



BRUSHLESS MOTOR DRIVE

SE-200
User manual

SE-200

BLDC Motor driver

■ Brief introduction

SE-200 is newly designed by ICAN-Tech and mainly for BLDC motors of 24~48v around 300w. It has speed display panel and rich speed regulation modes.

- Peak current setting
- Input voltage: DC24V~48V
- PID open/closed loop setting
- Motor pole-pairs selection
- Perfect protection and alarm display
- Acc/Dcc time setting
- Analog voltage speed control
- External potentiometer speed control
- External analog signal speed control
- PWM speed control

■ Electrical properties and environmental indicators

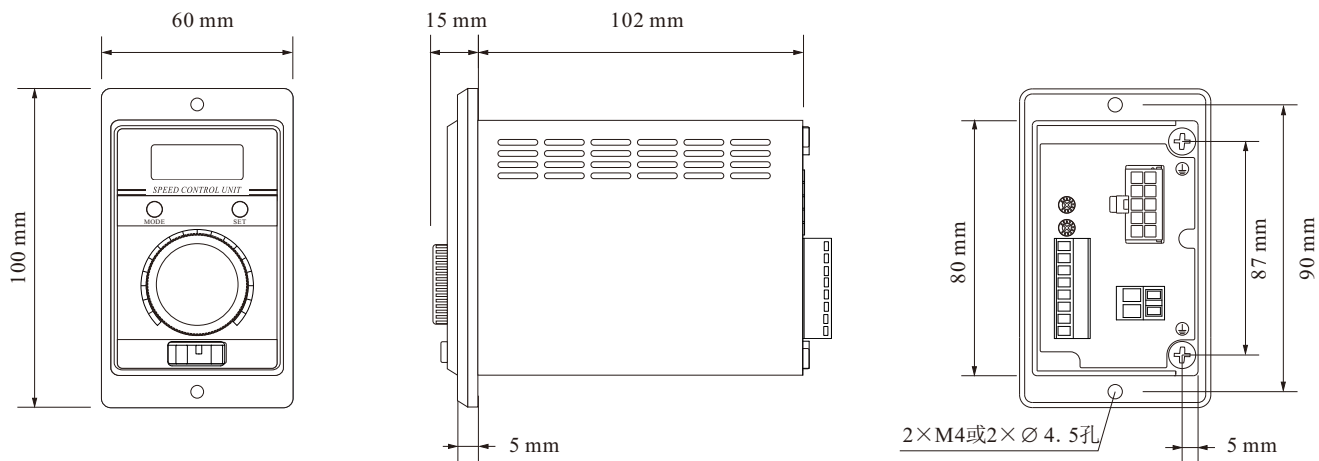
● Electrical properties

Driver parameter	Min Value	Typical Value	Max Value	Unit
Voltage input	15	24	48	VDC
Current output	-	5	7	A
Over voltage	-	-	59	VDC
Under voltage	15	-	-	VDC
Input signal voltage	-	-	5	VDC
Input analog voltage	-	-	5	VDC
Speed control range	-	-	4000	RPM

