

Mudhen Portable Slurry System Owners Manual



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MUDHEN MANUAL

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Disclaimer

Except where prohibited by law, the following is made in lieu of all expressed or implied rights, warranties, and conditions, statutory or otherwise, including without limitation any implied warranty of merchantability, non-infringement, or fitness for a particular purpose.

Manufacturer shall not be liable for any injury, loss or damage, direct or consequential, arising from the use of, or inability to use the product.

Before using, buyer shall determine the suitability of the product for the intended use. The user assumes all risk and liability whatsoever in connection therewith.

Safety Notice

Components on the Mudhen operate at and under high pressure and should only be serviced by a person competent in the field.

No modifications may be made to the portable slurry system and its components without prior written approval of the manufacturer.

All operators must be thoroughly familiar with this manual and be trained in the operation of the Mudhen.

Incoming slurry water must **never be pumped into the Mudhen at pressures in excess of 80 psi.**

Hydraulic pressure on the filter screens must never exceed 5000 psi. Exceeding this can be extremely dangerous. The pressure is applied to the screens to minimize leaking between the gaskets on each one. The Mudhen may have a small amount of water leakage during operation – this is considered a normal part of operations. To minimize leakage up the pressure on the filter screens.

The air blow down feature that comes as an option on some models must only be connected to an air supply that **cannot exceed 30 psi.** A regulator or pressure bleedoff valve should be installed to ensure that 30 psi is never exceeded or damage may be done to the system and components.

Hydraulic components including lines and fluids can be dangerous under high pressure. Service and operation should be performed by qualified individuals only.

Proper safety equipment should be worn at all times by any personnel in the vicinity of the Mudhen.

The water treated and produced by the Mudhen is NON-POTABLE, it is not fit for human consumption. Do not drink any of the water produced by the system.

Handling, Installation, & Assembly

The Mudhen should only be placed on a level surface capable of handling the weight of the system when in operation. Care in placement of the inlet side of the Mudhen should be taken to ensure the most effective operation and ease of access to the shutoff valves on the manifold.

The Mudhen is shipped with filter screens in order. If they are removed they should be carefully placed in order onto the rails of the press. Note that the screens are all aligned the same direction.

Prior to operating the Mudhen ensure that all plumbing components are connected and all components of the system are installed and operational. The following list is a basic flow of the system.

- 1 Place Mudhen on-site near the slurry to be treated. Ensure a level surface and safe workplace area.
- 2 Lock or chock wheels.
- 3 Connect slurry water line to pump inlet – and either place slurry inlet in your slurry tanks or attach to the optional slurry tank.
- 4 Connect a hose to the output of the Mudhen and either place hose to acceptable drain or to container for collection and reuse of the filtered water.
- 5 Connect a hose to the recirculation line on the Mudhen and run the hose back into the slurry tank.
- 6 Plumb the slurry system clean water out line to the holding tank.
- 7 Connect the air supply (see notes on air supply requirements)
- 8 Proceed to operation of the Mudhen.

Operation

The Mudhen is a liquid-solid separation device used to separate slurry from a liquid stream and to provide for reuse or disposal of both the solids collected in the filter screens and the liquid stream processed.

The Mudhen accomplishes this within a series of chambers (filter screens) into which the slurry is pumped.

Filtered liquid (filtrate) passes through filter screens and exits the Mudhen leaving behind filtered solids (filter slabs). When properly operated clear water is produced and can be ran to drain or reused (the water is not potable and can only be used as such). It is possible to operate the system improperly and have dirty water produced. Please contact us if you need guidance in improving the operation and quality of the filtered water.

The Mudhen is then opened and the filter slabs are discharged by gravity as each screen is shifted.

After cleaning and prior to operation, the Mudhen must be closed and pressurized with the hydraulic jack prior to operation. This minimizes leakage between the screens as the liquid is processed.

