

⚠ Read this manual before operation



**BELT FILTER PRESS
INSTRUCTION MANUAL**



YIXING TEIO INTERNATIONAL TRADE CO.,LTD.

SPECIALIZED IN WATER TREATMENT SOLUTIONS

CATALOGUE

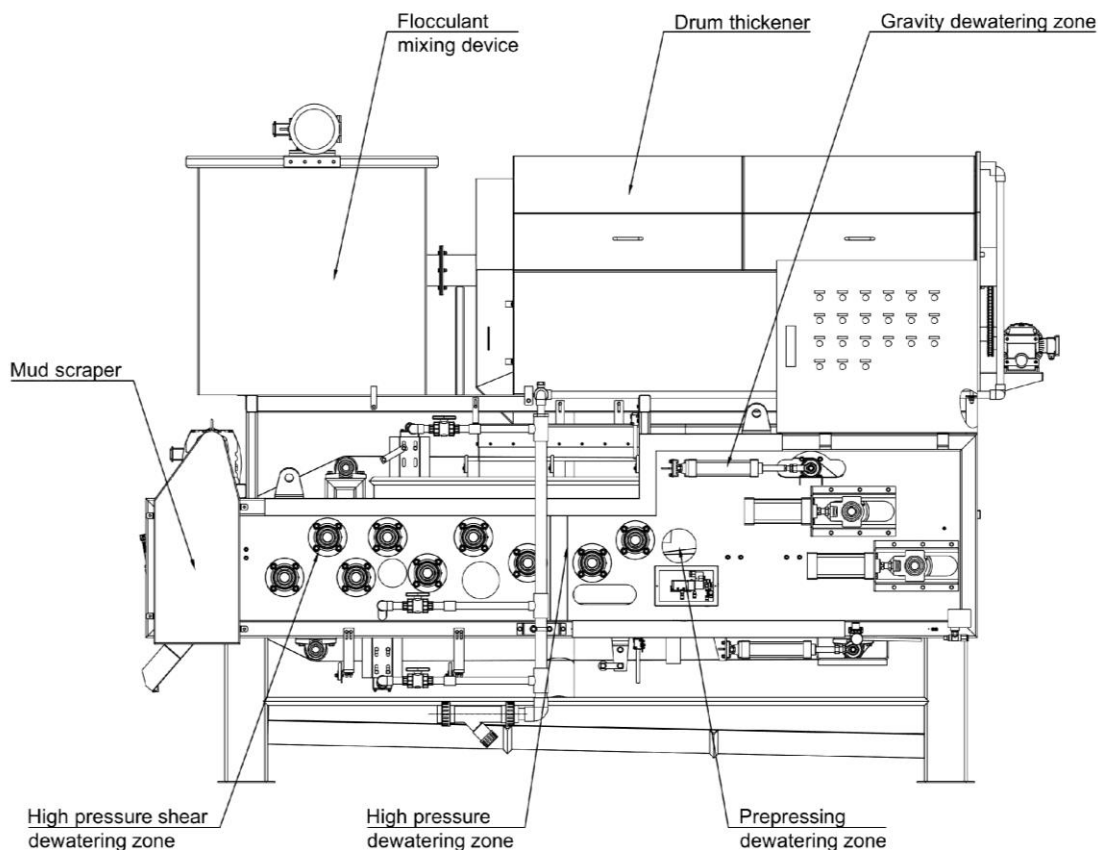
1. OVERVIEW.....	1
2. EQUIPMENT FEATURES.....	1-3
3. EQUIPMENT INSTALLATION.....	3
4. PREPARATIONS BEFORE OPERATION.....	3-4
5. OPERATION MODE.....	4-6
6. TROUBLESHOOTING.....	6-11
7. MAINTENANCE.....	11-12

1. Overview

- (1) Model: ZDY type.
- (2) Mud cake moisture content: 75-85%.
- (3) Operation mode: Automatic/manual operation, continuous operation.
- (4) Operation time: Continuous operation should not exceed 16 hours per day.
- (5) Operation process: sludge conditioning and stirring → sludge thickening → gravity dewatering → prepressing dewatering → high pressure dewatering → mud scraping.

2. Equipment Features

2.1 Main Structure



2.2 Mechanical Procedures

- (1) Drive control: frequency conversion speed control, the transmission speed of filter cloth can be adjusted freely.

