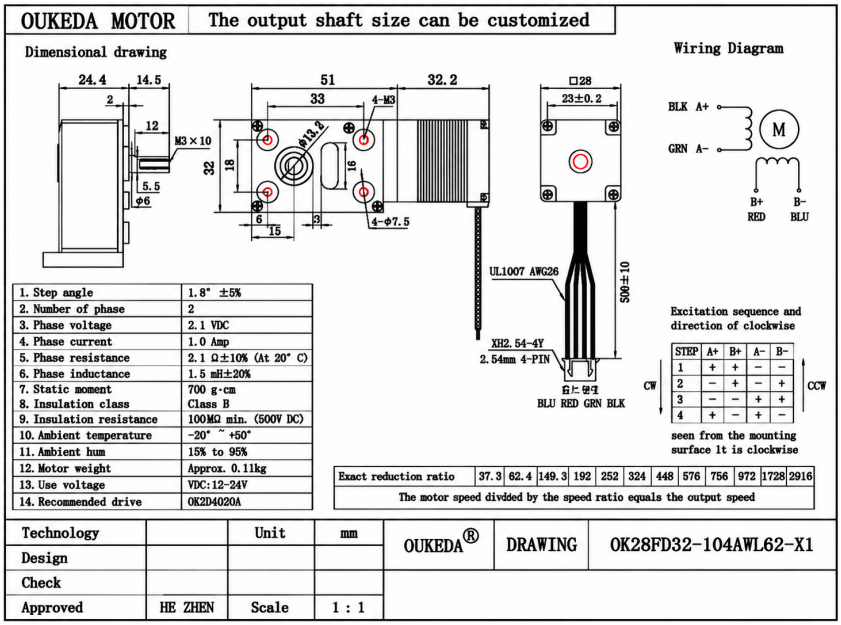
OUKEDA MOTOR

User Manual

NEMA 11 Stepper Motor with Worm Gearbox

Model: OK28FD32-104AWL62-X1

A compact 2-phase stepper motor assembly with a 28 × 28 mm nominal frame, four-lead connection, and multiple gearbox reduction options.



Product dimensional and wiring drawing supplied with this manual.

Important Safety Information

Read before installation. Disconnect the power supply before wiring or servicing. Use a suitable 2-phase stepper-motor driver and observe the specified phase current. Incorrect wiring, excessive current, or a stalled motor can cause overheating and damage.

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1. Product Specifications

Electrical Specifications

Manufacturer Part Number	OK28FD32-104AWL62-X1
Motor Type	2-Phase Hybrid Stepper Motor with Worm Gearbox
Number of Phases	2
Step Angle	1.8° ±5%
Holding Torque without Gearbox	6.86N·cm (0.97oz·in)
Rated Current/Phase	1.0A
Phase Resistance	2.1Ω ±10%
Phase Voltage	2.1VDC
Operating Voltage	12–24VDC
Inductance	1.5mH ±20%
Insulation Class	Class B
Insulation Resistance	100MΩ Min. (500VDC)
Recommended Driver	OK2D4020A

Gearbox Specifications

Gearbox Type	Worm Gearbox
Gear Ratio Options	37.3:1 / 62.4:1 / 149.3:1 / 192:1 / 252:1 / 324:1 / 448:1 / 576:1 / 756:1 / 972:1 / 1728:1 / 2916:1

Physical Specifications

Frame Size	28 × 28mm (nominal)
Motor Length	32mm
Gearbox Length	51mm
Shaft Diameter	6mm
Shaft Length	12mm
D-cut Length	5.5mm

Number of Leads	4
Lead Length	500 ±10mm
Wire Type	UL1007 AWG26
Connector Type	XH2.54-4Y, 2.54mm, 4-pin
Weight	Approx. 110g
Operating Ambient Temperature	−20°C to +50°C
Ambient Humidity	15% to 95%

Note: The 2.1VDC value is the rated phase voltage; 12–24VDC is the stated operating supply range. Use a current-regulated stepper driver and set the phase current to the motor rating.

2. Wiring and Driver Connection

The motor has four leads and two phases. The supplied drawing identifies the phase and wire-colour assignments as follows:

A+	Black	BLK
A−	Green	GRN
B+	Red	RED
B−	Blue	BLU

Connector Information

Connector: XH2.54-4Y, 2.54mm pitch, 4-pin. The drawing labels the four wire colours beneath the connector as BLU, RED, GRN, BLK. Confirm the connector viewing direction and pin numbering against the physical harness before connecting it to a controller.

