(N.m)		7.17
Maximum Current Im(A)		61
Standstill Torque Ts(N.m)		2.63
Standstill current Is(A)		20.5
Drive DC Link Voltage UDC(V)		48
Resistance line-line Rl(Ω)		0.097
Inductance line-line Ll(mH)		0.27
Electrical time constant τe(ms)		2.78
Mechanical time constant τm(ms)		1.25
Voltage constant Ke(V/krpm)		7.85
Torque constant Kt(Nm/A)		0.129
Rotor moment of inertia Jm(Kg.cm ²)		1.25
No. of poles		16
Insulation class		F
Weight (Kg)		0.8
Position Feedback Device		None
Temperature Sensor		None
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m asl: No derating; 1000m to 4000m asl: 1.5% derating per 100m

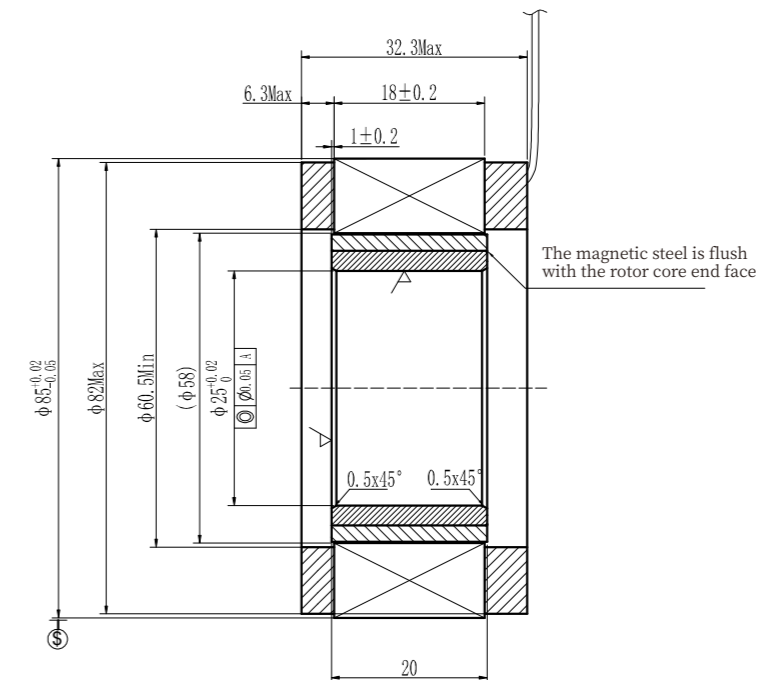
FMC08518 Frameless torque motor technical performance

Servo Motor Model	FMC08518-0056-3025N-8DS00	
Rated Power Pn(W)		565
Rated Torque Tn(N.m)		1.8
Rated Speed Nn(rpm)		3000
Rated Current In(A)		19
Maximum Torque Tm(N.m)		5.4
Maximum Current Im(A)		57
Standstill Torque Ts(N.m)		2
Standstill current Is(A)		21
Drive DC Link Voltage UDC(V)		48
Resistance line-line Rl(Ω)		0.058
Inductance line-line Ll(mH)		0.09
Electrical time constant τe(ms)		1.55
Mechanical time constant τm(ms)		1.38
Voltage constant Ke(V/krpm)		5.9
Torque constant Kt(Nm/A)		0.099
Rotor moment of inertia Jm(Kg.cm ²)		1.33
No. of poles		16
Insulation class		F
Weight (Kg)		0.7
Position Feedback Device		None
Temperature Sensor		None
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m asl: No derating; 1000m to 4000m asl: 1.5% derating per 100m

FMC07730 Frameless torque motor Outline Mounting dimensions (unit: mm)



FMC08518 Frameless torque motor Outline Mounting dimensions (unit: mm)



