

# **Tunnel Thruster of Precautions for Installation on Board**

## **(for reference only)**

Depending on the installation stage, some shipyards will require the manufacturer to ship the thruster barrel section in advance so that the simplification can be installed when the first section is constructed.

### 1. Installation of side push cylinder

1) When positioning the guide tube, be sure to keep the guide tube horizontal and vertical.

2) When welding the draft tube and the hull structure, the welding method that minimizes the bending deformation of the internal diameter of the draft tube shall be adopted.

3) Welding lugs or other accessories on the stainless steel plate in the draft tube will corrode the stainless steel plate, so welding is prohibited.

4) The hull rib plate can be welded with any part of the side thrust guide tube except the motor pedestal and its support plate.

5) After the welding of the side thrust guide pipe and the hull guide pipe is completed, the inner wall of the welded part needs to be polished smoothly.

6) During the welding of the guide tube, special attention should be paid not to damage the angle transmitter and the blade.

### 2. Installation of the main motor

1) To install the main motor, please refer to the "Elastic Coupling Instruction Manual". The installation is based on the axis of the side-push input shaft so that the installation error of the elastic coupling is within the allowable range.

2) Adjust the two ends of the elastic coupling to be parallel to meet the alignment requirements of the elastic coupling. After alignment is complete, record the alignment results.

3) Before installing the elastic coupling serpentine spring, it is necessary to carefully check whether there is foreign matter on the end face of the coupling, make a thorough cleaning, and then install it step by step according to the "Installation Essentials of Coupling Spacer".

4) After installing the main motor, hit the screw tail cone pin according to the requirements to fix the main motor.

5) Under normal circumstances, the manufacturer will also require the shipyard to install an appropriate anti-vibration bracket above the main motor after the main motor is installed to prevent the main motor from vibrating too much during operation.

### 3. Installation of the hydraulic device and gravity oil tank

1) The hydraulic system, gravity oil tank and other equipment must be installed

on a solid base with reference to the hydraulic system diagram provided by the manufacturer, and anti-vibration should also be fully considered.

2) When installing the hydraulic system, reserve appropriate maintenance space.

#### 4. Pipeline oil cleaning operation

##### 1) Preparations

①The oil pump for oil stringing and the oil tank of suitable capacity should be prepared.

②Prepare the filter for oil stringing, etc.

③The side thruster body, hydraulic system, gravity fuel tank, manual pump, etc. provided by the manufacturer have been cleaned with oil before delivery under normal circumstances. To prevent foreign matter from entering, auxiliary piping should be used to bypass the above equipment when oil is mixed in the shipyard. . Therefore, the shipyard needs to prepare an appropriate number of bypass pipes and their joints.

##### 2) String oil and refuelling

Referring to the hydraulic system diagram, by opening and closing the necessary valves in the system, the serial wash oil forms a circuit in the system pipeline. In order to enhance the oil-crossing effect, tap the piping lightly from the outside and at the same time increase the oil flow rate as much as possible. After the oil string is over, attention should be paid to preventing foreign matter from entering the oil pipe again, and the oil pipe should be installed according to the docking mark of the oil pipe as soon as possible. After all the pipelines are installed, inject the corresponding grade of lubricating oil into the system pipeline through the gravity oil tank.

So far, the installation process of the bow thruster on the ship has been completed. After the ship is launched or out of the dock, it is necessary to re-check the installation status and confirm the pitch angle scale and the blade pitch change action.

