

# Operating Procedures for Spiral Type Sludge Dewatering Machine



## 1. Pre-Start Inspection

- (1) Inspect around the equipment for any severe deformation or extensive damage to the paint (minor abrasions during transportation are normal).
- (2) Check if there are any foreign objects in the mixing tank (sludge water will be coagulation in this tank, and we also call it coagulation tank), whether the filter body has emptied the sludge, and whether there are any mud blocks at the head of the spiral shaft.

## 2. Preparation

- (1) Ensure that the equipment's pipeline connections are correct and that it operates normally after being powered on.
- (2) Prepare the dosing system and the necessary chemicals for the equipment, which is typically PAM cationic, with a molecular weight of 8000-10000. (PS: The usual default is 2-5kg of powder added to 1000L of water, diluted and stirred for 60 minutes. The specific amount may vary depending on the site conditions, and the data is for reference only.)

### 3. Starting Procedure

- (1) Power on the machine and start the main motor and mixer, observe the direction of rotation of the main motor to ensure that it is correct;
- (2) Start the coagulant dosing pump, sludge feeding pump, and coagulation mixing motor in sequence;
- (3) Adjust the sludge feeding and dosing amount to ensure that the sludge coagulation particles are larger than the size of soybeans, and that the mud and water are separated (refer to Figure 1 and Figure 2);
- (4) Use the frequency converter to adjust the speed of the entire spiral shaft (range: 30-50, refer to Figure 3), and adjust the spacing of the End Plate by tightening the mud pressure plate screw (refer to Figure 4) to achieve the best processing volume and moisture content.



Figure 1

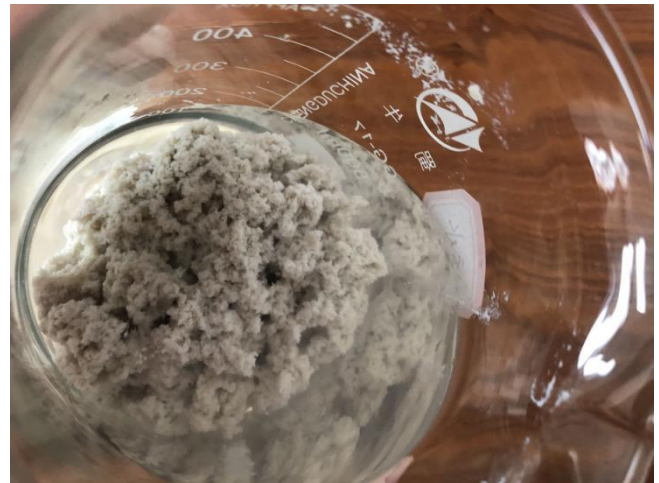


Figure 2



Figure 3



Figure 4

## 4. Post-Startup Inspection

Check if the spiral shaft is rotating normally, if the sludge level in the mixing tank is stable, if all rotating components are operating normally, and if there are any abnormal noises.

## 5. Shutdown Procedure

- (1) Turn off the sludge feed pump to stop the sludge feeding;
- (2) Turn off the coagulant dosing pump and the dosing system to stop dosing;
- (3) Drain the mixing tank and stop the coagulation mixing motor;
- (4) Wait for all the sludge to be discharged (no less than 30 minutes), manually spray the filter body for 5 minutes, and rinse the equipment clean;
- (5) Turn off the power supply.

## 6. Daily operation precautions

- (1) Set a reasonable start-stop time for automatic operation, and complete the entire process as required;
- (2) Adjust the "flow control tube" to the appropriate height according to different sludge concentrations;
- (3) Overloading of sludge is **strictly prohibited** to prevent sludge from accumulating in the thickening section of the dewatering machine due to excessive sludge;
- (4) Large slag, wood, metal blocks and other hard solids are **strictly prohibited** from flowing into the sludge pump and filter of the dewatering machine;
- (5) When manually cleaning, do not pour water onto electrical components such as motors and control boxes;
- (6) Regularly replace or add gear lubricating oil to the reducer(once every three months);
- (7) Check whether the nuts at various locations such as the filter body are loose regularly (once a month);
- (8) Conduct maintenance every three months.

#### Daily Inspection Items

Inspection locations	Inspection items	Check
Electric Motor	Is the motor running normally?	<input type="checkbox"/>
	Are there any abnormal noises?	<input type="checkbox"/>
	Is there any vibration?	<input type="checkbox"/>
End Plate	Is the gap set appropriately?	<input type="checkbox"/>
	Is the change in moisture content of the dewatered sludge too large?	<input type="checkbox"/>
Screw Press Body	Whether the solid content of the filtrate is abnormal?	<input type="checkbox"/>
Measuring Tank	Is there any sludge piled around the reflux pipe and weir?	<input type="checkbox"/>

Mixing Tank	Is there any sludge accumulated around the flow tube and electrode?	<input type="checkbox"/>
	Has an appropriate Alum flower formed?	<input type="checkbox"/>