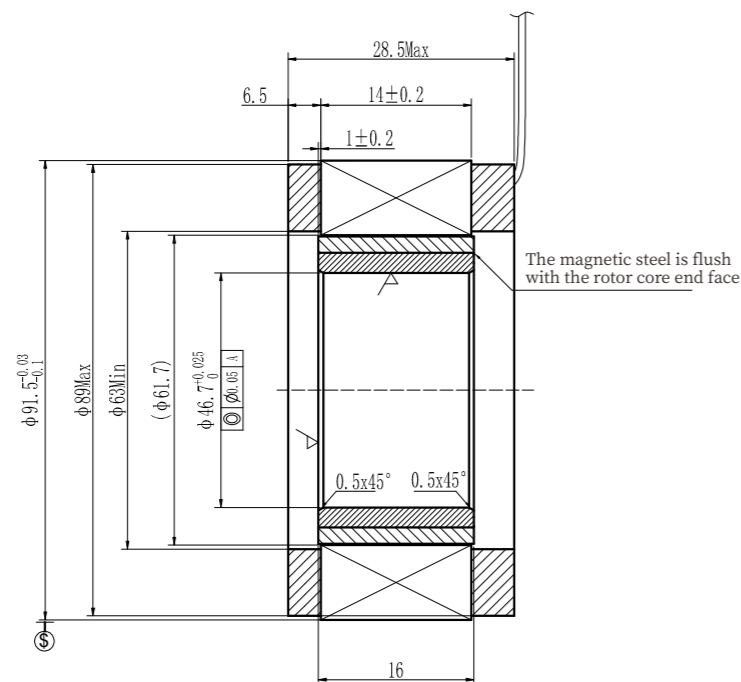
FMC09114 Frameless torque motor technical performance

Servo Motor Model	FMC09114-0063-3046N-8DS00	
Rated Power Pn(W)	630	
Rated Torque Tn(N.m)	2	
Rated Speed Nn(rpm)	3000	
Rated Current In(A)	16.2	
Maximum Torque Tm(N.m)	5	
Maximum Current Im(A)	43.5	
Standstill Torque Ts(N.m)	2.2	
Standstill current Is(A)	17.8	
Drive DC Link Voltage UDC(V)	48	
Resistance line-line Rl(Ω)	0.12	
Inductance line-line Ll(mH)	0.22	
Electrical time constant τe(ms)	1.83	
Mechanical time constant τm(ms)	1.39	
Voltage constant Ke(V/krpm)	7.9	
Torque constant Kt(Nm/A)	0.13	
Rotor moment of inertia Jm(Kg.cm ²)	1.14	
No. of poles	16	
Insulation class	F	
Weight (Kg)	0.78	
Position Feedback Device	None	
Temperature Sensor	None	
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m asml: No derating; 1000m to 4000m asml: 1.5% derating per 100m

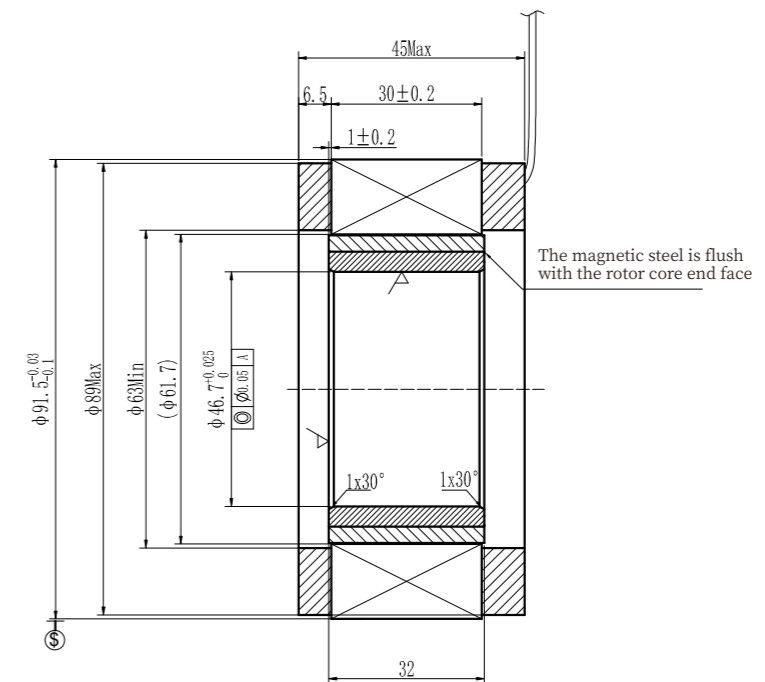
FMC09130 Frameless torque motor technical performance

