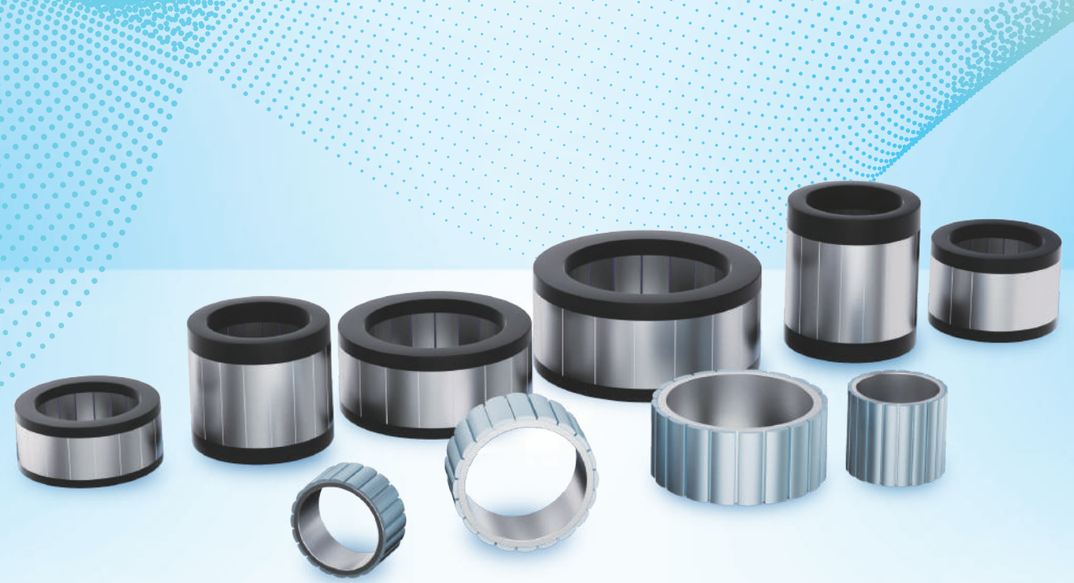
VEICHI

FT1 Series
Frameless Torque Motor



Stock Code：688698

VEICHI

Suzhou Veichi Electric Co., Ltd

No. 1888, Songwei Road, Guoxiang Street, Wuzhong Economic and Technological Development Zone, Suzhou, Jiangsu, China

Tel：+86-512-6617 1988　　Fax：+86-512-6617 3610

Facebook: https://www.facebook.com/veichigroup

Https://www.veichi.com/

About Us

Veichi Electric (Stock Code: 688698) specializes in electrical transmission and industrial control, operating as an integrated high-tech enterprise in R&D, production, and sales of industrial automation products. With a vision to lead in smart industry and green energy solutions, the company leverages its R&D and manufacturing hubs in Suzhou, additional R&D centers in Shenzhen and Xi'an, and wholly-owned subsidiaries overseas, consistently serving customers worldwide with competitive and reliable solutions.

Under the "One Core, Two New Drivers" strategy, Veichi focuses on industrial automation, offering AC drives, servo systems, and control systems widely applied across heavy and light industries, as well as high-end equipment sectors, supporting the digital and intelligent transformation of manufacturing with its tailored solutions. Simultaneously, in two emerging fields, it provides one-stop solutions for humanoid, collaborative, and mobile robots in embodied intelligence, while in green energy, it delves into segments like photovoltaic, energy storage, and hydrogen energy, to "connect every device with green power," fostering a synergistic growth between core operations and new ventures.

Sustained R&D has yielded a portfolio of proprietary patented technologies including silicon carbide application, HF injection, motor controls and protections (auto-tuning, flying-start, high-speed flux-weakening, V/F control, vector control), high-density water-cooling layout, and IGBT drive protection. As of December 31, 2025, Veichi holds 239 patents, with 70 for invention.

