# DA200 AC Servo System

MAUXA SYSTEMS

# Company profile

INVT INDUSTRIAL TECHNOLOGY (SHANGHAI) CO.,LTD. (formerly Shanghai KINWAY Technologies, Inc) is established in 2005 by several Chinese doctors from the U. S. who are outstanding in the field of automatic control. As the wholly-owned subsidiary of INVT(002334), this sino-foreign joint venture company has promoted the decades of successful technology development and management experience in the famous overseas company to China, focused on servo drive products and system integration, integrated the research and development, production, sales and service, to rank in the national high and new technology enterprises and innovative companies in Shanghai.

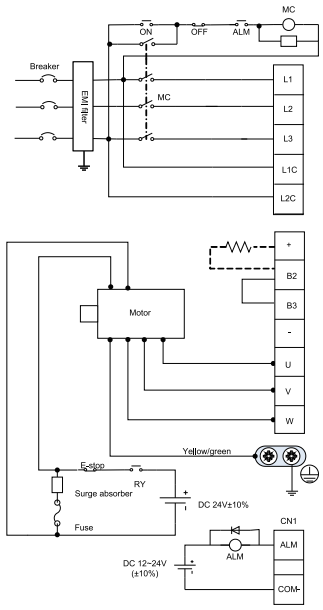
Relying on the core leading international technology of permanent magnet synchronous motor, power electronics, digital control, sensors, network and field bus, the company has a series of high-end servo systems and special dedicated computer control system. Its products of INVT and KINWAY are widely used in the field of CNC machine tools, printing and packaging machinery, electronic equipment, industrial robots, plastic machinery, textile printing and dyeing. Its technology is in the leading level and some of them even rival the international first-class level.

The sharp sense to market and needs ensure the creativity and flexibility of the company’s products; advanced integrated product development management, comprehensive product research and development, testing and automation, informationization production ensure the high reliability and performance of the company’s products; distributed domestic offices, after-sales service center and technical support team provide solutions, technical training and professional security services support to customers.

The company is striving to enhance the equipment manufacturing industry through leading servo drive and automation technology, to create more value and competitiveness for customers.


# User interface

## Terminals of the main circuit




The user is required to make this emergency stop protection circuit.
Fit surge absorbing devices on both ends of the electromagnetic contactor winding.

The input voltage range of 220V system: AC 220V (-15%)~240(+10%)

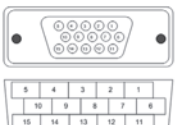
The input voltage range of 400V system: AC 380V (-15%)~440(+10%)

Correctly connect to output U, V, and W of the drive according to the phase sequence of the motor cable of the servo motor. Wrong phase sequence will cause drive fault.
Do not disconnect the short circuit wire between B2 and B3 unless an external regenerative braking resistor is used.
When and external regenerative braking resistor is used, disconnect the short circuit wire between B2 and B3, and connect it according to the dashed in the figure.

Be sure to ground the servo drive to avoid accident of electrical shock.

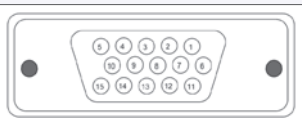
The electromagnetic brake uses 24V power supply which should be provided by the user. Moreover, it must be isolated with the 12-24V power supply which is used for the control signal.
Pay attention to the connection method of the freewheeling diode. Reversed polarity may damage the drive.

## CN3 terminals



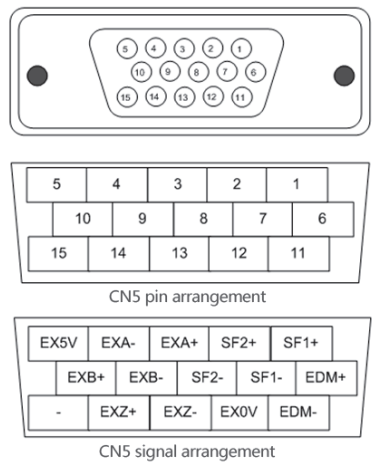
| CN3 interface | | | |
|---|---|---|---|
| Pin | Name | Function | Remark |
| 1 | 5V | Power supply | 485 and CAN use the same interface and each terminal has two pins for multiple networking. |
| 2 | GND | Power ground | |
| 3 | / | | |
| 4 | RS485+ | RS485 data+ | |
| 5 | RS485− | RS485 data− | |
| 6 | / | | |
| 7 | CAN_L | CAN data− | |
| 8 | CAN_H | CAN data+ | |

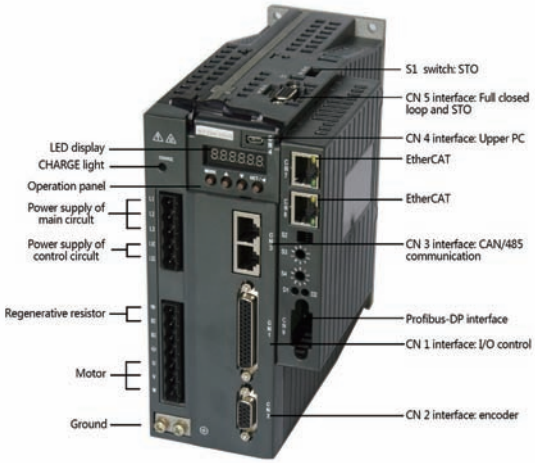
## CN2 terminals



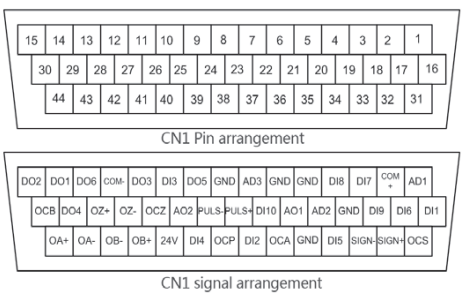
| CN2 interface | | | |
|---|---|---|---|
| Pin | Name | Function | Remark |
| 1 | V+/ SD+ | Parallel encoder V+/Serial encoder data+ | Different encoders use different cables |
| 2 | W+ | Signal of parallel encoder W+ | |
| 3 | A+ | Signal of parallel encoder A+ | |
| 4 | A− | Signal of parallel encoder A− | |
| 5 | 5V | Encoder power supply | |
| 6 | U+ | Signal of parallel encoder U+ | |
| 7 | V− /SD− | Parallel encoder V−/Serial encoder data− | |
| 8 | W− | Signal of parallel encoder W− | |
| 9 | B− | Signal of parallel encoder B− | |
| 10 | B+ | Signal of parallel encoder B+ | |
| 11 | U− | Signal of parallel encoder U− | |
| 12 | GND | Power earth | |
| 13 | Z− | Signal of parallel encoder Z− | |
| 14 | Z+ | Signal of parallel encoder Z+ | |
| 15 | / | | |

## CN5 terminals




## CN1 terminals



# Function and performance

## 1 Rapid speed response

Speed response frequency is more than 2.0 kHz，reducing the adjusting time and ranking the top in the circle.

## 2 Excellent positioning accuracy

2500-wire incremental, 17/20-bit absolute and 16-bit rotating transformer encoders are applied to increase the positioning accuracy and enhance the stability.

## 3 Close-loop control

Support the external encoder or grating ruler for full closed loop control and the gap shadow reduction and higher positioning accuracy.

## 4 Internal position control

128-step internal position control and simple programming through terminals combination for less PLC units and cost.

## 5 Various communication interface

Modbus, CANopen, PROFIBUS-DP, EtherCAT, MotionNet and other bus communication, long-distance, high-speed multi-axis synchronous control through networking.

## 6 CAM function

Embedded CAM function for the flying shear, paper printing, textile sending and so on. The user can make or modify the internal cam curve automatically or manually through PC software.

## 7 Input and output signal distribution

channels of digital and 6 channels of analog input and output signal can be distributed by parameters. ServoPlorer software can be modified by special interface.

# Easy operation

## 1 The load inertia identification

Online and offline inertia identification,Automatic identification corresponds to the internal gain settings to achieve the optimal performance and shorten the adjusting time of the system.

## 2 Simple gain adjustment and gain switching

The speed loop, position loop gain and filtering time constant can be set by the setting of rigid in different applications. The rigid can be set to simplify the commissioning, support two groups of gain setting and the setting can be switched by IO input, communication and internal variable for the flexible demand during the processing.

## 3 Automatic/manual notch filter

Support automatic detection resonance frequency and automatic trap setting, to reduce the mechanical resonance noise and vibration caused by mechanical resonance.
There are two groups of automatic and manual notch filters respectively , the setting frequency is 50~5000Hz and can be set to the notch depth.

## 4 Automatic/manual vibration-controlling filter

Overcome the low-frequency mechanical resonance and the vibration of long swing arm mechanism effectively through special low-frequency vibration suppression algorithm.

## 5 Speed observer

Internal speed observer to improve the accuracy and stability of speed control.