Servo Motor Model	FMC09130-0125-3046N-8DS00	
Rated Power Pn(W)	1257	
Rated Torque Tn(N.m)	4	
Rated Speed Nn(rpm)	3000	
Rated Current In(A)	27	
Maximum Torque Tm(N.m)	10	
Maximum Current Im(A)	72	
Standstill Torque Ts(N.m)	4.4	
Standstill current Is(A)	29.8	
Drive DC Link Voltage UDC(V)	48	
Resistance line-line Rl(Ω)	0.058	
Inductance line-line Ll(mH)	0.164	
Electrical time constant τe(ms)	2.83	
Mechanical time constant τm(ms)	0.93	
Voltage constant Ke(V/krpm)	9.3	
Torque constant Kt(Nm/A)	0.154	
Rotor moment of inertia Jm(Kg.cm ²)	2.19	
No. of poles	16	
Insulation class	F	
Weight (Kg)	1.03	
Position Feedback Device	None	
Temperature Sensor	None	
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m asml: No derating; 1000m to 4000m asml: 1.5% derating per 100m

FMC09114 Frameless torque motor Outline Mounting dimensions (unit: mm)



FMC09130 Frameless torque motor Outline Mounting dimensions (unit: mm)



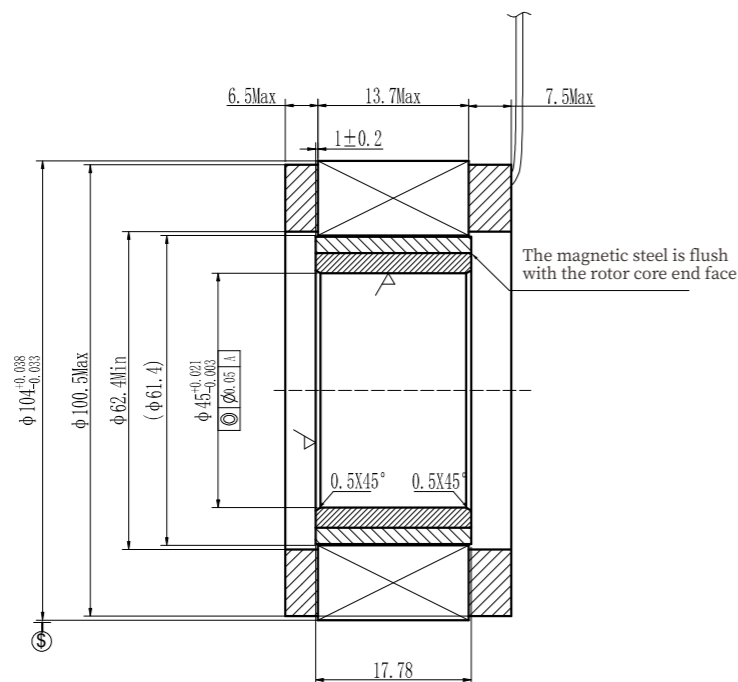
FMC10414 Frameless torque motor technical performance

Servo Motor Model	FMC10414-0038-2445N-8DK00	
Rated Power Pn(W)	380	
Rated Torque Tn(N.m)	1.5	
Rated Speed Nn(rpm)	2420	
Rated Current In(A)	10.3	
Maximum Torque Tm(N.m)	4.3	
Maximum Current Im(A)	30.9	
Standstill Torque Ts(N.m)	2.2	
Standstill current Is(A)	15.1	
Drive DC Link Voltage UDC(V)	48	
Resistance line-line Rl (Ω)	0.117	
Inductance line-line Ll (mH)	0.53	
Electrical time constant τe(ms)	4.53	
Mechanical time constant τm(ms)	1.6	
Voltage constant Ke(V/krpm)	9.68	
Torque constant Kt(Nm/A)	0.16	
Rotor moment of inertia Jm(Kg.cm ²)	2.018	
No. of poles	16	
Insulation class	F	
Weight (Kg)	0.77	
Position Feedback Device	None	
Temperature Sensor	None	
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m amsl: No derating; 1000m to 4000m amsl: 1.5% derating per 100m

