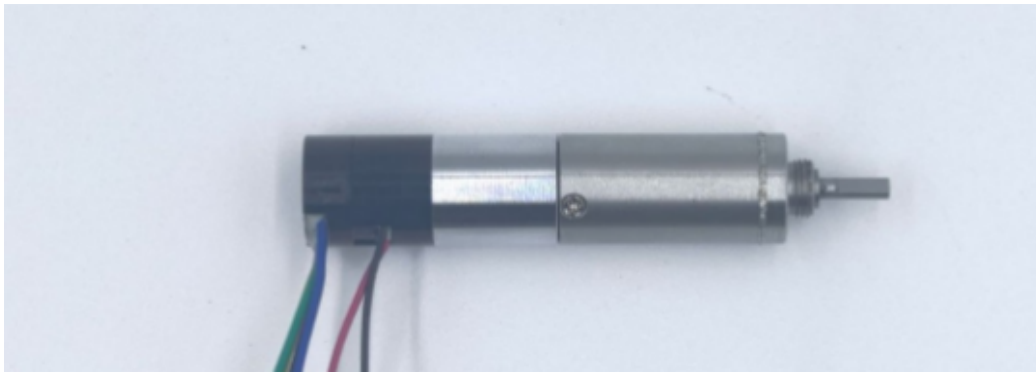


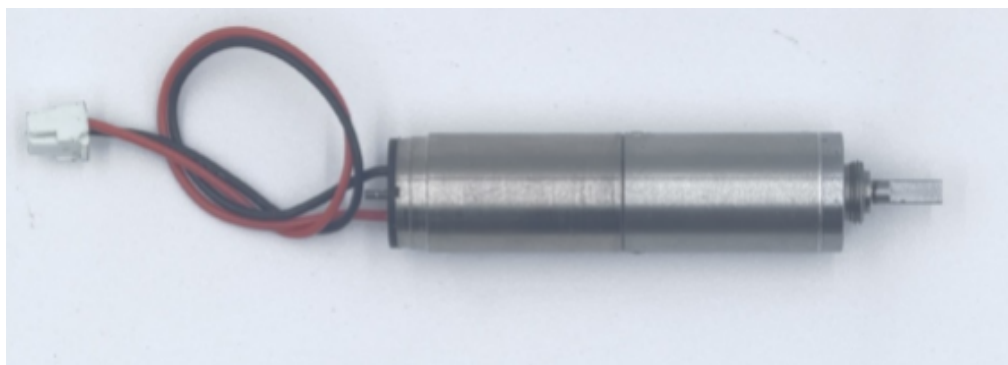
# TSL-PG10K326-KS1015-SPI



Motor Type	10mm Coreless Brushed Servo Gear Motor
Motor Components	Coreless Motor + Magnetic Encoder/ SPI + Planetary Gearbox
Outer Diameter	10mm
Total Body Length	44mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1.5mNM
Ratio	326:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

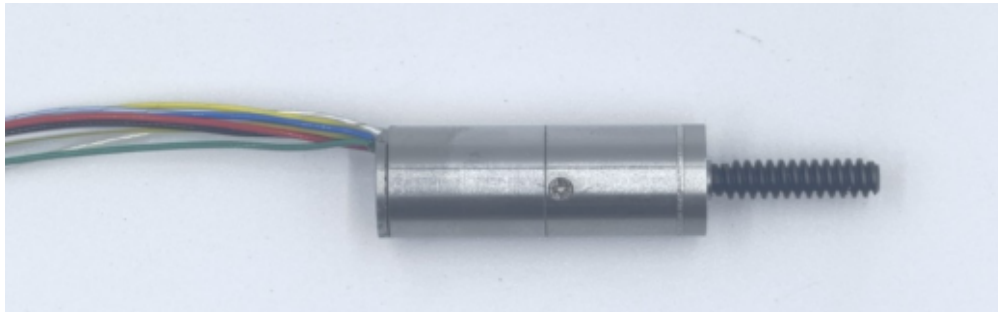
# TSL-PG10K236-KS1022



Motor Type	10mm Coreless Brushed Gear Motor
Motor Components	Coreless Motor + Planetary Gearbox
Outer Diameter	10mm
Total Body Length	42.7mm
Rated Voltage	DC 12V
Rated Speed	16000rpm
Rated Torque	2mNM
Ratio	326:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

# TSL-P10K28-KW1015



Motor Type	10mm Coreless Brushless Gear Motor
Motor Components	Coreless Motor + Hall+ Planetary Gearbox
Outer Diameter	10mm
Total Body Length	29.6mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	28:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

# TSL-PG10K28-KW1015-WG03M



Motor Type	10mm Coreless Brushless Worm Gear Motor
Motor Components	Coreless Brushless Motor + Hall Sensor PC Cable + Planetary Gearbox
Outer Diameter	10mm
Total Body Length	36.9mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	2420:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

# TSL-PG10K28-KW1016-WG03M



Motor Type	10mm Coreless Brushless Worm Gear Motor(Module)
Motor Components	Coreless Brushless Motor + Magnetic Encoder + Planetary Gearbox + Worm Gear Assembly
Outer Diameter	10mm
Total Body Length	45.5mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	1540:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

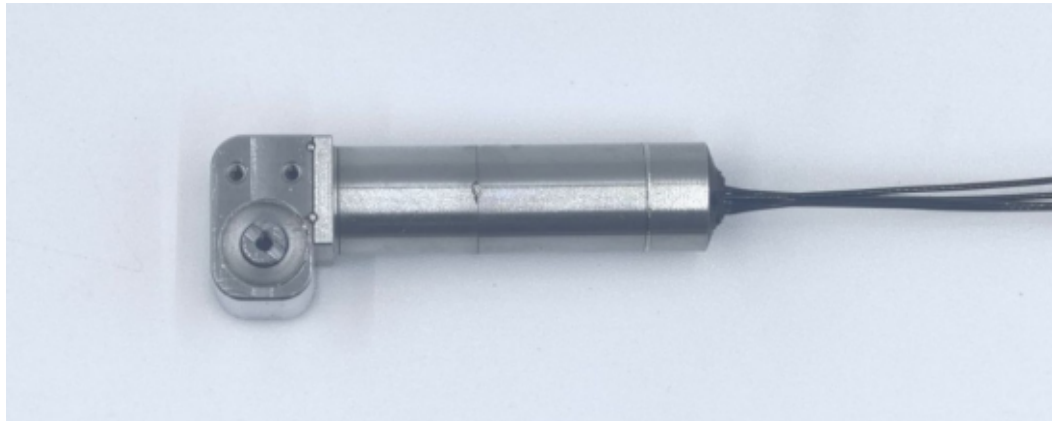
# TSL-PG10K5.33-KW1016-WG04M



Motor Type	10mm Coreless Brushless Worm Gear Motor(Module)
Motor Components	Coreless Brushless Motor + SPI Encoder + Planetary Gearbox + Worm Gear Assembly
Outer Diameter	10mm
Total Body Length	40.6mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	361:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

# TSL-PG10K28-KW1-16-WG03M-TO



Motor Type	10mm Integrated Drive-Control Joint Module Gear Motor
Motor Components	Brushless Motor + Built-in Drive-Control with 10 Serial Communication Ports
Outer Diameter	10mm
Total Body Length	45.5mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	1320:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

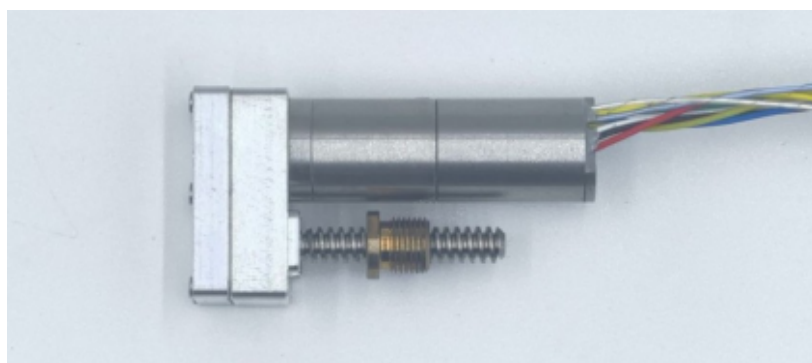
# TSL-PG10K5.33-KW1015-SG5.5T



Motor Type	10mm Electric Linear Actuator (Linear Motor)
Motor Components	Brushless Motor + Planetary Gearbox+ Lead Screw Assembly
Outer Diameter	10mm
Total Body Length	26mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	28:1
Lead Screw Assembly	Single-Start T3.5 × Pitch 1.2 mm

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

# TSL-PG10K28-KW1015-DZ3.5T



Motor Type	10mm Electric Linear Actuator (Inverted Linear Actuator)
Motor Components	Brushless Motor + Planetary Gearbox+ Lead Screw Assembly
Outer Diameter	10mm
Total Body Length	38.2mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	65:1
Lead Screw Assembly	Single-Start T3.5 × Pitch 1.2 mm

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

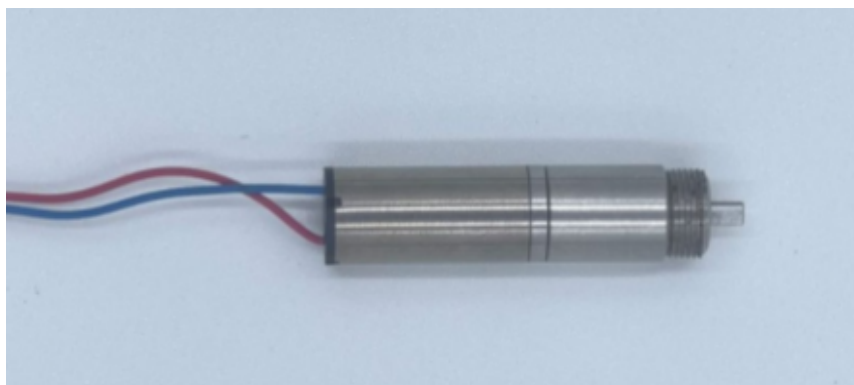
# TSL-PG8K1024-KW0816



Motor Type	8mm Coreless Brushles Gear Motor
Motor Components	Coreless Brushless Motor + Hall Encoder+ Planetary Gearbox
Outer Diameter	8mm
Total Body Length	40.7mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	1024:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

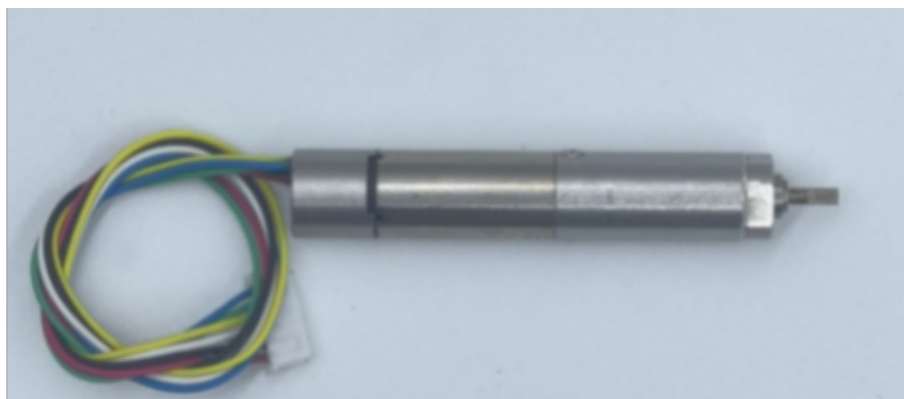
# TSL-PG8K125-KS0816



Motor Type	8mm Coreless Brushed Gear Motor
Motor Components	Coreless Motor + Planetary Gearbox
Outer Diameter	8mm
Total Body Length	31.5mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	125:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

# TSL-PG8K1024-KS0816-MA1024



Motor Type	8mm Coreless Brushed Gear Motor
Motor Components	Coreless Motor + Magnetic Encoder + Planetary Gearbox
Outer Diameter	8mm
Total Body Length	43.4mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	1024:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

# TSL-PG8K64-KS0816-WG03M



Motor Type	8mm Coreless Brushed Worm Gear Motor
Motor Components	Coreless Motor + Planetary Gearbox+Worm Gear
Outer Diameter	8mm
Total Body Length	30.4mm
Rated Voltage	DC 12V
Rated Speed	18000rpm
Rated Torque	1mNM
Ratio	1600:1

