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FULLY WELDED PLATE HEAT EXCHANGER

Operation and Maintenance Instruction Manual

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1. Introduction

The fully welded plate heat exchanger is currently the most advanced high-efficiency and energy-saving heat exchange equipment in the world. It uses corrugated plates as heat transfer elements, metal full welding process sealing, and no rubber gasket design. The corrugated plates have a "static stirring" effect,

which can form turbulence at a very low Reynolds number, and greatly reduce scaling, making the maintenance and cleaning of the equipment very convenient. The plate bundle of the fully welded plate heat exchanger can be installed in the pressure shell according to the design requirements, which improves safety and reliability. Therefore, the fully welded plate heat exchanger has the advantages of high heat transfer efficiency, compact structure and light weight, and inherits the advantages of shell and tube heat exchangers such as high pressure, high temperature resistance, good sealing performance and safety and reliability. The fully welded plate heat exchanger is designed for condensation, evaporation, liquid-liquid, vapor-liquid, gas-liquid, and gas-gas medium heat exchange.

2. Structural features

The common structural forms of fully welded plate heat exchangers are mainly plate frame type, welded box type, detachable box type, and plate shell type. It has the following characteristics:

2.1. High heat transfer efficiency

The heat exchange of the medium in the fully welded plate heat exchanger is achieved through the plate tube bundle. The plates that make up the plate tube bundle are pressed and formed by a special press for the plate heat exchanger. The structure is similar to the detachable plate heat exchanger, with the advantages of high heat transfer efficiency, small fluid pressure drop, and small heat dissipation loss.

2.2. Wide range of applications

The fully welded plate heat exchanger is a perfect combination of the efficient heat transfer performance of the plate heat exchanger and the temperature resistance and pressure bearing capacity of the shell and tube heat exchanger.

Since the plate bundle and the clamping plate are all welded, the fully welded plate heat exchanger can operate safely and smoothly under high temperature and high pressure conditions.

2.3. Compact structure, flexible and convenient

A set of molds can be used to press plates of the same width and different lengths to form a series of products with the same width. Therefore, there are many specifications and models, and there is a lot of room for choice. Different plate types can be selected according to different working conditions.

2.4. Not easy to scale and leak

The corrugated plate has a "static stirring" effect as a heat transfer element. The metal plate is sealed by advanced laser welding and fully automatic resistance welding, so it is not easy to scale and leak.

2.5. Small footprint

This product has a large unit heat transfer area and a high total heat transfer coefficient. In addition, there are three structural forms (horizontal, ear-type support vertical, leg-type support vertical), which is convenient for installation in different positions, so the footprint is greatly reduced.

3. Equipment installation requirements

3.1. Inspection before installation

3.1.1 Check whether the appearance of the equipment meets the requirements of the drawings and whether it is damaged during transportation.

3.1.2 Check whether there is rust at each interface that affects the sealing.

3.1.3 Check whether each fastener is loose, rusty, or spotted.

3.2. Site and foundation

3.2.1 According to the structural form of the equipment, sufficient space should be left at both ends after installation to meet the needs of disassembly, assembly, and maintenance.

3.2.2 The foundation size should be compatible with the support size. The foundation can be cast with concrete or steel structure.

3.3. Installation of equipment

3.3.1 Place horizontal equipment on the foundation and align it horizontally. Place vertical equipment on the foundation and align it vertically. The centerline deviation should be less than 5mm, and then tighten the nuts.

3.3.2 If there are anchor bolts on the movable support, two locking nuts should be installed, and a gap of 1~3mm should be left between the nuts and the base plate.

3.3.3 After the equipment is installed, the end of the movable support should not hinder the thermal expansion of the equipment.

3.3.4 The equipment should be connected to pipelines and accessories without force to avoid strong assembly.

3.3.5 The pipeline installation of the heat exchanger can refer to the completion drawing attached to the machine. First remove the plugging plates of each pipe port, and at the same time, valves of the same diameter should be installed on each inlet and outlet pipe port, and then connected to the pipeline. Before the pipeline and equipment are installed and docked, the debris in the pipeline should be removed to prevent dirt from entering the heat exchanger to cause blockage of the flow channel or damage to the plate, affecting the heat exchange effect.

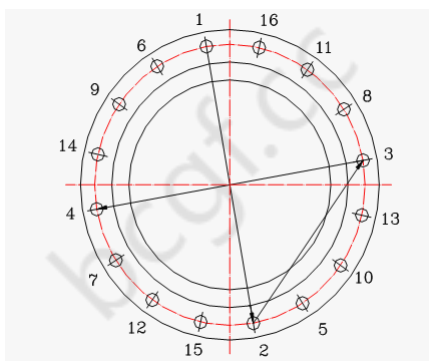
3.3.6 A decontaminator should be installed before the medium enters the heat exchanger to prevent debris from entering the heat exchanger during operation.

