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See Section 2.1.1.

Warning!

Proper training is the best protection against accidents. Read, understand, and follow the instructions in this manual before installing, operating, cleaning, or servicing the filter.

Proprietary Information:

This manual contains proprietary information on the Oberlin Pressure Filter. Use of this information for other than the support of an Oberlin Pressure Filter is prohibited.

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1.0 INTRODUCTION

The Oberlin Pressure Filter is an automatic filter system suitable for a wide variety of metallic and non-metallic filtering applications such as: coolant filtration, electroplating, heavy metals recovery, wastewater treatment, food processing, and medical manufacturing.

The system can remove particles as small as 0.5 microns from the dirty process liquid. The solids discharge in an easy to handle dry cake.

All Oberlin filter systems are custom engineered to suit specific customer requirements. The filter can be supplied as a stand-alone unit or as a complete system integrated with storage tanks, pumping equipment, chillers, different control options, and a number of other features to suit the particular application. Models are available in sizes ranging from 1.0 to 50.0 square feet of filtering area.

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Operation of the system is completely automatic. Oberlin units are capable of running 24 hours a day, 7 days a week. They are ruggedly constructed and easy to maintain, with Oberlin Customer Support available on call 24 hours a day, 7 days a week.

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1.1 DESCRIPTION

1.1.1 Main Components of the Filter

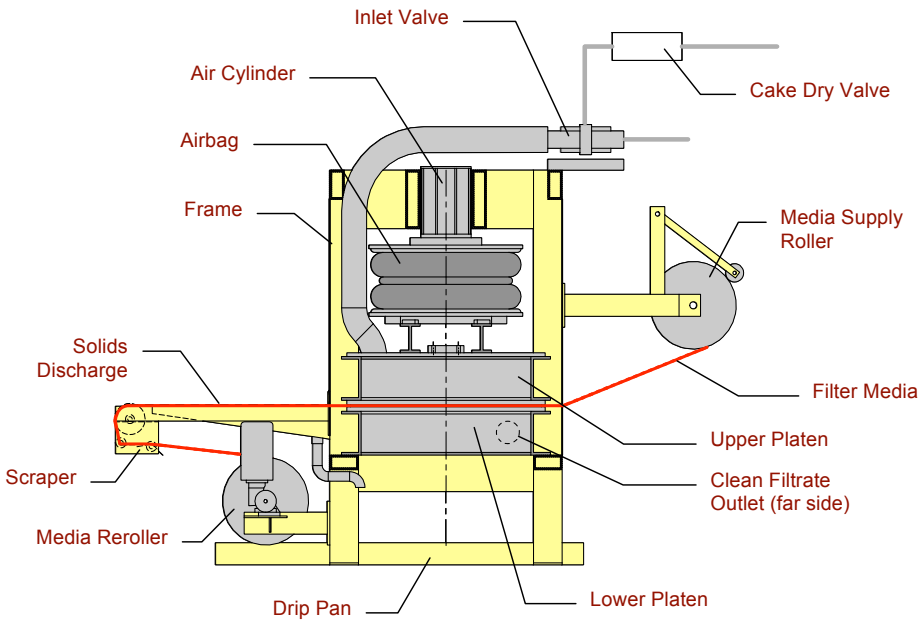

Figure 1-1 Main Components of the Filter

The main components of the system include:

- The **frame**, which supports all components of the filter.
- The filter media system including the **media supply roller**, **scraper**, media counter, **media reroller,** and reroller motor.
- The **upper platen**, where the filtering action takes place.
- The **lower platen**, where the clean filtrate is collected.
- The **airbag**, which applies pressure to seal the upper and lower platens against the filter media.
- The **air cylinder**, which raises and lowers the upper platen.

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- The **inlet** and **outlet** piping connections for the dirty process liquid and clean filtrate.
- Pneumatic and electrical controls, panels, solenoids, and pressure switches, as shown in the figure below for a typical unit.

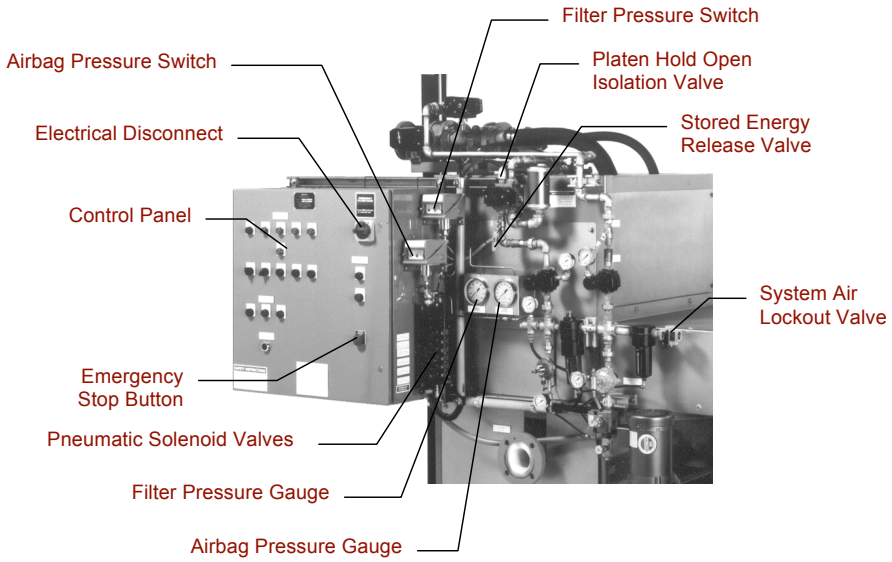

Figure 1-2 Controls for a Typical Unit

(exact locations may vary)

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1.2 PRINCIPLE OF OPERATION

The basic filtering process for all Oberlin filters consists of three cycles:

- The Filtering Cycle,
- The Drying Cycle,
- The Discharge Cycle.

Operation is automatically controlled by relays or a programmable logic controller (PLC). Once the system is set up and adjusted for a particular application, no operator attention is required during normal operation.

1.2.1 The Filtering Cycle

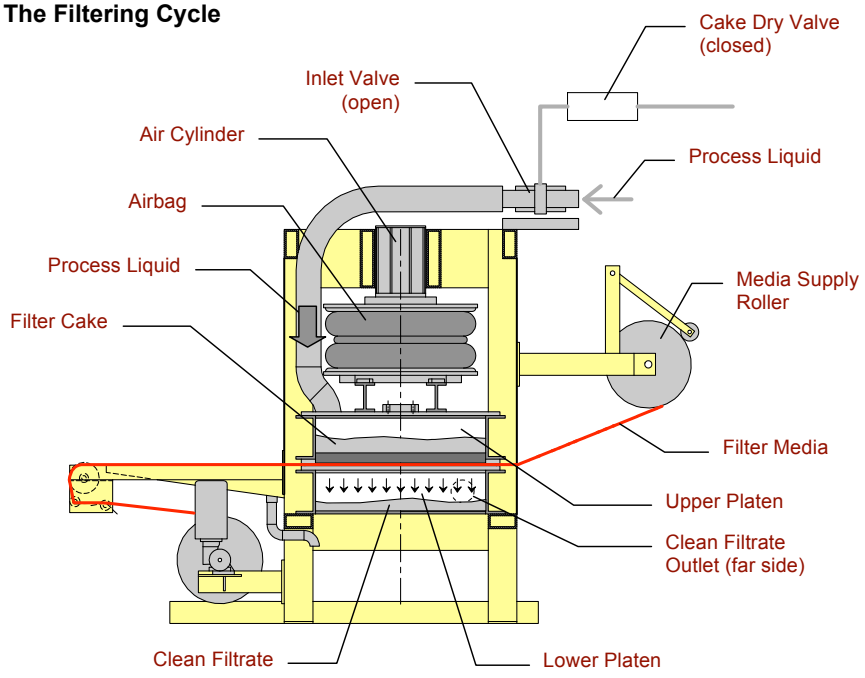

Figure 1-3 Filtering Cycle

The pneumatic **airbags** hold the **upper platen** against the **lower platen**. **Platen seals** on the perimeter of the platens create a liquid-tight seal completely around the **filter media**. Dirty **process liquid** is pumped into the upper platen. Pump pressure forces the liquid through the filter media. The filtered liquid is collected in the

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lower platen and drains out. When the filter pressure reaches 30-35 psi, the Filtering Cycle is complete and the Drying Cycle begins.

