Erection Work, Operating and Maintenance Instructions

Machine:	**MicraScreen Unit**
Manufacturing no.:	D-14-815751-010-3362/132206575 132208052
Year of manufacture:	2013
Order code:	Dong Tien Paper,Vietnam
Order no.:	PPF 40025865

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1 SAFETY INTRODUCTIONS

1.1 General safety instructions

To avoid accidents and injuries to persons it is important that the operators and other persons working near the equipment observe the following safety instructions.

The operator is a person who has been assigned to fit, operate, adjust, maintain, clean, repair or run the equipment.

The manual must be read, instructions for operation studied and understood. If the operator does not understand all instructions related to his job, they must be cleared before going on with the work.

Before starting the equipment to make sure that

-nobody is put in danger.

-all guards, covers and maintenance doors have been duly attached.

During running the equipment or component must not be cleaned or repaired by hand or with tools. If it is necessary to enter a running equipment for some actions as for adjustment or maintenance, only qualified persons are allowed to do that.

Interlocking

Before working on the danger area, as for maintenance, repair and inspection, the equipment must be stopped and the power supply switches interlocked in position OFF. The worker interlocks the switches and keeps the key.

A-DANGER - PERSONNEL AT WORK - warning sign must be attached in sight near the lock. The date and the worker's name are given on the warning sign. Also the power supply to all process equipment related, control systems and electric loops for control functions must be switched off if they are apart from the main switches. These systems must be also interlocked.

After performance of the work only the person who interlocked the switches can remove the warning sign and the lock.

When working inside the equipment, at least two persons should be involved in the work. When the equipment has been interlocked as described above, one person at a time must stay outside while the others work inside. The person outside the equipment must not leave his post as long as there is somebody working inside the equipment.

1.2 General safety instructions for installation works

Installation works can be performed by qualified persons only.

Before starting the installation works make sure that：

-the installing personnel reads and understands installation instructions and all related safety instructions and regulations.

-accessory equipment is appropriate (e.g. hoists are strong enough).

-sufficient space for installation is available.

-foundation/installation base for the equipment is correct.

-necessary permits (e.g. permit for hazardous work) have been granted.

-fitting tools and stands are appropriate (load tags, rails etc.).

-installation environment is clean, there is nothing unnecessary.

-when installing in the process, all dangerous situations have been eliminated (pipes empty, unpressurized and closed etc.).

-installation work has been duly informed (warning signs, notices, and announcements).

The documents submitted by the equipment manufacturer define, if necessary, the properties of the equipment related to installation (e.g. lifting places, weights, centers of gravity), ambient conditions (e.g. humidity, temperature) or technical data (e.g. moments of tightening, clearances). For the safety at work, it is very important that the installation work is carried out according to the defined properties and conditions and related regulations as well as given technical values are followed.

In other respects, the contractor shall be responsible for execution of the installation work, supervision and safety at work.

1.3 Instructions for safety

The following instructions for safety must be followed when operating and maintaining the Micra-Screen, besides the general instructions for safety.

Operating Personnel

Before start-up to be checked that the inspection covers are closed and nobody is working on the equipment.

If it is necessary to open the covers during running, the washing process must be switched off and the wash water valve closed. It is advisable not to open the covers because hot flows may splash outside the equipment. Also vapour may escape from the covers. Eye protectors are used against splashes. If you get suspension into your eyes, wash them immediately with clean water.

Flushing of the feed slice must be switched off if the slice is to be adjusted. During normal operation the adjusting mechanism for the feed slice must not be touched because the piston rod movement may cause a safety risk during flushing.

If the suspension to be treated is hot, the equipment parts must not be touched without safety gloves.

When the equipment is cleaned with high pressure water or steam, personal protective equipment must be used.

Maintenance Personnel

The above instructions concern also the maintenance personnel. Separate special instructions are given for maintenance.

For maintenance the equipment must be stopped and interlocked according to the general instruction for safety.