Over two decades of steady growth, Veichi has earned numerous certifications and accolades from national and regulatory authorities, including "High-Tech Enterprise," "Postdoctoral Research Workstation," and provincial honors like "Engineering Technology Research Center," "Enterprise Technology Center," and "Industrial Internet Development Demonstration Enterprise (Benchmark Factory Category)."

Guided by its mission to "Drive Smart Industry, Co-create a Green Future," Veichi will continue to intensify R&D and advance into high-performance, high-reliability fields to propel global progress.

2005
- Start of business in Shenzhen
- First generation of AC drive launched

2016
- Suzhou VEICHI Phase I put into operation
- First-generation motion control system successfully launched

2019
- Restructured into a joint-stock company
- VEICHI overseas subsidiary established, marking the start of global expansion

2020
- Listed on the Science and Technology Innovation Board (STAR Market)
- Recognized as a provincial SRDI "Little Giant" enterprise

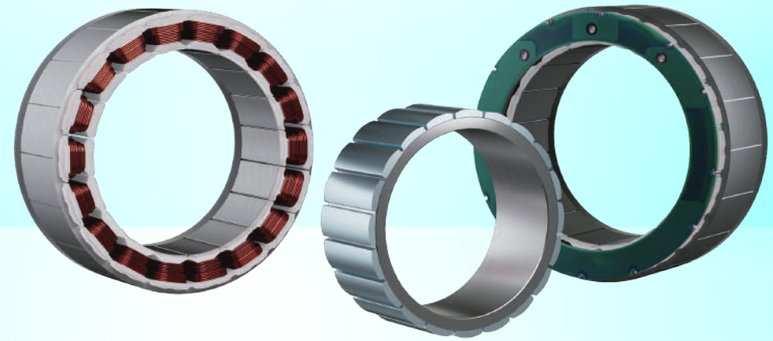
2021
- VEICHI-controlled subsidiary established, enhancing industrial chain integration
- Recognized as a SRDI "Little Giant" enterprise

2022
- Xi'an R&D Center established
- VEICHI Digital Energy subsidiary founded, digitalizing the green energy Integrated power solutions for humanoid/ collaborative/mobile robots launched, initiating deployment in the robotics sector

2023
- Suzhou VEICHI Phase II put into operation
- VEICHI Medical Equipment subsidiary established, expanding into the healthcare sector

2024
- Strategic acquisition of Changzhou Jiteng, entering the port and marine sector
- "One Core, Two New Drivers" development strategy adopted

2025
- Suzhou VEICHI Phase III digital production base put into operation
- Changzhou high-end electrical equipment production base topped out
- Jiujiang smart production base groundbreaking ceremony held



CONTENTS

Advantages

Leading direct driven performance

- Advanced electromagnetic solutions for maximum torque density and smaller motor size
- Smooth and noiseless rotation with less cogging torque

Safe and reliable structure

- Motor winding maximum temperature rating of 155 ℃, optional integrated thermistor for safe continuous operation in high standard application
- UL-standard insulation systems for the regulatory requirements
- Material selected in accordance with the RoHS directive
- Compliance with Class C in EN 60034-1:2004 – Rotating electrical machines and the low voltage directive in 2006-95-EC

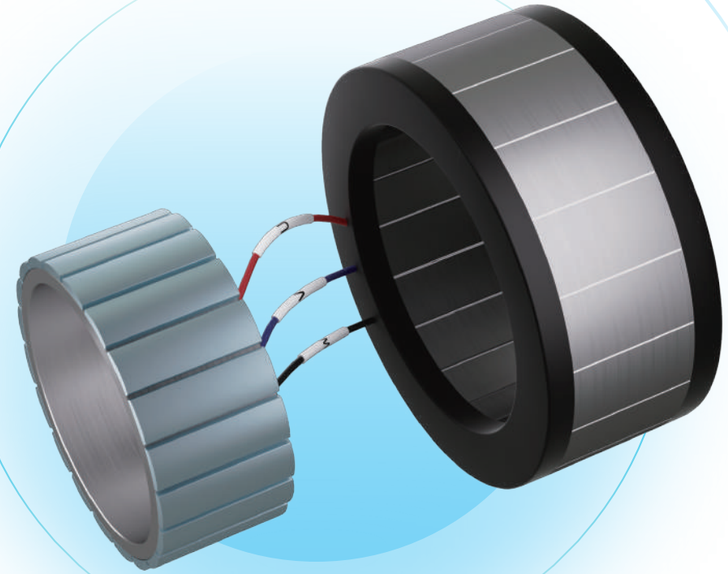
Multiple configuration options and timely solutions