1.2.2 The Drying Cycle

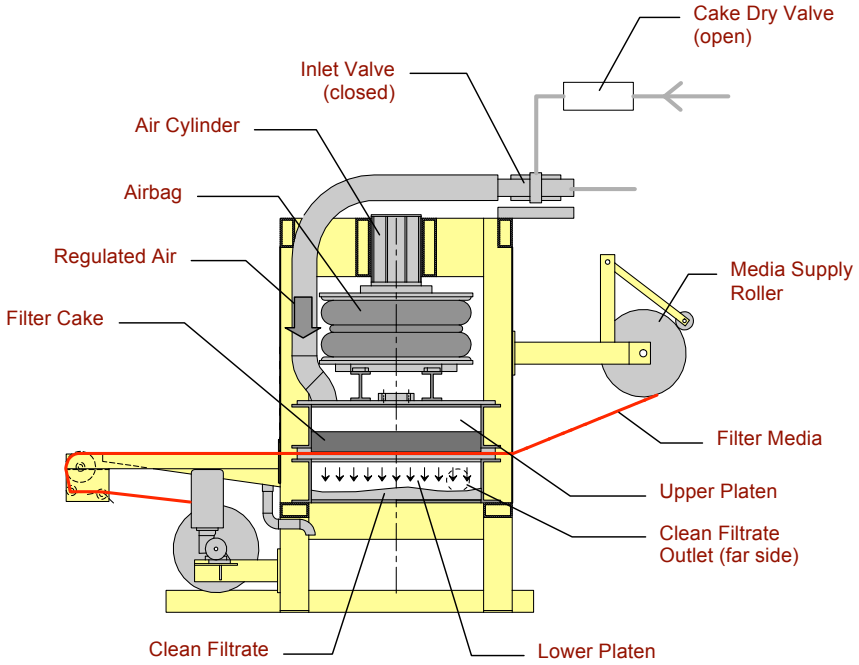

Figure 1-4 Drying Cycle

Regulated air is fed into the **upper platen**. This forces the liquid through the **filter cake** and media. After the cake is dried, determined by back pressure and time elapsed, the **upper platen** is lifted by an **air cylinder**.

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1.2.3 The Discharge Cycle

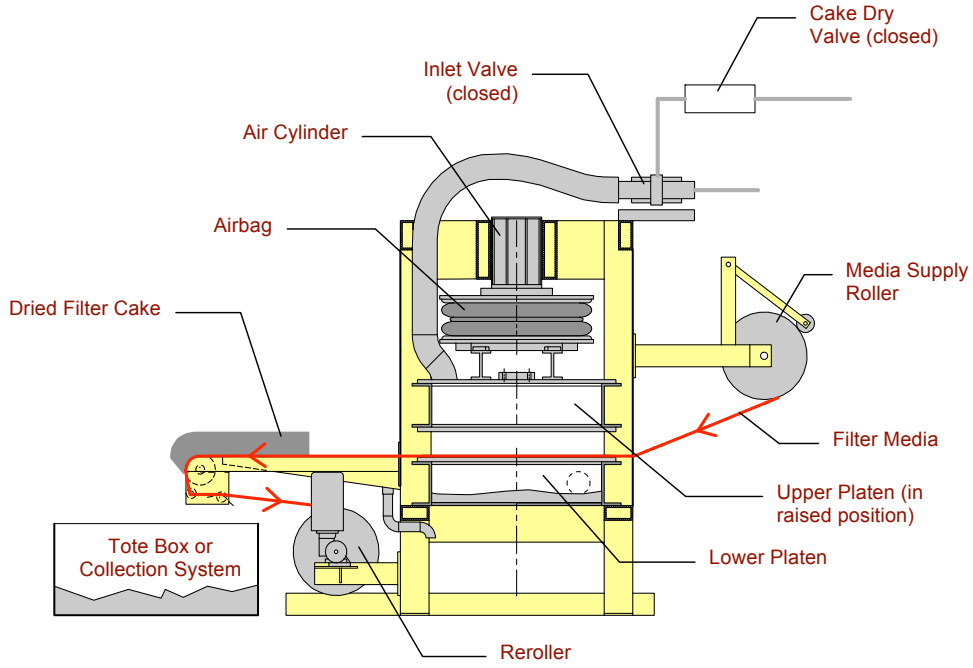

Figure 1-5 Discharge Cycle

The **dried filter cake** is automatically discharged by a motor driven **reroller** pulling the disposable **filter media**. After cake discharge, the **upper platen** automatically descends and a new filtration cycle starts.

1.2.4 Customization of the Process

The cycle can be customized to suit a wide variety of filtering applications by changing a number of variables, such as:

- Liquid and air pressures.
- Cycle times.
- Filter media.

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1.3 PURPOSE OF THIS MANUAL

The purpose of this manual is to provide information on the **operation**, **routine care** of the system by the operators, and **installation** of the typical Oberlin filter system.

It is not intended to provide instruction on your particular application nor on specific safety issues applicable to your industry.

Information on auxiliary equipment, such as pumps, tank systems, chillers, etc. is contained in separate documents provided with your system.

Service and maintenance procedures requiring trained maintenance personnel are described in the separate Maintenance Supplement accompanying this manual.

1.4 LIMITATIONS

The Oberlin Filter Company cannot be an expert in all possible flammable, toxic, or other hazardous characteristics of the substances that can be processed by this equipment. It is the responsibility of the customer and/or user to perform an appropriate hazard analysis for the entire process including upset conditions and processing errors.

Do not use the filter in an explosive environment unless the system is specifically designed for the application. Standard controls and other electrical equipment on the typical unit **are not** suitable for use in explosive environments.

Refer to Section 2.1.4 for additional information.

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2.0 SAFETY

2.1 GENERAL

Warning!

Failure to install, operate, clean, and service this machine in a safe manner can result in death, serious personal injury, and/or property damage.

The owner/operator is responsible to ensure that:

- The filter and its components will be installed, operated, and serviced only by qualified, trained personnel. The filter is **not intended** for use by untrained persons.
- The filter will be installed in accordance with OSHA, the National Electrical Code, and all other applicable national, state, and local codes, and in accordance with site designs by qualified facility engineers, including mechanical, structural, electrical, and any other applicable disciplines.
- The employer (owner or operating company) has installed separate lockable disconnects (Lockout/tagout devices) if required by OSHA and/or the National Electrical Code and has in place appropriate Lockout/tagout procedures, as is required of the employer under OSHA.
- The employer (owner or operating company) has implemented a comprehensive general safety program, and that anyone working on or around the filter has been trained in all procedures applicable to the owner's process, and to equipment of this type, including Lockout/tagout procedures.

2.1.1 Read and Understand this Manual

Warning!

Proper training is the best protection against accidents.

Before attempting to install, operate, clean or service this equipment, installers, machine operators, and service personnel must read and understand this instruction manual. All personnel must be familiar the basic construction of the filter, hazards associated with the equipment, the use and location of the controls, and the functioning and adjustment of the different mechanisms. They must confirm that the required maintenance schedule has been followed.

Most importantly, all personnel must completely understand and follow all safety procedures required by the owner's safety program, as well as any specific safety precautions called for in this manual or required by law.

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If you do not understand any of these instructions, **do not proceed** until and unless you have obtained clarification which answers your questions.

2.1.2 Signal Words - Safety Message Definitions

Three Signal Words may be used in this manual to indicate different levels of hazard:

DANGER! Indicates an extremely hazardous situation which, if not avoided, **will** result in death or serious injury. This Signal Word is limited to the most extreme situations of equipment operation and maintenance.

WARNING! Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.

CAUTION! Indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury. It may also be used to alert against unsafe operation or maintenance practices or property damage.

2.1.3 Warning Labels

Oberlin has provided labels on the machine in support the operating company's safety program. Although we use labels of very high quality, they may eventually become dislodged from the machine or damaged to the point that effectiveness is diminished. For the protection of your personnel, Oberlin has replacement labels and decals available; contact Oberlin Customer Support Department at **262-547-4900.**

2.1.4 Hazardous Operating Conditions

Warning!

Potential burn, explosion, toxic, chemical, environmental and other hazards!

Do not process flammable, explosive, toxic, or otherwise hazardous materials without first performing an appropriate hazard analysis.

Oberlin cannot be an expert in the chemical and biological properties of the large number of fluids that could be processed by this equipment. As sold, this machine is not designed to safely process hazardous materials unless additional precautions are taken.

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Before processing any material that is or can react to become flammable, explosive, toxic, or otherwise hazardous, the owner/operator must perform a thorough hazard analysis and risk assessment of the entire process including contingency plans for dealing with processing errors and upset conditions.

Do not use the filter in an explosive environment unless the unit and controls are specifically designed for the application. Standard controls and other electrical equipment on the unit **are not** suitable for use in explosive environments.

2.2 SAFETY FEATURES OF THE EQUIPMENT

The safety features of this equipment include:

- Enclosure of the principal moving parts
- Platen Hold-Open isolation valve
- Safety labels on the machine
- "Touch safe" electrical control cabinet
- "Emergency Stop" button
- "Emergency Platen Open" button
- Stored energy release valve

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2.3 LOCKOUT/TAGOUT PROCEDURES

Danger!

Unexpected start-up of the filter, electric shock, or sudden release of stored energy can result in death, serious injury, and/or property damage.

It is the responsibility of the employer (owner or operating company) to establish comprehensive and effective Lockout/tagout procedures appropriate to the specific process and installation. The following basic Lockout/tagout instructions must be supplemented by procedures based on **your specific process and installation**. (Refer also to Section 2.4 below regarding all procedures requiring work between the platens.)