When installing, removing and turning the screen plate, a separate screen plate is handled. When the fly nuts have been loosened, the screen plate may fall down or pop out from its original position. To avoid injury, a safety helmet must be used. The machine parts may be hot why personal protectors (overalls, gloves, shoes) must be used to avoid burns when carrying out maintenance works.

Dismantling, removal from service, scrapping

Before dismantling check the condition of the lifting points. If necessary, repair them. When dismantling, heavy, sharp-edged parts are handled why personal protectors must be used. Scrapping produces metal scrap, which can be reused. Materials can be seen from parts lists and material certificates.

All safety regulations for lifts, auxiliary devices and working in general, shall be followed during installation, repairing, dismantling and when replacing components.

1.4 Safety stickers

Safety stickers attached to the equipment .

The prohibitive and warning stickers shall be firmly attached to the equipment. The instructions of the safety stickers shall be always followed and the stickers shall be kept clean in all the operating conditions.

Responsible persons shall make sure that all user groups understand the safety stickers before the start-up of the equipment.

The location of the stickers on side of the equipment is shown in the main assembly drawing of the Micra-Screen.

- Aprohibitive sticker on the back cover (filtrate side): “Do not open while the machine is running”
- Awarning sticker on the front cover (solids side): “Beware of the remote controlled high pressure wash water. The wash water valve to be closed when opening the cover.

2 OPERATION

The Micra-Screen is a stationary, pressure fed screen designed primarily for separation of fine solids from slurries and for fractionation. Construction material is acid proof steel.

The feed is introduced tangentially to the curved screen plate through a feed slice. The opening of the feed slice is adjustable to perform optimal operation. Adjustment is based on application, screen plate and suspension. Normal feed pressure is between 50 and 250 kPa. The feed pressure effects on the capacity and solids discharge consistency.

The screen plate is a slotted, wedge wire construction, which is made of triangle-shaped wires with support rods welded beneath the screening surface. The size of the plate is 700 x 1800 and the curvature is 120°. The slot opening is 50...250 mdepending on the application.

The screen plate is washed periodically in order to prevent the slots from plugging. Opening the slice for a short period prevents solids build-up in the feed slice. Both these functions are automatic and can be adjusted individually for each application.

3 APPLICATIONS

The Micra-Screen is used for：

-fiber recovery from circulating waters of pulp, paper and wood pulp mills

-thickening of various pulp suspensions

-shower water and seal water purification

-long and short fiber fractionation

-fiber / filler separation

-waste water and circulating water purification

4 INSTALLATION AND MAINTENANCE

4.1 Installation of the unit

The Micra-Screen is delivered as a ready assembled unit. The foundation where the Micra-Screen is to be bolted down, has to be level. If not so, packing plates are required to ensure that the unit is level.

Space requirements for installation and maintenance are:

-800 mm in the front of the Micra-Screen

-600 mm in the back of the Micra-Screen

Net weights of the Micra-Screen units;

-single 410 kg (= 905 lbs)

-double 710 kg (= 1570 lbs)

-triple 1070 kg (= 2365 lbs)

Lift lugs have been provided on both sides of the unit. Lifting can be done with lifting ropes, no derrick is required.

Due care and attention are required when handling or storing the Micra-Screen screen plates.

4.2 Piping

All pipe lines have to be correctly lined and supported so that the unit remains unstressed. Each feed pipe should be equipped with a pressure gauge. It is recommended that the customer installs a manually operated control valve in the feed connection of the screen. This gives an opportunity to close one screen plate for maintenance without disturbing the operation of other screen plates.

4.3 Back spray and feed device

The feed pressure for the back spray water should be minimum 500 kPa (= 73 psig) and maximum 800 kPa (= 125 psig). The required amount at 500 kPa (= 73 psig) pressure is 100 dm^3/min (= 27 USGPM) intermittently depending on the shower timing.

The pneumatic cylinder of the back spray needs 20 dm^3/min (= 5.3 USGPM) and the feed device flushing 2.5 dm^3/min (= 0.7 USGPM) instrument air at 600 kPa (= 87 psig) pressure intermittently depending on timing.