- Multiple frame sizes available to meet more application requirements
- Optional Hall sensors for standard feedback capabilities
- Basic high and low voltage insulation
- Various standard windings for customization
- Adjustable mechanical interfaces
- Continuous and stable production in digitalized factories for global distribution, and multiple offices in China to provide support and service

Peak Torque
0.32N·m ~ 21.49N·m

Rated Speed
2000rpm ~ 3000rpm

Stator OD
58mm ~ 115mm

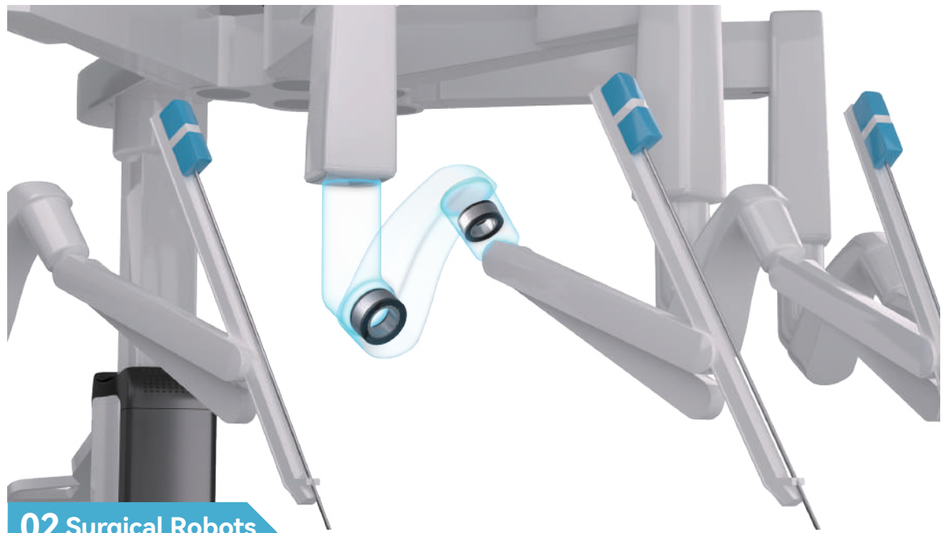


Product Information

Application Scenarios

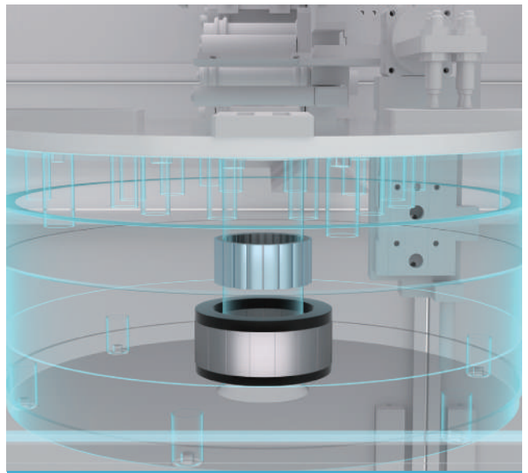
01 Collaborative Robots

Lighter frameless motors have irreplaceable advantages in collaborative robotics.



02 Surgical Robots

Surgical robots require a higher degree of precision than other scenarios, and a small frameless volume significantly reduces the height of the robot's joints, allowing for closer movement between the arms and thus a relatively smaller wound size.