- Lockout/tagout the electrical service before cleaning, servicing, or adjusting any mechanical or electrical component or opening the control panel.

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(The disconnect switch mounted on the filter de-energizes all components within the control panel **except as noted on the enclosure door.** Wiring not de-energized is color-coded orange or yellow.)

- Lockout/tagout the compressed air supply and **bleed off pressure** using the air service supply valve **and** the stored energy release valve before cleaning, servicing, or adjusting any pneumatic component.
- Perform Lockout/tagout procedures as above before removing any guard or any part of the filter enclosure.
- Do not under any circumstances attempt to clean, service, or adjust the filter while it is in operation.
- Lockout/tagout procedures must include safe procedures for starting the equipment. Do not start the filter unless all guards and enclosure panels are in place and access doors are closed.

2.4 PRECAUTIONS FOR WORKING NEAR OR BETWEEN THE PLATENS

Danger!

Unexpected fall of the platen can result in death, serious injury, and/or property damage.

It is necessary to work inside the filter to accomplish a number of procedures including servicing components and cleaning the filter. In such cases the following procedures **must** be followed:

1. Turn the "Platen Switch" on the control panel to the "Hold Open" position; if the unit is in the Filtering Cycle also push the "Stop Feed/Start Drying" button. Wait for the filter to complete the Drying Cycle, then discharge cycle, and go into "Standby" mode.
2. Turn the "Main Disconnect Switch" on the control panel to the off position.
3. If work **NEAR** the platens is required, turn the "Platen Hold-Open" isolation valve to the closed position. On models OPF-12 and larger, increase Airbag Pilot Regulator set-point to 80 psi to insure platen stays open. Such work could include metallic belt removal, or platen seal replacement. **Never under any circumstances place hands between platens.** When work is completed, decrease Airbag Pilot Regulator to original set-point (50 psi is normal).
4. If work **BETWEEN** the platens is required, turn the "Main System Air Lockout" valve to the closed position. Block platens open appropriately by placing blocks between platen seals. Such work could include distribution plate adjustment or removal, lower platen grating removal, or cleaning inside of platens.

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Deleted: 3. Shut off the air supply. (Pressure remains in the system.)

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Some procedures may, **in addition**, require Lockout/tagout of the electrical and/or pneumatic systems; refer to Section 2.3 above.

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2.5 SAFETY PRECAUTIONS

2.5.1 Precautions During Installation

1. **Lifting**

   Warning!

   Crush hazards! The filter and its subassemblies are heavy. Use only properly lifting equipment. The unit must be lifted only by properly qualified personnel familiar with rigging techniques. Do not allow personnel beneath the lifted load.

   The weight of your unit is shown on the Bill of Lading.

   The filter units may be lifted by the four lifting lugs provided at the top of the unit. Use spreader bars and multiple slings as necessary to protect all components.

   Units having substantial cross members beneath the drip pan may also be lifting using a properly rated forklift under the cross members. **Do not** lift by the drip pan!

   Do not lift under the platen or the discharge and/or feed arms.

   The filter and other components are top-heavy and may tip suddenly. Keep plumb and level while lifting.

2. **Fastening In Place**

   Warning!

   Crush hazards! The filter and other components are top-heavy and may tip suddenly. Make sure the filter is securely fastened to the supporting surface.

3. **Electric Wiring**

   Warning!

   Hazardous voltages! Danger of electric shock! All wiring must be in accordance with the National Electric Code and all applicable local, state, provincial, and national codes.

   Provide dedicated hard-wired grounding. Do not rely on conduit for ground.

   If explosive conditions exist, all motors and electrical devices must be explosion proof.

   Make sure that the current characteristics correspond to those shown on the nameplate on the filter.

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4. Piping Installation

Caution!

Tripping and burn hazards! Run piping high out of reach where possible. Insulate piping carrying hot fluids below a height of 7 ft (2.3m.).

2.5.2 Precautions During Operation

10. Guards, Covers, etc.

Warning!

Crush hazards! Pinch points! Do not operate the filter unless all guards, covers, access doors, and enclosure panels are in place or closed as applicable.

11. Hazardous Operating Conditions

Warning!

Burn, explosion, toxic, chemical, environmental and other hazards! Do not operate the filter under hazardous conditions unless a hazard analysis has been performed. Refer to Section 2.1.4 above.

12. Eye Hazards

Warning!

Pressure, toxic, contact, and other eye hazards! Wear approved eye protection while operating the filter.

13. Working Between the Platens (or Inside the Filter)

Danger!

Crush hazards! Pinch points! Unexpected fall of the platen can result in death, serious injury, and/or property damage. Turn off electrical and air services. Never place hands between platens unless platens are blocked open appropriately. Refer to Section 2.4 for additional information.

14. Interlocks

Warning!

Shock, crush, pressure, and other hazards. Do not by-pass or defeat any interlock or other protective device.

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Deleted: **Do not** under any circumstances disconnect the safety plug from the safety block.

14. Safety Plug

Danger!

Crush hazards! Pinch points! Unexpected start-up of the filter can result in serious injury and/or property damage. Unplug the safety plug from control panel when loading or unloading filter media or performing **any** procedure near moving parts.

(Removal of the safety plug will disable all control functions and prevent operation of the system, but **will not** de-energize all electrical and pneumatic components.)

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15. Emergency Conditions

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Press the **Emergency Stop** button to halt machine operation. All control functions, electric motors, and electrical devices will be disabled.

Press the **Emergency Platen Open** button on the solenoid rack to raise the platen. (Control functions **will not** be disabled.)

Keep away from mechanical components when using the emergency controls.

2.5.3 Precautions During Service

20. Lockout/Tagout

Danger!

Unexpected start-up of the filter, electric shock, or sudden release of stored energy can result in death, serious injury, and/or property damage. Follow the approved Lockout/tagout procedures before cleaning, servicing, or adjusting any mechanical or electrical component.

(The disconnect switch mounted on the filter de-energizes all components within the control panel **except as noted on the enclosure door.** Wiring not de-energized is color-coded orange or yellow.)

Refer to Section 2.3 for additional information.

21. Working Between the Platens (or Inside the Filter)

Danger!

Crush hazards! Pinch points! Unexpected fall of the platen can result in death, serious injury, and/or property damage. Turn off electrical and air services. Never place hands between platens unless platens are blocked open appropriately. Refer to Section 2.4 for additional information.

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Deleted: Remove the safety plug from the control panel and place the safety block between platen seals when performing **any** procedure inside the filter.

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Deleted: Do not under any circumstances disconnect the safety plug from the safety block.

22. Pneumatic Piping and Devices

Warning!

Pressure hazards! Do not service or adjust pneumatic components while under pressure. Lockout/tagout the air service and bleed pressure from the system using the air service supply valve **and** the stored energy release valve.

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23. Opening or Closing the Platen

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Warning!

Crush hazards! Pinch points! The platen is heavy. Some service procedures call for lowering the platen by releasing air pressure in the air cylinder. Keep away from the platen as it is being lowered.

Likewise, keep away from the platen as the system is re-pressurized and the platen raised.

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3.0 OPERATION

3.1 BEFORE OPERATING THE FILTER

Before operating the filter make sure that all operators have read and understood this manual in its entirety including the separate document Sequence of Operation - Specific, all controls have been properly set as described in Section 4, and on new installations, an initial start-up procedure has been performed as described in Section 7.5.

See Section 2.3.

Warning!

Follow approved Lockout/tagout procedures before starting the system.

3.2 LOADING AND UNLOADING FILTER MEDIA

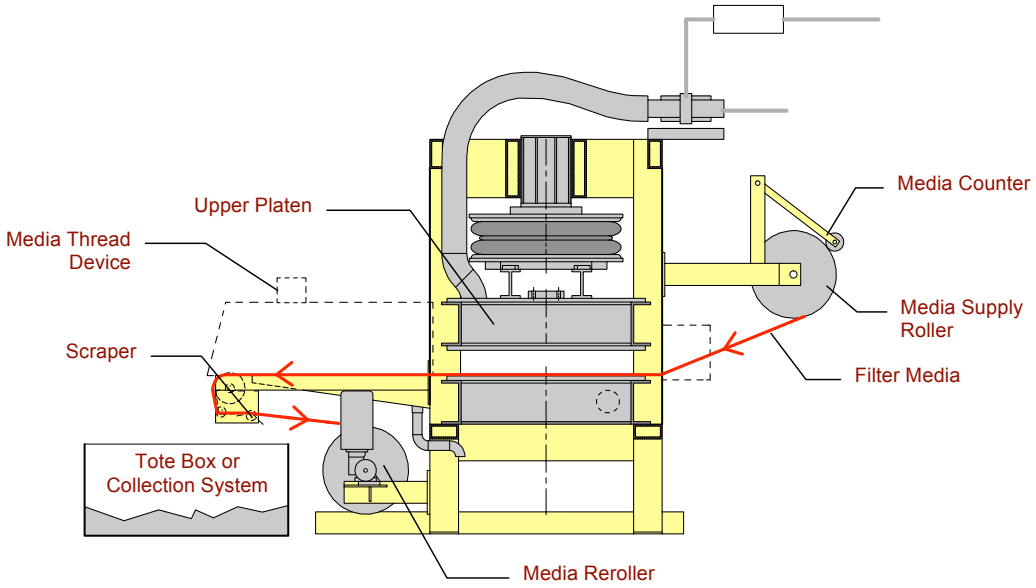

Figure 3-1 Loading the Filter Media

Follow the steps below to load and unload filter media if the end of a roll of media remains in the machine. If the machine is entirely empty of media follow the instructions for loading in Section 7.5.2.