The control box, pressure cylinders and wash water valve are cabled according to the wiring chart. The air hoses to pressure cylinders and the wash water valve is connected as shown by the broken lines in the wiring chart.

4.4 Screen plate installation

Warning! When the fly nuts are not fastened, the screen plate may fall down or pop out from its original position. Support the screen plate well when installing or removing it.

1. Lift the screen plate to the screen plate holder for the feed device so that the arrow of the flow direction shows downwards. Make sure that there is no offset between the screen surface and the feed slice and that they are on the same level. Fasten the three fly nuts on the back of the feed device.

2. Fasten the screen plate holder to the lower end of the screen.

3. Put the flat bars on place.

4. Fasten the screen plate with fly nuts on both sides.

5. Close front and back covers.

6. Open the feed valve carefully and check that the screen plate is operating well. If you open the front cover, note that the feed may splash outside the unit.

7. Switch on the back spray and the feed device flushing controls.

4.5 Screen plate removal

1. Shut down the screen.

2. Switch off the back spray and feed device flushing controls.

3. Open the front and back covers.

4. Unbolt the three fly nuts from the screen plate holder on the back of the feed device.

5. Remove the screen plate holder from the lower end of the screen.

6. Open the fly nuts from both sides of the screen (7 pcs on each side).

7. Remove the flat bars from both sides.

8. Take off the screen plate through the front aperture.

4.6 Turning of the screen plate

The screen plate cannot be turned.

4.7 Tensioning of V-belts

The screen plates should be cleaned if necessary on both sides.

The screen plates must not be cleaned with objects that scratch like steel wire brushes.

The screen plates can be washed with

-high pressure water (80...100 bar)

-steam

-soft brush and water

-soft brush and solvent

4.8 Maintenance

The following circumstances should be checked daily during operation to maintain a good screen performance:

-screen plate is clean

-feed enters the screen plate uniformly

-screen plate back spray washing operates properly

-feed slice flushing operates properly

-feed pressure is correct

The following actions should be taken during shut-down:

-pressure gauge(s) should be calibrated

-all parts that have worn out should be replaced

-plugged back spray nozzles should be unplugged

5 OPERATION

5.1 Initial start-up

Before starting up the Micra-Screen unit, the following points have to be checked

-all pipes are connected and properly sealed.

-there are no foreign objects after installation in the unit and especially not in the feed slice.

-after the instrument air is connected check that -- shower water pipe moves from side to side without touching the walls. If needed, adjust the movement from pressure cylinder piston rod.

-the feed device operates well.

-the front and back covers are closed.

1. Open the feed slice of the feed device to the maximum width by turning clockwise the adjustment nut of the cylinder piston rod.

2. Connect the instrument air (if not already connected)

3. Open the manual control valve (if installed) of each unit completely and start feeding the slurry into the Micra-Screen unit.

4. Adjust the feed slice by turning the adjustment nuts anti-clockwise until the pressure equals to the desired operating conditions. When the slice width decreases, feed pressure increases and vice versa.

