

NR50-5100 ATCRS

OM-K0668E 001

1. CAUTIONS FOR HANDLING AND OPERATION

⚠ WARNING

- ⚠ CAUTION**

Table.1 Packing List Contents

* The Collet chuck is attached to the Spindle.

① Defect in manufacturing.

- **Contact Us**

- For Other Markets

- ## 6. SPECIFICATIONS AND DIMENSIONS

* You may need to **lower** feed rate (mm/min) depending on the shape of **tools** being used or the thickness of work. **Always** check the milling condition before working.

- | | |
|--------------------------|---|
| <Option> | |
| Collet chuck (CHR-□□ RS) | φ3.0mm, φ3.175mm, φ4.0mm, φ6.0mm, φ6.35mm |

Make mine your favorite

⚠ CAUTION

Fig. 2

⚠ CAUTION

Fig. 3

⚠ CAUTION

- Please purchase the recommended commercially available air inlet fitting for the air inlet joint.

Fig. 4

9. CHANGING THE TOOL

⚠ WARNING

Do not open and close the collet chuck while the brushless motor is running.

⚠ CAUTION

- When the air is supplied to the inlet joint of the Spindle, the tool will be pushed out by exhausting the coolant air of brushless motor from the edge of Spindle. Be careful not to be damaged to the tool or be injured.
- Use the air on-off valve through which the air can be exhausted. Do not use 2 way valve, because the 2 way valve is not exhausted and the collet chuck is not closed.
- Do not open and close the collet chuck before the tool is not installed. Because this will cause damage to the collet chuck or loss of precision.

RECOMMENDATION

Please set the cutting tools to minimize the overhang amount. 13mm is the maximum amount of overhang to maintain high accuracy and safety.

- Stop the motor (Or check if the motor is stopped).
- Supply air pressure: from 0.55 - 0.6MPa to Air Inlet Joint through 3-way valve. Then, the chuck will be opened. At the same time, the tool is pushed out by the air exhaust for the coolant of motor. So, need the tool holder not to be damaged to the tool.
- Replace the tool.
- Exhaust the air through 3-way valve. The collet chuck will be closed and the tool can be fixed.

10. REPLACING THE COLLET CHUCK

⚠ CAUTION

- Collet chuck will be worn and torn if it will be opened and closed about 5,000 - 10,000 times. Replace it with the new collet chuck at this time.
- Before replacing the collet chuck, ensure that the Bushings (3 pcs.) and the O-ring (1 pc.) are properly and securely attached (Fig. 5). If any of these items are missing, install them before replacing the collet chuck.

- Stop the coolant air of motor.
- Supply air pressure : from 0.55 - 0.6MPa to Air Inlet Joint to keep the collet chuck opened.
- Do not take off the tool when the air pressure is supplied.
- Place the provided wrench 12mm on the wrench hook of the spindle shaft, and tighten the Spindle.
- And take off the collet chuck with the tool from the spindle shaft.
- Remove the tool from another collet chuck.
- Insert the tool into another collet chuck and turn it clockwise to be attached on the spindle shaft.
- Tight it tightly with the provided wrench 12mm and wrench 9mm. (Specified tightening torque : 1.0 N · m).
- Exhaust the air through 3-way valve.
- After the chuck is released, supply the coolant air of motor to the motor.

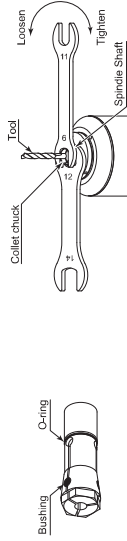


Fig. 5

11. INSTALLATION OF THE SPINDLE

⚠ WARNING

Whenever connecting a Spindle to a brushless motor, or when installing a spindle to a fixed base, ensure that the fixed base is grounded in order to avoid risk of an electric shock.

⚠ CAUTION

- When installing a Spindle, do not hit, drop or cause shock to the Spindle. This may cause damage to internal components and result in malfunctions.
- When mounting the Spindle, be sure to secure within Clamping area etched on the Spindle O.D. If the Spindle is installed incorrectly, damage to the internal components is possible.
- Cautions when tightening the securing bolts on to a Split Type Holder
 - Do not over-tighten the bolt. This will cause damage to Spindle's precision.
 - Tighten the bolt until the Spindle body can not be rotated by hand within the fixture.
 - Extreme tightening is not necessary or recommended.
- Apply working force and check that the Spindle is tight before using.

- When mounting a Spindle, refer to the Clamping Area etched on the Spindle (Fig. 7).

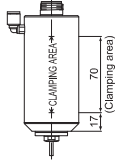


Fig. 7

- When installing a Spindle to the holder, recommended installation method is shown Fig. 8. Refer to "③ How to fabricate the Split Type Holder". If this is not possible, install as shown in Fig. 9.

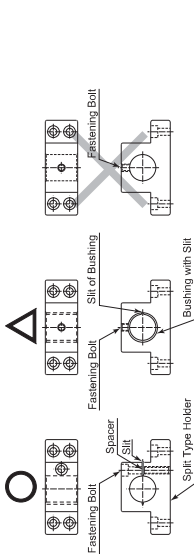


Fig. 8

Fig. 9

⚠ CAUTION

Do not allow set screws to come directly in contact with the Spindle body as shown in Fig. 10, as this will result in damage to the Spindle housing and internal components. When installing, never clamp directly over the bearings, as this will result in bearing damage. (Refer to Fig. 11)

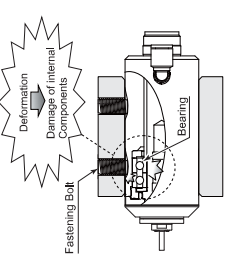


Fig. 10

Fig. 11

- How to fabricate the Split Type Holder

- Rough bore the inside diameter of the Split Type Holder.
- Cut a slit, (Ex. Slit 2mm) wide.
- Tighten the Screw for Removal and Force Open the Slit Area.
- Insert a spacer (Ex. thickness = 2mm) into the Slit Area.
- Loosen the Screw for Removal, and its tighten the fastening bolt with its specified torque.
- Finish the Split Type Holder so that the inside diameter of the Split Type Holder is $\phi 50$ with its tolerance range from -0.01mm to -0.015mm , and its roundness and cylindricity of less than $5\mu\text{m}$.
- When inserting the Spindle between the Fastening Bolt, and tighten the Screw for Removal, widening the Slit Area.