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1. Turn the "Platen Switch" on the control panel to the "Hold Open" position; if the unit is in the Filtering Cycle also push the "Stop Feed/Start Drying" button.. Wait for the filter to complete the Drying Cycle and go into "Standby" mode.
2. Press the "Media Jog" pushbutton. Operate the **media reroller** until all the **filter media** has been wound off the **supply reel**, but **do not** pull the used media all the way through the filter.
3. Place the **media counter** in the retracted position away from the reel.
4. Remove the empty supply reel and discard the core.
5. Install a clean roll of filter media onto the supply reel and set the reel in the supporting bracket. The media must unwind in the direction shown in the figure above.
6. Attach the leading edge of the clean media to the tail of the used media, using duct tape and/or ordinary paper staples.
7. Press the "Media Jog" pushbutton and advance the clean media through the machine until it nearly reaches the reroller. Cut the clean media away from the tail of the used.

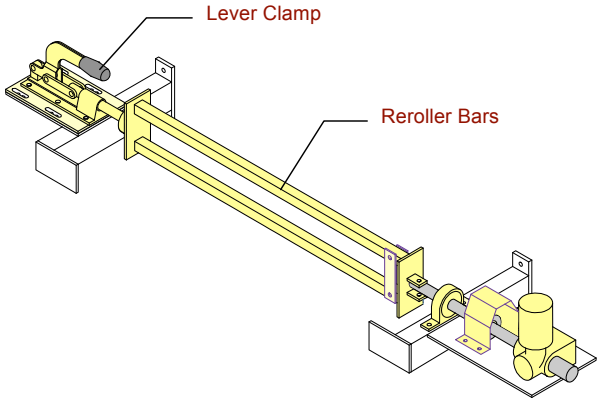

Figure 3-2 Reroller Assembly

8. Release the **lever clamp** from the swing arm holding the used media; swing the arm outward while supporting the media. Collapse the **reroller bars** holding the media; remove the used media. (If necessary, use a forklift or other lifting equipment to lift the used media.) Restore the bars, swing arm to the normal position, and close the lever clamp.
9. Thread about 2 feet (0.6 m) of clean media around the reroller bars. Press the "Media Jog" pushbutton until the media is caught by the reroller bars and is pulled through the filter. Make sure the media is centered, flat under the platen, and is being pulled in a straight path through the machine.

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10. Press the "Media Jog" pushbutton until approximately 60" (1.5 m) of new media is wound on the reroller.
11. Position the media counter so that it is resting on the supply roll.
12. Place a tote box or other receiver under the scraper bar at the discharge.
13. After the machine is completely reassembled, all access covers secured, and after following the approved Lockout/tagout procedures to be certain that it is safe to start the machine, normal operation of the system may be resumed.
14. Properly dispose of the used filter media.
15. Restart the filter as described in the separate document Sequence of Operation - Specific.

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3.3 SEQUENCE OF OPERATION - GENERAL

Each filter has a unique sequence of operation, based on the specific needs of the application. The sequence is described in detail in the separate document Sequence of Operation - Specific provided with this manual.

An **overview** of control function for typical units is described below.

3.3.1 Overview of System Control

The system is controlled by a PLC (programmable logic controller).

Once the system is energized:

1. A clean section of filter media is pulled under the upper platen. The process liquid supply pump is started.
2. The platen is lowered and the airbag is pressurized (to a minimum sealing pressure only on systems with optional Analog Proportional Airbag Control.)

Filtering Cycle:

3. When the airbag pressure reaches the "OK to Feed" setpoint, the inlet valve opens, and the process liquid flows into the platen. As the filter media begins to plug with solid particles, filter pressure rises. (Airbag pressure is gradually increased on systems with Analog Proportional Airbag Control to increase sealing pressure; refer to Section 3.3.1.1.)
4. Flow continues until filter pressure reaches the "Stop Feed/Start Drying" setpoint or after a timed interval, ending the Filtering Cycle.

Drying Cycle:

5. After a very short time delay the Drying Cycle starts. Pressurized air is fed into the platen, forcing liquid through the filter cake, drying the cake.
6. After a timed interval the bleed-off valve opens, allowing any residual liquid on top of the filter cake to bleed off.
7. As the filter cake dries, the resistance to air flow drops. When the pressure drops to the "Start Final Drying" setpoint a timed final drying period begins. After the timed interval the bleed-off valve opens to relieve pressure in the platen, and the Drying Cycle ends.

Discharge Cycle:

8. The platen rises.
9. The reroller pulls a clean section of filter media under the platen as dried filter cake drops into the collection box. The advance of the media is measured by a counter/proximity switch.

If the Platen Selector Switch is in the "Auto" position, the cycle will now repeat.

If the Platen Selector Switch is in the "Hold Open" position, the cycle will now go into "Standby" mode.

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3.3.1.1 Optional Analog Proportional Airbag Control (Typical on models OPF-12 and larger)

During the Filtering Cycle, the internal pressure of the airbag is gradually increased so as to increase the sealing force of the platen against the filter media. As the filter media plugs with solid particles and the cake builds up, this control system increases the pressure in the airbag and therefore the sealing pressure against the platen. This feature minimizes air consumption and extends seal life.

The systems functions as follows:

1. The airbag pilot regulator supplies air to the slave regulator at the pressure needed to effect an initial seal.
2. The booster regulator, connected to the upper platen, measures filter pressure as the Filtering Cycle progresses, and generates an output signal equal to twice the filter pressure signal.
3. The slave regulator pressurizes the airbags to the sum of the initial pilot setting and the output of the booster.
4. An adjustable exhaust muffler in the piping allows the previous control signal to bleed off for the next Filtering Cycle.

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4.0 SETTING OF CONTROLS

A number of switches, regulators, counters, and other controls must be set and adjusted for proper operation of the filter and to suit each particular application. (Additional fine-tuning based on operating experience may also be required to optimize the performance.)

4.0.1 Documentation of Settings

All settings (including any deviations from recommended values based on experience) should be carefully documented. As further adjustment are made this information should be updated; the record of previous settings should also be retained.

This information will be very helpful in obtaining the best performance for the system during the initial start-up period or thereafter. It can also be used to troubleshoot problems and/or restore optimal values after maintenance procedures.

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4.1 PRESSURE SWITCHES

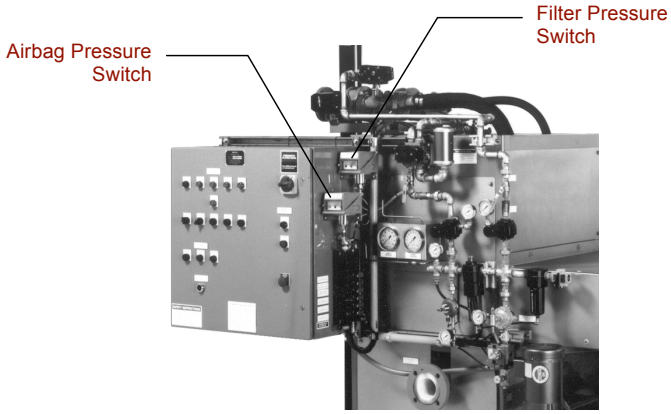

Figure 4-1 Pressure Switches

(Pressure switches may either be mechanical devices with the setting made on the switch, or analog transmitters with settings made in the PLC.)