5. Set the time parameters for back spray washing and feed device flushing. (See item 7.2)

6. Switch on the washing and feed device flushing processes.

7. Connect wash water.

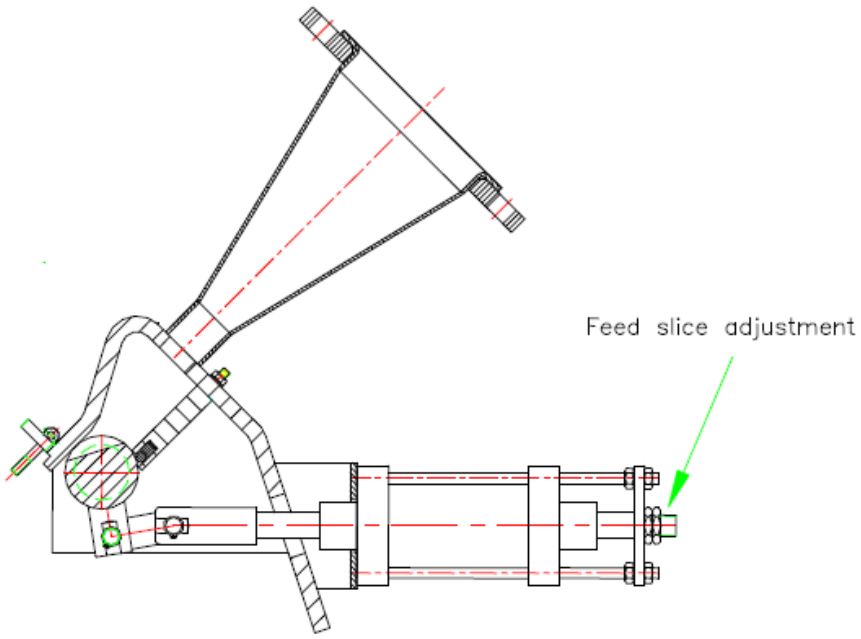

Figure1 Feed Device

5.2 Shut-down

Stop the feed pump. If Double and Triple units are closed only partly, close the manual feed valve.

In double and triple units the closing of one screen affects the function of the remaining units. If necessary, adjust the feed slice according to the present situation.

Never try to close a Micra-Screen by closing the feed slice of the feed device.

If the Micra-Screen is stopped for a longer period, wash the unit carefully.

5.3 Re-starting

1. If the feed device was not adjusted during the shut-down, the Micra-Screen can be re-started by starting the feed pump.

   If the feed device was adjusted during the shut-down, the screen will be re-started in the same way as it was during the initial start-up.

2. Check the balance of the system and adjust if necessary.

6 SPARE PARTS

It is advisable to keep the spare parts in stock to avoid shut-down periods. Recommended spare parts appear from the attached drawing SF-404680 and parts list.

7 INSTRUCTIONS FOR BACK SPRAY AND FEED DEVICE CONTROL AND ADJUSTMENT

7.1 General control settings

Back spray

-The washing period and interval are determined by operating conditions. The washing period varies from 10 to 60 sec and the interval from 30 min to 1 h.

-The shower pipe movement time over the screen is approx. 7 - 8 sec in both directions.

-In the beginning of the washing process the valve on the water pipe opens slowly and the washing pipe starts to move back and forth, movement time is approx. 7 or 8sec in both directions. The movement speed of the washing pipe is adjusted by adjusting valves on the pneumatic drive cylinder of the washing device to correspond to the movement time. In the end of the washing process the water valve closes and the shower pipe stops moving.

-There is a connection R3/8” for 6/4 hoses (2 pcs) on the adjusting valves of the cylinder.

-Required air: instrument air, pressure min. 6 bar.

Feed device

-The feed device flushing time (the slice completely open) is determined by the operating conditions. The flushing interval varies from 2 to 10 h and the flushing time is approx. 3 sec.

-The feed device control cylinder opens the slice completely in the beginning of the flushing process and closes it with the adjustment nut in the cylinder to a predetermined position after flushing.

-There is a connection R ½" on the cylinder, female thread (2 pcs)

-Required air: instrument air, min. 6 bar.

7.2 Local control box settings

Back spray:

1. Set the time parameter T1 so that the interval between washings is approx. 30 minutes and the time parameter T2 so that washing time is approx. 30 seconds. Set the movement time of the shower washing pipe with the parameter T3 to be 7 to 8 seconds in both directions.

2. Adjust the speed of the shower pipe movement to correspond to the movement time. The adjustment is carried out by adjustment screws in the pressure cylinder.

