

φ30 Oil Mist Type Reducer RG - 3004M

OPERATION MANUAL

Thank you for purchasing the φ30 Oil Mist Type Reducer "RG-3004M". This reducer was developed for reducing the spindle rotation speed while increasing the motor torque. This Reducer is designed to be connected between the Motor and the Spindle. The E3000 CONTROLLER, Spindle, Brushless Motor and Air Line Kit are required to drive this Reducer. Read this and all the associated component Operation Manuals carefully before use. Always keep this Operation Manual in a place where a user can refer to for reference at any time.

1. CAUTIONS FOR HANDLING AND OPERATION

- Read these warnings and cautions carefully and only use in the manner intended.
- These warnings and cautions are intended to avoid potential hazards that could result in personal injury to the operator or damage to the device. These are classified as follows in accordance with the seriousness of the risk.

Class	Degree of Risk
WARNING	A safety hazard could result in bodily injury or damage to the device if the safety instructions are not properly followed.
CAUTION	A hazard that could result in light or moderate bodily injury or damage to the device if the safety instructions are not followed.

WARNING

- The Reducer is not a hand tool. It is to be connected between the NSK spindle and brushless motor and installed on a CNC machine or a special designed machine.
- Do not touch the cutting tool while it is running. It is very dangerous.
- Wear safety glasses, dust mask and use a protective cover around the Reducer whenever the Reducer is rotating.
- Never connect, disconnect or touch the Power Cord Plug or Motor Cord Plug with wet hands. This may cause an electric shock.
- Never operate or handle the Reducer until you have thoroughly read the Operation Manuals and safe operation has been confirmed.
 - To prevent injuries / damages, check the brushless motor, Reducer, spindle and cutting tool for proper installation, before operating the brushless motor, Reducer, spindle and cutting tool.
 - Before disconnecting the Reducer from the brushless motor and spindle, always turn the control power off and turn the compressed air supply to the CONTROLLER off. Then it is safe to remove the Reducer.

CAUTION

- This reducer uses an oil mist. If oil is not supplied to the Reducer, damage to the internal components of the Reducer will occur.
- Before use, carefully read "CONTROLLER, brushless motor, spindle, air line kit Operation Manuals" regarding the correct connection, operation and cautions when using the CONTROLLER, brushless motor, spindle, air line kit.
- Do not exceed the maximum allowable motor speed of 60,000min⁻¹ (rpm).
- Do not drop or hit this Reducer, as shock can damage to the internal components.
- Make sure that the transmission clutches engage firmly, when connecting to the brushless motor and the spindle.
- Stop working immediately when abnormal rotation or unusual vibration are observed. Immediately, please check the content of section "7. TROUBLESHOOTING".
- After installation, repair, initial operation, or long periods of non operation, please carry out break - in as follow. Start rotating slowly and over a short period of time, increase speed gradually until allowable maximum speed.
- Do not disassemble, modify or attempt to repair this reducer. Additional damage will occur to the internal components. Service must be performed by NSK NAKANISHI or an authorized service center.
- When using this Reducer for mass production, please consider the purchase of an additional Reducer to be used as a back-up in case of emergency.
- Securely connect the air / oil hose to the brushless motor and air line kit to avoid accidental disconnection and injury to the operator during use.

2. FEATURES

- When the reducer is connected between the spindle and the motor, it reduces the spindle rotation speed and increases the torque while keeping the motor speed unchanged.
- The reducer housing is made from precision ground, hardened, stainless steel (SUS) with an outside diameter of φ30mm.
- The Reducer utilizes a planetary gear system.

3. SPECIFICATIONS AND DIMENSIONS

3 - 1 Specifications

Model	RG - 3004M
Reduction ratio	1 : 4
Maximum allowable Motor Speed	60,000min ⁻¹ (rpm)
Weight	240g

Standard Accessories

- Operation Manual • • 1set.

< Option >

Use ISO VG15 Liquid Paraffin (Shell Ondina Oil #15) in the Air Line Kit lubricator bowl (For U.S.A. specification, use Chevron Superla #9).

Model
• Lubricating oil (K-211) 70cc (4oz.)
• Lubricating oil (K-202) 1ℓ (32oz.)