## 6 Disturbance control

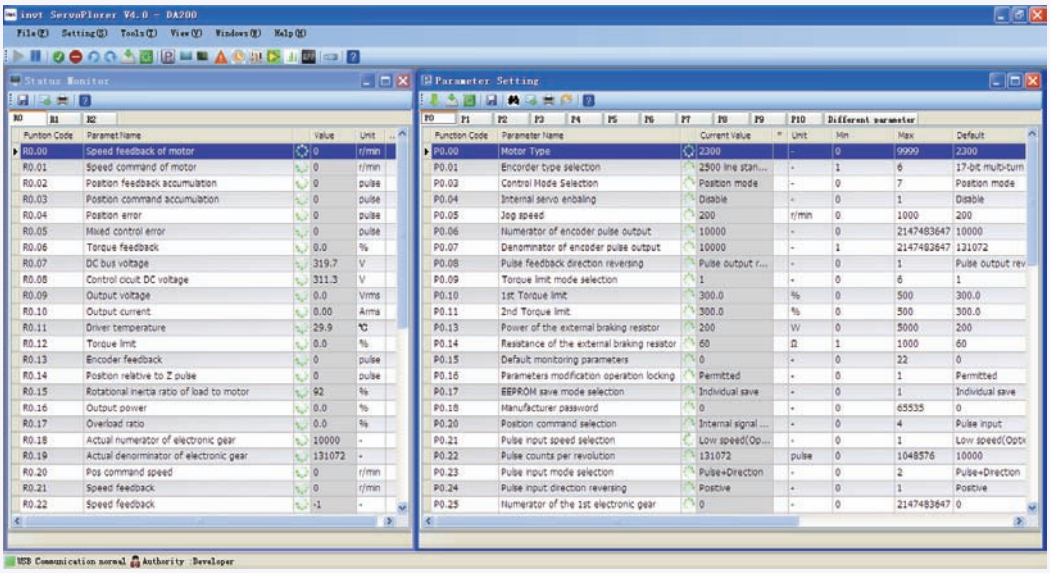
To compensate the impact of performance control when the load disturbance and parameter changes, increase the robustness of the system and improve the command response.

## 7 The friction torque compensation

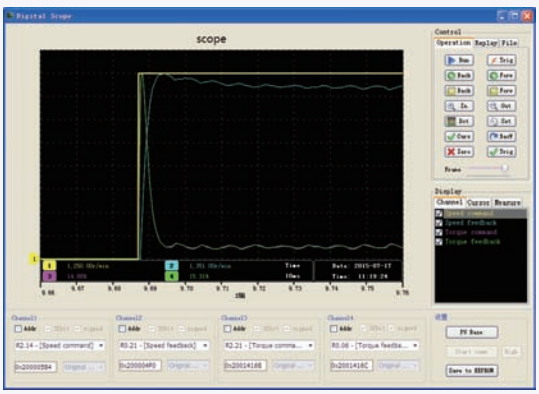
The function of friction torque compensation, to reduce the impact of static friction when direction changing and improve the command response when low speed operation.

# Powerful PC software — ServoPlorer V4.0

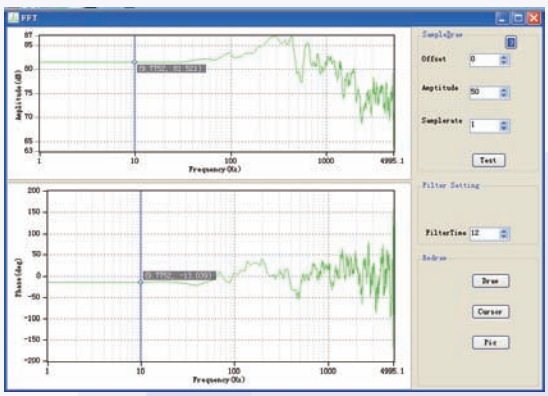
## Easy parameters setting and monitoring operation interface



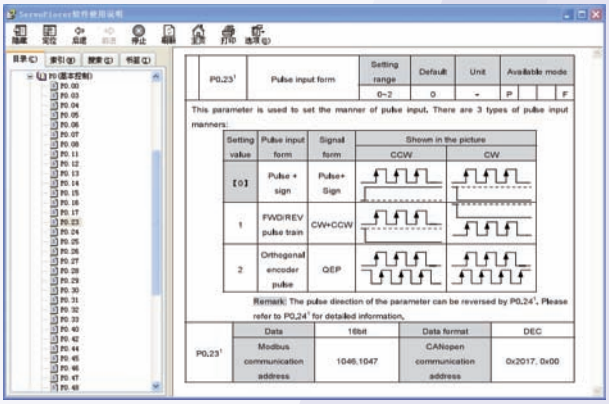

Online oscilloscope monitoring with USB communication for 4-channel waves (125us)




Frequency characteristic test for the system resonance frequency



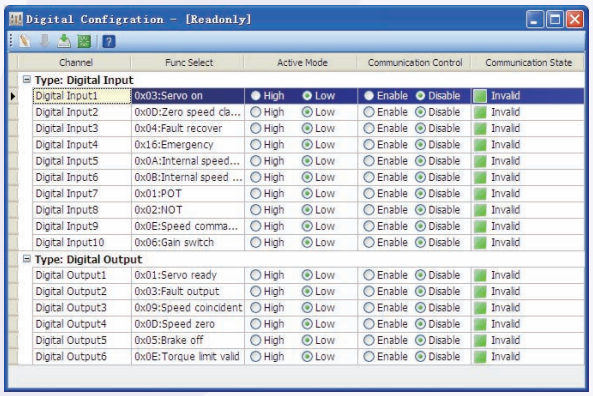

Built-in detailed parameters instructions



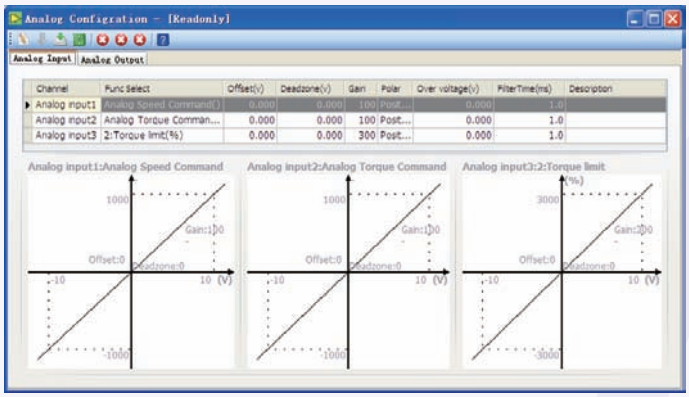
# Powerful PC software — ServoPlorer V4.0

## Easy parameters setting and monitoring operation interface

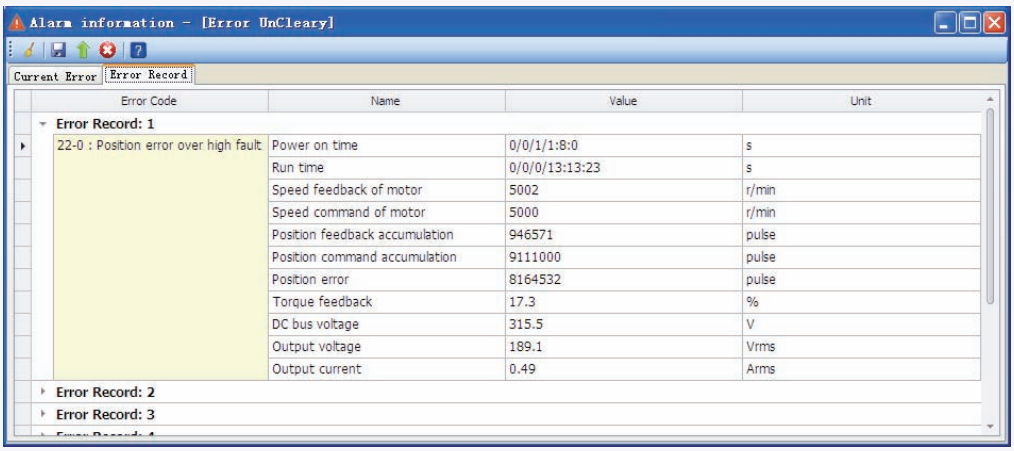
The valid logic and function configuration can be selected by the digital input and output signal



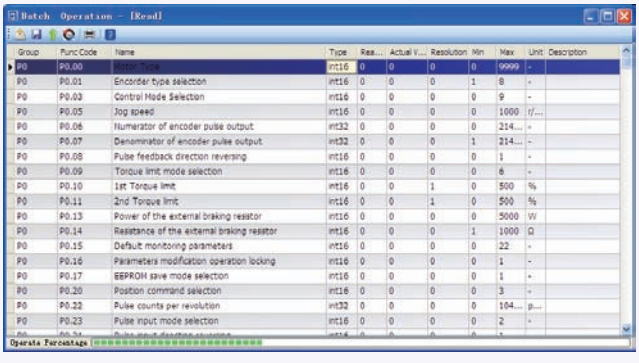

The parameters of gain, zero deviation and dead zone can be set through the analog input and output signal