- (2) Tension adjustment: air cylinder tension control, the pressure can be adjusted freely.
- (3) Deviation control: the filter cloth is controlled by the limit switch through air compressor power to regulate its movement within a certain range.
- (4) Conditioning and stirring: the spiral blades are three-section six-blade type, rotating crosswise and slowly to achieve full and uniform conditioning of polymers and sludge, producing flocculation.
- (5) Sludge thickening: under the action of centrifugal force, the flocculated sludge will be separated and concentrated.
- (6) Mud adjustment: the mud adjustment plate can regulate the sludge falling to the center of the filter cloth, so that the filter cloth is evenly stressed. This measure will extend the service life of the filter cloth.
- (7) Filter cloth cleaning: water pipes are respectively set on the upper and lower filter cloths, and multiple fan-shaped nozzles are arranged above the water pipes. After the washing pump started, a fan-shaped water jet will spray and wash the filter cloth to achieve the purpose of cleaning the filter cloth.
- (8) Mud scraping: the upper and lower scroll rollers are equipped with scraper seats, on which a scraper is placed. After dewatering, the sludge is in cake shape, and will be scraped off by the mud scraper.

2.3 Control Mode

- (1) Automatic/manual operation.
- (2) When the filter cloth deviates abnormally and touches the safety limit switch, the power supply will be quickly shut down.

2.4 Components Materials and Brand

- Machine body: carbon steel.
- Filter cloth: Polyester, acid and alkali resistant.
- Scroll roller: carbon steel galvanized.
- Driving roller: used to drive the filter cloth, the roller is covered with active rubber.
- Snake-shaped adjustment roller: used to guide filter cloth deviation, covered with active rubber.
- Reducer brand: Guomao, Chinese famous brand.
- Scraper: Nylon.
- Bearing: NSK.
- Nozzle: stainless steel.
- Air compressor: Chinese famous brand.

- Electric components: Schneider.

2.5 Optional Equipment

- Air compressor.
- Washing pump.
- Sludge pump.
- Flocculant pump.

3. Equipment Installation

- (1) The machine can be installed on the ground or on a raised platform according to the actual situation.
- (2) The machine should be kept stable during installation. The supporting feet can be positioned according to the site conditions and fixed with screws or expansion bolts when necessary.
- (3) The pipes that need to be connected to the machine are as follows.
 - Sludge pipe.
 - Flocculant pipe.
 - Air pressure pipe (must be a high-pressure hose or hard pipe that can withstand 10 kgf/cm²).
 - Washing water pipe.
 - Air compressor.
 - Filtrate return pipe.

The pipes can be PVC pipe, galvanized iron pipe, stainless steel pipe or high-pressure hose, etc. After the pipes are all connected to the machine, the machine can be started and used.

- (4) Generally, the pipes and valves are made of PVC, which is more economical and is easy for construction.
- (5) When installing the machine, please pay attention to the distance between the sludge tank, clean water tank, and flocculant tank. The horizontal distance should not be too far, and the height difference should not be too large, so as to avoid the problems of increasing the back pressure load and pressure difference siphon of the pump.

4. Preparations Before Operation

4.1 Flocculant Selection

Take samples with a test cup from the sludge thickening tank to measure the pH value. Generally, the best pH value is between 6 and 8. Then, add an appropriate amount of flocculant and stir evenly. Observe the status of flocs as a reference for the selection of flocculant. Whether the flocs are formed

well or not has a great impact on the sludge dewatering efficiency, so the flocs must be large and solid. Generally, the following points can be used to simply judge whether the flocs are good:

- (1) The condensation particles are large and strong, with good stability and are not easy to disperse.
- (2) After flocculation, the solid phase and liquid phase are obviously separated, the upper liquid phase is clear.
- (3) After flocculation, the sludge has good settling properties.

Attention: Generally, when the pH value of the sludge is below 6 or above 8, the flocculant will be ineffective and the flocculation effect will be poor. This will seriously affect the operating performance and of the belt filter press.

4.2 Flocculant Solution Preparation

1 kg of flocculant should be diluted 1000~1500 times with clean water (adjust the dilution ratio according to the type of sludge). Evenly mix the flocculant and water by a mixer for at least 0.5~1 hour.