03 Precise Turntable

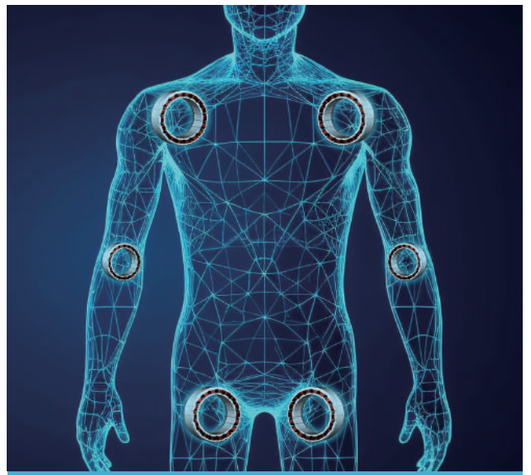
A frameless motor with optional high-precision bearings and encoders delivers faster positioning of the turntable than traditional direct-drive motors, while the optional axes allow modular modifications and adjustments.

04 Power Assisted Cycle

The compact design helps to reduce the weight of the power-assisted bicycle itself to enhance its maneuverability.

05 Delta Robots

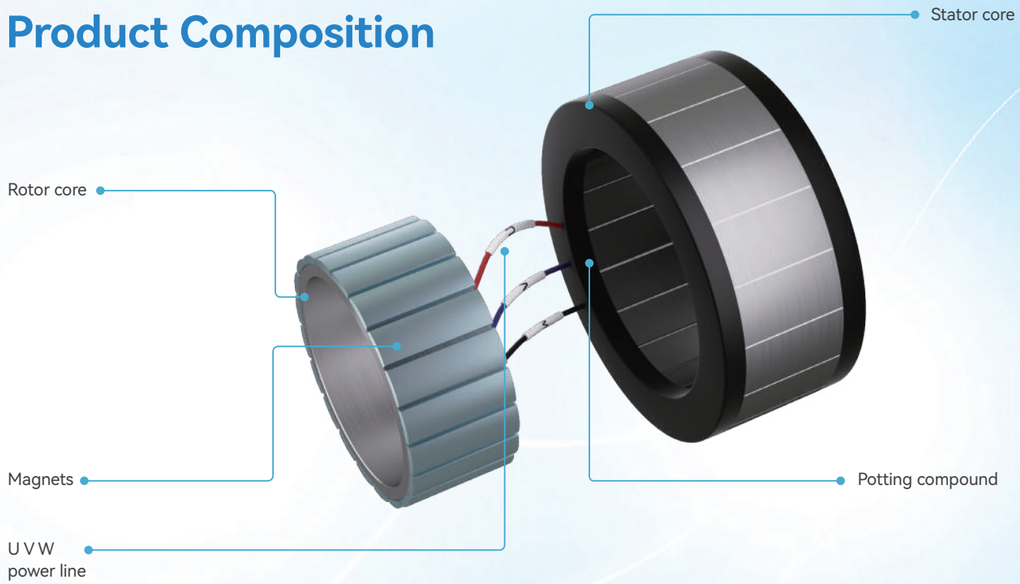
Customized frameless inner/outer diameters facilitate compact robot designs.



06 Robot Joints

A variety of sizes and joint modules provide new solutions for flexible robot movement.

Product Composition



Naming Rules

FT1 - 058 G 18 - R10 30 - N YX

Product Series
FT1: Product series

Stator Outer Diameter
058: 58mm
120: 120mm

Voltage Level
G: Operating voltage 48V

Total Height
18: Overall height not exceeding 18mm
38: Overall height not exceeding 38mm So as other values

Outlet Type and Length
Y: Direct outlet (200±20mm)
U: Outlet with adapter
X is the length of the outlet line, 200m by default.
No need to check this when it is not special, check the actual length.