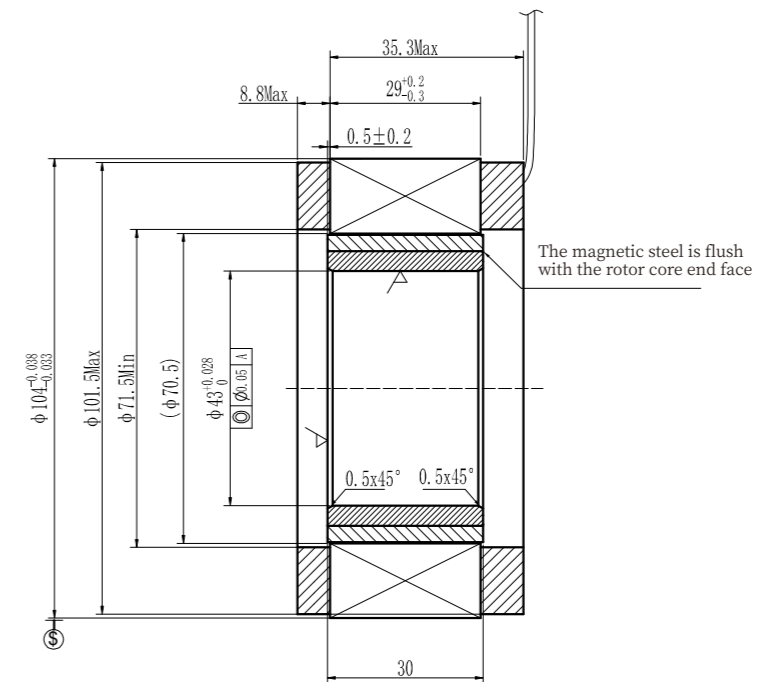
FMC10429 Frameless torque motor technical performance

Servo Motor Model	FMC10429-0100-2543N-8DS00	
Rated Power Pn(W)	1050	
Rated Torque Tn(N.m)	4	
Rated Speed Nn(rpm)	2500	
Rated Current In(A)	22.5	
Maximum Torque Tm(N.m)	12	
Maximum Current Im(A)	74.1	
Standstill Torque Ts(N.m)	4.4	
Standstill current Is(A)	24.6	
Drive DC Link Voltage UDC(V)	48	
Resistance line-line Rl (Ω)	0.058	
Inductance line-line Ll (mH)	0.19	
Electrical time constant τe(ms)	3.28	
Mechanical time constant τm(ms)	1.09	
Voltage constant Ke(V/krpm)	11.87	
Torque constant Kt(Nm/A)	0.196	
Rotor moment of inertia Jm(Kg.cm ²)	4.2	
No. of poles	16	
Insulation class	F	
Weight (Kg)	1.51	
Position Feedback Device	None	
Temperature Sensor	None	
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m amsl: No derating; 1000m to 4000m amsl: 1.5% derating per 100m

FMC10414 Frameless torque motor Outline Mounting dimensions (unit: mm)



FMC10429 Frameless torque motor Outline Mounting dimensions (unit: mm)