### Regular Inspection Items

Inspection locations	Inspection items	Check
Electrical Control Cabinet	Are all the indicator lights lighting up normally?	<input type="checkbox"/>
Electric Motor	Whether there is abnormal heating?	<input type="checkbox"/>
	Whether there is oil leakage?	<input type="checkbox"/>
	Whether the current value is similar to normal?	<input type="checkbox"/>
Timer	Is it running according to the set value?	<input type="checkbox"/>
Variable Frequency Drive (VFD)	Is it operating according to the set values?	<input type="checkbox"/>
	Is there any abnormal heat?	<input type="checkbox"/>
	Are the display screen and LEDs lighting up normally?	<input type="checkbox"/>
Screw Press Body	Whether the movable ring is in motion?	<input type="checkbox"/>
	Whether there is a large amount of filtrate leaking between the rings?	<input type="checkbox"/>
Solenoid Valve	Is it operating?	<input type="checkbox"/>
	Can it switch normally?	<input type="checkbox"/>
	Is it leaking water?	<input type="checkbox"/>
Measuring Tank	Has the inflow rate changed?	<input type="checkbox"/>
Bolts and Nuts	Are they loose?	<input type="checkbox"/>
Piping and Valve	Are they loose?	<input type="checkbox"/>

	Whether it is broken or damaged?	<input type="checkbox"/>
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### Handling of abnormal situations

Location of Exception	Exception Content	Possible Reasons	Corresponding Measures
Electric Control Cabine	Light is not on	The bulb has exceeded its service life	Replace the bulb
Electric Motor	Not running	Overload	Contact our company or agency
		The motor itself is faulty	Replace the Motor
		Poor contact	Check the line
	Abnormal heating	Overload	Reduce the load
		The motor is faulty	Replace the Motor
		Voltage too high (low)	Check the voltage
	Abnormal noise	The motor is faulty	Replace the Motor
		Foreign matter mixed in at the impeller	Clear foreign matter or replace the motor
	Vibration	Bolt is loose	Tighten the Bolts
		Motor is faulty	Replace the motor
Oil leakage	Motor is faulty	Replace the motor	
Timer	Not running	Poor contact	Check the line
	Not running according to the set value	Timer failure	Replace the Timer
Frequency Converter	Not running according to the set value	The setting method is incorrect	Please refer to the frequency converter manual
	Abnormal heating	Start and stop too frequently	Please refer to the frequency converter manual
		Voltage too high (low)	Please refer to the

			frequency converter manual
	Vibration	Fixed bolt is loose	Tighten
		Frequency converter failure	Replace the frequency converter
	The display screen and LED lights are not on	Poor contact	Check the line
Frequency converter failure		Replace the frequency converter	
End Plate	Not adjusted to a suitable gap	Fixed bolts is loose	Adjust to a suitable gap and then tighten the bolt
	The change in moisture content of the sludge cake is too large	The sludge characteristics have changed	Please refer to the manual.
Screw Press Body	The spindle is blocked	The spindle is blocked by sludge	Reverse operation will guide the sludge out
	Too much sludge leakage from the filter seam	No suitable alum flower has been formed	Please refer to the manual
		Too much sludge input	Reduce the sludge input through the liquid level regulating tube
		The rotation speed of the screw shaft is too slow	Increase the rotation speed of the screw shaft
	The solid content of the filtered liquid is too high	No suitable alum flower has been formed	Please refer to the manual
		Too much sludge input	Reduce the sludge input through the liquid level regulating tube
		The rotation speed of the screw shaft is too slow	Increase the rotation speed of the screw shaft
Solenoid Valve	Not running	Poor wiring	Check the line
		Foreign matter mixed in	Clear foreign matter
		Gate is closed	Open the passage
	Cannot fully switch	Foreign matter mixed in	Clear foreign matter

		Solenoid Valve failure	Replace the Solenoid Valve
	Leakage	Foreign matter mixed in	Clear foreign matter
Measuring Tank	Sludge accumulates around the reflux pipe and weir	--	Clear accumulated sludge
Mixing Tank	Sludge accumulates on the laminar flow pipe or electrode	--	Clear accumulated sludge
Bolts and Nuts	Loose	--	Tighten
Piping and Valve	Loose	--	Tighten
	Rupture or damage	--	Replace the damaged part.

### Precautions For Long-term Downtime

When the machine is shut down for more than one week (2-3 days for easily dried sludge), it is important to take the following precautions to protect the machine:

1. To prevent the sludge in the tank from decomposing and drying, the sludge in the mixing tank should be emptied through the cleaning discharge outlet and the tank should be rinsed with water. To empty the sludge in the mixing tank, keep the agitator stirring and open the ball valve below the mixing tank. This will enable the sludge in the tank to be emptied smoothly.
2. Open the End Plate to the maximum extent and manually run the spiral shaft inside the main body for 1 hour. After all the sludge in the main body is discharged, rinse it with water.
3. Turn off the power supply in the control cabinet.

If the machine is shut down for more than three months, in addition to the above precautions, the following should also be done:

1. To prevent the ports in the control cabinet from rusting, the control cabinet door must be closed and the indoor air must be kept circulating.
2. To prevent the electromagnetic relays in the control cabinet from rusting, the machine should be run manually once every three months.