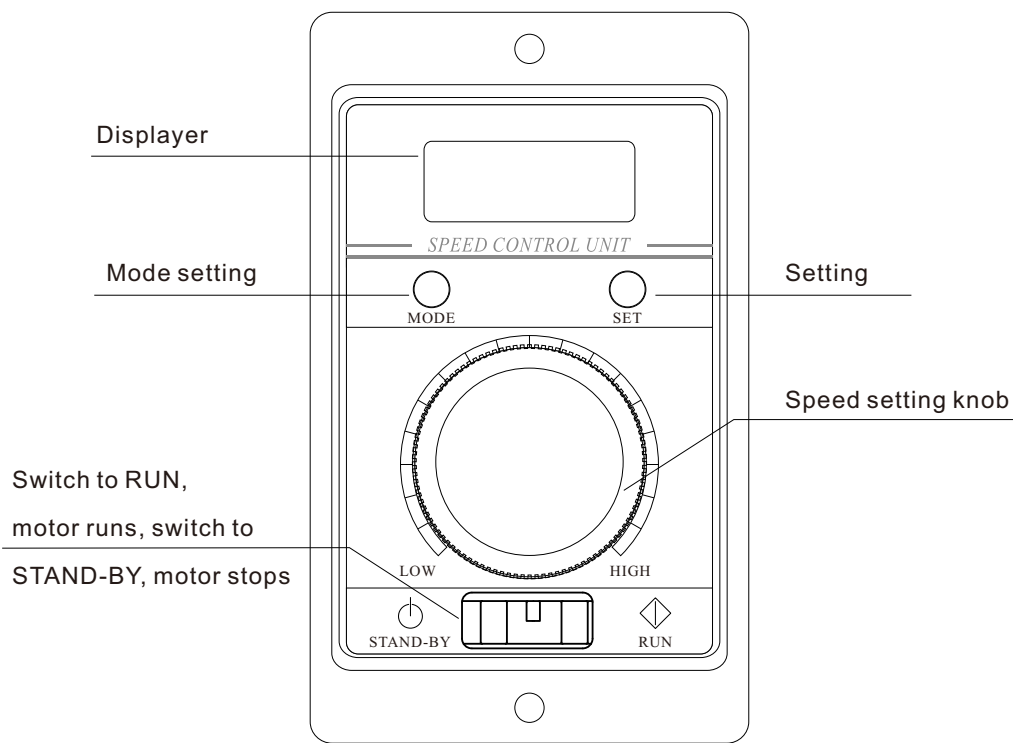
● Environmental indicators

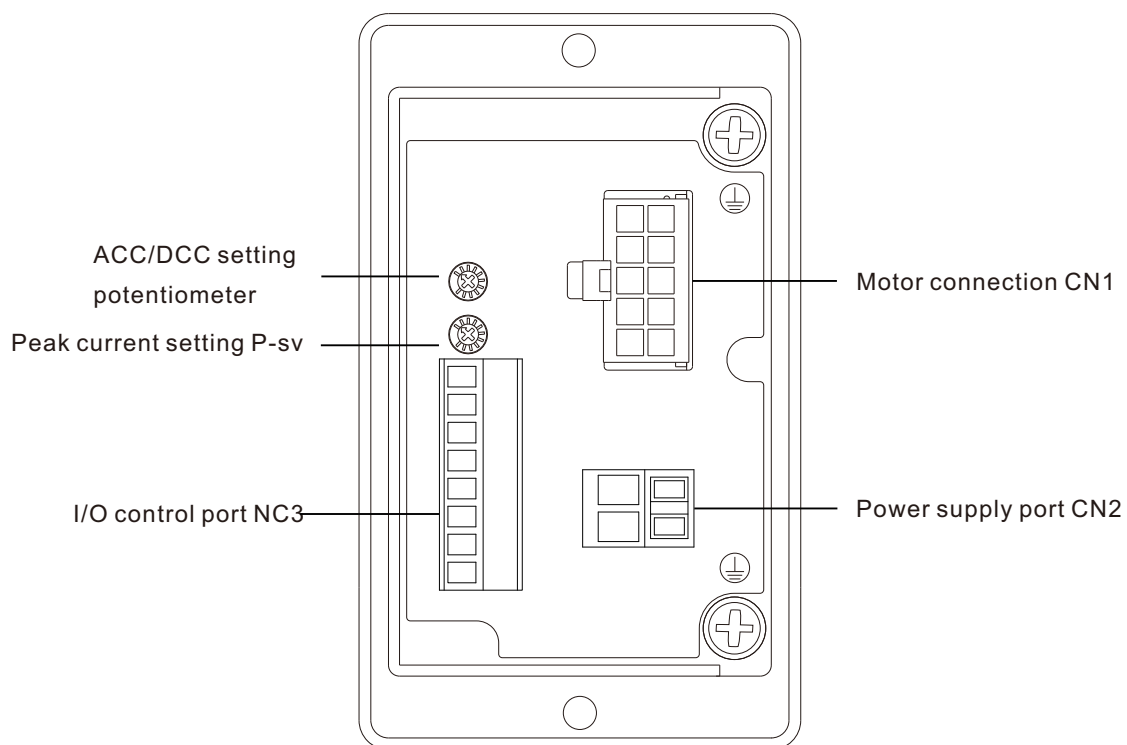
Heat Sinking Method	Natural cooling or fan-forced cooling
Atmosphere	Avoid dust, oily mist and corrosive air
Operating Temperature	0~40℃
Ambient Humidity	90% or less (non-condensing)
Storage Temperature	0~70℃
Vibration Resistance	5.9m/S ² maximum