- 1 Slide all filter screens together towards the head (the large metal end with the plumbing manifold) and ensure that all screens are aligned and in their proper order.
- 2 Open all water supply and water shutoff valves.
- 3 Close the release valve on the side of the hydraulic pump (tighten the wing nut to close the valve)
- 4 Extend the cylinder jack extension towards the filter screens by unscrewing the cylinder end.
- 5 For hand operated jack: Pump the hand jack until the cylinder extends, jacking by hand until it becomes difficult while standing on the ground and using the standard handle jack bar.
- 6 **DO NOT USE A CHEATER BAR TO EXTEND THE JACK HANDLE.**
- 7 NOTE: It is the responsibility of the operators to ensure no one is in the immediate are and is in a position where they could become pinched in the screens, rollers, or hydraulics during the duration of the MudHen opening and closing.

- 8 Start the slurry pump that pumps slurry water from your slurry container into the MudHen. This is done by having the air supply connected to the air fitting on the mudhen and placing the control switch on the panel to its ON position. To maximize the effectiveness of the MudHen and clarity of the product water operate this pump at a slow rate at first, 25 PSI OF AIR IS RECOMMENDED (this is adjusted by using the air regulator that is just after the input of the airline. By pumping slowly at first you are pre-coating the screens so that the water produced is of the best possible quality (if the slurry water is pumped too quickly through a clean MudHen the screens may not catch most of the slurry at first. Visually inspect the water exiting the MudHen. When the water quality is acceptable you may increase the air pressure to the MudHen by using the air regulator. This will speed up the processing rate of the MudHen. After 5 to 10 minutes you may increase the air pressure to the slurry pump again (this increases the speed of the pump) as long as the quality of water produced is acceptable.
- 9 It may be necessary – depending on the nature of your slurry – to water the slurry down to enable the pump to suck the slurry through the lines and into the MudHen unit. If the slurry is too thin it may be necessary to use a precoat material (such as perlite or dicalite) at the beginning of the cycle to prepare the cloth screens and effectively filter the water.
- 10 If the water quality begins to look unacceptable – reduce the air to the slurry pump to slow down the slurry water being pushed through the MudHen. Typical adjustments in air are 10-15 psi at a time. Eventually the MudHen slurry pump will stall out because of backpressure from solids building up on the filter screens in the system.
- 11 You may increase air pressure to the slurry pump up to 80 psi max – in 10-15 psi increments until the slurry pump finally stalls out and is full of solids in the chambers.
- 12 In some instances additional equipment and processes may be required to filter the slurry water to meet the customer's expectations.

- 13 After processing water and prior to cleaning follow the following procedure:

Remove suction line from slurry water and let hang or sit in open air. Leave controller in ON position and allow pump to suck and pump air through the system. This will help dry the cakes by squeezing out excess water. It may be necessary to apply more air pressure than when the system stalled – usually adding 10 psi of additional pressure will allow the system to start pumping and squeezing air through the cake. This process should be performed for at least 2 minutes to help dry the cake – the longer – the drier the cake. It will not hurt the slurry pump to do this at all.

Air Blow Down - Air Dry

- 14 Your system is equipped with an optional air blow down feature that removes some of the water inside the filter screens prior to cleaning the system.
- 15 Adjust the air into the slurry pump down to 20 psi. Ensure that the output hose for the clean water is held down or mounted so it doesn't buck from air flow purging through it. Move control valve from On position to Dry position. This valve will send air back through the MudHen filter screens and will push excess water out of the filter screens. Close isolation valve on plumbing manifold directly below the control valve (yellow handled ball valve in the black plumbing lines).
- 16 After 30 seconds of air blow down. Re-open the yellow handled pex isolation water valve. Turn control valve from Dry to Off position.

Opening & Cleaning

- 17 To open the MudHen utilizing a hand operated jack - unscrew the hydraulic bleed off valve **slowly**. Some water pressure will leak out from between the plates. The system will back off pressure on the plates. Then screw in the cylinder head extension until it is even with the cylinder shaft. It may also be necessary to push cylinder into the jack body to supply enough room to separate the plates and clean them.
- 18 Separate each screen one at a time and scrape off the sludge slab that does not fall by itself. **Use only a soft plastic or nylon scraper.** This is provided with your system. You can also drop the cakes by lifting and dropping one side of the plates via the handles – onto the frame rail. Make sure to wipe all edges to ensure a proper seal when the MudHen is put back into service.
- 19 Close the MudHen back up – **ensure that no personnel are near the screens when closing the system up and applying pressure. Also ensure not to over pressurize the screens (maximum 5000 psi or serious injury or death could occur).**
- 20 **Every few days it is recommended to do a more thoroughly cleaning of the cloths – this can be done by rinsing them with a garden hose or a low pressure – pressure washer. A high pressure – pressure washer may be used but should not be used with the nozzle head less than 12” away from cloth.**

