## Beffkkip SG90

# Beffkkip SG90 9g Micro Servo Instruction Manual

Model: SG90

## 1. Introduction


Figure 1.1: The Beffkkip SG90 9g Micro Servo.

This manual provides essential information for the proper setup, operation, and maintenance of your Beffkkip SG90 9g Micro Servo. The SG90 is a compact, lightweight, and cost-effective servo designed for various remote-controlled (RC) applications and microcontroller projects.

## 2. Product Features

- High quality and high cost performance.
- Operating speed: 0.1 second/60 degrees (4.8V no load).
- Operating voltage: 4.8-6V.
- Small size and light weight.
- Suitable for fixed-wing aircraft, helicopters, KT boards, gliders, small robots, robotic arms, and other models.
- Features metal gear column for added strength and durability.

## 3. Setup and Connection

The SG90 micro servo is designed for easy integration into your projects. It comes with a standard 3-pin connector for power and signal.

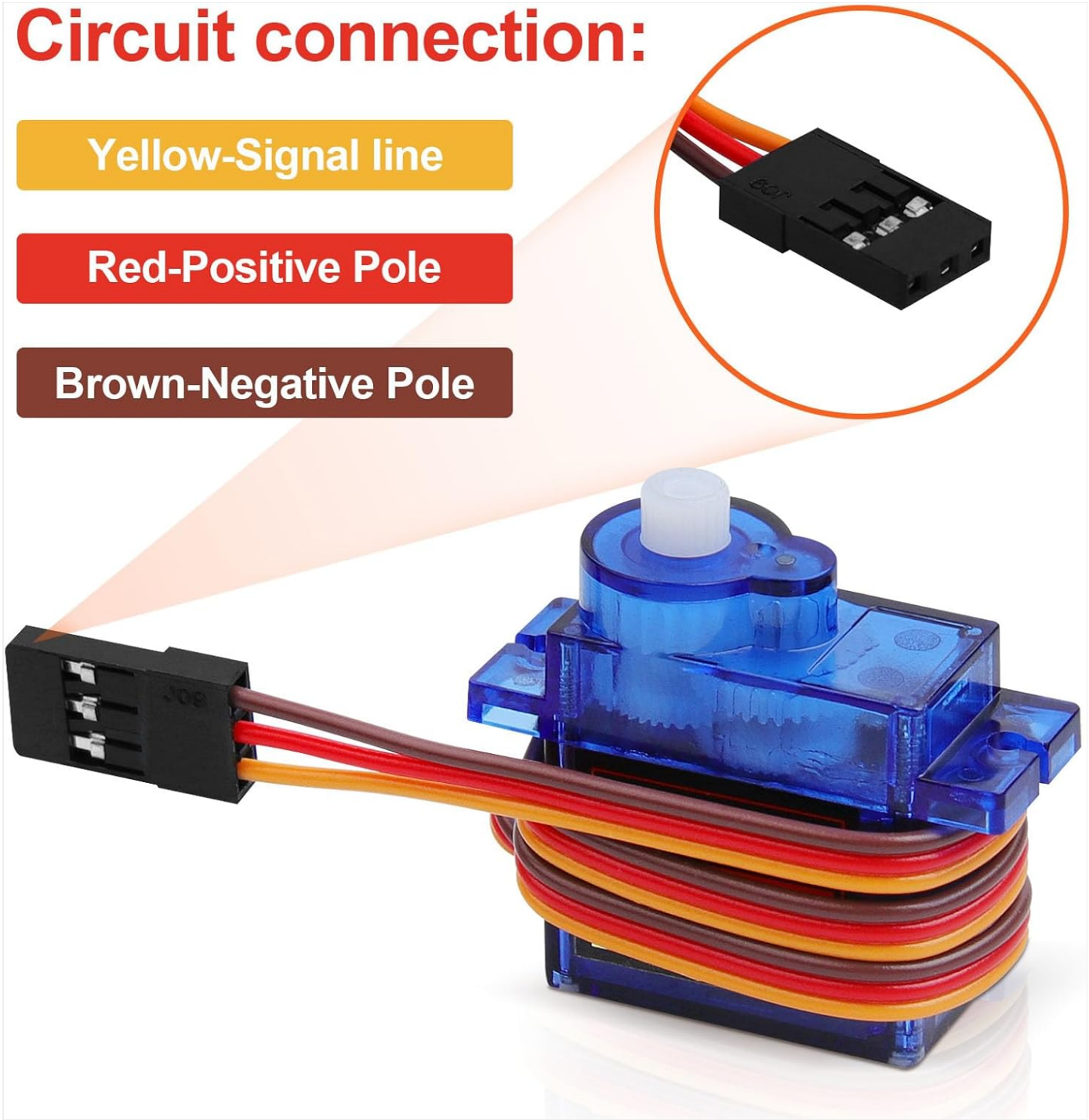


Figure 3.1: SG90 Micro Servo wiring diagram. The yellow wire is for signal, red for positive voltage, and brown for ground.

**Wiring Instructions:**

- **Yellow Wire:** Signal line (connects to your microcontroller's PWM pin).
- **Red Wire:** Positive power supply (connects to 4.8V-6V DC).
- **Brown Wire:** Negative power supply / Ground.

Ensure correct polarity when connecting the power supply to avoid damage to the servo. The servo typically requires a power source capable of supplying at least 1 Amp for stable operation, especially during startup or under load.


Figure 3.2: The SG90 Micro Servo features a metal gear column for enhanced durability. Included accessories are three types of servo horns and mounting hardware.

**Attaching Servo Horns:**

1. Select the appropriate servo horn for your application from the included accessories.
2. Align the servo horn with the output shaft of the servo.
3. Gently press the horn onto the shaft.
4. Secure the horn using the small screw provided, inserting it into the center of the horn and tightening it with a small screwdriver.

## 4. Operating Principles

The SG90 servo operates based on Pulse Width Modulation (PWM) signals. The duration of the pulse determines the angular position of the servo shaft.