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

# TSL-PG8K64-KW0816-MA1024-LG3.5T



Motor Type	8mm Coreless Brushless Gear Motor
Motor Components	Coreless Motor + Magnetic Encoder+ Planetary Gearbox+Lead Screw Assembly
Outer Diameter	8mm
Total Body Length	23.6mm
Rated Voltage	DC 12V
Rated Speed	20000rpm
Rated Torque	1.5mNM
Ratio	64:1
Lead Screw Assembly	Single-Start T3.5 × Pitch 1mm

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

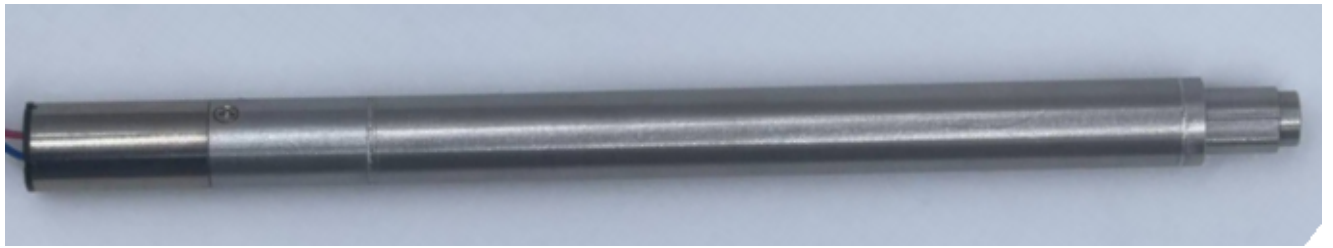
# TSL-PG8K256-KS0816-LG3.5T



Motor Type	8mm Coreless Brushed Gear Motor
Motor Components	Coreless Motor + Planetary Gearbox+Lead Screw Assembly
Outer Diameter	8mm
Total Body Length	41.9mm(Including thrust bearing)
Rated Voltage	DC 7.4V
Rated Speed	15000rpm
Rated Torque	1.5mNM
Ratio	256:1
Lead Screw Assembly	Single-Start T3.5 × Pitch 1.2 mm

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

# TSL-PG8K125-KS0816-TG3.5T

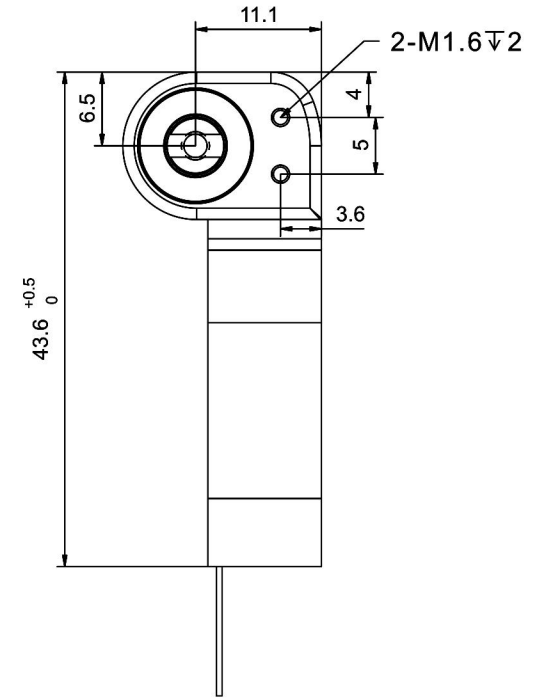
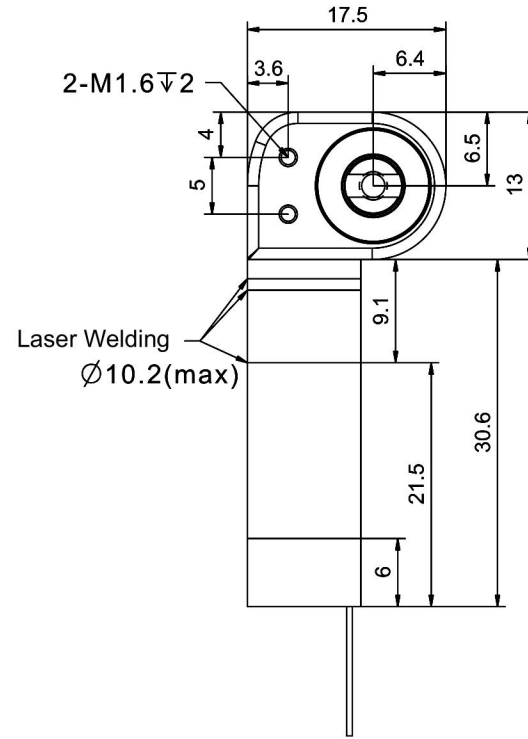
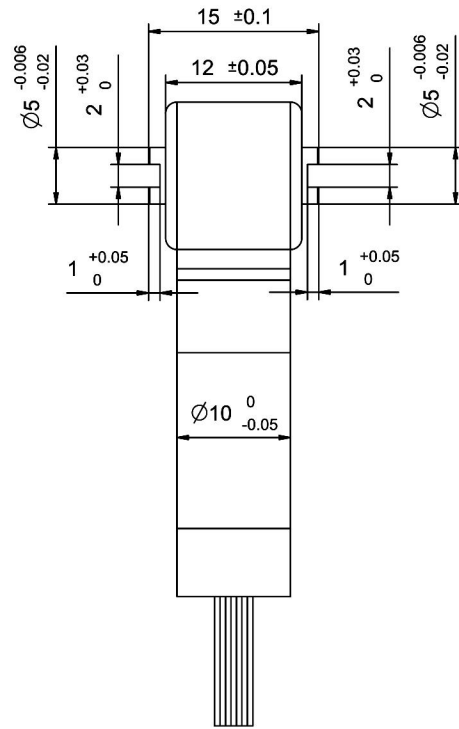


Motor Type	8mm Electric Linear Actuator
Motor Components	Coreless Motor + Planetary Gearbox+Linear Actuator Assembly
Outer Diameter	8mm
Total Body Length	108mm
Rated Voltage	DC 7.4V
Rated Speed	10000rpm
Rated Torque	2mNM
Ratio	125:1
Thrust	100N

**Note:** The motor parameters are for reference only. Specifications can be customized according to customer requirements.

Worm and Worm Gear Parameter Table

	Worm	Worm Gear
Module	0.4	
Number of Starts/ Number of Teeth	1	20
Pressure Angle	20°	20°
Tip Diameter	5	8.8
Reference Diameter	4.2	8
Lead Angle	Right-hand 5.44°	
Worm Lead	1.257	-
Worm Pitch	1.257	-
Addendum Coefficient	1	1
Clearance Coefficient	0.25	0.25
Modification Coefficient	-	-
Transmission Center Distance	6.1	
Material	20crmnti	
Accuracy Class	GB/T 10095-2001 - Grade 8	



Motor Performance Parameters:

1. Motor Type: Coreless Brushless Motor
2. Operating Voltage: 12V
3. No-load Speed: 32000 ±10% RPM
4. No-load Current: ≤0.15A
5. Rated Speed: 18000 ±10% RPM
6. Rated Torque: ≥10 g.cm
7. Rated Current: ≤0.5A
8. Pole Pairs: 2 Pole Pairs
9. Operating Temperature: -40-85°C
10. Noise: ≤45 DB
11. Motor Maximum Efficiency: 75%

Gearmotor Performance Parameters:

1. Operating Voltage: 12V
2. No-load Speed: 55 ±10% RPM
3. No-load Current: ≤0.2A
4. Rated Speed: 35 ±10% RPM
5. Rated Torque: ≥800 g.cm
6. Rated Current: ≤0.5A
7. Operating Temperature: -40-80°C
8. Reduction Ratio: 1:560  
(Planetary Stage 1:28, Worm and Worm Gear Stage 1:20)
9. Noise: ≤55 DB
10. Gearbox Material: Pure Steel  
(Machined)

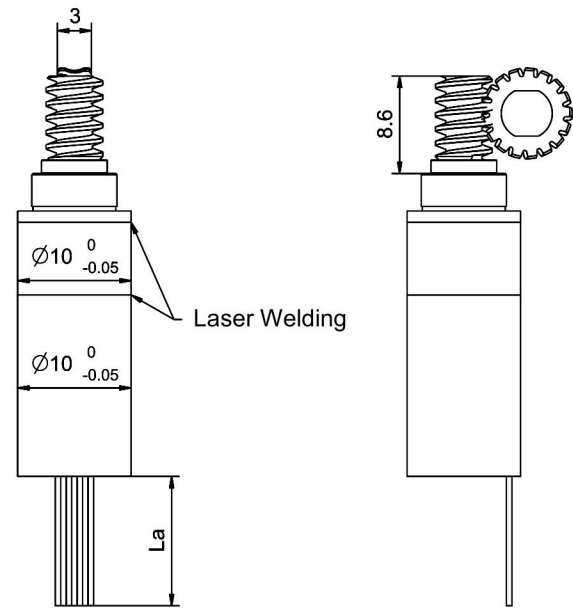
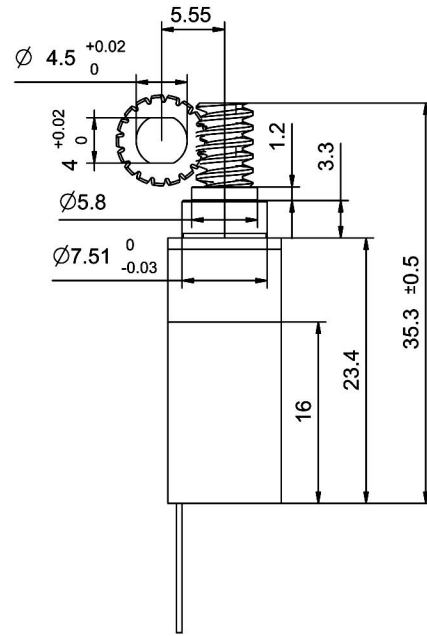
Encoder + Driver: pin1-4 wire

- pin1:VDD
- pin2:GND
- pin3:RXD
- pin4:TXD

Design		First Angle Projection	10mm Planetary Gearbox+10mm Coreless Brushless Motor+Encoder-Driver Integrated Unit+Worm and Worm Gear Reducer Gearbox (Product Type)
Reviewed			
Approved		General tolerances for untoleranced linear and angular dimensions: GB/T 1804-m eqv ISO 2768-1:m	PG10K28-KW1016+LG13175K20 (Product Model)
Date			Tsinglin Micro Motors Limited

**Worm and Worm Gear Parameter Table**

	Worm	Worm Gear
Module	0.4	
Number of Starts/ Number of Teeth	1	17
Pressure Angle	20°	20°
Tip Diameter	5	7.6
Reference Diameter	4.2	6.8
Lead Angle	Right-hand 5.44°	
Worm Lead	1.257	-
Worm Pitch	1.257	-
Addendum Coefficient	1	1
Clearance Coefficient	0.25	0.25
Modification Coefficient	-	-
Transmission Center Distance	5.55	
Material	SUS416	20crmnti
Accuracy Class	GB/T 10095-2001 - Grade 8	



