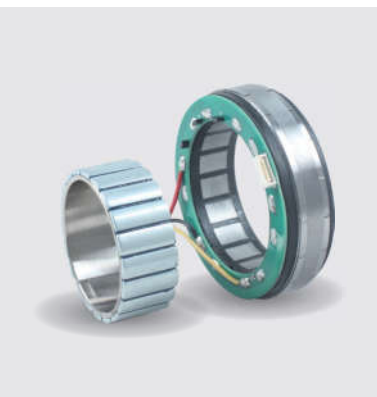




富兴机电

# BLDC MOTOR SERVO MOTOR

## 无刷电机 伺服电机



常州富兴机电有限公司  
Changzhou Fulling Motor Co.,Ltd

2024版

 **愿景 Vision**

成为世界级的控制电机制造商及系统集成方案提供者

Become a world-class manufacturer of control motors and a provider of system integration solutions.

 **使命 Mission**

为客户创造价值, 提供最优的行业解决方案

Create value for customers and provide the best industry solution.

 **价值观 Values**

责任, 诚信, 共赢

Responsibility, Integrity and Win-win.



# Company Profile - 公司简介

常州富兴机电有限公司是一家中、德、瑞合资企业，成立于2001年，位于中国常州。我们专业生产各类混合式步进电机，直流无刷电机，伺服电机及相关的驱动器，年生产各类电机550万台以上，另外我司有数家合资工厂，专业生产各类永磁步进电机，有刷直流电机，二相、三相交流电机，减速电机，年销售各类电机总量超650万台。产品广泛应用于自动化，AGV，机器人，纺织，印刷，包装，医疗器械，物流，通信，家电，汽车等行业，远销美国，德国，瑞士，意大利，法国等30多个国家和地区。

公司技术力量雄厚，生产工艺成熟，检验设备齐全。拥有优良的品质保证体系及服务体系，我们已获得德国TUV认证的ISO9001质量管理体系证书、IATF16949质量管理体系证书以及ISO14001环境管理体系证书，所有产品获得CE认证，并符合欧盟RoHS要求，部分获得UL认证。

公司秉承以质量至上，创新和社会责任为公司发展理念，持续为全球客户提供专业化的控制电机制造和研发服务。



Changzhou Fulling Motor Co., Ltd was established in year 2001 as a joint venture of Germany - Swiss - China. We are a professional motor manufacturer in Changzhou city, China. Our Company offers four major series of products: Hybrid stepper motors, DC brushless motors, Servo motors and the motor drivers. Production capacity exceeds more than 5.5 million motors per year. Changzhou Fulling Motor Co., Ltd also has several joint venture companies who specialized in the production of PM stepper motors, and DC gear motors.

We sell nearly 6.5 million different motors to customers worldwide every year. Our products are widely used on industrial automation, AGV, robots, textile, printing, medical equipments, logistics, communication, household appliances and automobile etc. We export our motors to more than 30 countries such as Italy, Germany and United States.

At the core of our development is a professional engineering team that comprises industry experts in the fields of design and application engineering. We provide these talented individuals with access to advanced technology and cutting-edge equipment, ensuring the yield of high-quality products. Our company has successfully passed the quality management system certification for the ISO9001, IATF16949 and ISO14001, which were authorized by the German TUV group. All products are RoHS compliant and CE certified; some are UL approved. Fulling declares no 3TG remain in our products. No 3TG intentionally added or used in the products or in the production process.

Fulling insists the quality first, innovation and social responsibility as company's concept of development and continues to provide global customers with specialized control motor manufacturing and R&D services.



# APPLICATIONS - 产品应用



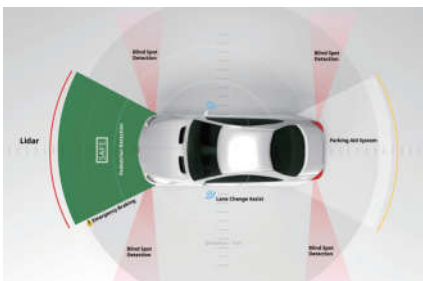
AGV



家电  
Home Appliance



闸机、自动门  
Barrier / Auto Door



激光雷达  
LIDAR



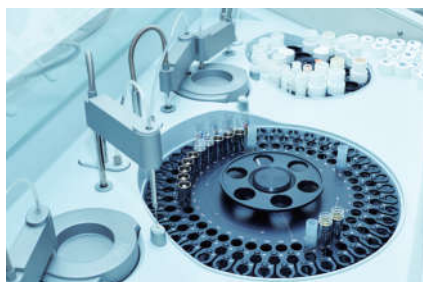
机器人  
Robotics



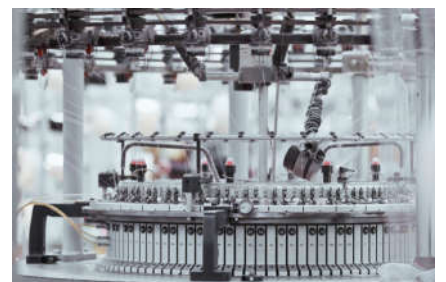
物流  
Logistics



新能源  
Green Energy



医疗行业  
Medical



纺织  
Textile



办公自动化  
Office Automation



金融设备  
Financial Equipment

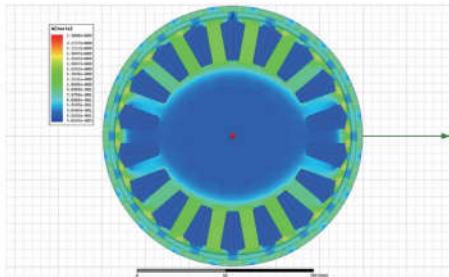


农业  
Agriculture


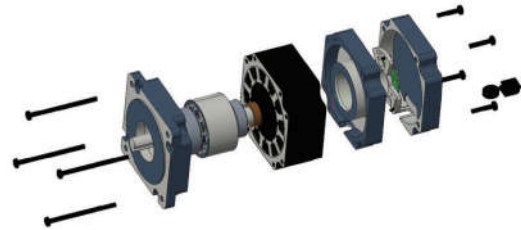


# Software system and Management system

## 电机研发及设计软件 Research and Development Software for motor



ANSYS 电机性能模拟设计软件  
ANSYS Simulation software

Creo 仿真机械设计软件  
3D drawing designed by Creo

## 管理体系证书 Certificates of Management



★ ISO 9001 ★



★ ISO 14001 ★



★ IATF 16949 ★

## 产品认证以及管理系统 Motor certification & Management System



\* 注:部分产品符合UL认证

Note: Part of products are UL certified

## A 标准直流无刷电机 Standard BLDC Motor

### A-1 常规无刷电机

Regular BLDC Motor

|               |     |
|---------------|-----|
| 22RBL         | 001 |
| 28BL          | 002 |
| 33BL          | 003 |
| 36RBL         | 004 |
| 40BL          | 005 |
| 40BL-Enhanced | 006 |
| 42BLA         | 007 |
| 42BLB         | 008 |
| 42BLS         | 009 |
| 42RBL         | 010 |
| 57BL(S)       | 011 |
| 57BLA         | 012 |
| 57BLB         | 013 |
| 70BLS         | 014 |
| 80BLS         | 015 |
| 86BLC         | 016 |
| 86BLS         | 017 |
| 125BL         | 018 |

### A-2 高性能防水无刷电机

High Performance and Water Proof

|        |     |
|--------|-----|
| 38BLG  | 019 |
| 60BLG  | 020 |
| 80BLG  | 021 |
| 100BLG | 022 |
| 110BLG | 023 |
| 130BLG | 024 |

### A-3 外转子无刷电机

Outer Rotor BLDC Motor

|            |     |
|------------|-----|
| 20BLW      | 025 |
| 32BLW      | 026 |
| 32BLWA     | 027 |
| 45BLW      | 028 |
| 45BLWH     | 029 |
| 60BLW      | 030 |
| 90BLW      | 031 |
| 60BLW42-EN | 032 |
| 90BLW42-EN | 033 |

### A-4 无齿无槽电机

Slotless BLDC Motor

|       |     |
|-------|-----|
| 14SBL | 034 |
| 16SBL | 035 |
| 19SBL | 036 |
| 22SBL | 037 |
| 24SBL | 038 |
| 28SBL | 039 |
| 32SBL | 040 |
| 40SBL | 041 |

### A-5 经济型无刷电机

Economical BLDC Motor

|        |     |
|--------|-----|
| 24CBL  | 042 |
| 28CBLA | 043 |
| 36CBL  | 044 |
| 38CBL  | 045 |
| 42CBL  | 046 |
| 48CBL  | 047 |
| 80BLE  | 048 |

## B 一体化无刷电机 BLDC Motor with Integrated Driver

|            |     |
|------------|-----|
| 24BLW25-IE | 049 |
| 24CBL-IE   | 050 |
| 28CBLA-IE  | 051 |
| 36CBL-IE   | 052 |
| 38CBL-IE   | 053 |
| 42BLS-IE   | 054 |
| 42CBL-IE   | 055 |
| 42RBL-IE   | 056 |
| 48CBL-IE   | 057 |
| 57BL(S)-IE | 058 |
| 57BL-IE    | 059 |

## C 无刷减速电机 BLDC Motor with Gearbox

### C-1 正齿轮箱

Spur Gearbox

|              |     |
|--------------|-----|
| 32BLW25-G-IE | 060 |
| 57BLS-60JB   | 061 |
| 86BLS-90JB   | 062 |

### C-2 行星减速箱

Planetary Gearbox

|                  |     |
|------------------|-----|
| 22RBL-22JN10K    | 063 |
| 28BL-28JN30K     | 064 |
| 33BL-32JXE30K    | 065 |
| 36RBL-36JXE30K   | 066 |
| 42RBL-42JMG50K   | 067 |
| 42BLS60-42JM100K | 068 |
| 57BL-56JM300K    | 069 |
| 20BLW14-22JM15K  | 070 |
| 32BLW18-32JM30K  | 071 |
| 45BLW-42JM150K   | 072 |
| 60BLW42-56JM300K | 073 |
| 90BLW-56JM450K   | 074 |
| 24CBL30-24JN10K  | 075 |
| 28CBLA-28JN30K   | 076 |
| 36CBL-36JXF50K   | 077 |
| 38CBL-36JXF50K   | 079 |
| 42CBL-42JXF100K  | 080 |

## D 伺服电机 Servo Motor

|       |     |
|-------|-----|
| 38SV  | 081 |
| 60SV  | 083 |
| 80SV  | 085 |
| 100SV | 087 |
| 110SV | 089 |
| 130SV | 091 |

## E 闭环步进电机 Closed-Loop Stepper Motor

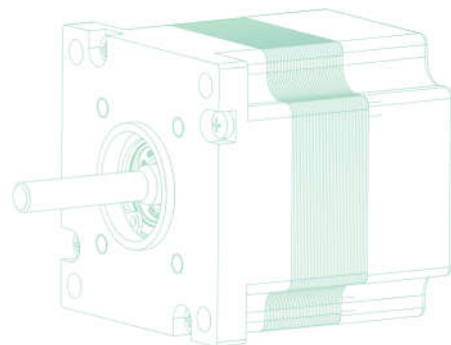
|      |     |
|------|-----|
| 42SC | 093 |
| 57SC | 095 |
| 60SC | 097 |
| 86SC | 099 |

## F 闭环无刷电机 Closed-Loop BLDC Motor

|       |     |
|-------|-----|
| 42SVA | 101 |
| 57SVA | 103 |
| 80SVA | 105 |
| 86SVA | 107 |

## G 无框电机 Frameless Motor

|       |     |
|-------|-----|
| 50BL  | 109 |
| 70BL  | 110 |
| 85BL  | 111 |
| 115BL | 112 |





## ★直流无刷电机简介

(Brief Introduction of DC Brushless Motor)

无刷电机使用电子换向,其特点是具有良好的转矩特性、高功率、极宽的调速范围,以及其无与伦比的使用寿命。

The electronically commutated motor are the characterized especially by their favorable torque characteristics、high power、extremely broad speed range and of cause by their unsurpassed service life.

## ★无刷电机原理 (Principles of operation)

直流无刷电机与直流有刷电机的机械换向的区别在于

The differences between a DC motor having a mechanical commutation system and a BLDC motor are mainly found in:

- 产品概念 The product concept
- 相电流换向 The commutation of phase currents.

从使用者角度来看,直流无刷电机与直流有刷电机机械特性基本相同:转矩与电流成正比,转速取决于电压和负载转矩。

From the user's point of view, DC brushless motors follow the same equations as those with brushes: torque is proportional to current, speed depends on the voltage and the load torque.

## ★无刷电机的换向 (The commutation of brushless motors)

传统直流有刷电机都是通过换向器与电刷之间进行机械换向。在无刷电机中是通过电子手段实现换向。在电子换向过程中必须知道瞬时转子的位置,以确定要通电的相位。

In the conventional DC motor commutation takes place mechanically through the commutator-and-brush system. In a BLDC motor, commutation is done by electronic means. In that case the instantaneous rotor position must be known in order to determine the phases to be energized.

转子的角度位置可以通过如下方式获得:

The angular rotor position can be known by:

- 使用位置传感器(霍尔元件、光学编码器、旋转变压器) Using a position sensor (Hall sensor, optical encoder, resolver)
- 无位置传感换向,使用电子分析计算绕组反电势过0点位置。 Electronically analyzing the back-EMF of a non-energized winding. This is called sensorless commutation.

## ★霍尔元件的使用 (Use of Hall sensors)

一般无刷电机有三相绕组,一次通电两相绕组,最简单常用的方式就是使用霍尔元件确定转子的位置。与有刷电机中的碳刷和换向器一样,无刷电机是通过简单的逻辑计算知道转子的位置并通知相绕组换向。

In general, BLDC motor have three phase windings. The easiest way is to power two of them at a time, using Hall sensors to know the rotor position. A simple logic allows for optimal energizing of the phases as a function of rotor position, just like the commutator and brushes are doing in the conventional DC motor.

## ★编码器或旋转变压器的使用

(Use of an encoder or resolver)

转子位置也可以通过编码器或旋转变压器来知道。换相可以非常简单地完成,类似于霍尔传感器的程序,或者通过在三相中调节正弦电流来完成更复杂的程序。这被称为矢量控制,其优点是提供理论零转矩脉动,以及精确定位的高分辨率。

The rotor position may also be known by use of an encoder or resolver. Commutation may be done very simply, similar to the procedure with Hall sensors, or it may be more complex by

modulating sinusoidal currents in the three phases. This is called vector control, and its advantage is to provide a torque ripple of theoretically zero, as well as a high resolution for precise positioning.

## ★反电势分析使用 (Use of Back-EMF analysis)

第三种方式不需要位置传感器,但是需要特殊电子电路设计支持。电机仅仅只有三根相线引出线,三相可以是三角形或星形连接方式。这种情况下,必须参考电压过0点来确认换向时刻。这类解决方案因为不需要传感器或电子元件,因此可以使用在极其恶劣的环境,对于手持式电动工具类应用,因为电缆需要不断移动,仅仅只有三根线也是很有优势的。

A third option requiring no position sensor is the use of a particular electronic circuit. The motor has only three hook-up wires, the three phase windings are connected in either triangle or star. In the latter case, resistors must be used to generate a zero reference voltage. With this solution the motor includes no sensors or electronic components and it is therefore highly insensitive to hostile environments. For applications such as hand-held tools, where the cable is constantly moved, the fact of just three wires is another advantage.

## ★直流无刷电机的损耗计算

(Loss calculation of BLDC motors)

无刷电机与一般直流电机一样使用相同的计算公式,但是在效率至关重要的场合,必须充分考虑到铁损和驱动电路损耗等参数。

It follows the same equations as the DC motor using mechanical commutation except that parameters like iron losses and losses in the drive circuit are no longer negligible in applications where efficiency is of prime importance.

## ★铁损耗 (Iron losses)

铁损耗与转速和转子的极数有关,转矩公式中可以作为粘性摩擦引入。电机有效转矩计算公式如下:

They depend on speed and motor poles, in the torque formula, may be introduced as viscous friction. The equation for useful motor torque becomes:

$$M_m = k \cdot I_m - k_v \cdot \omega - M_f$$

$M_m$  = 电机有效转矩 Motor useful torque

$k$  = 转矩常数 Torque constant

$I_m$  = 电机电流 Motor current

$k_v$  = 铁损粘性系数 Viscous coefficient for iron losses

$\omega$  = 角速度 Angular velocity

$M_f$  = 轴承摩擦 Bearing friction

$$P_{tr} = P_h + P_{ec} + P_e$$

$P_{tr}$ : 铁损 (Iron losses)

$P_h$ : 磁滞损耗 (Hysteresis losses)

$P_{ec}$ : 涡流损耗 (Eddy current losses)

$P_e$ : 附加损耗 (Additional losses)

铁损跟磁场强度的平方成正比,跟频率的1.3—1.5次方成正比,频率=转速\*极对数/60

The iron loss is proportional to the square of the magnetic field intensity, and the iron loss is proportional to the 1.3-1.5 power of the frequency. Frequency = Speed \* Poles' pair/60

## ★电子损耗 (Losses in the electronics)

电机所需的电流、电压以及驱动电路所需要的在既定的转速和扭矩下运行都取决于驱动电路。例如,双极技术中的驱动桥将使电机终端的可用电压降低约1.7V,总电流必须包括电路的消耗。



The current and voltage required by the motor and the drive circuit to be operated at the desired speed and torque depend also on the drive circuit. As an example, a driver bridge in bipolar technique will reduce the voltage available at the motor terminals by about 1.7V, and the total current must include the consumption of the circuitry.

#### ★建议 (Remember)

-带载启动运行场合,必须使用位置传感器换向。For commutation, position sensors are necessary when operating in incremental mode

-无位置传感建议在连续稳速或恒定负载的场合,譬如风扇类应用。Sensorless commutation is recommended only for applications running at constant speed and load such as fan applications.

#### ★电机参数说明 (Indications Of Motor Data)

1: 额定电压 (Nominal Voltage) 单位 (Unit): 伏 (V)

额定电压是在电机绕组上电过程中,施加在各相之间的电压值。所有的额定参数均参考电压值。在一定限值之内,低一点、高一点电压都是可以工作的。

Nominal voltage is the applied voltage between powered phases in block commutation. All nominal data refer to this voltage. Lower and higher voltage are permissible, provided that limits are not exceeded.

2: 额定转矩 (Nominal Torque) 单位 (Unit): 牛·米 (N.m)

额定转矩是在电机25度条件下,在额定电压和额定电流情况下输出的扭矩,它受连续运行范围限制,超出额定转矩越大,电机发热越厉害。

Nominal Torque is the torque generated for operation at nominal voltage and nominal current at a motor temperature of 25°C. It is at the limit of the motor's continue operation range. Higher torques heat up the winding too much.

3: 额定转速 (Nominal Speed) 单位 (Unit): 转/分 (rpm)

额定转速是在电机25度条件下,在额定电压和额定转矩情况下运行设定的转速。

Nominal speed is the speed set for operation at nominal voltage and nominal torque at a motor temperature of 25°C.

4: 转矩常数 (Torque constant) 单位 (Unit): 牛·米/安培 (N.m/A)

转矩常数是单位电流产生的单位力矩,可以理解为转矩值与电流的比值。

This may also be referred to as specific torque and represents the quotient from generated torque and applicable current.

#### ★命名规则 (Motor Numbering Information)

FL 28 CBL A 38 -24V- 50 10 A - IE

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①: 外型尺寸(Frame Size): 28mm

②: CBL: 经济型无刷电机(Economical BLDC Motor)

RBL/BL: 圆形无刷电机(Round BLDC Motor)

BLS: 方形无刷电机(BLS: Square BLDC Motor)

BLW: 外转子无刷电机(Outer Rotor BLDC Motor)

SBL: 无齿无槽无刷电机(Slotless BLDC Motor)

BLA/BLB/BLC/BLD: 派生电机(Derivative Version)

③: 系列号 Series

④: 整机长度(Motor Length): 38mm

⑤: 额定电压(Rated Voltage): 24V

⑥: 额定转速(Rated Speed): 5000rpm

⑦: 额定功率(Rated Power): 10W

⑧: 单端出轴Single Shaft(A)、双端出轴Double Shaft (B)

⑨: 带一体化控制器 (Integrated driver)

#### ★直流无刷电机 (DC Brushless motors)

尺寸系列齐全,尺寸范围: 22mm – 125mm;功率范围: 1W – 1500W。

We have complete size series from 22mm to 125mm and power range of 1W to 1500W

#### ★外转子无刷电机系列

(Out-rotor DC Brushless motors)

由于转子在外侧,同体积下,外转子电机的输出转矩将比内转子大。该类电机体积小,重量轻,但是输出转矩大。尺寸范围: 20mm – 90mm,功率范围: 1W – 190W。

Because the rotor is on the outside, the output torque of the motor will be larger than the inner rotor in the same volume. This kind of motor is small in size and light in weight, but its output torque is large. Size range : 20mm – 90mm Power range : 1W – 190W.

#### ★无齿无槽无刷电机系列

(Slotless DC Brushless motors)

铁芯无齿槽,转矩波动小,运行平稳,同时铁损小,运行效率高,发热低,适合高速运行场合。尺寸范围: 16mm – 49mm,功率范围: 1W – 500W。

Iron core without slot, small torque fluctuation, smooth operation, low iron loss, high operation efficiency, low heating, suitable for high-speed operation applications.

Size range : 16mm – 49mm Power range : 1W – 500W.

#### ★经济型无刷电机系列

(Economical BLDC motor)

参考有刷电机结构件设计,采用无刷电机电磁设计,制造出低成本无刷电机,在具有无刷电机优良特性的基础上,有效优化电机成本。尺寸范围: 24mm – 48mm,功率范围: 1W – 60W。

Referring to the structure design of brushless motor, brushless motor electromagnetic design is adopted to produce low cost brushless motor. Based on the excellent characteristics of brushless motor, the cost of motor is effectively optimized. Size range : 24mm – 48mm Power range : 1W – 60W.

#### ★一体化无刷电机系列

(BLDC motor with integrated driver)

集成驱动器,体积小,重量轻,驱动端口输出,易于控制。

The motor can be easily controlled with integrated driver but small volume、light weight and driver port output.

#### ★齿轮箱无刷电机系列

(BLDC motor with gearbox)

精密型、传动型齿轮箱可选;行星齿轮箱、正齿轮箱可选;不同承载能力、不同减速比可选;直齿、斜齿可选;可按照客户要求优化定制。

Precision and transmission gearboxes are optional; planetary gearboxes and spur gearboxes are optional; different carrying capacity and deceleration ratio are optional; straight and helical teeth are optional. Also can be designed and manufactured with customized request





## 标准伺服电机

### Servo Motor

特性:

◆功率范围:50W~1500W;

Power range:30W~1500W

◆绕组可支持电压:24VDC 到 240VAC;

The winding supports the voltage:24VDC to 240VAC;

◆功率密度高,体积小;

High power density, small volume

◆低齿槽效应,低噪音和振动;

Low cogging torque, low noise and vibration

◆效率高,温升小;

High efficiency, low temperature rise

◆高精度控制;

High precision control

◆可配置多种类型编码器;

Multiple types of encoders can be configured

◆高防护等级,可达IP65;

High protection grade, up to IP65;

◆可定制/选配。

出轴、绕组、连接至、制动器、编码器、轴端密封、温度传感器。

Customizable/optional

Shaft, winding, connection to, brake, encoder, shaft end

seal, temperature sensor.

### 命名规则Numbering Information

FL 60 SV 40—48V—30 A E B—JX 20—01

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①外型尺寸Frame Size:60mm

②系列号Series:SV为标准伺服电机,SV: Servo motor

③电机功率系列 Motor power series

④工作电压Operating voltage:48V

⑤电机额定转速Nominal Speed:30×100=3000rpm

⑥编码器类型:E为Encoder,R为Resolver

Encoder type: E: optical encode, R: Resolver

⑦制动器:B为带制动器,空白为不带制动器

Brake: B: with brake, blank: without brake

⑧减速器厂家产品简称Reducer manufacturers products

⑨减速比ratio:20:1

⑩派生型号derived type

## 闭环步进电机

### Closed-Loop Stepper Motor

特性 Feature:

◆闭环步进,精度高,响应快;

Closed-loop stepper motor, high precision, fast response

◆大扭矩,高效率,低发热;

High torque, high efficiency, low heating

◆低振动和噪音,平稳性高;

Low vibration and noise, high stability

◆长寿命,高可靠。

Long life, high reliability

### 命名规则Numbering Information

FL 42 SC 03—01

① ② ③ ④

①外型尺寸Frame Size:28mm

②系列号Series: SC为闭环步进电机, SC: Closed-loop Stepper Motor.

③电机保持转矩motor holding torque:除以10即为电机保持转矩,03表示转矩为0.3N.m.Divided by 10, 03 means the holding torque is 0.3 N.m

④派生型号derived type

### 一体化步进伺服电机Integrated stepper motor

一体化伺服电机是将电机、伺服驱动器集成为一体,减少了驱动器所占空间,免除了电机与驱动器之间的连接电缆,降低了电线之间的电磁干扰,增加了系统的易用性和可靠性。

The integrated servo motor integrates the motor and servo driver, reduces the space occupied by the driver, eliminates the connection cable between the motor and the driver, reduces the electromagnetic interference between the wires, and increases the ease of use and reliability of the system.



## 闭环无刷电机

### Closed-Loop BLDC Motor

特性Feature:

◆功率范围:30W~750W;

Power range:30W~750W

◆绕组可支持电压:24VDC 到 240VAC;

The winding supports the voltage:24VDC to 240VAC;

◆速度控制范围广, 转矩波动小, 可满足低速大扭矩需求;

Wide speed control range, small torque fluctuation, it can

meet the requirements of low speed and high torque.

◆过载能力强;

Strong overload capacity;

◆低噪音和振动;

Low noise and vibration

◆效率高, 温升小;

High efficiency, low temperature rise;

◆可配置多种类型编码器;

Multiple types of encoders can be configured

◆高防护等级, 可达IP65;

High protection grade, up to IP65;

◆可定制/选配。

出轴、绕组、连接至、制动器、编码器、轴端密封、温度传感器。

Customizable/optional

Shaft, winding, connection to, brake, encoder, shaft end seal, temperature sensor.

命名规则Numbering Information:

FL 42 SVA 01—48V—30 A E B—JX 20—01

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①外型尺寸Frame Size:28mm

②系列号Series:SVA为分体闭环无刷电机, SVA:

Closed-loop brushless DC motor

③电机功率系列Motor power series

④工作电压Operating voltage:48V

⑤电机额定转速Nominal Speed:30×100=3000rpm

⑥编码器类型:E为光编, M为磁编, R为旋转变压器

Encoder type: E: optical encoder, M: Magnetic encoder, R:

Resolver

⑦制动器:B为带制动器, 空白为不带制动器

Brake: B: with brake, blank: without brake

⑧减速器厂家产品简称Reducer manufacturers products

⑨减速比Ratio:20:1

⑩派生型号Derived type

一体化无刷伺服电机Integrated brushless DC motor

一体化伺服电机是将电机、伺服驱动器集成为一体, 减少了

驱动器所占空间, 免除了电机与驱动器之间的连接电缆, 降低了电线之间的电磁干扰, 增加了系统的易用性和可靠性。

The integrated servo motor integrates the motor and servo driver, reduces the space occupied by the driver, eliminates the connection cable between the motor and the driver, reduces the electromagnetic interference between the wires, and increases the ease of use and reliability of the system.

## 无框电机

### Frameless Motor

我司无框电机具有高效、运行平稳、寿命长和安装简单方便的特点。如需定制化服务请与我们联系, 以便准确了解您的需求, 设计新式定制电机以满足您应用系统的独特需求。

Our frameless motor has the characteristics of high efficiency, stable operation, long life and simple and convenient installation. If you need customized services, please contact us to accurately understand your needs and design a new customized motor to meet the unique needs of your application system.

无框电机一般由定子总成和转子总成两部分组成。

定子总成包含定子铁芯、嵌入定子铁芯的铜绕组和 PCB 电路板, PCB 电路板作为绕组过线和 hall 传感器固定使用。hall 传感器可以感应转子位置, 为控制系统提供位置信号。hall 传感器信号端口可由接插端子引出。为提高定子总成的可靠性和使用寿命, 定子总成采用灌封胶进行了真空灌封。

转子总成通常由导磁环和永磁体组成。永磁体由根据具体工况采用对应的方

式固定在导磁环上。永磁体材料的选择将取决于应用要求, 可包括钕铁硼或钕铁硼。

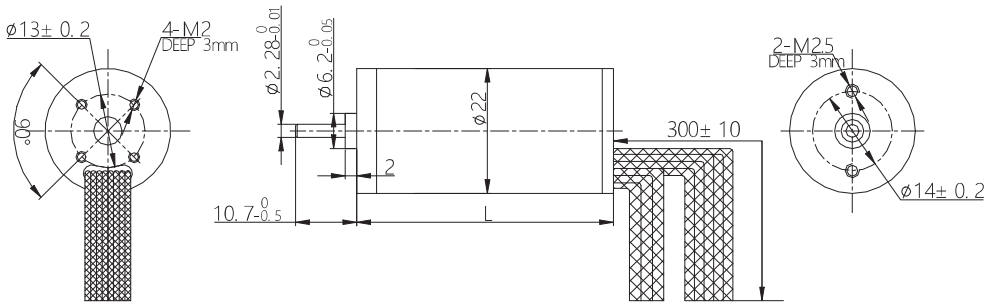
Frameless motors generally consist of two parts: a stator assembly and a rotor assembly.

The stator assembly includes a stator core, a copper winding embedded in the stator core, and a PCB circuit board. The PCB circuit board is used as a winding wire and a hall sensor. The hall sensor can sense the rotor position and provide position signals for the control system. The hall sensor signal port can be led out by plug-in terminals. In order to improve the reliability and service life of the stator assembly, the stator assembly is vacuum potted with potting glue.

The rotor assembly is usually composed of a magnetic ring and permanent magnets. The permanent magnet is fixed on the permeable ring in a corresponding manner according to specific working conditions. The choice of permanent magnet material will depend on the application requirements and can include samarium cobalt or neodymium iron boron.

### 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 5N 距法兰10mm (10mm From the flange)        |
| 最大轴向负载 (Max axial force)     | 2N                                       |
| 介电强度 (Dielectric Strength)   | 360VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1007 AWG28  | 蓝色 (Blue)      | 霍尔电源正 (Vcc)     |
|               | 黄色 (Yellow)    | 霍尔 U (Hu)       |
|               | 棕色 (Brown)     | 霍尔 V (Hv)       |
|               | 红色 (Red)       | 霍尔 W (Hw)       |
|               | 绿色 (Green)     | 霍尔电源负 (GND)     |
| UL1007 AWG26  | 红色 (Red)       | U相 (Phase U)    |
|               | 棕色 (Brown)     | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

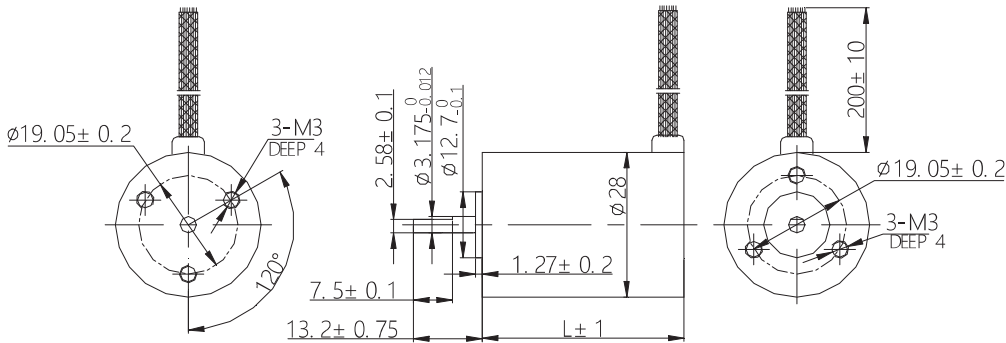
### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL22RBL45-24V-4604A | FL22RBL70-24V-3515A |
|----------------------------------|-------------------|---------------------|---------------------|
| 极数 (Number of poles)             |                   |                     | 8                   |
| 相数 (Number of phases)            |                   |                     | 3                   |
| 额定电压 (Rated voltage)             | VDC               |                     | 24                  |
| 额定转矩 (Rated torque)              | mN.m              | 8                   | 20                  |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 9.6                 | 24                  |
| 额定速度 (Rated speed)               | RPM               | 4600                | 3800                |
| 额定功率 (Rated power)               | W                 | 3.8                 | 8                   |
| 峰值扭矩 (Peak torque)               | mN.m              | 24                  | 60                  |
| 峰值电流 (Peak current)              | A                 | 1.1                 | 2.0                 |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 23                  | 11.6                |
| 线电感 (Line to line inductance)    | mH                | 6.2                 | 4.3                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 29.7                | 35.8                |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 2.2                 | 2.65                |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 0.66                | 1.32                |
| 机身长度 (Motor length) L            | mm                | 45                  | 68                  |
| 重量 (Weight)                      | Kg                | 0.07                | 0.12                |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件



齿轮箱



编码器

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 10N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 2N                                       |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1007 AWG26  | 黄色 (Yellow)    | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 橙色 (Orange)    | 霍尔 V (Hv)       |
|               | 棕色 (Brown)     | 霍尔 W (Hw)       |
| UL1007 AWG26  | 白色 (White)     | 霍尔电源负 (GND)     |
|               | 绿色 (Green)     | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

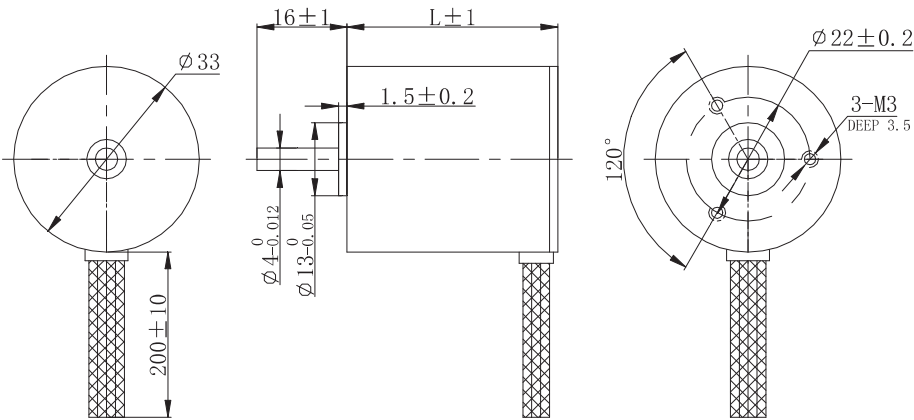
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL28BL28-15V-8006AF | FL28BL38 | FL28BL77-24V-3116AF |
|----------------------------------|-------------------|---------------------|----------|---------------------|
| 极数 (Number of poles)             |                   |                     | 4        |                     |
| 相数 (Number of phases)            |                   |                     | 3        |                     |
| 额定电压 (Rated voltage)             | VDC               | 15                  | 24       |                     |
| 额定转矩 (Rated torque)              | mN.m              | 5                   | 14       | 50                  |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 6                   | 17       | 60                  |
| 额定速度 (Rated speed)               | RPM               | 8000                | 10000    | 4000                |
| 额定功率 (Rated power)               | W                 | 4                   | 15       | 21                  |
| 峰值转矩 (Peak torque)               | mN.m              | 15                  | 42       | 150                 |
| 峰值电流 (Peak current)              | A                 | 1.1                 | 2.5      | 4.1                 |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 8.2                 | 4.2      | 4.2                 |
| 线电感 (Line to line inductance)    | mH                | 2.3                 | 1.69     | 2.3                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 14.3                | 16.9     | 37.4                |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 1.06                | 1.25     | 2.77                |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 2.35                | 3.69     | 10.98               |
| 机身长度 (Motor length) L            | mm                | 28                  | 38       | 77                  |
| 重量 (Weight)                      | Kg                | 0.06                | 0.082    | 0.28                |

### 机械尺寸

(Dimensions)



选件 Options



接插件



齿轮箱



编码器

### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 10N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 2N                                       |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100M $\Omega$ , 500VDC                   |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1007 AWG26  | 黄色 (Yellow)    | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 橙色 (Orange)    | 霍尔 V (Hv)       |
|               | 棕色 (Brown)     | 霍尔 W (Hw)       |
|               | 白色 (White)     | 霍尔电源负 (GND)     |
| UL1007 AWG26  | 绿色 (Green)     | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

### 电性能

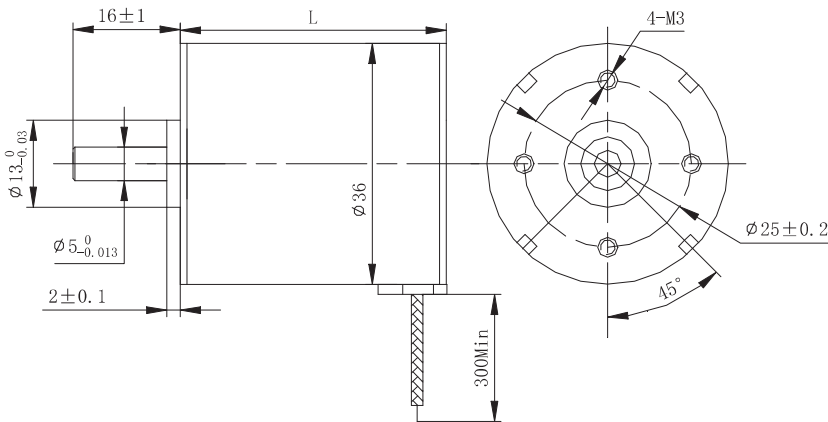
(Electrical Specifications)

|                                  | 单位 (Unit)         | FL33BL38-24V-3007A | FL33BL80-24V-7840A-S | FL33BL80-48V-10040AS |
|----------------------------------|-------------------|--------------------|----------------------|----------------------|
| 极数 (Number of poles)             |                   |                    | 4                    |                      |
| 相数 (Number of phases)            |                   |                    | 3                    |                      |
| 额定电压 (Rated voltage)             | VDC               | 24                 | 24                   | 48                   |
| 额定转矩 (Rated torque)              | mN.m              | 22                 | 50                   | 40                   |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 26                 | 60                   | 48                   |
| 额定速度 (Rated speed)               | RPM               | 3000               | 7800                 | 10000                |
| 额定功率 (Rated power)               | W                 | 7                  | 40                   | 40                   |
| 峰值扭矩 (Peak torque)               | mN.m              | 66                 | 150                  | 120                  |
| 峰值电流 (Peak current)              | A                 | 1.5                | 5.6                  | 2.9                  |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 14.2               | 0.86                 | 2.3                  |
| 线电感 (Line to line inductance)    | mH                | 7                  | 0.55                 | 1.45                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 46.3               | 27                   | 41.8                 |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.43               | 2.0                  | 3.1                  |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 7.95               | 23.55                | 23.55                |
| 机身长度 (Motor length) L            | mm                | 38                 | 80                   | 80                   |
| 重量 (Weight)                      | Kg                | 0.085              | 0.2                  | 0.2                  |



### ● 机械尺寸

(Dimensions)



选件 Options



接插件



齿轮箱



编码器

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1061 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1061 AWG24  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

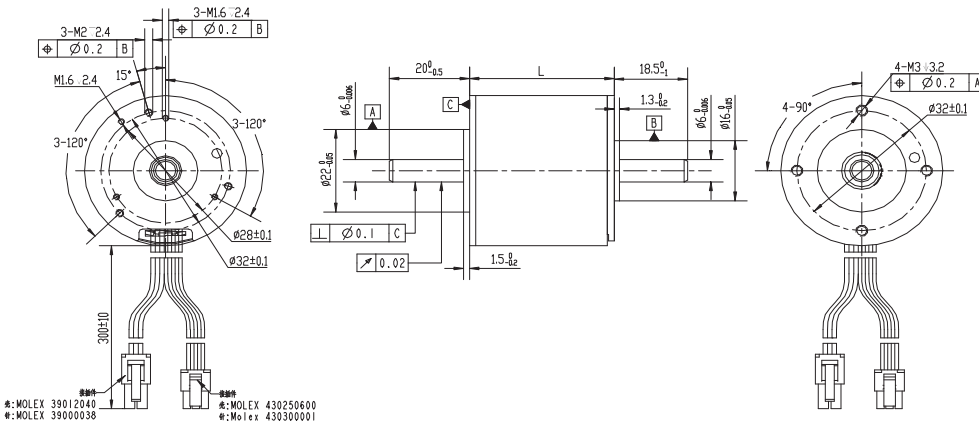
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL36RBL540-24V-4818A | FL36RBL557-24V-4524A |
|----------------------------------|-------------------|----------------------|----------------------|
| 极数 (Number of poles)             |                   |                      | 8                    |
| 相数 (Number of phases)            |                   |                      | 3                    |
| 额定电压 (Rated voltage)             | VDC               |                      | 24                   |
| 额定转矩 (Rated torque)              | mN.m              | 36                   | 50                   |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 43                   | 60                   |
| 额定速度 (Rated speed)               | RPM               | 4800                 | 4500                 |
| 额定功率 (Rated power)               | W                 | 18                   | 24                   |
| 峰值扭矩 (Peak torque)               | mN.m              | 108                  | 150                  |
| 峰值电流 (Peak current)              | A                 | 3.4                  | 3.8                  |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 2.4                  | 2                    |
| 线电感 (Line to line inductance)    | mH                | 2.1                  | 2.0                  |
| 转矩常数 (Torque constant)           | mN.m/A            | 32.4                 | 39.8                 |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 2.4                  | 2.95                 |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 14                   | 24                   |
| 机身长度 (Motor length) L            | mm                | 40                   | 55                   |
| 重量 (Weight)                      | Kg                | 0.16                 | 0.25                 |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 三角形 (Delta connection)                   |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | preloaded                                |
| 轴向间隙 (Axial Play)            | 0.15mm@9N                                |
| 最大径向负载 (Max radial force)    | 15N 距法兰5mm (5mm From the flange)         |
| 最大轴向负载 (Max axial force)     | 5N                                       |
| 介电强度 (Dielectric Strength)   | 500VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class F                                  |

### ● 接线说明

(Electric Connection)

| Pin No | 引出线型号<br>Type                      | 引出线颜色<br>Color | 功能<br>Functions |
|--------|------------------------------------|----------------|-----------------|
| 5      | UL1332 AWG26<br>MOLEX<br>430250600 | 绿色 (Green)     | 霍尔电源正 (Vcc)     |
| 1      |                                    | 黄色 (Yellow)    | 霍尔 U (Hu)       |
| 2      |                                    | 棕色 (Brown)     | 霍尔 V (Hv)       |
| 3      |                                    | 灰色 (Gray)      | 霍尔 W (Hw)       |
| 4      | UL1332 AWG20<br>MOLEX<br>39012040  | 蓝色 (Blue)      | 霍尔电源负 (GND)     |
| 1      |                                    | 红色 (Red)       | U相 (Phase U)    |
| 2      |                                    | 黑色 (Black)     | V相 (Phase V)    |
| 3      |                                    | 白色 (White)     | W相 (Phase W)    |

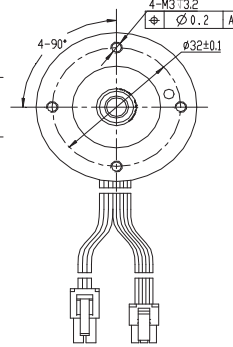
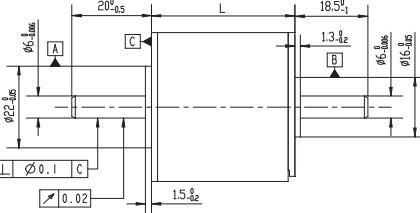
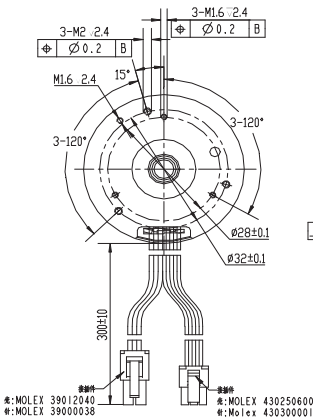
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL40BL26-12V-9644B | FL40BL26-24V-10357B | FL40BL36-18V-8260B | FL40BL36-36V-8776B |
|----------------------------------|-------------------|--------------------|---------------------|--------------------|--------------------|
| 极数 (Number of poles)             |                   | 14                 |                     |                    |                    |
| 相数 (Number of phases)            |                   | 3                  |                     |                    |                    |
| 额定电压 (Rated voltage)             | VDC               | 12                 | 24                  | 18                 | 36                 |
| 额定转矩 (Rated torque)              | mN.m              | 43.3               | 52.8                | 68.7               | 83.4               |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 52                 | 63                  | 82                 | 100                |
| 额定速度 (Rated speed)               | RPM               | 9660               | 10300               | 8230               | 8740               |
| 额定功率 (Rated power)               | W                 | 44                 | 57                  | 60                 | 76                 |
| 峰值扭矩 (Peak torque)               | mN.m              | 120                | 158                 | 206                | 250                |
| 峰值电流 (Peak current)              | A                 | 13.4               | 9.35                | 12.3               | 7.5                |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.227              | 0.501               | 0.34               | 0.84               |
| 线电感 (Line to line inductance)    | mH                | 0.109              | 0.39                | 0.18               | 0.64               |
| 转矩常数 (Torque constant)           | mN.m/A            | 8.95               | 16.9                | 16.7               | 33.5               |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 0.66               | 1.25                | 1.23               | 2.48               |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 10.5               | 10.5                | 24.2               | 24.2               |
| 机身长度 (Motor length) L            | mm                | 26                 | 26                  | 36                 | 36                 |
| 重量 (Weight)                      | Kg                | 0.17               | 0.17                | 0.24               | 0.24               |

### 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

编码器

### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 三角形 (Delta connection)                   |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | preloaded                                |
| 轴向间隙 (Axial Play)            | 0.15mm@9N                                |
| 最大径向负载 (Max radial force)    | 15N 距法兰5mm (5mm From the flange)         |
| 最大轴向负载 (Max axial force)     | 5N                                       |
| 介电强度 (Dielectric Strength)   | 500VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class F                                  |

### 接线说明

(Electric Connection)

| Pin No | 引出线型号<br>Type                      | 引出线颜色<br>Color | 功能<br>Functions |
|--------|------------------------------------|----------------|-----------------|
| 5      | UL1332 AWG26<br>MOLEX<br>430250600 | 绿色 (Green)     | 霍尔电源正 (Vcc)     |
| 1      |                                    | 黄色 (Yellow)    | 霍尔 U (Hu)       |
| 2      |                                    | 棕色 (Brown)     | 霍尔 V (Hv)       |
| 3      |                                    | 灰色 (Gray)      | 霍尔 W (Hw)       |
| 4      | UL1332 AWG20<br>MOLEX<br>39012040  | 蓝色 (Blue)      | 霍尔电源负 (GND)     |
| 1      |                                    | 红色 (Red)       | U相 (Phase U)    |
| 2      |                                    | 黑色 (Black)     | V相 (Phase V)    |
| 3      |                                    | 白色 (White)     | W相 (Phase W)    |

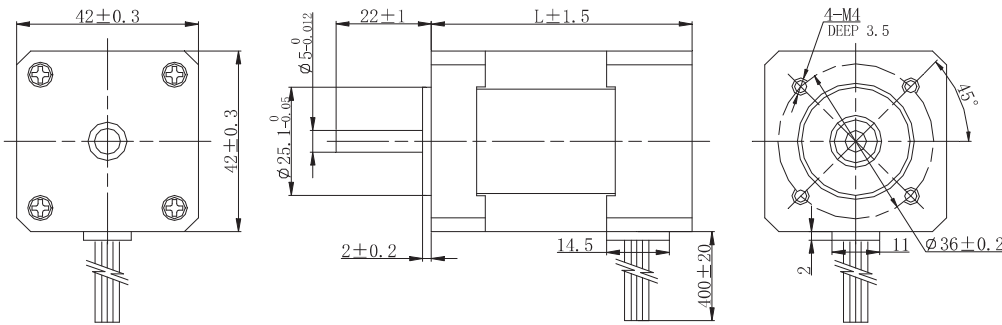
### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL40BL36-36V-6487B | FL40BL36-48V-4165B | FL40BL56-36V-3986B | FL40BL56-48V-43102B |
|----------------------------------|-------------------|--------------------|--------------------|--------------------|---------------------|
| 极数 (Number of poles)             |                   | 14                 |                    |                    |                     |
| 相数 (Number of phases)            |                   | 3                  |                    |                    |                     |
| 额定电压 (Rated voltage)             | VDC               | 36                 | 48                 | 36                 | 48                  |
| 额定转矩 (Rated torque)              | mN.m              | 129                | 151                | 207                | 222                 |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 181                | 181                | 248                | 266                 |
| 额定速度 (Rated speed)               | RPM               | 6450               | 4100               | 3950               | 4390                |
| 额定功率 (Rated power)               | W                 | 87                 | 65                 | 86                 | 102                 |
| 峰值转矩 (Peak torque)               | mN.m              | 387                | 453                | 621                | 666                 |
| 峰值电流 (Peak current)              | A                 | 8.4                | 4.95               | 8.3                | 7.3                 |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.59               | 2.28               | 0.85               | 1.01                |
| 线电感 (Line to line inductance)    | mH                | 0.51               | 2.05               | 0.68               | 1.0                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 46.1               | 91.8               | 75.2               | 91                  |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.42               | 6.8                | 5.57               | 6.73                |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 23                 | 23                 | 44                 | 44                  |
| 机身长度 (Motor length) L            | mm                | 36                 | 36                 | 56                 | 56                  |
| 重量 (Weight)                      | Kg                | 250                | 250                | 390                | 390                 |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 28N 距法兰20mm (20mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1430 AWG20  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

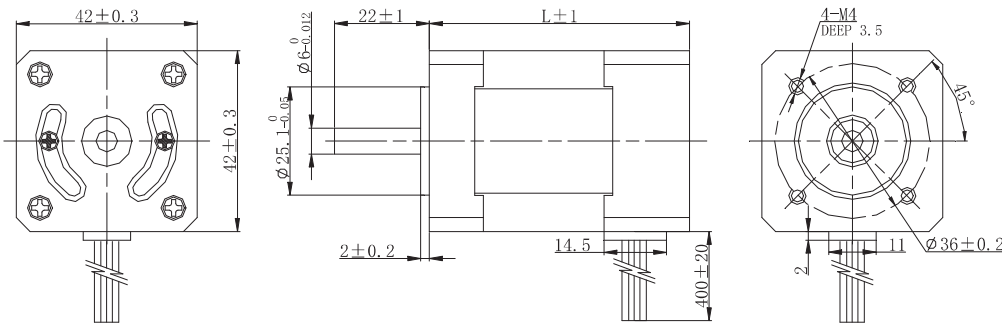
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL42BLA01 | FL42BLA02 | FL42BLA03 | FL42BLA04 |
|----------------------------------|-------------------|-----------|-----------|-----------|-----------|
| 极数 (Number of poles)             |                   |           |           | 10        |           |
| 相数 (Number of phases)            |                   |           |           | 3         |           |
| 额定电压 (Rated voltage)             | VDC               |           |           | 24        |           |
| 额定转矩 (Rated torque)              | mN.m              | 70        | 160       | 260       | 360       |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 81        | 190       | 300       | 410       |
| 额定速度 (Rated speed)               | RPM               | 3000      | 3000      | 3000      | 3000      |
| 额定功率 (Rated power)               | W                 | 22        | 50        | 81        | 113       |
| 峰值扭矩 (Peak torque)               | mN.m              | 210       | 480       | 780       | 1080      |
| 峰值电流 (Peak current)              | A                 | 3.9       | 8         | 13        | 17.5      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 2.6       | 1.1       | 0.7       | 0.5       |
| 线电感 (Line to line inductance)    | mH                | 1.83      | 0.96      | 0.58      | 0.44      |
| 转矩常数 (Torque constant)           | mN.m/A            | 0.054     | 0.06      | 0.06      | 0.062     |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 4.06      | 4.5       | 4.5       | 4.6       |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 48        | 101       | 154       | 207       |
| 机身长度 (Motor length) L            | mm                | 40.3      | 60.3      | 80.3      | 100.3     |
| 重量 (Weight)                      | Kg                | 0.26      | 0.46      | 0.65      | 0.85      |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 28N 距法兰20mm (20mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1430 AWG20  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

### ● 电性能

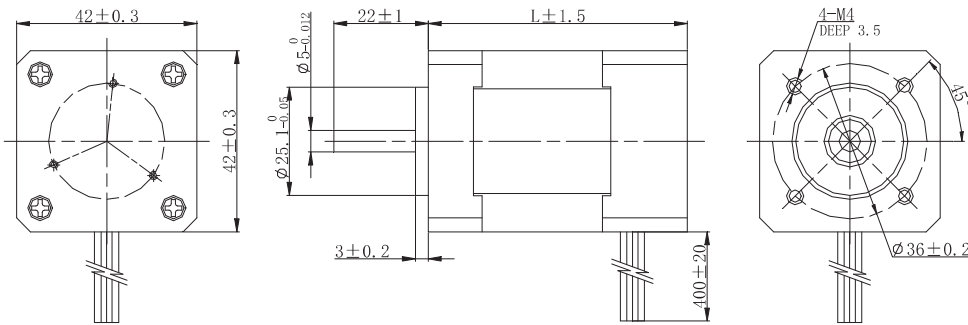
(Electrical Specifications)

|                                  | 单位 (Unit)         | FL42BLB01 | FL42BLB02 | FL42BLB03 | FL42BLB04 |
|----------------------------------|-------------------|-----------|-----------|-----------|-----------|
| 极数 (Number of poles)             |                   |           |           | 6         |           |
| 相数 (Number of phases)            |                   |           |           | 3         |           |
| 额定电压 (Rated voltage)             | VDC               |           |           | 24        |           |
| 额定转矩 (Rated torque)              | mN.m              | 64        | 170       | 300       | 440       |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 74        | 200       | 350       | 490       |
| 额定速度 (Rated speed)               | RPM               | 3000      | 3000      | 3000      | 3000      |
| 额定功率 (Rated power)               | W                 | 20        | 53.5      | 94        | 138       |
| 峰值扭矩 (Peak torque)               | mN.m              | 192       | 510       | 900       | 1320      |
| 峰值电流 (Peak current)              | A                 | 3.5       | 8.5       | 14.5      | 21        |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 4         | 1.05      | 0.54      | 0.4       |
| 线电感 (Line to line inductance)    | mH                | 2.1       | 0.75      | 0.46      | 0.3       |
| 转矩常数 (Torque constant)           | mN.m/A            | 0.057     | 0.06      | 0.062     | 0.0624    |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 4.2       | 4.5       | 4.57      | 4.6       |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 80        | 100       | 120       | 140       |
| 机身长度 (Motor length) L            | mm                | 40.3      | 60.3      | 80.3      | 100.3     |
| 重量 (Weight)                      | Kg                | 0.4       | 0.6       | 0.8       | 1         |



### 机械尺寸

(Dimensions)



选件 Options



### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 三角形 (Delta connection)                   |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 28N 距法兰20mm (20mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1430 AWG20  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