Switch	Function and Normal Setting
1. Plant Air (optional)	Senses air pressure downstream of the air service supply valve. A fault indicates air supply shut off or failure of the plant air supply. A fault condition occurs if the pressure falls below the setting for a predetermined period of time. Normal setting: 70 psi (4.8 Bar)
2. Airbag Inflated - Start Feed Cycle (Standard on models OPF 12 and larger.)	(Used only if filter has optional "analog proportional airbag control;" refer to Section 3.3.1.1 for further information.) Senses pressure in the airbag after the upper platen lowers at the start of the Filtering Cycle. The setting is the minimum to prove adequate pressure and allow the cycle to continue. As the cycle progresses the airbag control increases the pressure. Normal setting: 30 psi (2.1 Bar)

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3. Airbag Inflated - Start Drying Cycle (Standard on models OPF 12 and larger.)	(Used only if filter has optional "analog proportional airbag control;" refer to Section 3.3.1.1 for further information.) Senses whether sufficient pressure is present in the airbag before a Drying Cycle begins and is being maintained throughout the cycle. Normal setting: 80 psi (5.5 Bar)
4. Airbag Inflated	(Used only if the filter **does not** have optional "analog proportional airbag control;" refer to Section 3.3.1.1 for further information.) Proves adequate air pressure to run filtering and Drying Cycles. Normal setting: 80 psi (5.5 Bar)
5. Filter Pressure - Stop Feed, Start Dry	Senses pressure in upper platen, stops the Filtering Cycle when the pressure reaches the set value. Energizes high pressure to the airbag (on filters with "analog proportional airbag control") and when pressure is sufficient starts the Drying Cycle. Normal setting: 30 psi (2.1 Bar)
6. Filter Pressure - Start Final Dry	Senses pressure in the upper platen. As the cake nears a dry condition all the fluids have been forced through the cake and the pressure will drop. When the pressure drops to the set value this switch starts the Final Drying Cycle timer; refer to Section 4.2 below. (The timer controls the end of the Drying Cycle so that cake is dry when discharged.) Normal setting: 5-10 psi (0.3-0.7 Bar) below the setting of the cake drying regulator; refer to Section 4.3 below.
7. Filter Overpressure (optional)	Senses overpressure in the upper platen during all parts of the cycle, terminates cycle, opens bleed-off valve to vent pressure, sounds alarm. Normal setting: 40 psi (2.8 Bar)

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4.2 TIMERS/COUNTERS

(Timers/counters may be part of the PLC logic with settings made in the PLC.)

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Timer/Counter	Function and Normal Setting
1. Media Counter	Measures length of media drawn into filter at the beginning of each Filtering Cycle. Reroller motor stops when correct value is reached. Set in control cabinet, or in PLC on models so equipped. Normal setting: refer to table below.
2. Initial Dry Timer	0 seconds for coolant filtration. 10-30 seconds for other applications.
3. Discharge Alarm Delay Timer	Sets time allowable for media counter to reach set value. Excessive time indicates media is jammed or is slipping. Normal setting: refer to table below.
4. Bleed-off Timer	0 seconds for coolant filtration. 10-30 seconds for other applications.
5. Final Drying	Times the end of the Drying Cycle and determines the dryness of the filter cake. Starts when the pressure in the platen drops to a set value. Normal setting: 30-45 seconds
6. Plant Air (optional)	Sets the amount of time the plant air may fall below a set value before causing a fault; prevents nuisance faults/shutdowns caused by short drops in plant air pressure. Normal setting: 30 seconds

Model No.	Media Counter Setting	Discharge Alarm Delay Setting
OPF - 2	12	20
OPF - 4	13	25
OPF - 7	17	30
OPF - 12	17	30
OPF - 18	27	45
OPF - 24	30	60
OPF - 36	49	75

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4.3 REGULATORS

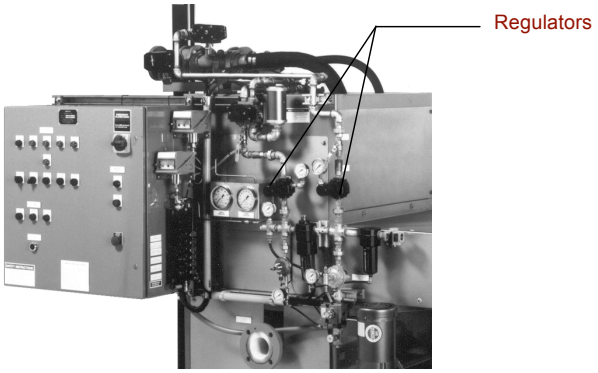

Figure 4-2 Regulators

(Regulators are mechanical devices with setting made at the regulator.)

Regulator	Function and Normal Setting
1. Cake Drying (filter pressure)	Regulates air pressure in the platen during the Drying Cycle. The setting is best made when the system is in the beginning of a Drying Cycle. Normal setting: 30-35 psi (2.1-2.4 Bar) 40 psi (2.8 Bar) max.
2. Airbag (standard)	Regulates the pressure in the airbag on machines without "analog proportional airbag control." Normal setting: 100 psi (6.9 Bar)
3. Airbag Pilot (optional)	Regulates the minimum air pressure fed into the airbag/cylinder by the slave cylinder. This regulator must be set during the beginning of the Filtering Cycle. When there is no pressure in the platen the airbag pressure gauge shows the setting of this regulator. Adjust until airbag pressure is 40-50 psi (2.8-3.5 Bar) with zero pressure in the platen. Normal setting: 40-50 psi (2.8-3.5 Bar)

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4. Airbag Slave (optional)	Regulates the pressure in the airbag/cylinder until the high pressure to the airbag is energized. This regulator is controlled by the pilot regulator. This regulator has a constant bleed that must remain slightly open to bleed excess pressure from the previous cycle. The amount of bleed is adjustable, but must not be closed.
5. Filter Feed Pump (optional on systems with air operated pump)	Establishes the minimum air pressure to the feed pump to control speed when there is no pressure in the filter. As filter pressure increases this regulator adds the pressure increase as a bias to maintain fairly constant pump speed. Normal setting: 40 psi (2.8 Bar)

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4.4 LIMIT / PROXIMITY / SWITCHES

The control system prevents the filter from operating (and will halt a cycle in progress) unless certain limit/proximity switches are satisfied.

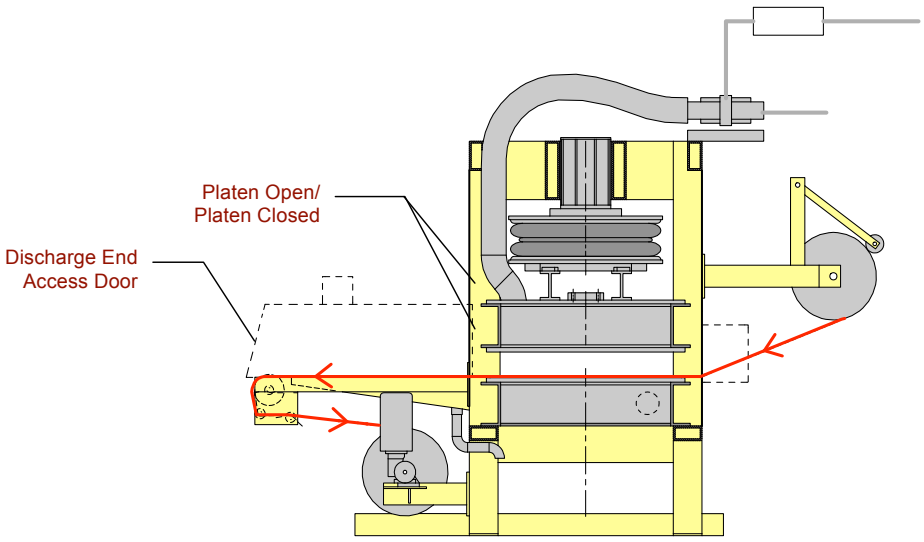

Figure 4-3 Typical Proximity Switches

(Limit/proximity switches are mechanical devices with any adjustments made at the switch. Adjustment consists of correctly positioning the switch.)

1. Platen Open Platen Closed	Two switches, sense fully open, fully closed positions of the platen. The appropriate switch must be satisfied to allow any of the three filter cycles to continue.

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5.0 PROBLEM SOLVING

See Section 2.3. and 2.4.

Danger!

Follow approved Lockout/tagout procedures before cleaning, servicing, or adjusting the system.

Take required safety precautions when working between the platens.

Follow approved Lockout/tagout procedures before restarting system.

5.1 ELECTRICAL AND MECHANICAL PROBLEMS

Symptom	Cause	Remedy
5.1.1 System entirely inoperative.	Electric service is disconnected.	• Turn on at the disconnect.
	Master control off.	• Ensure e-stop pushbutton disengaged.
	Main system air lockout valve is closed.	• Turn on plant air
5.1.2 Filtering Cycle will not start.	Incorrectly adjusted or malfunctioning platen proximity switches.	• Adjust or replace. Platen must be fully open or fully closed for cycle to proceed.
	Plant air off.	• Turn air supply on.
	Airbag regulator set too low.	• Adjust regulator in accordance with requirements of the Pneumatic Schematic.
	"Airbag Inflated - Start Feed" pressure switch set too high.	• Adjust setpoint in accordance with requirements of Section 4.1.
	Defective inlet valve or solenoid.	• Check for proper operation or defective components (blown fuse on solenoid, leaking pneumatic line, dirt in spool, etc.)
5.1.3 Process liquid supply pump does not run. (electric pumps)	No power to pump.	• Check power circuit. • Check starter, fuses, breaker, etc.
	Other pump malfunction.	• Service in accordance with manufacturer's instructions.