■ Dimension (Units: mm)



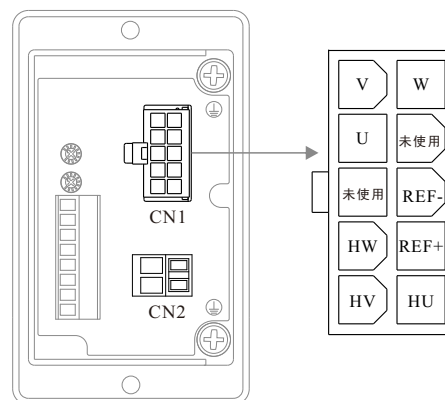
■ Motor driver interface





● Motor connection CN1

V	Motor line V phase
U	Motor line U phase
HW	Hall sensor signal Hw
HV	Hall sensor signal Hv
W	Motor line W phase
REF-	Hall sensor negative electrode
REF+	Hall sensor signal power supply+
HU	Hall sensor signal Hu

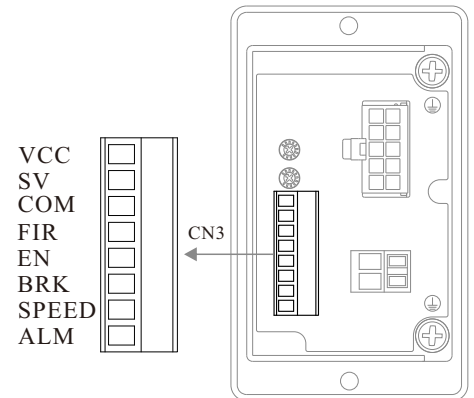


● Power supply port CN2

DC+	Power supply+(24v~48v)
DC-	Power supply-

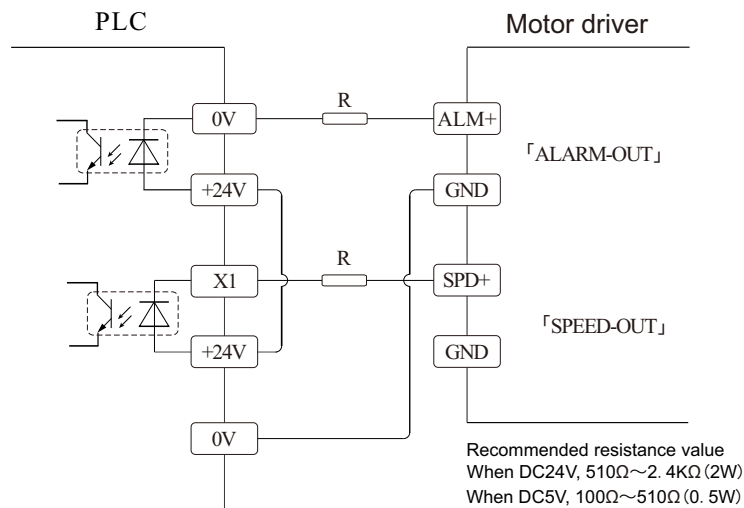
I/O control port NC3

VCC	External potentiometer power input (+5V)
SV	Speed control signal input or external potentiometer middle line connection
COM	Common port (0V reference level)
FIR	Motor direction control terminal and effective when connecting with COM
EN	Motor stop control terminal and effective when disconnection with COM
BRK	Motor brake stop control signal and effective when disconnection with COM
SPD	Open drain output frequency. Speed can be figured out according: $N \text{ (rpm)} = (F/P) \times 60/3$ F: Output pulse frequency (Hz) ; P: Motor pole pairs; N: Motor speed; For example: Motor has 4 pole pairs, output pulse width is 50ms, $F=1\text{sec}/50\text{ms}=20\text{Hz}$ $N \text{ (rpm)} = (20/4) \times 60/3=100$
ALM	Alarm output terminal and open drain output. It would be high level when alarm and low level when no alarm.



Output signal connection

PLC checking output signal



Function setting

Driver Start

Connect motor, driver and power supply, adjust the speed knob to limit position counterclockwise and switch the running switch to "STAND-BY".