CAUTION

Do not exceed the maximum allowable motor of speed 60,000min⁻¹ (rpm) for the Spindle and the Reducer.

3 - 2 Outside View

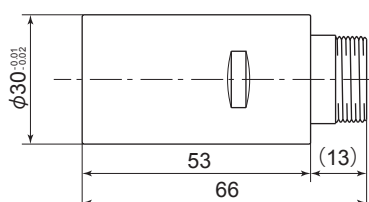


Fig. 1

4. CONNECTION OF THE REDUCER TO THE MOTOR

CAUTION

Make sure your hands and all interlocking parts of the Reducer and brushless motor are clean before connecting the Reducer to the brushless motor. This is critical in preventing contaminants from entering the brushless motor or Reducer.

Align the thread on the front end of the brushless motor and the rear of the Reducer, and turn the reducer clockwise. If the drive shaft of the brushless motor does not engage properly to the drive dog on the Reducer, it may only turn approximately two threads before stopping. DO NOT FORCE THEM TOGETHER. Loosen the reducer from the brushless motor, rotate the Reducer shaft by hand then re-try. The drive shaft and the drive dog must be fully engaged. When fully engaged, secure the brushless motor and Reducer using the provided 27mm wrench. (Fig. 2)

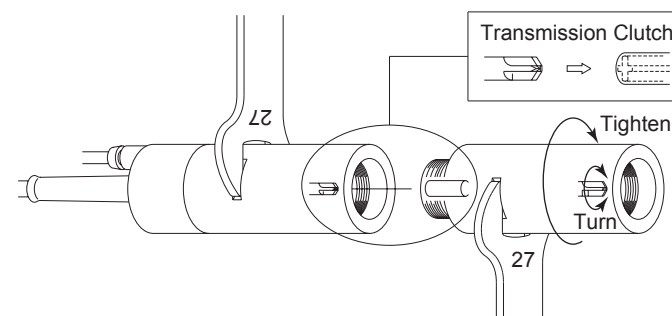
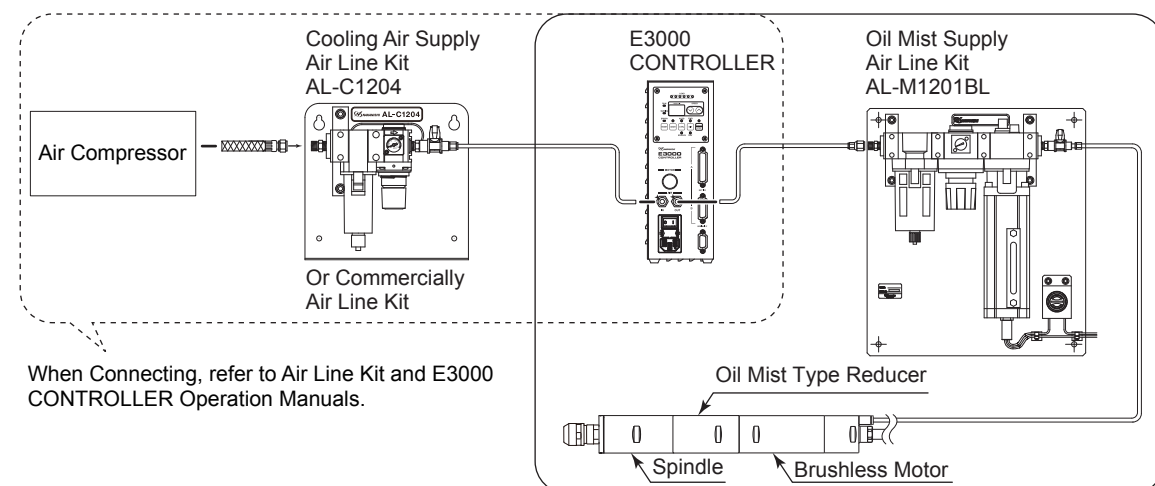


Fig. 2

5. SYSTEM CHART

The Oil Mist Type Reducer can be used with the following systems.