Sensor
N: No optional sensor
D: Hall + temperature sensor optional
W: Temperature sensor optional
H: Hall sensor optional

Rated Speed
Rated speed = Value × 100, e.g.: 30 for 3000rpm, and so as the other values

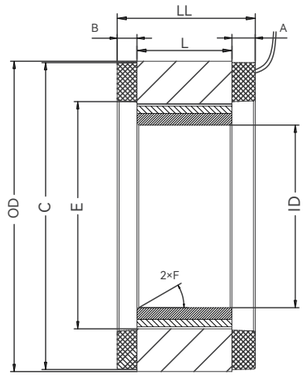
Rated Power
Rated speed = Value × 1000, R means the decimal point. e.g.: R10 for 100W, 1R5 for 1500W, and so as the other values

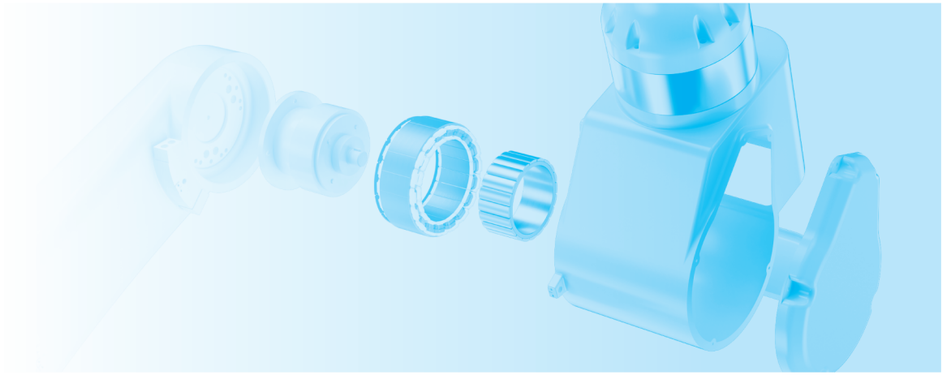
Specification

Mechanical Characteristics

Item		Description
Work mode		S1(Continuous)
Insulation resistance		>10MΩ
Excitation mode		Permanent magnet
Installation method		Outer diameter of stator plus end face of iron core
Insulation class		F
Insulation voltage		AC1500V, 1 minute(220V)
FWD operation		FWD by default in the drive setting Counterclockwise (CCW) when viewed from the axis extension side
Environment	Ambient temperature	-20℃~40℃(no freezing) (Use according the derating curve above 40℃)
	Working humidity	20%~ 90%(no condensing)
	Installation site	• Indoor places free of corrosive gas or explosive gas • Well-ventilated places with little dust, garbage and humidity • Places for easy inspection and cleaning • Use normally when the altitude is lower than 1000m, above 1000m, while derate when above 1000m. Refer to “3.3 Derating Characteristics” • Places free of intense electric or magnetic fields • Places away from heat sources such as furnaces • Not applicable to vacuum environments • Concentric installation as required
	Storage environment	When storing the motor without electricity, observe the following environmental requirements • Storage temperature -20℃~+60℃(no freezing) • Storage humidity 20%~~80%RH(no condensing)