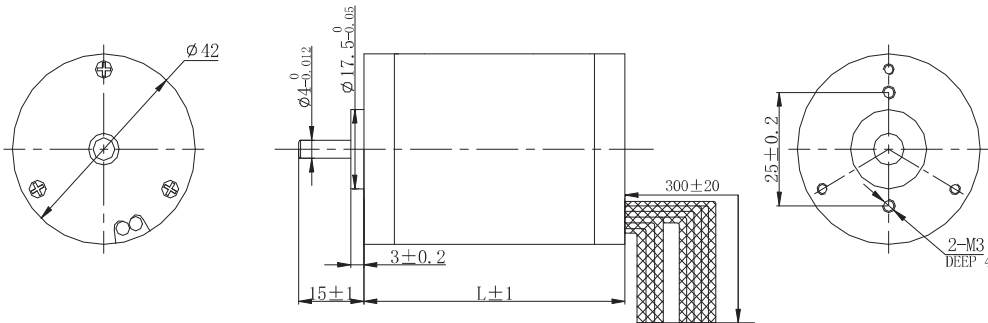
### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL42BLS01 | FL42BLS02 | FL42BLS03 | FL42BLS04 |
|----------------------------------|-------------------|-----------|-----------|-----------|-----------|
| 极数 (Number of poles)             |                   |           |           | 8         |           |
| 相数 (Number of phases)            |                   |           |           | 3         |           |
| 额定电压 (Rated voltage)             | VDC               |           |           | 24        |           |
| 额定转矩 (Rated torque)              | mN.m              | 62.5      | 125       | 185       | 250       |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 75        | 150       | 220       | 300       |
| 额定速度 (Rated speed)               | RPM               | 4000      | 4000      | 4000      | 4000      |
| 额定功率 (Rated power)               | W                 | 26        | 52.5      | 77.5      | 105       |
| 峰值扭矩 (Peak torque)               | mN.m              | 190       | 380       | 560       | 750       |
| 峰值电流 (Peak current)              | A                 | 5.75      | 10.4      | 15.1      | 21.2      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 1.5       | 0.8       | 0.43      | 0.3       |
| 线电感 (Line to line inductance)    | mH                | 2.1       | 1.2       | 0.71      | 0.5       |
| 转矩常数 (Torque constant)           | mN.m/A            | 0.033     | 0.0366    | 0.037     | 0.0354    |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 2.45      | 2.71      | 2.74      | 2.62      |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 24        | 48        | 72        | 96        |
| 机身长度 (Motor length) L            | mm                | 40.3      | 60.3      | 80.3      | 100.3     |
| 重量 (Weight)                      | Kg                | 0.30      | 0.45      | 0.65      | 0.80      |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件



齿轮箱



编码器

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 10N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 2N                                       |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100M $\Omega$ , 500VDC                   |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1007 AWG26  | 蓝色 (Blue)      | 霍尔电源正 (Vcc)     |
|               | 黄色 (Yellow)    | 霍尔 U (Hu)       |
|               | 棕色 (Brown)     | 霍尔 V (Hv)       |
|               | 红色 (Red)       | 霍尔 W (Hw)       |
|               | 绿色 (Green)     | 霍尔电源负 (GND)     |
| UL1007 AWG22  | 红色 (Red)       | U相 (Phase U)    |
|               | 棕色 (Brown)     | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

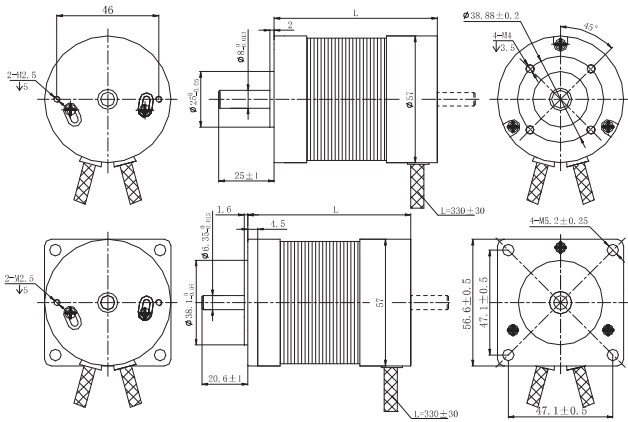
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL42RBL30-24V-4009A-P | FL42RBL60-24V-4030A-P | FL42RBL85-24V-4060A-P | FL42RBL93-24V-6375A-P |
|----------------------------------|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 极数 (Number of poles)             |                   | 8                     |                       |                       |                       |
| 相数 (Number of phases)            |                   | 3                     |                       |                       |                       |
| 额定电压 (Rated voltage)             | VDC               | 24                    |                       |                       |                       |
| 额定转矩 (Rated torque)              | mN.m              | 20                    | 56                    | 150                   | 115                   |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 24                    | 68                    | 180                   | 138                   |
| 额定速度 (Rated speed)               | RPM               | 4000                  | 4200                  | 4000                  | 6300                  |
| 额定功率 (Rated power)               | W                 | 8.4                   | 25                    | 62                    | 76                    |
| 峰值扭矩 (Peak torque)               | mN.m              | 60                    | 170                   | 450                   | 350                   |
| 峰值电流 (Peak current)              | A                 | 1.5                   | 4.2                   | 11.2                  | 11.5                  |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 5.9                   | 1.6                   | 0.71                  | 0.325                 |
| 线电感 (Line to line inductance)    | mH                | 5.1                   | 1.94                  | 0.86                  | 0.36                  |
| 转矩常数 (Torque constant)           | mN.m/A            | 39.8                  | 41.04                 | 40.5                  | 30.6                  |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 2.95                  | 3.04                  | 3.0                   | 2.27                  |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 15.6                  | 33                    | 84                    | 94                    |
| 机身长度 (Motor length) L            | mm                | 30                    | 60                    | 85                    | 93                    |
| 重量 (Weight)                      | Kg                | 0.25                  | 0.4                   | 0.7                   | 0.8                   |

### 机械尺寸

(Dimensions)



选件 Options



### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 三角形 (Delta connection)                   |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.025mm@460g                             |
| 轴向间隙 (Axial Play)            | 0.025mm@4000g                            |
| 最大径向负载 (Max radial force)    | 75N 距法兰20mm (20mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 15N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1430 AWG20  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

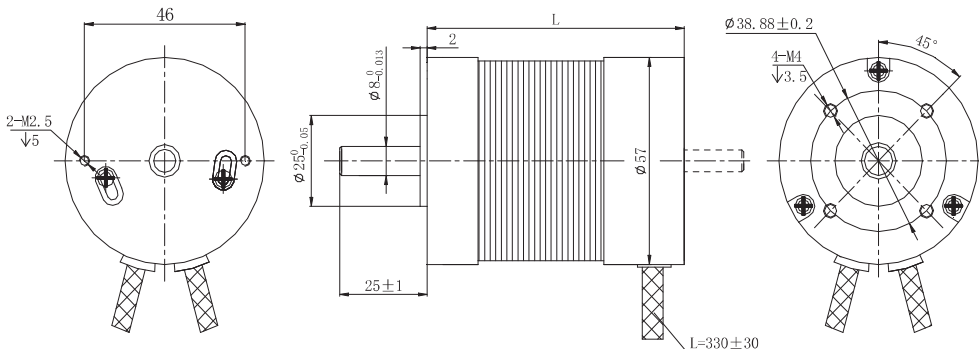
### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL57BL(S)01 | FL57BL(S)02 | FL57BL(S)03 | FL57BL(S)04 |
|----------------------------------|-------------------|-------------|-------------|-------------|-------------|
| 极数 (Number of poles)             |                   |             |             | 4           |             |
| 相数 (Number of phases)            |                   |             |             | 3           |             |
| 额定电压 (Rated voltage)             | VDC               |             |             | 36          |             |
| 额定转矩 (Rated torque)              | N.m               | 0.11        | 0.22        | 0.33        | 0.44        |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.132       | 0.264       | 0.396       | 0.528       |
| 额定速度 (Rated speed)               | RPM               | 4000        | 4000        | 4000        | 4000        |
| 额定功率 (Rated power)               | W                 | 46          | 99          | 138         | 184         |
| 峰值扭矩 (Peak torque)               | N.m               | 0.39        | 0.7         | 1.0         | 1.27        |
| 峰值电流 (Peak current)              | A                 | 6.5         | 12          | 16          | 21          |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 1.63        | 0.64        | 0.45        | 0.33        |
| 线电感 (Line to line inductance)    | mH                | 4.4         | 2           | 1.5         | 0.95        |
| 转矩常数 (Torque constant)           | N.m/A             | 0.0607      | 0.0601      | 0.0648      | 0.0621      |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 4.5         | 4.45        | 4.8         | 4.6         |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 75          | 119         | 173         | 230         |
| 机身长度 (Motor length) L            | mm                | 53.6        | 73.6        | 93.6        | 113.6       |
| 重量 (Weight)                      | Kg                | 0.44        | 0.72        | 0.95        | 1.2         |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 115N 距法兰20mm (20mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1332 AWG18  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

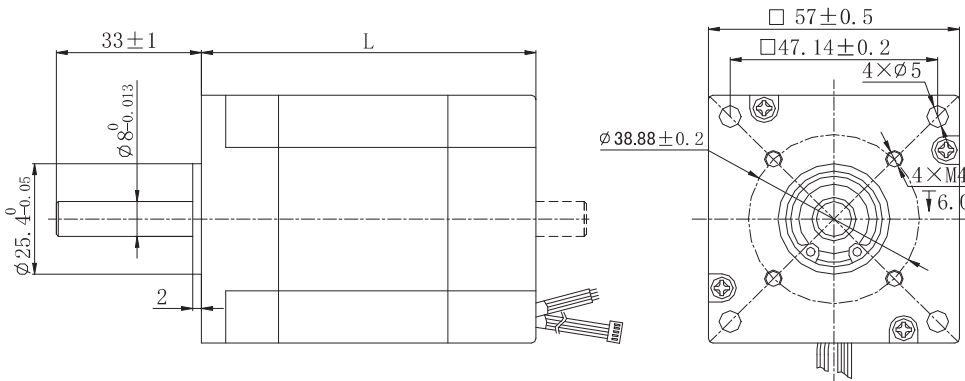
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL57BLA(S)01 | FL57BLA(S)02 | FL57BLA(S)03 | FL57BLA(S)04 |
|----------------------------------|-------------------|--------------|--------------|--------------|--------------|
| 极数 (Number of poles)             |                   | 6            |              |              |              |
| 相数 (Number of phases)            |                   | 3            |              |              |              |
| 额定电压 (Rated voltage)             | VDC               | 36           |              |              |              |
| 额定转矩 (Rated torque)              | N.m               | 0.2          | 0.4          | 0.6          | 0.8          |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.24         | 0.48         | 0.72         | 0.96         |
| 额定速度 (Rated speed)               | RPM               | 4000         | 4000         | 4000         | 4000         |
| 额定功率 (Rated power)               | W                 | 83           | 166          | 249          | 332          |
| 峰值转矩 (Peak torque)               | N.m               | 0.6          | 1.2          | 1.8          | 2.4          |
| 峰值电流 (Peak current)              | A                 | 9.1          | 17.9         | 28.2         | 34.3         |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.87         | 0.38         | 0.25         | 0.21         |
| 线电感 (Line to line inductance)    | mH                | 1            | 0.55         | 0.3          | 0.25         |
| 转矩常数 (Torque constant)           | N.m/A             | 0.066        | 0.067        | 0.064        | 0.07         |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 4.9          | 5            | 4.7          | 5.2          |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 275          | 375          | 510          | 693          |
| 机身长度 (Motor length) L            | mm                | 53.6         | 73.6         | 93.6         | 113.6        |
| 重量 (Weight)                      | Kg                | 0.76         | 1            | 1.25         | 1.52         |

### 机械尺寸

(Dimensions)



选件 Options



### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 115N 距法兰20mm (20mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1061 AWG28  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1430 AWG18  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

### 电性能

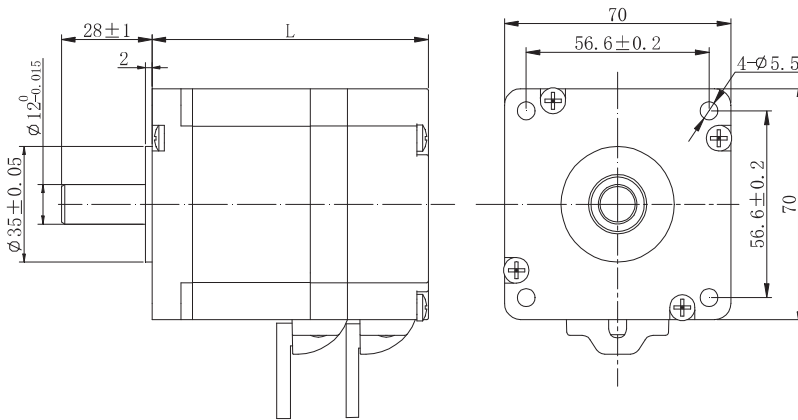
(Electrical Specifications)

|                                  | 单位 (Unit)         | FL57BLB40 | FL57BLB60 | FL57BLB80 |
|----------------------------------|-------------------|-----------|-----------|-----------|
| 极数 (Number of poles)             |                   |           | 8         |           |
| 相数 (Number of phases)            |                   |           | 3         |           |
| 额定电压 (Rated voltage)             | VDC               |           | 36        |           |
| 额定转矩 (Rated torque)              | N.m               | 0.3       | 0.45      | 0.6       |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.36      | 0.54      | 0.72      |
| 额定速度 (Rated speed)               | RPM               | 3000      | 3000      | 3000      |
| 额定功率 (Rated power)               | W                 | 94        | 141       | 188       |
| 峰值扭矩 (Peak torque)               | N.m               | 0.9       | 1.35      | 1.8       |
| 峰值电流 (Peak current)              | A                 | 12.3      | 18.2      | 23.8      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 1.2       | 0.8       | 0.5       |
| 线电感 (Line to line inductance)    | mH                | 1.2       | 0.8       | 0.6       |
| 转矩常数 (Torque constant)           | N.m/A             | 0.076     | 0.076     | 0.077     |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 5.6       | 5.6       | 5.7       |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 210       | 320       | 430       |
| 机身长度 (Motor length) L            | mm                | 76        | 96        | 116       |
| 重量 (Weight)                      | Kg                | 0.8       | 1.0       | 1.2       |



### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 115N 距法兰20mm (20mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL2464 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL2464 AWG16  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

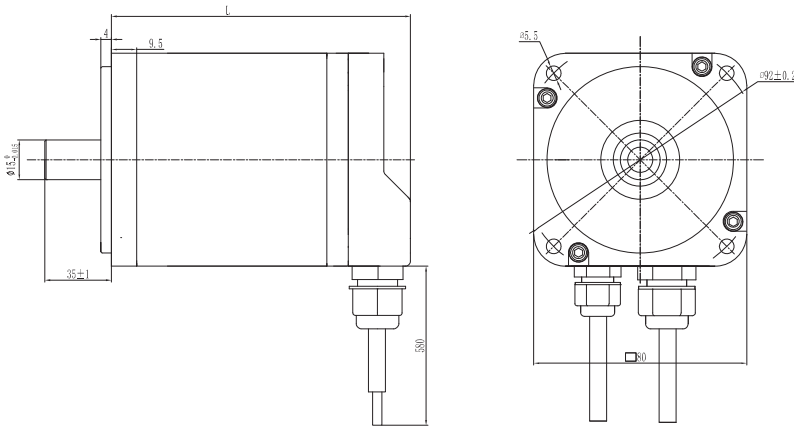
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL70BLS01 | FL70BLS02 | FL70BLS03 |
|----------------------------------|-------------------|-----------|-----------|-----------|
| 极数 (Number of poles)             |                   |           | 8         |           |
| 相数 (Number of phases)            |                   |           | 3         |           |
| 额定电压 (Rated voltage)             | VDC               |           | 48        |           |
| 额定转矩 (Rated torque)              | N.m               | 0.5       | 1.0       | 1.5       |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.6       | 1.2       | 1.8       |
| 额定速度 (Rated speed)               | RPM               | 3000      | 3000      | 3000      |
| 额定功率 (Rated power)               | W                 | 157       | 314       | 471       |
| 峰值转矩 (Peak torque)               | N.m               | 1.5       | 3.0       | 4.5       |
| 峰值电流 (Peak current)              | A                 | 13.0      | 26        | 38        |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.6       | 0.3       | 0.22      |
| 线电感 (Line to line inductance)    | mH                | 1.4       | 0.7       | 0.55      |
| 转矩常数 (Torque constant)           | N.m/A             | 0.12      | 0.12      | 0.12      |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 9.0       | 9.0       | 9.0       |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 200       | 400       | 600       |
| 机身长度 (Motor length) L            | mm                | 86        | 116       | 136       |
| 重量 (Weight)                      | Kg                | 1.3       | 2.1       | 2.9       |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 三角形 (Delta)                              |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 115N 距法兰20mm (20mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type                  | 引出线颜色<br>Color | 功能<br>Functions |
|--------------------------------|----------------|-----------------|
| UL2464 AWG26                   | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|                                | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|                                | 绿色 (Green)     | 霍尔 V (Hv)       |
|                                | 白色 (White)     | 霍尔 W (Hw)       |
|                                | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL2517 AWG16<br>或UL10393 AWG12 | 黄色 (Yellow)    | U相 (Phase U)    |
|                                | 红色 (Red)       | V相 (Phase V)    |
|                                | 黑色 (Black)     | W相 (Phase W)    |

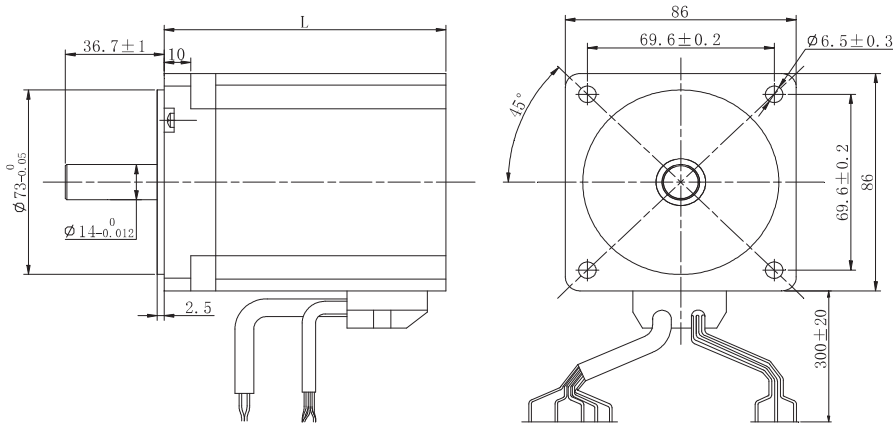
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL80BLS84 | FL80BLS105 | FL80BLS120 | FL80BLS140 |
|----------------------------------|-------------------|-----------|------------|------------|------------|
| 极数 (Number of poles)             |                   |           |            | 8          |            |
| 相数 (Number of phases)            |                   |           |            | 3          |            |
| 额定电压 (Rated voltage)             | VDC               |           |            | 48         |            |
| 额定转矩 (Rated torque)              | N.m               | 0.9       | 1.7        | 2.2        | 3          |
| 连续运行转矩 (Continuous stall torque) | N.m               | 1.08      | 2.04       | 2.64       | 3.96       |
| 额定速度 (Rated speed)               | RPM               | 3000      | 3000       | 3000       | 3000       |
| 额定功率 (Rated power)               | W                 | 280       | 530        | 700        | 950        |
| 峰值扭矩 (Peak torque)               | N.m               | 2.7       | 5.1        | 6.6        | 9.9        |
| 峰值电流 (Peak current)              | A                 | 23        | 45         | 61         | 89         |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.25      | 0.10       | 0.07       | 0.057      |
| 线电感 (Line to line inductance)    | mH                | 1.3       | 0.6        | 0.4        | 0.3        |
| 转矩常数 (Torque constant)           | N.m/A             | 0.118     | 0.113      | 0.109      | 0.111      |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 8.7       | 8.4        | 8.1        | 8.2        |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 544       | 1020       | 1360       | 1900       |
| 机身长度 (Motor length) L            | mm                | 84        | 105        | 120        | 140        |
| 重量 (Weight)                      | Kg                | 1.6       | 2          | 2.5        | 2.9        |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 220N距法兰20mm (20mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG24  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1332 AWG16  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

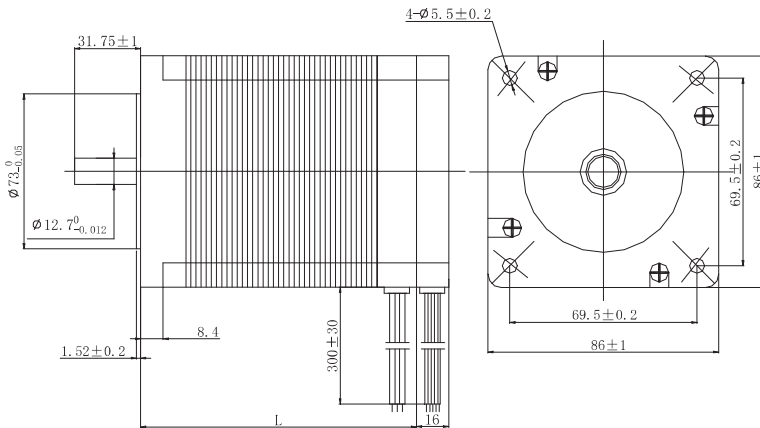
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL86BLC64 | FL86BLC77 | FL86BLC105 | FL86BLC125 |
|----------------------------------|-------------------|-----------|-----------|------------|------------|
| 极数 (Number of poles)             |                   |           |           | 8          |            |
| 相数 (Number of phases)            |                   |           |           | 3          |            |
| 额定电压 (Rated voltage)             | VDC               |           |           | 48         |            |
| 额定转矩 (Rated torque)              | N.m               | 0.4       | 0.8       | 1.6        | 2.22       |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.48      | 0.96      | 1.92       | 2.66       |
| 额定速度 (Rated speed)               | RPM               | 3000      | 3000      | 3000       | 3000       |
| 额定功率 (Rated power)               | W                 | 130       | 250       | 500        | 700        |
| 峰值转矩 (Peak torque)               | N.m               | 1.2       | 2.4       | 4.8        | 6.66       |
| 峰值电流 (Peak current)              | A                 | 10        | 17        | 36         | 51         |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 1         | 0.34      | 0.14       | 0.1        |
| 线电感 (Line to line inductance)    | mH                | 1.4       | 0.6       | 0.36       | 0.24       |
| 转矩常数 (Torque constant)           | N.m/A             | 0.122     | 0.149     | 0.135      | 0.131      |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 9         | 11        | 10         | 9.7        |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 400       | 800       | 1600       | 2400       |
| 机身长度 (Motor length) L            | mm                | 64        | 77        | 105        | 125        |
| 重量 (Weight)                      | Kg                | 1.5       | 1.85      | 2.7        | 4          |

### 机械尺寸

(Dimensions)



选件 Options



### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 220N 距法兰20mm (20mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 60N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1332 AWG22  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1332 AWG18  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

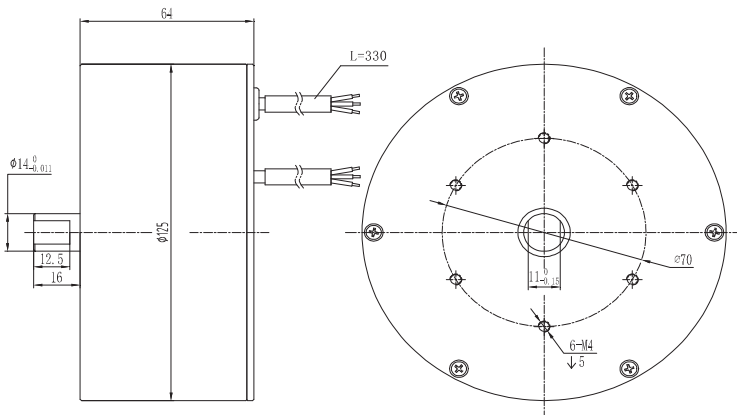
### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL86BLS58 | FL86BLS71 | FL86BLS84 | FL86BLS98 | FL86BLS125 |
|----------------------------------|-------------------|-----------|-----------|-----------|-----------|------------|
| 极数 (Number of poles)             |                   | 8         |           |           |           |            |
| 相数 (Number of phases)            |                   | 3         |           |           |           |            |
| 额定电压 (Rated voltage)             | VDC               | 48        |           |           |           |            |
| 额定转矩 (Rated torque)              | N.m               | 0.35      | 0.7       | 1.05      | 1.4       | 2.1        |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.42      | 0.84      | 1.26      | 1.68      | 2.52       |
| 额定速度 (Rated speed)               | RPM               | 3000      | 3000      | 3000      | 3000      | 3000       |
| 额定功率 (Rated power)               | W                 | 110       | 220       | 330       | 440       | 660        |
| 峰值扭矩 (Peak torque)               | N.m               | 1.05      | 2.1       | 3.15      | 4.2       | 6.3        |
| 峰值电流 (Peak current)              | A                 | 9.5       | 17.5      | 25        | 33.5      | 50         |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.9       | 0.34      | 0.2       | 0.16      | 0.1        |
| 线电感 (Line to line inductance)    | mH                | 2.6       | 1         | 0.66      | 0.5       | 0.31       |
| 转矩常数 (Torque constant)           | N.m/A             | 0.116     | 0.122     | 0.127     | 0.127     | 0.128      |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 8.6       | 9         | 9.4       | 9.4       | 9.5        |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 400       | 800       | 1200      | 1600      | 2400       |
| 机身长度 (Motor length) L            | mm                | 56        | 70        | 84        | 96        | 123        |
| 重量 (Weight)                      | Kg                | 1.6       | 2.12      | 2.64      | 3.15      | 4.2        |

### 机械尺寸

(Dimensions)



选件 Options



### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.025mm@460g                             |
| 轴向间隙 (Axial Play)            | 0.08mm@4000g                             |
| 最大径向负载 (Max radial force)    | 220N 距法兰20mm (20mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 60N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1332 AWG22  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL3135 AWG14  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

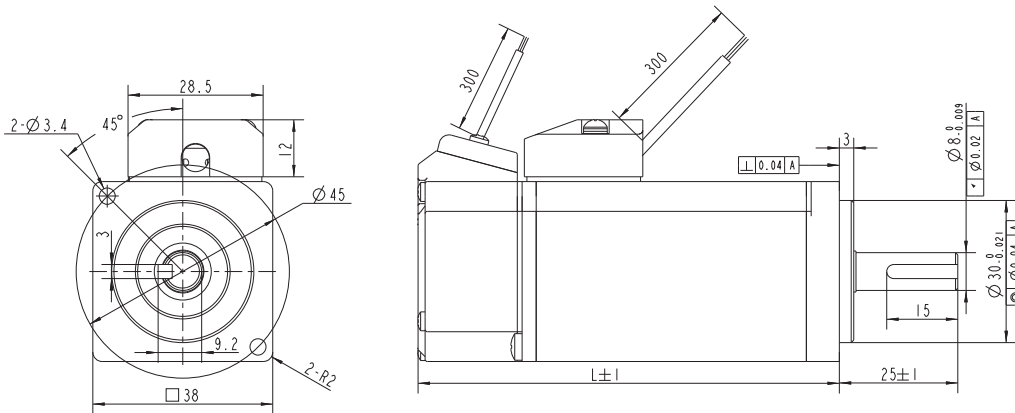
### 电性能

(Electrical Specifications)

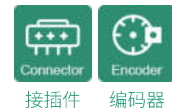
|                                  | 单位 (Unit)         | FL125BL60 |
|----------------------------------|-------------------|-----------|
| 极数 (Number of poles)             |                   | 28        |
| 相数 (Number of phases)            |                   | 3         |
| 额定电压 (Rated voltage)             | VDC               | 60        |
| 额定转矩 (Rated torque)              | N.m               | 6.8       |
| 连续运行转矩 (Continuous stall torque) | N.m               | 8.16      |
| 额定速度 (Rated speed)               | RPM               | 480       |
| 额定功率 (Rated power)               | W                 | 340       |
| 峰值扭矩 (Peak torque)               | N.m               | 40        |
| 峰值电流 (Peak current)              | A                 | 46        |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 1.1       |
| 线电感 (Line to line inductance)    | mH                | 2.4       |
| 转矩常数 (Torque constant)           | N.m/A             | 0.88      |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 65        |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 2100      |
| 机身长度 (Motor length) L            | mm                | 64        |
| 重量 (Weight)                      | Kg                | 2.9       |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式 (Winding Type)           | 星形 (Star connection)   |
| 径向负载 (Max radial force)         | 69N @ 14mm from the flange   |
| 轴向负载 (Max axial force)          | 59N  |
| 绝缘等级 (Insulation Class)         | Class F  |
| 防护等级 (Protection level)         | IP65   |
| 使用环境温度 (Temperature)            | -20°C~ +50°C   |
| 使用环境湿度 (Relative humidity)      | ≤90%RH (无凝露) (No dewing)   |
| 存储环境 (Storage Condition)        | -20°C~ +85°C, ≤85%RH (无凝露) (No dewing)   |
| 安装环境 (Installation environment) | 远离腐蚀、可燃性气体, 油滴, 灰尘, 海拔≤1000m Far away active gas, Combustible gas, oil drop, ash |

### ● 接线说明

(Electric Connection)

| Pin No | 引出线型号 Type | 引出线颜色 Color | 功能 Functions |
|--------|------------|-------------|--------------|
| 5      | AWG26      | 绿色 (Green)  | 霍尔电源正 (Vcc)  |
| 1      |            | 黄色 (Yellow) | 霍尔 U (Hu)    |
| 2      |            | 棕色 (Brown)  | 霍尔 V (Hv)    |
| 3      |            | 灰色 (Gray)   | 霍尔 W (Hw)    |
| 4      |            | 蓝色 (Blue)   | 霍尔电源负 (GND)  |
| 1      | AWG19(20)  | 黄色 (Yellow) | U相 (Phase U) |
| 2      |            | 红色 (Red)    | V相 (Phase V) |
| 3      |            | 黑色 (Black)  | W相 (Phase W) |

### ● 电性能

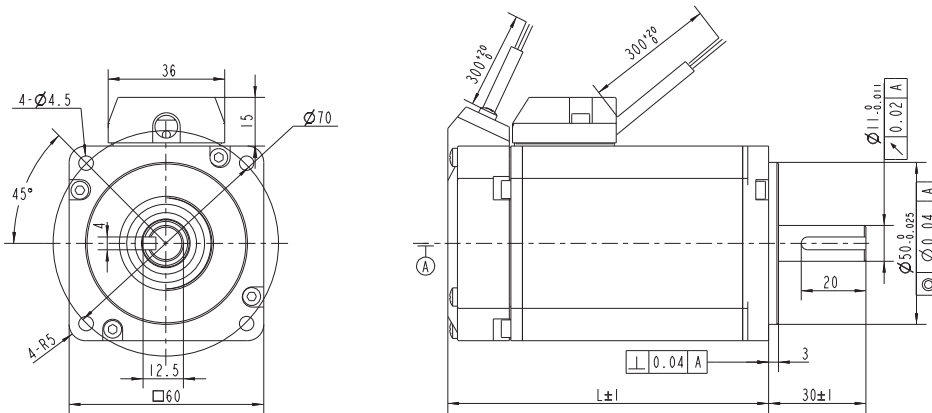
(Electrical Specifications)

| 类型 (Model)                              | 单位 (Unit)          | FL38BLG05 |       | FL38BLG10 |       |
|---|--------------------|-----------|-------|-----------|-------|
| 额定功率 (Rated power) Pn                   | W                  | 50        |       | 100       |       |
| 额定电压 (Rated voltage) Un                 | VAC/VDC            | 220       | 48    | 220       | 48    |
| 额定转速 (Rated speed) nn                   | RPM                | 3000      | 3000  | 3000      | 3000  |
| 额定转矩 (Rated torque) Tn                  | N·m                | 0.16      | 0.16  | 0.32      | 0.32  |
| 额定电流 (Rated current) In                 | Arms               | 0.2       | 1.3   | 0.4       | 22.5  |
| 峰值转矩 (Peak torque) Tm                   | N·m                | 0.48      | 0.48  | 0.96      | 0.96  |
| 峰值电流 (Peak current) Im                  | Arms               | 0.6       | 3.9   | 1.2       | 7.5   |
| 电阻 (Line to line resistance) RL         | ohm                | 248       | 5.8   | 118       | 2.8   |
| 电感 (Line to line inductance) LL         | mH                 | 160       | 3.8   | 88        | 2.1   |
| 反电势系数 (BackEMF) Ke                      | V/Krpm             | 54.5      | 8.5   | 54.5      | 8.5   |
| 转矩系数 (Torque constant) Kt               | N.m/A              | 0.80      | 0.123 | 0.80      | 0.128 |
| 转动惯量 (Rotor inertia) Jm0                | Kg.cm <sup>2</sup> | 0.024     | 0.024 | 0.04      | 0.04  |
| 转动惯量带制动器 (Rotor inertia with brake) Jm1 | Kg.cm <sup>2</sup> | 0.034     | 0.034 | 0.05      | 0.05  |
| 极数 (Number of poles)                    |                    | 10        | 10    | 10        | 10    |
| 机身长度 (Motor length) L1                  | mm                 | 72        |       | 88        |       |
| 机身长度带制动器 (Motor length with brake) L2   | mm                 | 106       |       | 122       |       |
| 重量 (Weight)                             | Kg                 | 0.4       |       | 0.5       |       |
| 重量带制动器 (Weight with brake)              | Kg                 | 0.65      |       | 0.75      |       |



### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱 编码器 刹车

### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式 (Winding Type)           | 星形 (Star connection)   |
| 径向负载 (Max radial force)         | 245N @ 20mm from the flange  |
| 轴向负载 (Max axial force)          | 98N  |
| 绝缘等级 (Insulation Class)         | Class F  |
| 防护等级 (Protection level)         | IP65   |
| 使用环境温度 (Temperature)            | -20°C~+50°C  |
| 使用环境湿度 (Relative humidity)      | ≤90%RH (无凝露) (No dewing)   |
| 存储环境 (Storage Condition)        | -20°C~+85°C, ≤85%RH (无凝露) (No dewing)  |
| 安装环境 (Installation environment) | 远离腐蚀、可燃性气体, 油滴, 灰尘, 海拔≤1000m Far away active gas, Combustible gas, oil drop, ash |

### ● 接线说明

(Electric Connection)

| Pin No | 引出线型号 Type | 引出线颜色 Color | 功能 Functions |
|--------|------------|-------------|--------------|
| 5      | AWG26      | 绿色 (Green)  | 霍尔电源正 (Vcc)  |
| 1      |            | 黄色 (Yellow) | 霍尔 U (Hu)    |
| 2      |            | 棕色 (Brown)  | 霍尔 V (Hv)    |
| 3      |            | 灰色 (Gray)   | 霍尔 W (Hw)    |
| 4      |            | 蓝色 (Blue)   | 霍尔电源负 (GND)  |
| 1      | AWG20(16)  | 黄色 (Yellow) | U相 (Phase U) |
| 2      |            | 红色 (Red)    | V相 (Phase V) |
| 3      |            | 黑色 (Black)  | W相 (Phase W) |

### ● 电性能

(Electrical Specifications)

| 类型 (Model)                          |     | 单位 (Unit)          | FL60 BLG20 |      | FL60 BLG40 |       |
|-------------------------------------|-----|--------------------|------------|------|------------|-------|
| 额定功率 (Rated power)                  | Pn  | W                  | 200        |      | 400        |       |
| 额定电压 (Rated voltage)                | Un  | VAC/VDC            | 48         | 220  | 48         | 220   |
| 额定转速 (Rated speed)                  | nn  | RPM                | 3000       | 3000 | 3000       | 3000  |
| 额定转矩 (Rated torque)                 | Tn  | N·m                | 0.64       | 0.64 | 1.27       | 1.27  |
| 额定电流 (Rated current)                | In  | A                  | 6          | 1.2  | 12         | 2.4   |
| 峰值转矩 (Peak torque)                  | Tm  | N·m                | 1.92       | 1.92 | 3.81       | 3.81  |
| 峰值电流 (Peak current)                 | Im  | A                  | 18         | 3.6  | 36         | 7.2   |
| 电阻 (Line to line resistance)        | RL  | Ω                  | 0.38       | 9.35 | 0.23       | 3.46  |
| 电感 (Line to line inductance)        | LL  | mH                 | 0.68       | 17   | 0.3        | 7.14  |
| 反电势系数 (BackEMF)                     | Ke  | V/Krpm             | 6.5        | 32   | 6.5        | 32    |
| 转矩系数 (Torque constant)              | Kt  | Nm/A               | 0.107      | 0.53 | 0.107      | 0.53  |
| 转动惯量 (Rotor inertia)                | Jm0 | Kg.cm <sup>2</sup> | 0.15       | 0.15 | 0.25       | 0.25  |
| 转动惯量带制动器 (Rotor inertia with brake) | Jm1 | Kg.cm <sup>2</sup> | 0.15       | 0.15 | 0.25       | 0.25  |
| 极数 (Number of poles)                |     |                    | 10         | 10   | 10         | 10    |
| 机身长度 (Motor length)                 | L1  | mm                 | 86.5       | 79.5 | 106        | 99    |
| 机身长度带制动器 (Motor length with brake)  | L2  | mm                 | 123        | 116  | 142.5      | 135.5 |
| 重量 (Weight)                         |     | Kg                 | 0.95       | 0.9  | 1.35       | 1.3   |
| 重量带制动器 (Weight with brake)          |     | Kg                 | 1.35       | 1.3  | 1.85       | 1.8   |

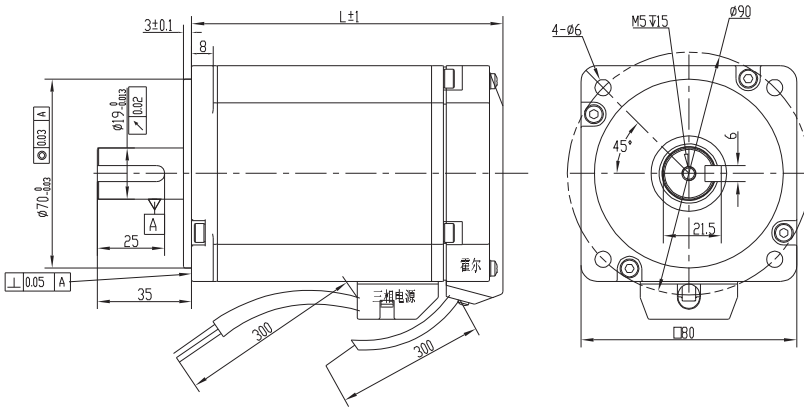


选件 Options



### 机械尺寸

(Dimensions)



### 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式 (Winding Type)           | 星形 (Star connection)   |
| 径向负载 (Max radial force)         | 392N @ 10mm from the flange  |
| 轴向负载 (Max axial force)          | 147N   |
| 绝缘等级 (Insulation Class)         | Class F  |
| 防护等级 (Protection level)         | IP65   |
| 使用环境温度 (Temperature)            | -20°C~ +50°C   |
| 使用环境湿度 (Relative humidity)      | ≤90%RH (无凝露) (No dewing)   |
| 存储环境 (Storage Condition)        | -20°C~ +85°C, ≤85%RH (无凝露) (No dewing)   |
| 安装环境 (Installation environment) | 远离腐蚀、可燃性气体, 油滴, 灰尘, 海拔≤1000m Far away active gas, Combustible gas, oil drop, ash |

### 接线说明

(Electric Connection)

| Pin No | 引出线型号 Type | 引出线颜色 Color | 功能 Functions |
|--------|------------|-------------|--------------|
| 5      | AWG26      | 红色 (Green)  | 霍尔电源正 (Vcc)  |
| 1      |            | 蓝色 (Blue)   | 霍尔 U (Hu)    |
| 2      |            | 绿色 (Green)  | 霍尔 V (Hv)    |
| 3      |            | 白色 (White)  | 霍尔 W (Hw)    |
| 4      |            | 黑色 (Black)  | 霍尔电源负 (GND)  |
| 1      | AWG16(13)  | 黄色 (Yellow) | U相 (Phase U) |
| 2      |            | 红色 (Red)    | V相 (Phase V) |
| 3      |            | 黑色 (Black)  | W相 (Phase W) |

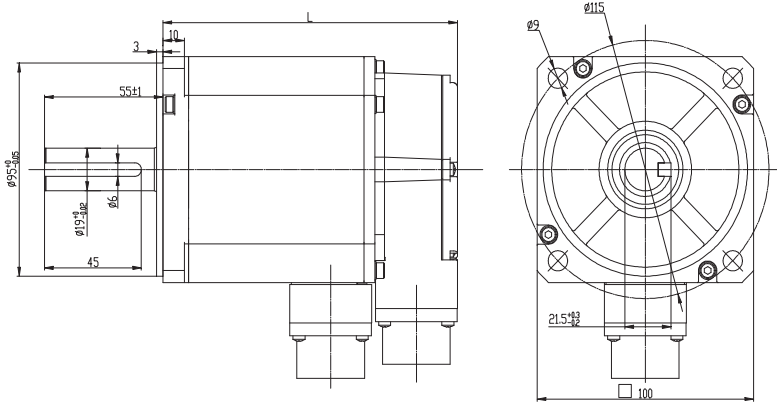
### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)          | FL80BLG75 |       | FL80BLG100 |       |
|----------------------------------|--------------------|-----------|-------|------------|-------|
| 极数 (Number of poles)             |                    |           |       | 10         |       |
| 相数 (Number of phases)            |                    |           |       | 3          |       |
| 额定电压 (Rated voltage)             | VDC                | 310       | 48    | 310        | 48    |
| 额定转矩 (Rated torque)              | N.m                | 2.39      | 2.39  | 3.18       | 3.18  |
| 连续运行转矩 (Continuous stall torque) | N.m                | 2.86      | 2.86  | 3.81       | 3.81  |
| 额定速度 (Rated speed)               | RPM                | 3000      | 3000  | 3000       | 3000  |
| 额定功率 (Rated power)               | W                  | 750       | 750   | 1000       | 1000  |
| 峰值扭矩 (Peak torque)               | N.m                | 7.14      | 7.14  | 9.6        | 9.6   |
| 峰值电流 (Peak current)              | A                  | 13.2      | 73.5  | 17.7       | 90    |
| 线电阻 (Line to line resistance)    | ohms@20°C          | 4.09      | 0.089 | 2.8        | 0.069 |
| 线电感 (Line to line inductance)    | mH                 | 12.6      | 0.275 | 8.67       | 0.208 |
| 转矩常数 (Torque constant)           | Nm/A               | 0.736     | 0.115 | 0.736      | 0.115 |
| 反电势 (Back EMF)                   | Vrms/KRPM          | 54.5      | 8.5   | 54.5       | 8.5   |
| 转动惯量 (Rotor inertia)             | kg.cm <sup>2</sup> | 1.56      | 1.56  | 2.22       | 2.22  |
| 机身长度 (Motor length) L            | mm                 | 112       | 118   | 129        | 135   |
| 重量 (Weight)                      | kg                 | 2.5       | 2.6   | 3.2        | 3.3   |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱 编码器 刹车

### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式 (Winding Type)           | 星形 (Star connection)   |
| 径向负载 (Max radial force)         | 490N @ 20mm from the flange  |
| 轴向负载 (Max axial force)          | 196N   |
| 绝缘等级 (Insulation Class)         | Class F  |
| 防护等级 (Protection level)         | IP65   |
| 使用环境温度 (Temperature)            | -20°C~ +50°C   |
| 使用环境湿度 (Relative humidity)      | ≤90%RH (无凝露) (No dewing)   |
| 存储环境 (Storage Condition)        | -20°C~ +85°C, ≤85%RH (无凝露) (No dewing)   |
| 安装环境 (Installation environment) | 远离腐蚀、可燃性气体, 油滴, 灰尘, 海拔≤1000m Far away active gas, Combustible gas, oil drop, ash |

### ● 接线说明

(Electric Connection)

| Pin No | 引出线型号 Type | 引出线颜色 Color | 功能 Functions |
|--------|------------|-------------|--------------|
| 5      | AWG26      | 绿色 (Green)  | 霍尔电源正 (Vcc)  |
| 1      |            | 黄色 (Yellow) | 霍尔 U (Hu)    |
| 2      |            | 棕色 (Brown)  | 霍尔 V (Hv)    |
| 3      |            | 灰色 (Gray)   | 霍尔 W (Hw)    |
| 4      |            | 蓝色 (Blue)   | 霍尔电源负 (GND)  |
| 1      | 具体规格见      | 黄色 (Yellow) | U相 (Phase U) |
| 2      | 图纸定义       | 红色 (Red)    | V相 (Phase V) |
| 3      |            | 黑色 (Black)  | W相 (Phase W) |

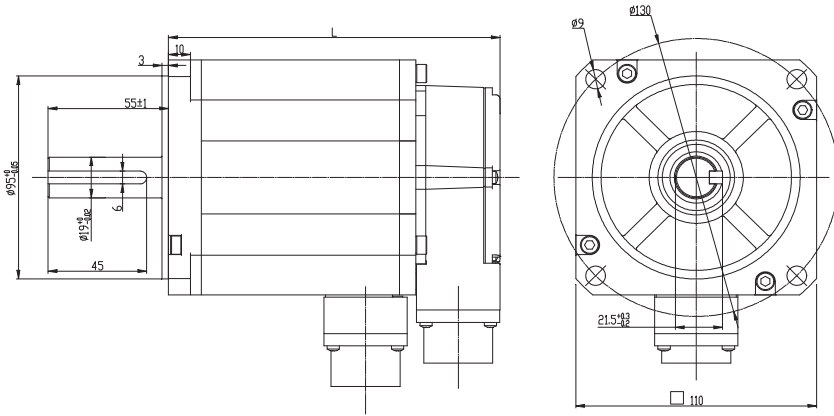
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)          | FL100BLG100 |       | FL100BLG150 |       |
|----------------------------------|--------------------|-------------|-------|-------------|-------|
|                                  |                    |             |       |             |       |
| 极数 (Number of poles)             |                    | 10          |       |             |       |
| 相数 (Number of phases)            |                    | 3           |       |             |       |
| 额定电压 (Rated voltage)             | VDC                | 310         | 48    | 310         | 48    |
| 额定转矩 (Rated torque)              | N.m                | 3.18        | 3.18  | 4.77        | 4.77  |
| 连续运行转矩 (Continuous stall torque) | N.m                | 3.81        | 3.81  | 5.72        | 5.72  |
| 额定速度 (Rated speed)               | RPM                | 3000        | 3000  | 3000        | 3000  |
| 额定功率 (Rated power)               | W                  | 1000        | 1000  | 1500        | 1500  |
| 峰值转矩 (Peak torque)               | N.m                | 7           | 7     | 10.5        | 10.5  |
| 峰值电流 (Peak current)              | A                  | 13.7        | 84.3  | 20.6        | 121   |
| 线电阻 (Line to line resistance)    | ohms@20°C          | 0.82        | 0.022 | 0.54        | 0.015 |
| 线电感 (Line to line inductance)    | mH                 | 7.4         | 0.2   | 5.2         | 0.15  |
| 转矩常数 (Torque constant)           | Nm/A               | 0.51        | 0.083 | 0.51        | 0.087 |
| 反电势 (Back EMF)                   | Vrms/KRPM          | 38          | 6.18  | 38          | 6.48  |
| 转动惯量 (Rotor inertia)             | kg.cm <sup>2</sup> | 1.3         | 1.3   | 1.84        | 1.84  |
| 机身长度 (Motor length) L            | mm                 | 137         | 142   | 159         | 164   |
| 重量 (Weight)                      | kg                 | 3.73        | 3.8   | 4.7         | 4.8   |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式 (Winding Type)           | 星形 (Star connection)   |
| 径向负载 (Max radial force)         | 630N @ 20mm from the flange  |
| 轴向负载 (Max axial force)          | 315N   |
| 绝缘等级 (Insulation Class)         | Class F  |
| 防护等级 (Protection level)         | IP65   |
| 使用环境温度 (Temperature)            | -20°C~ +50°C   |
| 使用环境湿度 (Relative humidity)      | ≤90%RH (无凝露) (No dewing)   |
| 存储环境 (Storage Condition)        | -20°C~ +85°C, ≤85%RH (无凝露) (No dewing)   |
| 安装环境 (Installation environment) | 远离腐蚀、可燃性气体, 油滴, 灰尘, 海拔≤1000m Far away active gas, Combustible gas, oil drop, ash |

### ● 接线说明

(Electric Connection)

| Pin No | 引出线型号 Type | 引出线颜色 Color | 功能 Functions |
|--------|------------|-------------|--------------|
| 5      | AWG26      | 绿色 (Green)  | 霍尔电源正 (Vcc)  |
| 1      |            | 黄色 (Yellow) | 霍尔 U (Hu)    |
| 2      |            | 棕色 (Brown)  | 霍尔 V (Hv)    |
| 3      |            | 灰色 (Gray)   | 霍尔 W (Hw)    |
| 4      |            | 蓝色 (Blue)   | 霍尔电源负 (GND)  |
| 1      | 具体规格见      | 黄色 (Yellow) | U相 (Phase U) |
| 2      | 图纸定义       | 红色 (Red)    | V相 (Phase V) |
| 3      |            | 黑色 (Black)  | W相 (Phase W) |

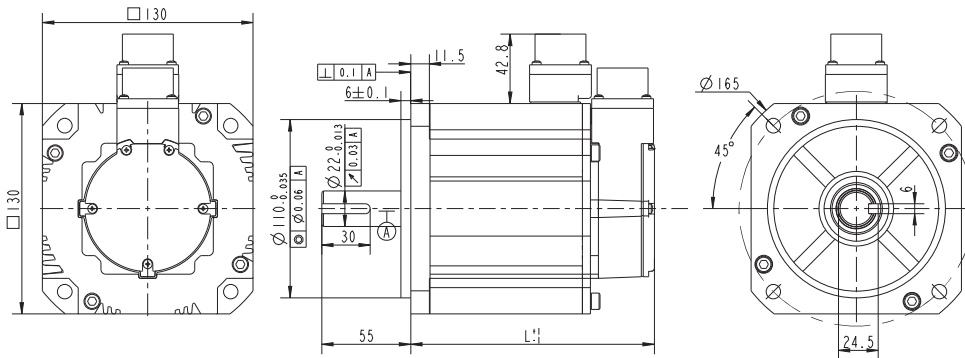
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)          | FL110BLG150 |       | FL110BLG200 |       |
|----------------------------------|--------------------|-------------|-------|-------------|-------|
|                                  |                    |             |       |             |       |
| 极数 (Number of poles)             |                    | 10          |       |             |       |
| 相数 (Number of phases)            |                    | 3           |       |             |       |
| 额定电压 (Rated voltage)             | VDC                | 310         | 48    | 310         | 48    |
| 额定转矩 (Rated torque)              | N.m                | 4.77        | 4.77  | 6.37        | 6.37  |
| 连续运行转矩 (Continuous stall torque) | N.m                | 5.72        | 5.72  | 7.64        | 7.64  |
| 额定速度 (Rated speed)               | RPM                | 3000        | 3000  | 3000        | 3000  |
| 额定功率 (Rated power)               | W                  | 1500        | 1500  | 2000        | 2000  |
| 峰值转矩 (Peak torque)               | N.m                | 14.3        | 14.3  | 19.1        | 19.1  |
| 峰值电流 (Peak current)              | A                  | 28          | 166   | 37.5        | 214   |
| 线电阻 (Line to line resistance)    | ohms@20°C          | 0.36        | 0.01  | 0.29        | 0.009 |
| 线电感 (Line to line inductance)    | mH                 | 5.6         | 0.16  | 4.8         | 0.145 |
| 转矩常数 (Torque constant)           | Nm/A               | 0.51        | 0.086 | 0.51        | 0.089 |
| 反电势 (Back EMF)                   | Vrms/KRPM          | 38.1        | 6.35  | 38.1        | 6.63  |
| 转动惯量 (Rotor inertia)             | kg.cm <sup>2</sup> | 3.1         | 3.1   | 4.1         | 4.1   |
| 机身长度 (Motor length) L            | mm                 | 151.5       | 156.5 | 168.5       | 173.5 |
| 重量 (Weight)                      | kg                 | 5           | 5.2   | 6.7         | 6.9   |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱 编码器 刹车

### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式 (Winding Type)           | 星形 (Star connection)   |
| 径向负载 (Max radial force)         | 490N @ 20mm from the flange  |
| 轴向负载 (Max axial force)          | 196N   |
| 绝缘等级 (Insulation Class)         | Class F  |
| 防护等级 (Protection level)         | IP65   |
| 使用环境温度 (Temperature)            | -20°C~+50°C  |
| 使用环境湿度 (Relative humidity)      | ≤90%RH (无凝露) (No dewing)   |
| 存储环境 (Storage Condition)        | -20°C~+60°C, ≤85%RH (无凝露) (No dewing)  |
| 安装环境 (Installation environment) | 远离腐蚀、可燃性气体, 油滴, 灰尘, 海拔≤1000m Far away active gas, Combustible gas, oil drop, ash |

### ● 接线说明

(Electric Connection)

| Pin No | 引出线型号 Type | 引出线颜色 Color | 功能 Functions |
|--------|------------|-------------|--------------|
| 5      | AWG26      | 绿色 (Green)  | 霍尔电源正 (Vcc)  |
| 1      |            | 黄色 (Yellow) | 霍尔 U (Hu)    |
| 2      |            | 棕色 (Brown)  | 霍尔 V (Hv)    |
| 3      |            | 灰色 (Gray)   | 霍尔 W (Hw)    |
| 4      |            | 蓝色 (Blue)   | 霍尔电源负 (GND)  |
| 1      | 具体规格见      | 黄色 (Yellow) | U相 (Phase U) |
| 2      | 图纸定义       | 红色 (Red)    | V相 (Phase V) |
| 3      |            | 黑色 (Black)  | W相 (Phase W) |

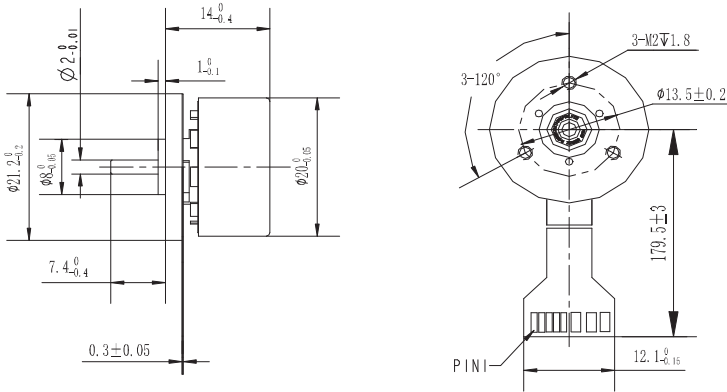
### ● 电性能

(Electrical Specifications)

| 类型 (Model)                              | 单位 (Unit)          | FL130BLG200 |       | FL130BLG300 |       |
|---|--------------------|-------------|-------|-------------|-------|
|   |                    | 2000        | 48    | 220         | 48    |
| 额定功率 (Rated power) Pn                   | W                  | 2000        |       | 3000        |       |
| 额定电压 (Rated voltage) Un                 | VAC/VDC            | 220         | 48    | 220         | 48    |
| 额定转速 (Rated speed) nn                   | RPM                | 2000        | 2000  | 2000        | 2000  |
| 额定转矩 (Rated torque) Tn                  | N·m                | 9.55        | 9.55  | 14.3        | 14.3  |
| 额定电流 (Rated current) In                 | Arms               | 7.8         | 52.9  | 11.7        | 79.3  |
| 峰值转矩 (Peak torque) Tm                   | N·m                | 28.65       | 28.65 | 42.9        | 42.9  |
| 峰值电流 (Peak current) Im                  | Arms               | 23.4        | 158.7 | 35.1        | 237.9 |
| 电阻 (Line to line resistance) RL         | ohm                | 1.4         | 0.03  | 0.84        | 0.018 |
| 电感 (Line to line inductance) LL         | mH                 | 6.8         | 0.14  | 4.8         | 0.1   |
| 反电势系数 (BackEMF) Ke                      | V/Krpm             | 81          | 12    | 81          | 12    |
| 转矩系数 (Torque constant) Kt               | N.m/A              | 1.22        | 0.18  | 1.22        | 0.18  |
| 转动惯量 (Rotor inertia) Jm0                | Kg.cm <sup>2</sup> | 14          | 14    | 19.9        | 19.9  |
| 转动惯量带制动器 (Rotor inertia with brake) Jm1 | Kg.cm <sup>2</sup> | 15.2        | 15.2  | 20.2        | 20.2  |
| 极数 (Number of poles)                    |                    | 10          | 10    | 10          | 10    |
| 机身长度 (Motor length) L1                  | mm                 | 150         | 165   | 178         | 193   |
| 机身长度带制动器 (Motor length with brake) L2   | mm                 | 178         | 193   | 206         | 221   |
| 重量 (Weight)                             | Kg                 | 7           | 7.5   | 11.7        | 12.7  |
| 重量带制动器 (Weight with brake)              | Kg                 | 10.5        | 10    | 14.2        | 15.2  |