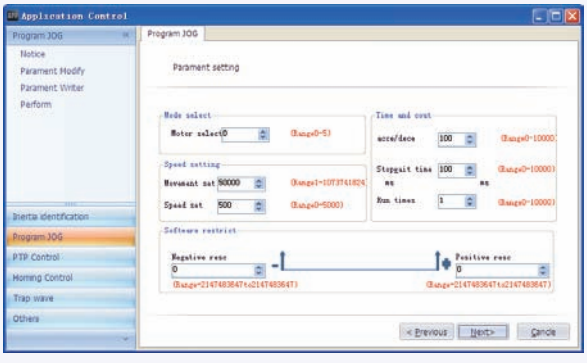

Read the real-time fault information and fault record




Save the parameters for later copying through the mass reading function




Various application controls for commissioning



# Naming of the drive

**SV–DA200–0R4–2–S 5**

**A B C D E F**

**A**

| Sign | Product |
|---|---|
| SV | Servo series products |

**B**

| Sign | Product Series |
|---|---|
| DA200 | Product series |

**C**

| Sign | Power ratings |
|---|---|
| R05 | 50W |
| 0R1 | 100W |
| 0R2 | 200W |
| 0R4 | 400W |
| 0R7 | 750W |
| 1R0 | 1.0kW |
| 1R5 | 1.5kW |
| 2R0 | 2.0kW |
| 3R0 | 3.0kW |
| 4R4 | 4.4kW |
| 5R5 | 5.5kW |
| 7R5 | 7.5kW |
| 011 | 11kW |
| 015 | 15kW |

**D**

| Sign | Input voltage |
|---|---|
| 2 | 220VAC |
| 4 | 400VAC |

**E**

| Sign | Machine type |
|---|---|
| E | Pulse |
| S | Standard |
| C | CANopen bus |
| P | PROFIBUS-DP bus |
| N | EtherCAT bus |
| M | MotionNet bus |
| T | ECAM |

**F**

| Sign | Available encoder type |
|---|---|
| Null | 2500-wire standard incremental |
| | 2500-wire multiplexed data line incremental |
| | 17-bit single circle absolute value |
| | 17-bit multiple circle absolute value |
| 5 | 20-bit single circle absolute value |
| | 20-bit multiple circle absolute value |
| 7 | 12-bit rotary transformer |
| 8 | 16-bit rotary transformer |

## Difference between machine types

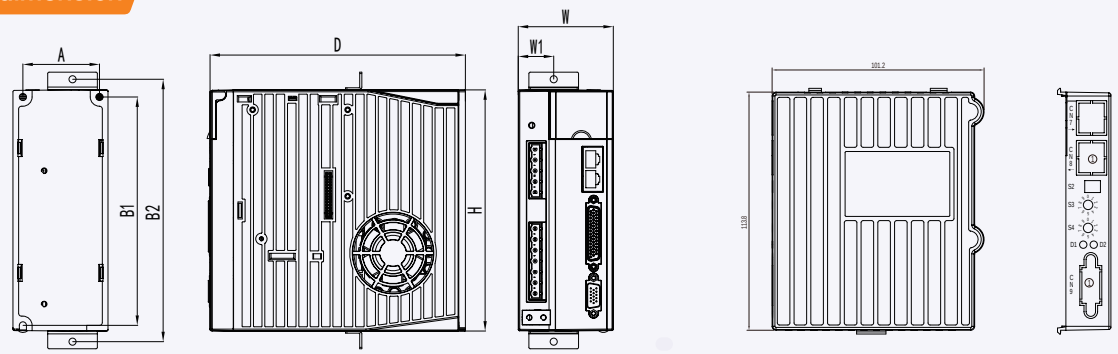
| Code | Type | Pulse input | 16bit analog | Full closed-loop | STO | RS485 | Canopen | Profibus-dp | Ethercat | MotionNet | ECAM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | Pulse | √ | X | √ | X | √ | X | X | X | X | X |
| S | Standard | √ | √ | √ | √ | √ | X | X | X | X | X |
| C | CAN | X | X | X | X | X | √ | X | X | X | X |
| P | PROFIBUS-DP | X | X | X | X | X | X | √ | X | X | X |
| N | EtherCAT | X | X | X | X | X | X | X | √ | X | X |
| M | MotionNet | X | X | √ | X | √ | X | X | X | √ | X |
| T | ECAM | √ | X | √ | X | √ | X | X | X | X | √ |

# Power ratings and volumes

## Power ratings and volumes

| Model | Input | Output | | Volume |
|---|---|---|---|---|
| | Voltage ( V ) | Power ( kW ) | Rated current ( A ) | |
| SV-DA200-0R2-2 | Single/Three phase 220 | 0.2 | 1.8 | A |
| SV-DA200-0R4-2 | Single/Three phase 220 | 0.4 | 2.8 | A |
| SV-DA200-0R7-2 | Single/Three phase 220 | 0.75 | 4.5 | B |
| SV-DA200-1R0-2 | Single/Three phase 220 | 1.0 | 5 | B |
| SV-DA200-1R5-2 | Three phase 220 | 1.5 | 7.6 | B |
| SV-DA200-2R0-2 | Three phase 220 | 2.0 | 10 | D |
| SV-DA200-3R0-2 | Three phase 220 | 3.0 | 13 | D |
| SV-DA200-4R4-2 | Three phase 220 | 4.4 | 16.5 | D |
| SV-DA200-1R0-4 | Three phase 400 | 1.0 | 3.5 | B |
| SV-DA200-1R5-4 | Three phase 400 | 1.5 | 4.5 | B |
| SV-DA200-2R0-4 | Three phase 400 | 2.0 | 6.5 | C |
| SV-DA200-3R0-4 | Three phase 400 | 3.0 | 8.5 | C |
| SV-DA200-4R4-4 | Three phase 400 | 4.4 | 12 | D |
| SV-DA200-5R5-4 | Three phase 400 | 5.5 | 16 | D |

## Drive dimension




| Model | External dimension | | | Installation dimension | | | | Installation ( mm ) |
|---|---|---|---|---|---|---|---|---|
| | H (mm) | W (mm) | D (mm) | A (mm) | B1 (mm) | B2 (mm) | W1 (mm) | |
| SV-DA200-0R2-2<br>SV-DA200-0R4-2 | 170 | 45 | 170 | 31 | 162 | 185 | 22.5 | M4(Φ5) |
| SV-DA200-0R7-2<br>SV-DA200-1R0-2<br>SV-DA200-1R5-2 | 170 | 67 | 180 | 54 | 162 | 185 | 25 | M4(Φ5) |
| SV-DA200-2R0-2<br>SV-DA200-3R0-2<br>SV-DA200-4R4-2 | 230 | 92 | 190 | 79 | 222 | 245 | 25 | M4(Φ5) |
| SV-DA200-1R0-4<br>SV-DA200-1R5-4 | 170 | 67 | 180 | 54 | 162 | 185 | 25 | M4(Φ5) |
| SV-DA200-2R0-4<br>SV-DA200-3R0-4 | 170 | 84 | 180 | 71 | 162 | 18 | 25 | M4(Φ5) |
| SV-DA200-4R4-4<br>SV-DA200-5R5-4 | 230 | 92 | 190 | 79 | 222 | 245 | 25 | M4(Φ5) |

## Braking resistors

| Model | Embedded braking resistor | Min. resistance of external braking resistors |
|---|---|---|
| SV-DA200-0R2-2 | / | 60Ω |
| SV-DA200-0R4-2 | / | 60Ω |
| SV-DA200-0R7-2 | 30Ω60W | 30Ω |
| SV-DA200-1R0-2 | 30Ω60W | 30Ω |
| SV-DA200-1R5-2 | 30Ω60W | 20Ω |
| SV-DA200-2R0-2 | 15Ω120W | 15Ω |
| SV-DA200-3R0-2 | 15Ω120W | 15Ω |
| SV-DA200-4R4-2 | 15Ω120W | 15Ω |
| SV-DA200-1R0-4 | 60Ω60W | 60Ω |
| SV-DA200-1R5-4 | 60Ω60W | 60Ω |
| SV-DA200-2R0-4 | 60Ω60W | 40Ω |
| SV-DA200-3R0-4 | 60Ω60W | 30Ω |
| SV-DA200-4R4-4 | 30Ω120W | 30Ω |
| SV-DA200-5R5-4 | 30Ω120W | 30Ω |