FPC Harness  
Length La:  
70mm



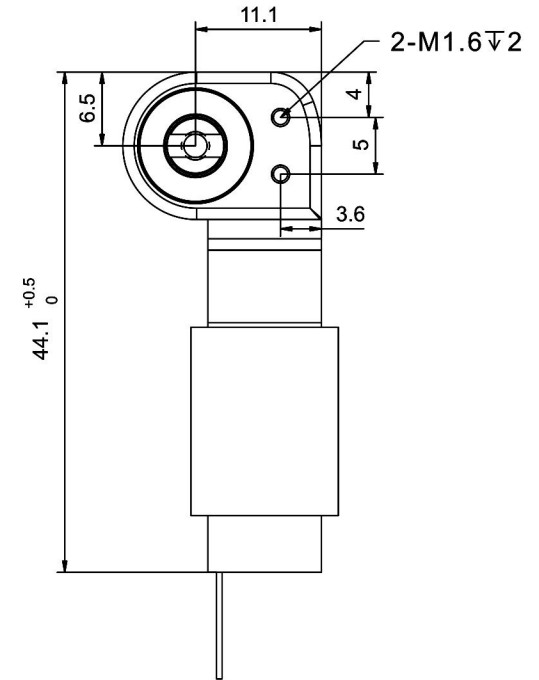
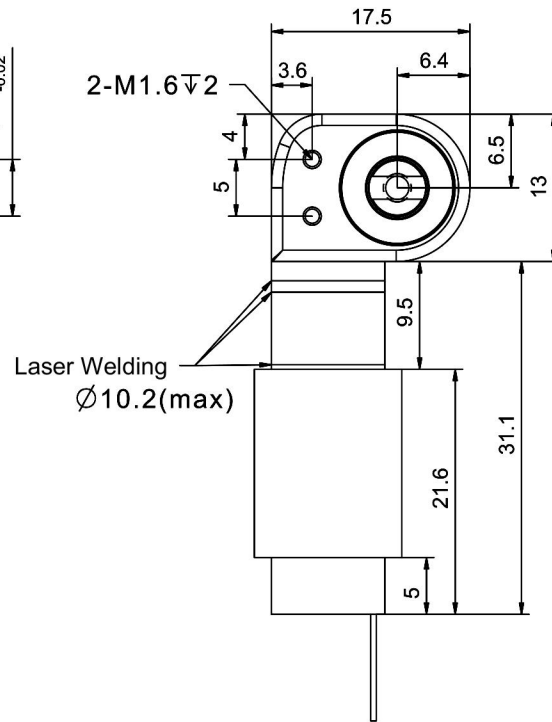
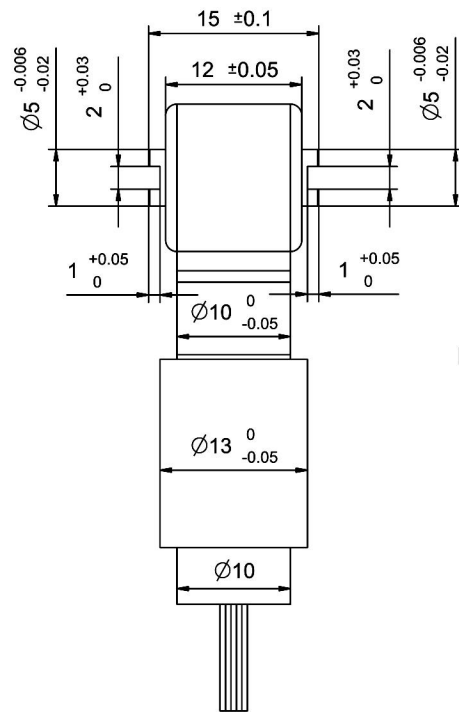
Coreless Brushless Motor:  
FPC: 0.5mm-12P  
Pin Assignment: PIN1-12  
pin1-HALL A  
pin2-HALL B  
pin3-HALL Z  
pin4-3.3V  
pin5-GND  
pin6+7-Motor U  
pin8+9-Motor V  
pin10+11-Motor W  
pin12-Temp. Ctrl.

- Motor Performance Parameters:**
1. Motor Type: Coreless Brushless Motor
  2. Operating Voltage: 12V
  3. No-load Speed: 32000 ±10% RPM
  4. No-load Current: ≤0.4A
  5. Rated Speed: 20000 ±10% RPM
  6. Rated Torque: ≥10 g.cm
  7. Rated Current: ≤0.6A
  8. Pole Pairs: 2 Pole Pairs
  9. Operating Temperature: -40-85°C
  10. Noise: ≤45 DB
  11. Motor Maximum Efficiency: 75%

- Gearmotor Performance Parameters:**
1. Operating Voltage: 12V
  2. No-load Speed: 65 ±10% RPM
  3. No-load Current: ≤0.3A
  4. Rated Speed: 40 ±10% RPM
  5. Rated Torque: ≥0.25NM
  6. Rated Current: ≤0.6A
  7. Peak Torque (2s): 0.6 N.m
  8. Peak Current: ≤1A
  9. Operating Temperature: -40-80°C
  10. Reduction Ratio: 1:476  
(Planetary Stage 1:28, Worm and Worm Gear Stage 1:17)
  11. Worm and Worm Gear Self-locking Torque: ≥2 NM
  12. Noise: ≤55 DB
  13. Gearbox Material: Pure Steel (Machined)

Design		First Angle Projection	10mm Planetary Gearbox+10mm Coreless Brushless Motor+Worm and Worm Gear Reducer Gearbox (Product Type)
Reviewed			PG10K28-KW1016+LG04M17Z (Actuator 1) (Product Model)
Approved		General tolerances for untoleranced linear and angular dimensions: GB/T 1804-m eqv ISO 2768-1:m	
Date	2026.01.20		<b>Tsinglin Micro Motors Limited</b>

Worm and Worm Gear Parameter Table		
	Worm	Worm Gear
Module	0.4	
Number of Starts/ Number of Teeth	1	20
Pressure Angle	20°	20°
Tip Diameter	5	8.8
Reference Diameter	4.2	8
Lead Angle	Right-hand 5.44°	
Worm Lead	1.257	-
Worm Pitch	1.257	-
Addendum Coefficient	1	1
Clearance Coefficient	0.25	0.25
Modification Coefficient	-	-
Transmission Center Distance	6.1	
Material	20crmnti	
Accuracy Class	GB/T 10095-2001 - Grade 8	



**Motor Performance Parameters:**

1. Motor Type: Coreless Brushless Motor
2. Operating Voltage: 12V
3. No-load Speed: 25000 ±10% RPM
4. No-load Current: ≤0.4A
5. Load Speed: 18000 ±10% RPM
6. Load Torque: ≥15 g.cm
7. Load Current: ≤1A
8. Stall Torque: ≥100 g.cm
9. Pole Pairs: 2 Pole Pairs
10. Operating Temperature: -40-85°C
11. Noise: ≤45 DB
12. Motor Maximum Efficiency: 75%

**Gearmotor Performance Parameters:**

1. Operating Voltage: 12V
2. No-load Speed: 45 ±10% RPM
3. No-load Current: ≤0.5A
4. Rated Speed: 30 ±10% RPM
5. Rated Torque: ≥2500 g.cm
6. Rated Current: ≤1.2A
7. Operating Temperature: -40-80°C
8. Reduction Ratio: 1:560  
(Planetary Stage 1:28, Worm and Worm Gear Stage 1:20)
9. Noise: ≤55 DB
10. Gearbox Material: Pure Steel  
(Machined)

Encoder + Driver: pin1-4 wire

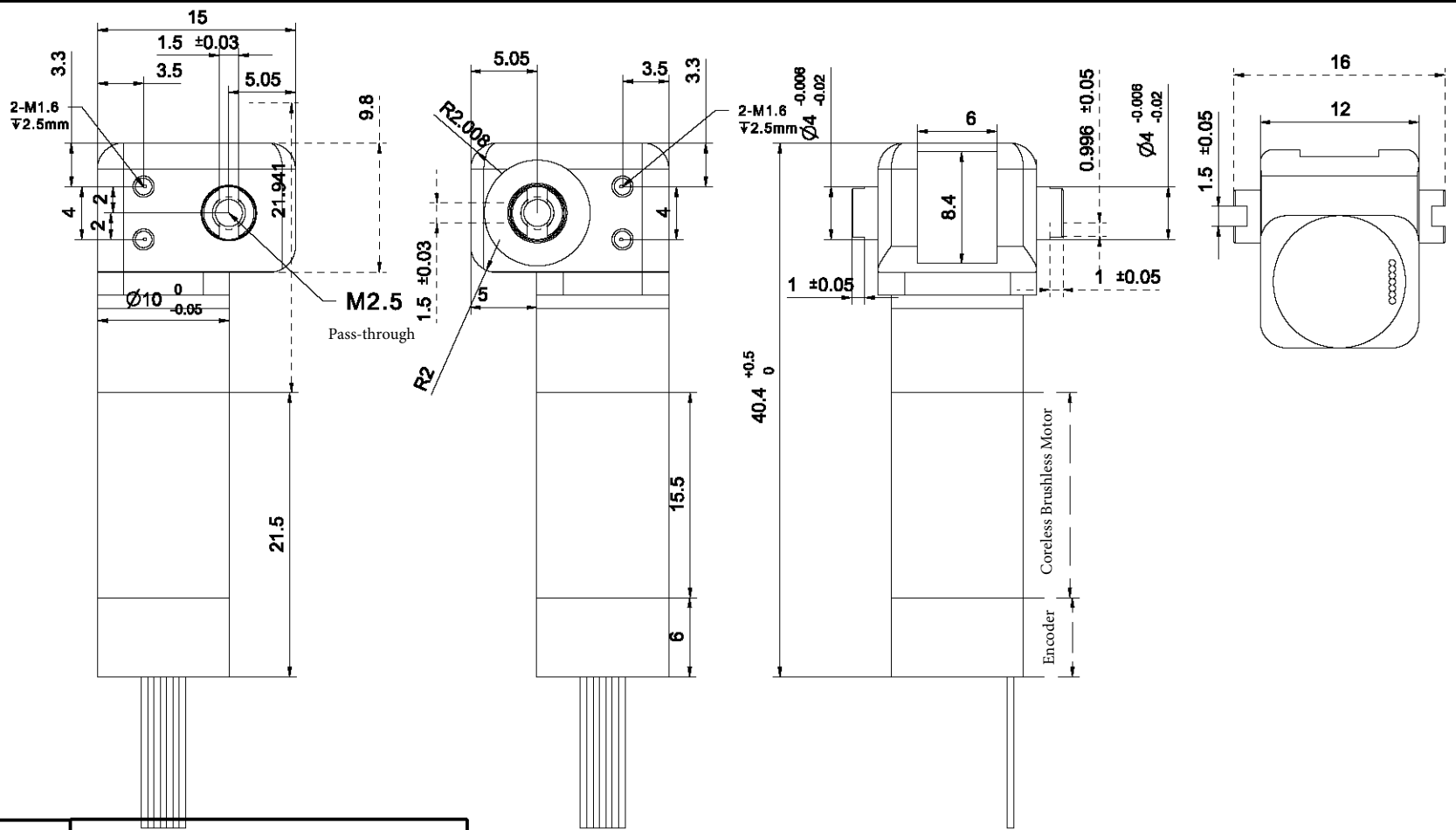
- pin1:VDD
- pin2:GND
- pin3:RXD
- pin4:TXD

Design			10mm Planetary Gearbox+13mm Coreless Brushless Motor+Encoder-Driver Integrated Unit+Worm and Worm Gear Reducer (Product Type)
Reviewed			
Approved		General tolerances for untoleranced linear and angular dimensions: GB/T 1804-m eqv ISO 2768-1:m	PG10K28-KW1317+LG13175K20 (Product Model)
Date			Tsinglin Micro Motors Limited



### Worm and Worm Gear Parameter Table

	Worm	Worm Gear
Module	0.3	
Number of Starts / Teeth	1	20
Pressure Angle	$20^\circ$	$20^\circ$
Addendum Circle Diameter	4.5	6.6
Pitch Circle Diameter	3.9	6
Lead Angle	Right-hand $4.51^\circ$	
Worm Lead	0.942	-
Worm Pitch	0.942	-
Addendum Coefficient	1	1
Clearance Coefficient	0.25	0.25
Modification Coefficient	-	-
Center Distance	4.95	
Material	SUS416	Beryllium Bronze
Accuracy Grade	GB/T 10095-2001, Grade 8	



