



山東北辰

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# **HYDROPHOBIC EXPANSION TANK**

## **Operation and Maintenance Instruction Manual**

**Shandong Beichen Mechanical&Electrical Equipment Co.,Ltd.**

# Contents

1. Equipment Overview.....	2
1.1 Equipment use and principle .....	2
1.2 Equipment parameters .....	2
1.3 External view of hydrophobic expansion tank.....	2
1.4 Annex .....	2
2. Equipment Description.....	2
2.1 Structural layout description.....	2
2.2 Factory information.....	3
3.Install .....	4
3.1 Pre-installation inspection .....	4
3.2 Site and foundation .....	4
3.3 Equipment hoisting .....	4
3.4 Installation of equipment .....	4
4. Operation and maintenance ...	5
5. Precautions ...	6

## 1. Equipment Overview

### 1.1 Equipment Purpose and Principle

The condensate expansion vessel described in this manual is suitable for the regular discharge of boiler blowdown water or condensate from other equipment in thermal power plants or other industries.

**Principle:** The boiler blowdown water and condensate from the continuous blowdown expansion vessel or other equipment enter the device through the condensate inlet and are evenly distributed by the internal mechanism of the device; this allows for the full separation of steam and water. The separated steam (exhaust steam) is discharged to the atmosphere from the top, while the condensate separated at the bottom is directly drained to the trench or sewage treatment system.

### 1.2 Equipment Parameters

Refer to the "Technical Characteristics Table" in the accompanying drawings.

### 1.3 Equipment Outline Diagram

Refer to the accompanying drawings.

### 1.4 Attachments

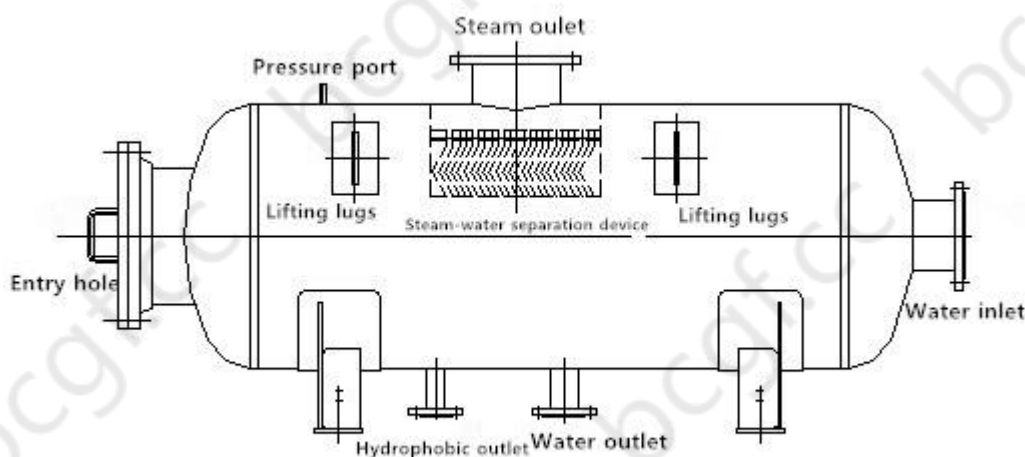
The main body of the equipment is equipped with a pressure measurement port.

## 2. Equipment Description

**2.1** The main components of the continuous blowdown expansion vessel include: cylinder and support.

## 1). Cylinder

The cylinder is a structure with standard elliptical heads at both ends welded to the cylinder sections, with a steam-water separation device inside. The external interfaces include water inlet and outlet, drain port, steam outlet, manhole, etc. The structural diagram is as follows:



## 2) . Support

The equipment is equipped with two supports (one fixed and one rolling or sliding) to eliminate thermal displacement of the equipment.

### 2.2 Factory Documentation

- a. Product qualification certificate;
- b. Quality certificate;
- c. Completion drawing;
- d. Installation, operation, maintenance, and user manual;
- e. Delivery list.

### **3.Installation**

#### **3.1 Pre-Installation Checks**

- (1) Check whether the equipment's appearance meets the drawing requirements and whether there are any damages incurred during transportation.
- (2) Check for rust at each interface that may affect sealing.
- (3) Check if any fasteners are loose, rusted, or have stains.

#### **3.2 Site and Foundation**

- (1) Sufficient space should be left at both ends of the equipment after installation to facilitate disassembly and maintenance.
- (2) The foundation dimensions should match the support dimensions. The foundation can be poured with concrete or constructed from steel. When using a concrete foundation, a base plate should be embedded in the foundation surface of the movable support, and the base plate must remain flat and smooth.

#### **3.3 Equipment Hoisting**

- (1) Equipment hoisting must strictly follow on-site operation regulations.
- (2) Pay attention to the center of gravity position when lifting the equipment.
- (3) If the equipment has lifting lugs, use them for hoisting. If there are no lifting lugs, the equipment body or other safe methods must be used. Under no circumstances should parts like lifting lugs or connection pipes be used to lift the equipment.

#### **3.4 Positioning and Installation of the Equipment**

- (1) Horizontal equipment should be placed on the foundation and leveled, while vertical equipment should be positioned and plumbed, with a centerline deviation of less than 5mm, and then secure the nuts.
- (2) Movable supports with anchor bolts should be equipped with two locking nuts, leaving a gap of 1-3mm between the nuts and the base plate.
- (3) After installation, the movable or rolling support ends should not obstruct the thermal expansion of the equipment.
- (4) Pipelines and fittings should be connected to the equipment in a stress-free state to avoid strong assembly.
- (5) Before the trial run, valves and instruments should be installed according to the drawings and system control requirements.

## **4.Operation and Maintenance**

**4.1** The equipment must not operate beyond the conditions specified on the nameplate.

**4.2** During operation, regularly check whether the valves and measuring instruments are functioning correctly and whether there are any leaks. If abnormalities are found, timely repairs or replacements should be made.

**4.3** During operation, regularly monitor the medium temperature, pressure, flow rate, and vibration conditions of the equipment. If abnormalities are detected, analyze the cause promptly. If necessary, conduct repairs and maintenance, which must be done during shutdown periods.



#### 4.4 Periodic Inspection

- a. Periodic inspection of the equipment should be conducted according to the "Safety Technical Supervision Regulations for Fixed Pressure Vessels."
- b. External and internal inspections of the equipment should follow the "Inspection Regulations for In-Service Pressure Vessels" regarding content and safety status levels.

#### 5.Precautions:

**5.1** When disassembling the equipment, if gaskets have been loosened, new gaskets must be replaced during reassembly.

**5.2** The equipment can only be used after passing pressure tests post-installation.

**5.3** Before using the equipment, open the bypass valve to drain any wastewater inside and flush the equipment, ensuring there are no particulate contaminants before closing the bypass valve and putting the equipment into normal operation.