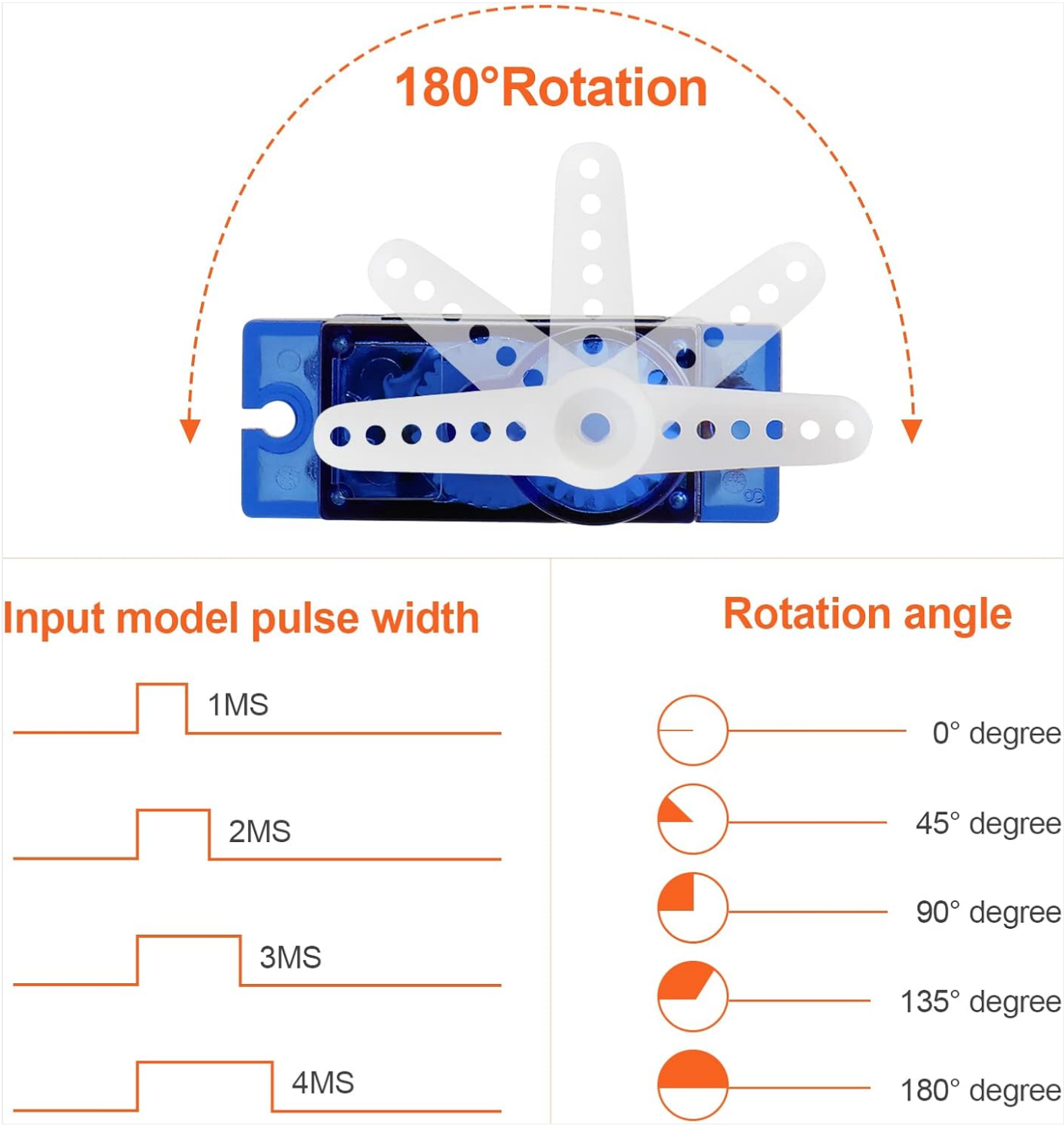


Figure 4.1: Illustration of the SG90 servo's 180-degree rotation range and corresponding input pulse widths.

**Rotation Angle and Pulse Width:**

- The SG90 servo has a maximum rotation angle of 180 degrees.
- A pulse width of approximately 1ms typically corresponds to 0 degrees.
- A pulse width of approximately 1.5ms typically corresponds to 90 degrees (center position).
- A pulse width of approximately 2ms typically corresponds to 180 degrees.

*Note:* The exact pulse width values for specific angles may vary slightly between individual servos. Calibration may be

required for precise positioning.

## 5. Maintenance

The Beffkkip SG90 micro servo is designed for durability and requires minimal maintenance.

- **Cleaning:** Keep the servo free from dust, dirt, and moisture. Use a soft, dry cloth for cleaning. Avoid using solvents or harsh chemicals.
- **Inspection:** Periodically check the servo horns and mounting screws for tightness. Ensure the wires are not frayed or damaged.
- **Storage:** Store the servo in a dry, cool environment when not in use.

## 6. Troubleshooting

| Problem | Possible Cause | Solution |
|---|---|---|
| Servo does not move or responds erratically. | Incorrect wiring.<br>Insufficient power supply voltage or current.<br>Incorrect PWM signal.<br>Mechanical obstruction. | Verify the yellow, red, and brown wires are connected correctly (Signal, VCC, GND).<br>Ensure the power supply is between 4.8V and 6V and can provide at least 1A. Note that 3.3V is generally too low for these servos.<br>Check your code or signal generator for correct pulse widths (1ms-2ms for 0-180 degrees).<br>Ensure no physical objects are blocking the servo's movement. |
| Servo makes buzzing noise. | Servo is trying to hold a position against a load.<br>Signal noise or unstable power. | This can be normal if the servo is holding a position. If excessive, reduce the load.<br>Ensure power supply is stable and signal wires are shielded if necessary. |
| Servo overheats. | Excessive load.<br>Continuous operation at maximum torque. | Reduce the load on the servo.<br>Allow the servo to rest periodically if operating under heavy load. |