Air Requirements

Clean, dry filtered air is required to minimize the maintenance on the system. The MudHen can be configured to effectively operate in a wide range of locations and conditions. MudHens are equipped with an air operated diaphragm pump. These pumps require a minimum of 5 scfm of air to operate (a large 110 volt compressor with large tank is the smallest air compressor that can operate a MudHen). The unit may need more air to operate effectively. Under normal operating conditions never feed over 80 psi of air to the system. The MudHen operates best between 8 to 12 scfm of air normally. As air pressure is increased the screens may begin to leak. Again, adding more pressure via the jack should reseal the plates.

There are multiple ways to operate the MudHen in the field. You can choose to reuse the water produced by collecting it in a container and reusing it in your industrial process (note again that the water is not potable and cannot be consumed by humans). You may choose to run the water produced to a drain (note it is the user's responsibility to ensure that the water being produced meets all requirements to send to drain).

End of Day Cleaning

At the end of each day of use it is important to flush out any slurry from the system. This includes the air pump and the filtration screens as well as any hoses. This can be done by either running fresh water through the system as if you are processing slurry – or by an air blow down cycle – followed by running fresh water through the slurry pump and out the clean water line.

Clean cloths with fresh water on the filter screens at least weekly when in use. The screens may require light pressure washing periodically to keep from blinding.

MUDHEN Maintenance

Hydraulic system: check reservoir levels periodically. Ensure that there are no leaks and that oil levels are at proper levels. Fill as needed with proper oil as stipulated in the hydraulic jack instructions. **Only fill when the ram is fully retracted. Serious damage can be caused if filled improperly.**

Screens & Cloths: Should be checked periodically for any sign of damage or premature wear. The cloths must be washed on a regular basis (depends on the volume of use of the system) to ensure proper sealing of the filter screens. To thoroughly clean the cloths use a pressure (less than 1000 psi) washer with warm water. Cloths and gaskets should be checked for wear and may need replacing to get a proper seal and proper water quality.

Air Regulators: Filter bowls should be purged periodically to ensure dry air. Dirty elements should be replaced if found. Again, the facility is responsible to provide clean, dry air to specification for operating all the system components that utilize air.

Pumps: Follow maintenance and operation recommendations in each individual pump manual. Try to avoid large solids entering the suction line to minimize service issues with the pump. Many customers will prescreen the sludge prior to pumping utilizing window screen mesh or other screen material to eliminate pump clogs.

Piping: Maintain all piping to ensure no ruptures. Long term operation of your system will require cleaning of the inlet piping on the slurry pump and into the MudHen. This can be accomplished with warm water and an appropriate brush to eliminate buildup in the piping.

