

# TSL-16GP-TEC1636 Series

16 mm Planetary Brushless DC Gear Motor - Product Specification



## SERIES OVERVIEW

- Rated voltage options: 12 V DC and 24 V DC
- Available planetary ratios: 4.75:1, 16:1, 22.6:1, 64:1, 90:1, 107:1, 172:1, 256:1, 361:1 and 509:1
- 16 mm planetary gearbox combined with a high-speed sensor-equipped DC motor
- Three-phase winding leads with Hall sensor / control interface
- Compact cylindrical construction for robotics, automation and precision drive applications

## ELECTRICAL OPTIONS

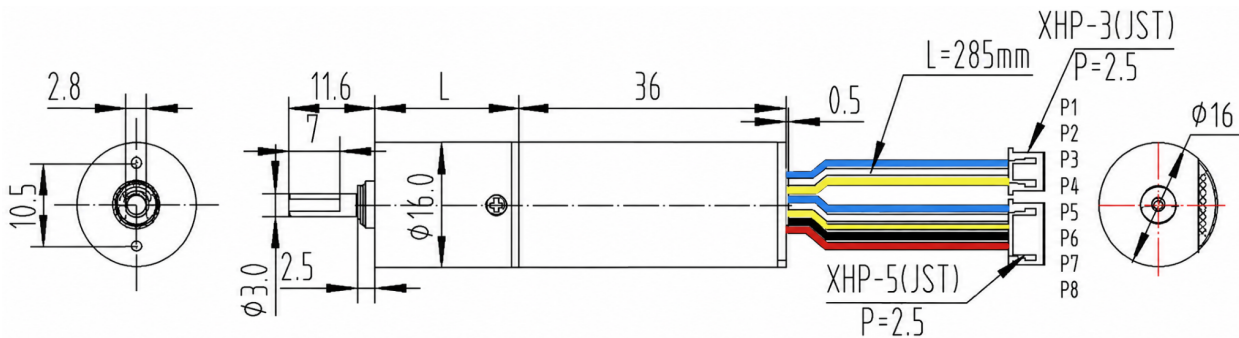
| Model            | Rated Voltage | Gear Ratios     |
|------------------|---------------|-----------------|
| TSL-16GP-TEC1636 | 12 / 24 V DC  | 4.75:1 to 509:1 |

## KEY INTERFACE INFORMATION

| Item                       | Specification                  |
|----------------------------|--------------------------------|
| Motor connector            | XHP-3 (JST), 3-pin, P = 2.5 mm |
| Sensor / control connector | XHP-5 (JST), 5-pin, P = 2.5 mm |
| Lead length                | 285 mm                         |
| Output diameter            | 16 mm motor / gearbox body     |

All dimensions are in mm unless otherwise specified. Specifications can be customized for project requirements.

## DIMENSIONAL DRAWING PREVIEW



# TSL-16GP-TEC1636 - 12 V DC

Geared Motor Technical Data by Reduction Ratio

| Reduction Ratio | Gearbox Length L | No-Load Speed | Rated Torque | Rated Speed |
|-----------------|------------------|---------------|--------------|-------------|
| i:1             | mm               | rpm           | kg.cm        | rpm         |
| 4.75            | 12.5             | 2500          | 0.14         | 2180        |
| 16              | 16               | 750           | 0.36         | 650         |
| 22.6            | 16               | 530           | 0.5          | 460         |
| 64              | 19.5             | 185           | 1.1          | 162         |
| 90              | 19.5             | 130           | 1.6          | 115         |
| 107             | 19.5             | 110           | 1.9          | 97          |
| 172             | 23               | 69            | 2.5          | 60          |
| 256             | 23               | 46            | 3.7          | 40          |
| 361             | 23               | 33            | 5            | 28          |
| 509             | 23               | 23            | 5            | 21          |

Specifications are reference values. Actual performance may vary with load, temperature, driver and production tolerance.