Excitation Sequence Shown in the Drawing

1	+	+	−	−
2	−	+	−	+
3	−	−	+	+
4	+	−	+	−

Connection precautions
- Switch off the driver supply before connecting or disconnecting motor leads.
- Do not connect or disconnect the motor while the driver is energized.
- Do not exceed 1.0A rated phase current. Configure the driver according to its manufacturer's instructions.
- If the motor rotates in the wrong direction, change the direction command in the controller or follow the driver manufacturer's phase-reversal procedure. Do not randomly rearrange wires while powered.

3. Installation and Commissioning

1. Mechanical mounting: Secure the motor/gearbox using suitable fasteners and a rigid mounting surface. Ensure the mounting holes, shaft, and driven load are aligned. Avoid applying impact or excessive radial/axial force to the output shaft.

2. Coupling: Use a coupling compatible with the Ø6mm output shaft. The drawing indicates a 12mm shaft length and a 5.5mm D-cut dimension. The output shaft size may be customized; verify the delivered configuration before designing the coupling.

3. Electrical setup: Connect the four leads according to the phase mapping. Use a suitable driver, with 12–24VDC supply as specified and a phase-current setting no higher than the 1.0A rated value.

4. Initial test: Start at a conservative speed and acceleration. Check for smooth rotation, abnormal noise, vibration, and excessive temperature before operating under load.

4. Gearbox and Speed Selection

Twelve reduction ratios are listed for this model. Select the ratio that matches the required output speed and load conditions.

Output speed relationship
Output speed = Motor speed ÷ Gear ratio

For example, with a 1000rpm motor speed and a 100:1 reduction ratio, the theoretical output speed is 10rpm. This is an illustrative calculation only; the actual motor speed depends on the driver, load, and operating conditions.

37.3:1	62.4:1	149.3:1	192:1
252:1	324:1	448:1	576:1
756:1	972:1	1728:1	2916:1

5. Maintenance

- Keep the motor and gearbox mounting area clean and free from chips, dust, and moisture.
- Periodically inspect mounting screws, couplings, and cable insulation.
- Prevent the cable from being pulled, sharply bent, or rubbed against moving parts.
- Monitor motor and gearbox temperature during initial operation and after changes in load or duty cycle.
- Do not disassemble the gearbox unless qualified service instructions are available.

6. Basic Troubleshooting

Motor does not rotate	Check supply voltage, driver enable state, pulse/command input, current setting, and all four motor connections.
Motor vibrates or makes noise	Check phase wiring, step pulse frequency, acceleration, mechanical alignment, and whether the load is excessive.
Insufficient output speed	Check the selected gear ratio and motor command speed. Output speed decreases as the reduction ratio increases.
Motor or driver overheats	Check phase-current setting, supply/driver configuration, load, duty cycle, and ventilation. Stop operation if temperature rises abnormally.
Output shaft does not move under load	Check for mechanical binding or an excessive load. Confirm that the required output torque is within the manufacturer's rating.