Turn on the power, motor is in standby mode and displays "HOLD". Switch running switch to "RUN", adjust the speed knob clockwise. The display shows the motor speed.

Motor pole-pairs selection

When motor driver runs normally, set the Speed Knob to limit position counterclockwise, the displayer display "0". Long press "MODE" over 3s, the drivers goes to poles setting mode, customers can select by pressing "SET"(options are 4, 5, 6, 7, 8, 9, 10, 1, 2, 3, 4,). 4 pairs of poles are default setting. Press "MODE" to confirm and go to PID modes selection.

PID open/closed loop controlling mode

When poles setting is finished, it goes to PID settings automatically. Press "SET" to select PID open/closed loop modes. "d0" is for open loop mode(default) and "d1" is for closed loop. Press "MOOD" to confirm and the driver goes to standby mode.

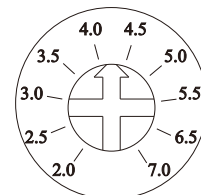
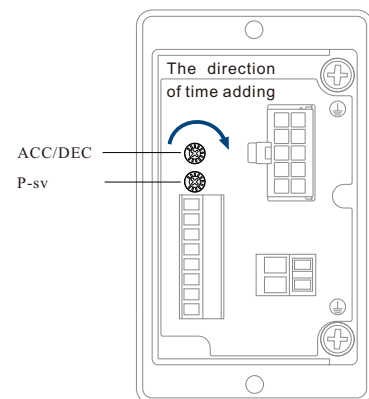
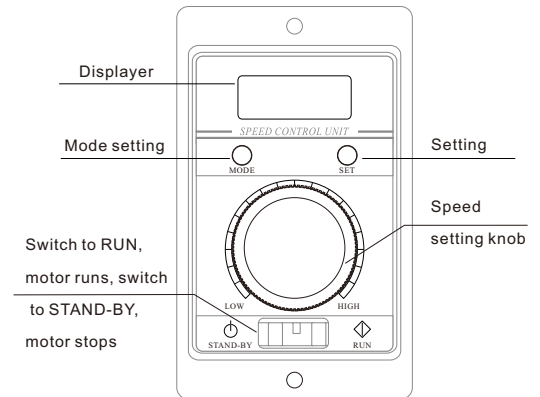
ACC/DCC time setting

Set acceleration time and deceleration time by ACC/DED, range is 0.3-15s. Acceleration time is time needed from 0 to rated speed. Deceleration time is time needed from rated speed to 0.

Peak current setting

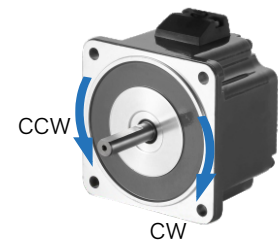
Use P-sv to set the output peak current. When load is increased suddenly, the output current could be limited by the setting value, which reduces motor speed and protects the motor. Current setting ranges: 2~7A. Please set as the right.

As the admissible error between real current and setting value is $\pm 10\%$, to ensure safety, set current lower accordingly.