4.3 Sludge Preparation

The sludge storage tank should be stirred evenly by a mixer, which is conducive to uniform sludge concentration. It can achieve stable and reasonable control of sludge feed amount.

5. Operation Mode

5.1 Automatic Mode

- (1) Turn on the main switch (no fuse switch) in the control box.
- (2) Turn on the power selector switch, and the indicator light will light up.
- (3) Turn on the selector switch of the air compressor. The air compressor starts running, and the pressure gauge slowly rises to the pressure set value, generally about 3 to 5 kg/cm² (the setting has been completed before the machine leaves the factory), the indicator light will light up.

Attention: All the interlocking switches on the machine are controlled by this pressure setting switch. When the air pressure does not reach the set value, the machine will not be able to start. (Except for the flocculant mixing device and pump).

- (4) Turn the selector switch of the filter cloth drive motor to 'Auto', the indicator light will light up, and the filter cloth starts to move.

- (5) Turn the selector switch of the flocculant mixing device to 'Auto', the indicator light will light up, and the device starts to stir.
- (6) Turn the selector switch of the drum thickener to 'Auto', the indicator light will light up, and the separator starts to rotate.
- (7) Turn the selector switch of the washing pump to 'Auto', the indicator light will light up, and the washing pump starts to wash the filter cloth and drum thickener.

Attention: The washing water should be tap water, groundwater or clean water, so as to avoid nozzle blockage.

- (8) Turn the selector switch of the flocculant dosing pump to 'Auto', the indicator light will light up, and the dosing pump starts to pump the flocculant into the flocculant mixing device.
- (9) Turn the selector switch of the sludge pump to 'Auto', the indicator light will light up, and the sludge pump starts to pump the sludge into the flocculant mixing device.
- (10) The selector switch of the flocculant mixing device is operated in 'On' and 'Off'. Its action is not controlled by the pressure set switch. As long as the power switch is turned on, it can be operated independently.
- (11) The forced drive button should be pressed when the filter cloth deviated abnormally and touched the safety limit switch. After the button is pressed, the machine will stop running, the filter cloth will be forced to slowly return to the normal operating position. After that, release the forced drive button and carry out subsequent maintenance work.

Attention: When the filter cloth is operating in the normal position, pressing this button will have no effect.

5.2 Manual Mode

- (1) The opening method of the main switch, power selector switch, and air compressor switch is the same as the automatic mode.
- (2) Turn the selector switches of filter cloth drive motor, flocculant mixing device, drum thickener, washing pump, and flocculant dosing pump to 'Manual' in sequence, the indicator lights will light up, and each unit starts running.
- (3) Turn the selector switch of sludge pump to 'Manual', the indicator light will light up, the sludge pump starts to pump sludge into the flocculant mixing device, and continuously processing until the mud cake is formed and scraped off. This operation mode is not automatically controlled by the level gauge. When the lower limit water level is reached, the system will not automatically stop. Therefore, special attention should be paid to the liquid level of the sludge tank and the

flocculant tank during operation, so as to avoid damage to the pump.

- (4) The usage of flocculant mixing device and forced drive button is the same as the automatic mode.

6. Troubleshooting

6.1 The Machine Does Not Work

6.1.1 Faults

- (1) The main power switch (leakage circuit breaker) is tripped or damaged.
- (2) The air pressure does not reach the set value (generally about 3-5 kg/cm²), or the pressure setting switch is damaged.
- (3) The air pressure relief valve (the blue pull ring at the front end of the pneumatic FRL) is not open.
- (4) The electric control relay of the filter cloth drive motor is tripped or damaged.
- (5) The filter cloth deviates abnormally and touches the safety limit switch, the alarm sounds.
- (6) The fuse burns out.

6.1.2 Troubleshooting

- (1) Repair the switch or replace with a new one.
- (2) Wait until the air pressure reaches the set value before starting the belt filter press. If the switch is damaged, replace with a new switch.
- (3) Manually pull the pressure relief valve upward to complete the opening action. After the pipeline is connected, the pressure gauge will display the pressure value. After reaching the set value, it can be started.
- (4) Repair the control relay or replace with a new one.
- (5) Check and find out the cause of the fault and eliminate it.
- (6) Replace with a new fuse.