Troubleshooting the Mudhen

Water quality from the system is not clean enough.	<ol style="list-style-type: none"> 1. Cloth is torn or loose. 2. Unsuitable cloth material for your sludge. 3. Pre coat process wasn't followed 4. Air pump operating too fast 	<ol style="list-style-type: none"> 1. Replace cloth 2. Replace with proper cloths 3. Follow pre coat process by slowly bringing the system up to speed.
Sludge pump stalls, slabs appear watery throughout – not as dry as they should be.	<ol style="list-style-type: none"> 1. Sludge pump air pressure too low. 2. Sludge pump not stalled out long enough. 3. Oil or other substances in your sludge blinding the cloths. 4. Running sludge pump at too high psi initially. 5. Filter Screen cloths plugged 6. Area between cloths and Screens are dirty. 	<ol style="list-style-type: none"> 1. Increase pressure up to 100 psi maximum. 2. Pump should stall until 1 to 2 strokes per minute – forcing dryer cakes. 3. Clean cloths with soap and water. 4. Start more slowly and gradually. 5. Clean cloths (see 3 above) 6. Remove screens and thoroughly clean them.
Sludge sprays out of screens and/or water leaks from screens during operation.	<ol style="list-style-type: none"> 1. Gaskets loose or torn 2. Hydraulic pressure too low on press. 3. Area between cloths and screens are dirty. 4. Incoming air pressure too high 	<ol style="list-style-type: none"> 1. Fix or replace gaskets 2. Increase sludge pump air pressure via regulator 3. Remove screens and thoroughly clean them. 4. Lower air pressure to slurry pump.
Hydraulic cylinder does not retract	<ol style="list-style-type: none"> 1. Coupling loose 2. Oil level high 3. other 	<ol style="list-style-type: none"> 1. tighten fittings on ram 2. follow hydraulic ram instructions to remove excess oil 3. consult troubleshooting section of hydraulic ram instructions for further information.
Sludge pump does not pump	<ol style="list-style-type: none"> 1. Air is not being fed to the pump. 2. The pump screen is plugged on the intake line. 3. The air end of the pump is damaged 4. The intake piping is plugged 5. The outgoing piping is plugged 	<ol style="list-style-type: none"> 1. Check air compressor 2. Check regulator and feed line 3. Consult pump manual – replace parts as needed. 4. Clean and/or replace piping 5. Clean and/or replace piping
Filter Screen Cloths not seated in grooves	<ol style="list-style-type: none"> 1. Air blow down started when Mudhen was not full of sludge. 	<ol style="list-style-type: none"> 1. Reseat filter cloths. Ensure Mudhen is full before blowdown.
Hydraulic jack does not pressurize the press	<ol style="list-style-type: none"> 1. Jack release valve is open 2. Oil level is low 3. Loose fittings and couplings 4. Trapped air in system 	<ol style="list-style-type: none"> 1. Close valve 2. Add oil according to instructions in Jack manual 3. Tighten couplings 4. Remove air according to instructions in Jack manual.
Cylinder does not hold pressure.	<ol style="list-style-type: none"> 1. Leaking connections or seals 2. Internal leakage in pump 	<ol style="list-style-type: none"> 1. Tighten all connections 2. Locate leaks and/or call a technician.

Operation

- Turn operation controller on panel to off position. Ensure isolation valve “A” is open. (valve in-line with the plumbing)
- Connect air compressor hose to Mudhen air fitting. Place hose slurry line into container of slurry
- Attach output hose and place hose securely into container that clarified water will flow to (it can move and spray water at times if not secured)
- Adjust regulator to 30 psi on Mudhen control regulator. Turn operation controller to on – the system will begin to pump slurry through the unit
- As back pressure builds in the Mudhen and the pump slows, adjust regulator psi up in 20 pound increments. This can be done up to 80 psi but should not exceed 80 psi
- When Mudhen pump stalls (this does not harm the pump) or pumps infrequently at 80 psi the unit is full of solids (note if the unit plates leak while pressure builds – apply more pressure via the hand jack)

Drying / Cleaning

- Remove slurry line from sludge and allow pump to pump air for a minimum of 5 minutes (the longer it operates the drier the cake)
- Turn operation controller to off. Adjust air to 30 psi. Turn operation controller to dry. Turn isolation valve “A” located right below controls to its off position. This will allow more air to travel through the plates.
- Water will sputter out of the output hose. After 2 minutes open the isolation valve “A”. Turn the operation controller to off.
- Loosen the hydraulic jack pressure relief valve and screw in the extension nut on the jack
- Open the screens and clean them with the enclosed scraper. Avoid sharp objects on the cloth.
- Weekly clean the filter cloths with a garden hose and a brush if necessary.
- After every 1 to 4 weeks depending on the nature of the slurry – pressure wash the plates & cloths to ensure open and clean pores for proper filtering

DO NOT LEAVE SOLIDS IN THE MUDHEN FOR MORE THAN 1 TO 2 DAYS – DOING SO CAN RUIN THE SCREEN CLOTHS INSIDE THE FILTER PLATES.