● Direction control

FIR and COM disconnects, motor runs CW.
FIR and COM connects, motor runs CCW.



● Motor starts and stops

EN and COM connects, motor runs.
EN and COM disconnects, motor naturally tops.

● Brake

BRK and COM connects, motor runs.
BRK and COM disconnects, motor brake stops.



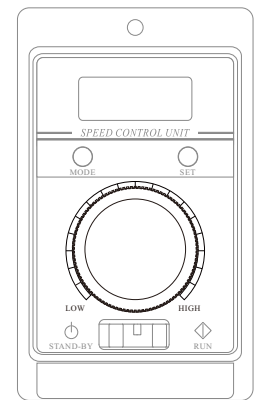
Notice: Differences between EN and BRK

1. EN is for stop naturally, BRK is for stop suddenly.
2. EN and BRK have the same startup state
3. When one of the modes are used, another mode must be set as default setting.

■ Speed setting methods and settings

● Speed knob

Rotate speed knob CW, motor speed increases;
rotate speed knob CCW, motor speed decreases.

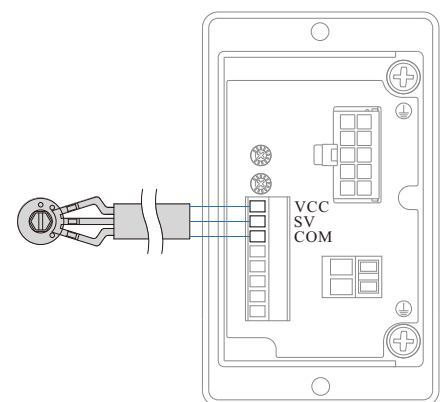


● Speed setting via external potentiometer

Use a suitable potentiometer with a resistance value of 10KΩ; the middle terminal connects to SV; the other two terminals connect to VCC and COM.

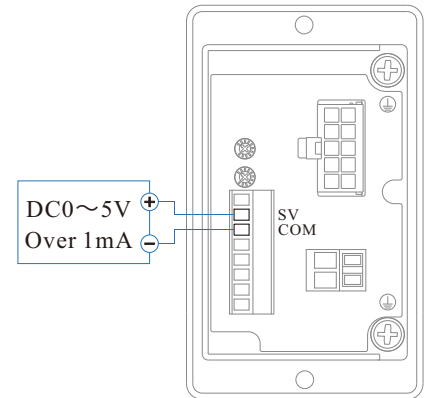


Speed knob should be rotated CCW to limit position when external potentiometer is used.

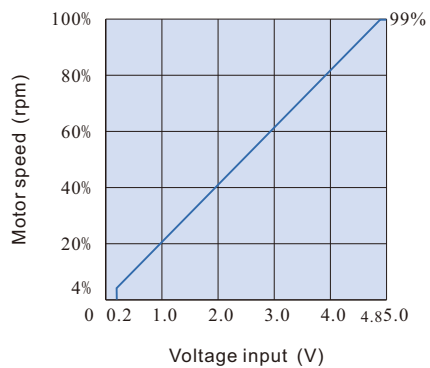


● Speed setting via external analog signal 0~5V

Adjust speed knob CCW to limit position when external analog signal is used.

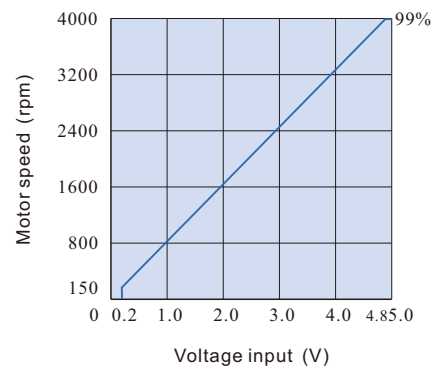


Relational graph between the analog signal voltage and motor speed (open-loop no-load)



When the voltage is 0.2VDC, the motor speed reaches 4% of fastest speed; when the voltage is 4.8 VDC, the motor speed reaches maximum value, which depends on the motor specification and power voltage.