### 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 5.3N距法兰5mm (5mm From the flange)         |
| 最大轴向负载 (Max axial force)     | 1.8N                                     |
| 介电强度 (Dielectric Strength)   | 360VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100M $\Omega$ , 500VDC                   |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| Pin No | 引出线型号<br>Type | 功能<br>Functions |
|--------|---------------|-----------------|
| 1      | FPC           | 霍尔电源正 (Vcc)     |
| 2      |               | 霍尔 W (Hw)       |
| 3      |               | 霍尔 U (Hu)       |
| 4      |               | 霍尔 V (Hv)       |
| 5      |               | 霍尔电源负 (GND)     |
| 6      |               | W相 (Phase W)    |
| 7      |               | V相 (Phase V)    |
| 8      |               | U相 (Phase U)    |

### 电性能

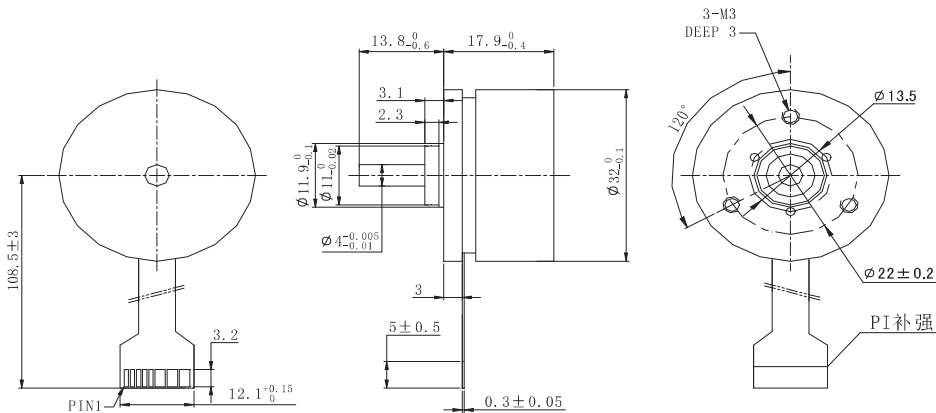
(Electrical Specifications)

|                                  | 单位 (Unit)         | FL20BLW14-12V-5105A | FL20BLW14-24V-5205A |
|----------------------------------|-------------------|---------------------|---------------------|
| 极数 (Number of poles)             |                   |                     | 8                   |
| 相数 (Number of phases)            |                   |                     | 3                   |
| 额定电压 (Rated voltage)             | VDC               | 12                  | 24                  |
| 额定转矩 (Rated torque)              | mN.m              | 7.59                | 7.74                |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 9.1                 | 9.2                 |
| 额定速度 (Rated speed)               | RPM               | 5170                | 5220                |
| 额定功率 (Rated power)               | W                 | 5                   | 5                   |
| 峰值扭矩 (Peak torque)               | mN.m              | 19                  | 20                  |
| 峰值电流 (Peak current)              | A                 | 1.62                | 0.85                |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 7.2                 | 26.1                |
| 线电感 (Line to line inductance)    | mH                | 0.62                | 2.6                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 12                  | 24                  |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 0.89                | 1.78                |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 5.1                 | 5.1                 |
| 机身长度 (Motor length)              | mm                | 14                  | 14                  |
| 重量 (Weight)                      | g                 | 23                  | 23                  |



### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 14N距法兰5mm (5mm From the flange)          |
| 最大轴向负载 (Max axial force)     | 4.8N                                     |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| Pin No | 引出线型号<br>Type | 功能<br>Functions |
|--------|---------------|-----------------|
| 1      | FPC           | 霍尔电源正 (Vcc)     |
| 2      |               | 霍尔 W (Hw)       |
| 3      |               | 霍尔 U (Hu)       |
| 4      |               | 霍尔 V (Hv)       |
| 5      |               | 霍尔电源负 (GND)     |
| 6      |               | W相 (Phase W)    |
| 7      |               | V相 (Phase V)    |
| 8      |               | U相 (Phase U)    |

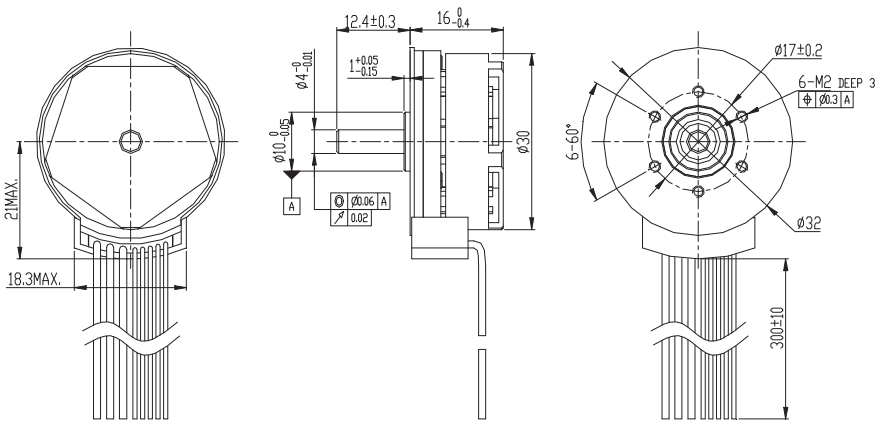
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL32BLW18<br>-9V-3706A | FL32BLW18<br>-12V-4607A | FL32BLW18<br>-24V-4507A | FL32BLW18<br>-48V-4808A |
|----------------------------------|-------------------|------------------------|-------------------------|-------------------------|-------------------------|
| 极数 (Number of poles)             |                   | 8                      |                         |                         |                         |
| 相数 (Number of phases)            |                   | 3                      |                         |                         |                         |
| 额定电压 (Rated voltage)             | VDC               | 9                      | 12                      | 24                      | 48                      |
| 额定转矩 (Rated torque)              | mN.m              | 29.5                   | 25.1                    | 25.5                    | 24.7                    |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 35.4                   | 30.1                    | 30.6                    | 29.6                    |
| 额定速度 (Rated speed)               | RPM               | 2100                   | 2800                    | 2760                    | 2950                    |
| 额定功率 (Rated power)               | W                 | 6                      | 7                       | 7                       | 8                       |
| 峰值扭矩 (Peak torque)               | mN.m              | 73.8                   | 75.3                    | 76.5                    | 74.1                    |
| 峰值电流 (Peak current)              | A                 | 3.4                    | 3.2                     | 1.7                     | 0.97                    |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 2.87                   | 3.43                    | 13.7                    | 53                      |
| 线电感 (Line to line inductance)    | mH                | 1.61                   | 1.87                    | 7.73                    | 27.8                    |
| 转矩常数 (Torque constant)           | mN.m/A            | 23                     | 24.8                    | 51                      | 96.1                    |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 1.7                    | 1.83                    | 3.77                    | 7.1                     |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 35                     | 35                      | 35                      | 35                      |
| 机身长度 (Motor length)              | mm                | 18                     | 18                      | 18                      | 18                      |
| 重量 (Weight)                      | g                 | 50                     | 50                      | 50                      | 50                      |

### 机械尺寸

(Dimensions)



选件 Options



### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 14N距法兰5mm (5mm From the flange)          |
| 最大轴向负载 (Max axial force)     | 4.8N                                     |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1061 26AWG  | 红色 (RED)       | 霍尔电源正 (Vcc)     |
|               | 绿色 (GRN)       | 霍尔 U (Hu)       |
|               | 蓝色 (BLU)       | 霍尔 V (Hv)       |
|               | 灰色 (GRY)       | 霍尔 W (Hw)       |
|               | 黑色 (BLK)       | 霍尔电源负 (GND)     |
| UL1007 20AWG  | 棕色 (BRN)       | W相 (Phase W)    |
|               | 橙色 (ORG)       | V相 (Phase V)    |
|               | 黄色 (YEL)       | U相 (Phase U)    |

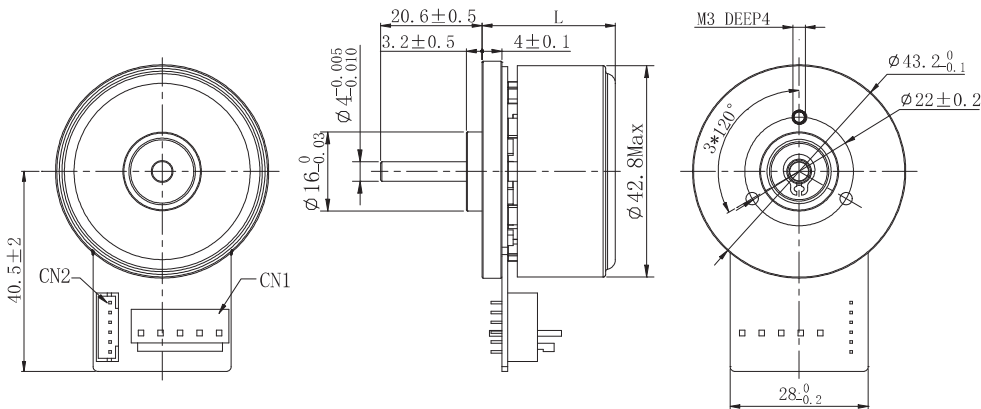
### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL32BLWA16-9V-3314A | FL32BLWA16-12V-3716A | FL32BLWA16-24V-4118A |
|----------------------------------|-------------------|---------------------|----------------------|----------------------|
| 极数 (Number of poles)             |                   | 14                  |                      |                      |
| 相数 (Number of phases)            |                   | 3                   |                      |                      |
| 额定电压 (Rated voltage)             | VDC               | 9                   | 12                   | 24                   |
| 额定转矩 (Rated torque)              | mN.m              | 39.5                | 40                   | 41                   |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 47.4                | 48                   | 49.2                 |
| 额定速度 (Rated speed)               | RPM               | 3320                | 3750                 | 4150                 |
| 额定功率 (Rated power)               | W                 | 14                  | 16                   | 18                   |
| 峰值转矩 (Peak torque)               | mN.m              | 118.5               | 120                  | 123                  |
| 峰值电流 (Peak current)              | A                 | 8.61                | 6.8                  | 3.51                 |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.55                | 0.88                 | 3.26                 |
| 线电感 (Line to line inductance)    | mH                | 0.19                | 0.33                 | 1.29                 |
| 转矩常数 (Torque constant)           | mNm/A             | 13.8                | 18.9                 | 35.8                 |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 1.02                | 1.4                  | 2.65                 |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 18.3                | 18.3                 | 18.3                 |
| 机身长度 (Motor length)              | mm                | 16                  | 16                   | 16                   |
| 重量 (Weight)                      | g                 | 58                  | 58                   | 58                   |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.14mm@450g                              |
| 最大径向负载 (Max radial force)    | 20N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 接插件型号<br>Connector Model | Pin位<br>Pin number | 功能<br>Functions |
|--------------------------|--------------------|-----------------|
| JST B6B-PH-K-S           | Pin 2              | 霍尔电源正 (Vcc)     |
|                          | Pin 3              | 霍尔 U (Hu)       |
|                          | Pin 4              | 霍尔 V (Hv)       |
|                          | Pin 5              | 霍尔 W (Hw)       |
|                          | Pin 1/ Pin 6       | 霍尔电源负 (GND)     |
| JST B5P-VH               | Pin 2              | U相 (Phase U)    |
|                          | Pin 3              | V相 (Phase V)    |
|                          | Pin 4              | W相 (Phase W)    |
|                          | Pin 1/ Pin 5       | 电源负 (GND)       |

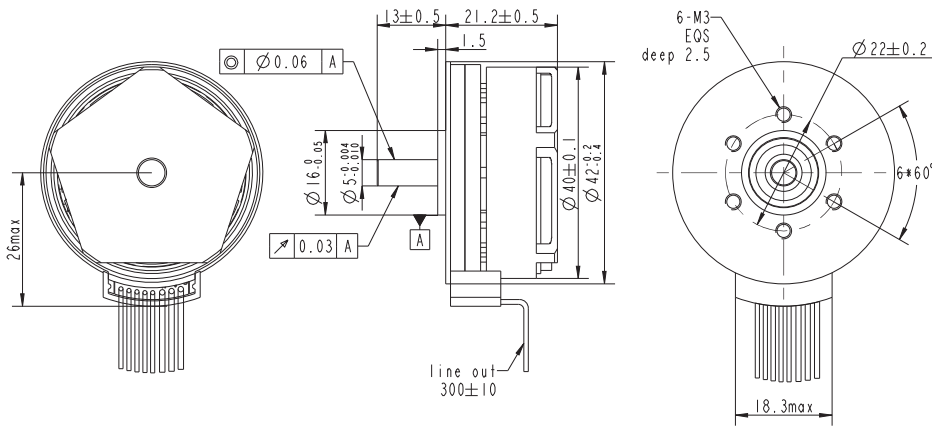
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL45BLW18-24V-7130A | FL45BLW21-24V-6750A | FL45BLW27-24V-6170A |
|----------------------------------|-------------------|---------------------|---------------------|---------------------|
| 极数 (Number of poles)             |                   |                     | 16                  |                     |
| 相数 (Number of phases)            |                   |                     | 3                   |                     |
| 额定电压 (Rated voltage)             | VDC               |                     | 24                  |                     |
| 额定转矩 (Rated torque)              | mN.m              | 50                  | 84                  | 130                 |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 60                  | 100                 | 156                 |
| 额定速度 (Rated speed)               | RPM               | 5000                | 5260                | 4840                |
| 额定功率 (Rated power)               | W                 | 30                  | 50                  | 70                  |
| 峰值转矩 (Peak torque)               | mN.m              | 150                 | 250                 | 390                 |
| 峰值电流 (Peak current)              | A                 | 4.3                 | 7.4                 | 11                  |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 1.42                | 0.72                | 0.56                |
| 线电感 (Line to line inductance)    | mH                | 0.59                | 0.33                | 0.27                |
| 转矩常数 (Torque constant)           | mN.m/A            | 35.2                | 34.4                | 37.1                |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 2.61                | 2.55                | 2.75                |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 100                 | 135                 | 180                 |
| 机身长度 (Motor length) L            | mm                | 18                  | 21.6                | 27                  |
| 重量 (Weight)                      | Kg                | 0.08                | 0.12                | 0.15                |

### 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 20N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +55°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1061 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 绿色 (Green)     | 霍尔 U (Hu)       |
|               | 蓝色 (Blue)      | 霍尔 V (Hv)       |
|               | 灰色 (Grey)      | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1007 AWG20  | 棕色 (Brown)     | U相 (Phase U)    |
|               | 橙色 (Orange)    | V相 (Phase V)    |
|               | 黄色 (Yellow)    | W相 (Phase W)    |

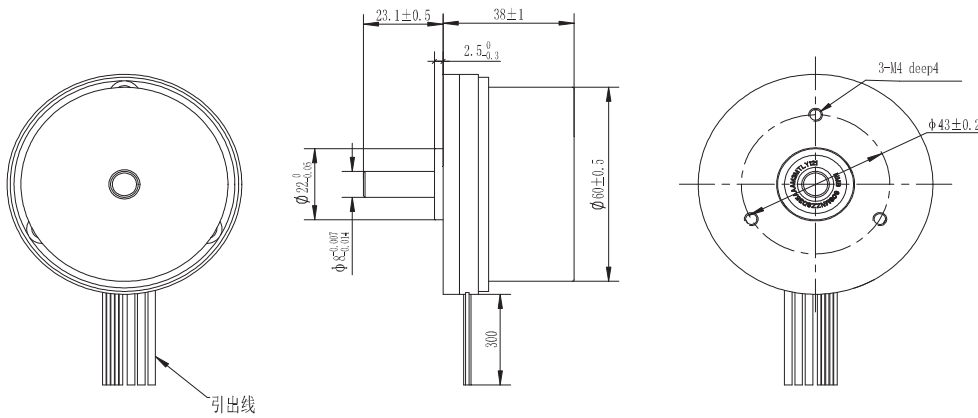
### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL45BLWH21-24V-4452A-2 |
|----------------------------------|-------------------|------------------------|
| 极数 (Number of poles)             |                   | 14                     |
| 相数 (Number of phases)            |                   | 3                      |
| 额定电压 (Rated voltage)             | VDC               | 24                     |
| 额定转矩 (Rated torque)              | mN.m              | 112                    |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 135                    |
| 额定速度 (Rated speed)               | RPM               | 4400                   |
| 额定功率 (Rated power)               | W                 | 50                     |
| 峰值扭矩 (Peak torque)               | mN.m              | 336                    |
| 峰值电流 (Peak current)              | A                 | 9                      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.75                   |
| 线电感 (Line to line inductance)    | mH                | 0.42                   |
| 转矩常数 (Torque constant)           | mN.m/A            | 37                     |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.1                    |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 135                    |
| 机身长度 (Motor length)              | mm                | 21.5                   |
| 重量 (Weight)                      | Kg                | 0.13                   |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱 编码器

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.14mm@450g                              |
| 最大径向负载 (Max radial force)    | 28N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1332 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1332 AWG18  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

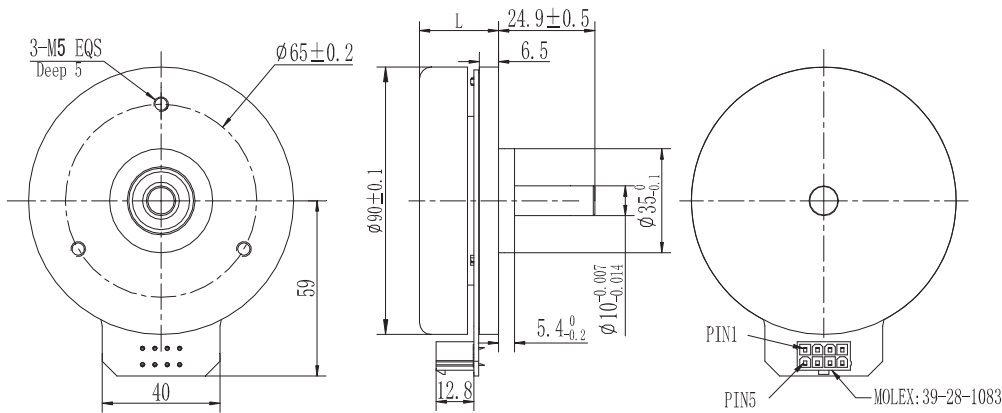
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL60BLW38-24V-37110A-1 |
|----------------------------------|-------------------|------------------------|
| 极数 (Number of poles)             |                   | 14                     |
| 相数 (Number of phases)            |                   | 3                      |
| 额定电压 (Rated voltage)             | VDC               | 24                     |
| 额定转矩 (Rated torque)              | mN.m              | 290                    |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 348                    |
| 额定速度 (Rated speed)               | RPM               | 3700                   |
| 额定功率 (Rated power)               | W                 | 110                    |
| 峰值转矩 (Peak torque)               | mN.m              | 870                    |
| 峰值电流 (Peak current)              | A                 | 17.4                   |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.29                   |
| 线电感 (Line to line inductance)    | mH                | 0.3                    |
| 转矩常数 (Torque constant)           | mN.m/A            | 50                     |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.75                   |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 1000                   |
| 机身长度 (Motor length)              | mm                | 38                     |
| 重量 (Weight)                      | Kg                | 0.5                    |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 110N 距法兰10mm (10mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 接插件型号<br>Connector Model | Pin位<br>Pin number | 功能<br>Functions |
|--------------------------|--------------------|-----------------|
| MOLEX:<br>39-28-1083     | PIN3               | 霍尔电源正 (Vcc)     |
|                          | PIN1               | 霍尔 U (Hu)       |
|                          | PIN2               | 霍尔 V (Hv)       |
|                          | PIN5               | 霍尔 W (Hw)       |
|                          | PIN6               | 霍尔电源负 (GND)     |
|                          | PIN7               | U相 (Phase U)    |
|                          | PIN8               | V相 (Phase V)    |
|                          | PIN4               | W相 (Phase W)    |

### ● 电性能

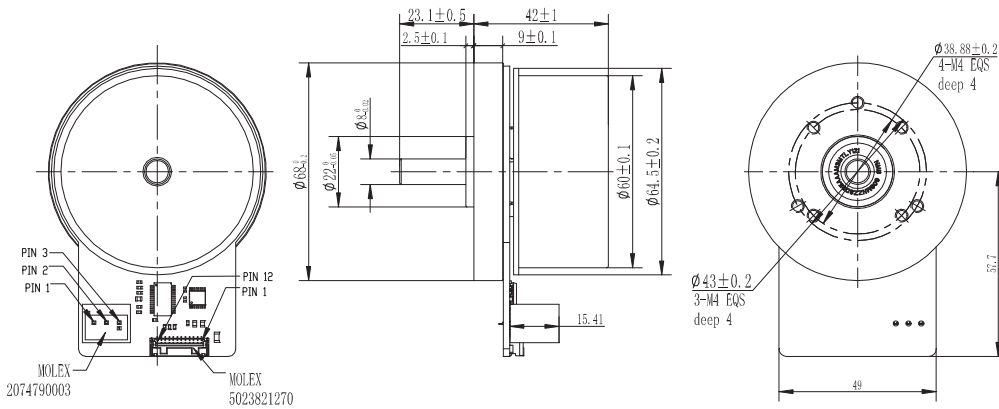
(Electrical Specifications)

|                                  | 单位 (Unit)         | FL90BLW27-24V-27130A | FL90BLW40-48V-16170A |
|----------------------------------|-------------------|----------------------|----------------------|
| 极数 (Number of poles)             |                   |                      | 22                   |
| 相数 (Number of phases)            |                   |                      | 3                    |
| 额定电压 (Rated voltage)             | VDC               | 24                   | 48                   |
| 额定转矩 (Rated torque)              | N.m               | 0.457                | 0.964                |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.548                | 1.157                |
| 额定速度 (Rated speed)               | RPM               | 2700                 | 1670                 |
| 额定功率 (Rated power)               | W                 | 130                  | 169                  |
| 峰值扭矩 (Peak torque)               | N.m               | 1.6                  | 3                    |
| 峰值电流 (Peak current)              | A                 | 23                   | 13                   |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.21                 | 0.65                 |
| 线电感 (Line to line inductance)    | mH                | 0.19                 | 0.9                  |
| 转矩常数 (Torque constant)           | mN.m/A            | 70.2                 | 241                  |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 5.2                  | 17.9                 |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 3000                 | 5000                 |
| 机身长度 (Motor length) L            | mm                | 27                   | 40                   |
| 重量 (Weight)                      | Kg                | 0.6                  | 1                    |



### 机械尺寸

(Dimensions)



选件 Options



### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 28N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 15N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

| 接插件型号<br>Connector Mode | Pin位<br>Pin number | 功能<br>Functions |
|-------------------------|--------------------|-----------------|
| Molex<br>2074790003     | Pin 1              | W相 (Phase W)    |
|                         | Pin 2              | V相 (Phase V)    |
|                         | Pin 3              | U相 (Phase U)    |
| Molex<br>5023821270     | Pin 1              | 霍尔电源正 (Vcc)     |
|                         | Pin 2              | 编码器 (A-)        |
|                         | Pin 3              | 编码器 (A+)        |
|                         | Pin 4              | 编码器 (B-)        |
|                         | Pin 5              | 编码器 (B+)        |
|                         | Pin 6              | 编码器 (Z-)        |
|                         | Pin 7              | 编码器 (Z+)        |
|                         | Pin 8              | 霍尔 U (Hu)       |
|                         | Pin 9              | 霍尔 V (Hv)       |
| Pin 10                  | 霍尔 W (Hw)          |                 |
| Pin 11                  | 编码器屏蔽线(PE)         |                 |
| Pin 12                  | 霍尔电源负 (GND)        |                 |

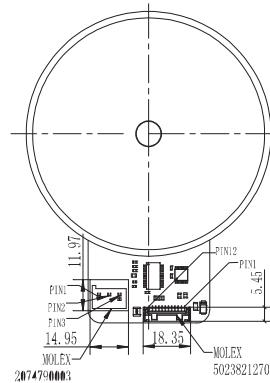
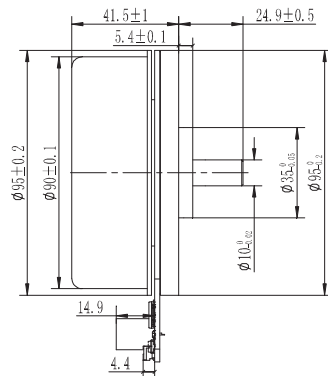
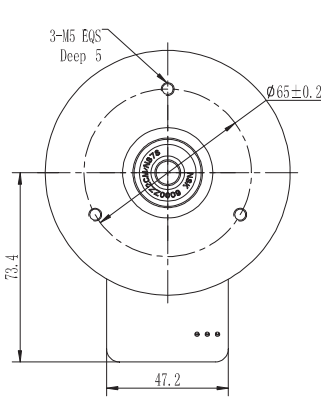
### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL60BLW42-24V-37110A-EN |
|----------------------------------|-------------------|-------------------------|
| 极数 (Number of poles)             |                   | 14                      |
| 相数 (Number of phases)            |                   | 3                       |
| 额定电压 (Rated voltage)             | VDC               | 24                      |
| 额定转矩 (Rated torque)              | mN.m              | 290                     |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 348                     |
| 额定速度 (Rated speed)               | RPM               | 3500                    |
| 额定功率 (Rated power)               | W                 | 106                     |
| 峰值扭矩 (Peak torque)               | mN.m              | 870                     |
| 峰值电流 (Peak current)              | A                 | 17                      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.23                    |
| 线电感 (Line to line inductance)    | mH                | 0.22                    |
| 转矩常数 (Torque constant)           | mN.m/A            | 50                      |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 4                       |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 1000                    |
| 机身长度 (Motor length)              | mm                | 42                      |
| 重量 (Weight)                      | Kg                | 0.48kg                  |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 110N 距法兰10mm (10mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 接插件型号<br>Connector Mode | Pin位<br>Pin number | 功能<br>Functions |
|-------------------------|--------------------|-----------------|
| Molex<br>2074790003     | Pin 1              | W相 (Phase W)    |
|                         | Pin 2              | V相 (Phase V)    |
|                         | Pin 3              | U相 (Phase U)    |
| Molex<br>5023821270     | Pin 1              | 霍尔电源正 (Vcc)     |
|                         | Pin 2              | 编码器 (A-)        |
|                         | Pin 3              | 编码器 (A+)        |
|                         | Pin 4              | 编码器 (B-)        |
|                         | Pin 5              | 编码器 (B+)        |
|                         | Pin 6              | 编码器 (Z-)        |
|                         | Pin 7              | 编码器 (Z+)        |
|                         | Pin 8              | 霍尔 U (Hu)       |
|                         | Pin 9              | 霍尔 V (Hv)       |
|                         | Pin 10             | 霍尔 W (Hw)       |
| Pin 11                  | 编码器屏蔽线(PE)         |                 |
| Pin 12                  | 霍尔电源负 (GND)        |                 |

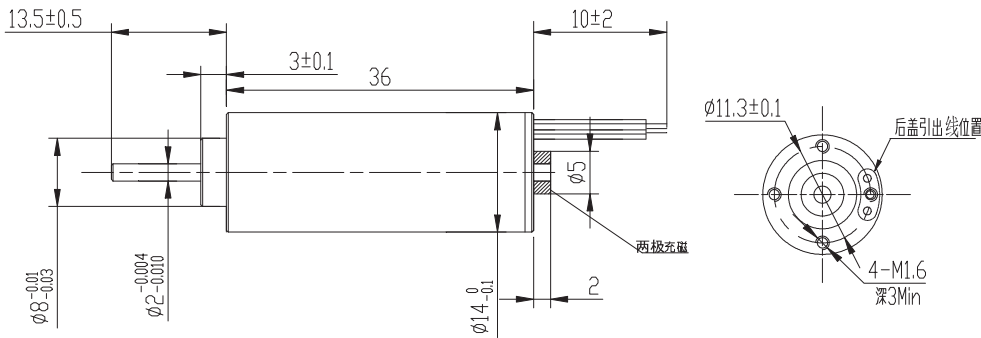
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL90BLW42-48V-16170A-EN |
|----------------------------------|-------------------|-------------------------|
| 极数 (Number of poles)             |                   | 22                      |
| 相数 (Number of phases)            |                   | 3                       |
| 额定电压 (Rated voltage)             | VDC               | 48                      |
| 额定转矩 (Rated torque)              | mN.m              | 964                     |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 1156                    |
| 额定速度 (Rated speed)               | RPM               | 1670                    |
| 额定功率 (Rated power)               | W                 | 169                     |
| 峰值扭矩 (Peak torque)               | mN.m              | 3000                    |
| 峰值电流 (Peak current)              | A                 | 13                      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.64                    |
| 线电感 (Line to line inductance)    | mH                | 0.65                    |
| 转矩常数 (Torque constant)           | mN.m/A            | 230                     |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 17.7                    |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 5000                    |
| 机身长度 (Motor length)              | mm                | 41.5                    |
| 重量 (Weight)                      | Kg                | 1.1kg                   |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |                                   |
|------------------------------|-----------------------------------|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)              |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                         |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                     |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                     |
| 绝缘等级 (Insulation Class)      | Class B                           |
| 径向间隙 (Radial Play)           | 0.025mm@4N                        |
| 轴向间隙 (Axial Play)            | 0.3mm@4N                          |
| 最大径向负载 (Max radial force)    | 15N距法兰10mm (10mm From the flange) |
| 最大轴向负载 (Max axial force)     | 5N                                |

### ● 接线说明

(Electric Connection)

| 线型号<br>Type  | 线颜色<br>Color | 功能<br>Functions |
|--------------|--------------|-----------------|
| UL1332 AWG26 | 黄色 (Yellow)  | U相 (Phase U)    |
|              | 红色 (Red)     | V相 (Phase V)    |
|              | 黑色 (Black)   | W相 (Phase W)    |

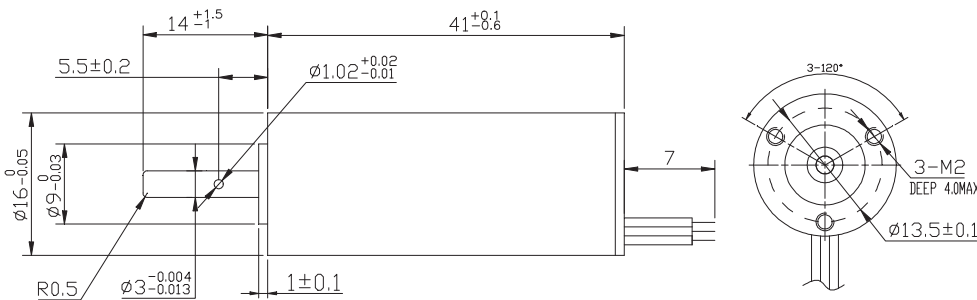
### ● 电性能

(Electrical Specifications)

|  | 单位 (Unit) | FL14SBL45-6V-12000 |
|--|-----------|--------------------|
| 极数 (Number of poles)                           |           | 2                  |
| 相数 (Number of phases)                          |           | 3                  |
| 额定电压 (Rated voltage)                           | VDC       | 6                  |
| 空载转速 (No load speed)                           | RPM       | 11000              |
| 空载电流 (No load current)                         | A         | 0.1                |
| 额定转矩 (Rated torque)                            | mN.m      | 3.6                |
| 额定电流 (Rated current)                           | A         | 0.8                |
| 额定速度 (Rated speed)                             | RPM       | 10000              |
| 额定功率 (Rated power)                             | W         | 3.8                |
| 额定效率 (Rated efficiency)                        | %         | 70                 |
| 峰值转矩 (Peak torque)                             | mN.m      | 10.8               |
| 峰值电流 (Peak current)                            | A         | 2.4                |
| 线电阻 (Line to line resistance)                  | ohms@20°C | 1.3                |
| 线电感 (Line to line inductance)                  | mH        | 0.06               |
| 转矩常数 (Torque constant)                         | mNm/A     | 5.27               |
| 反电势 (Back EMF)                                 | Vrms/Krpm | 0.39               |
| 外壳-环境热阻 (Housing - Ambient thermal resistance) | K/W       | 7.32               |
| 电机热时间常数 (Motor thermal time constant)          | S         | 869                |
| 绕组最高允许温度 (Max temperature of winding)          | °C        | 155                |
| 电气时间常数 (Electrical time constant)              | ms        | 0.046              |

### 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

### 特性概要

(General Specifications)

|                              |                                   |
|------------------------------|-----------------------------------|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)              |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                         |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                     |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                     |
| 绝缘等级 (Insulation Class)      | Class B                           |
| 径向间隙 (Radial Play)           | 0.02mm@4N                         |
| 轴向间隙 (Axial Play)            | 0.3mm@4N                          |
| 最大径向负载 (Max radial force)    | 15N距法兰10mm (10mm From the flange) |
| 最大轴向负载 (Max axial force)     | 5N                                |

### 接线说明

(Electric Connection)

| 线型号<br>Type  | 线颜色<br>Color | 功能<br>Functions |
|--------------|--------------|-----------------|
| UL1430 AWG26 | 黄色(Yellow)   | U相 (Phase U)    |
|              | 红色( Red)     | V相 (Phase V)    |
|              | 黑色(Black)    | W相 (Phase W)    |

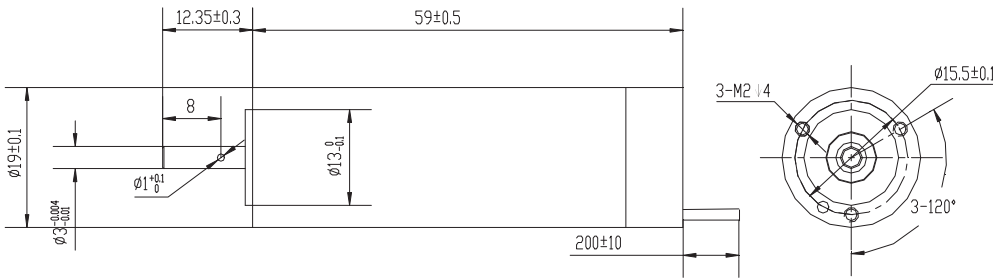
### 电性能

(Electrical Specifications)

|  | 单位 (Unit) | FL16SBL40-32V-400-21A-5 | FL16SBL40-6V-12000-X |
|--|-----------|-------------------------|----------------------|
| 极数 (Number of poles)                           |           | 2                       | 2                    |
| 相数 (Number of phases)                          |           | 3                       | 3                    |
| 额定电压 (Rated voltage)                           | VDC       | 32                      | 6                    |
| 空载转速 (No load speed)                           | RPM       | 40000                   | 12000                |
| 空载电流 (No load current)                         | A         | 0.2                     | 0.2                  |
| 额定转矩 (Rated torque)                            | mN.m      | 6                       | 2.5                  |
| 额定电流 (Rated current)                           | A         | 1                       | 0.5                  |
| 额定速度 (Rated speed)                             | RPM       | 35000                   | 10000                |
| 额定功率 (Rated power)                             | W         | 22                      | 2.6                  |
| 额定效率 (Rated efficiency)                        | %         | 80                      | 75                   |
| 峰值扭矩 (Peak torque)                             | mN.m      | 18                      | 7.5                  |
| 峰值电流 (Peak current)                            | A         | 2.4                     | 1.5                  |
| 线电阻 (Line to line resistance)                  | ohms@20°C | 2.25                    | 1.4                  |
| 线电感 (Line to line inductance)                  | mH        | 0.13                    | 0.07                 |
| 转矩常数 (Torque constant)                         | mNm/A     | 7.43                    | 4.7                  |
| 反电势 (Back EMF)                                 | Vrms/Krpm | 0.55                    | 0.35                 |
| 外壳-环境热阻 (Housing - Ambient thermal resistance) | K/W       | 8.4                     | 7.2                  |
| 电机热时间常数 (Motor thermal time constant)          | S         | 762                     | 930                  |
| 绕组最高允许温度 (Max temperature of winding)          | °C        | 155                     | 155                  |
| 电气时间常数 (Electrical time constant)              | ms        | 0.057                   | 0.05                 |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |                                |
|------------------------------|--------------------------------|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)           |
| 介电强度 (Dielectric Strength)   | 360VAC/1S                      |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                  |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                  |
| 绝缘等级 (Insulation Class)      | Class B                        |
| 径向间隙 (Radial Play)           | 0.02mm@4N                      |
| 轴向间隙 (Axial Play)            | 0.14mm@4N                      |
| 最大径向负载 (Max radial force)    | 8N距法兰5mm (5mm From the flange) |
| 最大轴向负载 (Max axial force)     | 4N                             |

### ● 接线说明

(Electric Connection)

| 线型号<br>Type        | 线颜色<br>Color | 功能<br>Functions |
|--------------------|--------------|-----------------|
| AFR250-SY<br>AWG26 | 红色(Red)      | 霍尔电源正(Vcc)      |
|                    | 蓝色(Blue)     | 霍尔 W (Hw)       |
|                    | 绿色(Green)    | 霍尔 V (Hv)       |
|                    | 白色(White)    | 霍尔 U (Hu)       |
|                    | 黑色(Black)    | 霍尔电源负(GND)      |
| UL1332 AWG22       | 黄色(Yellow)   | U相 (Phase U)    |
|                    | 红色( Red)     | V相 (Phase V)    |
|                    | 黑色(Black)    | W相 (Phase W)    |

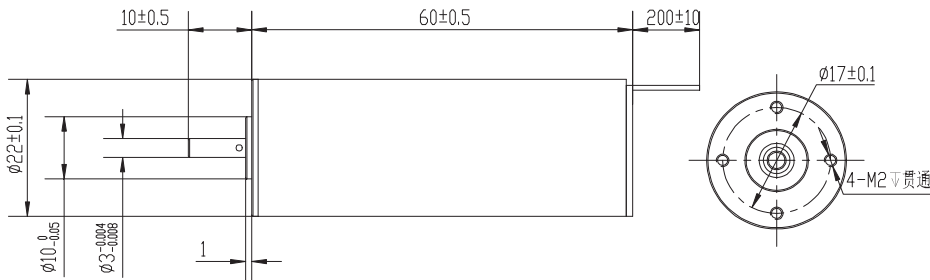
### ● 电性能

(Electrical Specifications)

|  | 单位 (Unit) | FL19SBL56-36V-530-130A | FL19SBL44-12V-280-30A |
|--|-----------|------------------------|-----------------------|
| 极数 (Number of poles)                           |           | 2                      | 2                     |
| 相数 (Number of phases)                          |           | 3                      | 3                     |
| 额定电压 (Rated voltage)                           | VDC       | 36                     | 12                    |
| 空载转速 (No load speed)                           | RPM       | 58000                  | 35000                 |
| 空载电流 (No load current)                         | A         | 0.2                    | 0.2                   |
| 额定转矩 (Rated torque)                            | mN.m      | 23.9                   | 11                    |
| 额定电流 (Rated current)                           | A         | 4.5                    | 3.5                   |
| 额定速度 (Rated speed)                             | RPM       | 53000                  | 28000                 |
| 额定功率 (Rated power)                             | W         | 130                    | 30                    |
| 额定效率 (Rated efficiency)                        | %         | 84.5                   | 83.7                  |
| 峰值转矩 (Peak torque)                             | mN.m      | 72                     | 33                    |
| 峰值电流 (Peak current)                            | A         | 13.5                   | 10.5                  |
| 线电阻 (Line to line resistance)                  | ohms@20°C | 0.45                   | 0.31                  |
| 线电感 (Line to line inductance)                  | mH        | 0.045                  | 0.027                 |
| 转矩常数 (Torque constant)                         | mNm/A     | 5.6                    | 3.2                   |
| 反电势 (Back EMF)                                 | Vrms/Krpm | 0.42                   | 0.24                  |
| 外壳-环境热阻 (Housing - Ambient thermal resistance) | K/W       | 11.6                   | 9                     |
| 电机热时间常数 (Motor thermal time constant)          | S         | 840                    | 780                   |
| 绕组最高允许温度 (Max temperature of winding)          | °C        | 155                    | 155                   |
| 电气时间常数 (Electrical time constant)              | ms        | 0.1                    | 0.087                 |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |                                |
|------------------------------|--------------------------------|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)           |
| 介电强度 (Dielectric Strength)   | 360VAC/1S                      |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                  |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                  |
| 绝缘等级 (Insulation Class)      | Class B                        |
| 径向间隙 (Radial Play)           | 0.02mm@4N                      |
| 轴向间隙 (Axial Play)            | 0.14mm@4N                      |
| 最大径向负载 (Max radial force)    | 8N距法兰5mm (5mm From the flange) |
| 最大轴向负载 (Max axial force)     | 4N                             |

### ● 接线说明

(Electric Connection)

| 线型号<br>Type        | 线颜色<br>Color | 功能<br>Functions |
|--------------------|--------------|-----------------|
| AFR250-SY<br>AWG26 | 红色(Red)      | 霍尔电源正(Vcc)      |
|                    | 蓝色(Blue)     | 霍尔 W (Hw)       |
|                    | 绿色(Green)    | 霍尔 V (Hv)       |
|                    | 白色(White)    | 霍尔 U (Hu)       |
|                    | 黑色(Black)    | 霍尔电源负(GND)      |
| UL1332 AWG20       | 黄色(Yellow)   | U相 (Phase U)    |
|                    | 红色 (Red)     | V相 (Phase V)    |
|                    | 黑色(Black)    | W相 (Phase W)    |

### ● 电性能

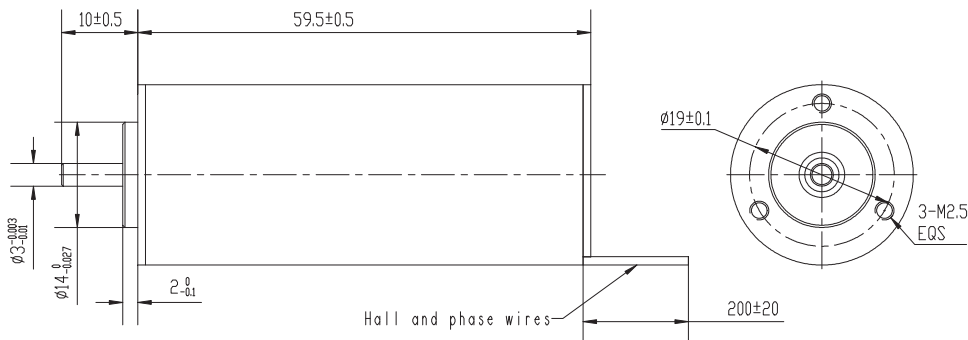
(Electrical Specifications)

|  | 单位 (Unit) | FL22SBL70-24V-300-130A | FL22SBL58-24V-450-100A |
|--|-----------|------------------------|------------------------|
| 极数 (Number of poles)                           |           | 2                      | 2                      |
| 相数 (Number of phases)                          |           | 3                      | 3                      |
| 额定电压 (Rated voltage)                           | VDC       | 24                     | 24                     |
| 空载转速 (No load speed)                           | RPM       | 40000                  | 48000                  |
| 空载电流 (No load current)                         | A         | 0.7                    | 0.56                   |
| 额定转矩 (Rated torque)                            | mN.m      | 41                     | 21                     |
| 额定电流 (Rated current)                           | A         | 8.5                    | 5                      |
| 额定速度 (Rated speed)                             | RPM       | 33000                  | 45000                  |
| 额定功率 (Rated power)                             | W         | 130                    | 100                    |
| 额定效率 (Rated efficiency)                        | %         | 80                     | 83.8                   |
| 峰值扭矩 (Peak torque)                             | mN.m      | 82                     | 63                     |
| 峰值电流 (Peak current)                            | A         | 17                     | 15                     |
| 线电阻 (Line to line resistance)                  | ohms@20°C | 0.35                   | 0.15                   |
| 线电感 (Line to line inductance)                  | mH        | 0.036                  | 0.012                  |
| 转矩常数 (Torque constant)                         | mNm/A     | 5.67                   | 4.72                   |
| 反电势 (Back EMF)                                 | Vrms/Krpm | 0.42                   | 0.35                   |
| 外壳-环境热阻 (Housing - Ambient thermal resistance) | K/W       | 6.2                    | 6.74                   |
| 电机热时间常数 (Motor thermal time constant)          | S         | 860                    | 900                    |
| 绕组最高允许温度 (Max temperature of winding)          | °C        | 155                    | 155                    |
| 电气时间常数 (Electrical time constant)              | ms        | 0.1                    | 0.08                   |



### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |                                |
|------------------------------|--------------------------------|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)           |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                      |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                  |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                  |
| 绝缘等级 (Insulation Class)      | Class B                        |
| 径向间隙 (Radial Play)           | 0.02mm@4N                      |
| 轴向间隙 (Axial Play)            | 0.14mm@4N                      |
| 最大径向负载 (Max radial force)    | 8N距法兰5mm (5mm From the flange) |
| 最大轴向负载 (Max axial force)     | 4N                             |

### ● 接线说明

(Electric Connection)

| 线型号<br>Type        | 线颜色<br>Color | 功能<br>Functions |
|--------------------|--------------|-----------------|
| AFR250-SY<br>AWG26 | 红色(Red)      | 霍尔电源正(Vcc)      |
|                    | 蓝色(Blue)     | 霍尔 W (Hw)       |
|                    | 绿色(Green)    | 霍尔 V (Hv)       |
|                    | 白色(White)    | 霍尔 U (Hu)       |
|                    | 黑色(Black)    | 霍尔电源负(GND)      |
| UL1332 AWG20       | 黄色(Yellow)   | U相 (Phase U)    |
|                    | 红色( Red)     | V相 (Phase V)    |
|                    | 黑色(Black)    | W相 (Phase W)    |

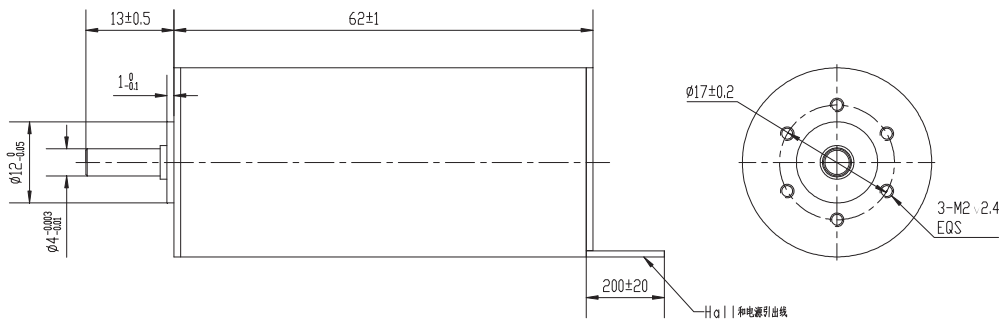
### ● 电性能

(Electrical Specifications)

|  | 单位 (Unit) | FL24SBL59-24V-18069A | FL24SBL44-24V-12030A |
|--|-----------|----------------------|----------------------|
| 极数 (Number of poles)                           |           | 2                    | 2                    |
| 相数 (Number of phases)                          |           | 3                    | 3                    |
| 额定电压 (Rated voltage)                           | VDC       | 24                   | 24                   |
| 空载转速 (No load speed)                           | RPM       | 20000                | 12000                |
| 空载电流 (No load current)                         | A         | 0.4                  | 0.12                 |
| 额定转矩 (Rated torque)                            | mN.m      | 40                   | 30                   |
| 额定电流 (Rated current)                           | A         | 3.9                  | 1.73                 |
| 额定速度 (Rated speed)                             | RPM       | 18500                | 9500                 |
| 额定功率 (Rated power)                             | W         | 96.8                 | 30                   |
| 额定效率 (Rated efficiency)                        | %         | 82                   | 77                   |
| 峰值转矩 (Peak torque)                             | mN.m      | 120                  | 90                   |
| 峰值电流 (Peak current)                            | A         | 11.7                 | 5.19                 |
| 线电阻 (Line to line resistance)                  | ohms@20°C | 0.52                 | 3                    |
| 线电感 (Line to line inductance)                  | mH        | 0.054                | 0.24                 |
| 转矩常数 (Torque constant)                         | mNm/A     | 11.5                 | 18.84                |
| 反电势 (Back EMF)                                 | Vrms/Krpm | 0.85                 | 1.4                  |
| 外壳-环境热阻 (Housing - Ambient thermal resistance) | K/W       | 7.08                 | 8.21                 |
| 电机热时间常数 (Motor thermal time constant)          | S         | 803                  | 735                  |
| 绕组最高允许温度 (Max temperature of winding)          | °C        | 155                  | 155                  |
| 电气时间常数 (Electrical time constant)              | ms        | 0.104                | 0.08                 |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

编码器

### ● 特性概要

(General Specifications)

|                              |                                 |
|------------------------------|---------------------------------|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)            |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                       |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                   |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                   |
| 绝缘等级 (Insulation Class)      | Class B                         |
| 径向间隙 (Radial Play)           | 0.02mm@4N                       |
| 轴向间隙 (Axial Play)            | 0.14mm@4N                       |
| 最大径向负载 (Max radial force)    | 10N距法兰5mm (5mm From the flange) |
| 最大轴向负载 (Max axial force)     | 4N                              |

### ● 接线说明

(Electric Connection)

| 线型号<br>Type        | 线颜色<br>Color | 功能<br>Functions |
|--------------------|--------------|-----------------|
| AFR250-SY<br>AWG26 | 红色(Red)      | 霍尔电源正(Vcc)      |
|                    | 蓝色(Blue)     | 霍尔 W (Hw)       |
|                    | 绿色(Green)    | 霍尔 V (Hv)       |
|                    | 白色(White)    | 霍尔 U (Hu)       |
|                    | 黑色(Black)    | 霍尔电源负(GND)      |
| UL1332 AWG20       | 黄色(Yellow)   | U相 (Phase U)    |
|                    | 红色 (Red)     | V相 (Phase V)    |
|                    | 黑色(Black)    | W相 (Phase W)    |

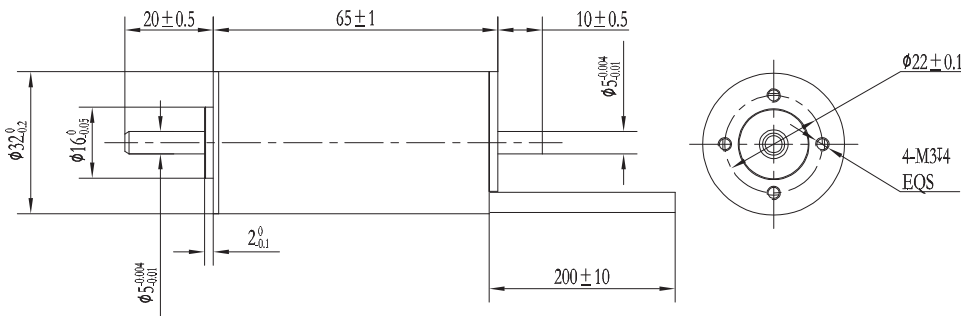
### ● 电性能

(Electrical Specifications)

|  | 单位 (Unit) | FL28SBL62-24V-12069A | FL28SBL52-24V-09043A |
|--|-----------|----------------------|----------------------|
| 极数 (Number of poles)                           |           | 2                    | 2                    |
| 相数 (Number of phases)                          |           | 3                    | 3                    |
| 额定电压 (Rated voltage)                           | VDC       | 24                   | 24                   |
| 空载转速 (No load speed)                           | RPM       | 13000                | 9000                 |
| 空载电流 (No load current)                         | A         | 0.35                 | 0.3                  |
| 额定转矩 (Rated torque)                            | mN.m      | 60                   | 50                   |
| 额定电流 (Rated current)                           | A         | 3.6                  | 2.3                  |
| 额定速度 (Rated speed)                             | RPM       | 11500                | 8200                 |
| 额定功率 (Rated power)                             | W         | 72.5                 | 43                   |
| 额定效率 (Rated efficiency)                        | %         | 84.9                 | 80.3                 |
| 峰值扭矩 (Peak torque)                             | mN.m      | 180                  | 150                  |
| 峰值电流 (Peak current)                            | A         | 14.5                 | 6.9                  |
| 线电阻 (Line to line resistance)                  | ohms@20°C | 0.54                 | 0.8                  |
| 线电感 (Line to line inductance)                  | mH        | 0.088                | 0.142                |
| 转矩常数 (Torque constant)                         | mNm/A     | 17.9                 | 25.27                |
| 反电势 (Back EMF)                                 | Vrms/KRPM | 1.33                 | 1.87                 |
| 外壳-环境热阻 (Housing - Ambient thermal resistance) | K/W       | 7.75                 | 7.63                 |
| 电机热时间常数 (Motor thermal time constant)          | S         | 1241                 | 1153                 |
| 绕组最高允许温度 (Max temperature of winding)          | °C        | 155                  | 155                  |
| 电气时间常数 (Electrical time constant)              | ms        | 0.163                | 0.18                 |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

编码器

### ● 特性概要

(General Specifications)

|                              |                                 |
|------------------------------|---------------------------------|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)            |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                       |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                   |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                   |
| 绝缘等级 (Insulation Class)      | Class B                         |
| 径向间隙 (Radial Play)           | 0.02mm@4N                       |
| 轴向间隙 (Axial Play)            | 0.14mm@4N                       |
| 最大径向负载 (Max radial force)    | 10N距法兰5mm (5mm From the flange) |
| 最大轴向负载 (Max axial force)     | 4N                              |

### ● 接线说明

(Electric Connection)

| 线型号<br>Type        | 线颜色<br>Color | 功能<br>Functions |
|--------------------|--------------|-----------------|
| AFR250-SY<br>AWG26 | 红色(Red)      | 霍尔电源正(Vcc)      |
|                    | 蓝色(Blue)     | 霍尔 W (Hw)       |
|                    | 绿色(Green)    | 霍尔 V (Hv)       |
|                    | 白色(White)    | 霍尔 U (Hu)       |
|                    | 黑色(Black)    | 霍尔电源负(GND)      |
| UL1332 AWG18       | 黄色(Yellow)   | U相 (Phase U)    |
|                    | 红色 (Red)     | V相 (Phase V)    |
|                    | 黑色(Black)    | W相 (Phase W)    |

