

■ Features

3-phase power brushless DC motor

- High power (high-speed and agile operation), high efficiency.
- Compatible with industry standard $\Phi 27$ stepper and mounting dimensions.
- Easily position-controllable when used in combination with the control IC W2RF018WF.

■ Applications

- Amusement equipment

■ Model Number Legend

W2SHM - 1

(1) (2)(3) (4)

- (1) Motor series
 (2) Medium-sized brushless DC motor
 (3) Oil-impregnated metal bearing <M>
 (4) Specification revision number



■ Specifications

<Motor section> * Values with OMRON circuit, at ambient temperature 20°C, motor voltage 12V, and hall voltage 5V
 motor voltage 12V, and hall voltage 5V

Item	Conditions	Ratings / Performance
Rated voltage	-	12 VDC $\pm 10\%$
Rated load torque	-	10 mNm
Rated load rotation speed	Rated load	3,500 rpm or more
Rated load current	Rated load	900 mA or less
No-load rotation speed	No load	4,400 rpm or more
No-load current	No load	220 mA or less
Starting current	Two-point method with no load and rated load	3,500 mA or less
Starting torque	Two-point method with no load and rated load	35 mNm or more
Resistance between terminals	Between U-V, V-W, W-U phases	3.1 $\Omega \pm 10\%$

<Hall IC section>

Item	Conditions	Ratings / Performance
Rated voltage	-	5 VDC $\pm 10\%$
Pulse count	Per motor shaft rotation	36
Current consumption	Total of 3 pieces	30 mA or less

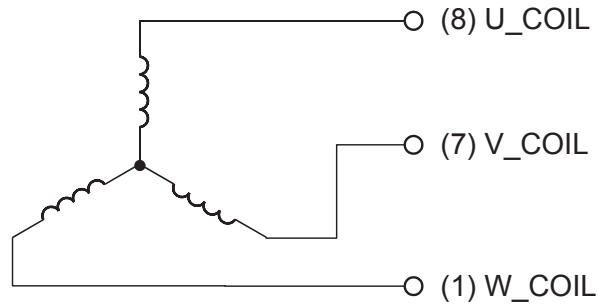
<Common>

Item	Ratings / Performance
Ambient temperature	Operating: 0 to 50°C (with no icing or condensation) Storage: -10 to 60°C (with no icing or condensation)
Ambient humidity	25 to 85% RH