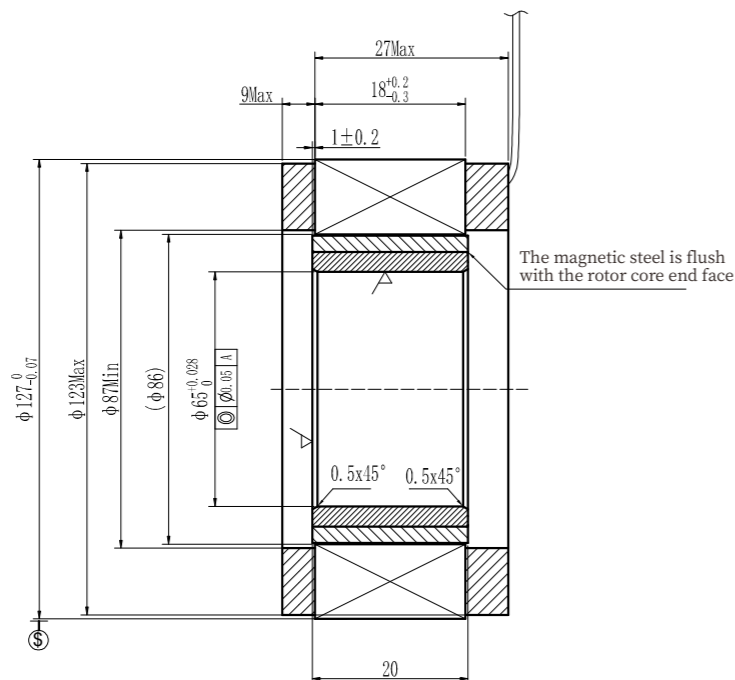
FMC12718 Frameless torque motor technical performance

Servo Motor Model	FMC12718-0090-2465N-8DS00	
Rated Power Pn(W)	904	
Rated Torque Tn(N.m)	3.6	
Rated Speed Nn(rpm)	2400	
Rated Current In(A)	24	
Maximum Torque Tm(N.m)	10.8	
Maximum Current Im(A)	72	
Standstill Torque Ts(N.m)	4	
Standstill current Is(A)	26.4	
Drive DC Link Voltage UDC(V)	48	
Resistance line-line Rl (Ω)	0.049	
Inductance line-line Ll (mH)	0.182	
Electrical time constant τe(ms)	3.71	
Mechanical time constant τm(ms)	1.46	
Voltage constant Ke(V/krpm)	9.72	
Torque constant Kt(Nm/A)	0.161	
Rotor moment of inertia Jm(Kg.cm ²)	4.46	
No. of poles	16	
Insulation class	F	
Weight (Kg)	1.31	
Position Feedback Device	None	
Temperature Sensor	None	
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	- 20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m asml: No derating; 1000m to 4000m asml: 1.5% derating per 100m

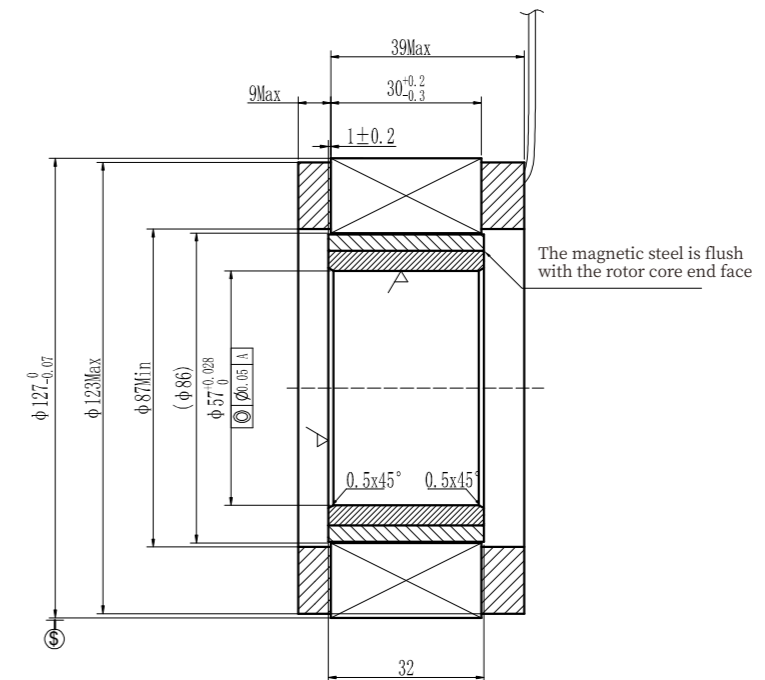
FMC12730 Frameless torque motor technical performance