Motor Parameters





Motor Size

Model	Stator OD	Package OD	Package ID	Stator ID	Overall Height	Stator Stack Height	Package Height (Terminal Side)	Package Height (Non-Terminal Side)
	OD	C	E	ID	LL	L	A	B
FT1-042G16-R0630-□□□	42.5±0.02	40±0.05	30±0.05	21H7	MAX 16.5	9	4.5	3
FT1-058G15-R1030-□□□	58±0.02	56±0.05	40±0.05	28H7	MAX 15	7	4.2	3.8
FT1-058G25-R1830-□□□	58±0.02	56±0.05	40±0.05	28H7	MAX 25	14	7	4
FT1-070G21-R1830-□□□	70±0.02	67±0.05	50.7±0.05	40H7	MAX 21	10	7	4
FT1-070G37-R5030-□□□	70±0.02	67±0.05	50.7±0.05	40H7	MAX 37	26	7	4
FT1-076G27-R3225-□□□-Z44	76±0.02	73.8±0.05	56±0.05	44H7	MAX 27	15	7.5	4.5
FT1-076G30-R4030-□□□	76±0.02	73.8±0.05	56±0.05	42H7	MAX 30	17	8.5	4.5
FT1-076G34-R2815-□□□	76±0.02	73.8±0.05	56±0.05	42H7	MAX 34	22	7.5	4.5
FT1-076G36-R6030-□□□	76±0.02	73.8±0.05	56±0.05	42H7	MAX 36	24	7.5	4.5
FT1-076G42-R7530-□□□	76±0.02	73.8±0.05	56±0.05	42H7	MAX 42	30	7.5	4.5
FT1-076G30-R3524-□□□-Z52	76±0.02	74.8±0.05	62.5±0.05	52H7	MAX 30	17	8.5	4.5
FT1-085G19-R1318-□□□	85±0.02	82.7±0.05	61.6±0.05	50H7	MAX 19	7	7	5
FT1-085G33-R5020-□□□	85±0.02	82.7±0.05	61.6±0.05	50H7	MAX 33	21	7	5
FT1-085G38-R6020-□□□	85±0.02	82.7±0.05	61.6±0.05	50H7	MAX 38	26	7	5
FT1-095G27-R6530-□□□-Z65	95±0.02	93±0.05	79±0.05	65H7	MAX 27	15	7	5
FT1-104G22-R9022-□□□-Z73	104±0.02	102±0.05	84±0.05	73H7	MAX 21.5	13	5.5	3
FT1-115G41-1R220-□□□	115±0.02	110.5±0.05	82±0.05	65H7	MAX 41	29	7	5
FT1-115G47-1R520-□□□	115±0.02	110.5±0.05	82±0.05	65H7	MAX 47	35	7	5

Motor Parameters

Model	Rated power	Voltage Level	Rated speed	Peak Speed	Rated torque	Peak torque	Rated current	Peak Current	Moment of Inertia	Total Mass
	W	V DC	rpm	rpm	N.m	N.m	A	A	kg*cm²	Kg
FT1-042G16-R0630-□□□	63	48	3000	4500	0.2	0.6	3.3	9.9	0.051	0.11
FT1-058G15-R1030-□□□	100	48	3000	3000	0.32	0.96	2.3	8.1	0.1	0.19
FT1-058G25-R1830-□□□	180	48	3000	3000	0.58	1.74	4.2	12.6	0.19	0.25
FT1-070G21-R1830-□□□	180	48	3000	3000	0.58	1.74	3.6	10.8	0.4	0.29
FT1-070G37-R5030-□□□	500	48	3000	4500	1.6	4.8	11.7	35.04	0.66	0.51
FT1-076G27-R3225-□□□-Z44	322	48	2500	2650	1.23	3.69	8.5	25.5	0.69	0.39
FT1-076G30-R4030-□□□	400	48	3000	3000	1.27	3.82	10	30	0.77	0.41
FT1-076G34-R2815-□□□	280	48	1500	2000	1.78	5.34	8.4	25.2	0.9	0.5
FT1-076G36-R6030-□□□	600	48	3000	3000	1.9	5.7	15.4	46.2	1.08	0.61
FT1-076G42-R7530-□□□	750	48	3000	3000	2.4	7.16	19.5	58.5	1.34	0.78
FT1-076G30-R3524-□□□-Z52	350	48	2400	3000	1.4	4.2	11	33	0.77	0.33
FT1-085G19-R1318-□□□	130	48	1800	4500	0.7	3.2	6	35	0.4	0.28
FT1-085G33-R5020-□□□	500	48	2000	3000	2.39	7.16	17.2	51.6	1.18	0.66
FT1-085G38-R6020-□□□	600	48	2000	3000	2.86	8.59	20	60	1.45	0.78
FT1-095G27-R6530-□□□-Z65	648	48	3000	6000	2.05	8.2	21	120	2.317	0.56
FT1-104G22-R9022-□□□-Z73	900	48	2300	2800	3.8	11.4	23	69	1.44	0.46
FT1-115G41-1R220-□□□	1200	48	2000	2000	5.73	17.19	29	87	4.88	1.5
FT1-115G47-1R520-□□□	1500	48	2000	2000	7.16	21.49	36	108	8.86	1.78

