

# **Elimination of blockages in refrigeration system**

## **(I) Elimination of ice blockage**

The reason for the ice blockage in refrigeration system is the excessive moisture in system. Therefore, the entire refrigeration system must be dried. There are two treatment methods:

1. Heat and dry the components with a drying oven by removing the compressor, condenser, evaporator, capillaries, return tube of the refrigeration system from the refrigerator, and putting them into the drying oven, with a temperature inside the oven around 120°C and a drying time of 4 hours. When components are naturally cooled, dry them one by one with nitrogen blowing. Replace a new dry filter, followed with the assembly welding, suppressing and leak detection, vacuuming, refrigerant charging, commissioning and sealing. It is the best way to eliminate the ice blockage, but only suitable for the warranty department of refrigerator manufacturer. General repair departments may eliminate the ice blockage by heating and vacuuming.

2. Eliminate the water in the components of refrigeration system by heating and vacuuming and secondary vacuuming. Please see the relevant content of Chapter IV for detailed methods of operation.

## **(II) Elimination of filth blockage**

There are two ways to eliminate the filth blockage in capillaries: First, blow out the filth blocked in the capillary with high-pressure nitrogen combined with other methods. When the capillary is clear, clean and dry the components of refrigeration system, and assembly and weld them again to eliminate the failure. Second, if the blockage in capillary is too severe to be eliminated by using the above method, replace the capillary may work. Detailed steps are as follows:

1. Blow out the filth blocked in the capillary with high-pressure nitrogen: Cut open the process pipe to discharge the liquid, remove the capillary from the dry filter, and connect the process pipe of compressor with the three-way repair valve, filled with high pressure nitrogen of 0.6 - 0.8MPa. Straighten the capillary and heat it with the carbonizing flame of gas welding to carbonize the filth in the pipe, and blow out the filth in the capillary with high-pressure nitrogen. When the capillary is clear, charge air to clean it with 100ml of carbon tetrachloride. Condenser may be cleaned with carbon tetrachloride on the pipe cleaning device. Then replace the dry filter, followed with nitrogen charging, leak detection, vacuuming, and refrigerant charging.

2. Replace the capillary: If the blockage in capillary may not be eliminated by using the above method, replace the capillary together with the low-pressure pipe. Remove the low-pressure pipe and capillary from the copper-aluminum joint of evaporator by gas welding. Before disassembly and welding, the copper-aluminum joint shall be

wrapped in wet cotton yarn to prevent the aluminum tube from being burned at high temperature.

The flow measurement shall be conducted when the capillary is replaced. Do not weld the outlet of capillary with the inlet of evaporator at first. Install the repair valve and pressure gauge in the suction-exhaust inlet and outlet of the compressor respectively. As the compressor runs and the air is inhaled from the low-pressure repair valve inhalation, when the suction pressure equals the external atmospheric pressure, the indicated pressure of the high pressure gauge shall remain at 1 - 1.2MPa. If the pressure exceeds, it indicates that the flow is too small, which may be resolved by cutting off a section of capillary until the pressure turns normal. If the pressure is too low, it indicates that the flow is too large, which may be resolved by winding the capillary to increase its resistance, or replacing a capillary, and welding the capillary and the inlet pipe of evaporator until the pressure turns normal.

When welding the new capillary, the length to be inserted into the copper-aluminum joint shall be about 4 - 5cm, so as to avoid the blockage by welding. When welding, the length of capillary to be inserted into the dry filter shall be 2.5cm. If the capillary is inserted too much into the dry filter, it would be too close to the filter screen, so that tiny molecular particles will enter the capillary and block it. When welding, if the capillary inserted into the dry filter is not enough, impurities and tiny molecular particles will enter the capillary and block it. Therefore, the capillary inserted into the filter must be neither too much nor too little. Too much or too little insertions will both lead to the blockage. Figure 6 - 11 show the connections between capillary and dry filter.

### **(III) Elimination of greasy blockage**

The greasy blockage indicates that there is so much refrigerator oil in the refrigeration system that it affects the refrigeration effect, or suspends the refrigeration. Therefore, it is necessary to remove the refrigerator oil from the system.

In the case of the greasy blockage in the filter, replace a new filter, and blow out a part of refrigerator oil accumulated in the condenser with high-pressure nitrogen, with a dryer to heat the condenser when charging nitrogen.