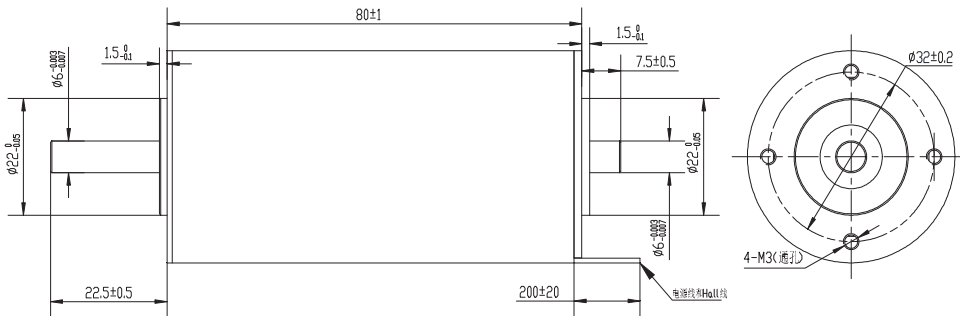
### ● 电性能

(Electrical Specifications)

|  | 单位 (Unit) | FL32SBL65-24V-157130A | FL32SBL50-24V-13075A |
|--|-----------|-----------------------|----------------------|
| 极数 (Number of poles)                           |           | 4                     | 4                    |
| 相数 (Number of phases)                          |           | 3                     | 3                    |
| 额定电压 (Rated voltage)                           | VDC       | 24                    | 24                   |
| 空载转速 (No load speed)                           | RPM       | 17000                 | 13000                |
| 空载电流 (No load current)                         | A         | 0.75                  | 0.3                  |
| 额定转矩 (Rated torque)                            | mN.m      | 80                    | 60                   |
| 额定电流 (Rated current)                           | A         | 6.74                  | 3.95                 |
| 额定速度 (Rated speed)                             | RPM       | 16100                 | 12000                |
| 额定功率 (Rated power)                             | W         | 134.8                 | 75                   |
| 额定效率 (Rated efficiency)                        | %         | 83.1                  | 78.3%                |
| 峰值转矩 (Peak torque)                             | mN.m      | 240                   | 180                  |
| 峰值电流 (Peak current)                            | A         | 20.5                  | 11.85                |
| 线电阻 (Line to line resistance)                  | ohms@20°C | 0.12                  | 0.35                 |
| 线电感 (Line to line inductance)                  | mH        | 0.015                 | 0.033                |
| 转矩常数 (Torque constant)                         | mNm/A     | 13.7                  | 17.56                |
| 反电势 (Back EMF)                                 | Vrms/KRPM | 1.02                  | 1.3                  |
| 外壳-环境热阻 (Housing - Ambient thermal resistance) | K/W       | 3.24                  | 3.02                 |
| 电机热时间常数 (Motor thermal time constant)          | S         | 630                   | 613                  |
| 绕组最高允许温度 (Max temperature of winding)          | °C        | 155                   | 155                  |
| 电气时间常数 (Electrical time constant)              | ms        | 0.125                 | 0.095                |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 特性概要

(General Specifications)

|                              |                                 |
|------------------------------|---------------------------------|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)            |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                       |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                   |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                   |
| 绝缘等级 (Insulation Class)      | Class B                         |
| 径向间隙 (Radial Play)           | 0.02mm@4N                       |
| 轴向间隙 (Axial Play)            | 0.14mm@4N                       |
| 最大径向负载 (Max radial force)    | 12N距法兰5mm (5mm From the flange) |
| 最大轴向负载 (Max axial force)     | 5N                              |

### ● 接线说明

(Electric Connection)

| 线型号<br>Type        | 线颜色<br>Color | 功能<br>Functions |
|--------------------|--------------|-----------------|
| AFR250-SY<br>AWG26 | 红色(Red)      | 霍尔电源正(Vcc)      |
|                    | 蓝色(Blue)     | 霍尔 W (Hw)       |
|                    | 绿色(Green)    | 霍尔 V (Hv)       |
|                    | 白色(White)    | 霍尔 U (Hu)       |
|                    | 黑色(Black)    | 霍尔电源负(GND)      |
| UL1332 AWG18       | 黄色(Yellow)   | U相 (Phase U)    |
|                    | 红色 (Red)     | V相 (Phase V)    |
|                    | 黑色(Black)    | W相 (Phase W)    |

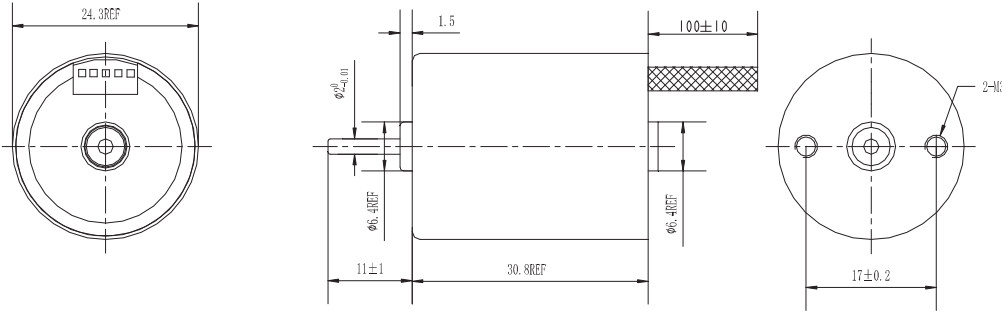
### ● 电性能

(Electrical Specifications)

|  | 单位 (Unit) | FL40SBL80-24V-072-022A | FL40SBL60-24V-085-164A |
|--|-----------|------------------------|------------------------|
| 极数 (Number of poles)                           |           | 4                      | 4                      |
| 相数 (Number of phases)                          |           | 3                      | 3                      |
| 额定电压 (Rated voltage)                           | VDC       | 24                     | 24                     |
| 空载转速 (No load speed)                           | RPM       | 5700                   | 8500                   |
| 空载电流 (No load current)                         | A         | 0.33                   | 0.5                    |
| 额定转矩 (Rated torque)                            | mN.m      | 250                    | 200                    |
| 额定电流 (Rated current)                           | A         | 7.0                    | 8.0                    |
| 额定速度 (Rated speed)                             | RPM       | 5100                   | 7850                   |
| 额定功率 (Rated power)                             | W         | 133.5                  | 164                    |
| 额定效率 (Rated efficiency)                        | %         | 82.3                   | 83.5%                  |
| 峰值扭矩 (Peak torque)                             | mN.m      | 750                    | 600                    |
| 峰值电流 (Peak current)                            | A         | 19.6                   | 24                     |
| 线电阻 (Line to line resistance)                  | ohms@20°C | 0.32                   | 0.2                    |
| 线电感 (Line to line inductance)                  | mH        | 0.061                  | 0.041                  |
| 转矩常数 (Torque constant)                         | mNm/A     | 40.5                   | 26.89                  |
| 反电势 (Back EMF)                                 | Vrms/KRPM | 3.0                    | 1.99                   |
| 外壳-环境热阻 (Housing - Ambient thermal resistance) | K/W       | 3.87                   | 3.67                   |
| 电机热时间常数 (Motor thermal time constant)          | S         | 760                    | 736                    |
| 绕组最高允许温度 (Max temperature of winding)          | °C        | 155                    | 155                    |
| 电气时间常数 (Electrical time constant)              | ms        | 0.191                  | 0.205                  |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0..025                                   |
| 轴向间隙 (Axial Play)            | 0.2-0.5                                  |
| 最大径向负载 (Max radial force)    | 5N 距法兰10mm (10mm From the flange)        |
| 最大轴向负载 (Max axial force)     | 2N                                       |
| 介电强度 (Dielectric Strength)   | 300VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG28  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1430 AWG26  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

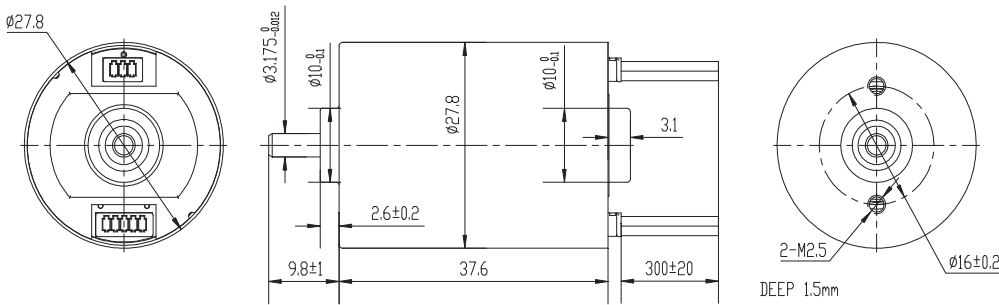
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL24CBL30-12V-4002A |
|----------------------------------|-------------------|---------------------|
| 极数 (Number of poles)             |                   | 12                  |
| 相数 (Number of phases)            |                   | 3                   |
| 额定电压 (Rated voltage)             | VDC               | 12                  |
| 额定转矩 (Rated torque)              | mN.m              | 5.7                 |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 6.8                 |
| 额定速度 (Rated speed)               | RPM               | 4000                |
| 额定功率 (Rated power)               | W                 | 2.4                 |
| 峰值扭矩 (Peak torque)               | mN.m              | 17.1                |
| 峰值电流 (Peak current)              | A                 | 0.9                 |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 7.3                 |
| 线电感 (Line to line inductance)    | mH                | 1.7                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 20                  |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 1.48                |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 2.3                 |
| 机身长度 (Motor length)              | mm                | 30.8                |
| 重量 (Weight)                      | kg                | 0.04                |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 5N 距法兰10mm (10mm From the flange)        |
| 最大轴向负载 (Max axial force)     | 2N                                       |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1061 AWG28  | 黄色 (Yellow)    | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 橙色 (Orange)    | 霍尔 V (Hv)       |
|               | 棕色 (Brown)     | 霍尔 W (Hw)       |
|               | 白色 (White)     | 霍尔电源负 (GND)     |
| UL1061 AWG26  | 绿色 (Green)     | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

### ● 电性能

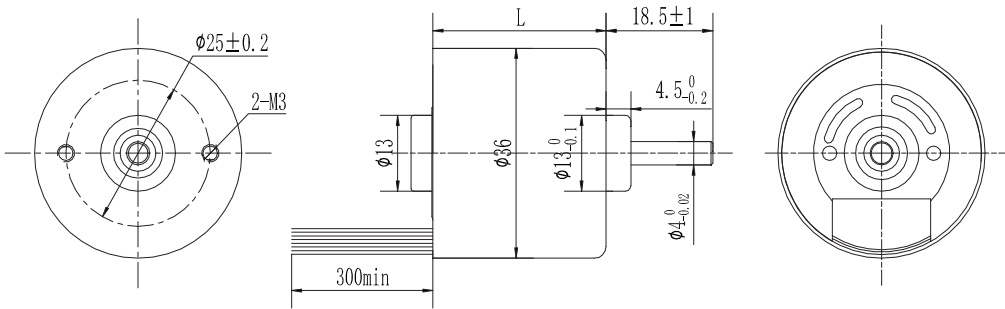
(Electrical Specifications)

|                                  | 单位 (Unit)         | FL28CBLA38-24V-4012A | FL28CBLA48-24V-4524A |
|----------------------------------|-------------------|----------------------|----------------------|
| 极数 (Number of poles)             |                   |                      | 8                    |
| 相数 (Number of phases)            |                   |                      | 3                    |
| 额定电压 (Rated voltage)             | VDC               |                      | 24                   |
| 额定转矩 (Rated torque)              | mN.m              | 28                   | 50                   |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 33.6                 | 60                   |
| 额定速度 (Rated speed)               | RPM               | 4000                 | 4500                 |
| 额定功率 (Rated power)               | W                 | 12                   | 24                   |
| 峰值转矩 (Peak torque)               | mN.m              | 84                   | 150                  |
| 峰值电流 (Peak current)              | A                 | 2.0                  | 4.5                  |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 5.7                  | 2.5                  |
| 线电感 (Line to line inductance)    | mH                | 2.48                 | 1.2                  |
| 转矩常数 (Torque constant)           | mN.m/A            | 42.8                 | 36                   |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.165                | 2.68                 |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 5.8                  | 7.3                  |
| 机身长度 (Motor length) L            | mm                | 38                   | 48                   |
| 重量 (Weight)                      | Kg                | 0.095                | 0.12                 |



### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1430 AWG24  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 棕色 (Brown)     | V相 (Phase V)    |
|               | 橙色 (Orange)    | W相 (Phase W)    |

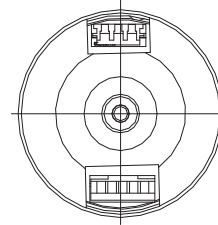
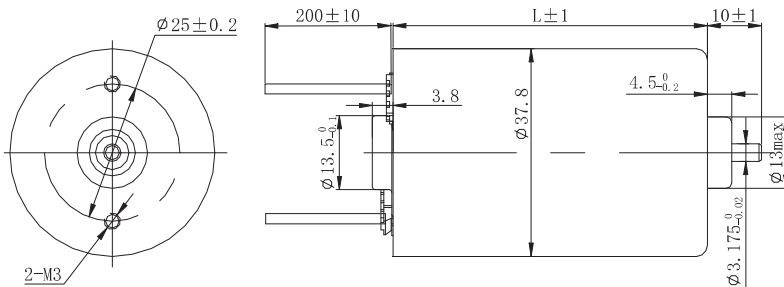
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL36CBL30-24V-488A-02 | FL36CBL40-24V-4818A-01 | FL36CBL50-24V-4828A | FL36CBL57-24V-4533A | FL36CBL60-24V-4840A | FL36CBL65-24V-4845A |
|----------------------------------|-------------------|-----------------------|------------------------|---------------------|---------------------|---------------------|---------------------|
| 极数 (Number of poles)             |                   | 8                     |                        |                     |                     |                     |                     |
| 相数 (Number of phases)            |                   | 3                     |                        |                     |                     |                     |                     |
| 额定电压 (Rated voltage)             | VDC               | 24                    |                        |                     |                     |                     |                     |
| 额定转矩 (Rated torque)              | mN.m              | 15                    | 35                     | 55                  | 70                  | 80                  | 90                  |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 18                    | 42                     | 66                  | 84                  | 96                  | 108                 |
| 额定速度 (Rated speed)               | RPM               | 4800                  | 4800                   | 4800                | 4500                | 4800                | 4800                |
| 额定功率 (Rated power)               | W                 | 8                     | 18                     | 28                  | 33                  | 40                  | 45                  |
| 峰值扭矩 (Peak torque)               | mN.m              | 45                    | 105                    | 165                 | 210                 | 240                 | 270                 |
| 峰值电流 (Peak current)              | A                 | 1.3                   | 2.7                    | 4.3                 | 5.3                 | 6                   | 6.8                 |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 5.2                   | 2                      | 1.2                 | 1.05                | 0.95                | 0.88                |
| 线电感 (Line to line inductance)    | mH                | 3.3                   | 1.75                   | 1.2                 | 1                   | 0.85                | 0.8                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 36                    | 40                     | 39                  | 40                  | 40                  | 40                  |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 2.7                   | 3                      | 2.9                 | 3                   | 3                   | 3                   |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 6                     | 12                     | 22                  | 27                  | 30                  | 32                  |
| 机身长度 (Motor length) L            | mm                | 30                    | 40                     | 50                  | 57                  | 60                  | 65                  |
| 重量 (Weight)                      | Kg                | 0.12                  | 0.16                   | 0.23                | 0.25                | 0.27                | 0.28                |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1430 AWG22  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

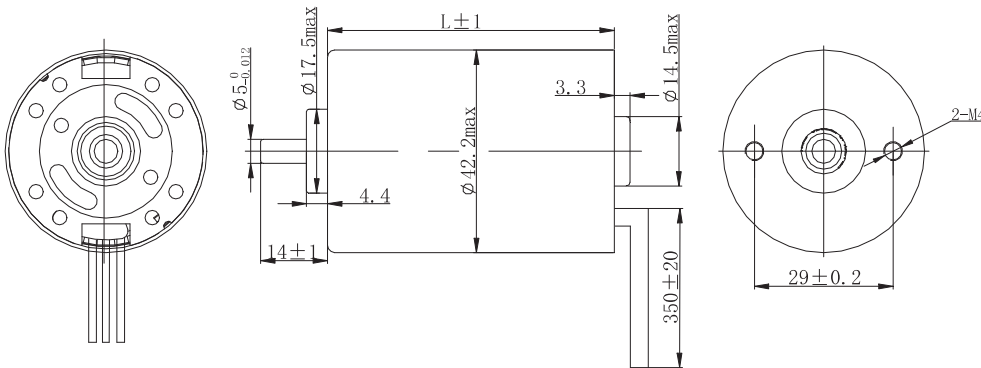
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL38CBL58-24V-4030A |
|----------------------------------|-------------------|---------------------|
| 极数 (Number of poles)             |                   | 4                   |
| 相数 (Number of phases)            |                   | 3                   |
| 额定电压 (Rated voltage)             | VDC               | 24                  |
| 额定转矩 (Rated torque)              | mN.m              | 70                  |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 84                  |
| 额定速度 (Rated speed)               | RPM               | 4000                |
| 额定功率 (Rated power)               | W                 | 30                  |
| 峰值扭矩 (Peak torque)               | mN.m              | 210                 |
| 峰值电流 (Peak current)              | A                 | 4.8                 |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 2.0                 |
| 线电感 (Line to line inductance)    | mH                | 1.5                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 44.55               |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.3                 |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 36                  |
| 机身长度 (Motor length) L            | mm                | 58                  |
| 重量 (Weight)                      | Kg                | 0.24                |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
|               | 黑色 (Black)     | 霍尔电源负 (GND)     |
| UL1332 AWG22  | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

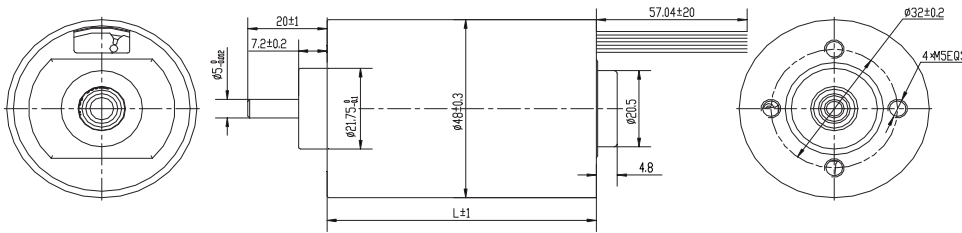
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL42CBL60-24V-3240A | FL42CBL60-24V-5943 | FL42CBL66-24V-4063A |
|----------------------------------|-------------------|---------------------|--------------------|---------------------|
| 极数 (Number of poles)             |                   |                     | 8                  |                     |
| 相数 (Number of phases)            |                   |                     | 3                  |                     |
| 额定电压 (Rated voltage)             | VDC               |                     | 24                 |                     |
| 额定转矩 (Rated torque)              | mN.m              | 120                 | 68                 | 150                 |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 144                 | 81.6               | 180                 |
| 额定速度 (Rated speed)               | RPM               | 3200                | 5900               | 4000                |
| 额定功率 (Rated power)               | W                 | 40                  | 43                 | 63                  |
| 峰值扭矩 (Peak torque)               | mN.m              | 360                 | 204                | 450                 |
| 峰值电流 (Peak current)              | A                 | 6.7                 | 6.3                | 11.2                |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 1.2                 | 0.6                | 0.75                |
| 线电感 (Line to line inductance)    | mH                | 1.6                 | 0.63               | 0.8                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 54                  | 32.4               | 40.5                |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 4.0                 | 2.4                | 3                   |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 44                  | 44                 | 55                  |
| 机身长度 (Motor length) L            | mm                | 60                  | 60                 | 66                  |
| 重量 (Weight)                      | Kg                | 0.35                | 0.35               | 0.44                |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线型号<br>Type | 引出线颜色<br>Color | 功能<br>Functions |
|---------------|----------------|-----------------|
| UL1430 AWG26  | 红色 (Red)       | 霍尔电源正 (Vcc)     |
|               | 蓝色 (Blue)      | 霍尔 U (Hu)       |
|               | 绿色 (Green)     | 霍尔 V (Hv)       |
|               | 白色 (White)     | 霍尔 W (Hw)       |
| UL1430 AWG20  | 黑色 (Black)     | 霍尔电源负 (GND)     |
|               | 黄色 (Yellow)    | U相 (Phase U)    |
|               | 红色 (Red)       | V相 (Phase V)    |
|               | 黑色 (Black)     | W相 (Phase W)    |

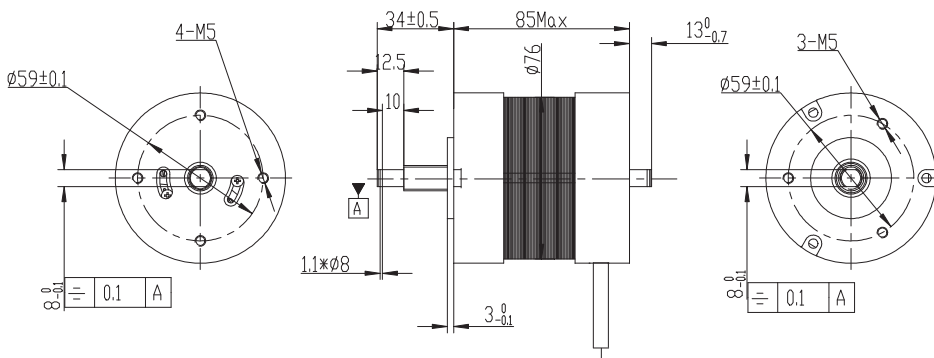
### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL48CBL68-24V-3060A |
|----------------------------------|-------------------|---------------------|
| 极数 (Number of poles)             |                   | 10                  |
| 相数 (Number of phases)            |                   | 3                   |
| 额定电压 (Rated voltage)             | VDC               | 24                  |
| 额定转矩 (Rated torque)              | mN.m              | 180                 |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 216                 |
| 额定速度 (Rated speed)               | RPM               | 3000                |
| 额定功率 (Rated power)               | W                 | 60                  |
| 峰值扭矩 (Peak torque)               | mN.m              | 540                 |
| 峰值电流 (Peak current)              | A                 | 9.4                 |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.7                 |
| 线电感 (Line to line inductance)    | mH                | 0.7                 |
| 转矩常数 (Torque constant)           | mN.m/A            | 58                  |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 4.3                 |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 80                  |
| 机身长度 (Motor length) L            | mm                | 68                  |
| 重量 (Weight)                      | Kg                | 0.5                 |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### ● 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm                                   |
| 轴向间隙 (Axial Play)            | 0.14mm                                   |
| 最大径向负载 (Max radial force)    | 115N 距法兰10mm (10mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

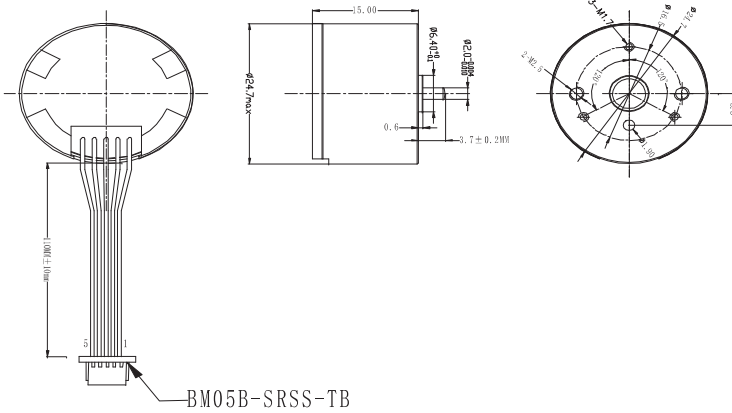
| 序号 | 引出线颜色<br>Color | 引出线型号<br>Type   | 功能<br>Functions | 说明<br>Description           |
|----|----------------|-----------------|-----------------|-----------------------------|
| 1  | 红色 (Red)       | UL1332<br>AWG26 | 霍尔电源正 (Vcc)     | Power positive<br>+5 ~ +24V |
| 2  | 蓝色 (Blue)      |                 | 霍尔 U (Hu)       |                             |
| 3  | 绿色 (Green)     |                 | 霍尔 V (Hv)       |                             |
| 4  | 白色 (White)     |                 | 霍尔 W (Hw)       |                             |
| 5  | 黑色 (Black)     |                 | 霍尔电源负 (GND)     | Power negative              |
| 6  | 黄色 (Yellow)    | UL1332<br>AWG16 | U相 (Phase U)    |                             |
| 7  | 红色 (Red)       |                 | V相 (Phase V)    |                             |
| 8  | 黑色 (Black)     |                 | W相 (Phase W)    |                             |

### ● 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL80BLE10-48V-5010B | FL80BLE40-48V-5047B |
|----------------------------------|-------------------|---------------------|---------------------|
| 极数 (Number of poles)             |                   | 4                   | 4                   |
| 相数 (Number of phases)            |                   | 3                   | 3                   |
| 额定电压 (Rated voltage)             | VDC               | 48                  | 48                  |
| 额定转矩 (Rated torque)              | N.m               | 0.2                 | 0.9                 |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.24                | 1.08                |
| 额定速度 (Rated speed)               | RPM               | 5000                | 5000                |
| 额定功率 (Rated power)               | W                 | 100                 | 470                 |
| 峰值扭矩 (Peak torque)               | N.m               | 0.6                 | 2.7                 |
| 峰值电流 (Peak current)              | A                 | 10.5                | 36                  |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 1.3                 | 0.26                |
| 线电感 (Line to line inductance)    | mH                | 1.9                 | 0.5                 |
| 转矩常数 (Torque constant)           | mNm/A             | 72                  | 72                  |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 5.4                 | 5.4                 |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 146                 | 385                 |
| 机身长度 (Motor length)              | mm                | 55                  | 85                  |
| 重量 (Weight)                      | Kg                | 0.8                 | 1.5                 |

### 机械尺寸 (Dimensions)



#### 选件 Options



### 特性概要 (General Specifications)

|   |                 |
|---|-----------------|
| 极数 (Number of Poles)                            | 12              |
| 相数 (Number of Phases)                           | 3               |
| 轴向间隙 (Axial Play)                               | 0.2mm           |
| 轴伸径向圆跳动 (Rounded runout of shaft and Extension) | 0.05mm Max      |
| 噪音 (Noise)                                      | ≤50dB           |
| 环境温度 (Ambient Temperature)                      | -10°C ~ +60°C   |
| 绝缘电阻 (Insulation resistance)                    | 100VDC/10MΩ Min |
| 旋转方向 (Direction of rotation)                    | CW/CCW          |
| 储存环境 (Storage condition)                        | -15°C ~ +65°C   |

### 接线说明 (Electric Connection)

| Pin No | 引出线型号 Type    | 功能 Functions |
|--------|---------------|--------------|
| 1      | UL-1571 30AWG | VCC(Red)     |
| 2      |               | GND(Black)   |
| 3      |               | PWM(Yellow)  |
| 4      |               | FG(White)    |
| 5      |               | F/R(Blue)    |
|        |               |              |

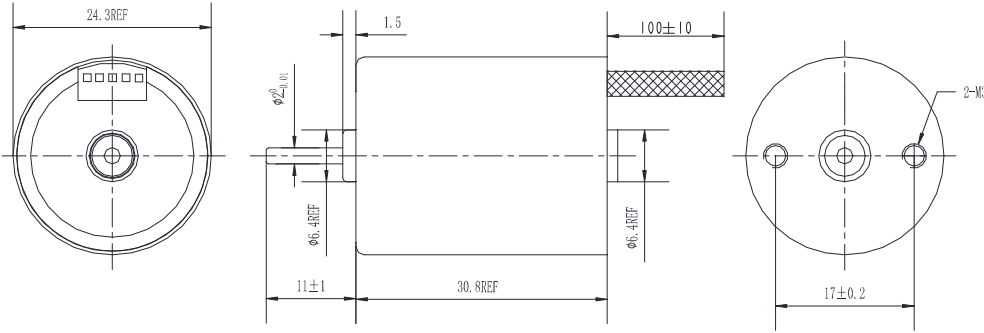
### 电性能 (Electrical Specifications)

|                        | 单位(Unit) | FL24BLW25-IE |
|------------------------|----------|--------------|
| 额定电压 (Rated voltage)   | VDC      | 5            |
| 额定转矩 (Rated torque)    | mN.m     | 3.5          |
| 额定速度 (Rated speed)     | RPM      | 5800         |
| 额定功率 (Rated power)     | W        | 2            |
| 堵转转矩 (Stall torque)    | mN.m     | 150          |
| 额定电流 (Rated current)   | A        | 0.7          |
| 空载电流 (No load current) | A        | 0.3 MAX      |
| 空载转速 (No load speed)   | RPM      | 7500         |
| 堵转电流 (Stall current)   | A        | 1.3          |
| 机身长度 (Motor length)    | mm       | 15           |
| 重量 (Weight)            | g        | 28.7         |



## 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

## 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.025                                    |
| 轴向间隙 (Axial Play)            | 0.2-0.5                                  |
| 最大径向负载 (Max radial force)    | 5N 距法兰10mm (10mm From the flange)        |
| 最大轴向负载 (Max axial force)     | 2N                                       |
| 介电强度 (Dielectric Strength)   | 300VAC/1min                              |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -25°C ~ +55°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

## 接线说明

(Electric Connection)

| 引出线型号<br>Type   | 引出线颜色<br>Color | 功能<br>Functions                     |
|-----------------|----------------|-------------------------------------|
| UL1430<br>AWG26 | 黄色 (Yellow)    | 电源正 (Vcc)                           |
|                 | 黑色 (Black)     | 电源负 (GND)                           |
|                 | 白色 (White)     | 转向控制<br>(Rotating Direction) CW/CCW |
|                 | 绿色 (Green)     | PWM调速 (Speed Control)               |
|                 | 蓝色 (Blue)      | 转速信号反馈 (Tacho out)                  |

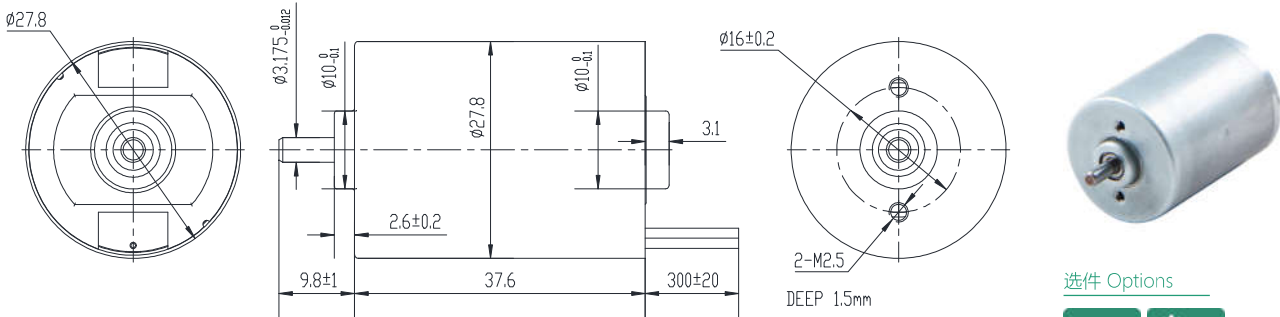
## 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL24CBL30-12V-4002A-IE |
|----------------------------------|-------------------|------------------------|
| 极数 (Number of poles)             |                   | 12                     |
| 相数 (Number of phases)            |                   | 3                      |
| 额定电压 (Rated voltage)             | VDC               | 12                     |
| 额定转矩 (Rated torque)              | mN.m              | 5.7                    |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 6.8                    |
| 额定速度 (Rated speed)               | RPM               | 4000                   |
| 额定功率 (Rated power)               | W                 | 2.4                    |
| 峰值扭矩 (Peak torque)               | mN.m              | 17.1                   |
| 峰值电流 (Peak current)              | A                 | 0.9                    |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 7.3                    |
| 线电感 (Line to line inductance)    | mH                | 1.7                    |
| 转矩常数 (Torque constant)           | mN.m/A            | 20                     |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 1.48                   |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 2.3                    |
| 机身长度 (Motor length) L            | mm                | 30.8                   |
| 重量 (Weight)                      | Kg                | 0.04                   |

## 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

## 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 5N 距法兰10mm (10mm From the flange)        |
| 最大轴向负载 (Max axial force)     | 2N                                       |
| 介电强度 (Dielectric Strength)   | 360VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

## 接线说明

(Electric Connection)

| 引出线型号<br>Type   | 引出线颜色<br>Color | 功能<br>Functions                     |
|-----------------|----------------|-------------------------------------|
| UL1430<br>AWG28 | 红色 (Red)       | 电源正 (Vcc)                           |
|                 | 黑色 (Black)     | 电源负 (GND)                           |
|                 | 绿色 (Green)     | 转向控制<br>(Rotating Direction) CW/CCW |
|                 | 蓝色 (Blue)      | PWM调速 (Speed Control)               |
|                 | 白色 (White)     | 转速信号反馈 (Tacho out)<br>PG            |

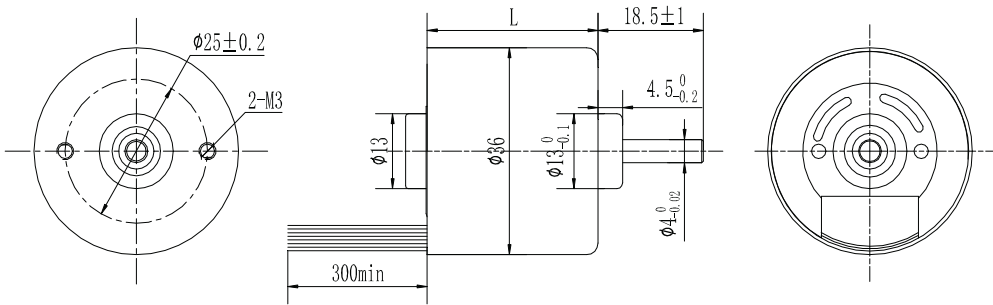
## 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL28CBLA38-24V-4012A-IE | FL28CBLA48-24V-4524A-IE |
|----------------------------------|-------------------|-------------------------|-------------------------|
| 极数 (Number of poles)             |                   |                         | 8                       |
| 相数 (Number of phases)            |                   |                         | 3                       |
| 额定电压 (Rated voltage)             | VDC               | 24                      | 24                      |
| 额定转矩 (Rated torque)              | mN.m              | 28                      | 50                      |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 33.6                    | 60                      |
| 额定速度 (Rated speed)               | RPM               | 4000                    | 4500                    |
| 额定功率 (Rated power)               | W                 | 12                      | 24                      |
| 峰值转矩 (Peak torque)               | mN.m              | 37.5                    | 100                     |
| 峰值电流 (Peak current)              | A                 | 1.0                     | 2.0                     |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 5.7                     | 3.2                     |
| 线电感 (Line to line inductance)    | mH                | 2.48                    | 1.2                     |
| 转矩常数 (Torque constant)           | mNm/A             | 42.8                    | 36.2                    |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.165                   | 2.68                    |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 5.8                     | 6                       |
| 机身长度 (Motor length) L            | mm                | 38                      | 48                      |
| 重量 (Weight)                      | Kg                | 0.095                   | 0.12                    |

## 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

## 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

## 接线说明

(Electric Connection)

| 引出线型号<br>Type  | 引出线颜色<br>Color | 功能<br>Functions                  |
|--|----------------|----------------------------------|
| 红色 Red \ 黑色 Black, UL1430 AWG24; others UL1430 AWG26 | 红色 (Red)       | 电源正 (Vcc)                        |
|  | 黑色 (Black)     | 电源负 (GND)                        |
|  | 蓝色 (Blue)      | 转向控制 (Rotating Direction) CW/CCW |
|  | 绿色 (Green)     | PWM调速 (Speed Control)            |
|  | 黄色 (Yellow)    | 转速信号反馈 (Tacho out)               |
|  | 白色 (White)     | 刹车 (Break)                       |

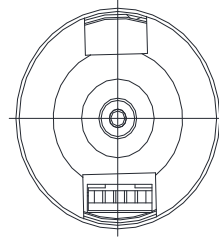
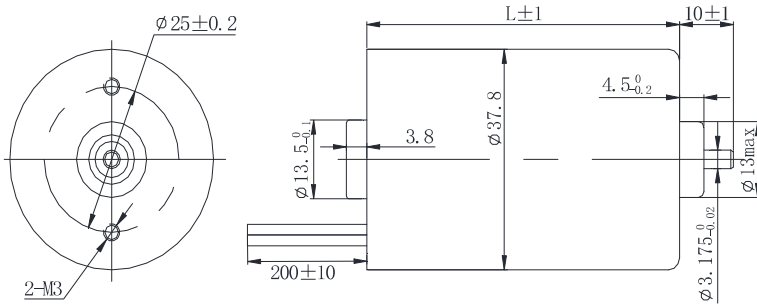
## 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL36CBL30-24V-488A-IE-02 | FL36CBL40-24V-4818A-IE-02 | FL36CBL50-24V-4828A-IE | FL36CBL57-24V-4533A-IE | FL36CBL60-24V-4840A-IE-01 | FL36CBL65-24V-4845A-IE |
|----------------------------------|-------------------|--------------------------|---------------------------|------------------------|------------------------|---------------------------|------------------------|
| 极数 (Number of poles)             |                   | 8                        |                           |                        |                        |                           |                        |
| 相数 (Number of phases)            |                   | 3                        |                           |                        |                        |                           |                        |
| 额定电压 (Rated voltage)             | VDC               | 24                       |                           |                        |                        |                           |                        |
| 额定转矩 (Rated torque)              | mN.m              | 15                       | 35                        | 55                     | 70                     | 80                        | 90                     |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 18                       | 42                        | 66                     | 84                     | 96                        | 108                    |
| 额定速度 (Rated speed)               | RPM               | 4800                     | 4800                      | 4800                   | 4500                   | 4800                      | 4800                   |
| 额定功率 (Rated power)               | W                 | 8                        | 18                        | 28                     | 33                     | 40                        | 45                     |
| 峰值扭矩 (Peak torque)               | mN.m              | 45                       | 105                       | 110                    | 110                    | 110                       | 110                    |
| 峰值电流 (Peak current)              | A                 | 1.3                      | 3                         | 3                      | 3                      | 3                         | 3                      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 5.2                      | 2                         | 1.2                    | 1.05                   | 0.95                      | 0.88                   |
| 线电感 (Line to line inductance)    | mH                | 3.3                      | 1.9                       | 1.2                    | 1                      | 0.85                      | 0.8                    |
| 转矩常数 (Torque constant)           | mN.m/A            | 36                       | 40                        | 39                     | 40                     | 40                        | 40                     |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 2.7                      | 3                         | 2.9                    | 3                      | 3                         | 3                      |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 6                        | 12                        | 22                     | 27                     | 30                        | 32                     |
| 机身长度 (Motor length) L            | mm                | 30                       | 40                        | 50                     | 57                     | 60                        | 65                     |
| 重量 (Weight)                      | Kg                | 0.12                     | 0.16                      | 0.23                   | 0.25                   | 0.27                      | 0.28                   |

## 机械尺寸

(Dimensions)



选件 Options



接插件

齿轮箱

## 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

## 接线说明

(Electric Connection)

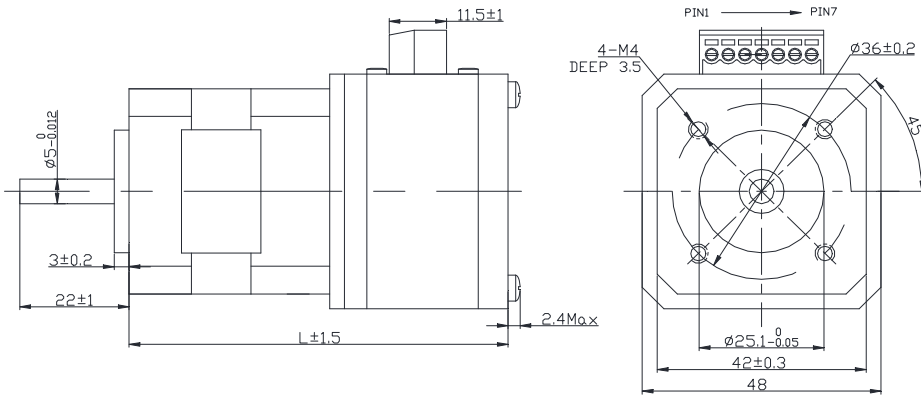
| 引出线型号<br>Type   | 引出线颜色<br>Color | 功能<br>Functions                     |
|-----------------|----------------|-------------------------------------|
| UL1430          | 红色 (Red)       | 电源正 (Vcc)                           |
| AWG22           | 黑色 (Black)     | 电源负 (GND)                           |
| UL1430<br>AWG26 | 绿色 (Green)     | 转向控制<br>(Rotating Direction) CW/CCW |
|                 | 白色 (White)     | PWM调速 (Speed Control)               |
|                 | 蓝色 (Blue)      | 刹车 (Brake)                          |
|                 | 黄色 (Yellow)    | PG转速信号反馈 (Tacho out)                |

## 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL38CBL58-24V-4030A-IE |
|----------------------------------|-------------------|------------------------|
| 极数 (Number of poles)             |                   | 4                      |
| 相数 (Number of phases)            |                   | 3                      |
| 额定电压 (Rated voltage)             | VDC               | 24                     |
| 额定转矩 (Rated torque)              | mN.m              | 70                     |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 84                     |
| 额定速度 (Rated speed)               | RPM               | 4000                   |
| 额定功率 (Rated power)               | W                 | 30                     |
| 峰值扭矩 (Peak torque)               | mN.m              | 126                    |
| 峰值电流 (Peak current)              | A                 | 3                      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 2.0                    |
| 线电感 (Line to line inductance)    | mH                | 1.5                    |
| 转矩常数 (Torque constant)           | mN.m/A            | 44.55                  |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.3                    |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 36                     |
| 机身长度 (Motor length) L            | mm                | 58                     |
| 重量 (Weight)                      | Kg                | 0.24                   |

### 机械尺寸 (Dimensions)



配件 Options



接插件 齿轮箱

### 特性概要 (General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 三角形 (Delta connection)                   |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.025mm@460g                             |
| 轴向间隙 (Axial Play)            | 0.08mm@4000g                             |
| 最大径向负载 (Max radial force)    | 10N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明 (Electric Connection)

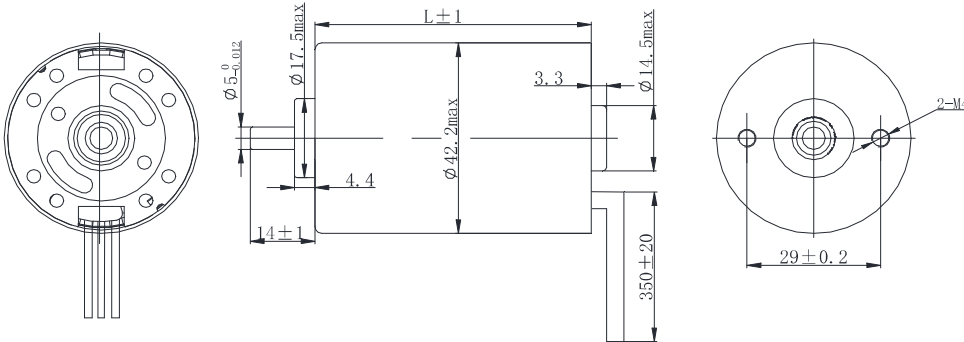
| Pin No |     | 功能 Functions                          |
|--------|-----|---------------------------------------|
| 1      | +5V | 电压输出(VOLTAGE OUTPUT)                  |
| 2      | F/R | 转向控制(ROTATING DIRECTION)              |
| 3      | SV  | 调速电压0—5VDC (SPEED VOLTAGE 0—5VDC)     |
| 4      | PG  | 速度脉冲输出(TTL) (SPEED PULSE OUTPUT(TTL)) |
| 5      | GND | 接地(GND)                               |
| 6      | GND | 接地(GND)                               |
| 7      | +Vp | +24VDC(DC POWER INPUT +24VDC)         |

### 电性能 (Electrical Specifications)

|                                  | 单位 (Unit)         | FL42BLS01-IE | FL42BLS02-IE | FL42BLS03-IE | FL42BLS04-IE |
|----------------------------------|-------------------|--------------|--------------|--------------|--------------|
| 极数 (Number of poles)             |                   | 8            |              |              |              |
| 相数 (Number of phases)            |                   | 3            |              |              |              |
| 额定电压 (Rated voltage)             | VDC               | 24           |              |              |              |
| 额定转矩 (Rated torque)              | N.m               | 0.0625       | 0.125        | 0.185        | 0.25         |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.075        | 0.15         | 0.22         | 0.3          |
| 额定速度 (Rated speed)               | RPM               | 4000         | 4000         | 4000         | 4000         |
| 额定功率 (Rated power)               | W                 | 26           | 52           | 78           | 104          |
| 峰值转矩 (Peak torque)               | N.m               | 0.11         | 0.18         | 0.28         | 0.28         |
| 峰值电流 (Peak current)              | A                 | 3.5          | 5.0          | 7.5          | 7.5          |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 1.5          | 0.8          | 0.43         | 0.3          |
| 线电感 (Line to line inductance)    | mH                | 2.1          | 1.2          | 0.71         | 0.5          |
| 转矩常数 (Torque constant)           | N.m/A             | 0.033        | 0.036        | 0.037        | 0.035        |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 2.45         | 2.71         | 2.74         | 2.62         |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 24           | 48           | 72           | 96           |
| 机身长度 (Motor length) L            | mm                | 77           | 97           | 137          | 157          |
| 重量 (Weight)                      | Kg                | 0.45         | 0.6          | 0.8          | 0.95         |

## 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

## 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

## 接线说明

(Electric Connection)

| 引出线型号<br>Type   | 引出线颜色<br>Color | 功能<br>Functions                     |
|-----------------|----------------|-------------------------------------|
| UL1332<br>AWG22 | 红色 (Red)       | 电源正 (Vcc)                           |
|                 | 黑色 (Black)     | 电源负 (GND)                           |
| UL1430<br>AWG26 | 绿色 (Green)     | 转向控制<br>(Rotating Direction) CW/CCW |
|                 | 白色 (White)     | PWM调速 (Speed Control)               |
|                 | 蓝色 (Blue)      | 刹车 (Brake)                          |
|                 | 黄色 (Yellow)    | PG转速信号反馈 (Tacho out)                |

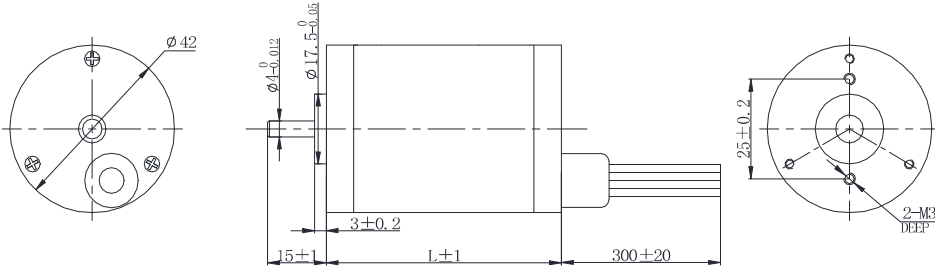
## 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL42CBL60-24V-5943-IE | FL42CBL66-24V-3031A-IE |
|----------------------------------|-------------------|-----------------------|------------------------|
| 极数 (Number of poles)             |                   |                       | 4                      |
| 相数 (Number of phases)            |                   |                       | 3                      |
| 额定电压 (Rated voltage)             | VDC               |                       | 24                     |
| 额定转矩 (Rated torque)              | mN.m              | 68                    | 100                    |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 81.6                  | 120                    |
| 额定速度 (Rated speed)               | RPM               | 5900                  | 3000                   |
| 额定功率 (Rated power)               | W                 | 43                    | 31                     |
| 峰值转矩 (Peak torque)               | mN.m              | 92                    | 200                    |
| 峰值电流 (Peak current)              | A                 | 3                     | 3                      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.82                  | 2.5                    |
| 线电感 (Line to line inductance)    | mH                | 1.2                   | 3.3                    |
| 转矩常数 (Torque constant)           | mN.m/A            | 33.75                 | 65                     |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 2.5                   | 4.82                   |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 44                    | 55                     |
| 机身长度 (Motor length) L            | mm                | 60                    | 66                     |
| 重量 (Weight)                      | Kg                | 0.35                  | 0.44                   |



## 机械尺寸 (Dimensions)



选件 Options



接插件 齿轮箱

## 特性概要 (General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100M $\Omega$ , 500VDC                   |
| 环境温度 (Ambient Temperature)   | -20 $^{\circ}$ C ~ +50 $^{\circ}$ C      |
| 绝缘等级 (Insulation Class)      | Class B                                  |

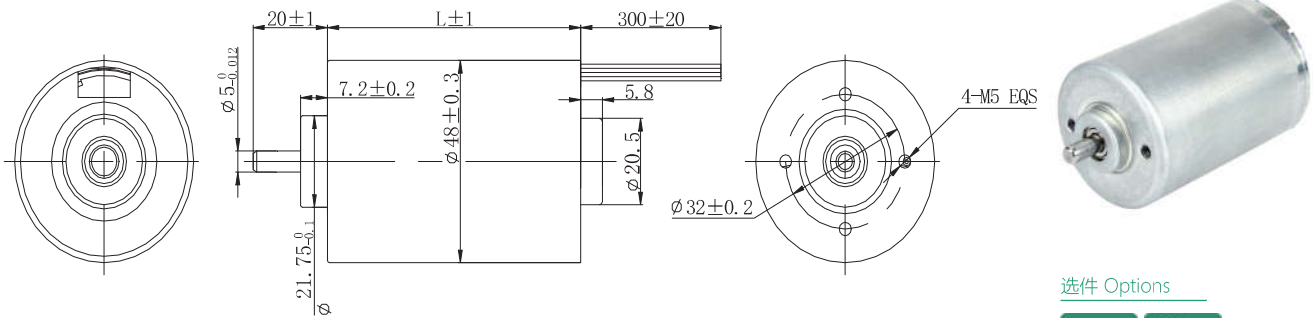
## 接线说明 (Electric Connection)

| 引出线型号<br>Type   | 引出线颜色<br>Color | 功能<br>Functions                             |
|-----------------|----------------|---|
| UL1007<br>AWG22 | 红色 (Red)       | 电源正 (Vcc)                                   |
|                 | 黑色 (Black)     | 电源负 (GND)                                   |
| UL1007<br>AWG22 | 白色 (White)     | 转向控制<br>(Rotating Direction) CW/CCW         |
|                 | 蓝色 (Blue)      | 模拟量调速 (Speed Control<br>with analog ref) 5V |
|                 | 黄色 (Yellow)    | 转速信号反馈 (Tacho out)<br>PG                    |

## 电性能 (Electrical Specifications)

|                                  | 单位 (Unit)            | FL42RBL60-24V-4030A-IE |
|----------------------------------|----------------------|------------------------|
| 极数 (Number of poles)             |                      | 8                      |
| 相数 (Number of phases)            |                      | 3                      |
| 额定电压 (Rated voltage)             | VDC                  | 24                     |
| 额定转矩 (Rated torque)              | mN.m                 | 56                     |
| 连续运行转矩 (Continuous stall torque) | mN.m                 | 68                     |
| 额定速度 (Rated speed)               | RPM                  | 4200                   |
| 额定功率 (Rated power)               | W                    | 25                     |
| 峰值转矩 (Peak torque)               | mN.m                 | 105                    |
| 峰值电流 (Peak current)              | A                    | 3                      |
| 线电阻 (Line to line resistance)    | ohms@20 $^{\circ}$ C | 1.6                    |
| 线电感 (Line to line inductance)    | mH                   | 1.94                   |
| 转矩常数 (Torque constant)           | mN.m/A               | 41.31                  |
| 反电势 (Back EMF)                   | Vrms/KRPM            | 3.04                   |
| 转动惯量 (Rotor inertia)             | g.cm $^2$            | 33                     |
| 机身长度 (Motor length) L            | mm                   | 64                     |
| 重量 (Weight)                      | Kg                   | 0.4                    |

## 机械尺寸 (Dimensions)



选件 Options



接插件 齿轮箱

## 特性概要 (General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 15N 距法兰10mm (10mm From the flange)       |
| 最大轴向负载 (Max axial force)     | 10N                                      |
| 介电强度 (Dielectric Strength)   | 600VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

## 接线说明 (Electric Connection)

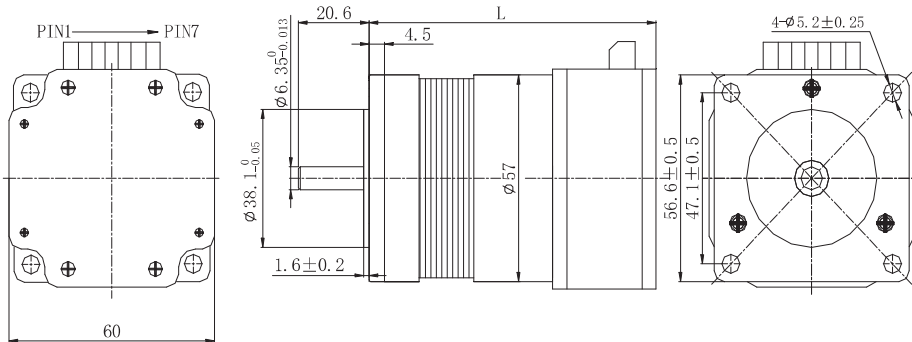
| 引出线型号<br>Type   | 引出线颜色<br>Color | 功能<br>Functions                     |
|-----------------|----------------|-------------------------------------|
| UL1430<br>AWG20 | 红色 (Red)       | 电源正 (Vcc)                           |
|                 | 黑色 (Black)     | 电源负 (GND)                           |
| UL1430<br>AWG26 | 绿色 (Green)     | 转向控制<br>(Rotating Direction) CW/CCW |
|                 | 白色 (White)     | PWM调速 (Speed Control)               |
|                 | 蓝色 (Blue)      | 刹车 (Brake)                          |
|                 | 黄色 (Yellow)    | 转速信号反馈 (Tacho out)<br>PG            |

## 电性能 (Electrical Specifications)

|                                  | 单位 (Unit)         | FL48CBL68-24V-3060A-IE |
|----------------------------------|-------------------|------------------------|
| 极数 (Number of poles)             |                   | 10                     |
| 相数 (Number of phases)            |                   | 3                      |
| 额定电压 (Rated voltage)             | VDC               | 24                     |
| 额定转矩 (Rated torque)              | mN.m              | 180                    |
| 连续运行转矩 (Continuous stall torque) | mN.m              | 216                    |
| 额定速度 (Rated speed)               | RPM               | 3000                   |
| 额定功率 (Rated power)               | W                 | 60                     |
| 峰值扭矩 (Peak torque)               | mN.m              | 257                    |
| 峰值电流 (Peak current)              | A                 | 5                      |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 0.7                    |
| 线电感 (Line to line inductance)    | mH                | 0.7                    |
| 转矩常数 (Torque constant)           | mN.m/A            | 58                     |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 4.3                    |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 80                     |
| 机身长度 (Motor length) L            | mm                | 68                     |
| 重量 (Weight)                      | Kg                | 0.5                    |

### 机械尺寸

(Dimensions)



选件 Options



接插件 齿轮箱

### 特性概要

(General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 三角形 (Delta connection)                   |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 115N 距法兰20mm (20mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 650VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

### 接线说明

(Electric Connection)

|     |     |     |    |    |     |     |
|-----|-----|-----|----|----|-----|-----|
| +Vp | GND | GND | PG | SV | F/R | +5V |
| ○   | ○   | ○   | ○  | ○  | ○   | ○   |
| 1   | 2   | 3   | 4  | 5  | 6   | 7   |