# Technical specifications

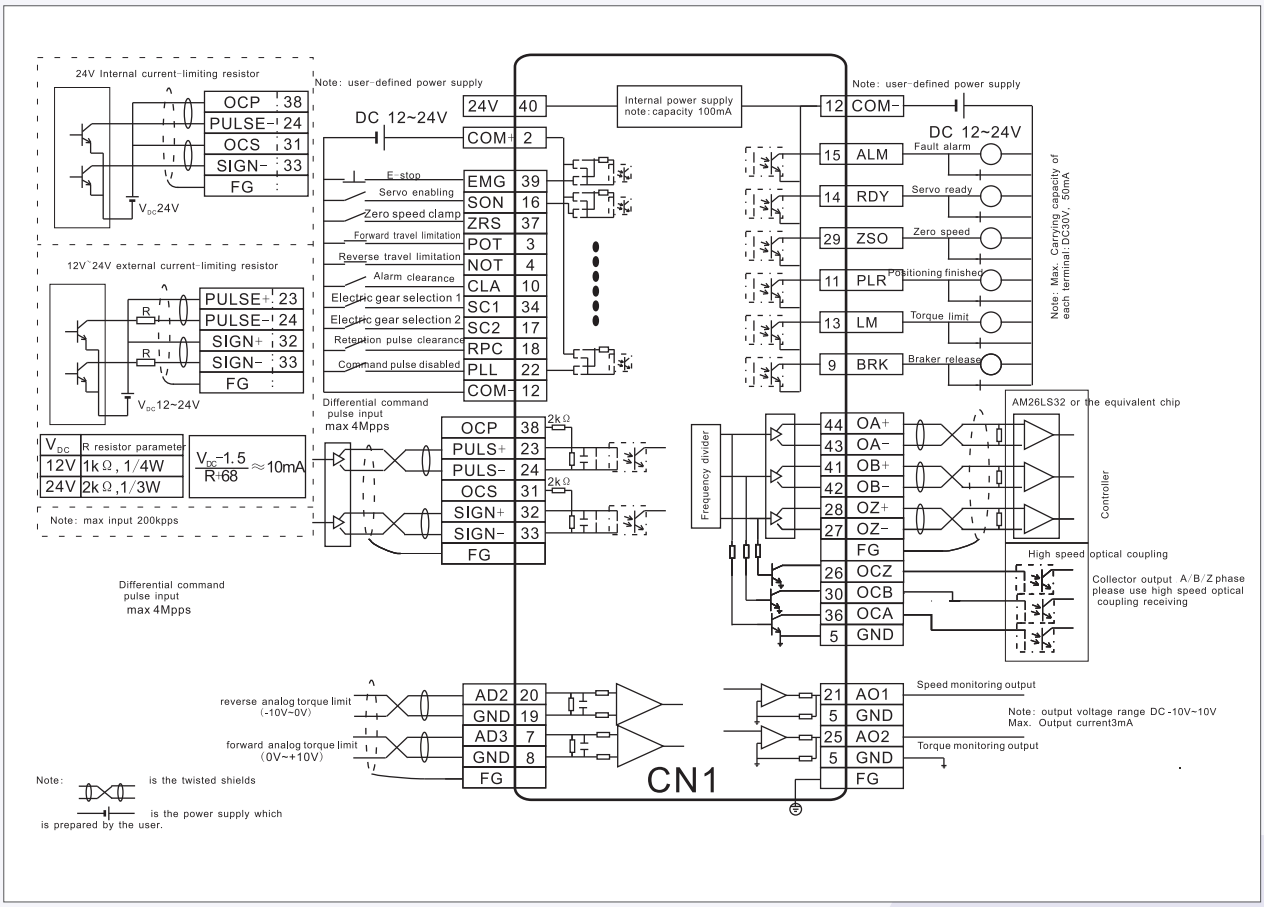
| DA200 series servo drives (50W~15kW) | | | | |
|---|---|---|---|---|
| Specifications | | | Description | |
| Power supply | 220V system input voltage | | 1P/3P AC 220V( -15%)~240(+10%) 47Hz~63Hz | |
| | 400V system input voltage | | 3P AC 380V( -15%)~440(+10%) 47Hz~63Hz | |
| Interface | Control signal | Input | 10 inputs, 30 kinds of function can be configured by some parameters, Invalid, forward direction drive disabled, reverse direction drive disabled, servo enabling, alarm clearing, control mode switching, gain switching, retention pulse clear, command pulse prohibited, torque limit switch, internal speed command 1, internal speed command 2, internal speed command 3, zero speed clamp, speed command sign, torque command sign, internal position command 1, internal position command 2, internal position command 3, internal position command 4, external fault, inertia ratio switching, E-stop, HOME switch input, HOME trigger, molecule 1 of electronic gear ratio, molecule 2 of electronic gear ratio, bit control trigger, the vibration control switch input, fast stop, bit control stop. | |
| | | Output | 6 outputs (15 kinds of function can be configured by some parameters, invalid, servo ready output, servo operation output, fault output, reserved, external brake signals clear, position command or not, positioning finished, control mode switch state, speed matching, speed arrival, speed limiting, speed command or not, speed zero output, torque limiting, zeroing finished, torque arrival. | |
| | Analog value | Input | 3 inputs (1 16bitA/D input, 2 12bitA/D inputs).. | |
| | | Output | 2 outputs (analog monitoring output) | |
| | Pulse signal | Input | 2 inputs (open collector input/differential input) | |
| | | Output | 6 outputs (3 differential outputs, 3 open collector outputs) | |
| | Communication | USB | 1:1 communication upper PC software (standard) | |
| | | RS485 | 1:n communication (standard) | |
| | | CANopen | 1:n communication (standard) | |
| | | Profibus-DP | 1:n communication (standard) | |
| | | EtherCAT | 1:n communication (standard) | |
| | Safety terminals | STO | Safe torque off (to the latest European safety standards) (optional) | |
| Control mode | 1. Position control; 2. Speed control; 3. Torque control; 4. Position/Speed mode switching; 5. Speed/Torque mode switching; 6. Position/Torque mode switching; 7. Full closed loop control; 8. CANopen mode; 9. EtherCAT mode; 10. MotionNet mode | | | |
| Functions | Position control | Control input | 1. Retention pulse clear; 2. Command pulse input disabled; 3. Command switch frequency doubling; 4. Vibration control switching | |
| | | Control output | Output after positioning finished | |
| | | Pulse input | Max. pulse input frequency | 1 optical coupling: differential input 4Mpps, open collector input 200Kpps |
| | | | Pulse input mode | 1. Positive/Negative direction; 2. A phase/B phase; 3. Command pulse/Command direction |
| | | | Electric gear | 1/10000~1000 times |
| | | | Filter | 1 Command smoothing filter; 2 FIR filter |
| | | Analog input | Torque command input | Can be independently arrange clockwise/ counterclockwise torque limit |
| | | Vibration control | Control the forward and whole machine vibration of 5~200Hz | |
| | | Pulse output | 1. Arbitrary frequency division settings under the encoder resolution 2. B phase reverse | |

# Technical specifications

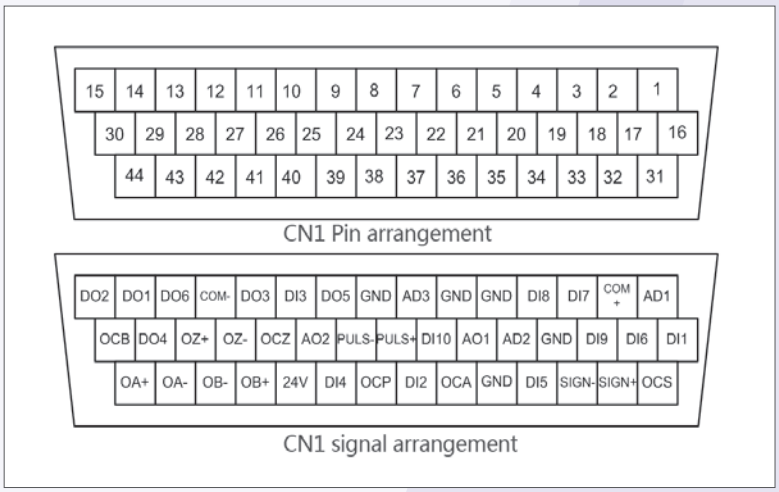
| DA200 series servo drives ( 50W~15kW ) | | | | |
|---|---|---|---|---|
| Specitications | | | Description | |
| Functions | Speed control | Control input | 1. Internal command speed 1; 2. Internal command speed 2;<br>3. Internal command speed 3; 4. Zero speed clamp | |
| | | Control output | Speed arrival | |
| | | Analog input | Speed command input | Speed command input of the analog voltage DC ± 10V setting |
| | | | Torque limit input | Can be independently arrange clockwise/ counterclockwise torque limit |
| | | Pulse input | Speed command input after setting to the pulse frequency | |
| | | Internal speed commands | 8 step speed can be switched according to the external control input | |
| | | ACC/DEC adjustment of the speed command | ACC/DEC time setting and S curve setting | |
| | | Zero speed clamp | In the speed mode, it can set the operation mode as the speed mode and position mode | |
| | | Speed command filter | A delay filter of analog input speed command | |
| | | Speed command zero drift control | Zero drift control to the outside interference Precision 0.3mV | |
| | Torque control | Control input | Zero speed clamp input | |
| | | Control output | Speed arrival | |
| | | Analog input | Torque command input | Analog torque command input, gain and polarity setting to the analog voltage Precision 4.88mV |
| | | | Speed limit input | Analog speed limit |
| | | Speed limit | Set the speed limit by parameters | |
| | | Torque command filte | A delay filter of analog input torque command | |
| | | Torque command Zero drift control | Zero drift control to the outside interference<br>Precision 4.88mV | |
| | Internal position plan | Plan points | 16-bit internal position planning, the positioning can be controlled through the communication | |
| | | Route setting | 1. Position; 2. Speed; 3. ACC time; 4. DEC time; 5. Stop timer;<br>6. Various state output; 7. Operational mode | |
| | | Origin returning | 1. LS signal; 2. Z phase signal; 3. LS signal+Z phase signal; 4. Torque limit signal | |
| Protection | Hardware protection | Overvoltage, undervoltage, overcurrent, overspeed, overload, braking resistor overload, overheat, encoder fault and so on | | |
| | Software protection | Memory and initialization fault, the I/O distribution abnormalities and large position deviation | | |
| | Protection and fault record | 1. 10 kinds of fault can be recorded<br>2. Can record the current key parameters when fault occurs | | |
| Environment | Temperature | Temperature | 0~45℃ | |
| | | Storage temperature | -20~80℃(no freezing) | |
| | Humidity | Operation/storage: ≤90%RH (no condensation) | | |
| | IP degree | IP20 | | |
| | Altitude | Below 1000m | | |
| | Vibration | ≤5.88m/s2, 10~60Hz(Not allowed to work at the resonance point) | | |