# TSL-16GP-TEC1636 - 24 V DC

Geared Motor Technical Data by Reduction Ratio

| Reduction Ratio | Gearbox Length L | No-Load Speed | Rated Torque | Rated Speed |
|-----------------|------------------|---------------|--------------|-------------|
| i:1             | mm               | rpm           | kg.cm        | rpm         |
| 4.75            | 12.5             | 2500          | 0.16         | 2120        |
| 16              | 16               | 750           | 0.43         | 630         |
| 22.6            | 16               | 530           | 0.6          | 445         |
| 64              | 19.5             | 185           | 1.4          | 157         |
| 90              | 19.5             | 130           | 1.9          | 112         |
| 107             | 19.5             | 110           | 2.2          | 94          |
| 172             | 23               | 69            | 2.9          | 58          |
| 256             | 23               | 46            | 4.3          | 42          |
| 361             | 23               | 33            | 5            | 29          |
| 509             | 23               | 23            | 5            | 21          |

Specifications are reference values. Actual performance may vary with load, temperature, driver and production tolerance.

# TSL-EC1636 Single Motor

Electrical Characteristics for the TSL-16GP-TEC1636 Gear Motor Series

| Motor Model      | Rated Voltage | No-Load Current | No-Load Speed | Max. Efficiency Current | Max. Efficiency Speed | Max. Efficiency Torque | Max. Efficiency Power | Max. Performance Current |
|------------------|---------------|-----------------|---------------|-------------------------|-----------------------|------------------------|-----------------------|--------------------------|
|                  | V             | mA              | rpm           | A                       | rpm                   | g.cm                   | W                     | A                        |
| TSL-EC1636-12120 | 12            | 70              | 12000         | 0.45                    | 10438                 | 35.8                   | 3.83                  | 1.52                     |
| TSL-EC1636-24120 | 24            | 58              | 12000         | 0.29                    | 10080                 | 42.4                   | 4.38                  | 0.78                     |

## KEY ELECTRICAL CHARACTERISTICS

| Parameter                 | 12 V Motor | 24 V Motor |
|---------------------------|------------|------------|
| No-load speed             | 12,000 rpm | 12,000 rpm |
| No-load current           | 70 mA      | 58 mA      |
| Maximum efficiency power  | 3.83 W     | 4.38 W     |
| Maximum efficiency torque | 35.8 g.cm  | 42.4 g.cm  |

## APPLICATION NOTES

- Select the voltage version and gear ratio according to the required output speed, torque and available installation length.
- Use a compatible brushless motor driver and verify connector pin assignment before power-on.
- Contact Tsinglin for customized shaft, cable, connector, winding or gearbox configurations.

Specifications are for reference only. Products can be customized according to customer requirements.

# TSL-16GP-EC1636 Functions Interface

## Connector Assignment and Signal Definition

| Connector   | PIN Spec  | Signal Mark            | Pin Functions                      |
|-------------|-----------|------------------------|------------------------------------|
| Connector A | XHP-3 PIN | Blue                   | Motor Winding U Phase, blue wire   |
|             |           | Yellow                 | Motor Winding V Phase, yellow wire |
|             |           | White                  | Motor Winding W Phase, white wire  |
| Connector B | XHP-5 PIN | Speed Control (Blue)   | Hall Sensor U, blue wire           |
|             |           | FG Signal (Yellow)     | Hall Sensor V, yellow wire         |
|             |           | CW/CCW Control (White) | Hall Sensor W, white wire          |
|             |           | GND (Black)            | Hall Sensor GND, black wire        |
|             |           | VCC Power (Red)        | Hall Sensor VCC: 3.3-5 V, red wire |

### CONNECTOR NOTES

| Connector   | Pitch  | Lead Length | Purpose                         |
|-------------|--------|-------------|---------------------------------|
| XHP-3 (JST) | 2.5 mm | 285 mm      | Three motor winding phase leads |
| XHP-5 (JST) | 2.5 mm | 285 mm      | Sensor / control interface      |

Verify the final wire sequence against the approved production sample or confirmation drawing before installation.