Encoder + Encoder: pin1-8 Wiring Sequence

#### Motor Performance Specifications:

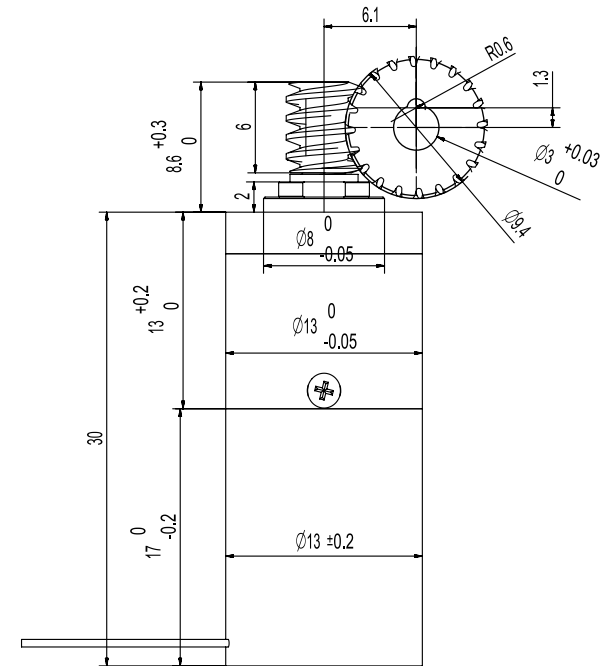
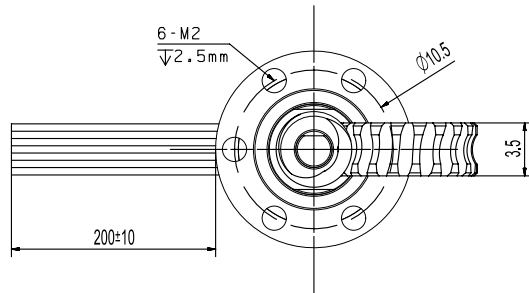
1. Motor Type: Coreless Brushless Motor
2. Operating Voltage: 12V
3. No-load Speed:  $33,000 \pm 10\%$  RPM
4. No-load Current:  $\leq 0.15$  A
5. Load Speed:  $18,000 \pm 10\%$  RPM
6. Load Torque:  $\geq 10$  g·cm
7. Load Current:  $\leq 0.5$  A
8. Number of Pole Pairs: 2 pole pairs
9. Operating Temperature: -20 to  $85^\circ\text{C}$
10. Noise Level:  $\leq 45$  dB
11. Maximum Motor Efficiency: 75%

#### Reducer Motor Performance Specifications:

1. Operating Voltage: 12V
  2. No-load Speed:  $55 \pm 10\%$  RPM
  3. No-load Current:  $\leq 0.25$  A
  4. Load Speed:  $35 \pm 10\%$  RPM
  5. Load Torque:  $\geq 800$  g·cm
  6. Load Current:  $\leq 0.5$  A
  7. Operating Temperature: -20 to  $80^\circ\text{C}$
  8. Reduction Ratio: 1:560  
(Planetary: 1:28, Worm Gear: 1:20)
  9. Noise Level:  $\leq 55$  dB (measured at 30 cm)
  10. Gearbox Material: Pure Copper (Machined)
- Note: The motor shaft material is relatively soft; long-term heavy-load operation is not recommended.

Design		First-Angle Projection Method 	10 mm Planetary Gearbox + 10 mm Coreless Brushless Motor +Encoder + Worm-Gear Reducer (Product Type)
Review			TSL-PG10K28-KW1016 -WGO3M (Product Model)
Approval		Unspecified linear and angular dimension tolerances: GB/T 1804-m eqv ISO 2768-1:m	
Date	<b>2025.08.27</b>		Tsinglin Micro Motors Limited

Worm and Worm Gear Parameter Table		
	Worm	Worm Gear
Module	0.4	
Number of Starts / Teeth	1	20
Pressure Angle	20°	20°
Addendum Circle Diameter	5	8.8
Pitch Circle Diameter	4.2	8
Lead Angle	Right-hand 5.44°	
Addendum Coefficient	1	1
Clearance Coefficient	0.25	0.25
Modification Coefficient	-	-
Material	SUS416	
Accuracy Grade	GB/T 10095-2001, Grade 8	



**Motor Performance Specifications:**

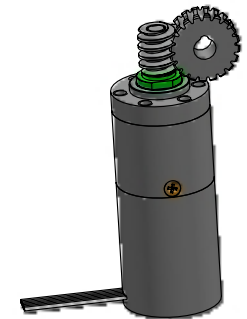
1. Motor Type: Coreless Brushless Motor
2. Operating Voltage: 12V
3. No-load Speed: 25,000 ± 10% RPM
4. No-load Current: ≤ 0.2 A
5. Load Speed: 18,000 ± 10% RPM
6. Load Torque: ≥ 15 g·cm
7. Load Current: ≤ 0.8 A
8. Stall Torque: ≥ 100 g·cm
9. Number of Pole Pairs: 2 pole pairs
10. Operating Temperature: -40 to 85°C
11. Weight: ≤ 30 g
12. Noise Level: ≤ 45 dB
13. Maximum Motor Efficiency: 75%

**Reducer Motor Performance Specifications:**

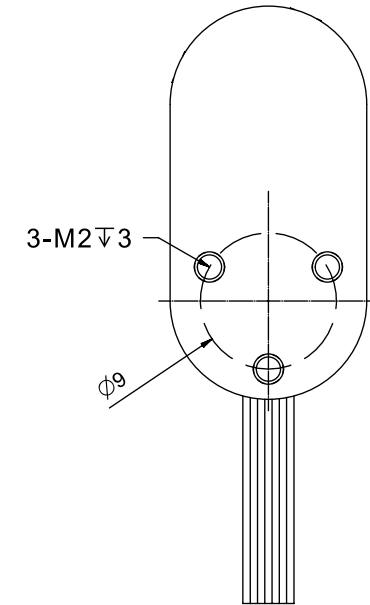
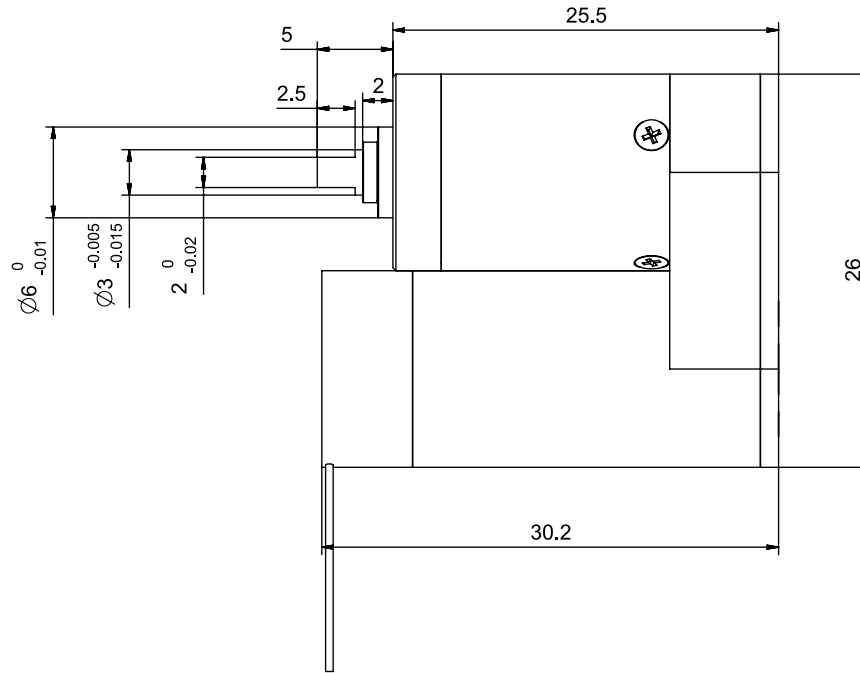
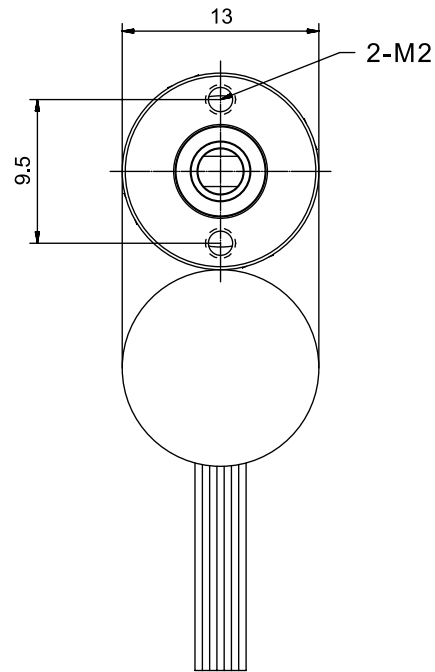
1. Operating Voltage: 12V
2. No-load Speed: 50 ± 10% RPM
3. No-load Current: ≤ 0.3 A
4. Load Speed: 35 ± 10% RPM
5. Load Torque: ≥ 0.4 N·m
6. Load Current: ≤ 1 A
7. Stall Torque: ≥ 3 N·m
8. Operating Temperature: -40 to 80°C
9. Gear Reduction Ratio: 1:500 (Planetary: 1:25, Worm Gear: 1:20)
10. Noise Level: ≤ 55 dB
11. Gearbox Material: Pure Copper (Machined)

### Coreless Brushless Motor Hall Sensor Pin Assignment: PIN1-8

- pin1 -U (Purple)
- pin2 -V (Brown)
- pin3 -W (White)
- pin4 - +5V (Red)
- pin5 -GND (Black)
- pin6 -HALL\_U (Yellow)
- pin7 -HALL\_V (Green)
- pin8 -HALL\_W (Blue)



Design		First-Angle Projection Method	13 mm Planetary Gear Reducer + 13 mm Coreless Brushless Motor (Product Type)
Review			+Worm-Gear Gearbox
Approval		Unspecified Linear and Angular Dimension Tolerances: GB/T 1804-m eqv ISO 2768-1:m	<b>TSG-13P1317RB-25+LG04M20Z</b> (Product Model)
Date	2025.03.21		Tsinglin Micro Motors Limited



**Motor Performance Parameters:**

- 1.Motor Type:Coreless Brushless Motor
- 2.Operating Voltage:12V
- 3.No-load Speed:25000±10%RPM
- 4.No-load Current: 0.2A
- 5.Load Speed:18000±10%RPM
- 6.Load Torque: 15g.cm
- 7.Load Current:≤0.8A
- 8.Stall Torque: 100g.cm
- 9.Pole Pairs:2 Pole Pairs
- 10.Operating Temperature:-40-85°C
- 11.Weight: ≤30g
- 12.Noise:≤45DB
- 13.Motor Maximum Efficiency:75%

**Gearmotor Performance Parameters:**

- 1.Operating Voltage:12V
- 2.No-load Speed:250±10%RPM
- 3.No-load Current:≤0.3A
- 4.Rated Speed:180±10%RPM
- 5.Rated Torque:≥0.08NM
- 6.Rated Current:≤1A
- 7.Stall Torque: ≥0.5 Nm
- 8.Operating Temperature:-40-80°C
- 9.Reduction Ratio:1:100
- 10.Noise:≤55DB
- 11.Gearbox Material:Pure Steel (Machined)

**Coreless Brushless Motor**

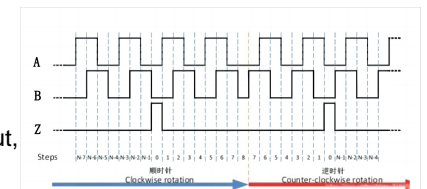
Wiring Sequence: PIN1-3

- pin1 - U (White)
- pin2 - V (Yellow)
- pin3 - W (Blue)

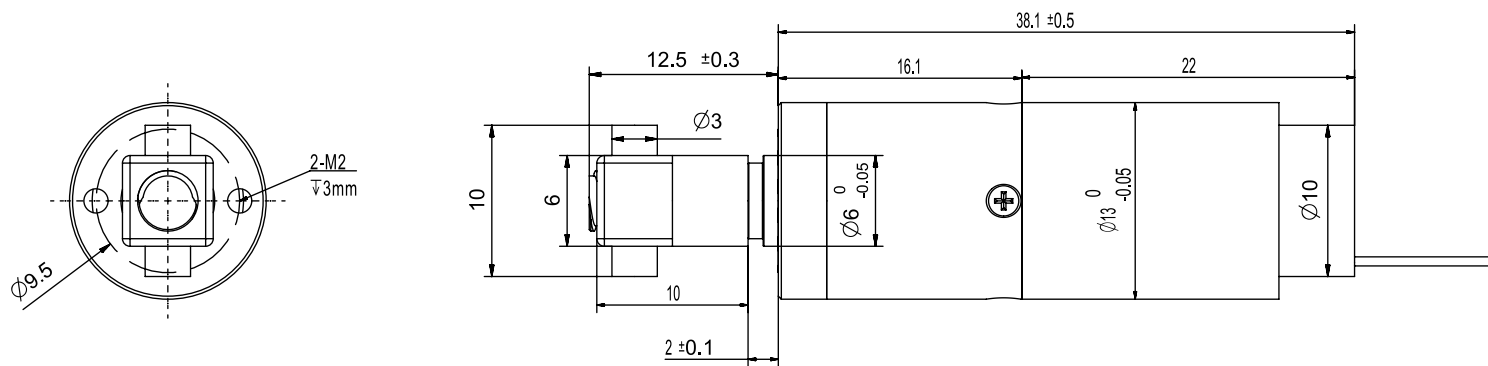
**Encoder Wiring Sequence: PIN1-5**

- pin1 - GND (Black)
- pin2 - VCC (Red)
- pin3 - A<sub>±</sub> (Single-ended) (Yellow)
- pin4 - B<sub>±</sub> (Single-ended) (Green)
- pin5 - Z<sub>±</sub> (Single-ended) (Blue)