# Standard wiring

## The position /close-loop mode (available to the pulse input control)

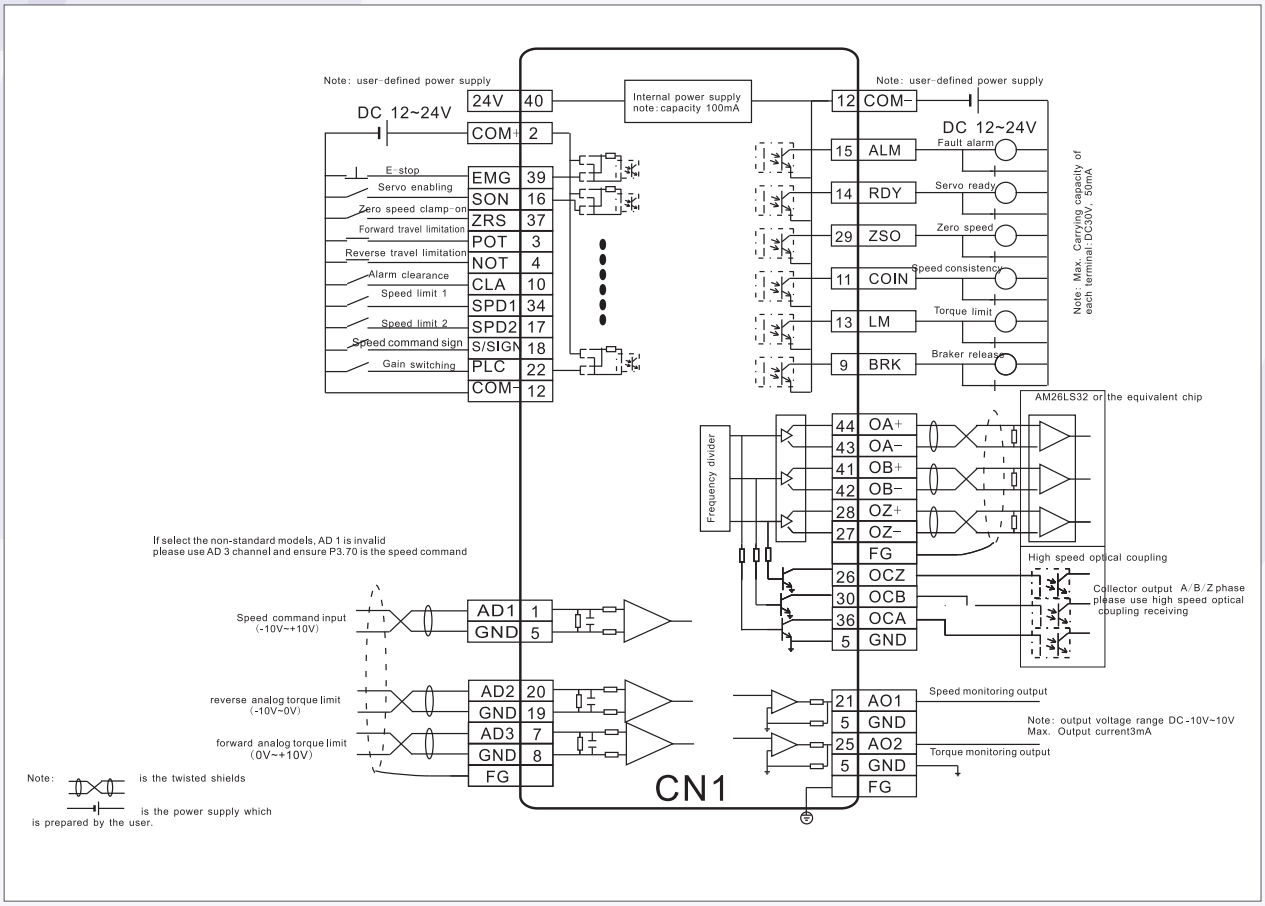



## CN1 terminals

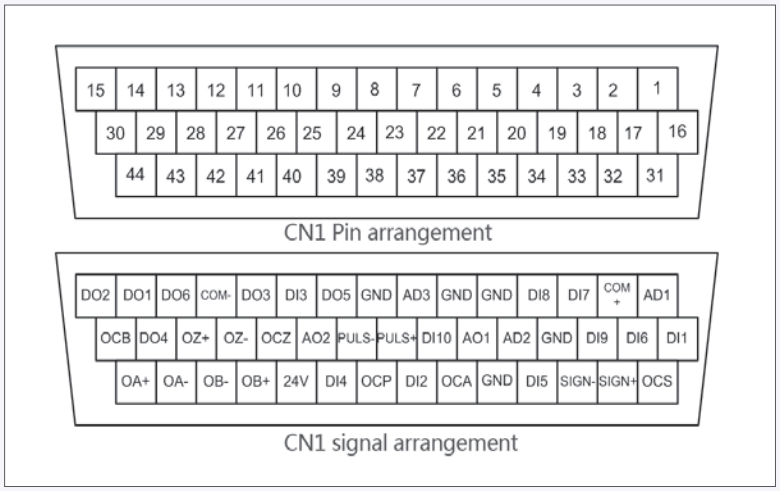


# Standard wiring

## The speed/torque mode (available to the analog input control)




## CN1 terminals



# Servo motor model

## Naming of the motor

**SV–ML 06–0R4 G–2–4 A 0**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① 

| 符号 | Product |
|---|---|
| SV | Servo system |

② 

| Sign | Inertia degree |
|---|---|
| ML | general servo motor of small inertia |
| MM | general servo motor of medium inertia |
| MH | general servo motor of big inertia |

③ 

| Sign | Base |
|---|---|
| 06 | 60 |
| 08 | 80 |
| 11 | 110 |
| 13 | 130 |
| 18 | 180 |

| Sign | Rated speed |
|---|---|
| A | 1000rpm |
| B | 1500rpm |
| E | 2000rpm |
| F | 2500rpm |
| G | 3000rpm |

④ 

| Sign | Rated power |
|---|---|
| R05 | 50W |
| 0R1 | 100W |
| 0R2 | 200W |
| 0R4 | 400W |
| 0R7 | 750W |
| 1R0 | 1.0kW |
| 1R5 | 1.5kW |
| 2R0 | 2kW |
| 3R0 | 3.0kW |
| 4R4 | 4.4kW |
| 5R5 | 5.5kW |
| 7R5 | 7.5kW |
| 011 | 11kW |
| 015 | 15kW |

⑤ 

| Sign | Rated speed |
|---|---|
| A | 1000rpm |
| B | 1500rpm |
| E | 2000rpm |
| F | 2500rpm |
| G | 3000rpm |

⑥ 

| Sign | Voltage degree |
|---|---|
| 2 | 220VAC |
| 4 | 400VAC |

⑦ 

| Sign | Encoder type |
|---|---|
| 1 | 2500-wire standard incrementa |
| 2 | 2500-wire multiplexed data line incremental |
| 3 | 17-bit single circle absolute value |
| 4 | 17-bit multiple circle absolute value |
| 5 | 20-bit single circle absolute value |
| 6 | 20-bit multiple circle absolute value |
| 7 | 12-bit rotary transformer |
| 8 | 16-bit rotary transformer |

⑧ 

| Sign | Axis connection |
|---|---|
| A | Solid with screw hole and key (standard) |
| B | Solid axis |

⑨ 

| Sign | Optional parts |
|---|---|
| 0 | With oil seal and no breaker |
| 1 | No breaker and oil seal |
| 2 | With oil seal and breaker |
| 3 | With breaker and no oil seal |

Note: currently 20-bit encoder motor only covers 200W, 400W and 750W single-circle absolute motors and 12/16-bit rotating transformer motors are not in the market.