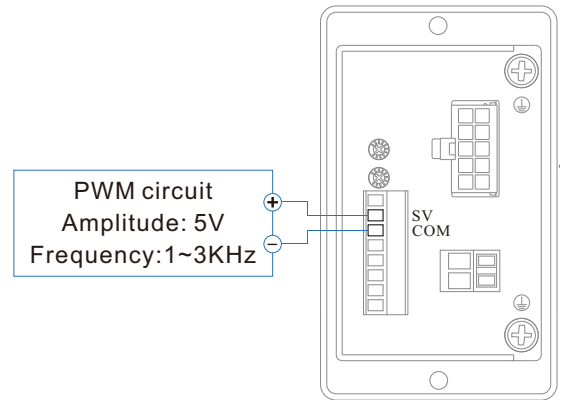
Relational graph between the analog signal voltage and motor speed (closed-loop no-load)



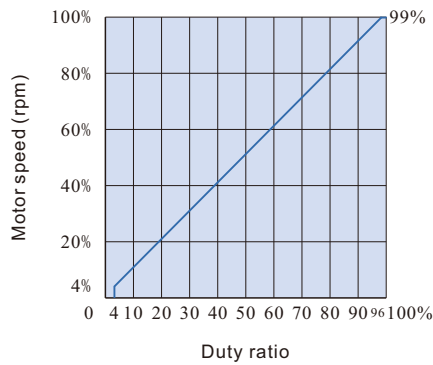
When the voltage is 0.2VDC, the motor speed would be 150rpm; when the voltage is 4.8 VDC, the motor speed reaches 4000rpm.

● PWM speed setting

Speed knob should be rotated CCW to limit position when PWM speed setting mode is used.

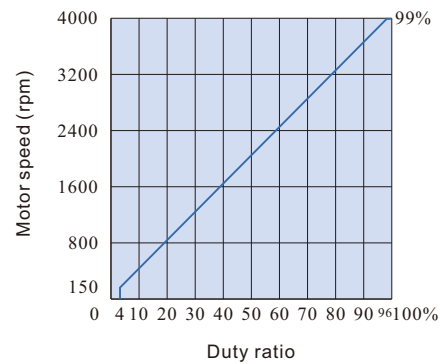


Relational graph between duty ratio and the motor speed (open loop no load)



When duty ratio of pulse is 4%, motor speed is 4% of max speed, when duty ratio is 96%, motor reaches max speed. The max speed also depends on the motor specification and power voltage.

Relational graph between duty ratio and the motor speed (closed loop no load)



When duty ratio of pulse is 4%, motor speed is 150rpm, when duty ratio is 96%, motor reaches max speed 4000rpm.

■ Alarm

Error code	Status	Reasons	Solutions
AL01	Motor run-away	Motor is out of control.	Check if there is interference source around motor hall.
AL02	Over voltage	Power supply is 130% higher than rated value.	Check power supply. Reduce the load or extend the acceleration and deceleration time.
AL03	Over temperature	The inner temperature of driver is over 75 degree.	Reduce ambient temperature or improve ventilation conditions.
AL04	Over current	Short circuit to GND.	Make sure wires between driver and motor are well.
AL05	Under voltage	Power supply is 60% lower than rated value.	Check power supply.
AL06	Hall error alarm	Hall wires are not connected well.	Check the connection wires between motor and driver.
AL07	Locked-rotor	External load becomes large suddenly and motor steps.	Check the load.
AL08	More than two errors	Mainly for hall error or locked-rotor.	Set P-sv to the largest value.

● Troubleshooting

Cut off the power and after 1 minute to turn on the power to release breakdown. When alarm protection is set up, please troubleshoot the cause and start again.