Servo Motor Model	FMC12730-0160-2457N-8DS00	
Rated Power Pn(W)	1600	
Rated Torque Tn(N.m)	6.37	
Rated Speed Nn(rpm)	2400	
Rated Current In(A)	35.5	
Maximum Torque Tm(N.m)	19.11	
Maximum Current Im(A)	110	
Standstill Torque Ts(N.m)	7	
Standstill current Is(A)	39	
Drive DC Link Voltage UDC(V)	48	
Resistance line-line Rl (Ω)	0.035	
Inductance line-line Ll (mH)	0.145	
Electrical time constant τe(ms)	4.14	
Mechanical time constant τm(ms)	1.14	
Voltage constant Ke(V/krpm)	11.4	
Torque constant Kt(Nm/A)	0.2	
Rotor moment of inertia Jm(Kg.cm ²)	6.7	
No. of poles	16	
Insulation class	F	
Weight (Kg)	2.18	
Position Feedback Device	None	
Temperature Sensor	None	
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	- 20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m asml: No derating; 1000m to 4000m asml: 1.5% derating per 100m

FMC12718 Frameless torque motor Outline Mounting dimensions (unit: mm)



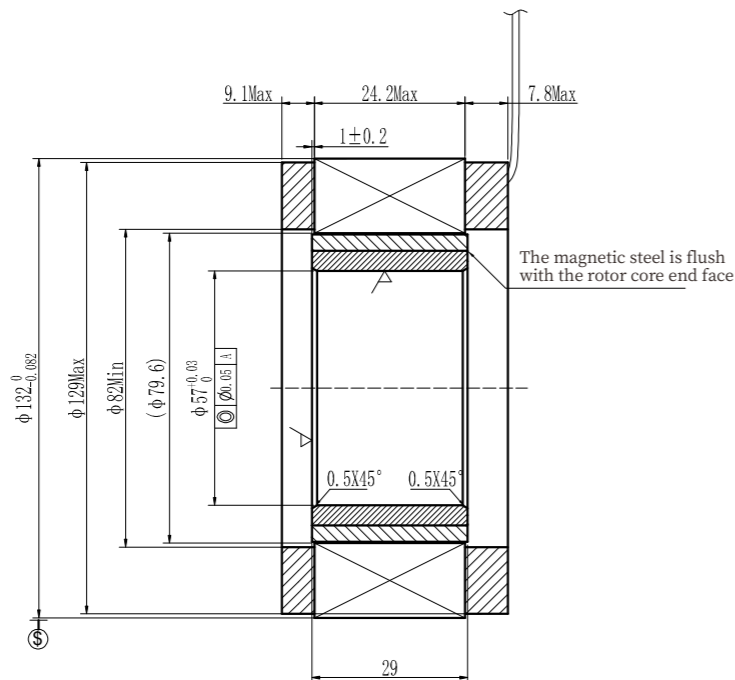
FMC12730 Frameless torque motor Outline Mounting dimensions (unit: mm)



FMC13224 Frameless torque motor technical performance

Servo Motor Model	FMC13224-0118-3243N-8DK00	
Rated Power Pn(W)	1180	
Rated Torque Tn(N.m)	3.5	
Rated Speed Nn(rpm)	3220	
Rated Current In(A)	29.2	
Maximum Torque Tm(N.m)	8.4	
Maximum Current Im(A)	70	
Standstill Torque T _s (N.m)	3.85	
Standstill current I _s (A)	32.1	
Drive DC Link Voltage UDC(V)	48	
Resistance line-line R _l (Ω)	0.02	
Inductance line-line L _l (mH)	0.102	
Electrical time constant τ _e (ms)	5.1	
Mechanical time constant τ _m (ms)	0.801	
Voltage constant K _e (V/krpm)	8	
Torque constant K _t (Nm/A)	0.132	
Rotor moment of inertia J _m (Kg.cm ²)	4.05	
No. of poles	16	
Insulation class	F	
Weight (Kg)	2.01	
Position Feedback Device	None	
Temperature Sensor	None	
Cooling method	Full coating, self-cooling	
Environmental conditions	Temperature	-20~40°C(non-freezing)
	Humidity	Below 90%RH (No condensation)
	Environment	Free from corrosive or flammable gases, oil mist, dust
	Installation altitude	<1000m asml: No derating; 1000m to 4000m asml: 1.5% derating per 100m