Fig. 12

⚠ CAUTION

- How to confirm the correct tightening or clamping of the Spindles in the holder
 - Measure the current value of the CONTROLLER's power cord by the clamp meter. Fasten the holder so that the increase in the no-load current value (during rotation at the maximum rotation speed) with the Spindle fastened is 10A (for type 200V / 230V) or less, compared to the no-load current value (during rotation at the maximum rotation speed) without fastening the Spindle. Do not over-tighten the Fastening Bolt. It may damage Spindle's precision and shorten the life of the bearings.
 - The final responsibility for ensuring holder's safety for use in a given application is left to the designer of the equipment in which NAKANISHI's capabilities and specifications.
 - NAKANISHI offers Spindle with a wide variety of capacities and specifications. Please carefully check the Spindle's specifications against the requirements of your equipment and verify suitability and safety of the Holder prior to initial use.

12. BREAK-IN PROCEDURE

During transportation, storage or installation, the grease inside the bearings will settle. If the Spindle is suddenly run at high-speed, the grease will be ejected from the bearings, causing excessive heat that will cause bearing damage. After installation, repair, initial operation, or long periods of non operation, please follow the break-in procedure detailed in Table 2.

Table 2					
Steps	1	2	3	4	
Rotation Speed (min ⁻¹) (rpm)	15,000	30,000	40,000	50,000	
Rotation Time (min)	15	10	10	15	
Items to Check	No Abnormal Noises	The spindle housing temperature during the break-in process should not exceed 20 degrees C (36 degrees F) above ambient temperature. Should the spindle exceed this limit, rest the spindle for at least 20 minutes and re-start the break in procedure from the beginning. If the housing temperature rises again and exceeds 20 degrees C (36 degrees F) above ambient temperature, check the spindle and motor for proper installation.			

13. CAUTIONS WHEN USING GRINDSTONES AND TOOLS

⚠ CAUTION

The maximum surface speed or rpm is always specified for a grindstone. Do not exceed the maximum speed with reference to the calculating chart below. Always follow the grindstone manufacturer's recommendations.

$$\text{Surface Speed (m/s)} = \frac{3.14 \times \text{Diameter (mm)} \times \text{rotation speed (min}^{-1}\text{)} (\text{rpm})}{1,000 \times 60}$$

- The proper surface speed for general grindstones is 10 - 30m/s.
- Do not exceed 13mm of overhang for mounted grindstones as shown in Fig. 13. If the overhang must exceed 13mm, reduce the motor speed in accordance with Table 3.
- Dress the grindstone prior to use.
- Do not use cutting tools with bent or broken shanks, cracks or excessive run-out.
- For grinding, the maximum depth of cut should not exceed 0.01mm radially or axially. Reciprocate the tool several times after each pass to eliminate tool pressure.
- Always operate cutting tools within the allowable recommended speed of the cutting tools. Use of a cutting tool outside of the allowable speed of the cutting tools could cause damage to the Spindle and injury to the operator.
- Keep the cutting tool shank and collet chuck clean. If contaminants are left in the collet chuck or chuck nut, excessive run-out will cause damage to the cutting tool and Spindle.
- Do not strike or disassemble the Spindle.
- Please set the cutting tools to minimize the overhang amount. 13mm is the maximum amount of overhang to maintain high accuracy and safety.

Table 3. Overhang and Speed

Overhang (mm)	Max. Speed (min ⁻¹) (rpm)
20	N x 0.5
25	N x 0.3
50	N x 0.1

N=Max. Operating Speed with 13mm overhang.

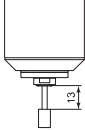


Fig. 13

14. TROUBLESHOOTING

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

Trouble	Cause	Inspection/Corrective Action
Spindle does not rotate or rotate smoothly.	The spindles ball bearings have been damaged. The motor has been damaged.	Replace the ball bearings. (Return to NAKANISHI dealer service.) Replace the motor. (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.	The tool shank is bent. Cutting debris has contaminated the ball bearing.	Replace the tool. Replace the ball bearings. (Return to NAKANISHI dealer service.)
Tool allpage.	The spindles ball bearings have been damaged. Collet chuck is not correctly installed.	Check and clean the collet chuck. Reinstall the collet chuck. Replace the collet chuck.
High run-out.	The tool is bent. Collet chuck is not correctly installed.	Change the tool. Secure the collet chuck correctly.
	The collet chuck is worn.	Replace the collet chuck.
	The collet of the Spindle is worn.	Replace the Spindle shaft. (Return to NAKANISHI dealer service.)
	Contaminants inside the collet chuck or the Spindle.	Clean the collet chuck and the inside of the taper and Spindle.
	The Spindle ball bearings has been damaged.	Replace the ball bearings. (Return to NAKANISHI dealer service.)
Check can not be opened and closed.	Poor the air hose.	Check all threaded joints and re-tighten if necessary.
	The air hose have been damaged.	Replace the air hoses.
	Low air pressure.	Check and adjusting the air circuit.
	Error connection of the air circuit.	

15. DISPOSAL OF THE SPINDLE

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