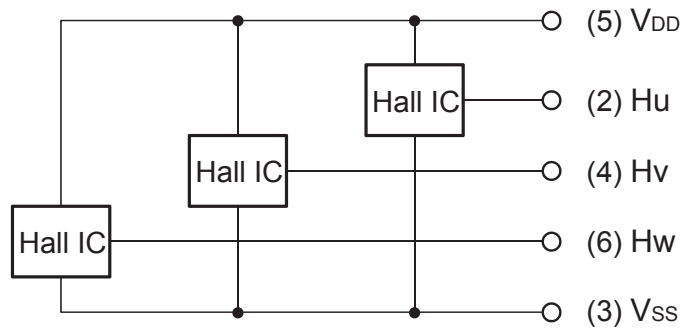
W2SHM-1

Internal Connection Diagram

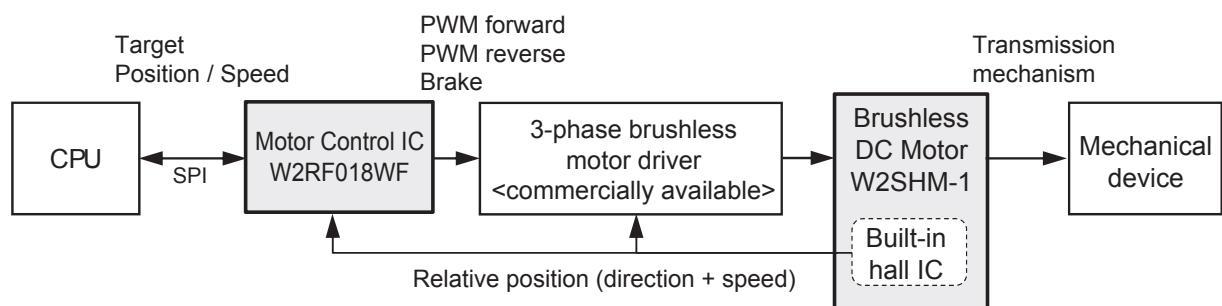
- Motor windings



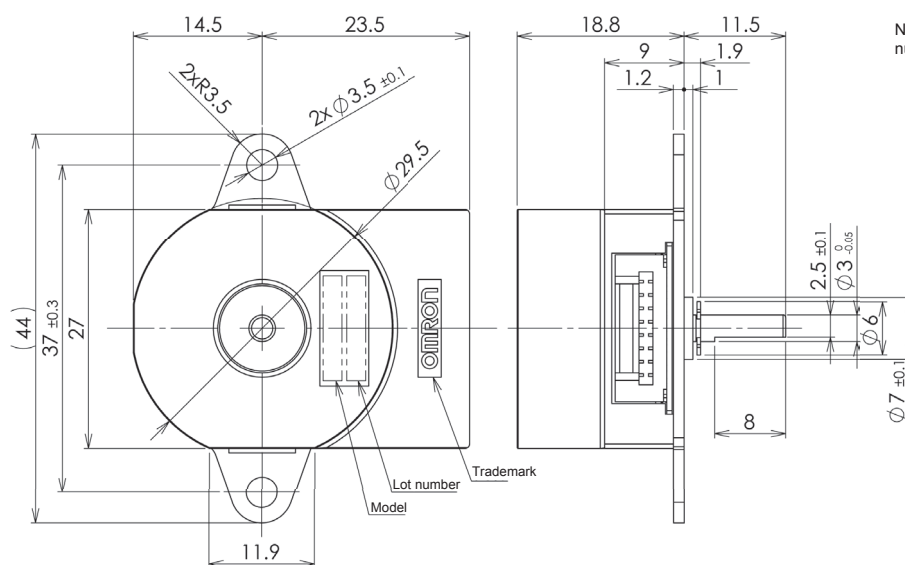
- Hall IC



System Block Diagram



External Dimensions

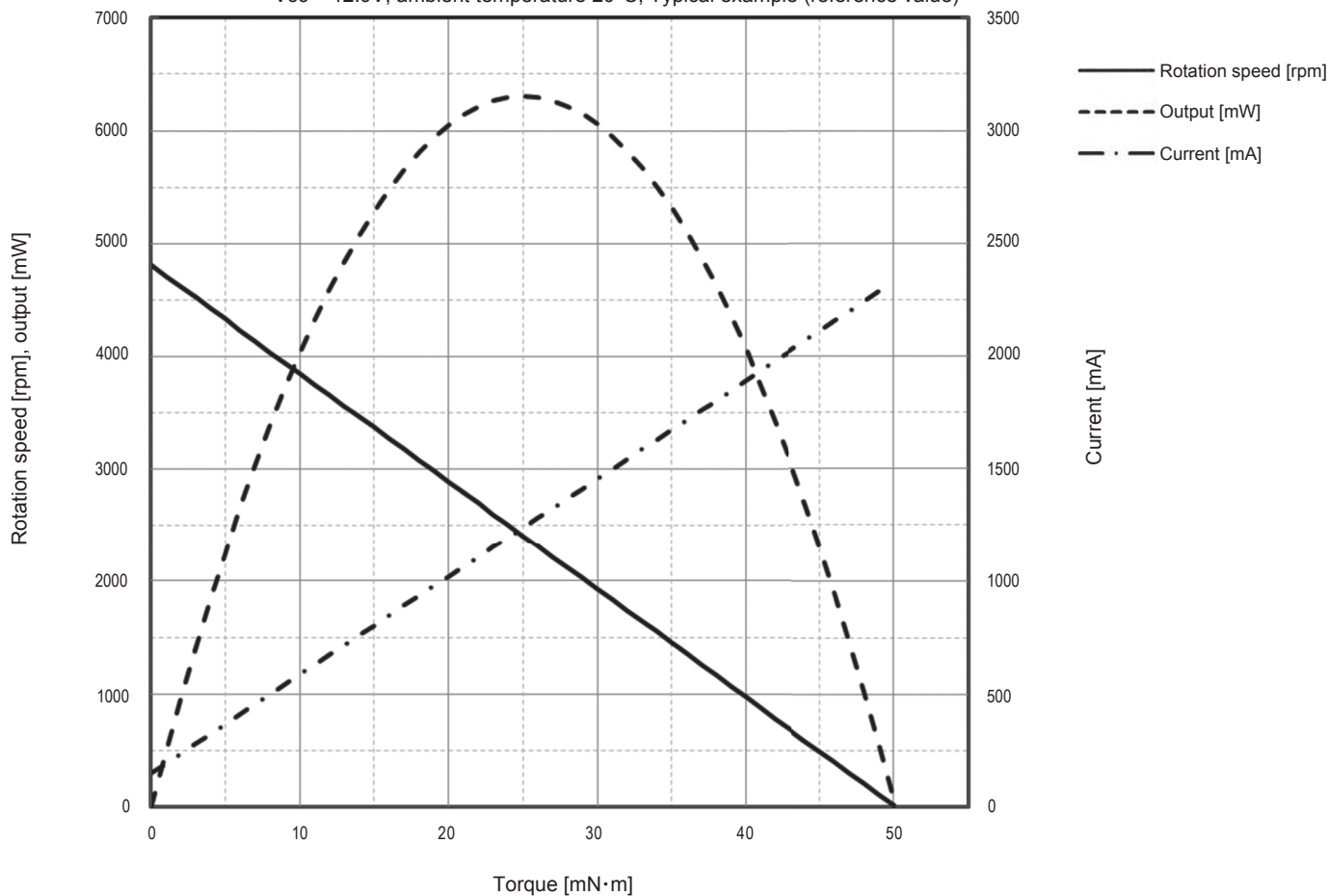


* The dimensional tolerance must be ± 0.5 unless otherwise specified.
[Unit: mm]

Engineering Data

Characteristics diagram <W2SHM-1>

Vcc = 12.0V, ambient temperature 20°C, Typical example (reference value)



■ Precautions for Use

1. Precautions

- Do not insert or remove connectors while the motor is energized.
- Do not touch moving parts while the power is ON.
- Do not touch the product while it is energized or for a while after it is energized. Doing so may result in burns.
- Continuous energizing at overload or repeated reversal operation will cause the motor to become hot, so provide an appropriate interval as a cooling period.
- Do not apply impact by dropping or other means. Doing so may damage the motor.
- Motors are relatively susceptible to impact due to their structure. Do not apply strong impact to the main unit. Similarly, do not apply strong impact to the output shaft.

2. Precautions for assembly

- Perform the assembly work in such a way that no force is applied to bend the output shaft.
- When press-fitting pulleys, etc. onto the output shaft, hold the opposite side of the output firmly.
- When gluing pulleys, etc. to the output shaft (including the adhesion of screws when screwing them in place), be careful not to allow the glue to flow into the bearing. In addition, select an adhesive material that is not affected by the oil contained in the bearing.

3. Layout

The bearing oil used in motors may cause cracks or other defects in some resins. When placing resin near the motor, carefully check before selecting the resin.