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5.1.4 Process liquid supply pump does not run. (air operated pumps)	Insufficient air pressure to pump.	• Check air supply line for leaks, blockage. • Make sure pump throttle needle valve on air supply is open. • Check pilot regulator for proper setting.
	Empty oil reservoir (especially if pump was run dry previously.)	• Check reservoir and fill if necessary.
	Other pump malfunction.	• Service in accordance with manufacturer's instructions.
5.1.5 Pump running but no liquid delivered.	Air leak in pump suction line, or line is plugged.	• Check line for leaks and repair. • Check line for blockage and remove.
	Centrifugal pump not primed.	• Prime pump.
	Coupling between pump and motor loose or damaged. (centrifugal pumps)	• Repair coupling.
	Fluid level in supply tank too low. (centrifugal pumps)	• Check fluid level.
5.1.6 "Filter Pressure" gauges not reading properly.	Line to gauge broken or plugged.	• Check line for leaks and repair. • Check line for blockage and remove.
	Dirt clogging gauge inlet.	• Clean inlet.
5.1.7 Pressure switches not activating at proper setpoints.	Line to switch broken or plugged.	• Check line for leaks and repair. • Check line for blockage and remove.
	Dirt clogging switch bellows inlet.	• Clean inlet.
	Faulty wiring or faulty switch.	• Check wiring for faults or breaks and repair. • Check switch for proper operation

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5.1.8 Leakage at upper or lower platen seals.	Cake dry pressure set too high.	• Lower pressure setting. Maximum setting 35 psi (2.4 Bar)
	Filter pressure too high with respect to airbag pressure.	• Adjust settings on pressure switches. Refer to Section 4.1 for proper settings.
	Airbag pressure too low.	• Adjust settings on pressure switches and/or regulators. Refer to Section 4.1 for proper settings.
	Airbag leaks.	• Check airbag for damage and replace if necessary. • Check retainer ring for tightness.
	Normal break-in of new platen seals or after prolonged downtime (over one week).	• Seals require break-in period.
	Defective/worn platen seals.	• Inspect and replace if necessary.
	Leakage at bolts holding platen seals.	• Replace fiber washer and/or apply gasket sealer.
	Debris between platen and media.	• Inspect and remove debris.
5.1.9 Constant flow of air exhausting through "Platen Control Valve."	Defective valve	• Replace valve.
	Defective open/close pilot solenoids	• Replace solenoids.
	Air cylinder seals defective- leaking air into exhaust line.	• Replace seals.
5.1.10 Upper platen will not lower.	Platen proximity switch arm misadjusted. (switch must activate when platen is completely open)	• Readjust switch. (The "Emergency Platen Open" pushbutton can be used, **with caution**, to raise platen to full open position.)
	Platen switch is in "Hold Open" position.	• Turn switch to "Auto."
	4-way platen control valve or corresponding solenoids working improperly.	• Check for blown fuse, dirt in spool area, leaking or pinched signal tube, loose or faulty wiring, etc.
	Platen binding, improperly aligned in filter frame.	• Check platen and air cylinder for proper mounting and alignment.

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5.1.11 Upper platen will not raise.	Insufficient plant air pressure.	• Provide air pressure in accordance with specifications.
	"Airbag" regulator set too low or defective.	• Increase regulator setting. (Refer to Section 4.3.) (If the filter pressure gauge reads 0 psi the "Emergency Platen Raised" pushbutton can be used, **with caution**, to raise platen.)
	Air cylinder defective.	• Check for misalignment, leaking seals, broken air lines.
	4-way platen control valve or corresponding solenoids working improperly.	• Check for blown fuse, dirt in spool area, leaking or pinched signal tube, loose or faulty wiring, etc
5.1.12 Cake Drying Cycle will not turn on or off.	Actuator or valve defective.	• Check for plugged valve, stripped connection between valve and actuator, stripped gear or jam in actuator, etc.
	Short-cycling due to insufficient air supply.	• Use manual valve to adjust air flows.
	Defective solenoid on air drying valve.	• Check for blown fuse, dirt in spool area, leaking or pinched signal tube, loose or faulty wiring, etc.
	Manual valve in air supply piping is closed.	• Open valve.
	"Filter Pressure Start Final Dry" switch setpoint not reached.	• Check for dirt in sensor line. • Reduce setpoint to correct value. (Refer to Section 4.1.) • Check for defective switch, loose or faulty wiring, etc.
5.1.13 Media reroller will not function.	Motor overloads in control panel tripped.	• Check for excess heat in panel. • Check for excessive drag in system - coupling, pillow blocks, reel, etc. • Check for wiring fault.
	Slipping clutch.	• Adjust to specifications.
	Defective motor.	• Check for jams, burn-out, etc.
	Defective wiring to motor.	• Check for breaks, loose connections, etc.
	Platen not open, or not raised completely.	• Refer to Item 5.1.11 above. • Check platen proximity switch and adjust if necessary- switch activates when platen is in full open position.

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5.2 FILTRATION PERFORMANCE PROBLEMS

Symptom	Cause	Remedy
5.2.1 Reduced flow through filter.	Filter inlet valve not fully opened or clogged.	• Check actuator for proper operation or defective components (stripped coupling, pinched tubing, etc.) • Clean valve.
	Defective supply pump.	• Service in accordance with manufacturer's instructions.
	Clogged supply piping.	• Clean piping.
	Filter pump manual by-pass valve set improperly.	• Set in accordance with pump curve.
	Filter pump automatic by-pass valve improperly set or not closing.	• Check actuator for proper operation or defective components (stripped coupling, pinched tubing, etc.)
	Clogged perforated metal screen beneath media. (Pressure will build up rapidly at start of filtration cycle.)	• Clean the screen as described in the separate Maintenance Supplement.
	Change in characteristics of process liquid: smaller particles, more solids, etc.	• Contact Oberlin Customer Service for assistance.
	Clogged filter outlet or lower platen.	• Clean outlet piping or lower platen.
5.2.2 Filtrate quality poor - too many suspended solids.	Hole, rip in media.	• Check for defective media.
	Filter media too coarse.	• Use different media - consult Oberlin Customer Support.
	Misalignment of media under upper platen.	• Make sure media is feeding correctly.
5.2.3 Excessively long Drying Cycle	Filter blinding - misapplied media.	• Load media suitable for the application.
	Filter media blinding - pollution in coolant.	• Contact Oberlin Customer Support for assistance.

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5.2.4 Filter cake too wet.	"Final Drying" timer set too short.	• Adjust to correct setting. (Refer to Section 4.2.)
	Hole in filter media or filter cake - air follows path of least resistance.	• Replace media. Determine cause of physical damage and correct.
	Insufficient air from regulator.	Place platen switch in "Hold Open" position and manually force cake dry solenoid open. You should hear air escaping. If not: • Check and adjust regulator. (Refer to Section 4.3.) • Check control valve - dirt in spool, pinched or broken signal tube, bad O-ring, etc. • Check solenoid - faulty wiring, air supply turned off or leaking, defective valve, etc. • Make sure manual valve in supply piping is open. • Check cake dry inlet valve for proper operation.
	Partial blockage of air drying supply line.	• Check for closed manual valve, plugged line, etc.
5.2.5 Filter cake wet in some areas only.	Filter not level.	• Check level and correct if necessary.
	Hole in filter media. (Air passes through without drying.)	• Replace media. Determine cause of physical damage and correct.
	Incorrect media type, if trailing edge is wet.	• Replace media with correct type. Contact Oberlin Customer Service for assistance.
	Too little spacing between cycles if trailing edge is wet.	• Increase setting of discharge counter to increase spacing.

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5.2.6 Filter cake too thin.	Plugged suction line to filter feed pump.	• Clean piping.
	Media "blinding" by small dirt or tramp oil particles - only fine suspended particles in solution are being processed through filter.	• Contact Oberlin Customer Support for assistance.
	Excessive flow at inlet.	• Readjust manual flow control valve.
	Media pores plugged with cake.	• Advance media to new section.
	Clogged perforated metal screen.	• Clean.
	Improperly adjusted controls.	• Adjust setpoints on pressure switches. (Refer to Section 4.1.)

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5.3 FAULT MESSAGES OR INDICATIONS

5.3.1 "Media Trouble"	Media torn or out of media.	• Check media and resupply if necessary.
	Loose media through filter - insufficient tension.	• Adjust media supply reel tension spring.
	Media wheel not in contact with media.	• Reposition
	Slippage at media counter.	• Check for residue on wheel, damaged components, etc.
	Slippage of clutch at reroller.	• Check for misadjusted or worn clutch. • Check for dirty media roll too large or heavy.
	Media counter/proximity switch not working properly.	• Check for position, screws missing in wheel, etc. • Check for loose or faulty wiring.
	Misadjusted timer or counter in program.	• Check counts vs. time.
5.3.2 "Filter Overpressure" (filter stopped with bleed-off valve open to relieve pressure in the upper platen.)	"Cake Drying" regulator set too high or not regulating.	• Adjust setpoint. (Refer to Section 4.3.) • Check regulator for proper operation.
	Filter blinding - misapplied media.	• Load media suitable for the application.
	Filter media blinding - pollution in coolant.	• Contact Oberlin Customer Support for assistance.
5.3.4 "Low Plant Air"	Insufficient supply - leaks, excessive demand, compressor down, etc.	• Investigate and correct.
	Regulator improperly adjusted.	• Adjust setpoint. (Refer to Section 4.3.)
	Air service supply valve closed.	• Open valve.

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6.0 MAINTENANCE/CARE

See Section 2.3. and 2.4.