6.2 The Filter Cloth Drive Motor, Flocculant Mixing Device, and Drum thickener Do Not Work

6.2.1 Faults

- (1) The circuit is disconnected, resulting in single-phase operation, the machine cannot be started.
- (2) Short circuit or overload causes the control relay to trip.
- (3) The motor coils burn out.
- (4) Abnormally high or low voltage causes the motor to burn out.

6.2.2 Troubleshooting

- (1) Check the circuit.
- (2) Repair the control relay or replace with a new one.
- (3) Repair the motor or replace with a new one.
- (4) Install a voltage stabilizer to improve the situation.

6.3 *Abnormal Deviation of Filter Cloth*

6.3.1 Faults

- (1) The filter cloth deviation control valve is faulty or damaged.
- (2) The distance between the control valve sensor rod and the filter cloth edge is too short or too long.
- (3) There is high-pressure air in the holes of the filter cloth deviation cylinder, but the cylinder still cannot work. The axis of the cylinder may be rusted and stuck.
- (4) The tension at both ends of the filter cloth tension adjustment roller is unbalanced, causing the positioning of the both ends of the roller to be skewed.
- (5) Some parts of filter cloth rectification roller are faulty, such as bearing damage, etc.
- (6) The rubber coating of the filter cloth rectification roller is severely worn; the roller cannot correct the deviation.
- (7) After long-term use, due to uneven force or other factors, a length difference will be formed on both sides of the filter cloth, causing the filter cloth rectification roller to lose its guiding function.

6.3.2 Troubleshooting

- (1) Repair the filter cloth deviation control valve or replace with a new one.
- (2) Adjust the position of the sensor rod. The distance between the sensor rod and the edge of the filter cloth should be about 1-2.5 cm.
- (3) Disassemble the cylinder and clean it with the finest sandpaper, lubricate it and assemble it. If the cylinder still does not work, replace with a new cylinder.
- (4) Readjust the tension, pay special attention to the bearing force at both ends of the roller when adjusting.
- (5) Repair the filter cloth rectification roller or replace with a new one.
- (6) Replace with a new filter cloth rectification roller.
- (7) Remove the filter cloth and send it to the factory for repair or replacement.

6.4 The Rectification Roller Does Not Work

6.4.1 Faults

- (1) The support bearing of the roller is damaged.
- (2) The O-ring inside the air cylinder is worn, causing air leakage.
- (3) The outer surface of the air cylinder is oxidized, rusted, corroded, etc.
- (4) The directional control valve sensor is faulty or damaged.
- (5) Air pressure pipe is damaged or leaked.

6.4.2 Troubleshooting

- (1) Replace with a new bearing.
- (2) Replace with a new O-ring.
- (3) Disassemble the cylinder and clean it with the finest sandpaper, lubricate it and reinstall it. If the cylinder still does not work, replace with a new cylinder.
- (4) Repair the directional control valve or replace with a new one.

(5) Replace with a new air pressure pipe.

6.5 Abnormal Sound of The Filter Cloth Rectification Roller

6.5.1 Faults

- (1) The support bearing is damaged.
- (2) The bearing is not lubricated regularly.
- (3) The foreshadow of the roller damaged.
- (4) The surface of the roller is covered with a layer of hardened mud.
- (5) The transmission chain of the filter cloth drive motor is too tight.

6.5.2 Troubleshooting

- (1) Replace with a new bearing.
- (2) Lubricate the bearing regularly to extend the service life of the bearing.
- (3) Replace with a new roller.
- (4) Disassemble the filter cloth and clean it thoroughly, reinstall it for continue use.
- (5) Stop the machine and adjust the chain to the appropriate tightness.

6.6 The Mud Cake Cannot Be Scraped Completely

6.6.1 Faults

- (1) The scraper seat is deformed or the scraper is unevenly worn.
- (2) The spring tension of the scraper seat is insufficient, causing the scraper to loosen.
- (3) Excessive used of flocculant will be stucked on the filter cloth, the flocculant is difficult to be scraped off.
- (4) There are holes or severe creases on the filter cloth, which will change the flatness of the filter cloth.

6.6.2 Troubleshooting

- (1) Repair the scraper seat and scraper or replace with a new one.
- (2) Slightly adjust the tension to the appropriate level.
- (3) Resample the sludge for test, select the correct type and amount of the flocculant.
- (4) Repair the filter cloth or replace with a new one.