When Connecting, refer to section "6. CONNECTION OF THE MIST AIR LINE KIT (AL - M1201BL) TO THE OIL MIST TYPE REDUCER".
Fig. 3

6. CONNECTION OF THE MIST AIR LINE KIT (AL - M1201BL) TO THE OIL MIST TYPE REDUCER

- Connect the Connection Joint (Air Line Kit's Standard Accessory) to the Primary Joint of the Air Line Kit.
- Connect the φ6mm air hose to the Air Output Joint on the CONTROLLER. Connect the other side of the φ6mm air hose to the Connection Joint of the Primary Joint of the Air Line Kit.
- Insert one end of the φ4mm air / oil hose (Motor Cord's Standard Accessory) into the back of the motor.
- Insert the other end of the φ4mm air / oil hose (Motor Cord's Standard Accessory) into the Secondary Joint (φ6 One - Touch Joint) of the Air Line Kit. Use the provided Reducer (φ6mm - φ4mm Adaptor : CONTROLLER's Standard Accessory).
- Turn the Regulator Knob, adjust the air pressure to between the 0.25 - 0.3MPa.
- Turn the Adjusting Dome on the Lubricator, adjusting the Oil Drip Rate to between 1 - 3 drops / min.

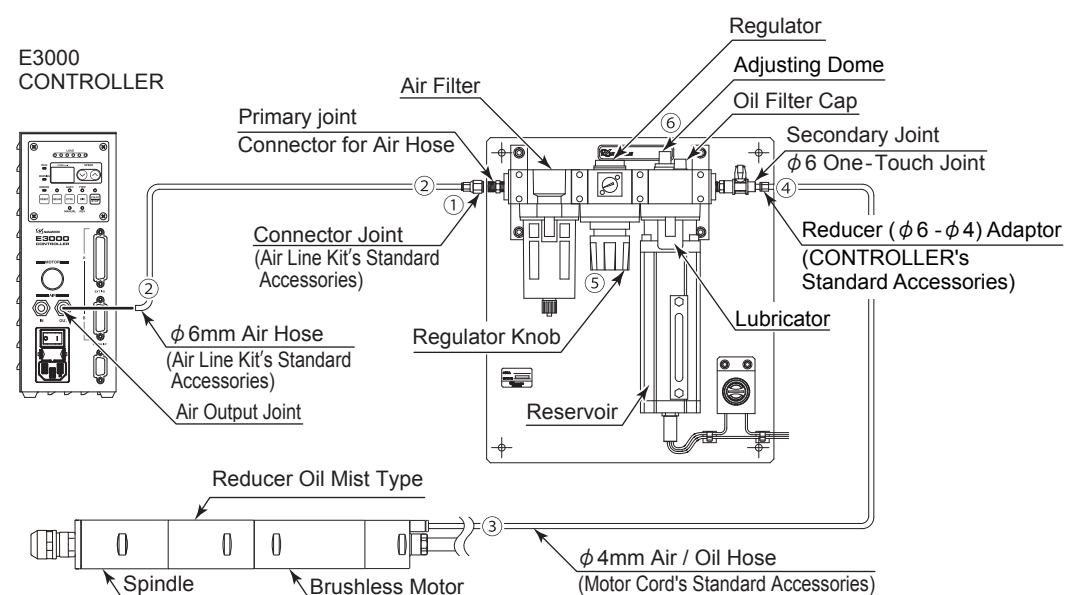


Fig. 4

7. TROUBLESHOOTING

If a problem or concern occurs, please check the following prior to consulting your dealer.

Trouble	Cause	Inspection / Corrective Action
Spindle does not rotate or rotate smoothly.	The Reducer bearings have been damaged.	Replace the ball bearings. (Return to NAKANISHI dealer service.)
	The Reducer gears have been damaged.	Replace the inner gears. (Return to NAKANISHI dealer service.)
Overheating during rotation.	Cutting debris has contaminated the ball bearings, and the ball bearings are damaged.	Replace the ball bearings. (Return to NAKANISHI dealer service.)
Abnormal vibration or noise during rotation.	Cutting debris has contaminated the ball bearing.	Replace the inner gears. (Return to NAKANISHI dealer service.)
	The spindles bearings have been damaged.	
	The Reducer gears have been damaged.	

8. DISPOSAL OF THE REDUCER

When disposal of a Reducer is necessary, follow the instructions from your local government agency for proper disposal of industrial components.