Danger!

Follow approved Lockout/tagout procedures before cleaning, servicing, or adjusting the system.

Take required safety precautions when working between the platens.

6.1 MAINTENANCE SCHEDULE

	Frequency		
	Weeks	**Months**	**Years**
Compressed Air Supply • Inspect filters • Replace filters	1	 6	
Oberlin Filter			
General Inspection	1		
Inspect Perforated Metal Screen for Plugging		1	
Disposable Media • Inspect • Empty reroller • Load new roll	1	 As req'd. As req'd.	
Air Cylinder • Inspect		6	
Pillow Block Bearings • Lubricate			1
Platen Seals • Inspect • Replace		1	 3-5
Airbag • Inspect • Replace		6	 5-10
Regulators, Valves, Solenoids • Inspect, check settings		1	

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Maintenance Schedule - Continued

	Frequency		
	Weeks	**Months**	**Years**
Reroller Gearbox • Check lubricant level			1 or per mfgr.
Electric Motors	In accordance with manufacturer's recommendations.		
Pumps	In accordance with manufacturer's recommendations.		
Auxiliary Equipment (such as chillers, compressors, etc. on machines so equipped)	In accordance with manufacturer's recommendations.		

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6.2 ROUTINE CARE OF THE MACHINE BY OPERATORS

This section describes routine maintenance and service procedures to be performed by operating personnel as part of normal operating procedures. More extensive service procedures requiring trained maintenance personnel are described in the separate Maintenance Supplement.

See Section 2.3, 2.4 and 2.5.

Danger!

Follow approved Lockout/tagout procedures before cleaning, servicing, or adjusting the system.

Take required safety precautions when working between the platens, loading / unloading filter media, or performing any procedure near moving parts.

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6.2.1 General Inspection

Make a general inspection of the entire filter system once a week, as follows:

- Observe the system in operation. Make sure the mechanism is operating smoothly without binding, vibration, excess noise, etc. Make sure the filter media is tracking properly through the filter - in a straight line without folding, binding, or tearing. Check the filter cake for proper dryness.
- Make sure no fault conditions are indicated on the control panel.
- Check regulators, valves, solenoids, pressure switches, etc. for correct settings in accordance with Section 4.
- Verify the correct operation of proximity switches.
- Check the condition of the perforated metal screen below the media. Clean if necessary. (Replacement is described in the separate Maintenance Supplement.)
- Make sure there is sufficient media on the supply roller. Load a new roll of media if necessary, as described in Section 3.2 (or 7.5.2 if there is no media at all left in the machine.)
- Check the reroller. Empty the reel if necessary, as described in Section 3.2. Wipe the rollers and scraper bar to remove any residues of filter cake.
- Check the filters in the air supply and replace if necessary. Check the operating record of the plant air system to make sure no contamination has occurred that could affect filter performance.
- Check the entire machine for loose bolts or fasteners, leakage from piping or fittings, or other abnormal conditions.
- Clean the operator screen. Before doing so, disable screen control function to avoid entering unwanted commands. (Typically there is a "Screen Disable" key

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on one of the menus; otherwise turn off power to the screen. Refer to the separate document Sequence of Operation - Specific for additional information.)

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7.0 INSTALLATION

7.1 RECEIVING

The filter is typically shipped fully assembled.

Remove packaging material (if provided.) Inspect carefully for damage that may have occurred during shipment, and make sure that all items on the packing list have been received. All damages and/or shortages should be noted on the Bill of Lading. The unit is shipped F.O.B. and title passes to the purchaser when it is loaded and accepted by the carrier. It is the responsibility of the purchaser to make claims for damages or shortages with the carrier.

7.2 LIFTING

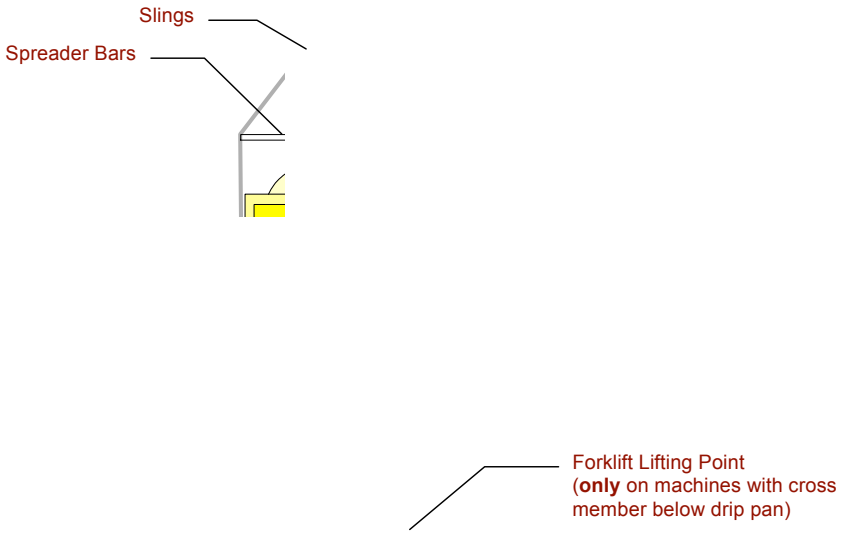

Figure 7-1 Lifting the Filter

See Section 2.5, Item 1.

Warning!

The filter and other components are heavy and may tip suddenly! Use properly rated lifting equipment and correct lifting procedures.

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The filter units may be lifted by the four **lifting lugs** provided at the top of the unit using properly rated lifting equipment. Use **spreader bars** and multiple **slings** as necessary to protect all components.

Units having substantial **cross members** beneath the drip pan may also be lifted using a properly rated forklift under the cross members. **Do not** lift by the drip pan! **Do not** lift under the platen, the discharge, or feed arms.

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7.3 SETTING IN PLACE

7.3.1 Location

Locate the filter system in a clear and clean area away from normal personnel traffic on a flat and solid concrete or steel surface. The supporting surface must be designed by qualified facilities engineers and must be adequate to support the filter, the weight of the material that could fill the filter during upset conditions, and all auxiliary equipment, including appropriate safety factors.

Ensure that there are unobstructed entrances and exits to and from the operation area. Ensure that the area has adequate lighting and ventilation.

Free areas are required at the sides of the filter (and auxiliary equipment as applicable) for removal of media, removal of the platen, and other operating and service procedures.

7.3.2 Fastening in Place

1. Set the filter in the required location. Level the unit with a precision level, using shims under the support legs if necessary. It is essential that the unit be **exactly level**, with each leg firmly supported. If the filter is not level the filter cake will not be of uniform thickness and not uniformly dry.
2. Bolt in place using suitable bolts or masonry anchors through the holes in the plates under each leg.

See Section 2.5, Item 2.

Warning!

The filter is top heavy and may tip! Fasten securely in place.

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7.4 CONNECTING THE FILTER SYSTEM

The connections required for your particular system are typically shown on the drawings provided in Appendix A as follows:

- The overall relationships of the filter to auxiliary equipment and external systems are shown on the Process Schematic drawing.
- Liquid piping connections are shown on the Process Schematic drawing.
- Pneumatic connections are shown on the Pneumatic Schematic drawing.
- Electrical connections are shown on the Electrical Schematic drawing.

Certain applications may also require connections to special auxiliary systems. If so, the necessary drawings have been supplied with your system.

The extent of field piping/wiring depends on the nature of the particular system. Field piping/wiring and customer supplied equipment are shown on the drawings using **dotted lines**.

See Section 2.5, Item 4.

Caution!

Tripping and burn hazards! Run piping high and insulate.

7.4.1 Liquid Piping Connections

7.4.1.1 Process (Dirty) Liquid

The process liquid to be filtered is pumped to the filter system from the manufacturing equipment or storage tanks. Clean filtrate is collected from the lower platen and flows back to the manufacturing equipment or storage tanks by gravity or by pumping, depending on the application. In addition to inlet and outlet connections, a bleed-off line runs from the upper platen back to the process liquid tank.

Make all required piping connections in accordance with the requirements of the Process Schematic drawing; required field piping is shown using dotted lines. Pipe sizes, connections details, and piping materials are shown on the drawing. Insulate all piping carrying hot liquids below a height of 7 feet (2.1 m).

7.4.1.2 Drip Pan Outlet

Connect drip pan outlet pipe to collection point is as shown on the Process Schematic drawing; required field piping is shown using dotted lines. Pipe sizes, connections details, and piping materials are shown on the drawing.

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7.4.2 Pneumatic Connections

Pressurized air is used to operate the platen, dry the filter cake, and in some applications, to drive auxiliary equipment such as pumps.

Internal components and piping for the pneumatic system are installed and connected at the factory.

Air Service Requirements:

Air pressure requirements are shown on the Pneumatic Schematic or Process Schematic in Appendix A, but in any case must not exceed 110 psi (7.6 Bar). Air must be clean, dry, and filtered; (instrument quality air is not required.)