FMC13224 Frameless torque motor Outline Mounting dimensions (unit: mm)



Mounting and installation guide

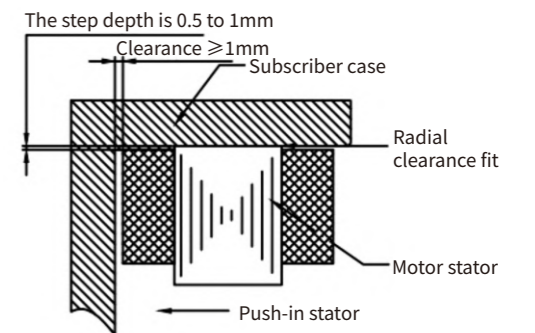
Kinco suggests the following options for installation of the frameless motors to realize the high performance, small space consumption, high efficiency and serviceability desired by the user.

Stator Mounting Practices

Stator bonding

In most cases, motors may have the stator bonded in place using anaerobic, such as Loctite 638/648 or other similar adhesives. Adhesive bonding is a preferred and convenient installation technique for all stators, the user should consult the adhesive manufacturer for proper curing instructions (depends on the adhesive applied). Following options for stator housing design and installation of the motor stator should be repeated:

1. The stator enclosure housing should be designed as a cylindrical cup.
2. A small shoulder with radial depth of 0.5mm-1mm for axial positioning at one end of the stator housing should be designed.
3. The shoulder serves as a axial stop point for the stator to bank against when inserted from the open end of the stator housing and should not use the stator winding lead-out end.
4. The clearance fit is adopted between stator outer diameter and the housing inner diameter. The user should consult the adhesive manufacturer's guidelines for proper housing inner diameter clearance design recommendations.
5. It is recommended to place additional adhesive grooves in the inner diameter of the housing to provide torsional strength for more reliable bonding.
6. Stator and housing surfaces should be cleaned thoroughly prior to bonding to ensure good adhesion.
7. Adhesive cure temperatures should not exceed 155°C to avoid damaging the motor stator.



Stator shrink Fit

In case adhesive is not preferred, a thermal shrink fit technique for motor stator installation is recommended. Cold pressing should be avoided during installation. Extreme pressures will result in damage to the structure of stator laminations stack.

If desired, following options for stator housing design and installation of the motor stator should be repeated:

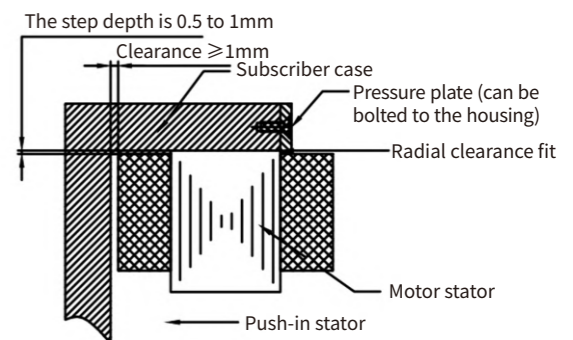
1. The stator enclosure housing should be designed as a cylindrical cup.
2. The clearance fit is adopted between stator outer diameter and the housing inner diameter. The user should consider required pulling-out force with respect to applications for proper housing inner diameter clearance design. Dissimilar thermal expansion coefficients (e.g. steel laminations vs. aluminum housing) should also be considered to ensure reliable holding strength across a board temperature range.

Stator clamping

For applications where the torque range is small or the stator may need to be repeatedly installed and removed from the system, axial clamping may also be an acceptable option. Kinco does not recommend this technique in mass production where shock or vibration from motor operation is high and the clamping methods may fail.