4. Input line

The motor does not have a built-in fuse. In case of mechanical trouble, there is a risk of smoke or fire, so take safety measures such as inserting a fuse in the input line.

5. Prevention of circuit element destruction

When the motor is released from the operating state, a surge voltage may be generated, destroying circuit elements, so we recommend that a protection circuit be installed.

6. Mechanical load connection

When connecting a motor to a mechanical load, be sure to connect the motor output shaft and the mechanical load without misalignment. A poor connection may cause a decrease in life cycles and malfunctions.

7. Magnetic generation

When the motor is energized, magnetism is generated from the coil. When using the product near computer screens or other parts that may be affected by magnetism, make sure that there is no magnetic influence.

8. External magnetic circuit

When the motor is energized, magnetism is generated from the coil and a magnetic circuit is formed. The motor is operated by this magnetic circuit. Therefore, if motor mounting plates, mechanical connection parts, stoppers, etc. are all composed of magnetic materials, note that an external magnetic circuit may be formed, which may cause operation failure due to reduced torque, mechanical lock at the start of operation, etc.

9. Vibration range

Motors have a vibration range, so carefully check the range before use. The frequency of the vibration range is almost fixed, but changes slightly depending on the load.

10. Controls

If power is continued for a long time with the output shaft locked, a large current will flow, causing overheating. Control the motor so that it detects the locked condition and shuts off the power to the motor.

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