

# MAINTENANCE MEASURES FOR LASER CUTTING MACHINE CHILLER IN WINTER

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As we all know, the laser cutting machine is a device that converts electric energy into laser energy. Its internal structure is complex, involving the combination of multiple disciplines and fields such as light and electricity. Although the optical fiber laser cutting machine has lower environmental requirements than other laser cutting machines, the use environment must also meet the requirements, so that its own protective measures can play the due protective role.

With the coming of winter, the laser cutting machine is facing the test of severe cold. Once used improperly, it may affect the normal operation of the equipment, and then affect the customer's production schedule; The laser and water chiller will be damaged, causing unnecessary property losses to customers. In order to avoid the above situations, customers are required to observe the following precautions when using the water chiller in winter:

1 The ambient temperature of the laser water chiller must be above 0 . The main reason is to prevent the water in the water system from freezing once the laser water chiller is stopped due to the low ambient temperature (especially in the north), which will affect the normal use of the equipment, and even damage the whole refrigeration system.

2 When the ambient temperature of the equipment is between 0 and - 10 , if the laser and water chiller stop working (such as power failure) and no antifreeze is added, the water in the water system must be drained in time, and the water in the laser must be drained with compressed air or nitrogen (pressure of about 5 bar), and the water in the water pump and pipeline of the water chiller must be drained manually. The water chiller will not cause equipment icing and damage when it is in operation. It is required that the water in the water system (including the laser machine) must be drained. The anti-freezing liquid designated by the laser is - Clariant Antifreeze N, and the freezing liquid: deionized water is 1:2. After adding antifreeze, it can resist - 20 without freezing. However, because the antifreeze is corrosive to a certain extent, please change back to the normal cooling water after winter, and clean the entire water circuit before that, and clean the antifreeze;

3 The ambient temperature of the laser cutting machine shall not be lower than - 10 .

4 Drainage method:

1. Laser drainage method: after the water pipe is disconnected, use compressed air or nitrogen (pressure of about 5 bar) to aim at the water inlet and outlet and blow water for about one minute to drain the water inside the laser.

2 Water tank drainage method: open the drain valve at the bottom of the water tank to drain the water in the water tank. If necessary, tilt the water cooler at a certain angle to make the drain outlet at a low point. Water drainage in the pipeline: use compressed air or nitrogen (pressure of about 5 bar) to blow from the inlet and outlet of low temperature water and high temperature water for about one minute respectively, and drain from the outlet of the water tank. Water pump head drainage: there is a drain screw at the lower part of each pump head. When the water cooler needs to be stopped and transported for a long time, open the drain screw at the pump head to drain the water in the water pump, blow it out with compressed air or nitrogen (the pressure is about 5 bar), and then tighten the drain screw. Drainage of filter and deionized water tank: open the drain valve at the lower part of filter and deionized water tank or plexiglass shell to drain the residual water.

3. Drainage method of laser cutting machine tool: blow for 2 minutes with compressed air inlet and outlet.

#### 5 Inspection points and treatment methods for opening laser water chiller in winter:

1. After starting the cooling water pump and normal temperature (external light path) water pump of the chiller, check the readings of the cooling water pressure gauge and normal temperature water pressure gauge first. In case of pressure or flow alarm, it is necessary to pay attention to whether there are valves in the water system that are not open or there is the possibility of icing, and timely judge and handle. If it is determined to be icing, the manufacturer must be notified in time to cooperate with it and never solve it by itself!

2. After the normal operation of the water pump, if the cooling water temperature is lower than the low temperature that the laser machine is allowed to start, the temperature cannot rise for a long time. The set temperature of cooling water and normal temperature water can be set higher than 5 . For other problems, see the instructions or notify the maintenance personnel. Finally, the set temperature of cooling water and normal temperature water must be adjusted to the specified set temperature value (generally, the set temperature of cooling water is 20-25 , and the set temperature of normal temperature water is 25-35 )