Motor User Guide

Installation Guide

Stator & Housing

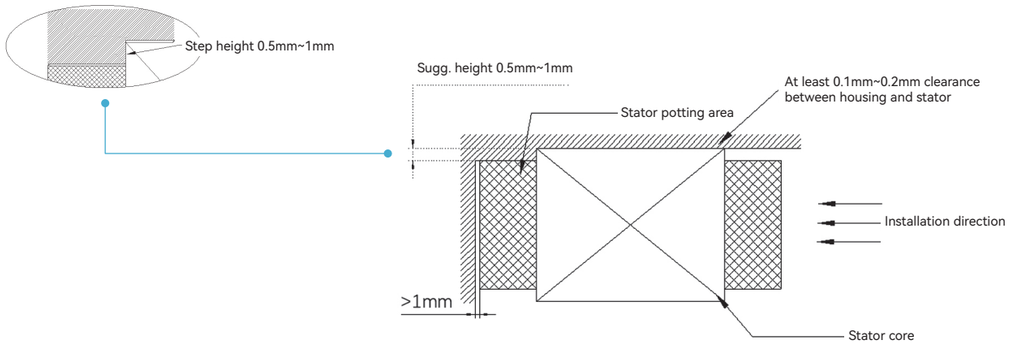
1) Housing material

It is recommended that the stator be assembled in a metal housing by means of bonding, heat sleeve or axial fastening. Installation in the correct structural manner results in optimum thermal conductivity for the entire machine. Aluminum alloy has good thermal conductivity and strength-to-weight ratio, so it is preferred. Carbon steel, cast iron, 400 series stainless steel alloys and other magnetically conductive ferrous metals are not recommended.

2) Stator mounting

1. Adhesive Bonding

For motors with low torque, epoxy adhesives such as Hysol EA934NA, 3M Scotchweld 2214, etc. or anaerobic water such as Loctite638/648 can be used as the bonding agent. In order to ensure the reliability of the bonding, the stator housing should be designed as a cylindrical cavity, and it is recommended that a small step (0.5mm~1mm recommended) be added axially within to position the stator to ensure that the stator is mounted in place. This is shown in the figure below:



When using the adhesive bonding , it is recommended to add some adhesive grooves on the mounting surface inside the housing to improve the bonding; if the epoxy structural adhesive needs to be heated and cured, note that the heating temperature should not exceed 155℃ to avoid damage to the stator core. For different coefficients of expansion [steel laminations vs. aluminum housings], excessive temperatures may cause failures. When used in accordance with the manufacturer's recommendations, these adhesives will provide excellent strength properties over a long period of time. The inside and the outside surfaces of the housing of the stator need to be thoroughly cleaned prior to bonding.

2. Heat Sleeve Assembly

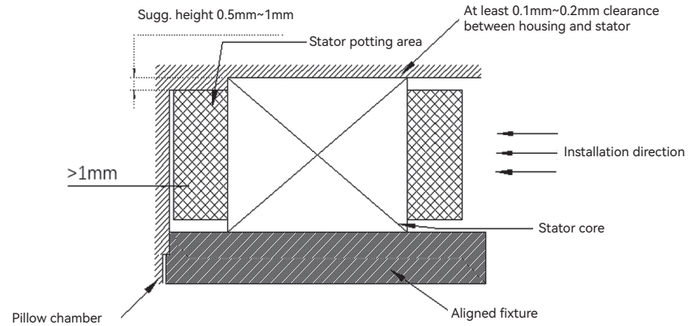
It is recommended that the stator be mounted with the heat sleeve process if without the use of an auxiliary adhesive, since the stator core is a laminated construction and is not suitable for cold pressing. When selecting a heat sleeve, there is an interference fit between the housing and the stator. Specific tolerances should be designed with reference to the coefficients of thermal expansion of the different materials. Please check the required pull-off force for the actual working conditions, and thus to decide whether the assembly of the heat sleeve can be completed at different temperatures.