3.3.7 Before the test run, the valves and instruments should be installed in place according to the drawings and the control requirements of the system.

3.3.8 The cold and hot medium inlet and outlet pipelines should strictly follow the provisions of the cold and hot medium inlet and outlet orientation of this product. Wrong connection will lose the operating effect or cause an accident.

4. Test run and operation

4.1. A water pressure test can be carried out before the test run. The bolts should be tightened again before the test, and the order should be carried out according to the diagram to avoid leakage on the sealing surface.



The pressure of the water pressure test is 1.25 times the working pressure, and it can also be carried out according to the system regulations, but the test pressure shall not exceed the value of the test pressure on the product nameplate; when the water pressure test is carried out on one side, the other side must maintain pressure, and the maximum pressure difference on both sides shall not exceed the difference in the water pressure test pressure specified in the drawing or nameplate. It is forbidden to use sewage for water pressure test to avoid water corrosion of the plate.

4.2. Before the test run, check the drawings for special requirements and instructions.

4.3. A vent valve should be installed in the pipeline system to exhaust the air in the medium and prevent gas from remaining in the equipment and reducing the heat transfer efficiency.

4.4. During the test run and operation, the low-pressure side medium should be slowly injected, and then the high-pressure side medium should be injected. When shutting down, the high-pressure side medium should be slowly cut off, and then the low-pressure side medium should be cut off. Do not impact

violently when starting. When the equipment starts to run or shut down, the pressure change shall not exceed 1MPa/min, and the temperature change shall not exceed 11℃/min.

4.5. If the equipment is used for steam-water heat exchange, the circulating water should be injected first, and then the steam; when shutting down, the steam should be cut off first, and then the circulating water should be cut off.

4.6. The equipment shall not be operated under conditions exceeding those specified on the nameplate, and over-temperature and over-pressure operation is strictly prohibited.

4.7. During the operation of the equipment, the valves and measuring instruments should be checked frequently to see if they are operating normally and whether there is any leakage. If there is any abnormality, they should be repaired or replaced in time.

4.8. During the operation of the equipment, the medium temperature, pressure drop, and vibration of the plate bundle of the plate and shell should be monitored frequently. If abnormality is found, the cause should be analyzed in time, and repair and maintenance should be carried out if necessary. Repair and maintenance must be carried out during the shutdown period.

4.9. Heat exchangers for flue gas should regularly remove the soot that may accumulate at the bottom of the equipment, and flush the pipes with desalted water to avoid scaling inside the pipes.

5. Maintenance and care

5.1. When the equipment works for a long time, the surface of the heat transfer plate will produce different degrees of dirt and sediment, which will increase the flow resistance and reduce the heat transfer performance, which is mainly manifested in the increase of the pressure difference between the inlet and outlet pressure gauges and the decrease of the outlet temperature of the secondary water side. Therefore, the equipment must be inspected and cleaned. For the cleaning of plate bundle dirt and sediment, chemical cleaning or mechanical cleaning can be selected according to specific conditions.

5.2. When the equipment stops running, the internal water should be drained and blown dry, and all valves should be closed in time to prevent air from entering, and the humidity in the equipment should be kept no more than 20%.

5.3. Anti-corrosion measures should be taken when the equipment is out of service for a long time.

5.3.1 Nitrogen filling method: drain all the water and blow dry, close all valves, and fill and maintain nitrogen with a purity of not less than 99% and a pressure of 0.05MPa.

5.3.2 Desiccant method: drain all the water and blow dry, put in desiccant, close all valves, check the desiccant after 7 to 10 days, if it is expired, replace it with a new one, and then check it every month and replace the expired medicine.

6. Equipment maintenance

6.1. When the equipment is repaired, the inlet valve on the plate shell side should be cut off to drain the medium in the equipment.

6.2. When the plate bundle of the equipment needs to be plugged, the pipe box at both ends of the equipment or the manhole of the pipe box can be opened to seal the heat exchange plate tube with a special plate plug.

7. Regular inspection

The equipment shall be inspected externally at least once a year, internally and externally at least once every three years, and comprehensively at least once every six years.

8. Precautions

8.1. The user should be careful and meticulous when inspecting the equipment for delivery, and should ensure that the equipment is consistent with the contract requirements. Our company is not responsible for problems caused by storage and installation after the equipment is signed for.

8.2. The equipment should work in an orderly and correct controlled state. When starting, the heat medium should be introduced slowly so that the entire equipment is heated evenly. It shall not be operated at overpressure or overtemperature.

8.3. When disassembling the equipment, if the gasket has been loosened, it must be replaced with a new one when reinstalling.

8.4. After the equipment is repaired, the water pressure test should be carried out

again, and it can be put into operation normally only after passing the test.

8.5. Without the consent of our company, our company will not be responsible for any problems caused by the repair or modification of the equipment by the user.

NOTE:Our company reserves the right to make technical changes, and individual data will not be notified in advance if there are any changes.