6.7 The Filter Cloth Cannot Be Used

6.7.1 Faults

- (1) The incoming sludge contains hard solids. After being squeezed, holes appear on the filter cloth.
- (2) Abnormal operation causes serious creases and unevenness on the filter cloth.
- (3) The connector of the filter cloth is abnormally broken.
- (4) The edges on both sides of the filter cloth are seriously damaged and the threads are peeled off.
- (5) The filter cloth cannot be cleaned thoroughly for a long time, and there is no improvement after it is rinsed with acid.

6.7.2 Troubleshooting

- (1) Repair the filter cloth or replace with a new one.
- (2) Replace with a new filter cloth.
- (3) Replace with a new connector.
- (4) Repair the filter cloth or replace with a new one.
- (5) Replace with a new filter cloth.

6.8 The Mesh Inside the Centrifuge Separator Cannot Be Used

6.8.1 Faults

- (1) The sludge contains hard solids, causing serious damage to the mesh.
- (2) The resin silicone seals at both ends of the mesh are damaged and fall off.
- (3) The mesh cannot be cleaned thoroughly for a long time, and there is no improvement after it is

rinsed with acid.

6.8.2 Troubleshooting

- (1) Replace with a new mesh.
- (2) Replace with new resin silicone seals.
- (3) Replace with a new mesh.

6.9 Blockage and Overflow of Drain Pipe

6.9.1 Faults

- (1) The incoming sludge is too much, resulting in serious sludge leakage, accumulated inside the machine.
- (2) The collection and drainage systems are not cleaned regularly, resulting in sludge residue to accumulate inside the machine.

6.9.2 Troubleshooting

- (1) Adjust the amount of incoming sludge to ensure the best effect of sludge treatment.
- (2) Regularly inspect the collection and drainage systems, and clean them up.

6.10 The Filter Cloth Cannot Be Cleaned Thoroughly

6.10.1 Faults

- (1) The nozzles are seriously blocked by foreign matter.
- (2) The water pressure of the washing pump is too low or the water volume is too small.

6.10.2 Troubleshooting

- (1) Regularly inspect the nozzles and remove the foreign matters. If the blockage occurs frequently, install a Y-type filter at the inlet of the washing pump.
- (2) Replace with a high lift or high flow pump.

7. Maintenance

- (1) Establish a maintenance record sheet, record all inspection (maintenance) items and contents.

- (2) Regularly inspect all relevant components to ensure that they are running normally.
- (3) Check the connector of the filter cloth once a month, if the connector is out of place or broken, stop the machine immediately to adjust the connector or replace with a new connector, so as to avoid damage to the filter cloth.
- (4) Use a grease gun to inject grease (BEACON-2) to lubricate all the bearings every 24 to 72 hours.
- (5) Regularly replace or add lubricating oil of the reducers every 2500 hours. Generally, the lubricating oil is HD-460 (temperature above 0°C) or HD-320 (temperature below 0°C).
- (6) Regularly inspect the pneumatic FRL, remove the water in it and add lubricating oil to it. Generally, the lubricating oil is VG-10#, ISO-10# or AW-10#.
- (7) Regularly inspect the air compressor, add lubricating oil to it. Generally, the lubricating oil is VG-30#, ISO-30# or AW-30#. Open the drain valve at the bottom of the air storage tank to remove oil and water.
- (8) Do not use a water gun or other tools to spray the machine, so as to avoid damage to electrical and pneumatic components.
- (9) Regularly inspect the washing nozzles, if there is any blockage, clean it or replace with new nozzles, so as to ensure the service life of the filter cloth and the processing quality.
- (10) Belt filter press is not suitable to be installed in the places with high humidity. If the belt filter press must be installed outdoors, a canopy should be added to cover it.
- (11) It is recommended to disassemble and clean the filter cloth once every 400 to 800 hours (depending on the on-site operation situation). Use 1% hydrochloric acid or 0.5% sulfuric acid to mix and soak the filter cloth for 24 hours. After that, brush it thoroughly manually or spray it with a high-pressure water gun (10~15 kg/cm²).

Attention: Do not spray the electrical components and control cabinet to avoid short circuit and danger.



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