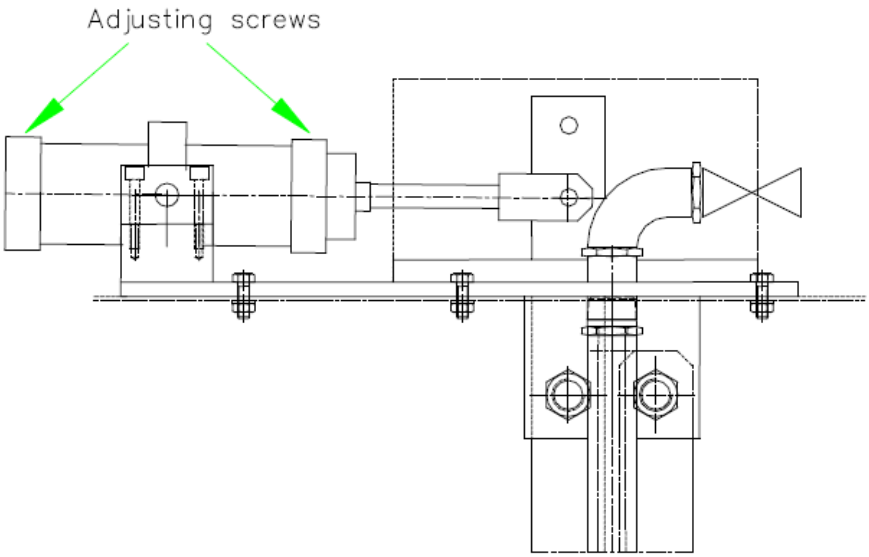

Figure 2. Back spray

3. Switch on the washing process with S1 on the control box.

4. When the unit is in operation, adjust the washing time and the rest time if necessary to obtain the required washing result.

Feed device flushing:

1. Set the time parameter T4 so that the interval between flushings is 2 hours for suspensions that contain large particles and 8 hours for suspensions that contain only small particles. Set the parameter T5 so that the flushing time is 3 seconds.

2. Switch on the flushing process with the switch S2 on the control box.

3. When the unit is in operation, adjust the flushing time and the rest time if necessary to prevent the feed slice from plugging.

Setting the time parameters:

Instructions for setting the time parameters:

1. Press OK (program … blinks)

2. Move downward with the key button (stop blinks). Press OK (run blinks).

3. Move downward with the key button (parameter blinks). Press OK (T1 blinks).

4. Move up or downwards with the key button to the time (T1-T5) you want to change. Move left < with the key button to the parameter you want to

change. Press the key button up or downwards until the time is correct. After time setting press OK.

5. Press Esc (parameter blinks). Press the key button upward (run blinks). Press OK (stop blinks).

6. Press Esc (the display is reset and RUN is read on the right low corner).

The change in the time program is ready.

Time settings (default settings):

T1 = interval between washings (30 min)

T2 = washing period (30 sec)

T3 = movement of the shower pipe (7 sec)

T4 = time between flushings of the feed slice (2 h)

T5 = feed slice open (3 sec)

8 TROUBLESHOOTING GUIDE

Malfunction		Reason	Remedy
1	Feed does not enter uniformly to the screen plate	Screen body has not been installed level Feed device is partly blocked	Level the unit Flush feed device
2	There is no feed	Feed pump is shut down Feed valve(s) is closed Feed slice is closed	Start up the pump Open feed valve(s) Open feed slice
3	Back spray pipe does not move	There is no pressurized air Air hoses are wrongly connected Air flow control valves in the pressure cylinder are closed Timing is wrong or control is switched off	Check the air line Check the connections Open air control valve carefully Check the control switch
4	Feed slice flushing is not working	See item 3 (excluding air flow control valves)	
5	No or too little back spray wate	Control valve is broken or wrongly connected There is no water Timing is wrong or control is switched off Water hose has come off Back spray nozzles are plugged Manual valve(s) is closed (double and triple units)	Check the valve and connections Check water line Check the control Connect the hose Clean or replace the nozzles Open the valve(s)
6	Back spray pipe movement is not correct	The piston rod length from pneumatic cylinder to the shower pipe arm is not correct Back spray movement time does not correspond to movement speed	Adjust the length from pneumatic cylinder piston rod。 Adjust either movement time or movement speed