

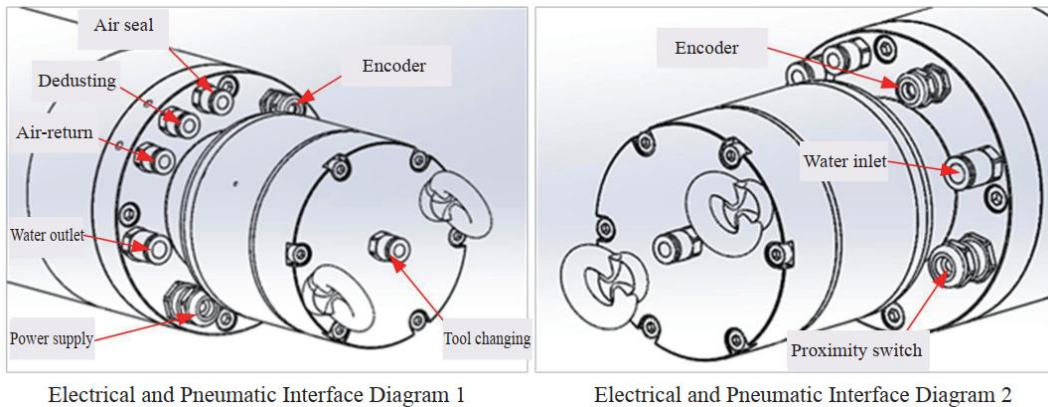
# Operating Guide for General Cylindered Spindle

## 1. Overview

This operating guide provides users a brief description of the electrical and pneumatic connection of general cylindered spindle and the cautions. Please refer to the profile drawing of this spindle for detailed parameters.



## 2. Diagram of the End Connection Interface of Spindle



## 3. Electrical Connection

- 1) The spindle motor shall be applied together with a suitable frequency converter or driven controller whose selection and the parameters shall match with the voltage, current and power of the spindle motor. During the operation, the frequency converter shall be set strictly according to the U-f curve of the spindle.

- 2) Wiring: tricolored wires connected to U, V, W phases; yellow-green wire is connected to ground. If user requires temperature protection control, two wires of 110℃ thermistor is connected to the temperature control system.

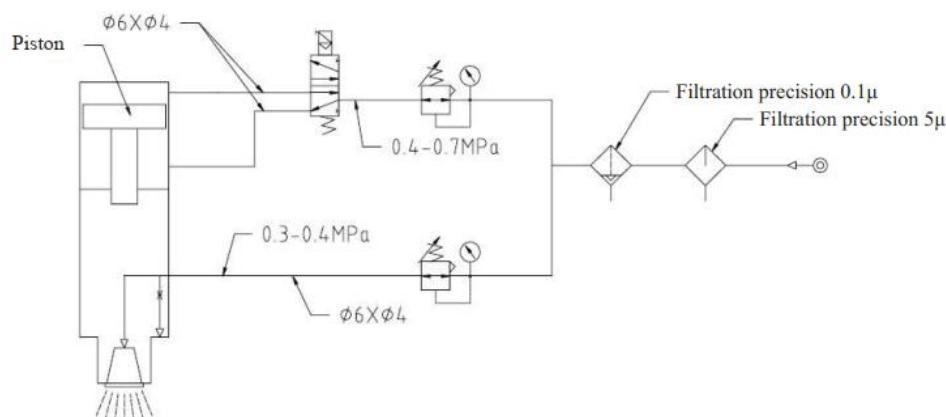
**⚠ Note:** User shall test the phase sequence of three-phase power supply connection, and ensure that the spindle rotates counterclockwise viewed from extension end of spindle!

- 3) Proximity switch: it is equipped with two PNP N.O. (normally open) proximity switches for tool-loading and tool-unloading. User can connect the wires according to the identifications of outgoing wires of proximity switches of spindle. Connection of proximity switch: brown wire is connected to +24VDC and the blue wire is connected to 0VDC; connect the positive of signal loading to black wire / and negative to 0VDC.
- 4) Encoder: this interface is a reserved interface and this type of spindle is not equipped with encoder.

## 4. Pneumatic Connection

Figure below is a pneumatic connection diagram. This type of spindle has four interfaces of compressed air for “Tool-changing”, “Air-return”, “Air seal” and “De-dusting”. All these

interfaces apply the hoses of  $\Phi 6 \times \Phi 4$  corresponding to the quick connections of spindle. The pneumatic system in the figure below shall be prepared by customer.



- 1) Interfaces of “Tool-changing” and “Air-return” controls the piston movement of tool-changing cylinder. This type of spindle is not equipped with piston reset spring. It shall reset the piston through connecting the compressed air to “Air-return” interface of spindle. It is recommended to apply a two-position-five-channels solenoid valve to control the “Tool-changing” and “Air-return”: connect the normally open end of two-position-five-channels solenoid valve to the “Air-return” interface of spindle, and the other end to the “Tool-changing” interface. The air pressure is 0.4~0.7Mpa.

**⚠ Cautions:** During the operation of spindle, it shall keep the “Air-return” interface normally open!

- 2) “De-dusting” interface shall be open during tool-changing to blow out the foreign materials inside the tapered bore of tool holder, maintain positive pressure to prevent foreign materials or dust from entering into the tapered bore. “Tool-changing” and “De-dusting” shall act simultaneously, thus both can be controlled in parallel. The air pressure is 0.3~0.4MPa.
- 3) “Air seal” interface is connected with clean dry air of 0.1~0.2MPa, and it keeps normally connected.

## 5. Cooling Water Connection

During the operation of spindle, it shall feed the cooling water to avoid over-heat the spindle. It shall apply a hose of  $\Phi 8-6$  for cooling water for the quick connection with water inlet and outlet of spindle. The delivery of pump head shall be not less than 12m.

## 6. Cautions of Spindle Operation

**⚠ Special Warning**

- 1) The spindle shall be mounted to the clamping position, otherwise it would damage the bearing!
- 2) It shall not change tools before complete stop of spindle. The manual tool-changing button shall be unavailable while spindle is rotating, otherwise it would cause the block of spindle!
- 3) It shall start the spindle after cylinder returns air (piston reset), otherwise it would block the spindle!
- 4) It shall keep the de-dusting air-line open while tool-changing to prevent the dust or foreign materials from entering into the spindle!
- 5) Air seal shall keep the state of normally open!
- 6) The compressed air shall be clean and dry with filtering precision of 0.1 $\mu$ m! Air sealing shall be normally open. It is recommended to apply two levels of filtering with precisions of 0.5 $\mu$ m / 0.1 $\mu$ m, and the filter shall be equipped with automatic drainage.
- 7) It shall set the frequency converter strictly according to the U-f curve of the spindle.