3. Axial Fastening Assembly

When there is a need to disassemble the motor, or when the output torque is small, the stator can be assembled by axial fastening, but this method is not recommended. When this method is selected, adopt a clearance fit between the stator and the housing, i.e., a sliding assembly, and the stator can be fixed by axial fastening, i.e., by adding new plates. The motor is a moving part that vibrates during operation, which amplifies the risk of loosening of the fasteners, so this method should not be used for mass-produced products.

Note:

Whether it is bonding, hot-setting or axial fastening, it is a type of clearance fit in actual working conditions. A clear coaxial datum should be assigned during the assembly to ensure the coaxiality of the stator and the housing, and positioning fixtures should be prepared to improve the coaxiality.



Rotor & Axis

Frameless motors stand out for their rotor assembly, which includes high-performance rare-earth magnets neatly fixed to a metal rotor ring. Common in industrial settings, this rotor ring is usually made from metal and is assembled using one of two methods: cold pressing or adhesive bonding. The exact shaft tolerances are determined by the assembly method used.

To guarantee superior motor performance, adhere to these key assembly principles when constructing the rotor and stator:

1. Align the rotor magnets with the stator core's center to ensure optimal magnetic interaction.
2. If absolute alignment cannot be confirmed, ensure that the magnetic portion fully encompasses the stator core within the maximum size limits.

Installation Precautions

Precautions

1) The uninstalled magnetic rotor emits a potent magnetic field. Be mindful of its influence on nearby electronic devices due to strong magnetism.
2) Due to the strong magnetic fields that can draw in metallic objects, it is crucial to wear gloves during installation to protect your fingers and palms from potential injuries. Additionally, to prevent damage, keep cell phones, watches, and magnetic data media at a safe distance from the magnetic field.
3) The motor stator's metal parts must be properly grounded within the housing for operator safety. Failure to do so may compro mise safety.
4) When not in use, store the rotor and stator in a dry area to prevent rapid rusting caused by excessive moisture.

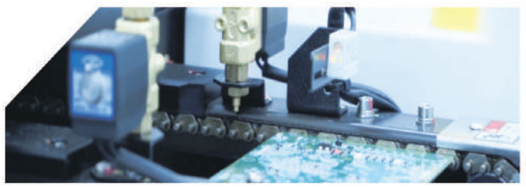
Research and Production

R&D and Technology Platform

- Consolidating a dynamic force of top-tier professionals and technical experts in domestic industrial control, our R&D team represents 34.29% of our workforce, with 76.42% of our technical staff boasting bachelor's degrees or higher.
- Guided by philosophy of "Innovate with technology and strive for excellence," VEICHI is deeply customer-centric by providing stable and reliable products and technologies designed to the evolving needs of our clients.
- Investing 10% of our revenue into R&D, VEICHI has crafted advanced labs for EMC, safety, reliability, and performance testing to ensure product quality.
- In-depth cooperation with many famous universities and research institutions in China has been established and "Jiangsu Postdoctoral Innovation Practice Base" and "Jiangsu Postgraduate Workstation" are set up successively.

Intelligent Automation

- Digitally driven from inception to production, VEICHI boasts an annual capacity of 914,600 units with streamlined efficiency.
- 5 imported SMT placement lines, 5 automated coating lines, 4 DIP test lines, a robotic arm-equipped automated line, and 12 production lines are equipped with the latest intelligent manufacturing tools.
- All of the product checks are carried out automatically by the management mode of 3 (tri-inspection system)+ 1(proportional inspection) during the whole process for standard performance.
- Three major production management system WMS, MES and ERP together ensure that the unique code of each product is traceable in the system to manage product quality.

Service and Support

VEICHI Electric has established an integrated global service network through its innovative "Region + Industry" marketing strategy, which synergizes cross-sector resources and distribution channels to deliver comprehensive solutions. With permanent business and technical support teams strategically located across 23 major Chinese cities and overseas operations including Indian subsidiaries, the company is supported by an extensive network of 364 domestic and international distributors that ensure seamless market coverage. By consistently delivering superior product quality backed by professional technical support and service excellence, VEICHI Electric continues to enhance its global brand reputation while driving sustainable international growth through reliable, customer-centric solutions.