■ Trouble shooting and solution

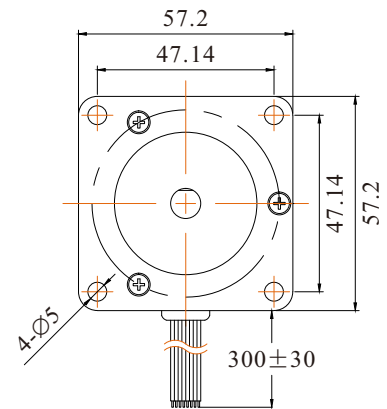
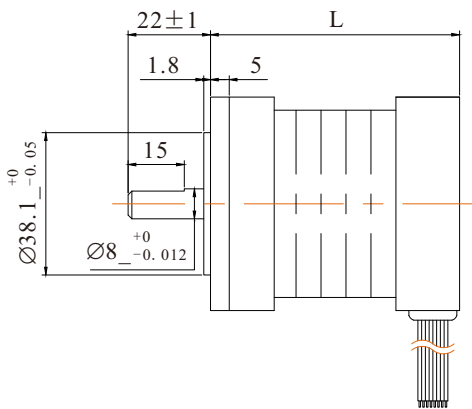
Situation	Possible reasons	Solutions
Motor stops	Power supply is not right	Ensure the power supply connection
	Alarm protection starts	Check the causes for alarm protection.
Motor runs in opposite direction of setting	An opposite direction of reducer is used	Set the motor to opposite direction.
Motor doesn't run stably	The motor output shaft is not aligned with the load axis	Make sure the motor is connected well with load.
	It is disturbed	When interference is confirmed, please: Isolate the source of interference Adjust the wiring Change the signal cable to shielded cable Install the ferrite core

Matched motor

The following recommended motors are matched with BLD-70. They have stable speed, large torque, low noise and low vibration.

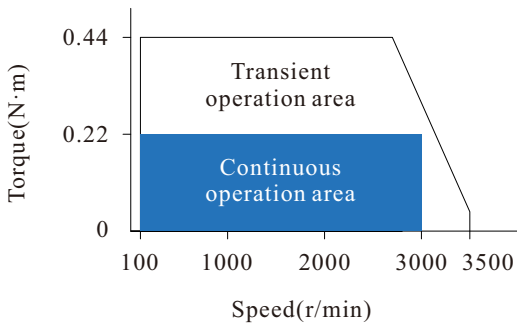
57mm*57mm round BLDC Motor

Model	Output power(W)	Voltage(VDC)	Rated speed(RPM)	Rated torque(Nm)	Motor length(mm)
57BLY-0730NBB	69	24	3000	0.22	66.5
57BLY-1030NBB	103	24	3000	0.33	88
57BLY-1230NBB	125	24	3000	0.44	106