## 7. Specifications

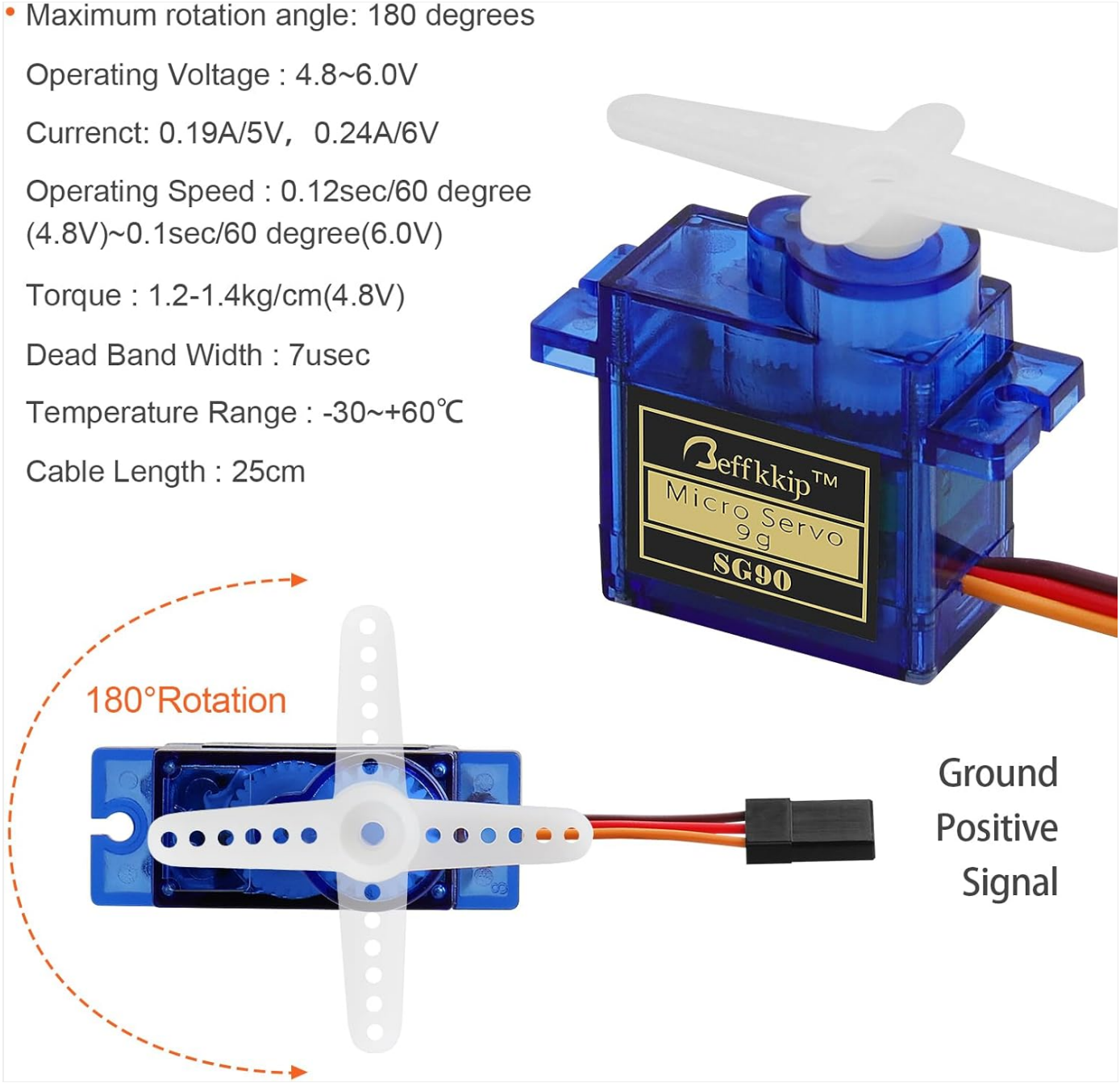


Figure 7.1: Detailed specifications and rotation diagram of the SG90 Micro Servo.

| Feature | Value |
|---|---|
| Product Dimensions | 0.8 x 0.5 x 1.2 inches (20.3 x 12.7 x 30.5 mm) |
| Item Weight | 0.423 ounces (12 grams) |
| Operating Voltage | 4.8V - 6.0V |
| Operating Speed (4.8V no load) | 0.12 sec/60 degrees |
| Operating Speed (6.0V no load) | 0.1 sec/60 degrees |
| Stall Torque (4.8V) | 1.2-1.4 kg/cm |
| Dead Band Width | 7 microseconds |
| Temperature Range | -30°C to +60°C |

| Feature | Value |
|---|---|
| Cable Length | 25 cm |
| Gear Type | Metal Gear Column (internal) |
| Rotation Angle | 180 degrees |


Figure 7.2: Detailed physical dimensions of the SG90 Micro Servo and its included horns.

## 8. Warranty and Support

For warranty information and technical support, please refer to the seller or manufacturer directly. Keep your purchase receipt as proof of purchase.