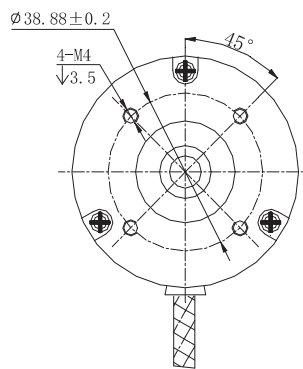
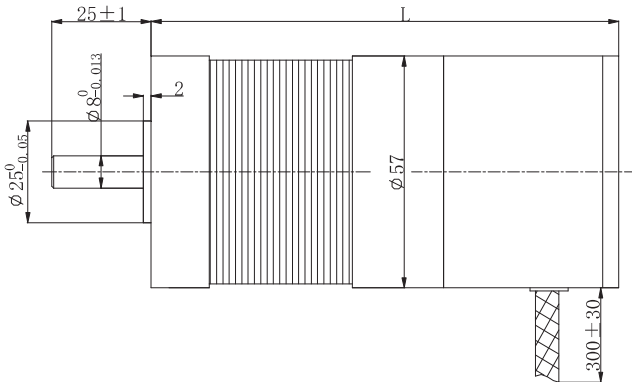
1 +Vp---输入电压 +36VDC(DC POWER INPUT +36VDC)  
 2 GND---系统的公共接地(COMMON GROUND OF SYSTEM)  
 3 GND---系统的公共接地(COMMON GROUND OF SYSTEM)  
 4 PG---速度脉冲输出(TTL), 6个/转(SPEED PULSE OUTPUT(TTL), 6 PULSE/REV)  
 5 SV---调速电压0—5VDC (SPEED VOLTAGE 0—5VDC)  
 6 F/R---转向控制(ROTATING DIRECTION)  
 7 +5V---+5V 电压输出(VOLTAGE OUTPUT)

### 电性能

(Electrical Specifications)

|                                  | 单位 (Unit)         | FL57BL(S)005-IE | FL57BL(S)01-IE | FL57BL(S)02-IE | FL57BL(S)03-IE |
|----------------------------------|-------------------|-----------------|----------------|----------------|----------------|
| 极数 (Number of poles)             |                   |                 |                | 4              |                |
| 相数 (Number of phases)            |                   |                 |                | 3              |                |
| 额定电压 (Rated voltage)             | VDC               |                 |                | 36             |                |
| 额定转矩 (Rated torque)              | N.m               | 0.055           | 0.11           | 0.22           | 0.33           |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.066           | 0.132          | 0.264          | 0.396          |
| 额定速度 (Rated speed)               | RPM               | 4000            | 4000           | 4000           | 4000           |
| 额定功率 (Rated power)               | W                 | 25              | 46             | 99             | 138            |
| 峰值扭矩 (Peak torque)               | N.m               | 0.15            | 0.3            | 0.45           | 0.48           |
| 峰值电流 (Peak current)              | A                 | 3.0             | 5.0            | 7.5            | 7.5            |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 4.3             | 1.63           | 0.64           | 0.45           |
| 线电感 (Line to line inductance)    | mH                | 10              | 4.4            | 2.0            | 1.5            |
| 转矩常数 (Torque constant)           | N.m/A             | 0.052           | 0.061          | 0.060          | 0.065          |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.8             | 4.5            | 4.45           | 4.8            |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 30              | 75             | 119            | 173            |
| 机身长度 (Motor length) L            | mm                | 90              | 100            | 139            | 159            |
| 重量 (Weight)                      | Kg                | 0.56            | 0.67           | 0.9            | 1.2            |

## 机械尺寸 (Dimensions)



选件 Options



接插件

齿轮箱

## 特性概要 (General Specifications)

|                              |  |
|------------------------------|--|
| 绕组连接方式 (Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度 (Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 径向间隙 (Radial Play)           | 0.02mm@450g                              |
| 轴向间隙 (Axial Play)            | 0.08mm@450g                              |
| 最大径向负载 (Max radial force)    | 115N 距法兰20mm (20mm From the flange)      |
| 最大轴向负载 (Max axial force)     | 45N                                      |
| 介电强度 (Dielectric Strength)   | 650VAC/1S                                |
| 绝缘电阻 (Insulation Resistance) | 100MΩ, 500VDC                            |
| 环境温度 (Ambient Temperature)   | -20°C ~ +50°C                            |
| 绝缘等级 (Insulation Class)      | Class B                                  |

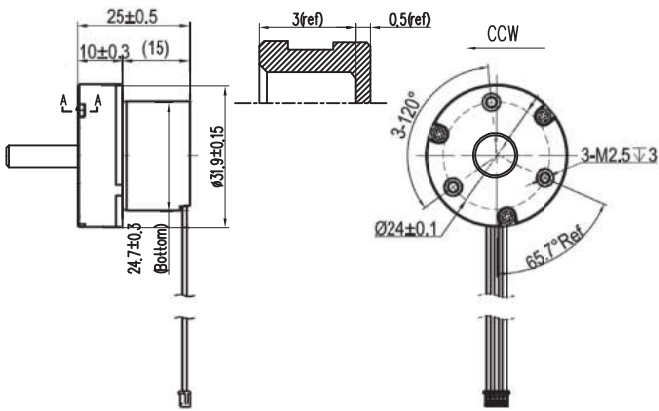
## 接线说明 (Electric Connection)

| 引出线型号<br>Type   | 引出线颜色<br>Color | 功能<br>Functions                     |
|-----------------|----------------|-------------------------------------|
| UL1430<br>AWG18 | 红色 (Red)       | 电源正 (Vcc)                           |
|                 | 黑色 (Black)     | 电源负 (GND)                           |
| UL1430<br>AWG26 | 蓝色 (Blue)      | 转向控制<br>(Rotating Direction) CW/CCW |
|                 | 黄色 (Yellow)    | 0 ~ +5V speed<br>regulation voltage |
|                 | 白色 (White)     | Speed pulse output(TTL)             |

## 电性能 (Electrical Specifications)

|                                  | 单位 (Unit)         | FL57BL005-IEX | FL57BL01-IEX | FL57BL02-IEX |
|----------------------------------|-------------------|---------------|--------------|--------------|
| 极数 (Number of poles)             |                   |               | 4            |              |
| 相数 (Number of phases)            |                   |               | 3            |              |
| 额定电压 (Rated voltage)             | VDC               |               | 24           |              |
| 额定转矩 (Rated torque)              | N.m               | 0.055         | 0.11         | 0.22         |
| 连续运行转矩 (Continuous stall torque) | N.m               | 0.066         | 0.132        | 0.264        |
| 额定速度 (Rated speed)               | RPM               | 4000          | 4000         | 4000         |
| 额定功率 (Rated power)               | W                 | 25            | 46           | 99           |
| 峰值扭矩 (Peak torque)               | N.m               | 0.15          | 0.22         | 0.22         |
| 峰值电流 (Peak current)              | A                 | 4.0           | 6.0          | 6.0          |
| 线电阻 (Line to line resistance)    | ohms@20°C         | 2.1           | 0.82         | 0.35         |
| 线电感 (Line to line inductance)    | mH                | 4.1           | 2.3          | 1.0          |
| 转矩常数 (Torque constant)           | N.m/A             | 0.04          | 0.04         | 0.04         |
| 反电势 (Back EMF)                   | Vrms/KRPM         | 3.0           | 3.0          | 3.0          |
| 转动惯量 (Rotor inertia)             | g.cm <sup>2</sup> | 30            | 75           | 119          |
| 机身长度 (Motor length) L            | mm                | 80            | 90           | 120          |
| 重量 (Weight)                      | Kg                | 0.5           | 0.6          | 0.8          |

### 机械尺寸 (Dimensions)



选件 Options



接插件

### 特性概要 (General Specifications)

|   |                 |
|---|-----------------|
| 轴向间隙 (Axial Play)                               | 0.02~0.5mm      |
| 轴伸径向圆跳动 (Rounded runout of shaft and Extension) | 0.05mm          |
| 噪音 (Noise)                                      | ≤65dB           |
| 减速比 (Ratio)                                     | 34.4:1          |
| 寿命 (Lifetime)                                   | 850个小时 (最大)     |
| 环境温度 (Ambient Temperature)                      | -10°C ~ +60°C   |
| 绝缘电阻 (Insulation resistance)                    | 100VDC/10MΩ Min |
| 介电强度 (Dielectric strength)                      | 100VAC/0.5mA/1S |
| 储存环境 (Storage condition)                        | -15°C ~ +70°C   |

### 接线说明 (Electric Connection)

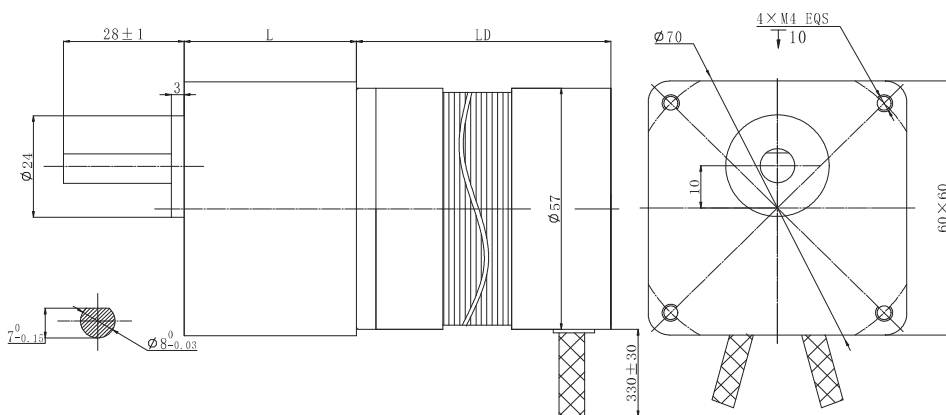
| Pin No | 引出线型号 Type    | 功能 Functions |
|--------|---------------|--------------|
| 1      | UL-1751 30AWG | VCC(Red)     |
| 2      |               | GND(Black)   |
| 3      |               | PWM(Yellow)  |
| 4      |               | FG(White)    |
| 5      |               | F/R(Blue)    |
|        |               |              |

### 电性能 (Electrical Specifications)

|                        | 单位 (Unit) | FL32BLW25-G-IE |
|------------------------|-----------|----------------|
| 额定电压 (Rated voltage)   | VDC       | 5              |
| 额定转矩 (Rated torque)    | mN.m      | 58.8           |
| 额定速度 (Rated speed)     | RPM       | 180            |
| 额定功率 (Rated power)     | W         | 1              |
| 堵转转矩 (Stall torque)    | mN.m      | 147            |
| 额定电流 (Rated current)   | A         | ≤1.08          |
| 空载电流 (No load current) | A         | ≤0.6           |
| 空载转速 (No load speed)   | RPM       | 215            |
| 堵转电流 (Stall current)   | A         | 1.4A           |
| 机身长度 (Motor length)    | mm        | 15             |
| 重量 (Weight)            | g         | 500            |

### 外形图

(DIMENSIONS)



选件 Options



接插件

| 减速比(Ratio) | L2(mm)         |                |                |                | L1(mm) |
|------------|----------------|----------------|----------------|----------------|--------|
|            | FL57BLS01-60JB | FL57BLS02-60JB | FL57BLS03-60JB | FL57BLS04-60JB |        |
| 3--15      | 59             | 79             | 99             | 119            | 32     |
| 25--150    |                |                |                |                | 40     |

### 齿轮箱参数

(Spur Gearbox Specifications)

| 减速比(Ratio)                      | 3     | 5 | 7.5 | 10 | 12.5 | 15 | 25  | 30 | 50 | 75  | 90 | 100 | 120 | 150 |
|---------------------------------|-------|---|-----|----|------|----|-----|----|----|-----|----|-----|-----|-----|
| 减速级数<br>(Number Of gear trains) | 2     |   |     |    |      |    | 3   |    |    | 4   |    |     |     |     |
| 额定转矩(Nominal torque)            | 5N.m  |   |     |    |      |    |     |    |    |     |    |     |     |     |
| 极限转矩(Ultimate torque)           | 10N.m |   |     |    |      |    |     |    |    |     |    |     |     |     |
| 效率(Efficiency)                  | 81%   |   |     |    |      |    | 73% |    |    | 66% |    |     |     |     |

### 正齿轮箱无刷直流电机参数

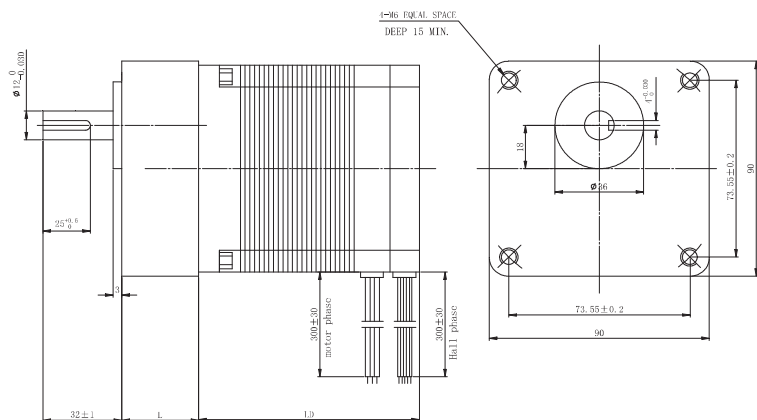
(Spur Geared BLDC Motor Specifications)

| 减速比(Ratio)     |                             | 3    | 5    | 7.5  | 10   | 12.5 | 15   | 25  | 30   | 50 | 75  | 90  | 100  | 120 |
|----------------|-----------------------------|------|------|------|------|------|------|-----|------|----|-----|-----|------|-----|
| FL57BLS01-60JB | 额定转矩(Rated torque) (N.m)    | 0.26 | 0.44 | 0.66 | 0.89 | 1.11 | 1.33 | 2   | 2.4  | 4  | 5.4 | 6.5 | 7.26 | 8.7 |
|                | 额定转速(Rated speed) (RPM)     | 1333 | 800  | 533  | 400  | 320  | 266  | 160 | 133  | 80 | 53  | 44  | 40   | 33  |
|                | 极限转矩(Ultimate torque) (N.m) | 0.78 | 1.32 | 1.98 | 2.67 | 3.33 | 3.99 | 6   | 7.2  | 10 |     |     |      |     |
| FL57BLS02-60JB | 额定转矩(Rated torque) (N.m)    | 0.54 | 0.89 | 1.33 | 1.78 | 2.22 | 2.67 | 4   | 4.8  | 8  | -   | -   | -    | -   |
|                | 额定转速(Rated speed) (RPM)     | 1333 | 800  | 533  | 400  | 320  | 266  | 160 | 133  | 80 | -   | -   | -    | -   |
|                | 极限转矩(Ultimate torque) (N.m) | 1.62 | 2.67 | 3.99 | 5.34 | 6.66 | 8    | 10  |      | -  | -   | -   | -    |     |
| FL57BLS03-60JB | 额定转矩(Rated torque) (N.m)    | 0.8  | 1.33 | 2    | 2.67 | 3.34 | 4    | 6   | 7.22 | -  | -   | -   | -    | -   |
|                | 额定转速(Rated speed) (RPM)     | 1333 | 800  | 533  | 400  | 320  | 266  | 160 | 133  | -  | -   | -   | -    | -   |
|                | 极限转矩(Ultimate torque) (N.m) | 2.4  | 3.99 | 6    | 8    | 10   |      |     | -    | -  | -   | -   | -    |     |
| FL57BLS04-60JB | 额定转矩(Rated torque) (N.m)    | 1.06 | 1.85 | 2.67 | 3.56 | 4.45 | 5.34 | 8   | 9.6  | -  | -   | -   | -    | -   |
|                | 额定转速(Rated speed) (RPM)     | 1333 | 800  | 533  | 400  | 320  | 266  | 160 | 133  | -  | -   | -   | -    | -   |
|                | 极限转矩(Ultimate torque) (N.m) | 3.18 | 5.55 | 8    | 10   |      |      | -   | -    | -  | -   | -   | -    |     |



### 外形图

(DIMENSIONS)



选件 Options



接插件 编码器

| 减速比(Ratio) | L2(mm)         |                |                |                 | L1(mm) |
|------------|----------------|----------------|----------------|-----------------|--------|
|            | FL86BLS58-90JB | FL86BLS71-90JB | FL86BLS98-90JB | FL86BLS125-90JB |        |
| 3--15      | 72             | 86             | 112            | 139             | 42     |
| 18--120    |                |                |                |                 | 60     |

### 齿轮箱参数

(Spur Gearbox Specifications)

| 减速比 (Ratio)                     | 3     | 5 | 6 | 7.5 | 9 | 10 | 13 | 15 | 18     | 20 | 25 | 30 | 36     | 40 | 50 | 60 | 75 | 90 | 100 | 120 |
|---------------------------------|-------|---|---|-----|---|----|----|----|--------|----|----|----|--------|----|----|----|----|----|-----|-----|
| 重量 (Weight)                     | 1.3kg |   |   |     |   |    |    |    | 1.5kg  |    |    |    |        |    |    |    |    |    |     |     |
| 减速级数<br>(Number Of gear trains) | 2     |   |   |     |   |    |    |    | 3      |    |    |    | 4      |    |    |    |    |    |     |     |
| 额定转矩 (Nominal torque)           | 30N.m |   |   |     |   |    |    |    |        |    |    |    |        |    |    |    |    |    |     |     |
| 极限转矩 (Ultimate torque)          | 45N.m |   |   |     |   |    |    |    |        |    |    |    |        |    |    |    |    |    |     |     |
| 效率 (Efficiency)                 | 81%   |   |   |     |   |    |    |    | 73%    |    |    |    | 66%    |    |    |    |    |    |     |     |
| 回差 (Backlash)                   | 4 deg |   |   |     |   |    |    |    | 3.5deg |    |    |    | 2.5deg |    |    |    |    |    |     |     |

### 正齿轮箱无刷直流电机参数

(Spur Geared BLDC Motor Specifications)

| 减速比(Ratio)      |                              | 3    | 5    | 6    | 7.5  | 9    | 10   | 12.5 | 15   | 18   | 20   | 25   | 30   | 36   | 40   | 50   | 60   | 75   | 90   | 100  | 120  |
|-----------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| FL86BLS58-90JB  | 额定转矩 (Rated torque) (N.m)    | 0.85 | 1.42 | 1.70 | 2.13 | 2.55 | 2.84 | 3.54 | 4.25 | 4.60 | 5.11 | 6.38 | 7.67 | 9.20 | 9.24 | 11.6 | 13.8 | 17.3 | 20.8 | 23.1 | 27.7 |
|                 | 额定转速 (Rated speed) (RPM)     | 1000 | 600  | 500  | 400  | 333  | 300  | 240  | 200  | 167  | 150  | 120  | 100  | 83.3 | 75   | 60   | 50   | 40   | 33.3 | 30   | 25   |
|                 | 极限转矩 (Ultimate torque) (N.m) | 2.55 | 4.25 | 5.10 | 6.38 | 7.65 | 8.52 | 10.6 | 12.7 | 13.8 | 15.3 | 19.1 | 23   | 27.6 | 27.7 | 34.8 | 41.4 | 45   |      |      |      |
| FL86BLS71-90JB  | 额定转矩 (Rated torque) (N.m)    | 1.70 | 2.84 | 3.4  | 4.25 | 5.10 | 5.67 | 7.08 | 8.50 | 9.20 | 10.2 | 12.8 | 15.3 | 18.4 | 18.5 | 23.1 | 27.7 | -    | -    | -    | -    |
|                 | 额定转速 (Rated speed) (RPM)     | 1000 | 600  | 500  | 400  | 333  | 300  | 240  | 200  | 167  | 150  | 120  | 100  | 83.3 | 75   | 60   | 50   | -    | -    | -    | -    |
|                 | 极限转矩 (Ultimate torque) (N.m) | 5.1  | 8.52 | 10.2 | 12.7 | 15.3 | 17.0 | 21.2 | 25.5 | 27.6 | 30.6 | 38.4 | 45   |      |      |      | -    | -    | -    | -    |      |
| FL86BLS98-90JB  | 额定转矩 (Rated torque) (N.m)    | 3.4  | 5.67 | 6.80 | 8.50 | 10.2 | 11.3 | 14.2 | 17   | 18.4 | 20.4 | 25.5 | 30.6 | -    | -    | -    | -    | -    | -    | -    | -    |
|                 | 额定转速 (Rated speed) (RPM)     | 1000 | 600  | 500  | 400  | 333  | 300  | 240  | 200  | 167  | 150  | 120  | 100  | -    | -    | -    | -    | -    | -    | -    | -    |
|                 | 极限转矩 (Ultimate torque) (N.m) | 10.2 | 17.0 | 20.4 | 25.5 | 30.6 | 33.9 | 42.6 | 45   |      |      |      | -    | -    | -    | -    | -    | -    | -    | -    |      |
| FL86BLS125-90JB | 额定转矩 (Rated torque) (N.m)    | 5.1  | 8.5  | 10.2 | 12.7 | 15.3 | 17.0 | 21.2 | 25.5 | 27.5 | 30.6 | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
|                 | 额定转速 (Rated speed) (RPM)     | 1000 | 600  | 500  | 400  | 333  | 300  | 240  | 200  | 167  | 150  | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
|                 | 极限转矩 (Ultimate torque) (N.m) | 15.3 | 25.5 | 30.6 | 38.1 | 45   |      |      |      | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |      |

# FL22RBL-22JN10K

行星减速无刷电机  
BLDC Motor with Planetary Gearbox



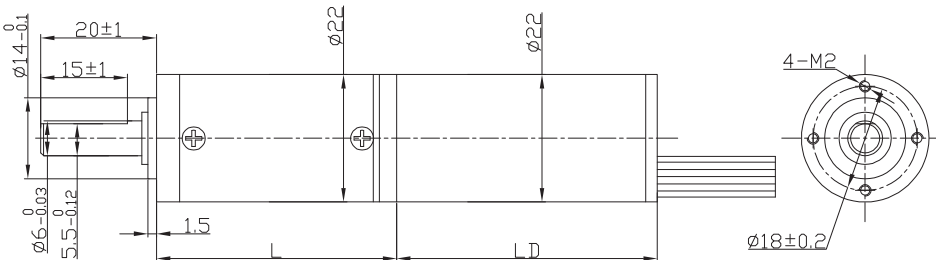
|           |                                  |  |
|-----------|----------------------------------|--|
| 内齿圈材质: 金属 | Φ22行星减速器, 允许转矩范围: 0.05N.m~0.5N.m | 22mm OD Planetary Gearbox,<br>Permissible Load Range: 0.05N.m~0.5N.m |
|-----------|----------------------------------|--|

## ● 接线方式 (Wire Diagram)

|              |            |            |              |             |            |          |            |
|--------------|------------|------------|--------------|-------------|------------|----------|------------|
| U            | V          | W          | Vcc          | Ha          | Hb         | Hc       | GND        |
| 红<br>Red     | 棕<br>Brown | 黑<br>Black | 蓝<br>Blue    | 黄<br>Yellow | 棕<br>Brown | 红<br>Red | 绿<br>Green |
| UL1007 AWG26 |            |            | UL1007 AWG28 |             |            |          |            |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE   | 极数              | 相数              | 额定电压                 | 空载转速                   | 额定转速                 | 额定转矩                 | 额定功率             | 峰值扭矩                | 峰值电流              | 电阻                              | 电感                            |
|----------------|-----------------|-----------------|----------------------|------------------------|----------------------|----------------------|------------------|---------------------|-------------------|---------------------------------|-------------------------------|
|                | Number of poles | Number of phase | Rated voltage<br>VDC | No-load speed<br>r/min | Rated speed<br>r/min | Rated torque<br>mN.m | Rated power<br>W | Reak torque<br>mN.m | Peak current<br>A | Line to line resistance<br>ohms | Line to line inductance<br>mH |
| FL22RBL45-2470 | 8               | 3               | 24                   | 7000                   | 4600                 | 8                    | 4                | 24                  | 0.8               | 23                              | 6.2                           |
| FL22RBL68-2460 | 8               | 3               | 24                   | 6000                   | 3800                 | 20                   | 8                | 60                  | 1.7               | 11.6                            | 4.3                           |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL22RBL45-2470无刷直流电机 FL22RBL45-2470 DC Brushless Motor

|   |       |       |       |       |      |      |      |      |      |      |      |      |      |
|---|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7   | 5.2   | 14    | 19   | 27   | 51   | 71   | 100  | 139  | 189  | 264  | 369  |
| 减速级数 Number of gear trains                        |       | 1     | 1     | 2     | 2    | 2    | 3    | 3    | 3    | 3    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 24.4  | 24.4  | 31.0  | 31.0 | 31.0 | 37.4 | 37.4 | 37.4 | 37.4 | 43.8 | 43.8 | 43.8 |
| 空载转速 No-load speed                                | r/min | 1887  | 1351  | 500   | 368  | 259  | 137  | 99   | 70   | 50   | 37   | 27   | 19   |
| 额定转速 Rated speed                                  | r/min | 1240  | 888   | 329   | 242  | 170  | 90   | 65   | 46   | 33   | 24   | 17   | 12   |
| 额定转矩 Rated torque                                 | N.m   | 0.027 | 0.037 | 0.091 | 0.12 | 0.17 | 0.30 | 0.41 | 0.58 | 0.80 | 1    | 1    | 1    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 0.3   | 0.3   | 1.2   | 1.2  | 1.2  | 2.5  | 2.5  | 2.5  | 2.5  | 3    | 3    | 3    |

配置FL22RBL68-2460无刷直流电机 FL22RBL68-2460 DC Brushless Motor

|   |       |       |       |      |      |      |      |      |      |      |
|---|-------|-------|-------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7   | 5.2   | 14   | 19   | 27   | 51   | 71   | 100  | 139  |
| 减速级数 Number of gear trains                        |       | 1     | 1     | 2    | 2    | 2    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 24.4  | 24.4  | 33.0 | 33.0 | 33.0 | 41.5 | 41.5 | 41.5 | 41.5 |
| 空载转速 No-load speed                                | r/min | 1617  | 1158  | 429  | 316  | 222  | 118  | 85   | 60   | 43   |
| 额定转速 Rated speed                                  | r/min | 1027  | 730   | 271  | 200  | 140  | 74   | 53   | 38   | 27   |
| 额定转矩 Rated torque                                 | N.m   | 0.067 | 0.093 | 0.23 | 0.31 | 0.44 | 0.74 | 1    | 1    | 1    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 0.3   | 0.3   | 1.2  | 1.2  | 1.2  | 3    | 3    | 3    | 3    |

# FL28BL-28JN30K

行星减速无刷电机  
BLDC Motor with Planetary Gearbox



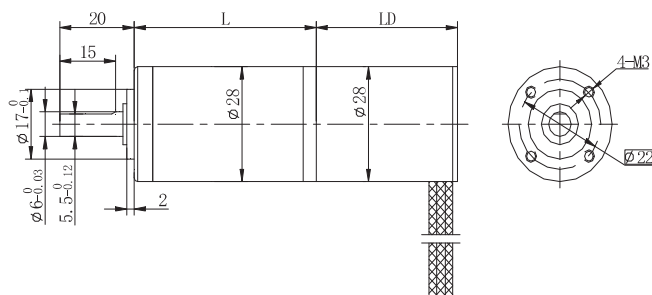
|           |                                 |   |
|-----------|---------------------------------|---|
| 内齿圈材质: 金属 | Φ28行星减速器, 允许转矩范围: 0.3N.m~3.0N.m | 28mm OD Planetary Gearbox,<br>Permissible Load Range: 0.3N.m~3.0N.m |
|-----------|---------------------------------|---|

## ● 接线方式 (Wire Diagram)

|              |          |            |             |           |             |            |            |
|--------------|----------|------------|-------------|-----------|-------------|------------|------------|
| U            | V        | W          | Vcc         | Ha        | Hb          | Hc         | GND        |
| 绿<br>Green   | 红<br>Red | 黑<br>Black | 黄<br>Yellow | 蓝<br>Blue | 橙<br>Orange | 棕<br>Brown | 白<br>White |
| UL1007 26AWG |          |            |             |           |             |            |            |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE  | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|---------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|               | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Reak torque | Peak current | Line to line resistance | Line to line inductance |
|               |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL28BL38-2460 | 4               | 3               | 24            | 6000          | 4350        | 10           | 4.5         | 30          | 1            | 19                      | 7.8                     |
| FL28BL77-2460 | 4               | 3               | 24            | 6000          | 4000        | 50           | 20          | 150         | 3            | 4.2                     | 2.2                     |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL28BL38-2460无刷直流电机(LD=38mm) FL28BL38-2460 DC Brushless Motor(LD=38mm)

|   |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7   | 5.2   | 14   | 19   | 27   | 35   | 51   | 71   | 100  | 139  | 189  | 264  | 369  | 516  | 720  |
| 减速级数 Number of gear trains                        |       | 1     | 1     | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 4    | 4    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 29.0  | 29.0  | 36.1 | 36.1 | 36.1 | 36.1 | 43.0 | 43.0 | 43.0 | 43.0 | 49.9 | 49.9 | 49.9 | 49.9 | 49.9 |
| 额定转速 Rated speed                                  | r/min | 1173  | 840   | 311  | 229  | 161  | 124  | 85   | 61   | 44   | 31   | 23   | 17   | 12   | 8.4  | 6.0  |
| 额定转矩 Rated torque                                 | N.m   | 0.033 | 0.047 | 0.11 | 0.15 | 0.22 | 0.28 | 0.37 | 0.52 | 0.73 | 1.0  | 1.2  | 1.7  | 2.4  | 3    | 3    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.0   | 1.0   | 3.5  | 3.5  | 3.5  | 3.5  | 7.5  | 7.5  | 7.5  | 7.5  | 9.0  | 9.0  | 9.0  | 9.0  | 9.0  |

配置FL28BL77-2460无刷直流电机(LD=77mm) FL28BL77-2460 DC Brushless Motor(LD=77mm)

|   |       |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7  | 5.2  | 14   | 19   | 27   | 35   | 51   | 71   | 100  | 139  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 29.0 | 29.0 | 36.1 | 36.1 | 36.1 | 36.1 | 43.0 | 43.0 | 43.0 | 43.0 |
| 空载转速 No-load speed                                | r/min | 1617 | 1158 | 429  | 316  | 222  | 171  | 118  | 85   | 60   | 43   |
| 额定转速 Rated speed                                  | r/min | 1080 | 769  | 285  | 210  | 148  | 114  | 78   | 56   | 40   | 2.9  |
| 额定转矩 Rated torque                                 | N.m   | 0.17 | 0.23 | 0.57 | 0.77 | 1.1  | 1.4  | 1.9  | 2.6  | 3    | 3    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.0  | 1.0  | 3.5  | 3.5  | 3.5  | 3.5  | 7.5  | 7.5  | 7.5  | 7.5  |

# FL33BL-32JXE30K

行星减速无刷电机  
BLDC Motor with Planetary Gearbox



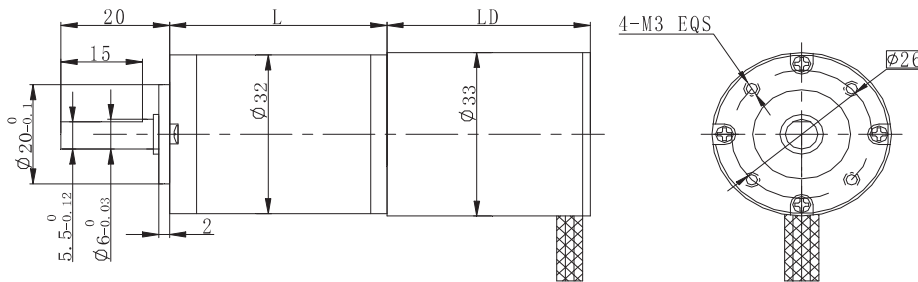
|           |                                 |   |
|-----------|---------------------------------|---|
| 内齿圈材质: 金属 | Φ32行星减速器, 允许转矩范围: 0.3N.m~3.0N.m | 32mm OD Planetary Gearbox,<br>Permissible Load Range: 0.3N.m~3.0N.m |
|-----------|---------------------------------|---|

## ● 接线方式 (Wire Diagram)

|              |     |       |        |      |        |       |       |
|--------------|-----|-------|--------|------|--------|-------|-------|
| U            | V   | W     | Vcc    | Ha   | Hb     | Hc    | GND   |
| 绿            | 红   | 黑     | 黄      | 蓝    | 橙      | 棕     | 白     |
| Green        | Red | Black | Yellow | Blue | Orange | Brown | White |
| UL1007 26AWG |     |       |        |      |        |       |       |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE  | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|---------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|               | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Reak torque | Peak current | Line to line resistance | Line to line inductance |
|               |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL33BL38-2445 | 4               | 3               | 24            | 4500          | 3000        | 22           | 7           | 66          | 0.64         | 12.8                    | 7                       |
| FL33BL80-2490 | 4               | 3               | 24            | 9000          | 7800        | 50           | 40          | 350         | 11           | 0.86                    | 0.55                    |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL33BL38-2445无刷直流电机 (LD=38mm) FL33BL38-2445 DC Brushless Motor(LD=38mm)

|   |       |       |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7   | 5.2  | 14   | 19   | 27   | 35   | 51   | 71   | 100  | 139  | 189  | 264  | 369  |
| 减速级数 Number of gear trains                        |       | 1     | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 25.7  | 25.7 | 32.8 | 32.8 | 32.8 | 32.8 | 39.7 | 39.7 | 39.7 | 39.7 | 46.6 | 46.6 | 46.6 |
| 空载转速 No-load speed                                | r/min | 1213  | 869  | 321  | 237  | 167  | 129  | 88   | 63   | 45   | 32   | 24   | 17   | 12   |
| 额定转速 Rated speed                                  | r/min | 809   | 579  | 214  | 158  | 111  | 86   | 59   | 42   | 30   | 22   | 16   | 11   | 8.1  |
| 额定转矩 Rated torque                                 | N.m   | 0.073 | 0.10 | 0.25 | 0.34 | 0.48 | 0.62 | 0.82 | 1.1  | 1.6  | 2.2  | 2.7  | 3    | 3    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.0   | 1.0  | 3.5  | 3.5  | 3.5  | 3.5  | 7.5  | 7.5  | 7.5  | 7.5  | 9.0  | 9.0  | 9.0  |

配置FL33BL80-2490无刷直流电机(LD=80mm) (FL33BL80-2490 DC Brushless Motor) (LD=80mm)

|   |       |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7  | 5.2  | 14   | 19   | 27   | 35   | 51   | 71   | 100  | 139  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 25.7 | 25.7 | 32.8 | 32.8 | 32.8 | 32.8 | 39.7 | 39.7 | 39.7 | 39.7 |
| 空载转速 No-load speed                                | r/min | 2425 | 1737 | 643  | 474  | 333  | 257  | 176  | 127  | 90   | 65   |
| 额定转速 Rated speed                                  | r/min | 2102 | 1506 | 557  | 411  | 289  | 223  | 153  | 110  | 78   | 56   |
| 额定转矩 Rated torque                                 | N.m   | 0.17 | 0.23 | 0.57 | 0.77 | 1.1  | 1.4  | 1.9  | 2.5  | 3    | 3    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.0  | 1.0  | 3.5  | 3.5  | 3.5  | 3.5  | 7.5  | 7.5  | 7.5  | 7.5  |

# FL36RBL-36JXE30K

行星减速无刷电机  
BLDC Motor with Planetary Gearbox



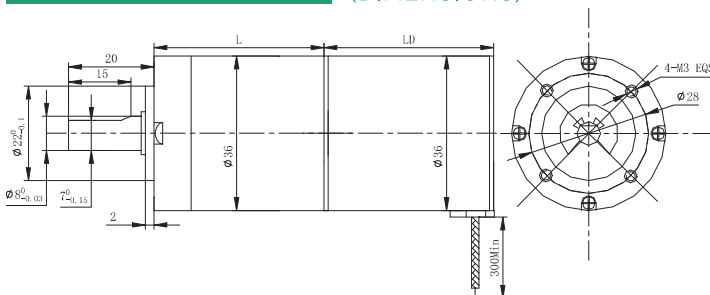
|           |                                 |   |
|-----------|---------------------------------|---|
| 内齿圈材质: 金属 | Φ36行星减速器, 允许转矩范围: 0.3N.m~3.0N.m | 36mm OD Planetary Gearbox,<br>Permissible Load Range: 0.3N.m~3.0N.m |
|-----------|---------------------------------|---|

## ● 接线方式 (Wire Diagram)

|                  |     |       |               |      |       |       |       |
|------------------|-----|-------|---------------|------|-------|-------|-------|
| U                | V   | W     | Vcc           | Ha   | Hb    | Hc    | GND   |
| 黄                | 红   | 黑     | 红             | 蓝    | 绿     | 白     | 黑     |
| Yellow           | Red | Black | Red           | Blue | Green | White | Black |
| UL1061 AWG 20/24 |     |       | UL1061 AWG 26 |      |       |       |       |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE         | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|----------------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                      | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Peak torque | Peak current | Line to line resistance | Line to line inductance |
|                      |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL36RBL540-24V-4818A | 4               | 3               | 24            | 7000          | 4800        | 36           | 18          | 108         | 3.7          | 2.4                     | 2.1                     |
| FL36RBL557-24V-4524A | 4               | 3               | 24            | 5800          | 4500        | 50           | 24          | 150         | 4.1          | 2                       | 2                       |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL36RBL540-24V-4818A无刷直流电机 (长度LD=40) FL36RBL540-24V-4818A DC Brushless Motor (LD=40)

|   |       |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7  | 5.2  | 14   | 19   | 27   | 35   | 51   | 71   | 96   | 115  | 139  | 181  | 219  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 31.0 | 31.0 | 40.1 | 40.1 | 40.1 | 40.1 | 49.0 | 49.0 | 49.0 | 49.0 | 49.0 | 57.9 | 57.9 |
| 空载转速 No-load speed                                | r/min | 1887 | 1351 | 500  | 368  | 259  | 200  | 137  | 99   | 73   | 61   | 50   | 39   | 32   |
| 额定转速 Rated speed                                  | r/min | 1294 | 927  | 343  | 253  | 178  | 137  | 94   | 68   | 50   | 42   | 35   | 27   | 22   |
| 额定转矩 Rated torque                                 | N.m   | 0.12 | 0.17 | 0.41 | 0.55 | 0.79 | 1.0  | 1.3  | 1.9  | 2.5  | 3    | 3    | 3    | 3    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.0  | 1.0  | 3.5  | 3.5  | 3.5  | 3.5  | 7.5  | 7.5  | 7.5  | 7.5  | 7.5  | 9.0  | 9.0  |

配置FL36RBL557-24V-4524A无刷直流电机 (长度LD=57) FL36RBL557-24V-4524A DC Brushless Motor (LD=57)

|   |       |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7  | 5.2  | 14   | 19   | 27   | 35   | 51   | 71   | 96   | 115  | 139  | 181  | 219  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 31.0 | 31.0 | 40.1 | 40.1 | 40.1 | 40.1 | 49.0 | 49.0 | 49.0 | 49.0 | 49.0 | 57.9 | 57.9 |
| 空载转速 No-load speed                                | r/min | 1563 | 1120 | 414  | 305  | 215  | 166  | 114  | 82   | 60   | 50   | 42   | 32   | 27   |
| 额定转速 Rated speed                                  | r/min | 1213 | 869  | 321  | 237  | 167  | 129  | 88   | 63   | 47   | 39   | 32   | 25   | 21   |
| 额定转矩 Rated torque                                 | N.m   | 0.17 | 0.23 | 0.57 | 0.77 | 1.1  | 1.4  | 1.9  | 2.6  | 3    | 3    | 3    | 3    | 3    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.0  | 1.0  | 3.5  | 3.5  | 3.5  | 3.5  | 7.5  | 7.5  | 7.5  | 7.5  | 7.5  | 9.0  | 9.0  |

# FL42RBL-42JMG50K

行星减速无刷电机  
BLDC Motor with Planetary Gearbox



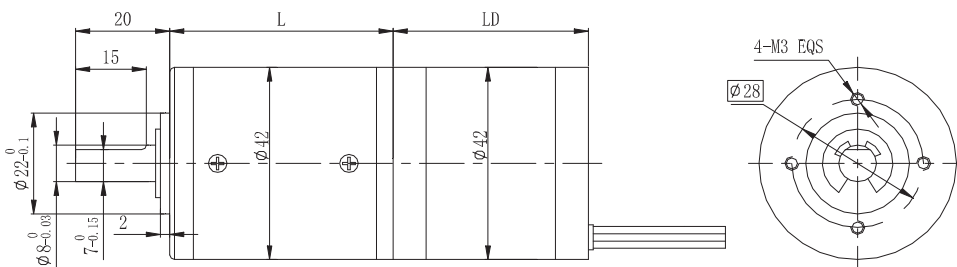
|           |                                 |   |
|-----------|---------------------------------|---|
| 内齿圈材质: 金属 | Φ42行星减速器, 允许转矩范围: 0.5N.m~5.0N.m | 42mm OD Planetary Gearbox,<br>Permissible Load Range: 0.5N.m~5.0N.m |
|-----------|---------------------------------|---|

## ● 接线方式 (Wire Diagram)

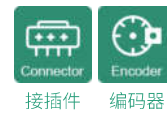
|              |            |            |              |             |            |          |            |
|--------------|------------|------------|--------------|-------------|------------|----------|------------|
| U            | V          | W          | Vcc          | Ha          | Hb         | Hc       | GND        |
| 红<br>Red     | 棕<br>Brown | 黑<br>Black | 蓝<br>Blue    | 黄<br>Yellow | 棕<br>Brown | 红<br>Red | 绿<br>Green |
| UL1007 AWG22 |            |            | UL1007 AWG26 |             |            |          |            |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件 编码器

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE   | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|----------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Peak torque | Peak current | Line to line resistance | Line to line inductance |
|                |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL42RBL30-2455 | 8               | 3               | 24            | 5500          | 4000        | 20           | 8.4         | 60          | 1.7          | 5.9                     | 5.1                     |
| FL42RBL60-2454 | 8               | 3               | 24            | 5400          | 4200        | 56           | 25          | 170         | 4.4          | 1.6                     | 1.94                    |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL42RBL30-2455无刷直流电机 (LD=30mm) FL42RBL30-2455 DC Brushless Motor(LD=30mm)

|   |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.8  | 4.9  | 15   | 19   | 24   | 56   | 71   | 91   | 116  | 212  | 271  | 346  | 442  | 565  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 4    | 4    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 35.2 | 35.2 | 45.7 | 45.7 | 45.7 | 56.0 | 56.0 | 56.0 | 56.0 | 66.3 | 66.3 | 66.3 | 66.3 | 66.3 |
| 空载转速 No-load speed                                | r/min | 1440 | 1127 | 367  | 289  | 229  | 98   | 77   | 60   | 47   | 26   | 20   | 16   | 12   | 9.7  |
| 额定转速 Rated speed                                  | r/min | 1047 | 820  | 267  | 211  | 167  | 71   | 56   | 44   | 34   | 19   | 15   | 12   | 9.0  | 7.1  |
| 额定转矩 Rated torque                                 | N.m   | 0.07 | 0.09 | 0.24 | 0.31 | 0.39 | 0.82 | 1.0  | 1.3  | 1.7  | 2.8  | 3.5  | 4.5  | 5    | 5    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.5  | 1.5  | 6    | 6    | 6    | 12   | 12   | 12   | 12   | 15   | 15   | 15   | 15   | 15   |

配置FL42RBL60-2454无刷直流电机(LD=60mm) FL42RBL60-2454 DC Brushless Motor(LD=60mm)

|   |       |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.8  | 4.9  | 15   | 19   | 24   | 56   | 71   | 91   | 116  | 212  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 35.2 | 35.2 | 45.7 | 45.7 | 45.7 | 56.0 | 56.0 | 56.0 | 56.0 | 66.3 |
| 空载转速 No-load speed                                | r/min | 1414 | 1107 | 360  | 264  | 225  | 96   | 76   | 59   | 47   | 25   |
| 额定转速 Rated speed                                  | r/min | 1099 | 861  | 280  | 221  | 175  | 75   | 59   | 46   | 36   | 20   |
| 额定转矩 Rated torque                                 | N.m   | 0.19 | 0.25 | 0.68 | 0.86 | 1.1  | 2.3  | 2.9  | 3.7  | 4.7  | 5    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.5  | 1.5  | 6    | 6    | 6    | 12   | 12   | 12   | 12   | 15   |



# FL42BLS60-42JM100K

行星减速无刷电机  
BLDC Motor with Planetary Gearbox



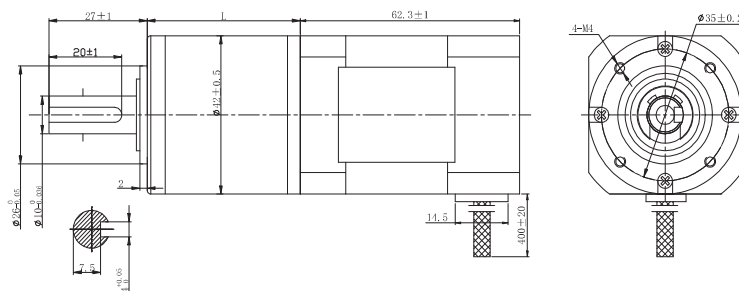
|           |                              |  |
|-----------|------------------------------|--|
| 内齿圈材质: 金属 | Φ42行星减速器, 允许转矩范围: 1N.m~10N.m | 42mm OD Planetary Gearbox,<br>Permissible Load Range: 1N.m~10N.m |
|-----------|------------------------------|--|

## ● 接线方式 (Wire Diagram)

|              |     |       |              |      |       |       |       |
|--------------|-----|-------|--------------|------|-------|-------|-------|
| U            | V   | W     | Vcc          | Ha   | Hb    | Hc    | GND   |
| 黄            | 红   | 黑     | 红            | 蓝    | 绿     | 白     | 黑     |
| Yellow       | Red | Black | Red          | Blue | Green | White | Black |
| UL1430 AWG20 |     |       | UL1430 AWG26 |      |       |       |       |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件 编码器

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE   | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|----------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Peak torque | Peak current | Line to line resistance | Line to line inductance |
|                |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL42BLS60-2460 | 8               | 3               | 24            | 6000          | 4000        | 125          | 52.5        | 380         | 10.6         | 0.8                     | 1.2                     |
| FL42BLA60-2440 | 10              | 3               | 24            | 4000          | 3000        | 160          | 50          | 480         | 8            | 1.1                     | 0.96                    |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL42BLS60-2460无刷直流电机 FL42BLS60-2460 DC Brushless Motor

|   |       |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.71 | 5.18 | 14   | 19   | 27   | 49   | 59   | 67   | 82   | 95   | 115  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 31.5 | 31.5 | 42.1 | 42.1 | 42.1 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 |
| 额定转速 Rated speed                                  | r/min | 1078 | 772  | 286  | 211  | 148  | 82   | 68   | 59   | 49   | 42   | 35   |
| 额定转矩 Rated torque                                 | N.m   | 0.42 | 0.58 | 1.4  | 1.9  | 2.7  | 4.4  | 5.3  | 6.2  | 7.4  | 8.7  | 10   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 3    | 3    | 12   | 12   | 12   | 25   | 25   | 25   | 25   | 25   | 25   |

配置FL42BLA60-2440无刷直流电机 FL42BLA60-2440 DC Brushless Motor

|   |       |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.71 | 5.18 | 14   | 19   | 27   | 49   | 59   | 67   | 82   | 95   | 115  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 31.5 | 31.5 | 42.1 | 42.1 | 42.1 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 |
| 额定转速 Rated speed                                  | r/min | 809  | 579  | 214  | 158  | 111  | 61   | 51   | 44   | 37   | 32   | 26   |
| 额定转矩 Rated torque                                 | N.m   | 0.53 | 0.74 | 1.8  | 2.4  | 3.5  | 5.7  | 6.8  | 7.9  | 9.5  | 10   | 10   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 3    | 3    | 12   | 12   | 12   | 25   | 25   | 25   | 25   | 25   | 25   |



# FL57BL/56JM300K

## 行星减速无刷电机 BLDC Motor with Planetary Gearbox



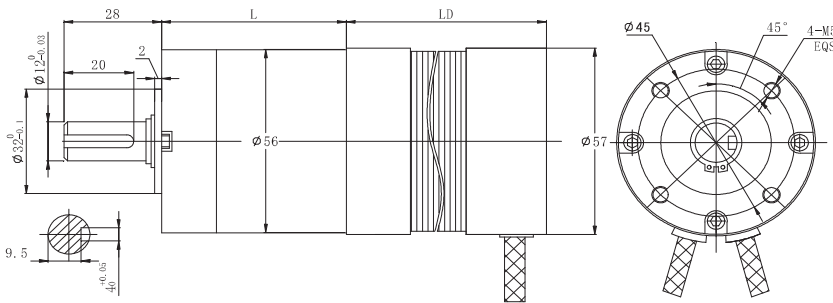
|           |                                 |   |
|-----------|---------------------------------|---|
| 内齿圈材质: 金属 | Φ42行星减速器, 允许转矩范围: 0.5N.m~5.0N.m | 42mm OD Planetary Gearbox,<br>Permissible Load Range: 0.5N.m~5.0N.m |
|-----------|---------------------------------|---|

### ● 接线方式 (Wire Diagram)

|              |     |       |              |      |       |       |       |
|--------------|-----|-------|--------------|------|-------|-------|-------|
| U            | V   | W     | Vcc          | Ha   | Hb    | Hc    | GND   |
| 黄            | 红   | 黑     | 红            | 蓝    | 绿     | 白     | 黑     |
| Yellow       | Red | Black | Red          | Blue | Green | White | Black |
| UL1430 AWG20 |     |       | UL1430 AWG20 |      |       |       |       |



### ● 外形和安装尺寸 (DIMENSIONS)



#### 选件 Options



### ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE  | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值转矩        | 峰值电流         | 电阻                      | 电感                      |
|---------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|               | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Peak torque | Peak current | Line to line resistance | Line to line inductance |
|               |                 |                 | VDC           | r/min         | r/min       | N.m          | W           | N.m         | A            | ohms                    | mH                      |
| FL57BL54-3650 | 4               | 3               | 36            | 5000          | 4000        | 0.11         | 46          | 0.39        | 6.8          | 1.63                    | 4.4                     |
| FL57BL74-3650 | 4               | 3               | 36            | 5000          | 4000        | 0.22         | 99          | 0.7         | 12           | 0.64                    | 2                       |

### ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

#### 配置FL57BLS54-3650无刷直流电机 (LD=53.6mm) FL57BLS54-3650 DC Brushless Motor(LD=53.6mm)

|   |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.60 | 4.25 | 5.33 | 13   | 15   | 18   | 23   | 28   | 43   | 52   | 61   | 72   | 96   | 121  | 154  | 187  | 220  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 1    | 2    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 37.8 | 37.8 | 37.8 | 49.5 | 49.5 | 49.5 | 49.5 | 49.5 | 60.8 | 60.8 | 60.8 | 60.8 | 60.8 | 60.8 | 71.9 | 71.9 | 71.9 |
| 额定转速 Rated speed                                  | r/min | 111  | 941  | 750  | 308  | 267  | 222  | 174  | 143  | 93   | 77   | 66   | 56   | 42   | 33   | 26   | 21   | 18   |
| 额定转矩 Rated torque                                 | N.m   | 0.36 | 0.42 | 0.53 | 1.2  | 1.3  | 1.6  | 2.0  | 2.5  | 3.5  | 4.2  | 4.9  | 5.8  | 7.7  | 9.7  | 11   | 13   | 16   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 9    | 9    | 9    | 36   | 36   | 36   | 36   | 36   | 72   | 72   | 72   | 72   | 72   | 72   | 90   | 90   | 90   |

#### 配置FL57BLS74-3650无刷直流电机 (LD=73.6mm) FL57BLS74-3650 DC Brushless Motor(LD=73.6mm)

|   |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.60 | 4.25 | 5.33 | 13   | 15   | 18   | 23   | 28   | 43   | 52   | 61   | 72   | 96   | 1121 | 154  | 187  | 220  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 1    | 2    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 37.8 | 37.8 | 37.8 | 49.5 | 49.5 | 49.5 | 49.5 | 49.5 | 60.8 | 60.8 | 60.8 | 60.8 | 60.8 | 60.8 | 71.9 | 71.9 | 71.9 |
| 额定转速 Rated speed                                  | r/min | 111  | 941  | 750  | 308  | 267  | 222  | 174  | 143  | 93   | 77   | 66   | 56   | 42   | 33   | 26   | 21   | 18   |
| 额定转矩 Rated torque                                 | N.m   | 0.71 | 0.84 | 1.1  | 2.3  | 2.7  | 3.2  | 4.1  | 5.0  | 6.9  | 8.4  | 9.8  | 12   | 15   | 19   | 22   | 27   | 30   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 9    | 9    | 9    | 36   | 36   | 36   | 36   | 36   | 72   | 72   | 72   | 72   | 72   | 72   | 90   | 90   | 90   |

# FL20BLW14-22JM15K

## 行星减速外转子电机 Outer Rotor Motor with Planetary Gearbox

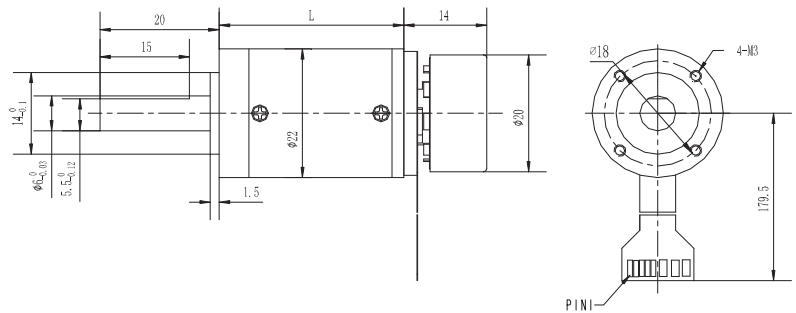


|          |                               |  |
|----------|-------------------------------|--|
| 内齿圈材质:金属 | Φ22减速器, 允许转矩范围:0.15N.m~1.5N.m | 22mm OD Planetary Gearbox,<br>Permissible Load Range: 0.15N.m~1.5N.m |
|----------|-------------------------------|--|

### ● 接线方式 (Wire Diagram)

| 接插件<br>Connecto | 插针号<br>Pin | 功能<br>Functions | 说明<br>Description      |
|-----------------|------------|-----------------|------------------------|
| FPC             | 1          | V cc            | Hall电源输入+5VDC ~ +24VDC |
|                 | 2          | Hall W          |                        |
|                 | 3          | Hall U          |                        |
|                 | 4          | Hall V          |                        |
|                 | 5          | GND             | Hall 接地                |
|                 | 6          | Phase W         |                        |
|                 | 7          | Phase V         |                        |
|                 | 8          | Phase U         |                        |

### ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件



### ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE        | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|---------------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                     | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Reak torque | Peak current | Line to line resistance | Line to line inductance |
|                     |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL20BLW14-12V-5105A | 8               | 3               | 12            | 9530          | 5170        | 7.59         | 5           | 19          | 1.62         | 7.2                     | 0.62                    |
| FL20BLW14-24V-5105A | 8               | 3               | 24            | 9530          | 5220        | 4.74         | 5           | 20          | 0.85         | 26.1                    | 0.2.6                   |

### ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL20BLW14-12V-5105A无刷直流电机 FL20BLW14-12V-5105A BLDC Motor

| 减速比 Reduction ratio                               |       | 3.71  | 5.18  | 14    | 19   | 27   | 51   | 71   | 100  | 139  | 189  | 264  | 369  |
|---|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        |       | 1     | 1     | 2     | 2    | 2    | 3    | 3    | 3    | 3    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 25.4  | 25.4  | 34    | 34   | 34   | 42.4 | 42.4 | 42.4 | 42.4 | 50.8 | 50.8 | 50.8 |
| 空载转速 No-load speed                                | r/min | 2534  | 1815  | 671   | 495  | 348  | 184  | 132  | 94   | 68   | 50   | 36   | 25   |
| 额定转速 Rated speed                                  | r/min | 1394  | 998   | 369   | 272  | 191  | 101  | 73   | 52   | 37   | 27   | 20   | 14   |
| 额定转矩 Rated torque                                 | N.m   | 0.025 | 0.035 | 0.086 | 0.12 | 0.17 | 0.28 | 0.39 | 0.55 | 0.77 | 0.93 | 1.3  | 1.5  |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 0.4   | 0.4   | 1.5   | 1.5  | 1.5  | 3    | 3    | 3    | 3    | 4    | 4    | 4    |

配置FL20BLW14-24V-5105A无刷直流电机 FL20BLW14-24V-5105A BLDC Motor

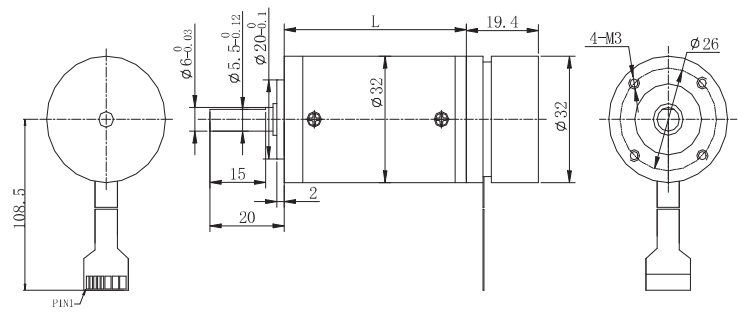
| 减速比 Reduction ratio                               |       | 3.71  | 5.18  | 14    | 19   | 27   | 51   | 71   | 100  | 139  | 189  | 264  | 369  |
|---|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        |       | 1     | 1     | 2     | 2    | 2    | 3    | 3    | 3    | 3    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 25.4  | 25.4  | 34    | 34   | 34   | 42.4 | 42.4 | 42.4 | 42.4 | 50.8 | 50.8 | 50.8 |
| 空载转速 No-load speed                                | r/min | 2534  | 1815  | 671   | 495  | 348  | 184  | 132  | 94   | 68   | 50   | 36   | 25   |
| 额定转速 Rated speed                                  | r/min | 1407  | 1008  | 373   | 275  | 193  | 102  | 74   | 52   | 38   | 28   | 20   | 14   |
| 额定转矩 Rated torque                                 | N.m   | 0.026 | 0.036 | 0.088 | 0.12 | 0.17 | 0.29 | 0.4  | 0.57 | 0.79 | 0.95 | 1.3  | 1.5  |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 0.4   | 0.4   | 1.5   | 1.5  | 1.5  | 3    | 3    | 3    | 3    | 4    | 4    | 4    |

|           |                               |   |
|-----------|-------------------------------|---|
| 内齿圈材质: 金属 | Φ32减速器, 允许转矩范围: 0.5N.m~5.0N.m | 32mm OD Planetary Gearbox,<br>Permissible Load Range: 0.5N.m~5.0N.m |
|-----------|-------------------------------|---|

### ● 接线方式 (Wire Diagram)

| 接插件<br>Connecto | 插针号<br>Pin | 功能<br>Functions | 说明<br>Description      |
|-----------------|------------|-----------------|------------------------|
| FPC             | 1          | V cc            | Hall电源输入: +5VDC~+24VDC |
|                 | 2          | Hall W          |                        |
|                 | 3          | Hall U          |                        |
|                 | 4          | Hall V          |                        |
|                 | 5          | GND             | Hall 接地                |
|                 | 6          | Phase W         |                        |
|                 | 7          | Phase V         |                        |
|                 | 8          | Phase U         |                        |

### ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件



### ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE        | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|---------------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                     | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Reak torque | Peak current | Line to line resistance | Line to line inductance |
|                     |                 |                 | VDC           | r/min         | r/min       | N.m          | W           | N.m         | A            | ohms                    | mH                      |
| FL32BLW18-9V-3706A  | 8               | 3               | 9             | 3700          | 2100        | 29.5         | 6           | 73.8        | 3.4          | 2.87                    | 1.61                    |
| FL32BLW18-12V-4607A | 8               | 3               | 12            | 4600          | 2800        | 25.1         | 7           | 75.3        | 3.2          | 3.43                    | 1.87                    |
| FL32BLW18-24V-4507A | 8               | 3               | 24            | 4500          | 2760        | 25.5         | 7           | 76.5        | 1.7          | 13.7                    | 7.73                    |
| FL32BLW18-48V-4808A | 8               | 3               | 48            | 4800          | 2950        | 24.7         | 8           | 74.1        | 0.97         | 53                      | 27.8                    |

### ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL32BLW18无刷直流电机 FL32BLW18 BLDC Motor

| 减速比 Reduction ratio                               |                   | 3.7   | 5.2   | 14   | 19   | 27   | 35   | 49   | 59   | 68  | 82  | 95   | 115 | 181 | 218 | 253 |     |
|---|-------------------|-------|-------|------|------|------|------|------|------|-----|-----|------|-----|-----|-----|-----|-----|
| 9V  | 额定转速 Rated speed  | r/min | 566   | 405  | 150  | 111  | 78   | 60   | 43   | 36  | 31  | 26   | 22  | 18  | 12  | 9.6 | 8.3 |
|   | 额定转矩 Rated torque | N.m   | 0.099 | 0.14 | 0.33 | 0.45 | 0.65 | 0.84 | 1.1  | 1.3 | 1.5 | 1.8  | 2.0 | 2.5 | 3.5 | 4.2 | 4.9 |
| 12V   | 额定转速 Rated speed  | r/min | 755   | 541  | 200  | 147  | 104  | 80   | 57   | 47  | 41  | 34   | 29  | 24  | 15  | 13  | 11  |
|   | 额定转矩 Rated torque | N.m   | 0.084 | 0.12 | 0.28 | 0.39 | 0.55 | 0.71 | 0.90 | 1.1 | 1.2 | 1.5  | 1.7 | 2.1 | 3.0 | 3.6 | 4.1 |
| 24V   | 额定转速 Rated speed  | r/min | 744   | 533  | 197  | 145  | 102  | 79   | 56   | 47  | 41  | 34   | 29  | 24  | 15  | 13  | 11  |
|   | 额定转矩 Rated torque | N.m   | 0.085 | 0.12 | 0.29 | 0.39 | 0.56 | 0.72 | 0.91 | 1.1 | 1.3 | 1.5  | 1.8 | 2.1 | 3.0 | 3.6 | 4.2 |
| 48V   | 额定转速 Rated speed  | r/min | 795   | 569  | 211  | 155  | 109  | 84   | 60   | 50  | 43  | 36   | 31  | 26  | 16  | 14  | 12  |
|   | 额定转矩 Rated torque | N.m   | 0.082 | 0.12 | 0.28 | 0.38 | 0.54 | 0.70 | 0.88 | 1.1 | 1.2 | 1.5  | 1.7 | 2.1 | 2.9 | 3.5 | 4.1 |
| 减速级数 Number of gear trains                        |                   |       | 1     |      |      | 2    |      |      | 3    |     |     | 4    |     |     |     |     |     |
| 减速器长度(L) Length(L)                                |                   | mm    | 25.7  |      |      | 32.8 |      |      | 39.7 |     |     | 46.6 |     |     |     |     |     |
| 最大瞬间允许负载<br>Max. permissible load in a short time |                   | N.m   | 1.5   |      |      | 6    |      |      | 10   |     |     | 12   |     |     |     |     |     |

# FL45BLW-42JM150K

## 行星减速外转子电机 Outer Rotor Motor with Planetary Gearbox



|          |                             |  |
|----------|-----------------------------|--|
| 内齿圈材质:金属 | Φ42减速器, 允许转矩范围:1.5N.m~15N.m | 42mm OD Planetary Gearbox,<br>Permissible Load Range: 1.5N.m~15N.m |
|----------|-----------------------------|--|

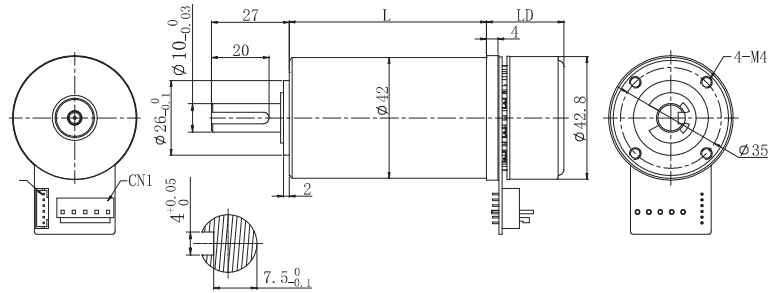
### ● 接线方式

(Wire Diagram)

| 接插件<br>Connecto          | 插针号<br>Pin | 功能<br>Functions | 说明<br>Description |
|--------------------------|------------|-----------------|-------------------|
| CN1<br>JST<br>B5P-VH     | PIN1       | GND             |                   |
|                          | PIN2       | Phase U         |                   |
|                          | PIN3       | Phase V         |                   |
|                          | PIN4       | Phase W         |                   |
|                          | PIN5       | GND             |                   |
| CN2<br>JST<br>B5B-PH-K-S | PIN1       | GND             |                   |
|                          | PIN2       | +5V             | DC(+4.5V ~ 18VDC) |
|                          | PIN3       | Hall U          |                   |
|                          | PIN4       | Hall V          |                   |
|                          | PIN5       | Hall W          |                   |
|                          | PIN6       | GND             |                   |

### ● 外形和安装尺寸

(DIMENSIONS)



选件 Options



接插件



### ● 无刷电动机主要技术参数

(Spur Gearbox Specifications)

| 电机型号<br>TYPE        | 极数<br>Number of poles | 相数<br>Number of phase | 额定电压 | 空载转速  | 额定转速  | 额定转矩 | 额定功率 | 峰值扭矩 | 峰值电流 | 电阻   | 电感   |
|---------------------|-----------------------|-----------------------|------|-------|-------|------|------|------|------|------|------|
|                     |                       |                       | VDC  | r/min | r/min | mN.m | W    | mN.m | A    | ohms | mH   |
| FL45BLW18-24V-7130A | 16                    | 3                     | 24   | 6500  | 5000  | 50   | 30   | 150  | 4.8  | 1.42 | 0.59 |
| FL45BLW21-24V-6750A |                       |                       | 24   | 6700  | 5260  | 84   | 50   | 250  | 7.1  | 0.72 | 0.33 |

### ● 无刷行星齿轮减速电机主要技术参数

(Brushless Gear Motor Technical Data)

配置FL45BLW18-24V-7130A无刷直流电机(LD=18mm) FL45BLW18-24V-7130A BLDC Motor (LD=18mm)

| 减速比 Reduction ratio                               | 3.71  | 5.18 | 14   | 19   | 27   | 49   | 59   | 68   | 82   | 95   | 115  | 181  | 218  | 253  | 305  | 354  | 426  |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        | 1     | 1    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 4    | 4    | 4    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 31.5 | 31.5 | 42.1 | 42.1 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 62.9 | 62.9 | 62.9 | 62.9 | 62.9 | 62.9 |
| 空载转速 No-load speed                                | r/min | 1752 | 1255 | 464  | 342  | 241  | 133  | 110  | 96   | 79   | 68   | 57   | 36   | 30   | 26   | 21   | 18   |
| 额定转速 Rated speed                                  | r/min | 1348 | 965  | 357  | 263  | 185  | 102  | 85   | 74   | 61   | 53   | 43   | 28   | 23   | 20   | 16   | 14   |
| 额定转矩 Rated torque                                 | N.m   | 0.17 | 0.23 | 0.57 | 0.77 | 1.1  | 1.8  | 2.2  | 2.5  | 3.0  | 3.5  | 4.2  | 5.9  | 7.1  | 8.2  | 9.9  | 12   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 4.5  | 4.5  | 18   | 18   | 30   | 30   | 30   | 30   | 30   | 30   | 30   | 38   | 38   | 38   | 38   | 38   |

配置FL45BLW21-24V-6750A无刷直流电机(LD=21mm) FL45BLW21-24V-6750A BLDC Motor (LD=21mm)

| 减速比 Reduction ratio                               | 3.71  | 5.18 | 14   | 19   | 27   | 449  | 59   | 68   | 82   | 95   | 115  | 181  | 218  | 253  | 305  | 354  |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        | 1     | 1    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 4    | 4    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 31.5 | 31.5 | 42.1 | 42.1 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 62.9 | 62.9 | 62.9 | 62.9 | 62.9 |
| 空载转速 No-load speed                                | r/min | 1806 | 1293 | 479  | 353  | 248  | 137  | 114  | 99   | 82   | 71   | 58   | 37   | 31   | 26   | 22   |
| 额定转速 Rated speed                                  | r/min | 1418 | 1015 | 376  | 277  | 195  | 107  | 89   | 77   | 64   | 55   | 46   | 29   | 24   | 21   | 17   |
| 额定转矩 Rated torque                                 | N.m   | 0.28 | 0.39 | 0.95 | 1.3  | 1.8  | 3.0  | 3.6  | 4.2  | 5.0  | 5.8  | 7.1  | 9.9  | 12   | 14   | 15   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 4.5  | 4.5  | 18   | 18   | 30   | 30   | 30   | 30   | 30   | 30   | 30   | 38   | 38   | 38   | 38   |

|           |                              |  |
|-----------|------------------------------|--|
| 内齿圈材质: 金属 | Φ56减速器, 允许转矩范围: 3.0N.m~30N.m | 56mm OD Planetary Gearbox,<br>Permissible Load Range: 3.0N.m~30N.m |
|-----------|------------------------------|--|

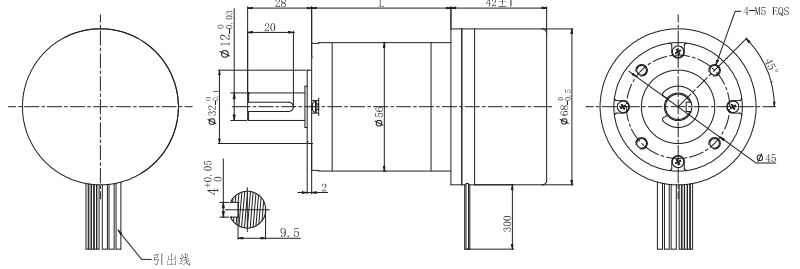
### ● 接线方式

(Wire Diagram)

| Nº | 颜色<br>Color | 引出线型号<br>Type   | 功能<br>Functions | 说明<br>Description       |
|----|-------------|-----------------|-----------------|-------------------------|
| 1  | YEL         | UL1332<br>AWG18 | Phase U         |                         |
| 2  | RED         |                 | Phase V         |                         |
| 3  | BLK         |                 | Phase W         |                         |
| 4  | BLK         | UL1332<br>AWG26 | GND             | Hall 接地                 |
| 5  | RED         |                 | Vcc             | Hall电源DC(+4.5V ~ 18VDC) |
| 6  | BLU         |                 | Hall A          |                         |
| 7  | GRN         |                 | Hall B          |                         |
| 8  | WHT         |                 | Hall C          |                         |

### ● 外形和安装尺寸

(DIMENSIONS)



选件 Options



接插件 编码器



### ● 无刷电动机主要技术参数

(Spur Gearbox Specifications)

| 电机型号<br>TYPE         | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|----------------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                      | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Peak torque | Peak current | Line to line resistance | Line to line inductance |
| FL60BLW42-24V-37110A | 14              | 3               | VDC           | r/min         | r/min       | N.m          | W           | N.m         | A            | ohms                    | mH                      |
|                      |                 |                 | 24            | 4300          | 3700        | 290          | 112         | 870         | 18           | 0.25                    | 0.3                     |

### ● 无刷行星齿轮减速电机主要技术参数

(Brushless Gear Motor Technical Data)

配置FL60BLW42-24V-37110A无刷直流电机 (FL60BLW42-24V-37110A BLDC Motor)

| 减速比 Reduction ratio                               |       | 3.60 | 4.25 | 5.33 | 13   | 15   | 18   | 23   | 28   | 43   | 52   | 61   | 72   | 96   | 121  | 154  | 187  |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        |       | 1    | 1    | 1    | 2    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 37.8 | 37.8 | 37.8 | 49.5 | 49.5 | 49.5 | 49.5 | 49.5 | 60.8 | 60.8 | 60.8 | 60.8 | 60.8 | 60.8 | 71.9 | 71.9 |
| 空载转速 No-load speed                                | r/min | 1194 | 1012 | 807  | 331  | 287  | 239  | 187  | 154  | 100  | 83   | 70   | 60   | 45   | 36   | 28   | 23   |
| 额定转速 Rated speed                                  | r/min | 1028 | 871  | 684  | 285  | 247  | 206  | 161  | 132  | 86   | 71   | 61   | 51   | 39   | 31   | 24   | 20   |
| 额定转矩 Rated torque                                 | N.m   | 0.94 | 1.1  | 1.3  | 3.1  | 3.5  | 4.2  | 5.4  | 6.6  | 9.1  | 11   | 13   | 15   | 20   | 23   | 29   | 30   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 9    | 9    | 9    | 36   | 36   | 36   | 36   | 36   | 72   | 72   | 72   | 72   | 72   | 72   | 90   | 90   |

# FL90BLW-56JM450K

## 行星减速外转子电机 Outer Rotor Motor with Planetary Gearbox

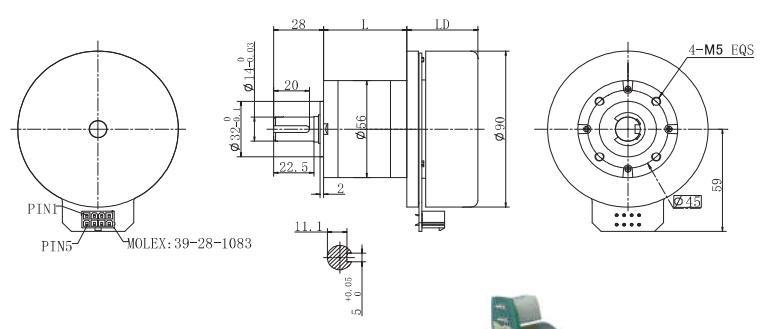


|          |                             |  |
|----------|-----------------------------|--|
| 内齿圈材质:金属 | Φ56减速器, 允许转矩范围:4.0N.m~45N.m | 56mm OD Planetary Gearbox,<br>Permissible Load Range: 4.0N.m~45N.m |
|----------|-----------------------------|--|

### ● 接线方式 (Wire Diagram)

| Nº | Pin  | 接插件型号<br>Type       | 功能<br>Functions | 说明<br>Description |
|----|------|---------------------|-----------------|-------------------|
| 1  | PIN3 | MOLEX<br>39-28-1083 | 霍尔电源正 (Vcc)     |                   |
| 2  | PIN1 |                     | 霍尔U (Hu)        |                   |
| 3  | PIN2 |                     | 霍尔V (Hv)        |                   |
| 4  | PIN5 |                     | 霍尔W (Hw)        |                   |
| 5  | PIN6 |                     | 霍尔电源负 (GND)     |                   |
| 6  | PIN7 |                     | 相U (Phase U)    |                   |
| 7  | PIN8 |                     | 相V (Phase V)    |                   |
| 8  | PIN4 |                     | 相W (Phase W)    |                   |

### ● 外形和安装尺寸 (DIMENSIONS)



#### 选件 Options



### ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE         | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|----------------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                      | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Reak torque | Peak current | Line to line resistance | Line to line inductance |
|                      |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL90BLW27-24V-37130A | 22              | 3               | 24            | 3400          | 2700        | 0.457        | 130         | 1.6         | 23           | 0.21                    | 0.19                    |
| FL90BLW40-48V-16170A | 22              | 3               | 48            | 1950          | 1670        | 0.964        | 169         | 3           | 13           | 0.65                    | 0.9                     |

### ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

#### 配置FL90BLW27-24V-37130A无刷直流电机(LD=27mm) FL90BLW27-24V-37130A BLDC Motor(LD=27mm)

| 减速比 Reduction ratio                               |       | 3.60 | 4.25 | 5.33 | 13   | 15   | 18   | 23   | 28   | 43   | 52   | 61   | 72   | 96   | 121  | 154  | 187  |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        |       | 1    | 1    | 1    | 2    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 40.3 | 40.3 | 40.3 | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 67.2 | 67.2 | 67.2 | 67.2 | 67.2 | 67.2 | 80.6 | 80.6 |
| 额定转速 Rated speed                                  | r/min | 750  | 635  | 507  | 208  | 180  | 150  | 117  | 96   | 63   | 52   | 44   | 38   | 28   | 22   | 18   | 14   |
| 额定转矩 Rated torque                                 | N.m   | 1.5  | 1.8  | 2.0  | 4.8  | 5.6  | 6.7  | 8.5  | 10   | 14   | 17   | 20   | 24   | 32   | 36   | 45   | 45   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 12   | 12   | 12   | 36   | 36   | 36   | 36   | 36   | 72   | 72   | 72   | 72   | 72   | 72   | 90   | 90   |

#### 配置FL90BLW40-48V-16170A无刷直流电机(LD=40mm) FL90BLW40-48V-16170A BLDC Motor(LD=40mm)

| 减速比 Reduction ratio                               |       | 3.60 | 4.25 | 5.33 | 13   | 15   | 18   | 23   | 28   | 43   | 52   | 61   | 72   | 96   |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        |       | 1    | 1    | 1    | 2    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 40.3 | 40.3 | 40.3 | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 67.2 | 67.2 | 67.2 | 67.2 | 67.2 |
| 额定转速 Rated speed                                  | r/min | 464  | 393  | 313  | 128  | 111  | 93   | 73   | 60   | 39   | 32   | 27   | 23   | 17   |
| 额定转矩 Rated torque                                 | N.m   | 3.1  | 3.7  | 4.2  | 10   | 12   | 14   | 18   | 22   | 30   | 37   | 43   | 45   | 45   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 12   | 12   | 12   | 36   | 36   | 36   | 36   | 36   | 72   | 72   | 72   | 72   | 72   |



# FL24CBL30-24JN10K

经济型无刷减速电机  
Economical BLDC Motor with Planetary Gearbox



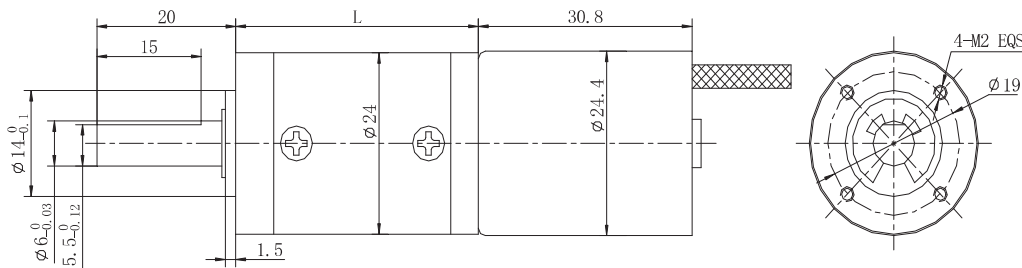
|           |                                 |   |
|-----------|---------------------------------|---|
| 内齿圈材质: 金属 | Φ24行星减速器, 允许转矩范围: 0.1N.m~1.0N.m | 24mm OD Planetary Gearbox,<br>Permissible Load Range: 0.1N.m~1.0N.m |
|-----------|---------------------------------|---|

## ● 接线方式 (Wire Diagram)

|              |     |       |              |      |       |       |       |
|--------------|-----|-------|--------------|------|-------|-------|-------|
| U            | V   | W     | Vcc          | Ha   | Hb    | Hc    | GND   |
| 黄            | 红   | 黑     | 红            | 蓝    | 绿     | 白     | 黑     |
| Yellow       | Red | Black | Red          | Blue | Green | White | Black |
| UL1430 AWG26 |     |       | UL1430 AWG28 |      |       |       |       |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE   | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|----------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Peak torque | Peak current | Line to line resistance | Line to line inductance |
|                |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL24CBL30-1250 | 12              | 3               | 12            | 5000          | 4000        | 5.1          | 2.4         | 17.1        | 0.9          | 7.3                     | 1.7                     |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL24CBL30-1250无刷电机 FL24CBL30-1250 BLDC Motor

| 减速比 Reduction ratio                               |       | 3.7   | 5.2   | 14    | 19    | 27   | 51   | 71   | 100  | 139  | 189  | 264  | 369  | 516  | 720  |
|---|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        |       | 1     | 1     | 2     | 2     | 2    | 3    | 3    | 3    | 3    | 4    | 4    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 25.0  | 25.0  | 31.6  | 31.6  | 31.6 | 38.0 | 38.0 | 38.0 | 38.0 | 44.4 | 44.4 | 44.4 | 44.4 | 44.4 |
| 空载转速 No-load speed                                | r/min | 1348  | 965   | 357   | 263   | 185  | 98   | 70   | 50   | 36   | 26   | 19   | 14   | 10   | 7    |
| 额定转速 Rated speed                                  | r/min | 1078  | 772   | 286   | 211   | 148  | 78   | 56   | 40   | 29   | 21   | 15   | 11   | 7.8  | 5.6  |
| 额定转矩 Rated torque                                 | N.m   | 0.019 | 0.027 | 0.065 | 0.088 | 0.12 | 0.21 | 0.30 | 0.42 | 0.58 | 0.70 | 1    | 1    | 1    | 1    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 0.3   | 0.3   | 1.2   | 1.2   | 1.2  | 2.4  | 2.4  | 2.4  | 2.4  | 3    | 3    | 3    | 3    | 3    |



# FL28CBLA-28JN30K

经济型无刷减速电机  
Economical BLDC Motor with Planetary Gearbox



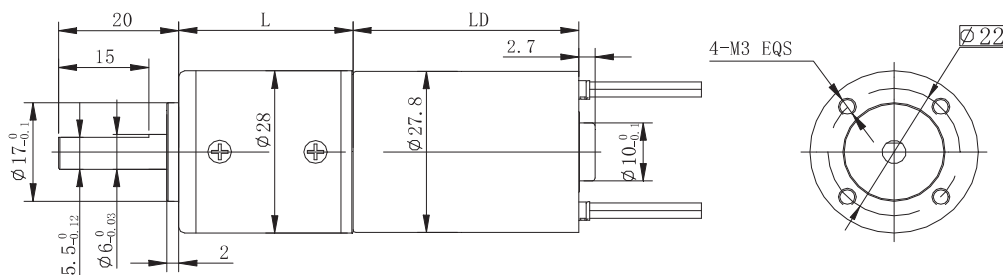
|           |                                 |   |
|-----------|---------------------------------|---|
| 内齿圈材质: 金属 | Φ28行星减速器, 允许转矩范围: 0.3N.m~3.0N.m | 28mm OD Planetary Gearbox,<br>Permissible Load Range: 0.3N.m~3.0N.m |
|-----------|---------------------------------|---|

## ● 接线方式 (Wire Diagram)

|              |     |       |              |      |        |       |       |
|--------------|-----|-------|--------------|------|--------|-------|-------|
| U            | V   | W     | Vcc          | Ha   | Hb     | Hc    | GND   |
| 绿            | 红   | 黑     | 黄            | 蓝    | 橙      | 棕     | 白     |
| Green        | Red | Black | Yellow       | Blue | Orange | Brown | White |
| UL1061 AWG26 |     |       | UL1061 AWG28 |      |        |       |       |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE    | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|-----------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                 | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Peak torque | Peak current | Line to line resistance | Line to line inductance |
|                 |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL28CBLA38-2454 | 8               | 3               | 24            | 5400          | 4000        | 28           | 12          | 84          | 2            | 5.7                     | 2.48                    |
| FL28CBLA48-2456 | 8               | 3               | 24            | 6300          | 4500        | 50           | 24          | 150         | 4.5          | 2.5                     | 1.2                     |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL28CBLA38-2454无刷电机 (LD=38mm) FL28CBLA38-2454 BLDC Motor(LD=38mm)

|   |       |       |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7   | 5.2  | 114  | 19   | 27   | 35   | 51   | 71   | 100  | 139  | 181  | 218  | 254  |
| 减速级数 Number of gear trains                        |       | 1     | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 4    | 4    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 29.0  | 29.0 | 36.1 | 36.1 | 36.1 | 36.1 | 43.0 | 43.0 | 43.0 | 43.0 | 49.9 | 49.9 | 49.9 |
| 空载转速 No-load speed                                | r/min | 1456  | 1042 | 386  | 284  | 200  | 154  | 106  | 76   | 54   | 39   | 30   | 25   | 21   |
| 额定转速 Rated speed                                  | r/min | 1078  | 772  | 286  | 211  | 148  | 114  | 78   | 56   | 40   | 29   | 22   | 18   | 16   |
| 额定转矩 Rated torque                                 | N.m   | 0.093 | 0.13 | 0.32 | 0.43 | 0.61 | 0.79 | 1.0  | 1.5  | 2.0  | 2.8  | 3    | 3    | 3    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1     | 1    | 3.5  | 3.5  | 3.5  | 3.5  | 7.5  | 7.5  | 7.5  | 7.5  | 9    | 9    | 9    |

配置FL28CBLA48-2456无刷电机(LD=48mm) FL28CBLA48-2456 BLDC Motor(LD=48mm)

|   |       |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7  | 5.2  | 14   | 19   | 27   | 35   | 51   | 71   | 100  | 139  | 181  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 29.0 | 29.0 | 36.1 | 36.1 | 36.1 | 36.1 | 43.0 | 43.0 | 43.0 | 43.0 | 49.9 |
| 空载转速 No-load speed                                | r/min | 1700 | 1216 | 450  | 332  | 233  | 154  | 124  | 89   | 63   | 45   | 35   |
| 额定转速 Rated speed                                  | r/min | 1213 | 869  | 321  | 237  | 167  | 114  | 88   | 63   | 45   | 32   | 25   |
| 额定转矩 Rated torque                                 | N.m   | 0.17 | 0.23 | 0.57 | 0.77 | 1.1  | 0.79 | 1.9  | 2.6  | 3    | 3    | 3    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1    | 1    | 3.5  | 3.5  | 3.5  | 3.5  | 7.5  | 7.5  | 7.5  | 7.5  | 9    |

# FL36CBL-36JXF50K

经济型无刷减速电机  
Economical BLDC Motor with Planetary Gearbox



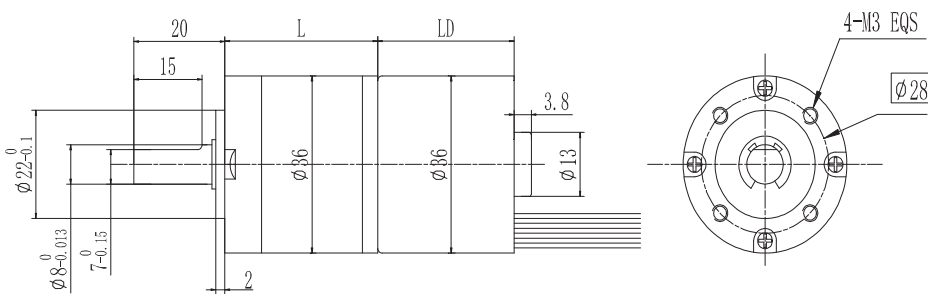
|           |                                 |   |
|-----------|---------------------------------|---|
| 内齿圈材质: 金属 | Φ36行星减速器, 允许转矩范围: 0.5N.m~5.0N.m | 36mm OD Planetary Gearbox,<br>Permissible Load Range: 0.5N.m~5.0N.m |
|-----------|---------------------------------|---|

## ● 接线方式 (Wire Diagram)

|              |            |             |              |           |            |            |            |
|--------------|------------|-------------|--------------|-----------|------------|------------|------------|
| U            | V          | W           | Vcc          | Ha        | Hb         | Hc         | GND        |
| 黄<br>Yellow  | 棕<br>Brown | 橙<br>Orange | 红<br>Red     | 蓝<br>Blue | 绿<br>Green | 白<br>White | 黑<br>Black |
| UL1430 AWG24 |            |             | UL1430 AWG26 |           |            |            |            |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE    | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|-----------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                 | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Peak torque | Peak current | Line to line resistance | Line to line inductance |
|                 |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL36C BL50-2460 | 8               | 3               | 24            | 6000          | 4800        | 55           | 28          | 165         | 4.5          | 1.2                     | 1.2                     |
| FL36C BL57-2455 | 8               | 3               | 24            | 5500          | 4500        | 70           | 33          | 210         | 5.4          | 1.05                    | 1                       |
| FL36C BL60-2458 | 8               | 3               | 24            | 5800          | 4800        | 80           | 40          | 240         | 7            | 0.95                    | 0.85                    |
| FL36C BL65-2458 | 8               | 3               | 24            | 5800          | 4800        | 90           | 45          | 270         | 7.5          | 0.88                    | 0.8                     |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL36CBL50-2460无刷电机(LD=50mm) FL36CBL50-2460 BLDC Motor(LD=50mm)

|   |       |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.71 | 5.18 | 14   | 19   | 27   | 35   | 49   | 59   | 68   | 82   | 95   | 115  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 29.0 | 29.0 | 38.4 | 38.4 | 38.4 | 38.4 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 |
| 空载转速 No-load speed                                | r/min | 1617 | 1158 | 429  | 316  | 222  | 171  | 122  | 102  | 88   | 73   | 63   | 52   |
| 额定转速 Rated speed                                  | r/min | 1294 | 927  | 343  | 253  | 178  | 137  | 98   | 81   | 71   | 59   | 51   | 42   |
| 额定转矩 Rated torque                                 | N.m   | 0.18 | 0.26 | 0.62 | 0.85 | 1.2  | 1.6  | 2.0  | 2.4  | 2.7  | 3.3  | 3.8  | 4.6  |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.5  | 1.5  | 6    | 6    | 6    | 6    | 10   | 10   | 10   | 10   | 12   | 12   |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL36CBL57-2455无刷电机(LD=57mm) FL36CBL57-2455 BLDC Motor(LD=57mm)

|   |       |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.71 | 5.18 | 14   | 19   | 27   | 35   | 49   | 59   | 68   | 82   | 95   | 115  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 29.0 | 29.0 | 38.4 | 38.4 | 38.4 | 38.4 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 |
| 空载转速 No-load speed                                | r/min | 1482 | 1062 | 393  | 289  | 204  | 157  | 112  | 93   | 81   | 67   | 58   | 48   |
| 额定转速 Rated speed                                  | r/min | 1213 | 869  | 321  | 237  | 167  | 129  | 92   | 76   | 66   | 55   | 47   | 39   |
| 额定转矩 Rated torque                                 | N.m   | 0.23 | 0.33 | 0.79 | 1.1  | 1.5  | 2.0  | 2.5  | 3.0  | 3.5  | 4.2  | 4.9  | 5    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.5  | 1.5  | 6    | 6    | 6    | 6    | 10   | 10   | 10   | 10   | 12   | 12   |

配置FL36CBL60-2458无刷电机(LD=60mm) FL36CBL60-2458BLDC Motor(LD=60mm)

|   |       |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.71 | 5.18 | 14   | 19   | 27   | 49   | 59   | 68   | 82   | 95   | 115  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 29.0 | 29.0 | 38.4 | 38.4 | 38.4 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 |
| 空载转速 No-load speed                                | r/min | 1563 | 1120 | 414  | 305  | 215  | 118  | 98   | 85   | 71   | 61   | 50   |
| 额定转速 Rated speed                                  | r/min | 1294 | 927  | 343  | 253  | 178  | 98   | 81   | 71   | 59   | 51   | 42   |
| 额定转矩 Rated torque                                 | N.m   | 0.27 | 0.37 | 0.91 | 1.2  | 1.8  | 2.9  | 3.5  | 4.0  | 4.8  | 5    | 5    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.5  | 1.5  | 6    | 6    | 6    | 10   | 10   | 10   | 10   | 12   | 12   |

配置FL36CBL65-2458无刷电机(LD=65mm) FL36CBL65-2458 BLDC Motor(LD=65mm)

|   |       |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.71 | 5.18 | 14   | 19   | 27   | 49   | 59   | 68   | 82   | 95   | 115  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 29.0 | 29.0 | 38.4 | 38.4 | 38.4 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 |
| 空载转速 No-load speed                                | r/min | 1563 | 1120 | 414  | 305  | 215  | 118  | 98   | 85   | 71   | 61   | 50   |
| 额定转速 Rated speed                                  | r/min | 1294 | 927  | 343  | 253  | 178  | 98   | 81   | 71   | 59   | 51   | 42   |
| 额定转矩 Rated torque                                 | N.m   | 0.30 | 0.42 | 1.0  | 1.4  | 2.0  | 3.2  | 3.9  | 4.5  | 5    | 5    | 5    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.5  | 1.5  | 6    | 6    | 6    | 10   | 10   | 10   | 10   | 12   | 12   |

# FL38CBL-36JXF50K

经济型无刷减速电机  
Economical BLDC Motor with Planetary Gearbox



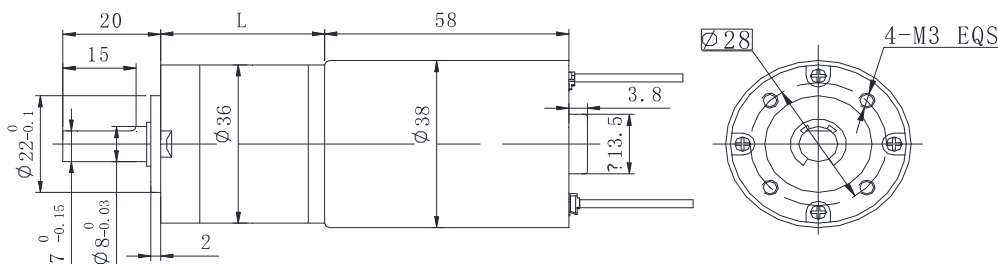
|           |                                 |   |
|-----------|---------------------------------|---|
| 内齿圈材质: 金属 | Φ36行星减速器, 允许转矩范围: 0.5N.m~5.0N.m | 36mm OD Planetary Gearbox,<br>Permissible Load Range: 0.5N.m~5.0N.m |
|-----------|---------------------------------|---|

## ● 接线方式 (Wire Diagram)

|              |     |       |              |      |       |       |       |
|--------------|-----|-------|--------------|------|-------|-------|-------|
| U            | V   | W     | Vcc          | Ha   | Hb    | Hc    | GND   |
| 黄            | 红   | 黑     | 红            | 蓝    | 绿     | 白     | 黑     |
| Yellow       | Red | Black | Red          | Blue | Green | White | Black |
| UL1430 AWG20 |     |       | UL1430 AWG26 |      |       |       |       |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE   | 极数              | 相数              | 额定电压          | 空载转速          | 额定转速        | 额定转矩         | 额定功率        | 峰值扭矩        | 峰值电流         | 电阻                      | 电感                      |
|----------------|-----------------|-----------------|---------------|---------------|-------------|--------------|-------------|-------------|--------------|-------------------------|-------------------------|
|                | Number of poles | Number of phase | Rated voltage | No-load speed | Rated speed | Rated torque | Rated power | Peak torque | Peak current | Line to line resistance | Line to line inductance |
|                |                 |                 | VDC           | r/min         | r/min       | mN.m         | W           | mN.m        | A            | ohms                    | mH                      |
| FL38CBL58-2450 | 4               | 3               | 24            | 5000          | 4000        | 70           | 30          | 210         | 5.1          | 2                       | 1.5                     |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL38CBL58-2450无刷电机 FL38CBL58-2450 BLDC Motor

|   |       |      |      |      |      |      |      |      |      |      |      |      |      |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速比 Reduction ratio                               |       | 3.7  | 5.2  | 14   | 19   | 27   | 35   | 49   | 59   | 68   | 82   | 95   | 115  |
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 29.0 | 29.0 | 38.4 | 38.4 | 38.4 | 38.4 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 | 45.7 |
| 空载转速 No-load speed                                | r/min | 1348 | 965  | 357  | 263  | 185  | 143  | 102  | 85   | 74   | 61   | 53   | 43   |
| 额定转速 Rated speed                                  | r/min | 1078 | 772  | 286  | 211  | 148  | 114  | 82   | 58   | 59   | 49   | 42   | 35   |
| 额定转矩 Rated torque                                 | N.m   | 0.23 | 0.33 | 0.79 | 1.1  | 1.5  | 2.0  | 2.5  | 3.0  | 3.5  | 4.2  | 4.9  | 5    |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 1.5  | 1.5  | 6    | 6    | 6    | 6    | 10   | 10   | 10   | 10   | 12   | 12   |

# FL42CBL-42JXF100K

经济型无刷减速电机  
Economical BLDC Motor with Planetary Gearbox



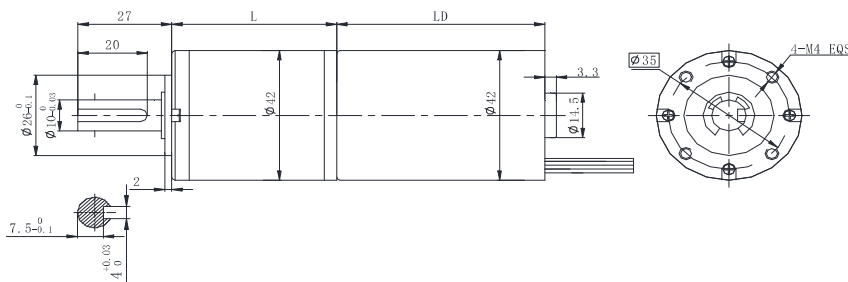
|           |                              |  |
|-----------|------------------------------|--|
| 内齿圈材质: 金属 | Φ42行星减速器, 允许转矩范围: 1N.m~10N.m | 42mm OD Planetary Gearbox,<br>Permissible Load Range: 1N.m~10N.m |
|-----------|------------------------------|--|

## ● 接线方式 (Wire Diagram)

|              |     |       |              |      |       |       |       |
|--------------|-----|-------|--------------|------|-------|-------|-------|
| U            | V   | W     | Vcc          | Ha   | Hb    | Hc    | GND   |
| 黄            | 红   | 黑     | 红            | 蓝    | 绿     | 白     | 黑     |
| Yellow       | Red | Black | Red          | Blue | Green | White | Black |
| UL1430 AWG20 |     |       | UL1430 AWG26 |      |       |       |       |



## ● 外形和安装尺寸 (DIMENSIONS)



选件 Options



接插件

## ● 无刷电动机主要技术参数 (Spur Gearbox Specifications)

| 电机型号<br>TYPE   | 极数<br>Number of poles | 相数<br>Number of phase | 额定电压 | 空载转速  | 额定转速  | 额定转矩 | 额定功率 | 峰值扭矩 | 峰值电流 | 电阻   | 电感  |
|----------------|-----------------------|-----------------------|------|-------|-------|------|------|------|------|------|-----|
|                |                       |                       | VDC  | r/min | r/min | mN.m | W    | mN.m | A    | ohms | mH  |
| FL42CBL60-2442 | 8                     | 3                     | 24   | 4200  | 3200  | 120  | 40   | 360  | 6.3  | 1.2  | 1.6 |
| FL42CBL66-2459 | 8                     | 3                     | 24   | 5900  | 4000  | 150  | 63   | 450  | 7    | 0.75 | 0.8 |

## ● 无刷行星齿轮减速电机主要技术参数 (Brushless Gear Motor Technical Data)

配置FL42CBL60-2442无刷电机(LD=60mm) FL42CBL60-2442 BLDC Motor(LD=60mm)

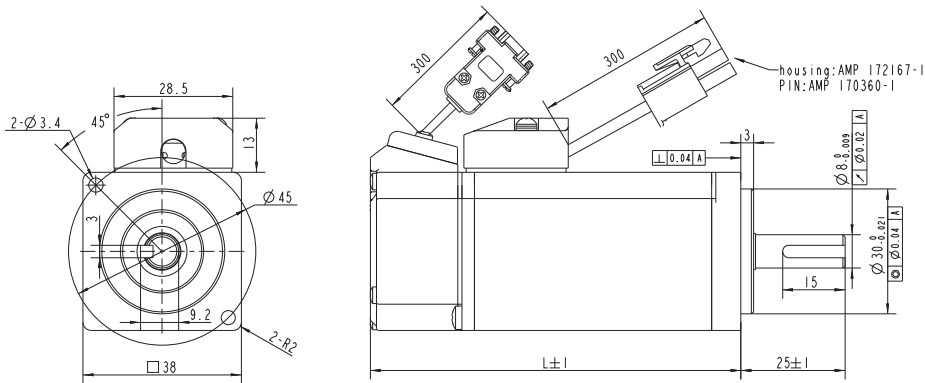
| 减速比 Reduction ratio                               |       | 3.7  | 5.2  | 14   | 19   | 27   | 49   | 59   | 68   | 82   | 95   | 115  | 181  |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 4    |
| 减速器长度(L) Length(L)                                | mm    | 31.5 | 31.5 | 42.1 | 42.1 | 42.1 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 62.9 |
| 空载转速 No-load speed                                | r/min | 1132 | 811  | 300  | 221  | 156  | 86   | 71   | 62   | 51   | 44   | 37   | 23   |
| 额定转速 Rated speed                                  | r/min | 863  | 618  | 229  | 168  | 119  | 65   | 54   | 47   | 39   | 34   | 28   | 18   |
| 额定转矩 Rated torque                                 | N.m   | 0.40 | 0.56 | 1.4  | 1.9  | 2.6  | 4.3  | 5.2  | 6.0  | 7.2  | 8.3  | 10   | 10   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 3    | 3    | 12   | 12   | 12   | 25   | 25   | 25   | 25   | 25   | 25   | 30   |

配置FL42CBL66-2459无刷电机(LD=66mm) FL42CBL66-2459 BLDC Motor(LD=66mm)

| 减速比 Reduction ratio                               |       | 3.7  | 5.2  | 14   | 19   | 27   | 49   | 59   | 68   | 82   | 95   | 115  |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|
| 减速级数 Number of gear trains                        |       | 1    | 1    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    |
| 减速器长度(L) Length(L)                                | mm    | 31.5 | 31.5 | 42.1 | 42.1 | 42.1 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 | 52.5 |
| 空载转速 No-load speed                                | r/min | 1590 | 1139 | 421  | 311  | 219  | 120  | 100  | 87   | 72   | 62   | 51   |
| 额定转速 Rated speed                                  | r/min | 1081 | 769  | 286  | 211  | 148  | 82   | 68   | 59   | 49   | 42   | 35   |
| 额定转矩 Rated torque                                 | N.m   | 0.50 | 0.70 | 1.7  | 2.3  | 3.3  | 5.4  | 6.5  | 7.5  | 9.0  | 10   | 10   |
| 最大瞬间允许负载<br>Max. permissible load in a short time | N.m   | 3    | 3    | 12   | 12   | 12   | 25   | 25   | 25   | 25   | 25   | 25   |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件



齿轮箱



刹车

### ● 接线说明

(Electric Connection)

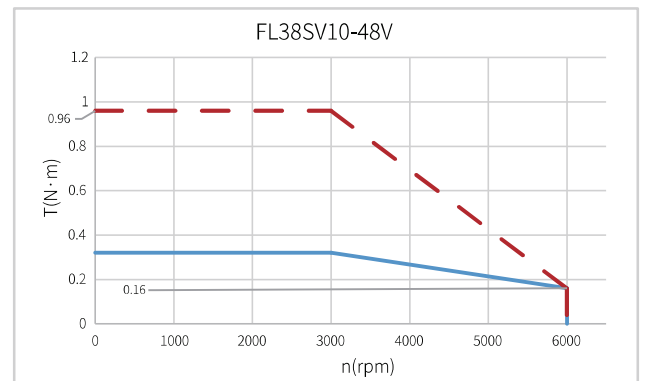
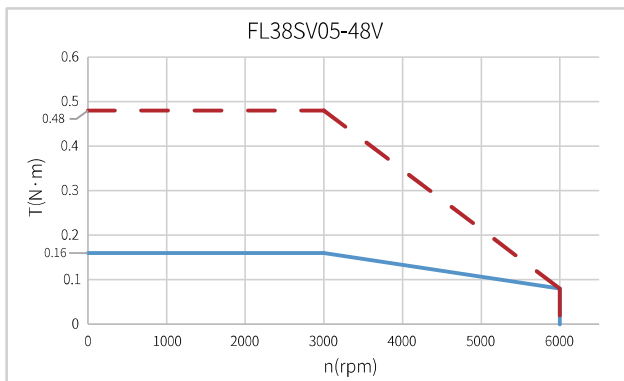
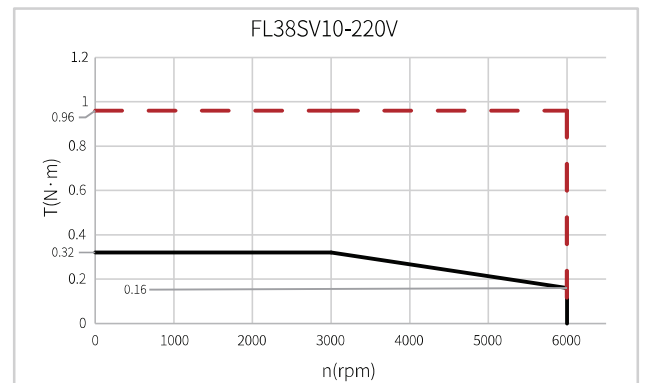
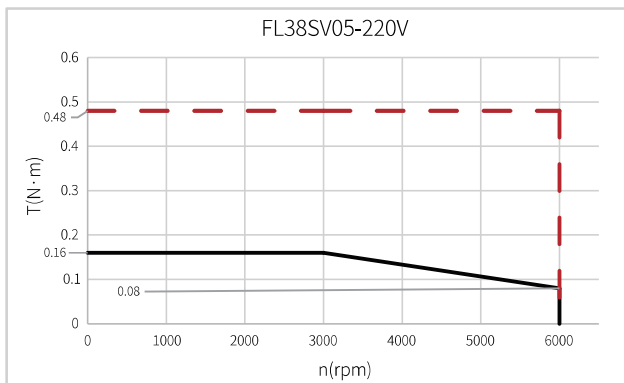
| 序号  | 引出线颜色      | 引出线型号      | 功能          | 说明          |
|-----|------------|------------|-------------|-------------|
| No. | Lead Color | Lead Gauge | Function    | Description |
| 1   | 黄色(Yellow) | AWG19(20)  | U相(Phase U) |             |
| 2   | 红色(Red)    |            | V相(Phase V) |             |
| 3   | 黑色(Black)  |            | W相(Phase W) |             |

编码器接线颜色定义见图纸。

Electric connection of encoder cable is shown in the official drawing.

### ● 性能曲线

(Performance Curve)



## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 69N @ 14mm<br>from the flange  | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +50°C;<br>Temperature: -20°C~ +50°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +85°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +85°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 59N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | Class F  |                                  |   |
| 防护等级<br>(Protection level) | IP65   |                                  |   |

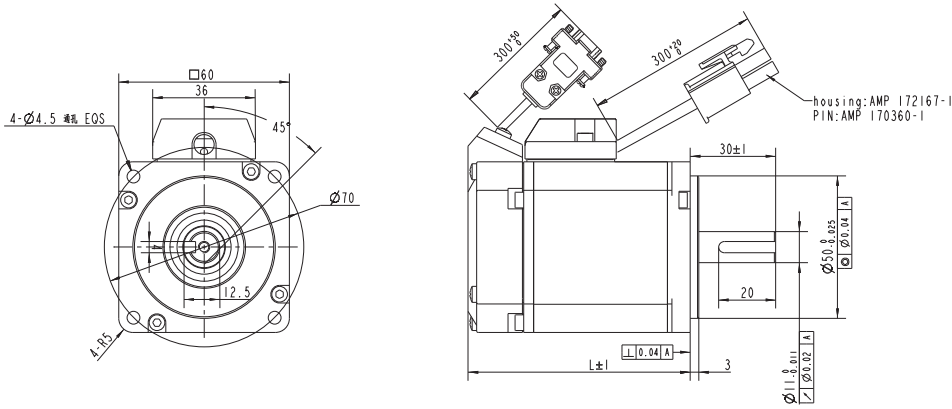
## ● 电性能 (Electrical Specifications)

| 类型(Model)                              | 单位 (Unit)          | FL38SV05  | FL38SV10 |
|--|--------------------|---|----------|
| 额定功率(Rated power) Pn                   | W                  | 50  | 100      |
| 额定电压(Rated voltage) U                  | VDC                | 220   | 220      |
| 额定转速(Rated speed) nn                   | RPM                | 3000  | 3000     |
| 额定转矩(Rated torque) Tn                  | N·m                | 0.16  | 0.32     |
| 额定电流(Rated current) In                 | A                  | 0.5   | 1        |
| 最大转速(Maximum speed) nmax               | RPM                | 6000  | 6000     |
| 最大转矩(Maximum torque) Tm                | N·m                | 0.48  | 0.96     |
| 最大电流(Maximum current) Im               | A                  | 1.5   | 3        |
| 电阻(Line to line resistance) RL         | Ω                  | 33  | 17.5     |
| 电感(Line to line inductance) LL         | mH                 | 24  | 12.4     |
| 反电势系数(BackEMF) Ke                      | V/Krpm             | 21  | 21       |
| 转矩系数(Torque constant) Kt               | Nm/A               | 0.32  | 0.32     |
| 电气时间常数(Electrical time constant) τe    | ms                 | 0.7   | 0.7      |
| 机械时间常数(Mechanical time constant) τm    | ms                 | 1.23  | 1.09     |
| 转动惯量(Rotor inertia) Jm0                | Kg.cm <sup>2</sup> | 0.024   | 0.04     |
| 转动惯量带制动器(Rotor inertia with brake) Jm1 | Kg.cm <sup>2</sup> | 0.034   | 0.05     |
| 极数(Number of poles)                    |                    | 10  | 10       |
| 编码器(Encoder)                           |                    | 2500ppr光电编码器 (增量式)<br>2500p/rev incremental encoder |          |
| 机身长度(Motor length) L1                  | mm                 | 72  | 88       |
| 机身长度带制动器(Motor length with brake) L2   | mm                 | 106   | 122      |
| 重量 (Weight)                            | Kg                 | 0.4   | 0.5      |
| 重量带制动器(Weight with brake)              | Kg                 | 0.65  | 0.75     |



### ● 机械尺寸

(Dimensions)



选件 Options



接插件



齿轮箱



刹车

### ● 接线说明

(Electric Connection)

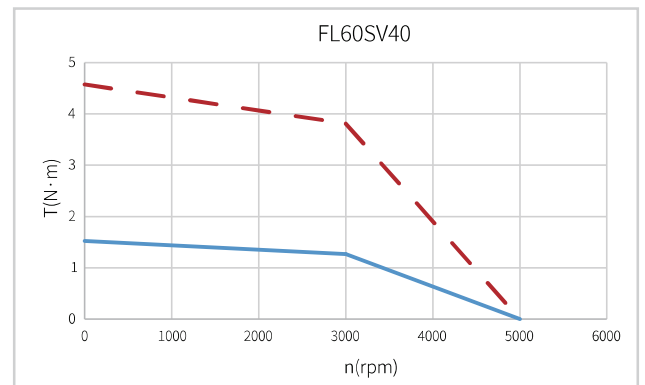
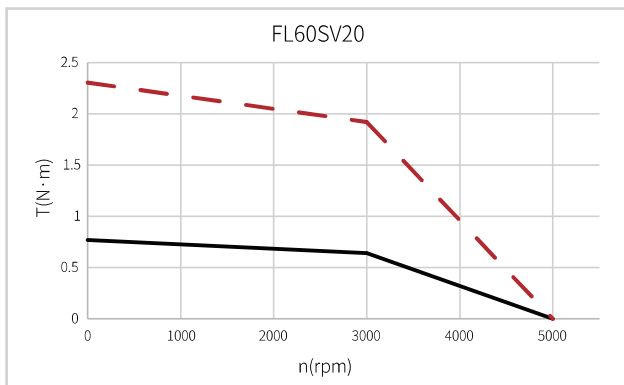
| 序号  | 引出线颜色      | 引出线型号      | 功能          | 说明          |
|-----|------------|------------|-------------|-------------|
| No. | Lead Color | Lead Gauge | Function    | Description |
| 1   | 黄色(Yellow) | AWG19(20)  | U相(Phase U) |             |
| 2   | 红色(Red)    |            | V相(Phase V) |             |
| 3   | 黑色(Black)  |            | W相(Phase W) |             |

编码器接线颜色定义见图纸。

Electric connection of encoder cable is shown in the official drawing.