Filter Screen Assembly

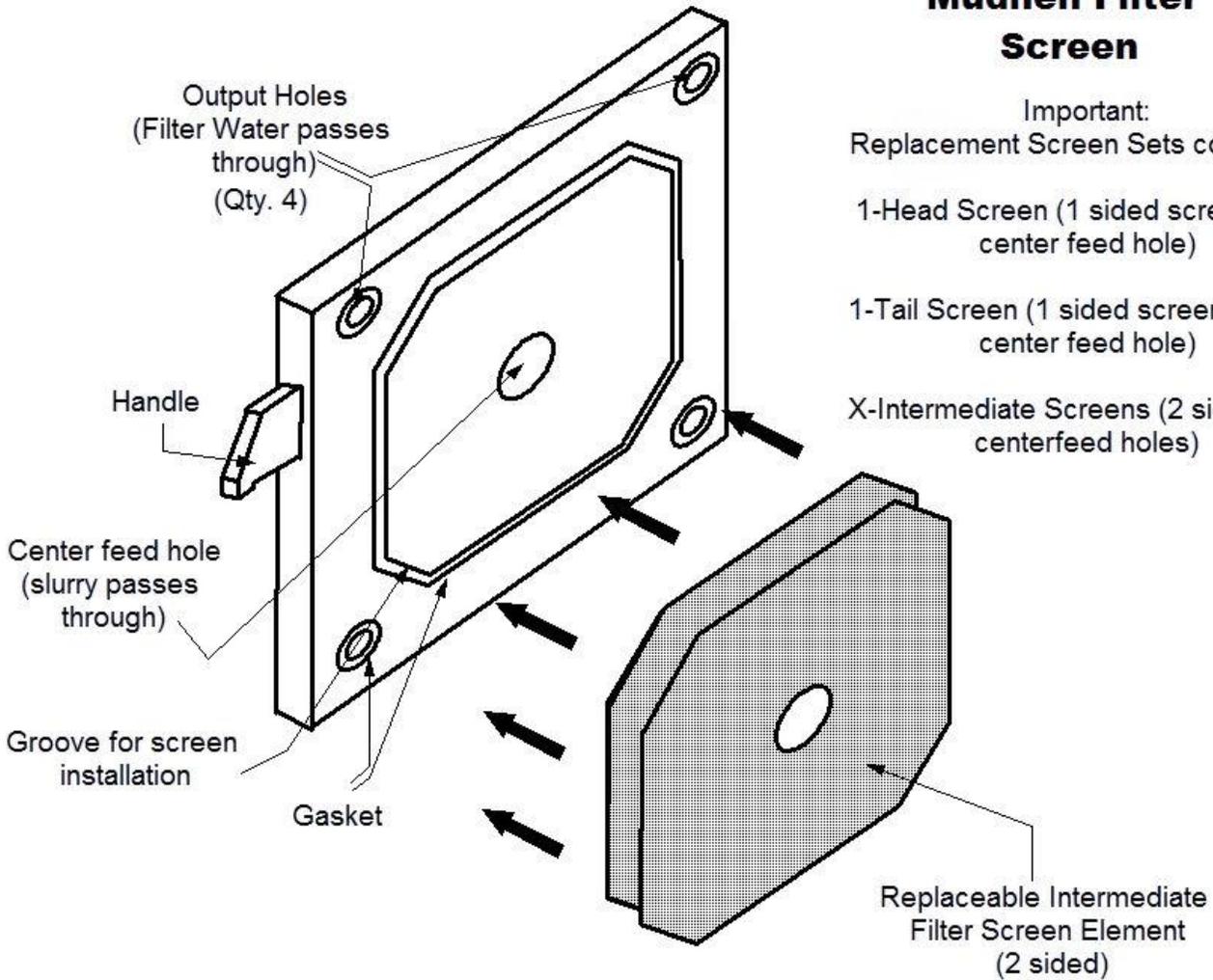
Mudhen Filter Screen

Important:
Replacement Screen Sets consist of:

1-Head Screen (1 sided screen with center feed hole)

1-Tail Screen (1 sided screen with no center feed hole)

X-Intermediate Screens (2 sided with centerfeed holes)



Controls Panel (Rear View)

