

REDUCER RG-01 • RG-02

OPERATION MANUAL

Thank you for purchasing the Reducer, RG - 01 and RG - 02. These are designed for reducing rotating speed and increasing torque for speed, mounted on motors. The Emax EVOLution <motor> or ROTUS <air motor> are required to drive this Reducer. Read this Operation Manual and <Emax EVOLution> or <ROTUS Air Motor> Operation Manual carefully before use.

1. CAUTIONS FOR HANDLING AND OPERATION

- Read these 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 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

- This Reducer is designed for hand use. Mount between the motor and the attachment and use.
- Do not exceed the " Maximum Allowable Motor Rotation Speed " (Refer to " 3 - 1 Specifications ").
- When sensing that the Reducer, attachment and motor are overheated during operation, reduce the working force or the motor rotation speed, or stop the operation until the Reducer cools down before restarting.
- 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.
- Do not apply excessive force. This may cause tool slippage, tool damage, injury to the operator, loss of concentricity and precision.

CAUTION

- Do not drop or hit this Reducer, as shock can cause damage to the internal components.
- When cleaning a Reducer, stop the motor and remove dirt with a brush or a cloth. Do not blow compressed air into the Reducer. Foreign particles or cutting chips may get into the ball bearings.
- Make sure that the transmission clutches engage firmly, when connecting to the motor and the attachment.
- Stop operating immediately when abnormal rotation or any unusual vibrations are observed. Afterwards, please check the content of Section " 5. TROUBLESHOOTING ".
- No lubrication is required because grease impregnated ball bearings are used.
- After repair, initial operation, or long periods of non operational time, please use the following break-in procedure. Start rotating slowly and over a short period of time, then increase the speed gradually until reaching the maximum allowable speed.
- Do not disassemble, modify or attempt to repair the Reducer. Additional damage will occur to the internal components. Service must be performed by NSK NAKANISHI or an authorized service center.

2. FEATURES

- If the Reducer is connected between the motor and the attachment, it reduces the rotating 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 $\phi 18.9\text{mm}$.

3. SPECIFICATIONS AND DIMENSIONS

3 - 1 Specifications

Model	RG - 01	RG - 02
Speed Reduction Ratio	1 / 4	1 / 15
Maximum Allowable Motor Rotation Speed	Less than $30,000\text{min}^{-1}$ (rpm)	
Maximum Motor Rotation Speed at the Cutting Tool	Less than $7,650\text{min}^{-1}$ (rpm)	Less than $1,950\text{min}^{-1}$ (rpm)
Applicable Motor	Emax EVOLution Motor (ENK - 410S, ENK - 250T)	ROTUS Air Motor (IM - 301, IM - 300)
Weight	68g	93g
Noise Level at 1m distance	Less than 70dB (A)	

	Temperature	Humidity	Atmospheric Pressure
Operation Environment	0 - 40°C	MAX.75% (No condensation)	800 - 1,060hPa
Transportation and Storage Environment	-10 - 50°C	10 - 85%	500 - 1,060hPa

Standard Accessories

- Pin Spanner (K - 233) • • 1pc.
- Operation Manual • • 1set.

WARNING

- Do not exceed the " Maximum Allowable Motor Rotation Speed ".
- When sensing that the Reducer, attachment and motor are overheated during operation, reduce the working force or the motor rotation speed, or stop the operation until the Reducer cools down before restarting.

3 - 2 Outside View

① RG - 01

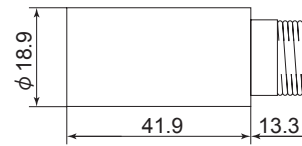


Fig. 1

② RG - 02

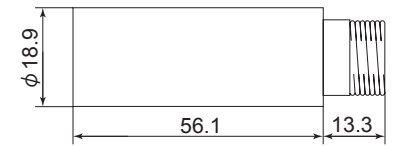


Fig. 2

4. CONNECTING TO THE MOTOR

CAUTION

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

Align the threads on the front end of the motor and the rear end of the Reducer, and turn the Reducer clockwise. If the drive shaft of the motor does not engage the drive dog on the Reducer, you may only turn it about 2 turns. DO NOT FORCE. Turn the Reducer back a few threads, rotate the thread on the front end of the Reducer by hand to engage the drive shaft and the drive dog, and screw them together with a provided pin spanner.

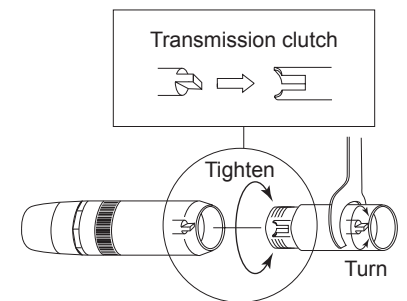


Fig. 3

5. TROUBLESHOOTING

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

Trouble	Cause	Inspection/Corrective Action
Reducer does not run.	The ball bearings are damaged.	Replace the ball bearings. (Return to NAKANISHI dealer service.)
	The inner gears are damaged.	Replace the inner gears. (Return to NAKANISHI dealer service.)
Overheating during rotation.	Cutting debris has contaminated the ball bearing, 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 bearings.	
	The ball bearings are worn.	Replace the inner gears. (Return to NAKANISHI dealer service.)
The inner gears are damaged.		

6. 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.