# Servo motor parameters

## Motor specification

| Motor model | Rated power (kW) | Rated current(A) | Instan-taneous maximum currentA) | Rated torque(Nm) | Instan-taneous maximum torque(Nm) | Rated speed(rpm) | Highest speed(rpm) | Rotor inertia (Kg.cm$^2$) | Voltage |
|---|---|---|---|---|---|---|---|---|---|
| ML series small inertia | | | | | | | | | |
| SV-ML06-0R2G-2-□□□ | 0.2 | 1.5 | 4.5 | 0.64 | 1.92 | | | 0.21 | 220 |
| SV-ML06-0R4G-2-□□□ | 0.4 | 2.8 | 8.4 | 1.27 | 3.8 | 3000 | 6000 | 0.32 | 220 |
| SV-ML08-0R7G-2-□□□ | 0.75 | 4.5 | 13.5 | 2.4 | 7.2 | | | 1.26 | 220 |
| SV-ML08-1R0F-2-□□□ | 1.0 | 4.4 | 13.2 | 4.0 | 12.0 | 2500 | 3000 | 2.97 | 220 |
| MM series medium inertia | | | | | | | | | |
| SV-MM13-1R0E-2-□□□ | 1.0 | 4.8 | 14.4 | 4.77 | 14.3 | | | 6.3 | 220 |
| SV-MM13-1R5E-2-□□□ | 1.5 | 7.6 | 22.8 | 7.16 | 21.5 | 2000 | 3000 | 9.36 | 220 |
| SV-MM13-2R0E-2-□□□ | 2.0 | 9.5 | 28.5 | 9.55 | 28.6 | | | 12.16 | 220 |
| SV-MM13-3R0E-2-□□□ | 3.0 | 13.6 | 40.8 | 14.3 | 42 | | | 18.0 | 220 |
| SV-MM13-1R0F-2-□□□ | 1.0 | 5.0 | 15 | 5.0 | 15 | | | 8.5 | 220 |
| SV-MM13-1R5F-2-□□□ | 1.5 | 7.5 | 21.5 | 7.7 | 22 | 2500 | 3000 | 12.6 | 220 |
| SV-MM13-2R0F-2-□□□ | 2.0 | 10 | 30 | 10 | 30 | | | 15.3 | 220 |
| SV-MM13-1R0E-4-□□□ | 1.0 | 2.8 | 8.4 | 4.77 | 14.3 | | | 6.3 | 380 |
| SV-MM13-1R5E-4-□□□ | 1.5 | 4.5 | 13.5 | 7.16 | 21.5 | 2000 | 3000 | 9.36 | 380 |
| SV-MM13-2R0E-4-□□□ | 2.0 | 5.5 | 16.5 | 9.55 | 28.6 | | | 12.16 | 380 |
| SV-MM13-3R0E-4-□□□ | 3.0 | 7.8 | 23.4 | 14.3 | 42 | | | 18.0 | 380 |
| MH series high inertia | | | | | | | | | |
| SV-MH06-0R2-2-□□□ | 0.2 | 1.5 | 4.5 | 0.64 | 1.92 | | | 0.42 | 220 |
| SV-MH06-0R4-2-□□□ | 0.4 | 2.8 | 8.4 | 1.27 | 3.8 | 3000 | 6000 | 0.67 | 220 |
| SV-MH08-0R7-2-□□□ | 0.75 | 4.5 | 13.5 | 2.4 | 7.2 | | | 2.5 | 220 |
| SV-MH13-0R8B-2-□□□ | 0.85 | 5.5 | 15 | 5.41 | 16.2 | | | 14.6 | 220 |
| SV-MH13-1R3B-2-□□□ | 1.3 | 8.2 | 24.6 | 8.34 | 25.2 | 1500 | 2000 | 20.5 | 220 |
| SV-MH13-0R8B-4-□□□ | 0.85 | 3.2 | 9.6 | 5.41 | 16.2 | | | 14.6 | 380 |
| SV-MH13-1R3B-4-□□□ | 1.3 | 4.8 | 14.4 | 8.34 | 25.2 | | | 20.5 | 380 |
| MM series medium inertia | | | | | | | | | |
| SV-MM18-3R0B-4-□□□ | 3.0 | 7.5 | 18.75 | 19.0 | 47.0 | | | 38 | 380 |
| SV-MM18-4R4B-4-□□□ | 4.4 | 10.0 | 25.0 | 27.0 | 67.0 | 1500 | 2000 | 61 | 380 |
| SV-MM18-5R5B-4-□□□ | 5.5 | 12.0 | 30.0 | 35.0 | 70.0 | | | 86 | 380 |
| Insulation class | Class F(155℃) | | | | | | | | |
| Protection degree | IP65 | | | | | | | | |
| Environment | Temperature：-20℃~50℃（no ice）；Humidity：90%RH以下（no condensation） | | | | | | | | |

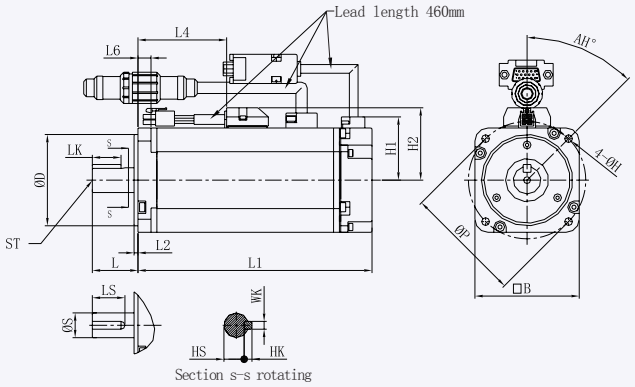
# Installation dimension

## Appearance and dimension of 60 bases (unit:mm)

Note: The motor structure may change to the different design. Please contact with the company to confirm the dimension before ordering.

200W, 400W ( Vn = 3000rpm, Vmax = 6000rpm )

| Motor model | Encoder | The flange dimensions(mm) | | | | | | | The shaft and key dimensions(mm) | | | | | | | L1 (mm) | L4 (mm) | H1 (mm) | H2 (mm) | ST (mm) | Quality (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D | L2 | L6 | P | H | AH | B | S | L | WK | HK | LK | HS | LS | | | | | | |
| SV-ML06-0R2G-2-1A0 | 2500-wire | $50^{+0}_{-0.025}$ | 3 | 6.5 | 70 | 5.5 | 45 | 60 | $14^{+0}_{-0.011}$ | 30 | 5 | 5 | 22.5 | 11 | 25 | 114.5 | 41 | 38.5 | 45.5 | M5 depth 10 | 1.4 |
| SV-MH06-0R2G-2-1A0 | | | | | | | | | | | | | | | | 120 | 46.5 | | | | 1.6 |
| SV-ML06-0R2G-2-1A2 | | | | | | | | | | | | | | | | 151.5 | 41 | | | | 1.6 |
| SV-ML06-0R4G-2-1A0 | | | | | | | | | | | | | | | | 138.5 | 65 | | | | 1.8 |
| SV-MH06-0R4G-2-1A0 | | | | | | | | | | | | | | | | 146.5 | 73 | | | | 2.0 |
| SV-ML06-0R4G-2-1A2 | | | | | | | | | | | | | | | | 175.5 | 65 | | | | 2.0 |
| SV-ML06-0R2G-2-4A0 | 17 /20-bit | | | | | | | | | | | | | | | 114.5 | 41 | | | | 1.4 |
| SV-ML06-0R2G-2-4A2 | | | | | | | | | | | | | | | | 151.5 | 41 | | | | 1.6 |
| SV-ML06-0R4G-2-4A0 | | | | | | | | | | | | | | | | 138.5 | 65 | | | | 1.8 |
| SV-MH06-0R4G-2-4A0 | | | | | | | | | | | | | | | | 146.5 | 73 | | | | 2.0 |
| SV-ML06-0R4G-2-4A2 | | | | | | | | | | | | | | | | 175.5 | 65 | | | | 2.0 |
| SV-ML06-0R4G-2-5A0 | | | | | | | | | | | | | | | | 138.5 | 65 | | | | 1.8 |
| SV-ML06-0R4G-2-5A2 | | | | | | | | | | | | | | | | 175.5 | 65 | | | | 2.0 |

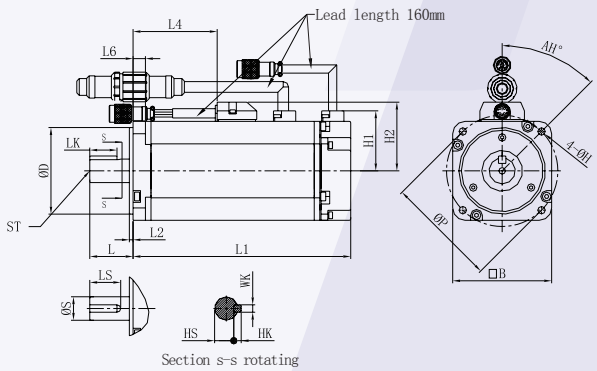


Section s-s rotating

## Appearance and dimension of 60 bases (unit:mm)

750W ( Vn = 3000rpm, Vmax = 6000rpm ) 1.0kW ( Vn = 2500rpm, Vmax = 3000rpm )

| Motor model | Encoder | The flange dimensions(mm) | | | | | | | The shaft and key dimensions(mm) | | | | | | | L1 (mm) | L4 (mm) | H1 (mm) | H2 (mm) | ST (mm) | Quality(kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D | L2 | L6 | P | H | AH | B | S | L | WK | HK | LK | HS | LS | | | | | | |
| SV-ML08-0R7G-2-1A0 | 2500-wire | $70^{+0}_{-0.03}$ | 3 | 10 | 90 | 7 | 45 | 80 | $19^{+0}_{-0.013}$ | 35 | 6 | 6 | 22 | 15.5 | 25 | 140 | 68 | 48.5 | 55.5 | M5 depth 10 | 3.0 |
| SV-MH08-0R7G-2-1A0 | | | | | | | | | | | | | | | | 151 | 79 | | | | 3.3 |
| SV-ML08-0R7G-2-1A2 | | | | | | | | | | | | | | | | 186.5 | 68 | | | | 3.5 |
| SV-ML08-0R7G-2-4A0 | 17 /20-bit | | | | | | | | | | | | | | | 140 | 68 | | | | 3.0 |
| SV-ML08-0R7G-2-5A0 | | | | | | | | | | | | | | | | 140 | 68 | | | | 3.0 |
| SV-ML08-0R7G-2-4A2 | | | | | | | | | | | | | | | | 186.5 | 68 | | | | 3.5 |
| SV-ML08-0R7G-2-5A2 | | | | | | | | | | | | | | | | 186.5 | 68 | | | | 3.5 |
| SV-ML08-1R0F-2-1A0 | 2500-wire | | 3 | 8 | 90 | 6 | 45 | 80.4 | | 35 | 6 | 6 | 22 | 15.5 | 25 | 191 | / | 49.5 | 49.8 | M5 depth 22 | 4.1 |
| SV-ML08-1R0F-2-1A2 | | | | | | | | | | | | | | | | 231 | / | | | | 5.1 |