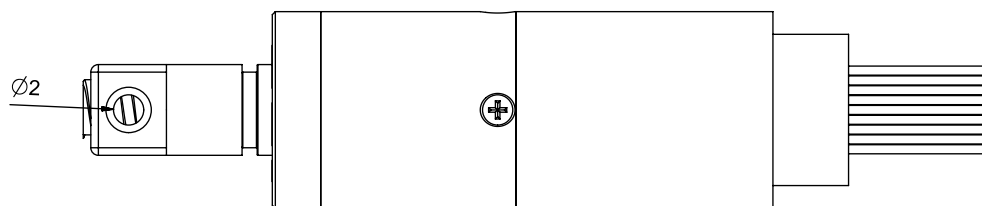
Note: Magnetic encoder, digital output, 3 channels, 1024 PPR



设计		第一视觉画法 	13mm Planetary Gearbox + 13mm Coreless Brushless Motor + Encoder (Product Type)
审核			TSL-PG13K100-KW1317+MA1024 (Inverted Module) (Product Model)
批准		未注线性与角度尺寸公差: GB/T1804-m eqv ISO 2768-1:m	Tsinglin Micro Motors Limited
日期	2025.11.15		



Lower lead screw nut, lead 2, diameter 4mm



**Motor Performance Parameters:**

1. Motor Type: Coreless Brushless Motor
2. Operating Voltage: 12V
3. No-load Speed: 25000 ± 10% RPM
4. No-load Current: ≤ 0.2A
5. Load Speed: 18000 ± 10% RPM
6. Load Torque: ≥ 15g.cm
7. Load Current: ≤ 0.8A
8. Stall Torque: ≥ 100g.cm
9. Pole Pairs: 2 Pole Pairs
10. Operating Temperature: -40-85°C
11. Noise: ≤ 45DB
12. Motor Maximum Efficiency: 75%

**Gearmotor Performance Parameters:**

1. Operating Voltage: 12V
2. No-load Speed: 1000 ± 10% RPM
3. No-load Current: ≤ 0.3A
4. Load Speed: 720 ± 10% RPM
5. Load Torque: ≥ 220g.cm
6. Load Current: ≤ 1A
7. Operating Temperature: -40-85°C
8. Reduction Ratio: 1:25
9. Noise: ≤ 55DB
10. Gearbox Material: Pure Steel (Machined)
11. Geared motors should not be subjected to frequent impacts or stalling during operation.

**Coreless Brushless Motor**

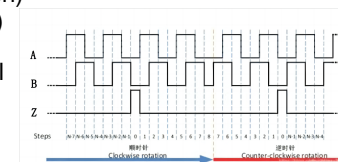
**Wiring Sequence: PIN1-3**

- pin1 - U (White)
- pin2 - V (Yellow)
- pin3 - W (Blue)

**Encoder Wiring Sequence: PIN1-5**

- pin1 - GND (Black)
- pin2 - VCC (Red)
- pin3 - A+ (Single-ended) (Yellow)
- pin4 - B+ (Single-ended) (Green)
- pin5 - Z+ (Single-ended) (Blue)

Note: Magnetic encoder, digital output, 3 channels, 1024 PPR



设计

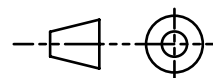
审核

批准

日期

2025.11.05

第一视觉画法



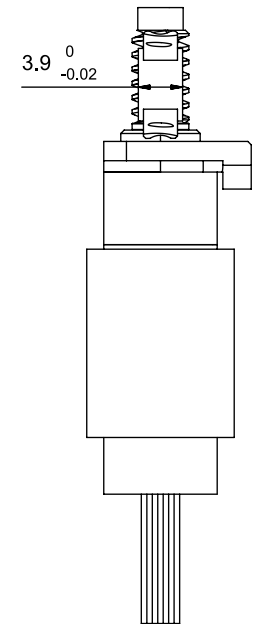
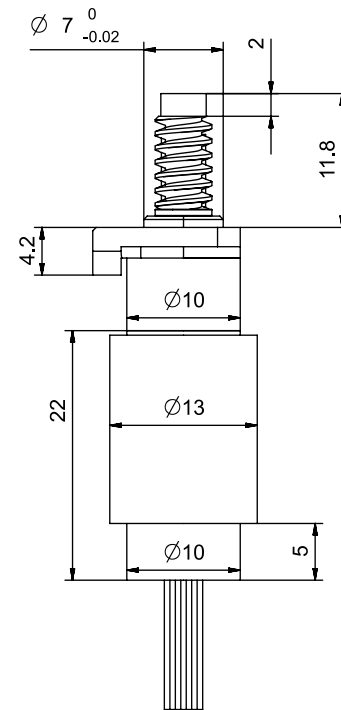
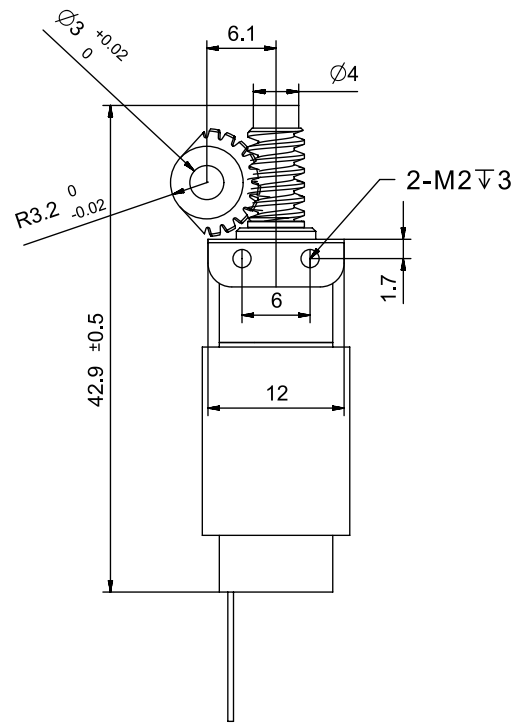
未注线性与角度尺寸公差：  
GB/T 1804 - m eq v  
ISO 2768 - 1 : m

13mm Planetary Gearbox + 13mm Coreless Brushless Motor + T-type lead screw + Encoder  
(Product Type)

TSL-PG13K25-KW1317-SG04+MA1024  
(Product Model)

Tsinglin Micro Motors Limited

Worm and Worm Gear Parameter Table		
	Worm	Worm Gear
Module	0.4	
Pressure Angle	1	20
Tip Diameter	20°	20°
Reference Diameter	5	8.8
Lead Angle	4.2	8
Worm Lead	Right-hand 5.44°	
Worm Pitch	1.257	-
Addendum Coefficient	1	1
Clearance Coefficient	0.25	0.25
Modification Coefficient	-	-
Transmission Center Distance	6.1	
Material	SUS416	20crmnti
Accuracy Class	GB/T 10095-2001-8级	



**Motor Performance Parameters:**

- Motor Type: Coreless Brushless Motor
- Operating Voltage: 12V
- No-load Speed: 25000±10%RPM
- No-load Current: ≤0.4A
- Load Speed: 18000±10%RPM
- Load Torque: ≥15g.cm
- Load Current: ≤1A
- Stall Torque: ≥100g.cm
- Pole Pairs: 2 Pole Pairs
- Operating Temperature: -40-85°C
- Weight: ≤30g
- Noise: ≤45DB
- Motor Maximum Efficiency: 75%

**Gearmotor Performance Parameters:**

- Operating Voltage: 12V
- No-load Speed: 45±10%RPM
- No-load Current: ≤0.5A
- Rated Speed: 30±10%RPM
- Rated Torque: ≥2500g.cm
- Rated Current: ≤1.2A
- Operating Temperature: -40-80°C
- Reduction Ratio: 1:560  
(Planetary Stage1:28, Wormand WormGear Stage1:20)
- Noise: ≤55DB
- Gearbox Material: PureSteel  
(Machined)

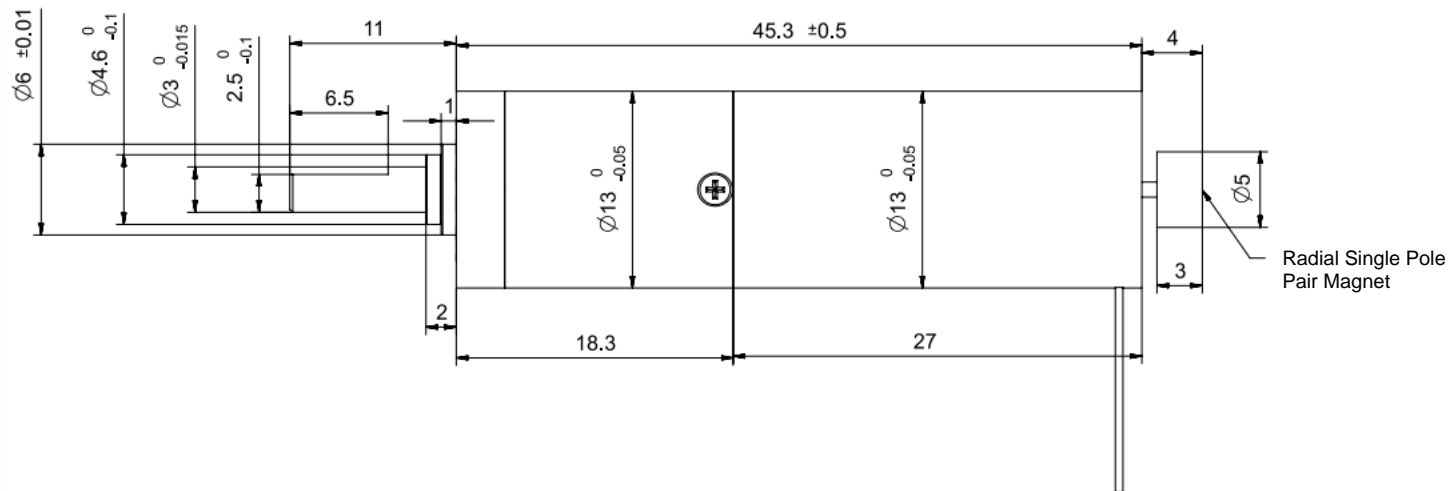
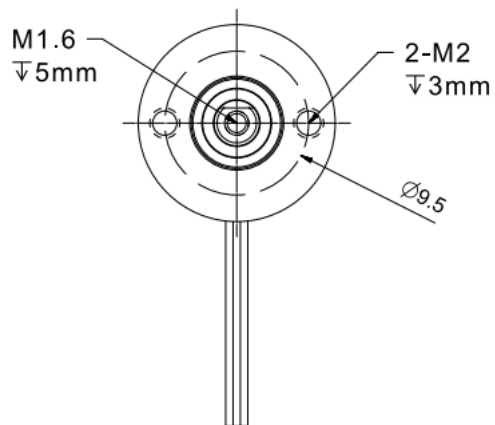
**Coreless Brushless Motor**  
Wiring Sequence: PIN1-3  
pin1 - U  
pin2 - V  
pin3 - W

设计		第一视觉画法 
审核		
批准		未注线性与角度尺寸公差： GB/T1804-m eqv ISO 2768-1:m
日期	2025.11.22	

10mm Planetary Gearbox + 13mm Coreless Brushless Motor+Worm Gear Reducer + Drive  
(Product Type)

TSL-PG10K28-KW1317+LG04M20Z (Module)  
(Product Model)