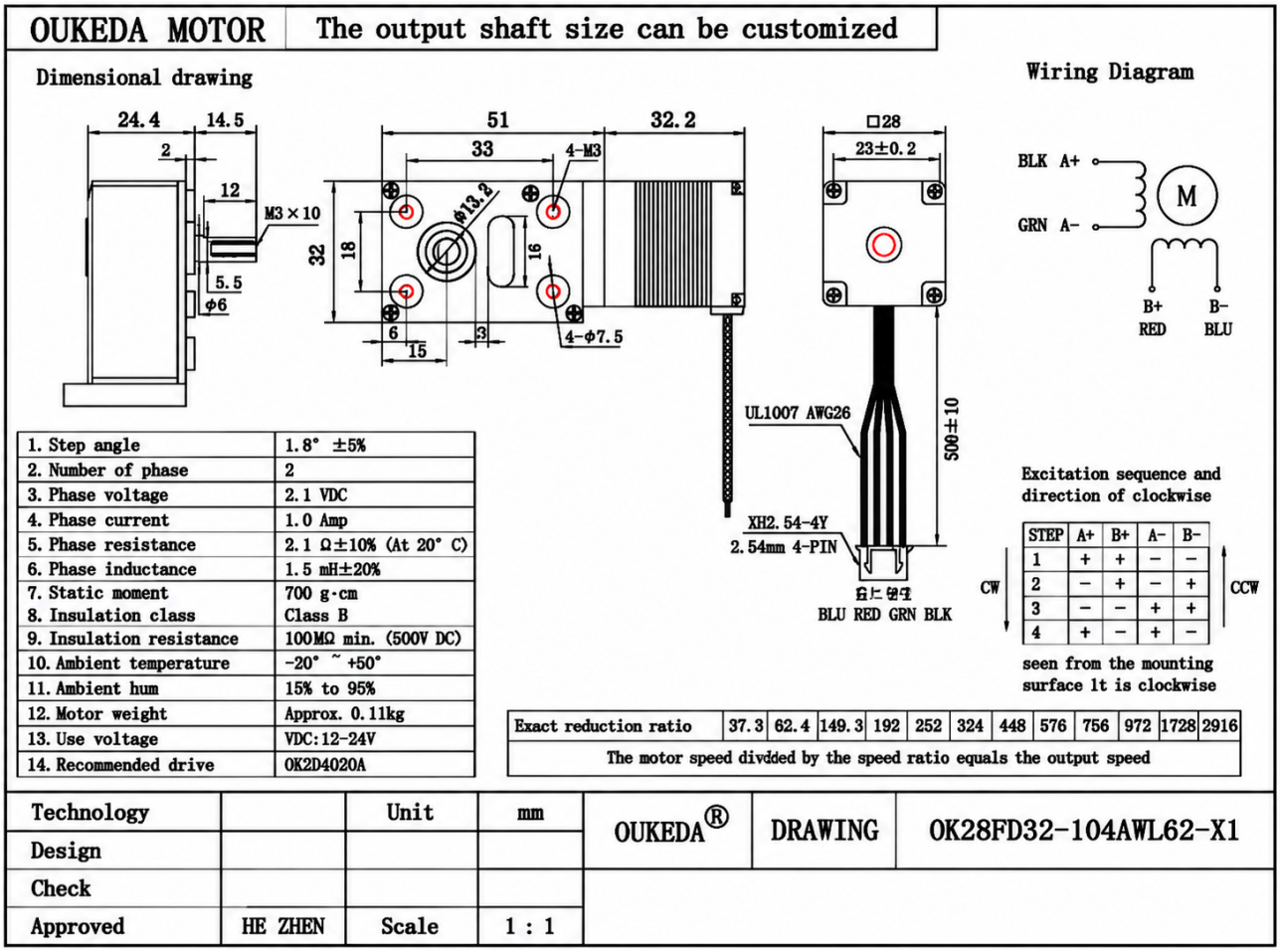
7. Information to Confirm with the Supplier

The supplied drawing and product details do not specify gearbox efficiency, no-load backlash, maximum permissible output torque, maximum axial/radial shaft loads, or rated output speed. Obtain these values from the manufacturer before finalizing a load-bearing application or safety-critical design.

The 700g·cm static moment is treated here as the motor holding torque without the gearbox, as stated in the product information. It must not be interpreted as the gearbox output torque.

8. Dimensional and Wiring Drawing

Use the supplied drawing as the dimensional reference. Dimensions are shown in millimetres unless otherwise indicated. The drawing notes that the output shaft size can be customized.



1. Step angle	1.8° ±5%
2. Number of phase	2
3. Phase voltage	2.1 VDC
4. Phase current	1.0 Amp
5. Phase resistance	2.1 Ω±10% (At 20° C)
6. Phase inductance	1.5 mH±20%
7. Static moment	700 g·cm
8. Insulation class	Class B
9. Insulation resistance	100MΩ min. (500V DC)
10. Ambient temperature	-20° ~ +50°
11. Ambient hum	15% to 95%
12. Motor weight	Approx. 0.11kg
13. Use voltage	VDC:12-24V
14. Recommended drive	OK2D4020A

STEP	A+	B+	A-	B-
1	+	+	−	−
2	−	+	−	+
3	−	−	+	+
4	+	−	+	−

Exact reduction ratio	37.3	62.4	149.3	192	252	324	448	576	756	972	1728	2916
The motor speed divdded by the speed ratio equals the output speed												

Technology		Unit	mm	OUKEDA®	DRAWING	OK28FD32-104AWL62-X1
Design						
Check						
Approved	HE ZHEN	Scale	1 : 1			

Dimensional verification: Confirm the actual motor, gearbox, shaft, connector, and mounting dimensions on the delivered unit before manufacturing mating parts. The drawing is a reference and should not be used as a substitute for dimensional inspection.

Document note: This manual is compiled from the supplied product drawing and product specifications. Where a parameter is not stated in the source information, it is identified as requiring supplier confirmation.