Section s-s rotating

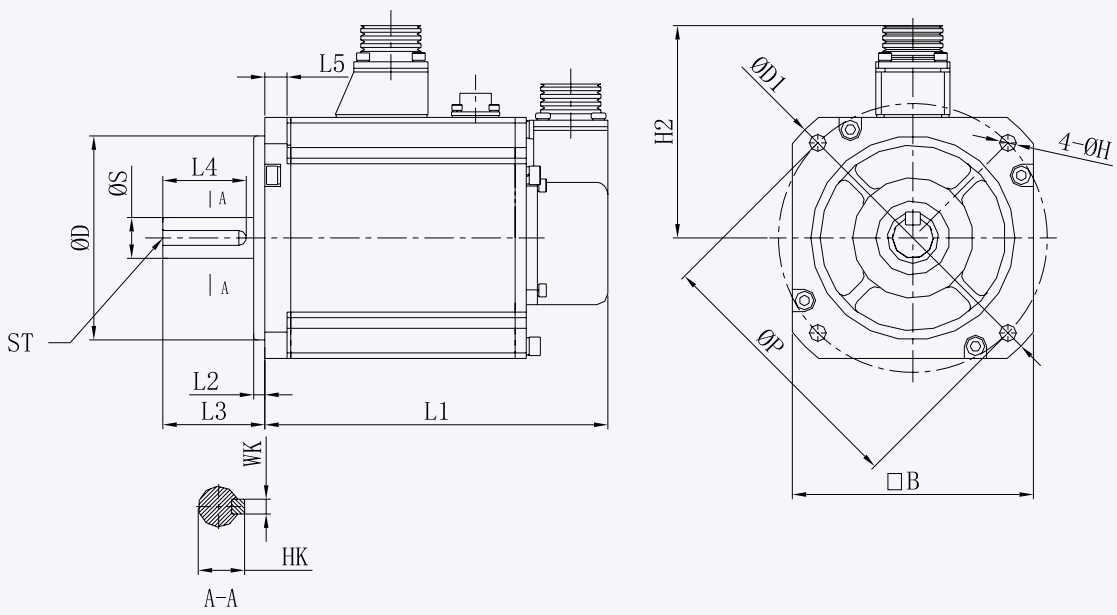
# Installation dimension

## 130/180机座电机外形尺寸(单位:mm)

130series：1.0kW、1.5kW、2.0kW、3kW ( Vn = 2000/2500rpm, Vmax = 3000rpm )
850W、1.3kW ( Vn = 1500rpm, Vmax = 2000rpm )
180series：3.0W, 4.4kW, 5.5kW ( Vn = 1500rpm, Vmax = 2000rpm )

Note: The motor structure may change to the different design. Please contact with the company to confirm the dimension before ordering.

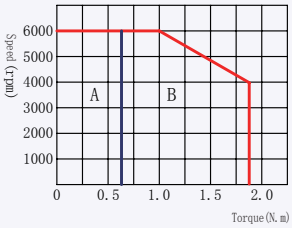
| Motor model | Dimension table | | | | | | | | | | | | | | Quality (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L2 | L3 | L4 | L5 | S | WK | HK | B | D1 | P | H | H2 | ST | |
| SV-MM13-1R0E-□-□A0 | 110h7 | 143 | 6 | 55 | 45 | 12 | 22h7 | 6h9 | 24.5 | 130 | 165 | 145 | 9 | 114.5 | M6 depth 22 | 3.0 |
| SV-MM13-1R0E-□-□A2 | | 185 | | | | | | | | | | | | | | 3.3 |
| SV-MM13-1R5E-□-□A0 | | 159 | | | | | | | | | | | | | | 3.5 |
| SV-MM13-1R5E-□-□A2 | | 201 | | | | | | | | | | | | | | 3.0 |
| SV-MM13-2R0E-□-□A0 | | 175 | | | | | | | | | | | | | | 3.0 |
| SV-MM13-2R0E-□-□A2 | | 217 | | | | | | | | | | | | | | 3.5 |
| SV-MM13-3R0E-□-□A0 | | 207 | | | | | | | | | | | | | | 3.5 |
| SV-MM13-3R0E-□-□A2 | | 249 | | | | | | | | | | | | | | 4.1 |
| SV-MH13-0R8B-□-□A0 | | 167 | | | | | | | | | | | | | | 5.1 |
| SV-MH13-0R8B-□-□A2 | | 209 | | | | | | | | | | | | | | |
| SV-MH13-1R3B-□-□A0 | | 202 | | | | | | | | | | | | | | |
| SV-MH13-1R3B-□-□A2 | | 244 | | | | | | | | | | | | | | |
| SV-MM13-1R0F-2-□A0 | | 166 | | | | | | | | | | | | | | |
| SV-MM13-1R0F-2-□A2 | | 223 | | | | | | | | | | | | | | |
| SV-MM13-1R5F-2-□A0 | | 179 | | | | | | | | | | | | | | |
| SV-MM13-1R5F-2-□A2 | | 236 | | | | | | | | | | | | | | |
| SV-MM13-2R0F-2-□A0 | | 192 | | | | | | | | | | | | | | |
| SV-MM13-2R0F-2-□A2 | | 249 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| SV-MM18-3R0B-4-□A0 | 114.3h7 | 232 | 3.2 | 65 | 54 | 18 | 35h7 | 10h9 | 38 | 180.5 | 233 | 200 | 13.5 | 138.5 | | 20.5 |
| SV-MM18-3R0B-4-□A2 | | 304 | | | | | | | | | | | | | | 22.5 |
| SV-MM18-4R4B-4-□A0 | | 262 | | | | | | | | | | | | | | 25.5 |
| SV-MM18-4R4B-4-□A2 | | 334 | | | | | | | | | | | | | | 27.5 |
| SV-MM18-5R5B-4-□A0 | | 292 | | | | | | | | | | | | | | 30.5 |
| SV-MM18-5R5B-4-□A2 | | 364 | | | | | | | | | | | | | | 32.5 |



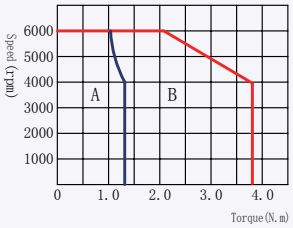
# Motor torque-speed

## 60/80 base (small inertia)

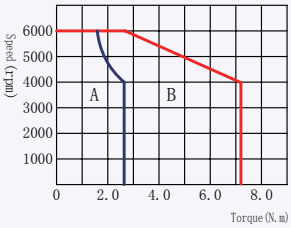
SV-MM06-0R2G-2-□□□



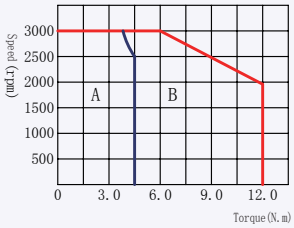

SV-MM06-0R4G-2-□□□




SV-MM08-0R7G-2-□□□

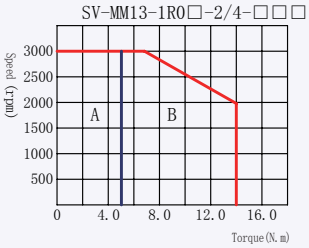



SV-MM08-1R0F-2-□□□

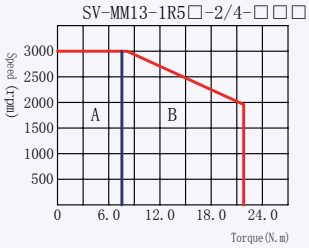



## 130 base (medium inertia)

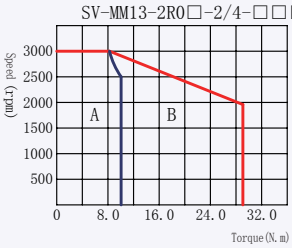
SV-MM13-1R0□-2/4-□□□



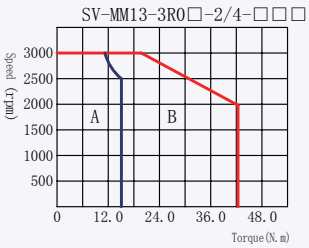

SV-MM13-1R5□-2/4-□□□




SV-MM13-2R0□-2/4-□□□

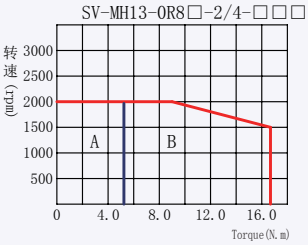



SV-MM13-3R0□-2/4-□□□

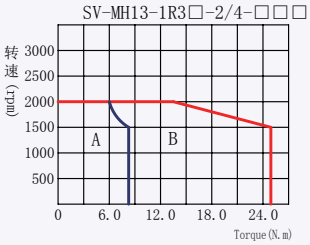



## 130 base (high inertia)

SV-MH13-0R8□-2/4-□□□

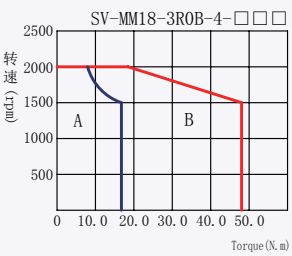



SV-MH13-1R3□-2/4-□□□



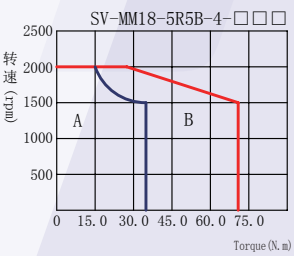

## 180 base (medium inertia)

SV-MM18-3R0B-4-□□□




SV-MM18-4R4B-4-□□□


SV-MM18-5R5B-4-□□□



# Cable model

## Power cable

**DA ML–075–03–A B F**

① ② ③ ④ ⑤ ⑥ ⑦

## Power cable accessories

**DA ML–A B**

① ② ⑤ ⑥

① 

| Sign | Series |
|---|---|
| DA | Manufacturer |

② 

| Sign | Cable type |
|---|---|
| ML | Power cable |

③ 

| Sign | Coil diameter |
|---|---|
| 075 | 0.75mm² |
| 100 | 1.0mm² |
| 150 | 1.5mm² |
| 250 | 2.5mm² |