Tsinglin Micro Motors Limited



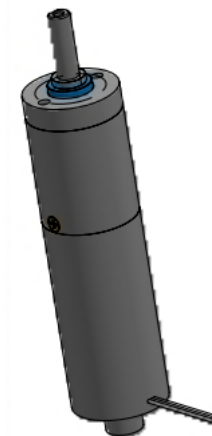
### Coreless Brushless Motor

Wiring Sequence: PIN1-3

pin1 - U (White)

pin2 - V (Yellow)

pin3 - W (Blue)



#### Motor Performance Parameters:

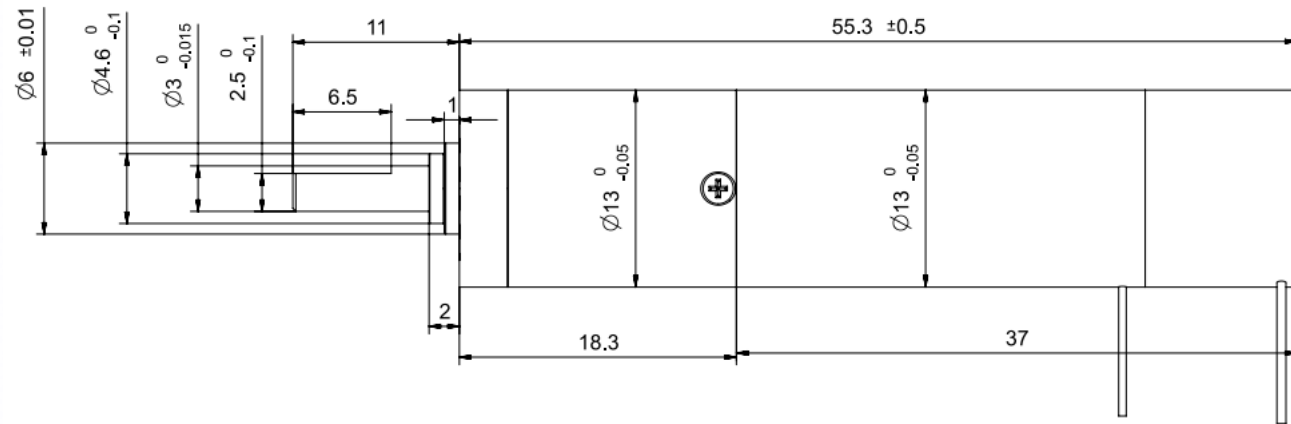
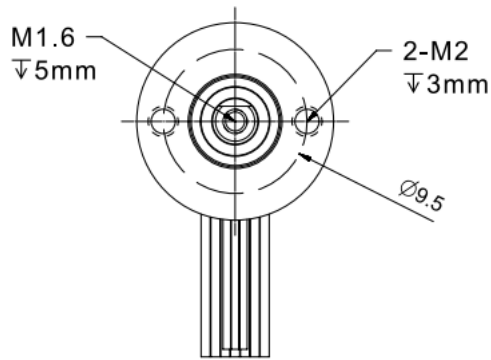
Motor Type: Coreless Brushless Motor

1. Operating Voltage: 12V
2. No-load Speed: 25000 ±10% RPM
3. No-load Current: ≤0.4A
4. Load Speed: 20000 ±10% RPM
5. Load Torque: ≥60 g·cm
6. Load Current: ≤0.8A
7. Stall Torque: >100 g·cm
8. Pole Pairs: 2
9. Operating Temperature: -40~85°C
10. Noise: ≤45 dB
11. Maximum Motor Efficiency: 75%

#### Gear Motor Performance Parameters:

1. Operating Voltage: 12V
2. No-load Speed: 200 ±10% RPM
3. No-load Current: ≤0.5A
4. Load Speed: 80 ±10% RPM
5. Load Torque: ≥0.4 N·m
6. Load Current: ≤1A
7. Operating Temperature: -40~80°C
8. Gear Ratio: 1:125
9. Noise: ≤55 dB
10. Gearbox Material: Solid Steel (Machined)

设计		第一视觉画法 	13mm Planetary Gearbox + 13mm Coreless Brushless Motor (Product Type)
审核			TSL-PG13K125-KW1327 (Product Model)
批准		未注线性与角度尺寸公差: GB\T1804-m eqv ISO 2768-1:m	Tsinglin Micro Motors Limited
日期	2025.08.08		



**Brushless Coreless Motor**

Wiring Sequence: PIN1-3

- pin1 - U (White)
- pin2 - V (Yellow)
- pin3 - W (Blue)

**Encoder Wiring Sequence: PIN1-5**

- pin1 - GND (Black)
- pin2 - VCC (Red)
- pin3 - A+ (Single-ended) (Yellow)
- pin4 - B+ (Single-ended) (Green)
- pin5 - Z+ (Single-ended) (Blue)

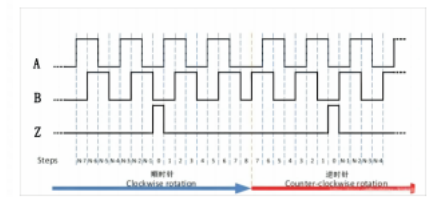
Note: Magnetic encoder, digital output, 3 channels, 1024 PPR

**Motor Performance Parameters:**

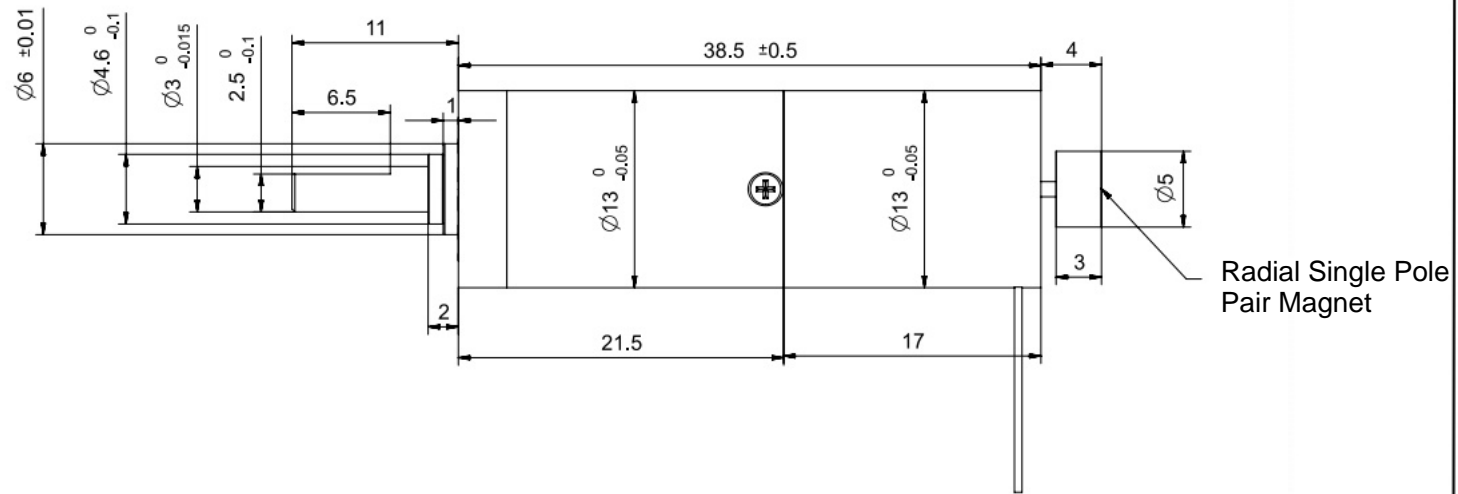
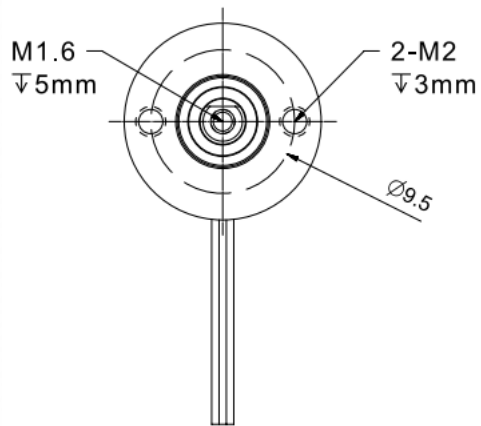
- 1.Motor Type: Brushless Coreless Motor
- 2.Operating Voltage: 12V
- 3.No-load Speed: 25000 ±10% RPM
- 4.No-load Current: ≤0.4A
- 5.Load Speed: 20000 ±10% RPM
- 6.Load Torque: ≥60 g·cm
- 7.Load Current: ≤0.8A
- 8.Stall Torque: >100 g·cm
- 9.Pole Pairs: 2
- 10.Operating Temperature: -40~85°C
- 11.Noise: ≤45 dB
- 12.Maximum Motor Efficiency: 75%

**Gear Motor Performance Parameters:**

- 1.Operating Voltage: 12V
- 2.No-load Speed: 200 ±10% RPM
- 3.No-load Current: ≤0.5A
- 4.Load Speed: 80 ±10% RPM
- 5.Load Torque: ≥0.4 N·m
- 6.Load Current: ≤1A
- 7.Operating Temperature: -40~80°C
- 8.Gear Ratio: 1:125
- 9.Noise: ≤55 dB
- 10.Gearbox Material: Solid Steel (Machined)



设计		第一视觉画法 	13mm Planetary Gearbox + 13mm Coreless Brushless Motor+Magnetic Encoder (Product Type)
审核			TSL-PG13K125-KW1327+MA1024 (Product Model)
批准		未注线性与角度尺寸公差： GB\T1804-m eqv ISO 2768-1:m	Tsinglin Micro Motors Limited
日期	2025.12.22		



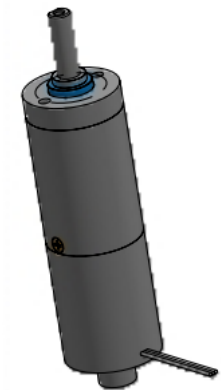
### Coreless Brushless Motor

Wiring Sequence: PIN1-3

pin1 - U (White)

pin2 - V (Yellow)

pin3 - W (Blue)



#### Motor Performance Parameters:

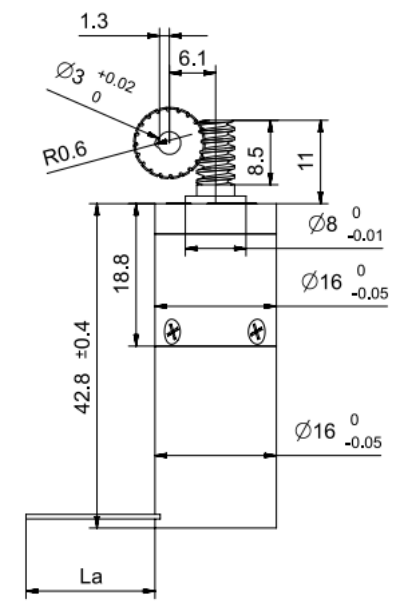
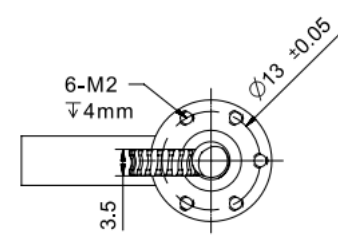
1. Motor Type: Coreless Brushless Motor
2. Operating Voltage: 12V
3. No-load Speed: 25000 ±10% RPM
4. No-load Current: ≤0.4A
5. Load Speed: 20000 ±10% RPM
6. Load Torque: ≥40 g·cm
7. Load Current: ≤0.8A
8. Stall Torque: >100 g·cm
9. Pole Pairs: 2
10. Operating Temperature: -40~85°C
11. Noise: ≤45 dB
12. Maximum Motor Efficiency: 75%

#### Gear Motor Performance Parameters:

1. Operating Voltage: 12V
2. No-load Speed: 90 ±10% RPM
3. No-load Current: ≤0.5A
4. Load Speed: 80 ±10% RPM
5. Load Torque: ≥0.7 N·m
6. Load Current: ≤1A
7. Operating Temperature: -40~80°C
8. Gear Ratio: 1:256
9. Noise: ≤55 dB
10. Gearbox Material: Solid Steel (Machined)