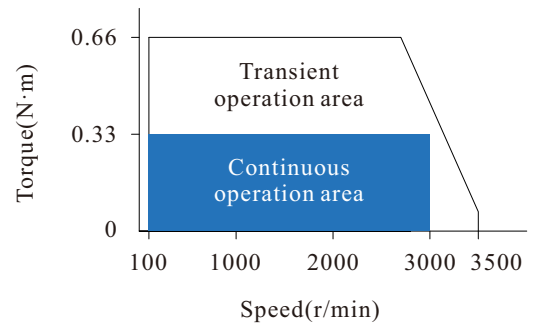


Troubleshooting

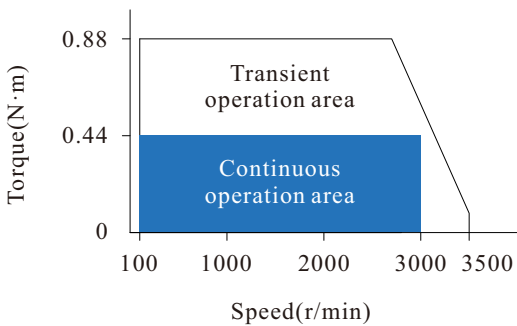
57BLY-0730NBB



57BLY-1030NBB

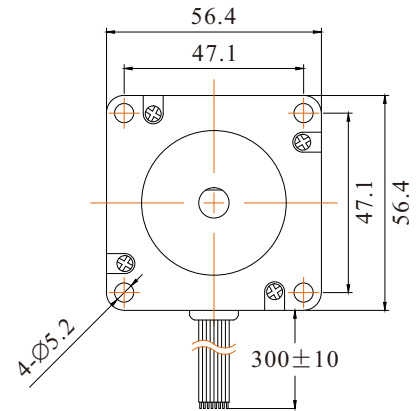
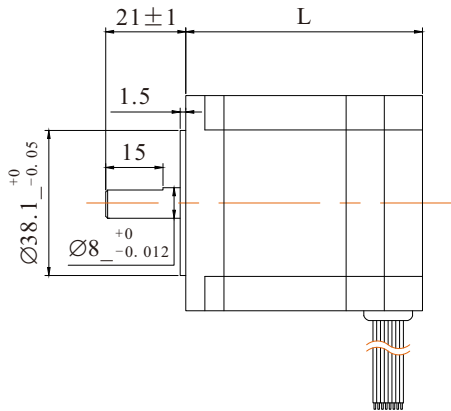


57BLY-1230NBB



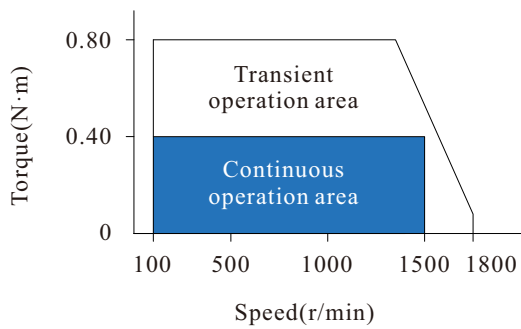
● 57mm*57mm square BLDC motor

Model	Output power(W)	Voltage(VDC)	Rated speed(RPM)	Rated torque(Nm)	Motor length(mm)
57BLF-0615NBB	65	24	1500	0.4	80
57BLF-1230NBB	125	24	3000	0.4	80
57BLF-1830NBB	188	24	3000	0.6	101

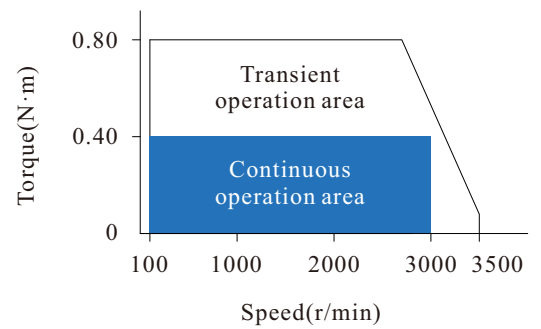


● Troubleshooting

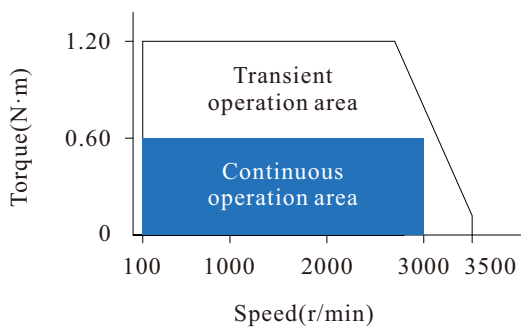
57BLF-0615NBB



57BLF-1230NBB



57BLF-1830NBB



After sale service

Warranty period

Dongguan ICAN Technology provides warranty for 1 year from the date of shipping.

Maintenance process

- 1) Get the maintenance permission
- 2) Ship the package to the following address: 4/F, Block B, RuiLian Zhenxing Industrial Park,
Wanjiang District, Dongguan City, Guangdong Province
Tel: 86-0769-22327568

Return policy

1. After use or man-made damage condition (etc, wrong wiring), no return
2. ICAN Technology guarantees the product quality, but product incompatibility is not in the return or maintain condition.
3. Customers don't use the products under the specified electrical performance and environment indicators, no maintain condition.



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