Air volume requirements depend on the nature of the application and area of the filter. Most of the air is consumed during drying of the filter cake. Air requirements for drying can be as high as 5 SCFM per square foot (25 l/sec/m^2) of filter area.

Where plant air is not available, a compressor and receiver may be used. Contact Oberlin Customer Support for assistance in selecting the correct compressor and receiver for your particular application.

Air Service Connections:

Connect the filter to plant air in accordance with the requirements of the Pneumatic Schematic drawing; the required pipe size is shown on the drawing. (The filter is supplied with a lockable air service supply valve, which also can be used to bleed off downstream pressure.)

Auxiliary Equipment Connections:

Field connections may be required to auxiliary components; such connections are shown on the Pneumatic Schematic drawing using dotted lines. Pipe sizes, connections details, and piping materials are shown on the drawing.

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7.4.3 Electrical Connections

See Section 2.5, Item 3.

Warning!

Shock and other hazards. All wiring must be in accordance with all applicable electrical codes, and must be properly grounded.

Electrical Service Requirements:

Refer to the Electrical Schematic in Appendix A for the voltage, phase, frequency, and amperage requirements for your system.

Electrical Service Connections:

Typically the system requires a single connection to the electrical service. Connections to motors, valves, control circuits, etc. within the filter unit are typically factory wired within the control cabinet; separate power feeds to these devices are usually not required. (However, refer to the Electrical Schematic for specific requirements for your system.)

Make incoming electrical service connections in accordance with the Electrical Schematic drawing.

Connections to Auxiliary Components:

Power for field-installed auxiliary components, such as pumps, fans, sensors, etc. is typically supplied from the control cabinet; field connections from the control cabinet to such equipment are required. (However, refer to the Electrical Schematic for specific requirements for your system.)

Make all required connections in accordance with the Electrical Schematic; terminals have been provided within the control cabinet. Field wiring is indicated by dotted lines on the Electrical Schematic.

Connections to Control Circuits:

Make all required connections to field installed control components and to external plant control circuits in accordance with the Electrical Schematic. Terminals are provided within the control cabinet for connection to field installed control components, and also for connection to plant-wide control systems. Field wiring is indicated by dotted lines on the Electrical Schematic.

In cases where the control cabinet is remote from the filter unit itself, multi-pin connectors may have been provided for cables between the cabinet and a junction box on the filter unit. The Electrical Schematic indicates pin assignments.

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7.5 NEW INSTALLATIONS - INITIAL START-UP

See Section 2.3. 2.4.

Danger!

Follow approved Lockout/tagout procedures before cleaning, servicing, or adjusting the system.

Take required safety precautions when working between the platens.

7.5.1 Prestart Checks

The following checks must be made before the filter is started for the first time.

1. Make sure that the filter is level and is securely bolted in place.
2. Make sure pump couplings have been aligned (if applicable to your system.)
3. Make sure that all piping and pneumatic connections have been properly made and are tight.
4. Make sure that all electrical connections have been properly made in accordance with all applicable codes and with proper grounding.
5. Turn on the air service supply valve. The upper platen should rise. If it does not, push and hold the "Emergency Platen Open" pushbutton on the pneumatic control panel. Turn the "Platen Switch" to the "Hold Open" position. Turn all other switches on the control panel to "Off."

See Section 2.4.

Danger!

Take required safety precautions when working between platens. Do not place hands between platens.

6. Open the access door on the discharge end of the filter. Remove any shipping media or other debris from between the platens and elsewhere inside the unit.
7. Energize the electrical service. Turn the Master/Filter Power Control on the control panel to "On."
8. Review the operational status of all electronic controls in accordance with the requirements of the separate document Sequence of Operation - Specific, including:
   - System Fault Status - if any faults are indicated investigate and correct.
   - Adjustable setpoints - set in accordance with Section 4.
9. Check, and adjust if necessary, the settings of all field-adjustable devices (such as pressure switches and regulators) in accordance with the requirements of the Section 4 and/or documented field experience.

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Deleted: 5. Plug the safety plug into the receptacle at the bottom of the control panel.

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10. Press the Media Jog pushbutton located on the side of the enclosure near the reroller motor. The direction of rotation of the media reroller should be as shown in Figure 7-2 below. Please note: the dirt always gets rolled to the inside on the media roll.

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7.5.2 Loading the Media

(If some media remains in the machine refer to Section 3.2.)

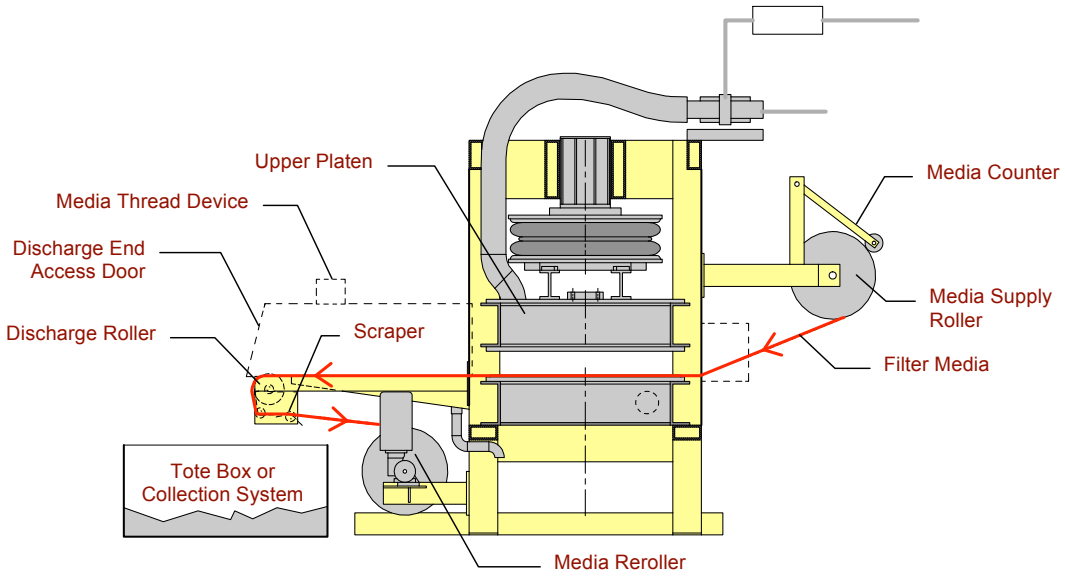

Figure 7-2 Loading Filter Media

See Section 2.5, Item 13.

Danger!

Never place hands between platens when loading filter media.

1. Verify that the pneumatic system is energized.
2. Place the **media counter** in the retracted position away from the **supply reel**.
3. Install a new roll of **filter media** onto the supply reel and center the reel in the supporting brackets. The media must unwind in the direction shown in the figure 7-2.

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4. With the platen in the open position, open the discharge end **access door** of the filter.
5. From the discharge end of the filter, push the **media thread device** through the filter, until the device is sticking out the feed end of the filter.
6. Attach the new **filter media** to the **media thread device** and pull device with attached media through filter.

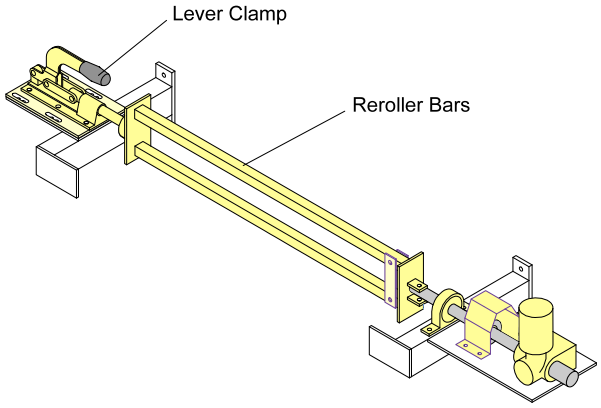

Figure 7-3 Reroller Assembly

7. Detach the new **filter media** from the **media thread device**, pull the filter media over the **discharge roller**, thread through **scraper assembly**, and wrap around the **reroller bars**, as shown in figure 7-2.
8. Close the discharge end **access doors** of the filter.
9. Press the "Media Jog" pushbutton until the **filter media** is caught by the **reroller bars** and is pulled through the filter. Make sure the media is centered, laying flat inside the platens, and is being pulled in a straight path through the filter.
10. Position the **media counter** so that it is resting on the new **media supply roll**.
11. Place a tote box or other receiver under the **scraper assembly** at the discharge end of the filter.
12. This completes the initial start-up procedure. After the machine is completely reassembled, all access covers secured, and after following the approved Lockout/tagout procedures to be certain that it is safe to start the machine, normal operation of the system may begin.

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Deleted: Feed filter media through the slot below the access door and through the filter. The media enters at the feed end, rides on top of the perforated screen, and exits at the discharge end. **Use a push stick; do not place hands underneath the upper platen.**

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8.0 APPENDICES

APPENDIX A – DRAWINGS
APPENDIX B - PARTS LISTS
APPENDIX C - SOFTWARE LISTING
APPENDIX D - MANUFACTURERS' INFORMATION
APPENDIX E - FUTURE

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