### ● 性能曲线

(Performance Curve)



## ● 一般技术特性 (General Technical Information)

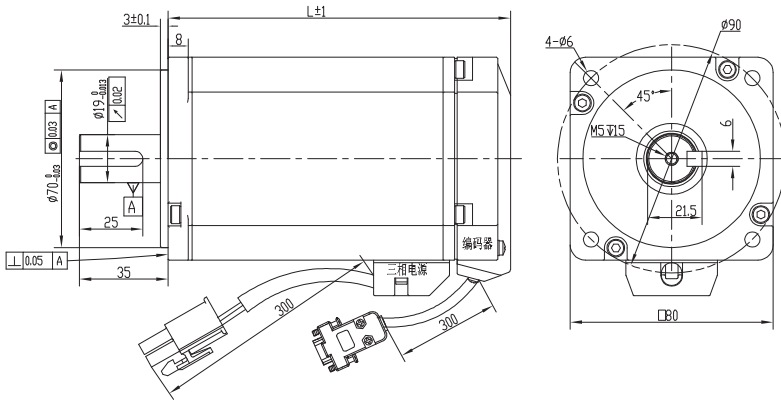
|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 245N @ 20mm<br>from the flange   | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +50°C;<br>Temperature: -20°C~ +50°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +85°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +85°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 98N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | Class F  |                                  |   |
| 防护等级<br>(Protection level) | IP65   |                                  |   |

## ● 电性能 (Electrical Specifications)

| 类型(Model)                              | 单位 (Unit)          | FL60SV20  | FL60SV40 |       |       |
|--|--------------------|---|----------|-------|-------|
| 额定功率(Rated power) Pn                   | W                  | 200   |          | 400   |       |
| 额定电压(Rated voltage) U                  | VDC                | 48  | 220      | 48    | 220   |
| 额定转速(Rated speed) nn                   | RPM                | 3000  | 3000     | 3000  | 3000  |
| 额定转矩(Rated torque) Tn                  | N·m                | 0.64  | 0.64     | 1.27  | 1.27  |
| 额定电流(Rated current) In                 | A                  | 6   | 1.2      | 12    | 2.4   |
| 最大转速(Maximum speed) nmax               | RPM                | 5000  | 6000     | 5000  | 6000  |
| 最大转矩(Maximum torque) Tm                | N·m                | 1.92  | 1.92     | 3.81  | 3.81  |
| 最大电流(Maximum current) Im               | A                  | 18  | 3.6      | 36    | 7.2   |
| 电阻(Line to line resistance) RL         | Ω                  | 0.38  | 9.35     | 0.23  | 3.46  |
| 电感(Line to line inductance) LL         | mH                 | 0.68  | 17       | 0.3   | 7.14  |
| 反电势系数(BackEMF) Ke                      | V/Krpm             | 6.5   | 32       | 6.5   | 32    |
| 转矩系数(Torque constant) Kt               | Nm/A               | 0.107   | 0.53     | 0.107 | 0.53  |
| 电气时间常数(Electrical time constant) τe    | ms                 | 1.79  | 1.81     | 1.3   | 2.06  |
| 机械时间常数(Mechanical time constant) τm    | ms                 | 0.85  | 21.01    | 0.52  | 12.96 |
| 转动惯量(Rotor inertia) Jm0                | Kg.cm <sup>2</sup> | 0.15  | 0.15     | 0.25  | 0.25  |
| 转动惯量带制动器(Rotor inertia with brake) Jm1 | Kg.cm <sup>2</sup> | 0.15  | 0.15     | 0.25  | 0.25  |
| 极数(Number of poles)                    |                    | 10  | 10       | 10    | 10    |
| 编码器(Encoder)                           |                    | 2500ppr光电编码器 (增量式)<br>2500p/rev incremental encoder |          |       |       |
| 机身长度(Motor length) L1                  | mm                 | 86.5  | 79.5     | 106   | 99    |
| 机身长度带制动器(Motor length with brake) L2   | mm                 | 123   | 116      | 142.5 | 135.5 |
| 重量 (Weight)                            | Kg                 | 0.95  | 0.9      | 1.35  | 1.3   |
| 重量带制动器(Weight with brake)              | Kg                 | 1.35  | 1.3      | 1.85  | 1.8   |

### ● 机械尺寸

(Dimensions)



选件 Options



### ● 接线说明

(Electric Connection)

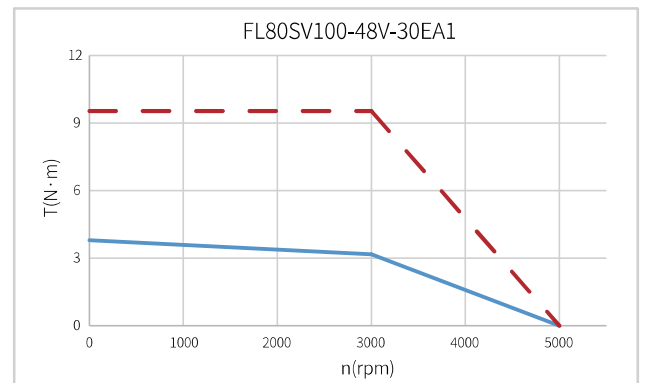
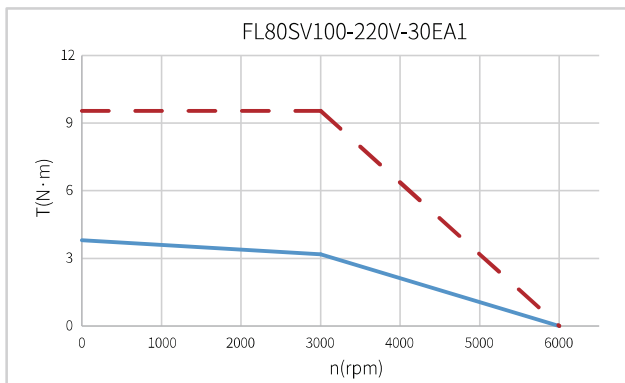
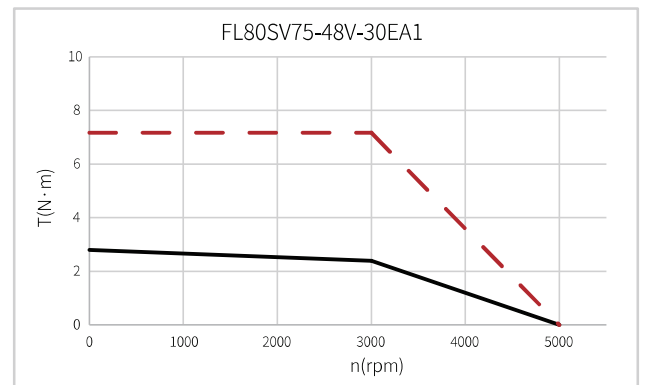
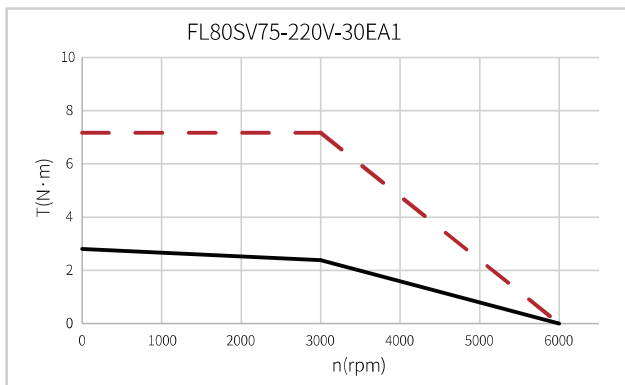
| 序号  | 引出线颜色      | 引出线型号      | 功能          | 说明          |
|-----|------------|------------|-------------|-------------|
| No. | Lead Color | Lead Gauge | Function    | Description |
| 1   | 黄色(Yellow) | AWG16(13)  | U相(Phase U) |             |
| 2   | 红色(Red)    |            | V相(Phase V) |             |
| 3   | 黑色(Black)  |            | W相(Phase W) |             |

编码器接线颜色定义见图纸。

Electric connection of encoder cable is shown in the official drawing.

### ● 性能曲线

(Performance Curve)



## ● 一般技术特性 (General Technical Information)

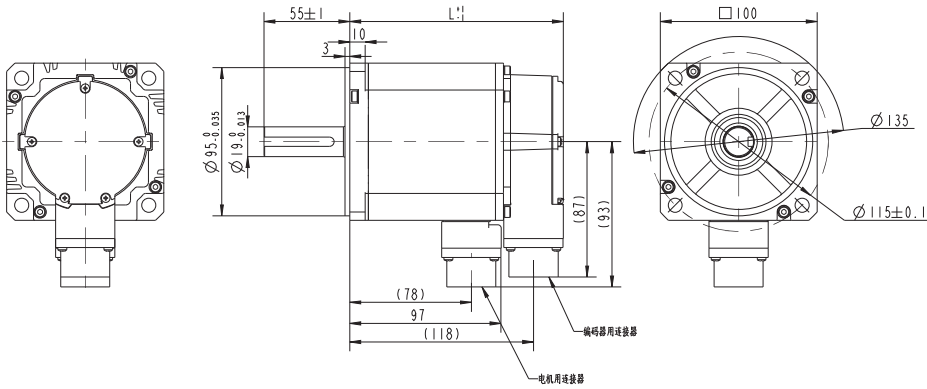
|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 392N @ 20mm<br>from the flange   | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +50°C;<br>Temperature: -20°C~ +50°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +85°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +85°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 147N   |                                  |   |
| 绝缘等级<br>(Insulation Class) | Class F  |                                  |   |
| 防护等级<br>(Protection level) | IP65   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

| 类型(Model)                          |      | 单位 (Unit)          | FL80SV75  |       | FL80SV100 |       |
|------------------------------------|------|--------------------|---|-------|-----------|-------|
| 额定功率(Rated power)                  | Pn   | W                  | 750   |       | 1000      |       |
| 额定电压(Rated voltage)                | U    | VDC                | 220   | 48    | 220       | 48    |
| 额定转速(Rated speed)                  | nn   | RPM                | 3000  | 3000  | 3000      | 3000  |
| 额定转矩(Rated torque)                 | Tn   | N·m                | 2.39  | 2.39  | 3.18      | 3.18  |
| 额定电流(Rated current)                | In   | A                  | 4.4   | 22.2  | 5.9       | 30    |
| 最大转速(Maximum speed)                | nmax | RPM                | 6000  | 5000  | 6000      | 5000  |
| 最大转矩(Maximum torque)               | Tm   | N·m                | 7.14  | 7.14  | 9.6       | 9.6   |
| 最大电流(Maximum current)              | Im   | A                  | 13.2  | 73.5  | 17.7      | 90    |
| 电阻(Line to line resistance)        | RL   | Ω                  | 1.77  | 0.064 | 0.885     | 0.034 |
| 电感(Line to line inductance)        | LL   | mH                 | 5.6   | 0.2   | 3.67      | 0.16  |
| 反电势系数(BackEMF)                     | Ke   | V/Krpm             | 36  | 6.5   | 36        | 6.5   |
| 转矩系数(Torque constant)              | Kt   | Nm/A               | 0.54  | 0.098 | 0.54      | 0.107 |
| 电气时间常数(Electrical time constant)   | τe   | ms                 | 3.2   | 3.1   | 4.1       | 4.7   |
| 机械时间常数(Mechanical time constant)   | τm   | ms                 | 1.48  | 1.65  | 1.06      | 0.86  |
| 转动惯量(Rotor inertia)                | Jm0  | Kg.cm <sup>2</sup> | 1.56  | 1.56  | 2.22      | 2.22  |
| 转动惯量带制动器(Rotor inertia with brake) | Jm1  | Kg.cm <sup>2</sup> | 1.685   | 1.685 | 2.34      | 2.34  |
| 极数(Number of poles)                |      |                    | 10  | 10    | 10        | 10    |
| 编码器(Encoder)                       |      |                    | 2500ppr光电编码器 (增量式)<br>2500p/rev incremental encoder |       |           |       |
| 机身长度(Motor length)                 | L1   | mm                 | 112   | 118   | 129       | 135   |
| 机身长度带制动器(Motor length with brake)  | L2   | mm                 | 149   | 155   | 165       | 171   |
| 重量 (Weight)                        |      | Kg                 | 2.5   | 2.6   | 3.2       | 3.3   |
| 重量带制动器(Weight with brake)          |      | Kg                 | 3.1   | 3.2   | 3.8       | 3.9   |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件



齿轮箱



刹车

### ● 接线说明

(Electric Connection)

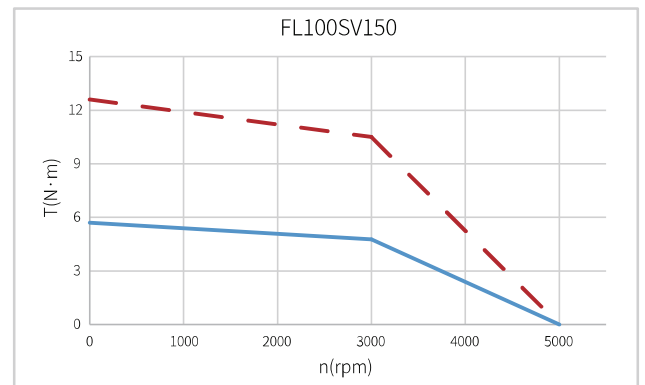
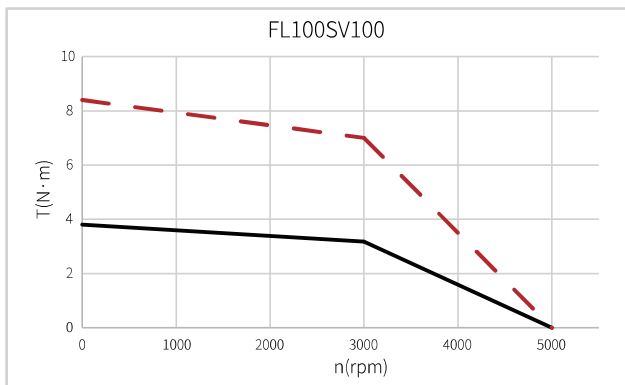
动力线的连接器接线定义见图纸。

编码器的连接器接线定义见图纸。

Electric connection of power and encoder cable is shown in the official drawing.

### ● 性能曲线

(Performance Curve)



## ● 一般技术特性 (General Technical Information)

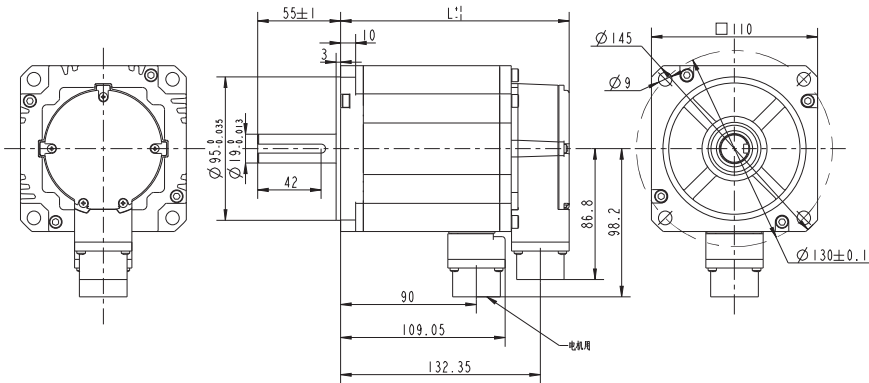
|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 490N @ 20mm<br>from the flange   | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +50°C;<br>Temperature: -20°C~ +50°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +85°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +85°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 196N   |                                  |   |
| 绝缘等级<br>(Insulation Class) | Class F  |                                  |   |
| 防护等级<br>(Protection level) | IP65   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

| 类型(Model)                          | 单位 (Unit) | FL100SV100         |   | FL100SV150 |        |       |
|------------------------------------|-----------|--------------------|---|------------|--------|-------|
| 额定功率(Rated power)                  | Pn        | W                  | 1000  |            | 1500   |       |
| 额定电压(Rated voltage)                | U         | VDC                | 220VAC  | 48VDC      | 220VAC | 48VDC |
| 额定转速(Rated speed)                  | nn        | RPM                | 3000  | 3000       | 3000   | 3000  |
| 额定转矩(Rated torque)                 | Tn        | N·m                | 3.18  | 3.18       | 4.77   | 4.77  |
| 额定电流(Rated current)                | In        | A                  | 5.0   | 31.8       | 7.5    | 43.4  |
| 最大转速(Maximum speed)                | nmax      | RPM                | 5000  | 5000       | 5000   | 5000  |
| 最大转矩(Maximum torque)               | Tm        | N·m                | 7   | 7          | 10.5   | 10.5  |
| 最大电流(Maximum current)              | Im        | A                  | 11  | 70         | 16.7   | 95.5  |
| 电阻(Line to line resistance)        | RL        | Ω                  | 0.82  | 0.022      | 0.54   | 0.015 |
| 电感(Line to line inductance)        | LL        | mH                 | 7.4   | 0.2        | 5.2    | 0.15  |
| 反电势系数(BackEMF)                     | Ke        | V/Krpm             | 38  | 6.18       | 38     | 6.48  |
| 转矩系数(Torque constant)              | Kt        | Nm/A               | 0.63  | 0.1        | 0.63   | 0.11  |
| 电气时间常数(Electrical time constant)   | τe        | ms                 | 9   | 9          | 9.6    | 10    |
| 机械时间常数(Mechanical time constant)   | τm        | ms                 | 0.46  | 0.47       | 0.43   | 0.29  |
| 转动惯量(Rotor inertia)                | Jm0       | Kg.cm <sup>2</sup> | 1.3   | 1.3        | 1.84   | 1.84  |
| 转动惯量带制动器(Rotor inertia with brake) | Jm1       | Kg.cm <sup>2</sup> | 1.67  | 1.67       | 2.21   | 2.21  |
| 极数(Number of poles)                |           |                    | 10  | 10         | 10     | 10    |
| 编码器(Encoder)                       |           |                    | 2500ppr光电编码器 (增量式)<br>2500p/rev incremental encoder |            |        |       |
| 机身长度(Motor length)                 | L1        | mm                 | 137   | 142        | 159    | 164   |
| 机身长度带制动器(Motor length with brake)  | L2        | mm                 | 172   | 177        | 194    | 199   |
| 重量 (Weight)                        |           | Kg                 | 3.73  | 3.8        | 4.7    | 4.8   |
| 重量带制动器(Weight with brake)          |           | Kg                 | 4.73  | 4.8        | 5.7    | 5.8   |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件



齿轮箱



刹车

### ● 接线说明

(Electric Connection)

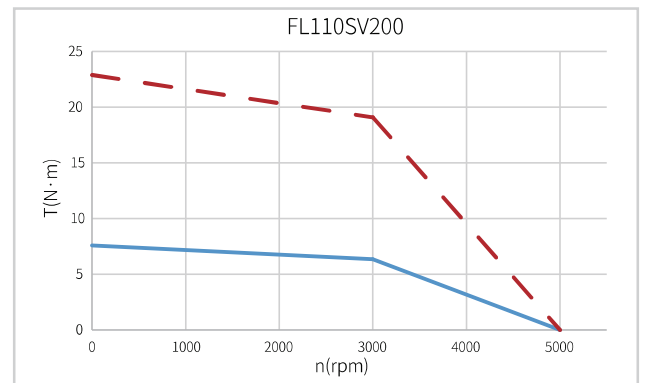
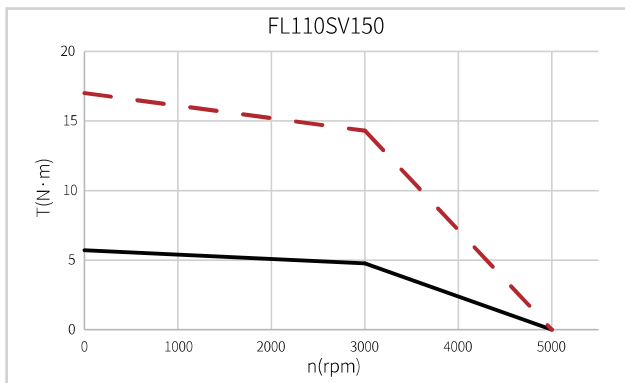
动力线的连接器接线定义见图纸。

编码器的连接器接线定义见图纸。

Electric connection of power and encoder cable is shown in the official drawing.

### ● 性能曲线

(Performance Curve)







## ● 一般技术特性 (General Technical Information)

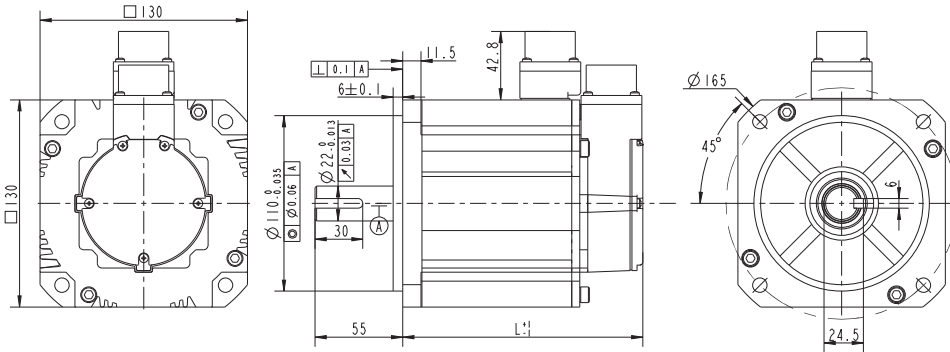
|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 490N @ 20mm<br>from the flange   | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +50°C;<br>Temperature: -20°C~ +50°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +85°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +85°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 196N   |                                  |   |
| 绝缘等级<br>(Insulation Class) | Class F  |                                  |   |
| 防护等级<br>(Protection level) | IP65   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

| 类型(Model)                          | 单位 (Unit) | FL110SV150         |   | FL110SV200 |        |       |
|------------------------------------|-----------|--------------------|---|------------|--------|-------|
| 额定功率(Rated power)                  | Pn        | W                  | 1500  |            | 2000   |       |
| 额定电压(Rated voltage)                | U         | VDC                | 220VAC  | 48VDC      | 220VAC | 48VDC |
| 额定转速(Rated speed)                  | nn        | RPM                | 3000  | 3000       | 3000   | 3000  |
| 额定转矩(Rated torque)                 | Tn        | N·m                | 4.77  | 4.77       | 6.37   | 6.37  |
| 额定电流(Rated current)                | In        | A                  | 7.6   | 43.4       | 10.1   | 58    |
| 最大转速(Maximum speed)                | nmax      | RPM                | 5000  | 5000       | 5000   | 5000  |
| 最大转矩(Maximum torque)               | Tm        | N·m                | 14.3  | 14.3       | 19.1   | 19.1  |
| 最大电流(Maximum current)              | Im        | A                  | 22.8  | 130        | 30.3   | 174   |
| 电阻(Line to line resistance)        | RL        | Ω                  | 0.36  | 0.01       | 0.29   | 0.009 |
| 电感(Line to line inductance)        | LL        | mH                 | 5.6   | 0.16       | 4.8    | 0.145 |
| 反电势系数(BackEMF)                     | Ke        | V/Krpm             | 38.1  | 6.35       | 38.1   | 6.63  |
| 转矩系数(Torque constant)              | Kt        | Nm/A               | 0.63  | 0.11       | 0.63   | 0.11  |
| 电气时间常数(Electrical time constant)   | τe        | ms                 | 15  | 16         | 16.5   | 16.1  |
| 机械时间常数(Mechanical time constant)   | τm        | ms                 | 0.48  | 0.48       | 0.51   | 0.53  |
| 转动惯量(Rotor inertia)                | Jm0       | Kg.cm <sup>2</sup> | 3.1   | 3.1        | 4.1    | 4.1   |
| 转动惯量带制动器(Rotor inertia with brake) | Jm1       | Kg.cm <sup>2</sup> | 3.47  | 3.47       | 4.47   | 4.47  |
| 极数(Number of poles)                |           |                    | 10  | 10         | 10     | 10    |
| 编码器(Encoder)                       |           |                    | 2500ppr光电编码器 (增量式)<br>2500p/rev incremental encoder |            |        |       |
| 机身长度(Motor length)                 | L1        | mm                 | 151.5   | 156.5      | 168.5  | 173.5 |
| 机身长度带制动器(Motor length with brake)  | L2        | mm                 | 187   | 192        | 204    | 209   |
| 重量 (Weight)                        |           | Kg                 | 5   | 5.2        | 6.7    | 6.9   |
| 重量带制动器(Weight with brake)          |           | Kg                 | 6   | 6.2        | 7.7    | 7.9   |

### ● 机械尺寸

(Dimensions)



选件 Options



接插件



齿轮箱



刹车

### ● 接线说明

(Electric Connection)

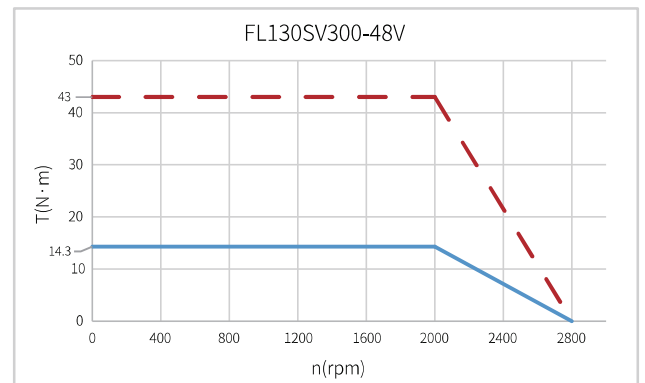
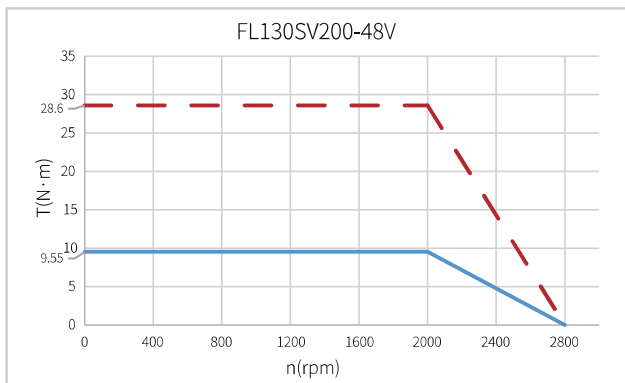
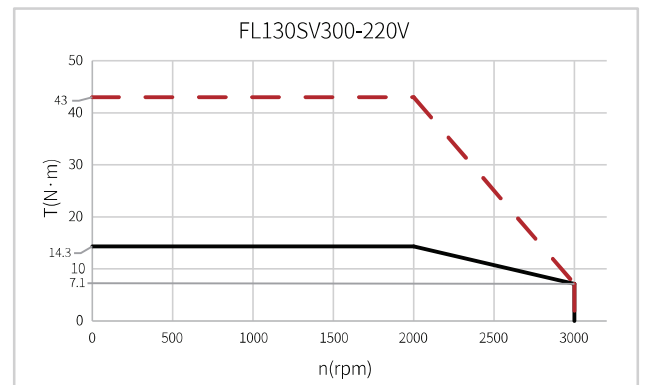
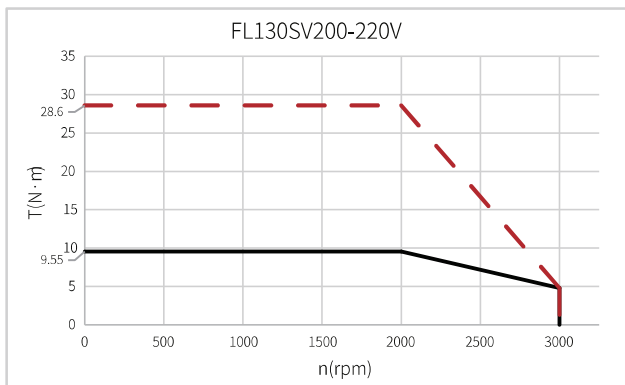
动力线的连接器接线定义见图纸。

编码器的连接器接线定义见图纸。

Electric connection of power and encoder cable is shown in the official drawing.

### ● 性能曲线

(Performance Curve)





## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 490N @ 20mm<br>from the flange   | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +40°C;<br>Temperature: -20°C~ +40°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +60°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +60°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 196N   |                                  |   |
| 绝缘等级<br>(Insulation Class) | Class F  |                                  |   |
| 防护等级<br>(Protection level) | IP65   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

| 类型(Model)                          | 单位 (Unit) | FL130SV200         |   | FL130SV300 |      |       |
|------------------------------------|-----------|--------------------|---|------------|------|-------|
| 额定功率(Rated power)                  | Pn        | W                  | 2000  |            | 3000 |       |
| 额定电压(Rated voltage)                | U         | VDC                | 220   | 48         | 220  | 48    |
| 额定转速(Rated speed)                  | nn        | RPM                | 2000  | 2000       | 2000 | 2000  |
| 额定转矩(Rated torque)                 | Tn        | N·m                | 9.55  | 9.55       | 14.3 | 14.3  |
| 额定电流(Rated current)                | In        | A                  | 9.3   | 52.9       | 14   | 79.3  |
| 最大转速(Maximum speed)                | nmax      | RPM                | 3000  | 3000       | 3000 | 300   |
| 最大转矩(Maximum torque)               | Tm        | N·m                | 28.65   | 28.65      | 42.9 | 42.9  |
| 最大电流(Maximum current)              | Im        | A                  | 27.9  | 158.7      | 42   | 237.9 |
| 电阻(Line to line resistance)        | RL        | Ω                  | 0.8   | 0.025      | 0.5  | 0.016 |
| 电感(Line to line inductance)        | LL        | mH                 | 4.2   | 0.14       | 3    | 0.1   |
| 反电势系数(BackEMF)                     | Ke        | V/Krpm             | 68  | 12         | 68   | 12    |
| 转矩系数(Torque constant)              | Kt        | Nm/A               | 1.03  | 0.18       | 1.02 | 0.18  |
| 电气时间常数(Electrical time constant)   | τe        | ms                 | 5.3   | 5.6        | 6    | 6.3   |
| 机械时间常数(Mechanical time constant)   | τm        | ms                 | 1.68  | 1.69       | 1.5  | 1.54  |
| 转动惯量(Rotor inertia)                | Jm0       | Kg.cm <sup>2</sup> | 14  | 14         | 19.9 | 19.9  |
| 转动惯量带制动器(Rotor inertia with brake) | Jm1       | Kg.cm <sup>2</sup> | 15.2  | 15.2       | 20.2 | 20.2  |
| 极数(Number of poles)                |           |                    | 10  | 10         | 10   | 10    |
| 编码器(Encoder)                       |           |                    | 2500ppr光电编码器 (增量式)<br>2500p/rev incremental encoder |            |      |       |
| 机身长度(Motor length)                 | L1        | mm                 | 150   | 165        | 178  | 193   |
| 机身长度带制动器(Motor length with brake)  | L2        | mm                 | 178   | 193        | 206  | 221   |
| 重量 (Weight)                        |           | Kg                 | 7   | 7.5        | 11.7 | 12.7  |
| 重量带制动器(Weight with brake)          |           | Kg                 | 9.5   | 10         | 14.2 | 15.2  |



选件 Options



Connector

接插件

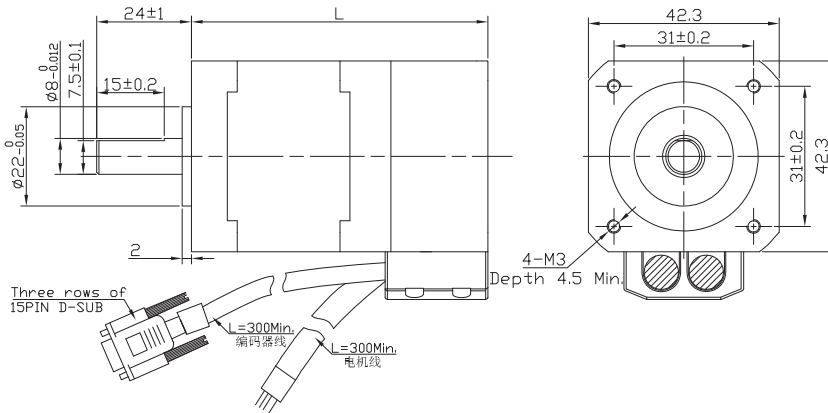


Gearbox

齿轮箱

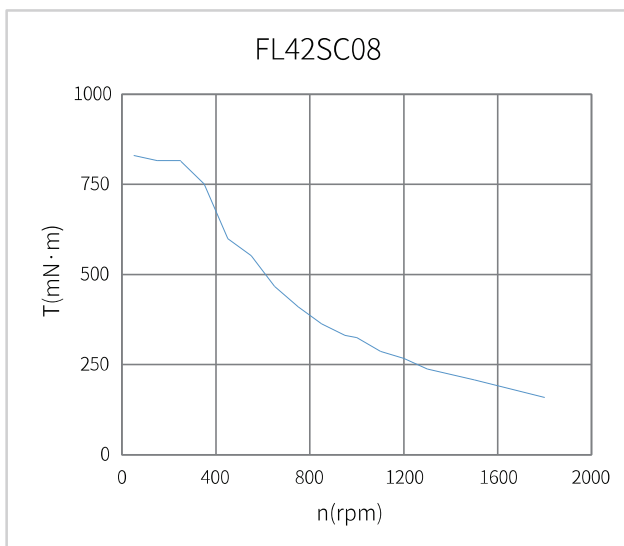
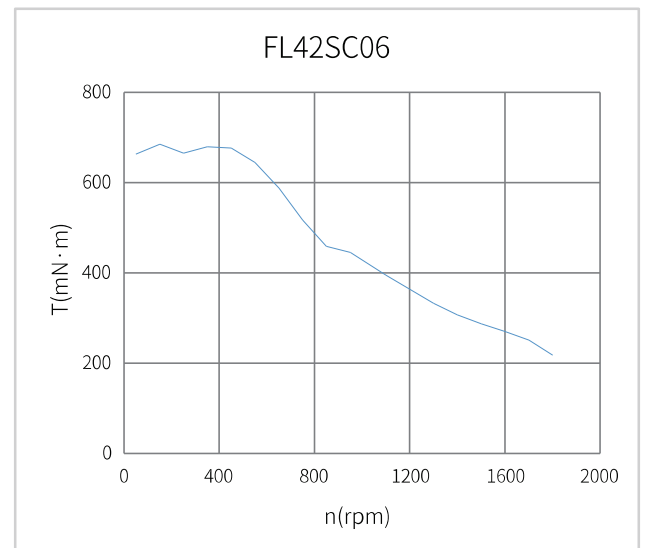
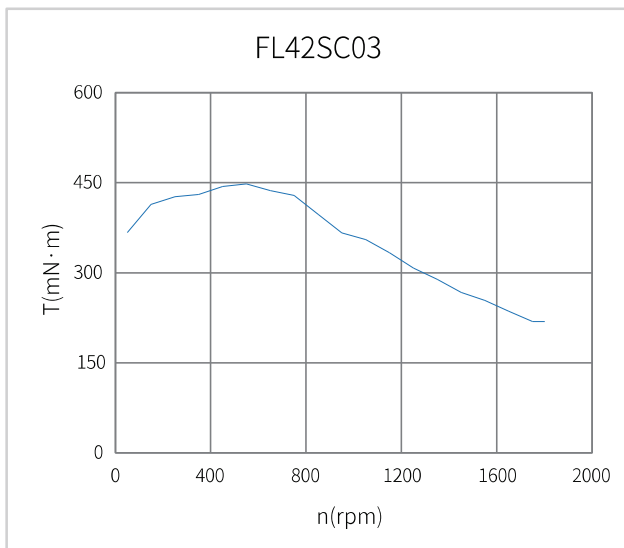
### 机械尺寸

(Dimensions)



### 矩频曲线

(Pull out torque curve)



## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 28N@20mm<br>from the flange  | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +40°C;<br>Temperature: -20°C~ +40°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +60°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +60°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 10N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | B  |                                  |   |
| 防护等级<br>(Protection level) | IP30   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

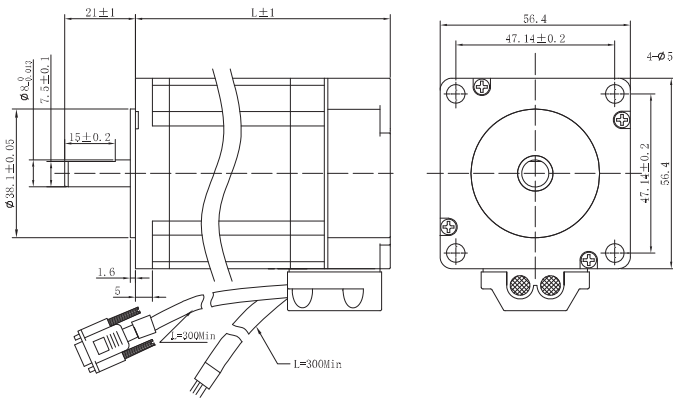
|                       | 单位 (Unit)         | FL42SC03   | FL42SC06 | FL42SC08 |
|-----------------------|-------------------|--|----------|----------|
| 相电流 (Phase current)   | A                 | 2.3  | 2.3      | 2.3      |
| 保持转矩 (Holding torque) | N·m               | 0.3  | 0.6      | 0.8      |
| 最高转速 (Speed)          | rpm               | 1800   | 1800     | 1800     |
| 编码器 (Encoder)         |                   | 1000cpr光电增量式编码器<br>1000cpr incremental optical encoder |          |          |
| 转动惯量 (Rotor inertia)  | g.cm <sup>2</sup> | 54   | 92       | 102      |
| 机身长度 (Motor Length) L | mm                | 59.5   | 74.5     | 80       |
| 重量 (Weight)           | Kg                | 0.3  | 0.5      | 0.55     |

## ● 接线说明 (Electric Connection)

| 序号<br>No. | 引出线颜色<br>Lead Color | 引出线型号<br>Lead Gauge                   | 功能<br>Function | 说明<br>Description   |
|-----------|---------------------|---------------------------------------|----------------|---|
| 3         | 红白色 (Red/White)     | Cable<br>Three rows of<br>15PIN D-SUB | GND            | Signal Power negative   |
| 2         | 红色 (Red)            |                                       | VCC:+5VDC      | Signal Power positive   |
| 13        | 蓝色 (Blue)           |                                       | EA-            | Two-channel differential signal (Three-channel<br>differential signal can be provided). |
| 1         | 蓝黑色 (Blue/Black)    |                                       | EA+            |   |
| 12        | 黑色 (Black)          |                                       | EB-            |   |
| 11        | 黑白色 (Black/White)   |                                       | EB+            |   |
| 1         | 黑色 (Black)          | Cable<br>UL2464<br>AWG20              | A相 (Phase A)   |   |
| 2         | 绿色 (Green)          |                                       | C相 (Phase C)   |   |
| 3         | 红色 (Red)            |                                       | B相 (Phase B)   |   |
| 4         | 蓝色 (Blue)           |                                       | D相 (Phase D)   |   |

### ● 机械尺寸

(Dimensions)



选件 Options



Connector

接插件

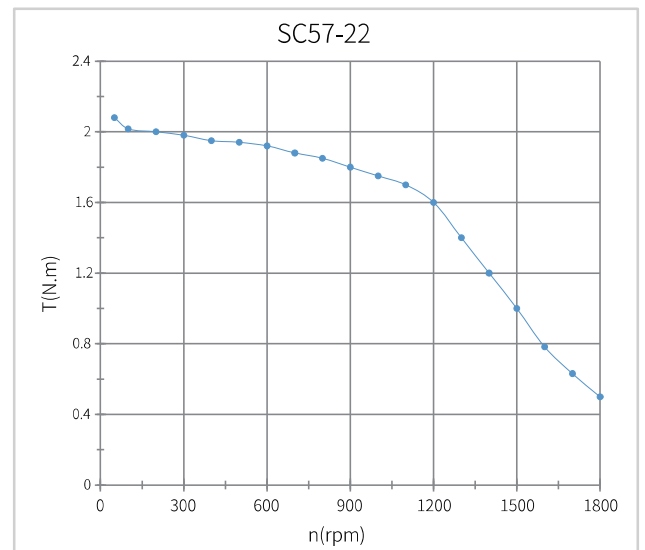
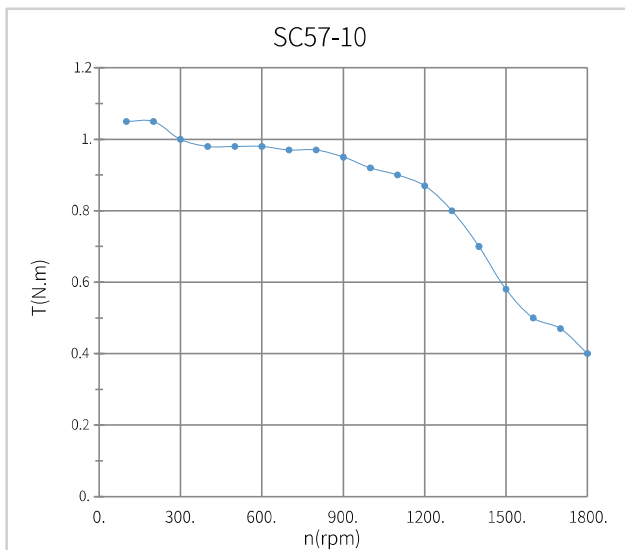


Gearbox

齿轮箱

### ● 矩频曲线

(Pull out torque curve)



## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 75N@20mm<br>from the flange  | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +40°C;<br>Temperature: -20°C~ +40°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +60°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +60°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 15N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | B  |                                  |   |
| 防护等级<br>(Protection level) | IP30   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

|                       | 单位 (Unit)         | FL57SC10   | FL57SC22 |
|-----------------------|-------------------|--|----------|
| 相电流 (Phase current)   | A                 | 6.0  | 5.6      |
| 保持转矩 (Holding torque) | N·m               | 1.2  | 2.2      |
| 最高转速 (Speed)          | rpm               | 1800   | 1800     |
| 编码器 (Encoder)         |                   | 1000cpr光电增量式编码器<br>1000cpr incremental optical encoder |          |
| 转动惯量 (Rotor inertia)  | g.cm <sup>2</sup> | 300  | 480      |
| 机身长度 (Motor Length) L | mm                | 74   | 95       |
| 重量 (Weight)           | Kg                | 1  | 1.5      |

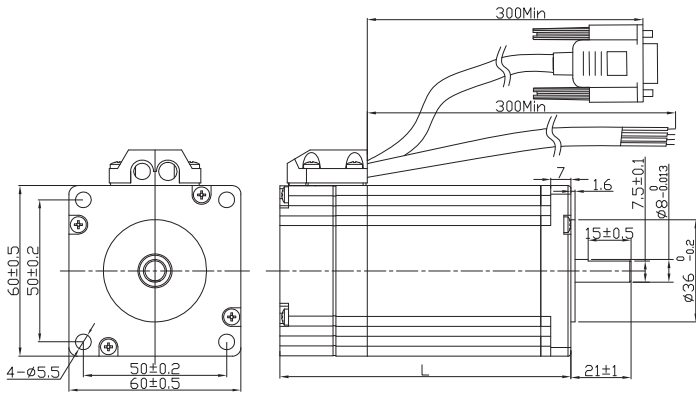
## ● 接线说明 (Electric Connection)

| 序号<br>No. | 引出线颜色<br>Lead Color | 引出线型号<br>Lead Gauge                   | 功能<br>Function | 说明<br>Description   |
|-----------|---------------------|---------------------------------------|----------------|---|
| 3         | 红白色 (Red/White)     | Cable<br>Three rows of<br>15PIN D-SUB | GND            | Signal Power negative   |
| 2         | 红色 (Red)            |                                       | VCC:+5VDC      | Signal Power positive   |
| 13        | 蓝色 (Blue)           |                                       | EA-            | Two-channel differential signal (Three-channel<br>differential signal can be provided). |
| 1         | 蓝黑色 (Blue/Black)    |                                       | EA+            |   |
| 12        | 黑色 (Black)          |                                       | EB-            |   |
| 11        | 黑白色 (Black/White)   |                                       | EB+            |   |
| 1         | 黑色 (Black)          | Cable<br>UL2464<br>AWG20              | A相 (Phase A)   |   |
| 2         | 绿色 (Green)          |                                       | C相 (Phase C)   |   |
| 3         | 红色 (Red)            |                                       | B相 (Phase B)   |   |
| 4         | 蓝色 (Blue)           |                                       | D相 (Phase D)   |   |



### ● 机械尺寸

(Dimensions)



选件 Options



Connector



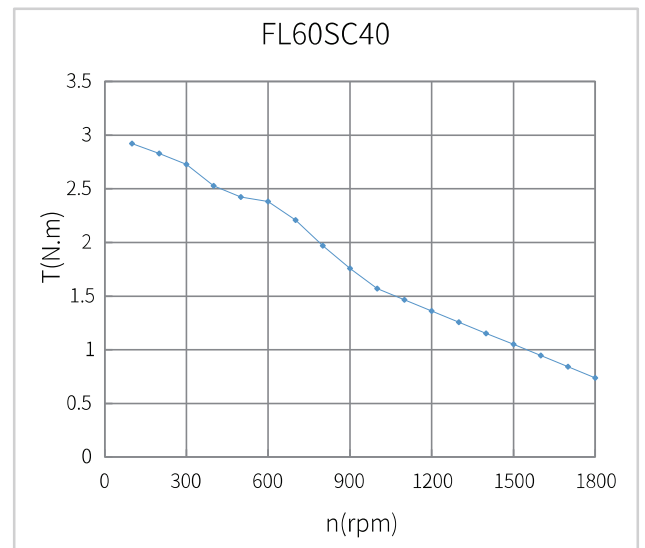
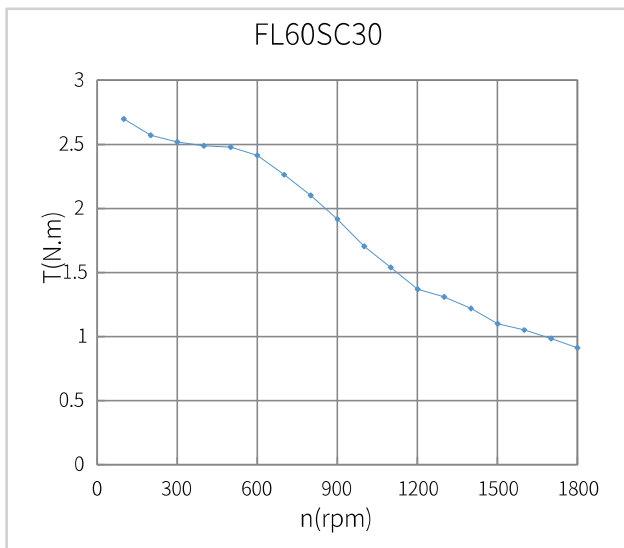
Gearbox

接插件

齿轮箱

### ● 矩频曲线

(Pull out torque curve)



## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 75N@20mm<br>from the flange  | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +40°C;<br>Temperature: -20°C~ +40°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +60°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +60°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 15N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | B  |                                  |   |
| 防护等级<br>(Protection level) | IP30   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

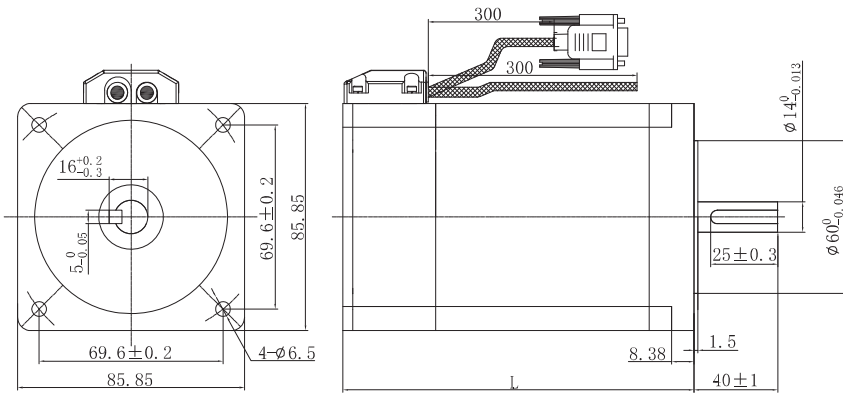
|                       | 单位 (Unit)         | FL60SC30   | FL60SC40 |
|-----------------------|-------------------|--|----------|
| 相电流 (Phase current)   | A                 | 6.0  | 5.6      |
| 保持转矩 (Holding torque) | N·m               | 3.0  | 3.6      |
| 最高转速 (Speed)          | rpm               | 1800   | 1800     |
| 编码器 (Encoder)         |                   | 1000cpr光电增量式编码器<br>1000cpr incremental optical encoder |          |
| 转动惯量 (Rotor inertia)  | g.cm <sup>2</sup> | 800  | 860      |
| 机身长度 (Motor Length) L | mm                | 103  | 109      |
| 重量 (Weight)           | Kg                | 1.4  | 1.6      |

## ● 接线说明 (Electric Connection)

| 序号<br>No. | 引出线颜色<br>Lead Color | 引出线型号<br>Lead Gauge                   | 功能<br>Function | 说明<br>Description   |
|-----------|---------------------|---------------------------------------|----------------|---|
| 3         | 红白色 (Red/White)     | Cable<br>Three rows of<br>15PIN D-SUB | GND            | Signal Power negative   |
| 2         | 红色 (Red)            |                                       | VCC:+5VDC      | Signal Power positive   |
| 13        | 蓝色 (Blue)           |                                       | EA-            | Two-channel differential signal (Three-channel<br>differential signal can be provided). |
| 1         | 蓝黑色 (Blue/Black)    |                                       | EA+            |   |
| 12        | 黑色 (Black)          |                                       | EB-            |   |
| 11        | 黑白色 (Black/White)   |                                       | EB+            |   |
| 1         | 黑色 (Black)          | Cable<br>UL2464<br>AWG20              | A相 (Phase A)   |   |
| 2         | 绿色 (Green)          |                                       | C相 (Phase C)   |   |
| 3         | 红色 (Red)            |                                       | B相 (Phase B)   |   |
| 4         | 蓝色 (Blue)           |                                       | D相 (Phase D)   |   |

### ● 机械尺寸

(Dimensions)



选件 Options

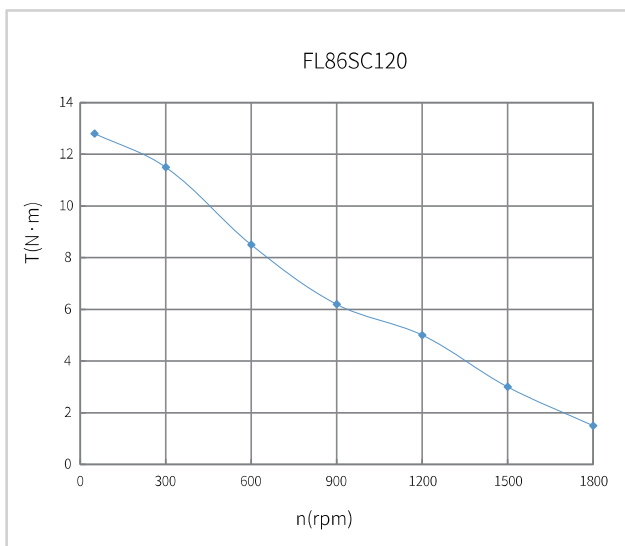
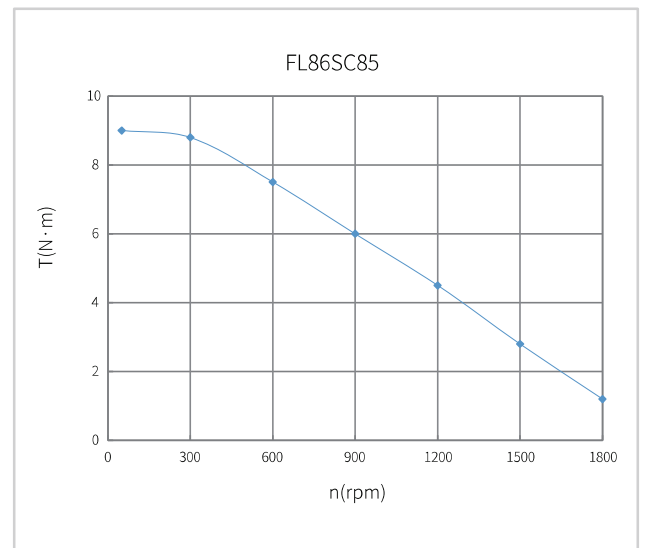
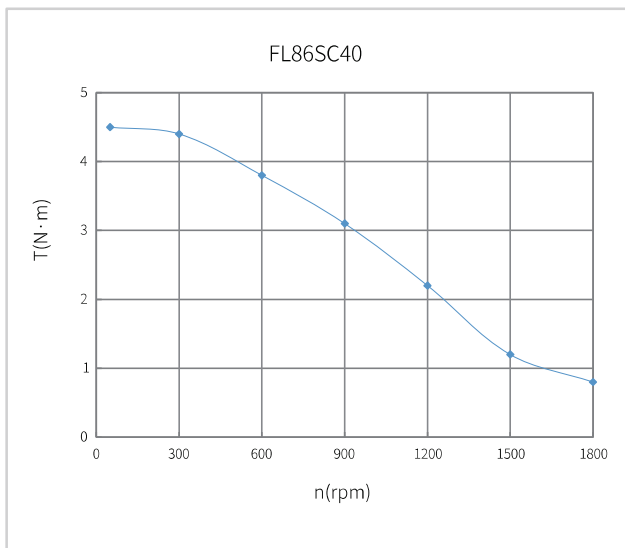


接插件

齿轮箱

### ● 矩频曲线

(Pull out torque curve)



## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 130N@20mm<br>from the flange   | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +40°C;<br>Temperature: -20°C~ +40°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +60°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +60°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 36N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | B  |                                  |   |
| 防护等级<br>(Protection level) | IP30   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