④ 

| Sign | Cable length |
|---|---|
| 03 | 3m |
| 05 | 5m |
| 10 | 10m |
| 15 | 15m |

⑤ 

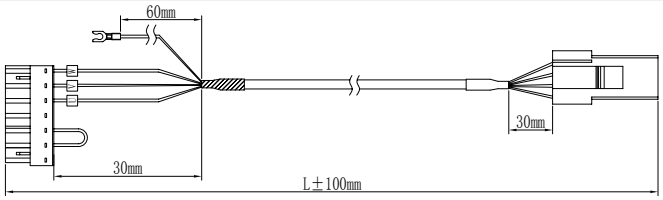
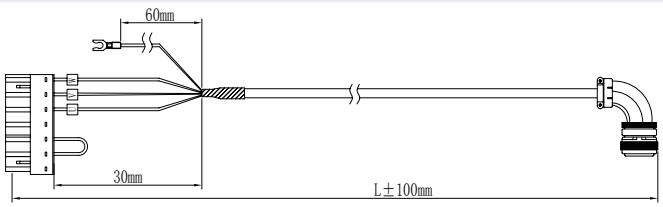
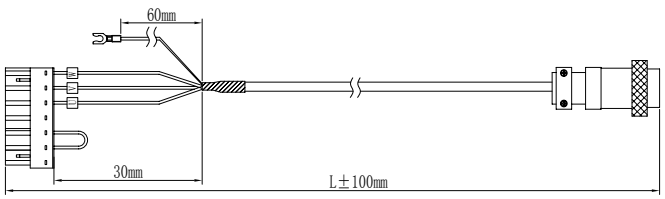
| Sign | Pin for motors |
|---|---|
| A | 4PIN plastic pin |
| B | 4PIN general aviation pin YD28 |
| C | 4PIN metal pin |

⑥ 

| Sign | Pin for drives |
|---|---|
| B | European 7PIN 20A pin |
| W | No pin |

⑦ 

| Sign | Cable materials |
|---|---|
| Null | Standard cables |
| F | Flexible tray cables |

| Encoder cable | Cable appearance |
|---|---|
| DAML-□□□-□□-AB□ |  |
| DAML-□□□-□□-BB□ |  |
| DAML-□□□-□□-CB□ |  |

# Cable model

## Cable core

**DB EL–15–03–A F**

① ② ③ ④ ⑤ ⑥

## Encoder cable

**DB EL–A A**

① ② ⑦ ⑤

① 

| Sign | Series |
|---|---|
| DB | Manufacturer |

② 

| Sign | Cable type |
|---|---|
| EL | Encoder cable |

③ 

| Sign | Cable core |
|---|---|
| 06 | 6-core cable |
| 09 | 9-core cable |
| 15 | 15-core cable |

④ 

| Sign | Cable length |
|---|---|
| 03 | 3m |
| 05 | 5m |
| 10 | 10m |
| 15 | 15m |

⑤ 

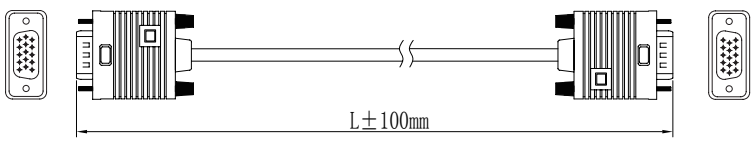
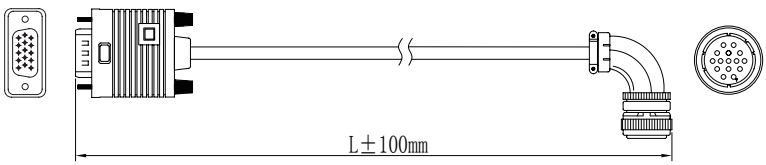
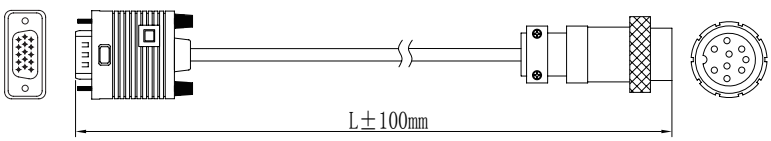
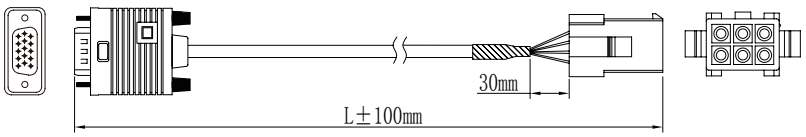
| Sign | Pin for motors |
|---|---|
| A | 15pin DB pin |
| B | 15PIN general aviation pin YD28 |
| C | 9PIN metal pin |
| D | 6PIN plastic pin |

⑥ 

| Sign | Cable materials |
|---|---|
| Null | Standard cables |
| D | with battery |
| F | Flexible tray cables |
| H | with battery flexible cables |

⑦ 

| Sign | Pin for drives |
|---|---|
| A | 15pin DB pin |

| Encoder cable | Cable appearance |
|---|---|
| DBEL-□□-□□-A□ |   |
| DBEL-□□-□□-B□ |   |
| DBEL-□□-□□-C□ |   |
| DBEL-□□-□□-D□ |   |

# Ordering instruction

| Voltage | Power | Servo motor | Available drive | Power cable Encoder cable | Plug fittings |
|---|---|---|---|---|---|
| 220V | 200W | SV-ML06-0R2G-2-□□□ | SV-DA200-0R2-2-□ | DAML-075-□□-□B□<br>DBEL-□□-□□-□□ | DAML-□B<br>DBEL-A□ |
| | 400W | SV-ML06-0R4G-2-□□□ | SV-DA200-0R4-2-□ | | |
| | 750W | SV-ML08-0R7G-2-□□□ | SV-DA200-0R7-2-□ | | |
| | 1.0kW | SV-ML08-1R0F-2-□□□ | | | |
| | 850W | SV-MH13-0R8B-2-□□□ | SV-DA200-1R0-2-□ | DAML-150-□□-BB□<br>DBEL-□□-□□-B□ | DAML-BB<br>DBEL-AB |
| | 1.0kW | SV-MM13-1R0E-2-□□□ | | | |
| | | SV-MM13-1R0F-2-□□□ | | | |
| | 1.3kW | SV-MH13-1R3B-2-□□□ | SV-DA200-2R0-2-□ | | |
| | 1.5kW | SV-MM13-1R5E-2-□□□ | SV-DA200-1R5-2-□ | | |
| | | SV-MM13-1R5F-2-□□□ | | | |
| | 2.0kW | SV-MM13-2R0E-2-□□□ | SV-DA200-2R0-2-□ | DBML-250-□□-BW□<br>DBEL-□□-□□-B□ | DBML-BW<br>DBEL-AB |
| | | SV-MM13-2R0F-2-□□□ | | | |
| | 3.0kW | SV-MM13-3R0B-2-□□□ | SV-DA200-3R0-2-□ | | |
| | 4.4 kW | SV-MM13-4R4B-2-□□□ | SV-DA200-4R4-2-□ | | |
| 400V | 850W | SV-MH13-0R8B-4-□□□ | SV-DA200-1R0-4-□ | DAML-150-□□-BB□<br>DBEL-□□-□□-B□ | DAML-BB<br>DBEL-AB |
| | 1.0kW | SV-MM13-1R0E-4-□□□ | | | |
| | 1.3kW | SV-MH13-1R3B-4-□□□ | SV-DA200-2R0-4-□ | | |
| | 1.5kW | SV-MM13-1R5E-4-□□□ | SV-DA200-1R5-4-□ | | |
| | 2.0kW | SV-MM13-2R0E-4-□□□ | SV-DA200-2R0-4-□ | | |
| | 3.0kW | SV-MM18-3R0B-4-□□□ | SV-DA200-3R0-4-□ | | |
| | 4.4kW | SV-MM18-4R4B-4-□□□ | SV-DA200-4R4-4-□ | DBML-250-□□-BW□<br>DBEL-□□-□□-B□ | DBML-BW<br>DBEL-AB |
| | 5.5kW | SV-MM18-5R5B-4-□□□ | SV-DA200-5R5-4-□ | | |

Ordering instruction: 1. There are two kinds of cable selection: to purchase the standard configured cable or to make the cable;
2. Select the cable length to the actual need; the standard length is 3m, 5m, 10m and 15m
3. Please contact with the local supplier for more motor information

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