If desired, following options for stator housing design and installation of the motor stator should be repeated:

1. The stator enclosure housing should be designed as a cylindrical cup.
2. A small shoulder with radial depth of 0.5mm-1mm for axial positioning at one end of the stator housing should be designed.
3. The shoulder serves as a axial stop point for the stator to bank against when inserted from the open end of the stator housing and should not use the stator winding lead-out end.
4. A clamping ring is needed at the opposite end of the stator and bolted to the housing. The clamping ring should contact the stator with pressures designed according to the clamping forces needed in the applications.
5. The sliding fit between stator outer diameter and the housing inner diameter.



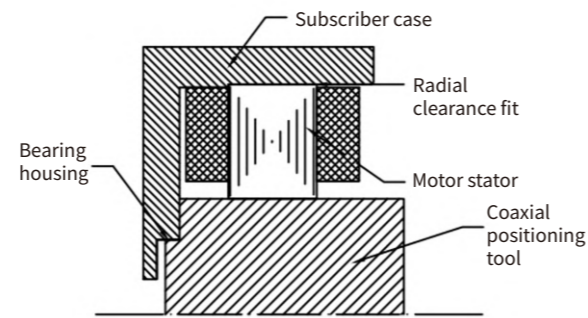
Mounting and installation guide

Important

All these three installation options are clearance fit between stator outer diameter and housing inner diameter during stator insertion and the radial running out tolerance in between will be presented as a result and therefore further create the running out tolerance between motor stator and rotor.

The axial alignment between stator inner diameter and rotor outer diameter must be maintained to ensure proper motor performance. It is recommended to have a common and stable axial basis when mounting the stator and rotor:

1. Set the stator housing case stop point or bearing chamber as the positioning basis.
2. Insert the rotor into the stator by using a custom installation fixture.

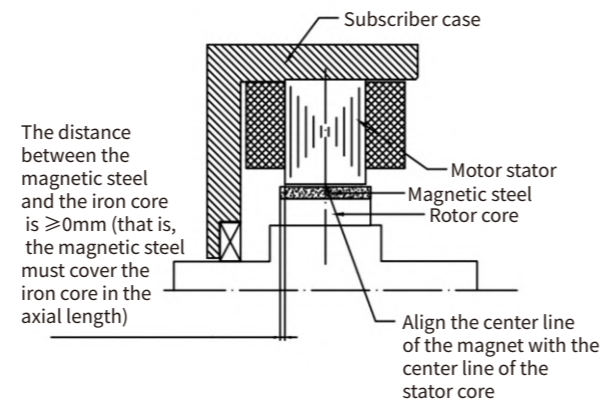


Rotor Mounting Practices

The rotor of a frameless motor generally consists of a ring shaped metal yoke with magnets equally placed around its outer surface with adhesive bonding technique. The user can install the rotor to a shaft by the inner bore of the metal ring for most applications. Generally the rotors can be installed by means of adhesive bonding or cold pressing techniques. Consider proper fit tolerance with respect to different installation option taken or applicaiton requirements.

To ensure proper motor performance, following specified mounting dimension principles must be respected:

1. Axial alignment must be maintained between rotor magnets and stator.
2. Or the dimension tolerance design should at least guarantee that the axial length of the rotor magnets can envelop the axial length of the stator lamination stack.



Important

Kinco FMC freameless motors utilize high-performance rare earth magnets, the attractive forces between magnetized rotors and nearby stator steel lamination can be extremely powerful. Improper handling can result in unexpected impacts and can potentially damage the rotor fiber band layer. Following assembly process can be followed:

1. Insert the rotor into the position inside the stator by using a custom installation fixture to avoid rotor from sticking to the inner bore of the stator.
2. In case no custom fixture is available, user can install a thin layer of shim material (such as insulation film) in the inner bore of the stator, prior to inserting the rotor into the stator. Remove the shim material from the airgap between the rotor and stator after the installation.