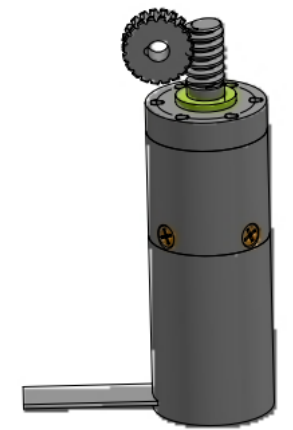
设计		第一视觉画法 	13mm Planetary Gearbox + 13mm Coreless Brushless Motor (Product Type)
审核			TSL-PG13K256-KW1317 (Product Model)
批准		未注线性与角度尺寸公差: GB\T1804-m eqv ISO 2768-1:m	Tsinglin Micro Motors Limited
日期	2025.08.08		

Worm and Worm Gear Parameter		
	Worm	Worm Gear
Module	0.4	
Number of Starts/Teeth	1	20
Pressure Angle	20°	20°
Addendum Circle Diameter	5	8.8
Pitch Circle Diameter	4.2	8
Lead Angle	右旋 5.44°	
worm lead	1.257	-
worm pitch	1.257	-
Addendum Coefficient	1	1
Clearance Coefficient	0.25	0.25
Modification Coefficient	-	-
center distance	6.1	
Material	20crmnti	SUS416
Accuracy Grade	GB/T 10095-2001-8级	



FPC Cable Length (La): 90 mm

- Pin Number Definition
- pin1-Ha
  - pin2-Hb
  - pin3-Hc
  - pin4-3.3V
  - pin5-GND
  - pin6+7-U
  - pin8+9-V
  - pin10+11-W
  - pin12-Thermistor



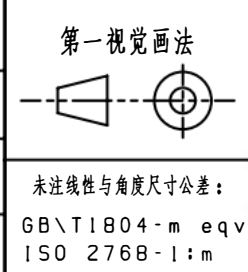
**Motor Performance Parameters**

- Motor Type: Coreless brushless motor
- Operating Voltage: 12 V
- No-load Speed: 35000 ± 10% RPM
- No-load Current: ≤ 0.4 A
- Rated Speed: 18000 ± 10% RPM
- Rated Torque: ≥ 70 g·cm
- Rated Current: ≤ 2 A
- Stall Torque: ≥ 200 g·cm
- Stall Current: ≤ 6 A
- Pole Pairs: 1 pair
- Operating Temperature: -40 - 80 °C
- Noise: ≤ 45 dB
- Maximum Motor Efficiency: 75%

**Gear Motor Performance Parameters**

- Operating Voltage: 12 V
- No-load Speed: 60 ± 10% RPM
- No-load Current: ≤ 0.4 A
- Rated Speed: 30 ± 10% RPM
- Rated Torque: ≥ 2 N·m
- Rated Current: ≤ 2 A
- Stall Torque: ≥ 5 N·m
- Operating Temperature: -40 - 80 °C
- Reduction Ratio: 1:580 (Planetary: 1:29; Worm Gear: 1:20)
- Noise: ≤ 55 dB
- Gearbox Material: Pure copper (machined)

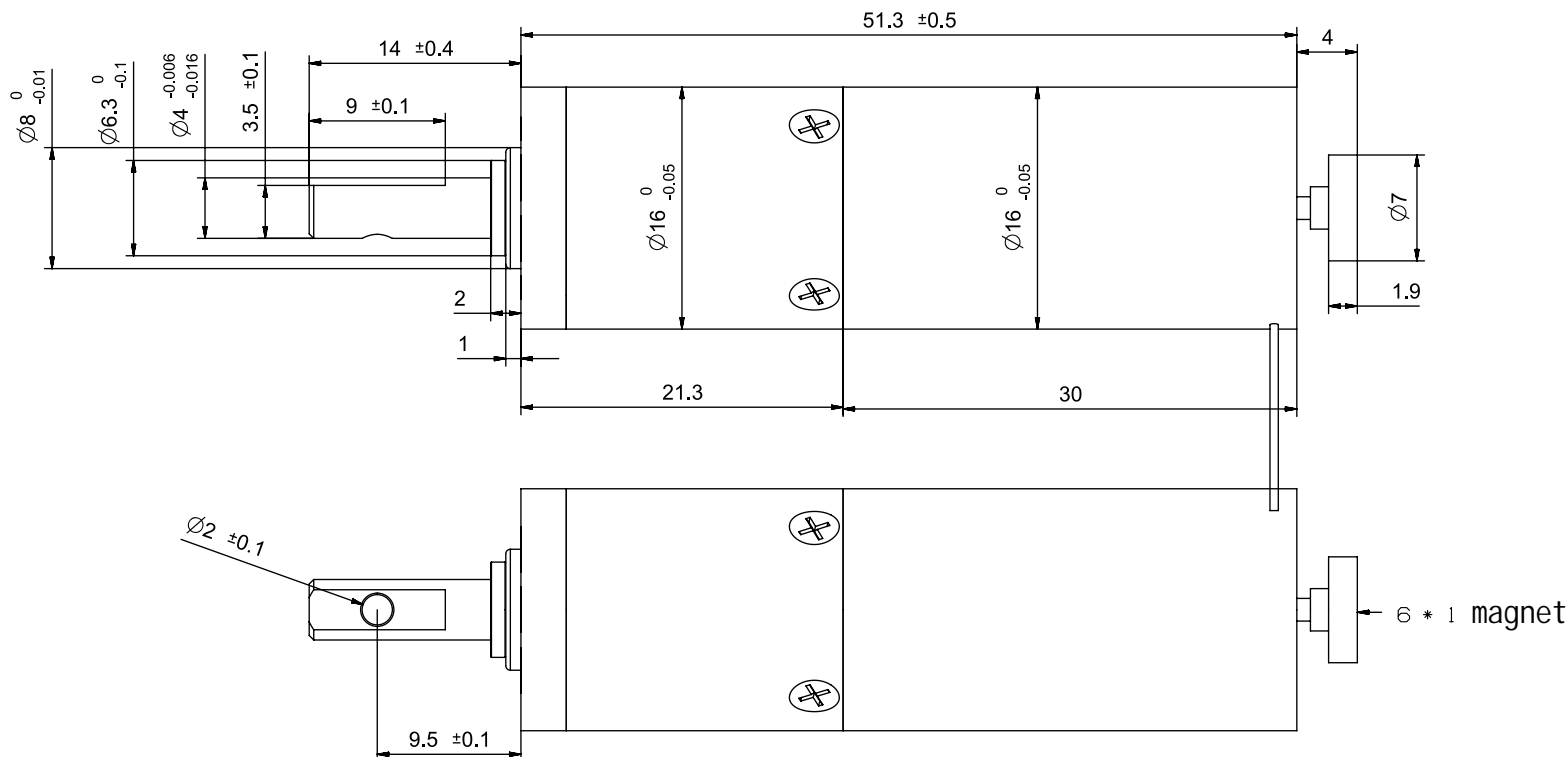
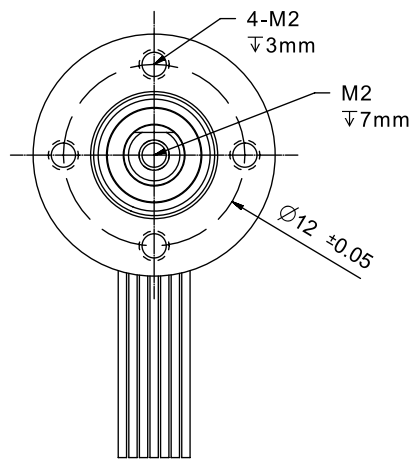
版本	变更日期	变更内容
A 1	2025.04.10	Changed worm shaft and output shaft to be integrated
A 2	2025.04.11	Changed overall machine length and worm shaft length
设计		
审核		
批准		
日期	2025.04.10	



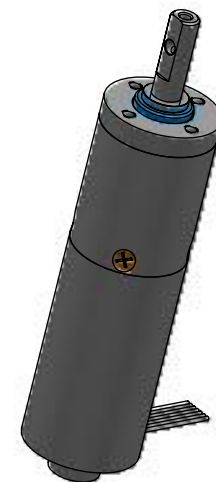
16mm Planetary Gearbox + 16mm Coreless Brushless Motor + Worm Gear Output (Product Type)

PG16K29-KW1624+LG04K20 (Product Model)

Tsinglin Micro Motors Limited



**Coreless Brushless Motor**  
Hall Wiring Sequence: PIN1-8



**Motor Performance Parameters:**

1. Motor Type: Coreless Brushless Motor
2. Operating Voltage: 12V
3. No-load Speed: 26000 ± 10% RPM
4. No-load Current: ≤ 0.4A
5. Rated Speed: 21000 ± 10% RPM
6. Rated Torque: ≥ 160 g·cm
7. Rated Current: ≤ 2A
8. Pole Pairs: 2
9. Operating Temperature: -40~80°C
10. Noise: ≤ 35 dB
11. Maximum Motor Efficiency: 75%

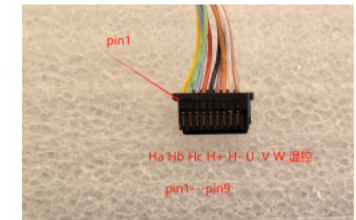
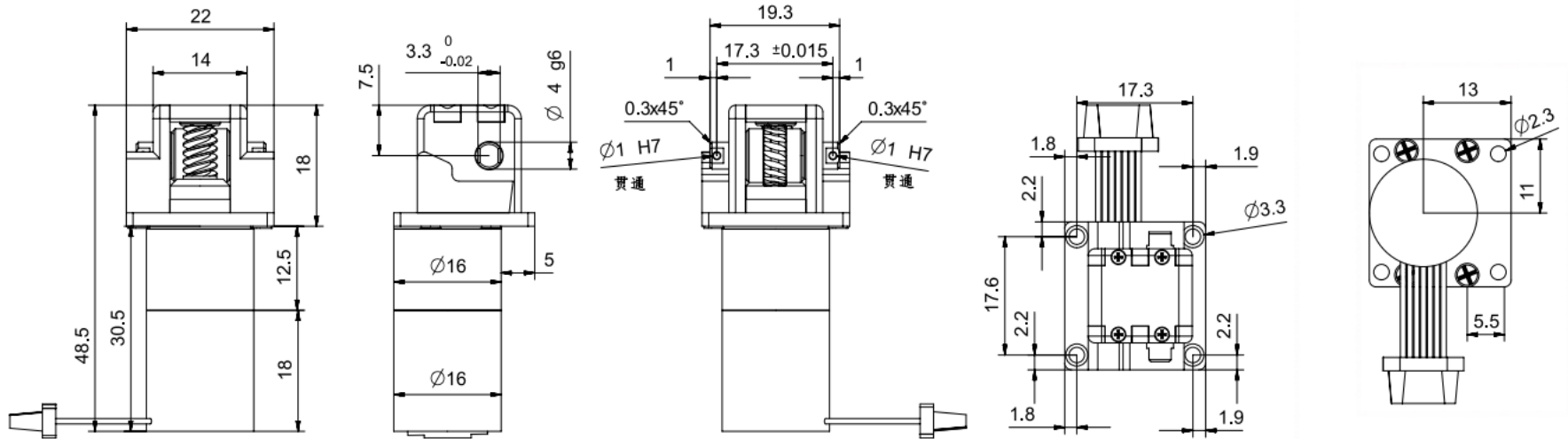
**Gear Motor Performance Parameters:**

1. Operating Voltage: 12V
2. No-load Speed: 300 ± 10% RPM
3. No-load Current: ≤ 0.4A
4. Rated Speed: 240 ± 10% RPM
5. Rated Torque: ≥ 0.8 N·m
6. Rated Current: ≤ 2A
7. Operating Temperature: -40~80°C
8. Gear Ratio: 1:84
9. Noise: ≤ 45 dB
10. Gearbox Material: Solid Steel (Machined)

- pin1 - U (White \ Thick)
- pin2 - V (Yellow \ Thick)
- pin3 - W (Blue \ Thick)
- pin4 - +5V (Red)
- pin5 - GND (Black)
- pin6 - HALL\_U (White)
- pin7 - HALL\_V (Yellow)
- pin8 - HALL\_W (Blue)

设计		第一视觉画法 	16mm Planetary Gearbox + 16mm Coreless Brushless Motor (Product Type)
审核			TSL-PG16K84-KW1630 (Product Model)
批准		未注线性与角度尺寸公差: GB/T1804-m eqv ISO 2768-1:m	Tsinglin Micro Motors Limited
日期	2025.02.25		

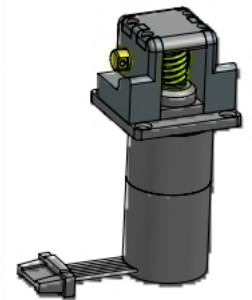
Worm and Worm Gear Parameter		
	Worm	Worm Gear
Module	0.4	
Number of Starts/Teeth	3	20
Pressure Angle	20°	20°
Addendum Circle Diameter	5	8.8
Pitch Circle Diameter	4.2	8
Lead Angle	Right-hand   5.95°	
Addendum Coefficient	1	1
Clearance Coefficient	0.25	0.25
Modification Coefficient	-	-
Material	20crmnti	SUS416
Accuracy Grade	GB/T 10095-2001, Grade 8	



Terminal Model:KW30-10P-1C(800)

Wiring Sequence:1-9

- pin1-HALLA
- pin2-HALLB
- pin3-HALLZ
- pin4-3.3V
- pin5-GND
- pin6-motor U
- pin7-motor V
- pin8-motorW
- pin9-Temp.Ctrl.