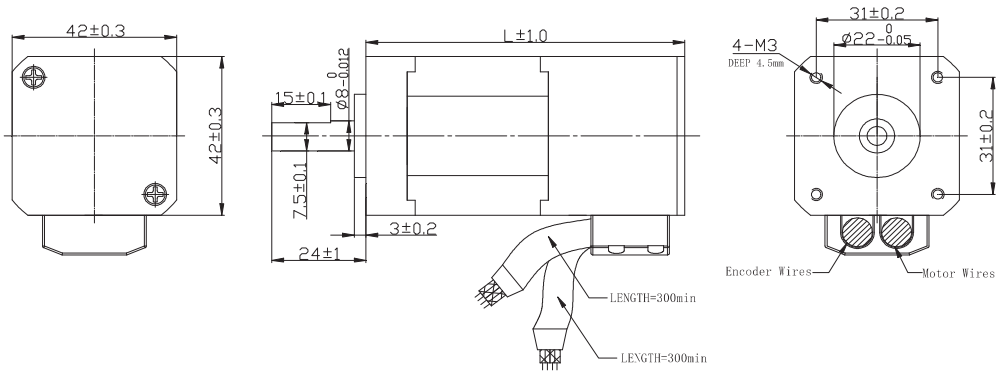
|                       | 单位 (Unit)         | FL86SC40   | FL86SC85 | FL86SC120 |
|-----------------------|-------------------|--|----------|-----------|
| 相电流 (Phase current)   | A                 | 6  | 6        | 6         |
| 保持转矩 (Holding torque) | N·m               | 4  | 8.5      | 12        |
| 最高转速 (Speed)          | rpm               | 1800   | 1800     | 1800      |
| 编码器 (Encoder)         |                   | 1000cpr光电增量式编码器<br>1000cpr incremental optical encoder |          |           |
| 转动惯量 (Rotor inertia)  | g.cm <sup>2</sup> | 1400   | 2700     | 4000      |
| 机身长度 (Motor Length) L | mm                | 96   | 133      | 171       |
| 重量 (Weight)           | Kg                | 2.5  | 3.8      | 5.5       |

## ● 接线说明 (Electric Connection)

| 序号<br>No. | 引出线颜色<br>Lead Color | 引出线型号<br>Lead Gauge          | 功能<br>Function | 说明<br>Description   |
|-----------|---------------------|------------------------------|----------------|---|
| 3         | 红白色 (Red/White)     | Three rows of<br>15PIN D-SUB | GND            | Signal Power negative   |
| 2         | 红色 (Red)            |                              | VCC:+5VDC      | Signal Power positive   |
| 13        | 蓝色 (Blue)           |                              | EA-            | Two-channel differential signal (Three-channel<br>differential signal can be provided). |
| 1         | 蓝黑色 (Blue/Black)    |                              | EA+            |   |
| 12        | 黑色 (Black)          |                              | EB-            |   |
| 11        | 黑白色 (Black/White)   |                              | EB+            |   |
| 1         | 黄色 (Yellow)         | YGZF -S 4*0.75 Cable         | A相 (Phase A)   |   |
| 2         | 绿色 (Green)          |                              | C相 (Phase C)   |   |
| 3         | 红色 (Red)            |                              | B相 (Phase B)   |   |
| 4         | 黑色 (Black)          |                              | D相 (Phase D)   |   |

### ● 机械尺寸

(Dimensions)



选件 Options

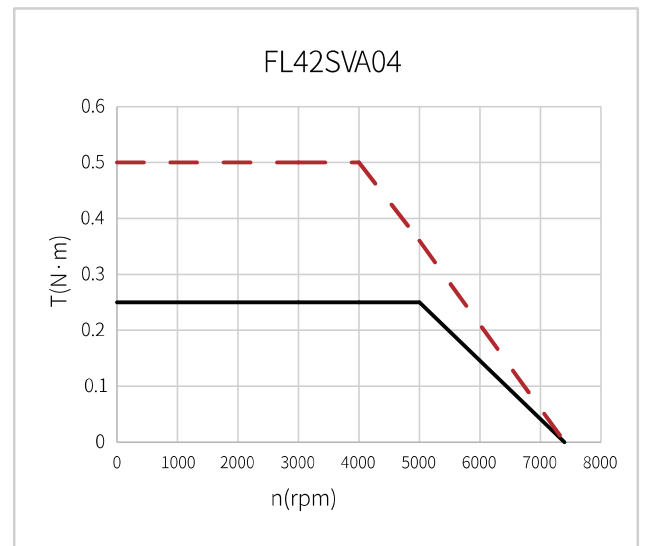
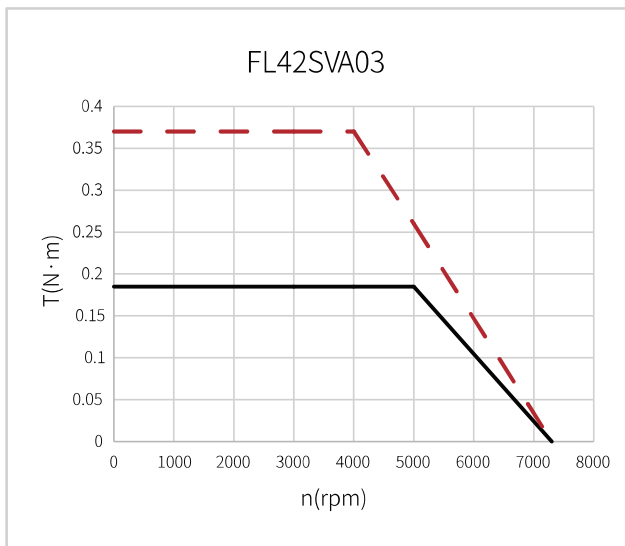
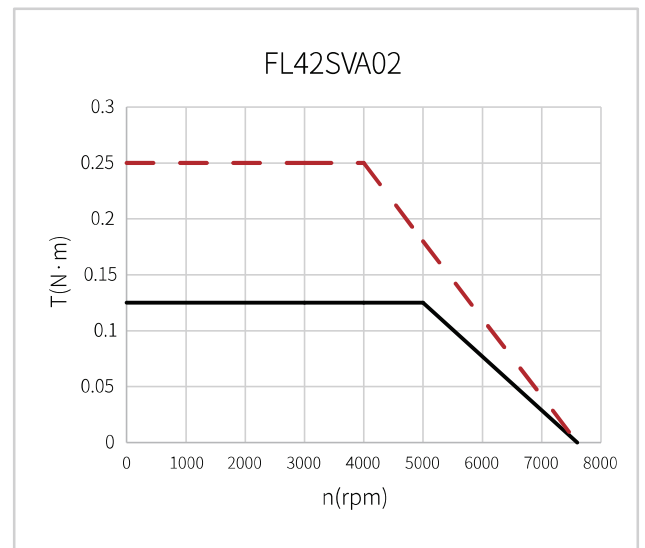
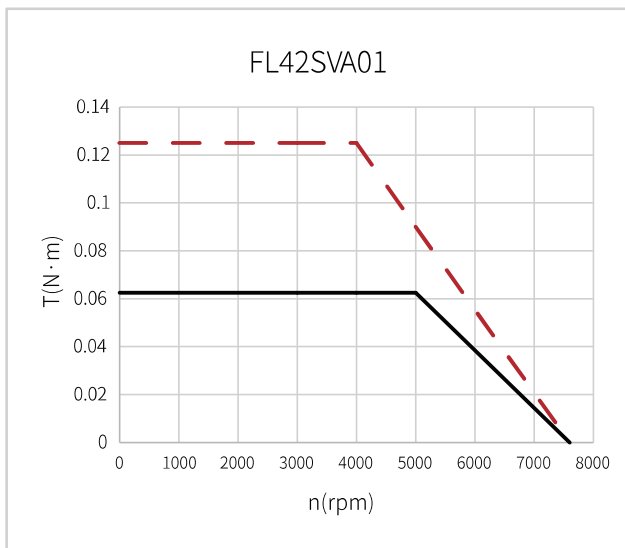


接插件

齿轮箱

### ● 性能曲线

(Performance Curve)



## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 28N @ 20mm<br>from the flange  | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +40°C;<br>Temperature: -20°C~ +40°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +60°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +60°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 10N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | Class B  |                                  |   |
| 防护等级<br>(Protection level) | IP40   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

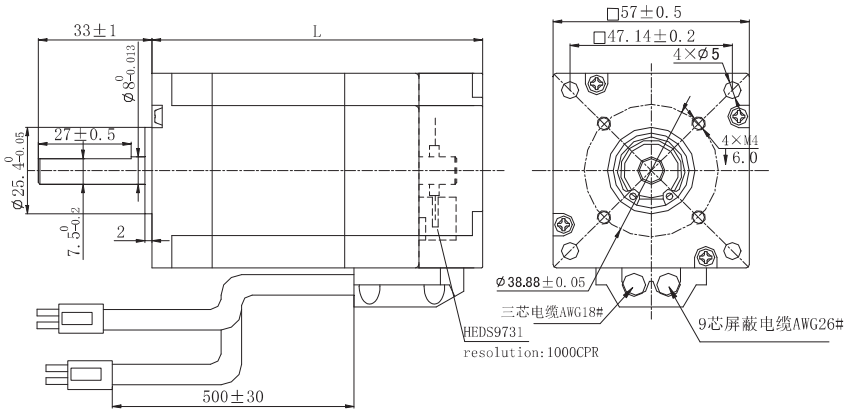
|                             | 单位 (Unit)         | FL42SVA01 | FL42SVA02 | FL42SVA03 | FL42SVA04 |
|-----------------------------|-------------------|-----------|-----------|-----------|-----------|
| 额定电压(Rated voltage)         | VDC               | 24        | 24        | 24        | 24        |
| 额定转速(Rated speed)           | RPM               | 5000      | 5000      | 5000      | 5000      |
| 额定转矩(Rated torque)          | N·m               | 0.0625    | 0.125     | 0.185     | 0.25      |
| 额定电流(Rated current)         | A                 | 2.1       | 4         | 6         | 8         |
| 空载转速(no load speed)         | RPM               | 7600      | 7400      | 7300      | 7400      |
| 峰值扭矩(Peak torque)           | N·m               | 0.19      | 0.38      | 0.56      | 0.75      |
| 峰值电流(Peak current)          | A                 | 6.25      | 12        | 18        | 24        |
| 电阻(Line to line resistance) | Ω                 | 1.15      | 0.5       | 0.28      | 0.25      |
| 电感(Line to line inductance) | mH                | 1.75      | 0.9       | 0.51      | 0.38      |
| 反电势系数(Back EMF)             | V/Krpm            | 2.23      | 2.3       | 2.32      | 2.28      |
| 转矩系数(Torque constant)       | Nm/A              | 0.03      | 0.031     | 0.031     | 0.031     |
| 极数(Number of poles)         |                   | 8         | 8         | 8         | 8         |
| 编码器(Encoder)                | CPR               | 1000      | 1000      | 1000      | 1000      |
| 转动惯量(Rotor inertia)         | g·cm <sup>2</sup> | 24        | 48        | 72        | 96        |
| 机身长度(Motor length) L        | mm                | 61.3      | 81.3      | 101.3     | 121.3     |
| 重量(Weight)                  | Kg                | 0.3       | 0.45      | 0.65      | 0.8       |

## ● 接线说明 (Electric Connection)

| 序号<br>No. | 引出线颜色<br>Lead Color | 引出线型号<br>Lead Gauge | 功能<br>Function | 说明<br>Description  |
|-----------|---------------------|---------------------|----------------|--|
| 1         | 红白色(Red/White)      | Cable<br>AWG26      | GND            | Signal Power negative  |
| 2         | 红色( Red)            |                     | VCC:+5VDC      | Signal Power positive  |
| 3         | 蓝色(Blue)            |                     | EA-            | Two-channel differential signal (Three-channel differential signal can be provided). |
| 4         | 蓝黑色(Blue/Black)     |                     | EA+            |  |
| 5         | 黑色(Black)           |                     | EB-            |  |
| 6         | 黑白色(Black/White)    |                     | EB+            |  |
| 7         | 棕色(Brown)           |                     | 霍尔HALL A       |  |
| 8         | 橙色(Orange)          |                     | 霍尔HALL B       |  |
| 9         | 黄色(Yellow)          |                     | 霍尔HALL C       |  |
| 1         | 黄色(Yellow)          | Cable<br>AWG18      | U相(Phase U)    |  |
| 2         | 红色(Red)             |                     | V相(Phase V)    |  |
| 3         | 黑色(Black)           |                     | W相(Phase W)    |  |

### ● 机械尺寸

(Dimensions)



选件 Options

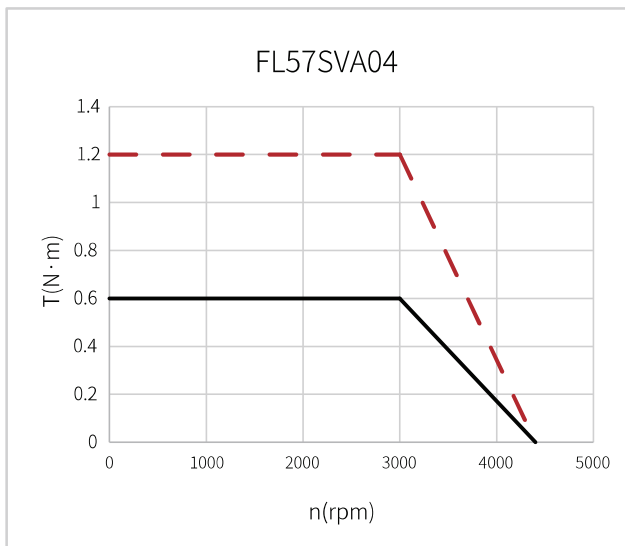
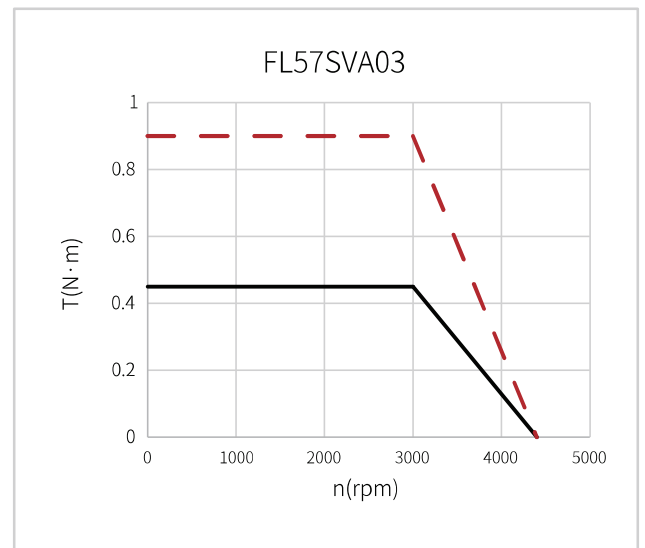
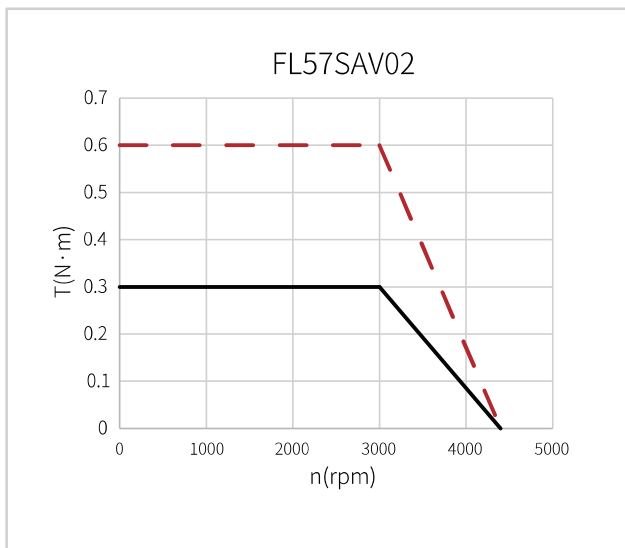


接插件

齿轮箱

### ● 性能曲线

(Performance Curve)





## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 115N@20mm<br>from the flange   | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +40°C;<br>Temperature: -20°C~ +40°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +60°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +60°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 45N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | B  |                                  |   |
| 防护等级<br>(Protection level) | IP30   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

|                             | 单位 (Unit)         | FL57SVA02 | FL57SVA03 | FL57SVA04 |
|-----------------------------|-------------------|-----------|-----------|-----------|
| 额定电压(Rated voltage)         | VDC               | 36        | 36        | 36        |
| 额定转速(Rated speed)           | RPM               | 3000      | 3000      | 3000      |
| 额定转矩(Rated torque)          | N·m               | 0.3       | 0.45      | 0.6       |
| 额定电流(Rated current)         | A                 | 4.0       | 6.0       | 8.0       |
| 空载转速(no load speed)         | RPM               | 4400      | 4400      | 4400      |
| 峰值转矩(Peak torque)           | N·m               | 0.9       | 1.35      | 1.8       |
| 峰值电流(Peak current)          | A                 | 12.6      | 16.2      | 22.5      |
| 电阻(Line to line resistance) | Ω                 | 1.2       | 0.8       | 0.5       |
| 电感(Line to line inductance) | mH                | 1.2       | 0.8       | 0.6       |
| 反电势系数(Back EMF)             | V/Krpm            | 5.6       | 5.6       | 5.7       |
| 转矩系数(Torque constant)       | Nm/A              | 0.075     | 0.075     | 0.075     |
| 极数(Number of poles)         |                   |           | 8         |           |
| 编码器(Encoder)                | CPR               |           | 1000      |           |
| 转动惯量(Rotor inertia)         | g·cm <sup>2</sup> | 210       | 320       | 430       |
| 机身长度(Motor length) L        | mm                | 76        | 96        | 116       |
| 重量(Weight)                  | Kg                | 0.8       | 1.0       | 1.2       |

## ● 接线说明 (Electric Connection)

| 序号<br>No. | 引出线颜色<br>Lead Color | 引出线型号<br>Lead Gauge | 功能<br>Function | 说明<br>Description  |
|-----------|---------------------|---------------------|----------------|--|
| 1         | 红白色(Red/White)      | Cable<br>AWG26      | GND            | Signal Power negative  |
| 2         | 红色( Red)            |                     | VCC:+5VDC      | Signal Power positive  |
| 3         | 蓝色(Blue)            |                     | EA-            | Two-channel differential signal (Three-channel differential signal can be provided). |
| 4         | 蓝黑色(Blue/Black)     |                     | EA+            |  |
| 5         | 黑色(Black)           |                     | EB-            |  |
| 6         | 黑白色(Black/White)    |                     | EB+            |  |
| 7         | 棕色(Brown)           |                     | 霍尔HALL A       |  |
| 8         | 橙色(Orange)          |                     | 霍尔HALL B       |  |
| 9         | 黄色(Yellow)          |                     | 霍尔HALL C       |  |
| 1         | 黄色(Yellow)          | Cable<br>AWG18      | U相(Phase U)    |  |
| 2         | 红色(Red)             |                     | V相(Phase V)    |  |
| 3         | 黑色(Black)           |                     | W相(Phase W)    |  |

# FL80SVA Series

闭环无刷电机  
Closed-Loop BLDC Motor



选件 Options



Connector

接插件

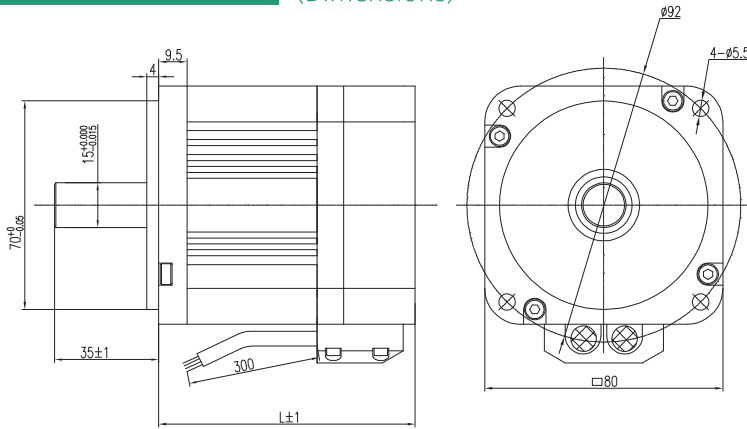


Gearbox

齿轮箱

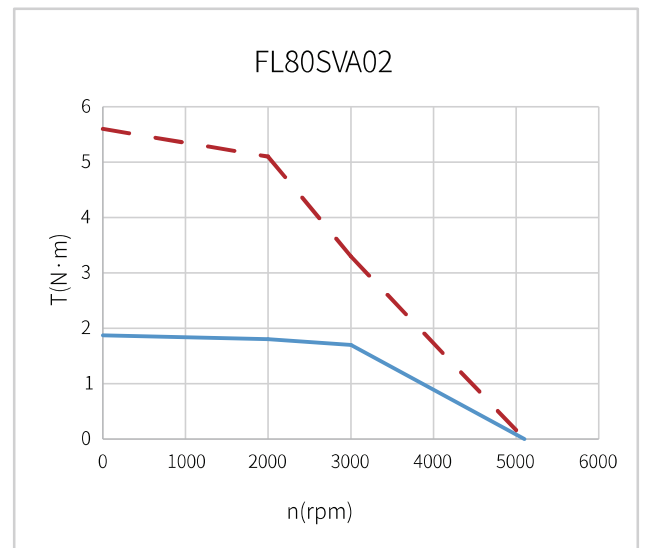
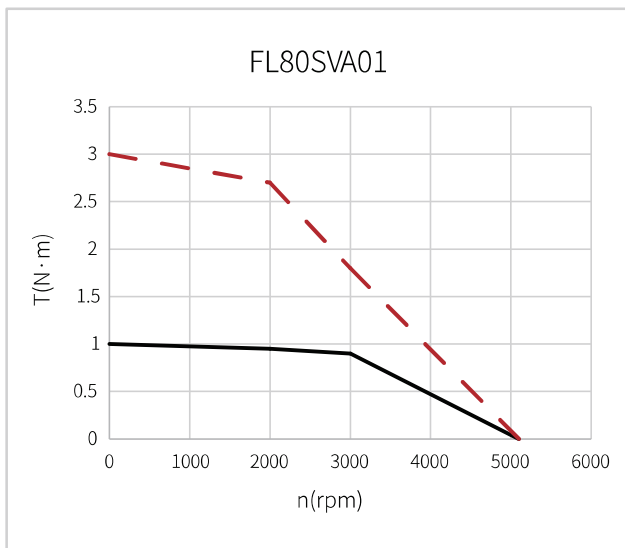
## ● 机械尺寸

(Dimensions)



## ● 性能曲线

(Performance Curve)



## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 115N @ 20mm<br>from the flange   | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +40°C;<br>Temperature: -20°C~ +40°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +60°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +60°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 45N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | Class B  |                                  |   |
| 防护等级<br>(Protection level) | IP65   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

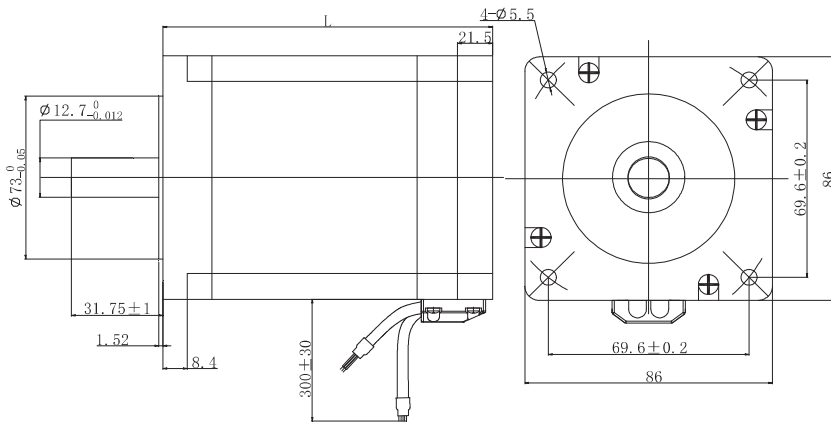
|                             | 单位 (Unit)         | FL80SVA01 | FL80SVA02 |
|-----------------------------|-------------------|-----------|-----------|
| 额定电压(Rated voltage)         | VDC               | 48        | 48        |
| 额定转速(Rated speed)           | RPM               | 3000      | 3000      |
| 额定转矩(Rated torque)          | N·m               | 0.9       | 1.7       |
| 额定电流(Rated current)         | A                 | 3000      | 3000      |
| 空载转速(no load speed)         | RPM               | 4000      | 4000      |
| 峰值转矩(Peak torque)           | N·m               | 2.7       | 5.1       |
| 峰值电流(Peak current)          | A                 | 23        | 45        |
| 电阻(Line to line resistance) | Ω                 | 0.29      | 0.11      |
| 电感(Line to line inductance) | mH                | 1.3       | 0.6       |
| 反电势系数(Back EMF)             | V/Krpm            | 8.7       | 8.4       |
| 转矩系数(Torque constant)       | Nm/A              | 0.118     | 0.113     |
| 极数(Number of poles)         |                   | 8         | 8         |
| 编码器(Encoder)                | CPR               | 1000      | 1000      |
| 转动惯量(Rotor inertia)         | g·cm <sup>2</sup> | 544       | 1020      |
| 机身长度(Motor length) L        | mm                | 86        | 107       |
| 重量(Weight)                  | Kg                | 1.7       | 2.1       |

## ● 接线说明 (Electric Connection)

| 序号<br>No. | 引出线颜色<br>Lead Color | 引出线型号<br>Lead Gauge | 功能<br>Function | 说明<br>Description  |
|-----------|---------------------|---------------------|----------------|--|
| 1         | 红白色(Red/White)      | Cable<br>AWG26      | GND            | Signal Power negative  |
| 2         | 红色( Red)            |                     | VCC:+5VDC      | Signal Power positive  |
| 3         | 蓝色(Blue)            |                     | EA-            | Two-channel differential signal (Three-channel differential signal can be provided). |
| 4         | 蓝黑色(Blue/Black)     |                     | EA+            |  |
| 5         | 黑色(Black)           |                     | EB-            |  |
| 6         | 黑白色(Black/White)    |                     | EB+            |  |
| 7         | 棕色(Brown)           |                     | 霍尔HALL A       |  |
| 8         | 橙色(Orange)          |                     | 霍尔HALL B       |  |
| 9         | 黄色(Yellow)          |                     | 霍尔HALL C       |  |
| 1         | 黄色(Yellow)          | Cable<br>AWG16      | U相(Phase U)    |  |
| 2         | 红色(Red)             |                     | V相(Phase V)    |  |
| 3         | 黑色(Black)           |                     | W相(Phase W)    |  |

### ● 机械尺寸

(Dimensions)



选件 Options



Connector

接插件

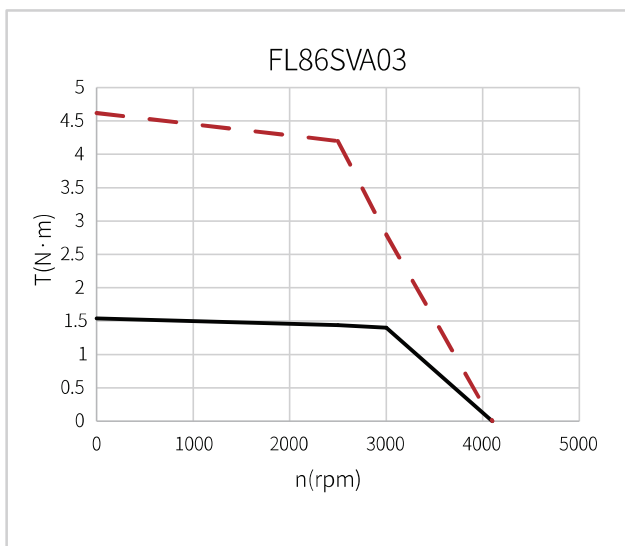
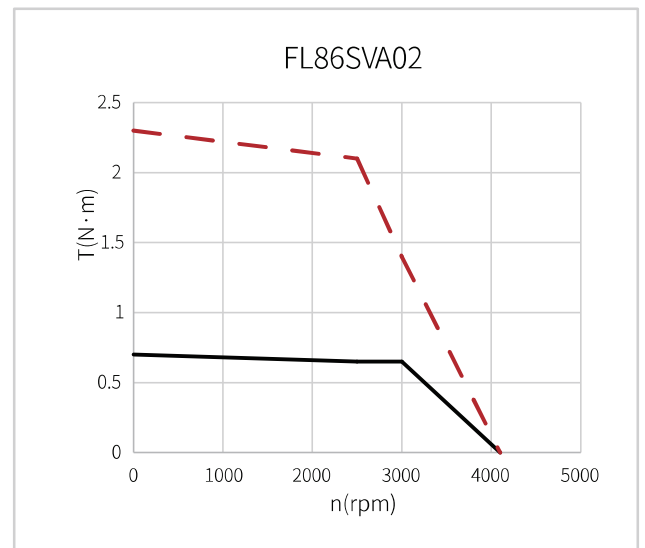
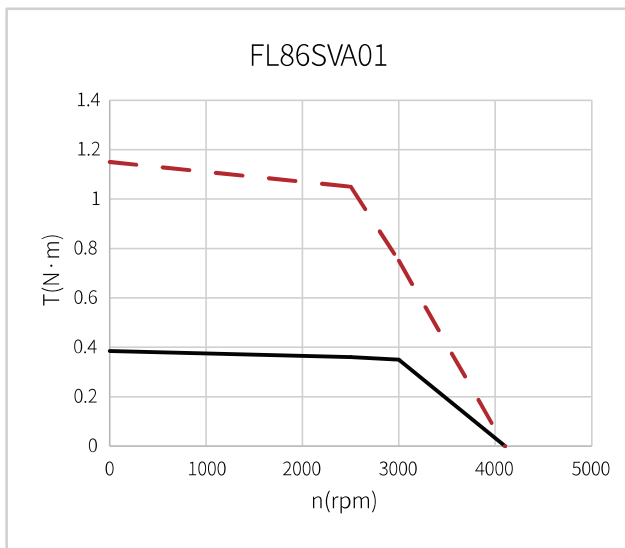


Gearbox

齿轮箱

### ● 性能曲线

(Performance Curve)



## ● 一般技术特性 (General Technical Information)

|                            |  |                                  |   |
|----------------------------|--|----------------------------------|---|
| 编码器类型<br>(Encoder type)    | 1、光电编码器 Optical encoder<br>2、磁编码器 Magnetic encoder<br>3、旋转变压器 Resolver<br>备注: 多种分辨率可选, 增量式、绝对值式可选。<br>Note: Multiple resolutions are available; Incremental and absolute values are available. |                                  |   |
| 径向负载<br>(Max radial force) | 200N@20mm<br>from the flange   | 环境条件<br>Environmental conditions | 使用环境温度: -20°C~ +40°C;<br>Temperature: -20°C~ +40°C<br>使用环境湿度: ≤90%RH (无凝露);<br>Relative humidity: ≤90%RH (No dewing)<br>安装环境: 远离腐蚀、可燃性气体, 油滴, 灰尘,<br>海拔≤1000m(1000~4000m, 降额使用);<br>Installation environment: Far away active gas,<br>Combustible gas, oil drop, ash.<br>altitude≤1000m(1000~4000m, Derating use);<br>存储环境: -20°C~ +60°C, ≤85%RH (无凝露)。<br>Storage Condition: -20°C~ +60°C, ≤85%RH (No dewing). |
| 轴向负载<br>(Max axial force)  | 65N  |                                  |   |
| 绝缘等级<br>(Insulation Class) | Class B  |                                  |   |
| 防护等级<br>(Protection level) | IP30   |                                  |   |

## ● 电机技术性能 (Motor Technical Specification)

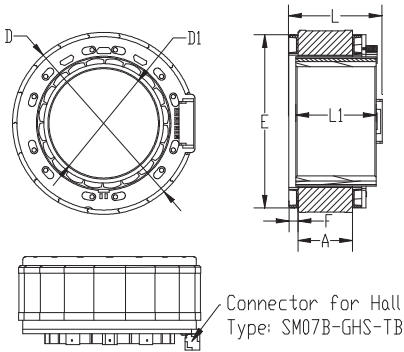
|                             | 单位 (Unit)         | FL86SVA01 | FL86SVA02 | FL86SVA03 |
|-----------------------------|-------------------|-----------|-----------|-----------|
| 额定电压(Rated voltage)         | VDC               | 48        |           |           |
| 额定转速(Rated speed)           | RPM               | 3000      |           |           |
| 额定转矩(Rated torque)          | N·m               | 0.35      | 0.7       | 1.4       |
| 额定电流(Rated current)         | A                 | 3         | 5.6       | 11        |
| 空载转速(no load speed)         | RPM               | 3600      |           |           |
| 峰值转矩(Peak torque)           | N·m               | 1.05      | 2.1       | 4.2       |
| 峰值电流(Peak current)          | A                 | 9.5       | 17.5      | 33.5      |
| 电阻(Line to line resistance) | Ω                 | 0.09      | 0.34      | 0.16      |
| 电感(Line to line inductance) | mH                | 2.6       | 1         | 0.5       |
| 反电势系数(Back EMF)             | V/Krpm            | 8.6       | 9         | 9.4       |
| 转矩系数(Torque constant)       | Nm/A              | 0.116     | 0.124     | 0.127     |
| 极数(Number of poles)         |                   | 8         |           |           |
| 编码器(Encoder)                | CPR               | 1000      |           |           |
| 转动惯量(Rotor inertia)         | g·cm <sup>2</sup> | 400       | 800       | 1600      |
| 机身长度(Motor length) L        | mm                | 86        | 99        | 126       |
| 重量(Weight)                  | Kg                | 1.9       | 2.4       | 3.5       |

## ● 接线说明 (Electric Connection)

| 序号<br>No. | 引出线颜色<br>Lead Color | 引出线型号<br>Lead Gauge | 功能<br>Function | 说明<br>Description  |
|-----------|---------------------|---------------------|----------------|--|
| 1         | 红白色(Red/White)      | Cable<br>AWG26      | GND            | Signal Power negative  |
| 2         | 红色( Red)            |                     | VCC:+5VDC      | Signal Power positive  |
| 3         | 蓝色(Blue)            |                     | EA-            | Two-channel differential signal (Three-channel differential signal can be provided). |
| 4         | 蓝黑色(Blue/Black)     |                     | EA+            |  |
| 5         | 黑色(Black)           |                     | EB-            |  |
| 6         | 黑白色(Black/White)    |                     | EB+            |  |
| 7         | 棕色(Brown)           | Cable<br>AWG18      | 霍尔HALL A       |  |
| 8         | 橙色(Orange)          |                     | 霍尔HALL B       |  |
| 9         | 黄色(Yellow)          |                     | 霍尔HALL C       |  |
| 1         | 黄色(Yellow)          |                     | U相(Phase U)    |  |
| 2         | 红色(Red)             |                     | V相(Phase V)    |  |
| 3         | 黑色(Black)           |                     | W相(Phase W)    |  |

### ● 机械尺寸

(Dimensions)



| 项目(Items) | FL50BL15 | FL50BL08 | 公差(Tolerance) |
|-----------|----------|----------|---------------|
| 定子外径D     | 50mm     | 50mm     | ±0.031(js9)   |
| 定子长度L     | 26mm     | 20mm     | ±1            |
| 转子内径D1    | 30mm     | 30mm     | (+0.033/0)H8  |
| 转子长度L1    | 22mm     | 16mm     | ±0.2          |
| 灌胶面外圆E    | 47.6mm   | 47.6mm   | ±0.2          |
| 灌胶面高度F    | 2.5mm    | 2.5mm    | ±0.3          |
| 定子铁芯高度A   | 15mm     | 8.6mm    | /             |



选件 Options



接插件

### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式<br>(Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度<br>(Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 介电强度<br>(Dielectric Strength)   | 1000VAC/1S                               |
| 绝缘电阻<br>(Insulation Resistance) | 100MQ, 500VDC                            |
| 使用环境<br>(Operation Ambient)     | -20°C ~ +50°C                            |
| 绝缘等级<br>(Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线颜色<br>Color | 引出线型号<br>Type  | 功能<br>Functions |
|----------------|--|-----------------|
| PIN1           | Connector for Hall is optional<br>Type: SM07B-GHS-TB | 热敏 (NTC2)       |
| PIN2           |  | 热敏 (NTC1)       |
| PIN3           |  | 霍尔电源负 (GND)     |
| PIN4           |  | 霍尔 A (Ha)       |
| PIN5           |  | 霍尔 B (Hb)       |
| PIN6           |  | 霍尔 C (Hc)       |
| PIN7           |  | 霍尔电源正 (Vcc)     |
| 黄色 (Yellow)    | UL1332 AWG22<br>UL1332 AWG20                         | U相 (Phase U)    |
| 红色 (Red)       |  | V相 (Phase V)    |
| 黑色 (Black)     |  | W相 (Phase W)    |

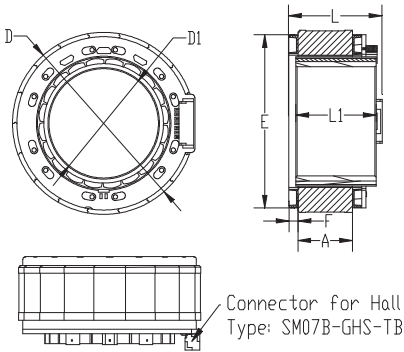
### ● 电性能

(Electrical Specifications)

|                                   | 单位(Unit)  | FL50BL15-48V-35183A | FL50BL08-48V-50170A |
|-----------------------------------|-----------|---------------------|---------------------|
| 极数 (Number of poles)              |           | 20                  | 20                  |
| 相数 (Number of phases)             |           | 3                   | 3                   |
| 额定电压 (Rated voltage)              | VDC       | 48                  | 48                  |
| 额定转矩 (Rated torque)               | N.m       | 0.5                 | 0.3                 |
| 额定电流 (Rated current)              | A         | 4.8                 | 3.6                 |
| 额定速度 (Rated speed)                | RPM       | 3500                | 5000                |
| 额定功率 (Rated power)                | W         | 183                 | 157                 |
| 最大转速 (Maximum speed)              | RPM       | 4800                | 6200                |
| 峰值扭矩 (Peak torque)                | N.m       | 1.5                 | 0.96                |
| 峰值电流 (Peak current)               | A         | 14.5                | 11.6                |
| 线电阻 (Line to line resistance)     | ohms@20°C | 0.77                | 0.93                |
| 线电感 (Line to line inductance)     | mH        | 0.38                | 0.45                |
| 转矩常数 (Torque constant)            | Nm/A      | 0.117               | 0.089               |
| 反电势 (Back EMF)                    | Vrms/KRPM | 7.1                 | 5.4                 |
| 机身长度 (Motor length)               | mm        | 26                  | 20                  |
| 重量 (Weight)                       | g         | 147                 | 96                  |
| 电气时间常数 (Electrical time constant) | ms        | 0.49                | 0.48                |

### ● 机械尺寸

(Dimensions)



| 项目(Items) | FL50BL15 | FL50BL08 | 公差(Tolerance) |
|-----------|----------|----------|---------------|
| 定子外径D     | 50mm     | 50mm     | ±0.031(js9)   |
| 定子长度L     | 26mm     | 20mm     | ±1            |
| 转子内径D1    | 30mm     | 30mm     | (+0.033/0)H8  |
| 转子长度L1    | 22mm     | 16mm     | ±0.2          |
| 灌胶面外圆E    | 47.6mm   | 47.6mm   | ±0.2          |
| 灌胶面高度F    | 2.5mm    | 2.5mm    | ±0.3          |
| 定子铁芯高度A   | 15mm     | 8.6mm    | /             |



选件 Options



接插件

### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式<br>(Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度<br>(Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 介电强度<br>(Dielectric Strength)   | 1000VAC/1S                               |
| 绝缘电阻<br>(Insulation Resistance) | 100MQ, 500VDC                            |
| 使用环境<br>(Operation Ambient)     | -20°C ~ +50°C                            |
| 绝缘等级<br>(Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线颜色<br>Color | 引出线型号<br>Type  | 功能<br>Functions |
|----------------|--|-----------------|
| PIN1           | Connector for Hall is optional<br>Type: SM07B-GHS-TB | 热敏 (NTC2)       |
| PIN2           |  | 热敏 (NTC1)       |
| PIN3           |  | 霍尔电源负 (GND)     |
| PIN4           |  | 霍尔 A (Ha)       |
| PIN5           |  | 霍尔 B (Hb)       |
| PIN6           |  | 霍尔 C (Hc)       |
| PIN7           |  | 霍尔电源正 (Vcc)     |
| 黄色 (Yellow)    | UL1332 AWG22<br>UL1332 AWG20                         | U相 (Phase U)    |
| 红色 (Red)       |  | V相 (Phase V)    |
| 黑色 (Black)     |  | W相 (Phase W)    |

### ● 电性能

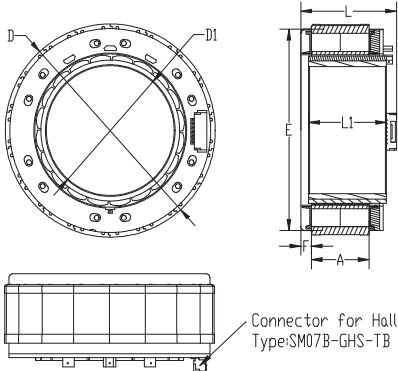
(Electrical Specifications)

|                                   | 单位 (Unit) | FL50BL15-48V-35183A | FL50BL08-48V-50170A |
|-----------------------------------|-----------|---------------------|---------------------|
| 极数 (Number of poles)              |           | 20                  | 20                  |
| 相数 (Number of phases)             |           | 3                   | 3                   |
| 额定电压 (Rated voltage)              | VDC       | 48                  | 48                  |
| 额定转矩 (Rated torque)               | N.m       | 0.5                 | 0.3                 |
| 额定电流 (Rated current)              | A         | 4.8                 | 3.6                 |
| 额定速度 (Rated speed)                | RPM       | 3500                | 5000                |
| 额定功率 (Rated power)                | W         | 183                 | 157                 |
| 最大转速 (Maximum speed)              | RPM       | 4800                | 6200                |
| 峰值扭矩 (Peak torque)                | N.m       | 1.5                 | 0.96                |
| 峰值电流 (Peak current)               | A         | 14.5                | 11.6                |
| 线电阻 (Line to line resistance)     | ohms@20°C | 0.77                | 0.93                |
| 线电感 (Line to line inductance)     | mH        | 0.38                | 0.45                |
| 转矩常数 (Torque constant)            | Nm/A      | 0.117               | 0.089               |
| 反电势 (Back EMF)                    | Vrms/KRPM | 7.1                 | 5.4                 |
| 机身长度 (Motor length)               | mm        | 26                  | 20                  |
| 重量 (Weight)                       | g         | 147                 | 96                  |
| 电气时间常数 (Electrical time constant) | ms        | 0.49                | 0.48                |



### ● 机械尺寸

(Dimensions)



| 项目(Items) | FL70BL19 | FL70BL10 | 公差(Tolerance) |
|-----------|----------|----------|---------------|
| 定子外径D     | 69mm     | 69mm     | ±0.037(js9)   |
| 定子长度L     | 32mm     | 23.5mm   | ±1            |
| 转子内径D1    | 42mm     | 42mm     | +0.039/0(H8)  |
| 转子长度L1    | 27.5mm   | 18mm     | ±0.2          |
| 灌胶面外圆E    | 66mm     | 66mm     | ±0.2          |
| 灌胶面高度F    | 3.5mm    | 3.5mm    | ±0.3          |
| 定子铁芯高度A   | 18.9mm   | 10.5mm   | /             |



选件 Options



接插件

### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式<br>(Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度<br>(Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 介电强度<br>(Dielectric Strength)   | 1000VAC/1S                               |
| 绝缘电阻<br>(Insulation Resistance) | 100MQ, 500VDC                            |
| 使用环境<br>(Operation Ambient)     | -20°C ~ +50°C                            |
| 绝缘等级<br>(Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线颜色<br>Color | 引出线型号<br>Type  | 功能<br>Functions |
|----------------|--|-----------------|
| PIN1           | Connector for Hall is optional<br>Type: SM07B-GHS-TB | 热敏 ( NTC2 )     |
| PIN2           |  | 热敏 ( NTC1 )     |
| PIN3           |  | 霍尔电源负 ( GND )   |
| PIN4           |  | 霍尔 A ( Ha )     |
| PIN5           |  | 霍尔 B ( Hb )     |
| PIN6           |  | 霍尔 C( Hc )      |
| PIN7           |  | 霍尔电源正 ( Vcc )   |
| 黄色 ( Yellow )  | UL1332 AWG20<br>UL1332 AWG18                         | U相 ( Phase U )  |
| 红色 ( Red )     |  | V相 ( Phase V )  |
| 黑色 ( Black )   |  | W相 ( Phase W )  |

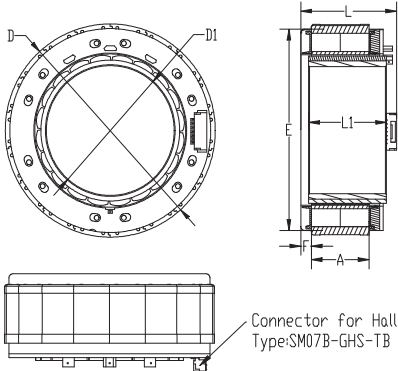
### ● 电性能

(Electrical Specifications)

|                                     | 单位 (Unit) | FL70BL19-48V-35366A | FL70BL10-48V-36250A |
|-------------------------------------|-----------|---------------------|---------------------|
| 极数 ( Number of poles )              |           | 20                  | 20                  |
| 相数 ( Number of phases )             |           | 3                   | 3                   |
| 额定电压 ( Rated voltage )              | VDC       | 48                  | 48                  |
| 额定转矩 ( Rated torque )               | N.m       | 1.0                 | 0.55                |
| 额定电流 ( Rated current )              | A         | 9.2                 | 5.1                 |
| 额定速度 ( Rated speed )                | RPM       | 3500                | 3650                |
| 额定功率 ( Rated power )                | W         | 366                 | 210                 |
| 最大转速 ( Maximum speed )              | RPM       | 4500                | 4750                |
| 峰值扭矩 ( Peak torque )                | N.m       | 3.0                 | 1.65                |
| 峰值电流 ( Peak current )               | A         | 28                  | 15.5                |
| 线电阻 ( Line to line resistance )     | ohms@20°C | 0.19                | 0.38                |
| 线电感 ( Line to line inductance )     | mH        | 0.18                | 0.33                |
| 转矩常数 ( Torque constant )            | Nm/A      | 0.12                | 0.118               |
| 反电势 ( Back EMF )                    | Vrms/KRPM | 7.4                 | 7.14                |
| 机身长度 ( Motor length )               | mm        | 32                  | 23.5                |
| 重量 ( Weight )                       | g         | 315                 | 210                 |
| 电气时间常数 ( Electrical time constant ) | ms        | 0.95                | 0.87                |

### ● 机械尺寸

(Dimensions)



| 项目(Items) | FL85BL23 | FL85BL13 | 公差(Tolerance) |
|-----------|----------|----------|---------------|
| 定子外径D     | 85mm     | 85mm     | ±0.043(js9)   |
| 定子长度L     | 36mm     | 27.5mm   | ±1            |
| 转子内径D1    | 52mm     | 52mm     | +0.046/0(H8)  |
| 转子长度L1    | 34mm     | 22.5mm   | ±0.2          |
| 灌胶面外圆E    | 81mm     | 81mm     | ±0.2          |
| 灌胶面高度F    | 4.2mm    | 4.2mm    | ±0.3          |
| 定子铁芯高度A   | 23mm     | 13mm     | /             |



选件 Options



接插件

### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式<br>(Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度<br>(Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 介电强度<br>(Dielectric Strength)   | 1000VAC/1S                               |
| 绝缘电阻<br>(Insulation Resistance) | 100MΩ, 500VDC                            |
| 使用环境<br>(Operation Ambient)     | -20°C ~ +50°C                            |
| 绝缘等级<br>(Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线颜色<br>Color | 引出线型号<br>Type  | 功能<br>Functions |
|----------------|--|-----------------|
| PIN1           | Connector for Hall is optional<br>Type: SM07B-GHS-TB | 热敏 (NTC2)       |
| PIN2           |  | 热敏 (NTC1)       |
| PIN3           |  | 霍尔电源负 (GND)     |
| PIN4           |  | 霍尔 A (Ha)       |
| PIN5           |  | 霍尔 B (Hb)       |
| PIN6           |  | 霍尔 C (Hc)       |
| PIN7           |  | 霍尔电源正 (Vcc)     |
| 黄色 (Yellow)    | UL1332 AWG18<br>UL1332 AWG16                         | U相 (Phase U)    |
| 红色 (Red)       |  | V相 (Phase V)    |
| 黑色 (Black)     |  | W相 (Phase W)    |

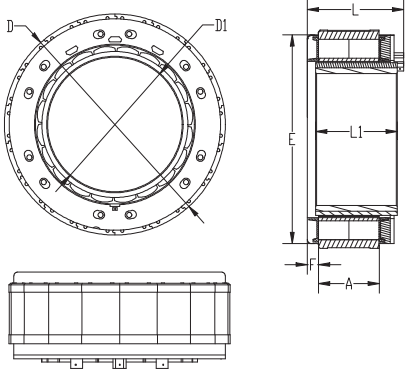
### ● 电性能

(Electrical Specifications)

|                                   | 单位 (Unit) | FL85BL23-48V-3500730A | FL85BL13-48V-29400A |
|-----------------------------------|-----------|-----------------------|---------------------|
| 极数 (Number of poles)              |           | 20                    | 20                  |
| 相数 (Number of phases)             |           | 3                     | 3                   |
| 额定电压 (Rated voltage)              | VDC       | 48                    | 48                  |
| 额定转矩 (Rated torque)               | N.m       | 2.0                   | 1.2                 |
| 额定电流 (Rated current)              | A         | 15                    | 8.6                 |
| 额定速度 (Rated speed)                | RPM       | 3500                  | 2950                |
| 额定功率 (Rated power)                | W         | 732                   | 370                 |
| 最大转速 (Maximum speed)              | RPM       | 4000                  | 3700                |
| 峰值扭矩 (Peak torque)                | N.m       | 6.0                   | 3.6                 |
| 峰值电流 (Peak current)               | A         | 45                    | 25.8                |
| 线电阻 (Line to line resistance)     | ohms@20°C | 0.09                  | 0.23                |
| 线电感 (Line to line inductance)     | mH        | 0.13                  | 0.3                 |
| 转矩常数 (Torque constant)            | Nm/A      | 0.14                  | 0.15                |
| 反电势 (Back EMF)                    | Vrms/KRPM | 8.3                   | 9                   |
| 机身长度 (Motor length)               | mm        | 35                    | 27.5                |
| 重量 (Weight)                       | g         | 597                   | 386                 |
| 电气时间常数 (Electrical time constant) | ms        | 1.44                  | 1.3                 |

### ● 机械尺寸

(Dimensions)



| 项目(Items) | FL115BL25 | FL115BL50 | 公差(Tolerance) |
|-----------|-----------|-----------|---------------|
| 定子外径D     | 115mm     | 115mm     | js9           |
| 定子长度L     | 39mm      | 68mm      | ±1            |
| 转子内径D1    | 74mm      | 74mm      | H8            |
| 转子长度L1    | 32.7mm    | 57.7mm    | ±0.25         |
| 灌胶面外圆E    | 112mm     | 112mm     | ±0.2          |
| 灌胶面高度F    | 5.5mm     | 5.5mm     | ±0.3          |
| 定子铁芯高度A   | 25mm      | 50mm      | /             |



选件 Options



接插件

### ● 特性概要

(General Specifications)

|                                 |  |
|---------------------------------|--|
| 绕组连接方式<br>(Winding Type)        | 星形 (Star connection)                     |
| 霍尔分布角度<br>(Hall Effect Angle)   | 120度电角度 (Electrical Angle of 120 degree) |
| 介电强度<br>(Dielectric Strength)   | 1000VAC/1S                               |
| 绝缘电阻<br>(Insulation Resistance) | 100MΩ, 500VDC                            |
| 使用环境<br>(Operation Ambient)     | -20°C ~ +50°C                            |
| 绝缘等级<br>(Insulation Class)      | Class B                                  |

### ● 接线说明

(Electric Connection)

| 引出线颜色<br>Color | 引出线型号<br>Type                    | 功能<br>Functions |
|----------------|----------------------------------|-----------------|
| 红色 (Red)       | UL2464 AWG26<br>Hall is optional | 霍尔电源正 (Vcc)     |
| 蓝色 (Blue)      |                                  | 霍尔 W (Hw)       |
| 绿色 (Green)     |                                  | 霍尔 V (Hv)       |
| 白色 (White)     |                                  | 霍尔 U (Hu)       |
| 黑色 (Black)     |                                  | 霍尔电源负 (GND)     |
| 黄色 (Yellow)    | UL1332 AWG18                     | U相 (Phase U)    |
| 红色 (Red)       |                                  | V相 (Phase V)    |
| 黑色 (Black)     |                                  | W相 (Phase W)    |

### ● 电性能

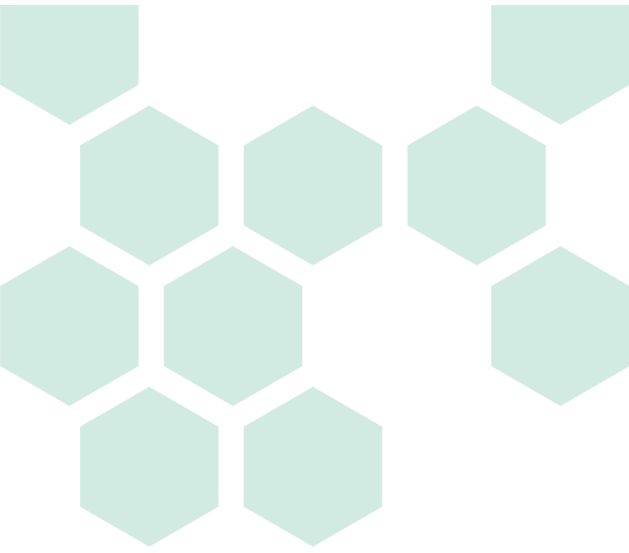
(Electrical Specifications)

|                                   | 单位 (Unit) | FL115BL25-48V-14570 | FL115BL50-48V-06620 |
|-----------------------------------|-----------|---------------------|---------------------|
| 极数 (Number of poles)              |           | 30                  | 30                  |
| 相数 (Number of phases)             |           | 3                   | 3                   |
| 额定电压 (Rated voltage)              | VDC       | 48                  | 48                  |
| 额定转矩 (Rated torque)               | N.m       | 3.9                 | 9.51                |
| 额定电流 (Rated current)              | A         | 14.1                | 15.1                |
| 额定速度 (Rated speed)                | RPM       | 1400                | 620                 |
| 额定功率 (Rated power)                | W         | 570                 | 620                 |
| 最大转速 (Maximum speed)              | RPM       | 1900                | 850                 |
| 峰值扭矩 (Peak torque)                | N.m       | 12.7                | 31.4                |
| 峰值电流 (Peak current)               | A         | 49                  | 52                  |
| 线电阻 (Line to line resistance)     | ohms@20°C | 0.23                | 0.38                |
| 线电感 (Line to line inductance)     | mH        | 0.25                | 0.48                |
| 转矩常数 (Torque constant)            | Nm/A      | 0.293               | 0.662               |
| 反电势 (Back EMF)                    | Vrms/KRPM | 17.7                | 40                  |
| 机身长度 (Motor length)               | mm        | 39                  | 68                  |
| 重量 (Weight)                       | g         | 1110                | 2200                |
| 电气时间常数 (Electrical time constant) | ms        | 1.1                 | 1.8                 |



**注意事项:** 本样册中所有信息均为参考值。因检测和测量方法不同,可能存在偏差。请直接联系我们,以了解详细信息。我们原则上保留技术变更的权利。

**Attentions:** All figures are approximate values. Variations are possible and may arise for example due to non-standardized inspection and measurement methods. For more detailed information, please contact us directly. Fulling Motor company always reserves the right to make technical modifications.



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微信公众号



公司主页



抖音