Motor Performance Specifications:

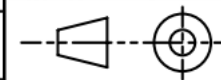
- Motor Type:Coreless Brushless Motor
- Operating Voltage:12V
- No-load Speed:32000±10%RPM
- No-load Current:≤0.5A
- Load Speed:28000±10%RPM
- Load Torque:≥3mNm
- Load Current:≤2A
- Number Of Pole Pairs:2 pole pairs
- Operating Temperature:-40 to 85°C
- Noise Level:≤45DB
- Maximum Motor Efficiency:75%

Reducer Motor Performance Specifications:

- Operating Voltage:12V
- No-load Speed:35±10%RPM
- No-load Current:≤0.5A
- Load Speed:30±10%RPM
- Load Torque:≥1mNm
- Load Current:≤2A
- Operating Temperature:-40 to 85°C
- Gear Reduction Ratio:1:853 (Planetary:1:128,Worm Gear:1:6.67)
- Noise Level:≤55DB
- Gearbox Backlash: ≤1.5 degree
- Gearbox Material:Pure Copper (Machined)

版本	变更日期	变更内容
A 1	2025.03.22	Change the worm gear and output shaft to an integrated design
设计		
审核		
批准		
日期	2025.04.30	

第一视觉画法



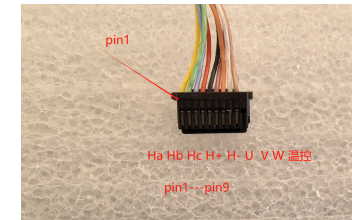
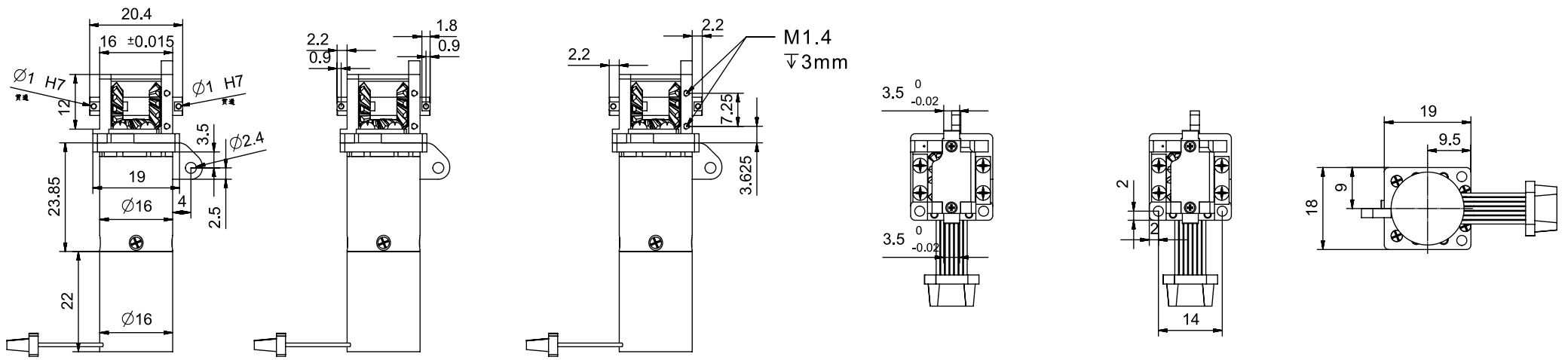
未注线性与角度尺寸公差:

GB\T1804-m eqv  
ISO 2768-1:m

16mm Planetary Gearbox+16mm Coreless Brushless Motor+worm gear reverse output (Product Type)

PG16K128-KW1618+LG04M20Z (Thumb Grasp Motor Module) (Product Model)

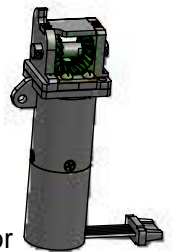
Tsinglin Micro Motors Limited



Connector Model: KW30-10P-1C (800)

Wire Sequence (Pins 1-9):  
Pin Number Definition

- pin1 HALLA
- pin2 HALLB
- pin3 HALLZ
- pin4 3.3V
- pin5 GND
- pin6 Motor U
- pin7 Motor V
- pin8 Motor W
- pin9 Motor Thermistor



**Motor Performance Parameters**

- 1.Motor Type: Coreless brushless motor
- 2.Operating Voltage: 12 V
- 3.No-load Speed: 20000 ± 10% RPM
- 4.No-load Current: ≤ 0.15 A
- 5.Rated Speed: 18000 ± 10% RPM
- 6.Rated Torque: ≥ 25 g·cm
- 7.Rated Current: ≤ 0.5 A
- 8.Stall Torque: ≥ 260 g·cm
- 9.Stall Current: ≤ 3 A
- 10.Pole Pairs: 1 pair
- 11.Operating Temperature: -40 - 80 °C
- 12.Weight: ≤ 50 g
- 13.Noise: ≤ 45 dB
- 14.Maximum Motor Efficiency: 75%a

**Gear Motor Performance Parameters**

- 1.Operating Voltage: 12 V
- 2.No-load Speed: 50 ± 10% RPM
- 3.No-load Current: ≤ 0.2 A
- 4.Rated Speed: 45 ± 10% RPM
- 5.Rated Torque: ≥ 0.6 N·m
- 6.Rated Current: ≤ 0.6 A
- 7.Stall Torque: ≥ 5 N·m
- 8.Operating Temperature: -40 - 80 °C
- 9.Reduction Ratio: 1:388
- 10.Noise: ≤ 55 dB
- 11.Gearbox Backlash: ≤ 1.5°
- 12.Gearbox Material: Pure copper (machined)

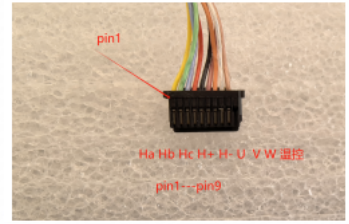
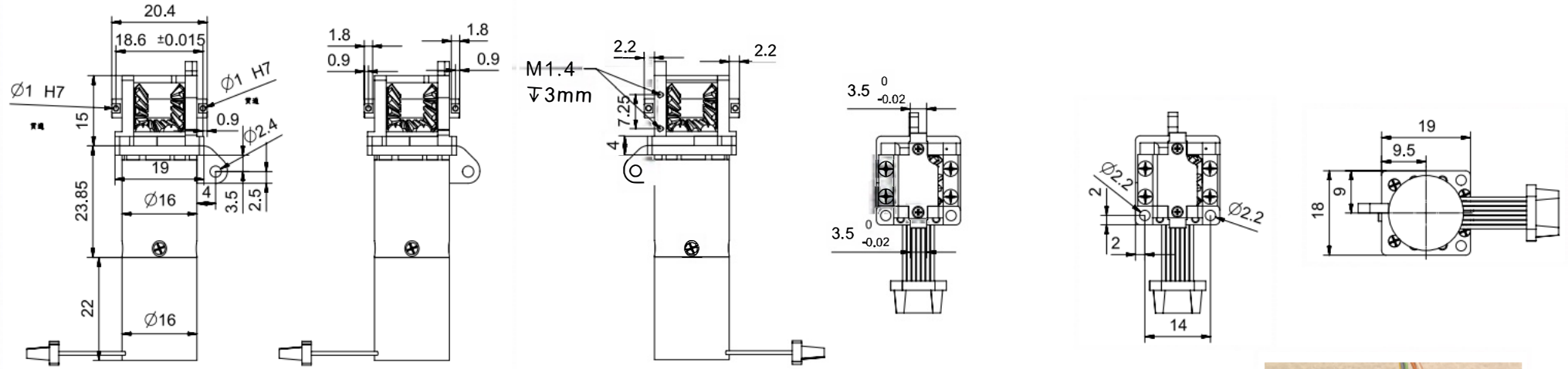
版本	变更日期	变更内容
A 1	2025.03.22	Modified upper and lower brackets to enhance rigidity
设计		第一视觉画法 
审核		
批准		未注线性与角度尺寸公差： GB\T1804-m eqv ISO 2768-1:m
日期	2025.04.30	

16mm Planetary Gearbox + 16mm Coreless Brushless Motor + 0.8 Modulus Bevel Gear  
Direction Change Output (Product Type)

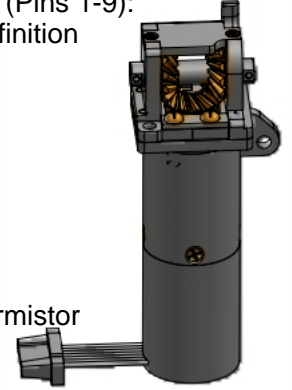
PG16K388R-KW1622

+SC08M12Z (Right-hand Wrist Motor Module) (Product Model)

Tsinglin Micro Motors Limited



Connector Model: KW30-10P-1C(800)  
 Wire Sequence (Pins 1-9):  
 Pin Number Definition  
 pin1 HALLA  
 pin2 HALLB  
 pin3 HALLZ  
 pin4 3.3V  
 pin5 GND  
 pin6 Motor U  
 pin7 Motor V  
 pin8 Motor W  
 pin9 Motor Thermistor



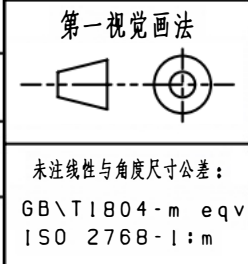
**Motor Performance Parameters**

- Motor Type: Coreless brushless motor
- Operating Voltage: 12 V
- No-load Speed: 20000 ± 10% RPM
- No-load Current: ≤ 0.15 A
- Rated Speed: 18000 ± 10% RPM
- Rated Torque: ≥ 25 g·cm
- Rated Current: ≤ 0.5 A
- Stall Torque: ≥ 260 g·cm
- Stall Current: ≤ 3 A
- Pole Pairs: 1 pair
- Operating Temperature: -40 - 80 °C
- Weight: ≤ 50 g
- Noise: ≤ 45 dB
- Maximum Motor Efficiency: 75%

**Gear Motor Performance Parameters**

- Operating Voltage: 12 V
- No-load Speed: 50 ± 10% RPM
- No-load Current: ≤ 0.2 A
- Rated Speed: 45 ± 10% RPM
- Rated Torque: ≥ 0.6 N·m
- Rated Current: ≤ 0.6 A
- Stall Torque: ≥ 5 N·m
- Operating Temperature: -40 - 80 °C
- Reduction Ratio: 1:388
- Noise: ≤ 55 dB
- Gearbox Backlash: ≤ 1.5°
- Gearbox Material: Pure copper (machined)

版本	变更日期	变更内容
A 1	2025.03.22	Modified upper and lower brackets to enhance rigidity
设计		
审核		
批准		
日期	2025.04.30	



16mm Planetary Gearbox + 16mm Coreless Brushless Motor + 0.8 Modulus Bevel Gear  
 Direction Change Output (Product Type)

PG16K388L-KW1622 + SC08M12Z (Left-hand Wrist Motor Module)  
 (Product Model)

Tsinglin Micro Motors Limited