



Clear Filter Press Instructions



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INTRODUCTION

A filter press is an effective and efficient method for filtering maple syrup to improve its clarity. A combination of food grade diatomaceous earth, filter papers and specially designed plates and frames act together under pressure to remove niter and sugar sand from your maple syrup to improve the clarity. The LEADER EVAPORATOR Clear Filter Press offers increased filter paper support and better heat handling.

EQUIPMENT DESCRIPTION

NOTE: The Oberdorfer Gear Pump is no longer offered as an option on a complete filter press. This document includes information on the gear pumps for users of that pump.

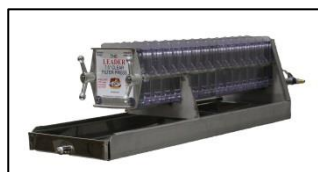
The LEADER EVAPORATOR Clear Filter Press is available as follows and includes the parts as listed:



- 5 frame
 - Bank Only (LEADER Order #550505B)
 - With Diaphragm Air Pump (Leader Order #550505A)



- 10 frame
 - Bank Only (LEADER Order #550510B)
 - With Diaphragm Air Pump (Leader Order #550510A)



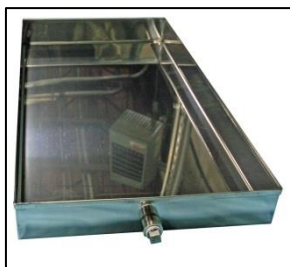
- 15 frame
 - Bank Only (LEADER Order #550515B)
 - With Diaphragm Air Pump (Leader Order #550510A)

Pump:



- Air Driven Pump- requires 4 SCFM @40 to 60 PSI (LEADER Order # 55118)

Parts:



Drip Tray with Drain- located under the filter bank

5 Frame – LEADER Order #550506

10 Frame – LEADER Order # 550511

15 Frame – LEADER Order #550516



Frame (LEADER order #55098)

5 Frame Press – 5 supplied

10 Frame Press – 10 supplied

15 Frame Press – 15 supplied

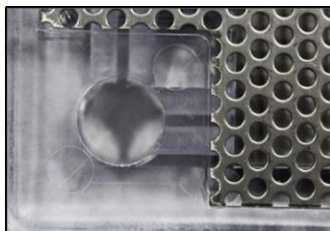


Plate (LEADER order #55097)

5 Frame Press – 4 supplied

10 Frame Press – 9 supplied

15 Frame Press – 14 supplied



Filter Press Entrance Plate (LEADER order #55088)





Filter Press End Plate (handle / wing nut end) (LEADER order #55092)

Exploded View (5 Plate Filter Section Less End Plates)



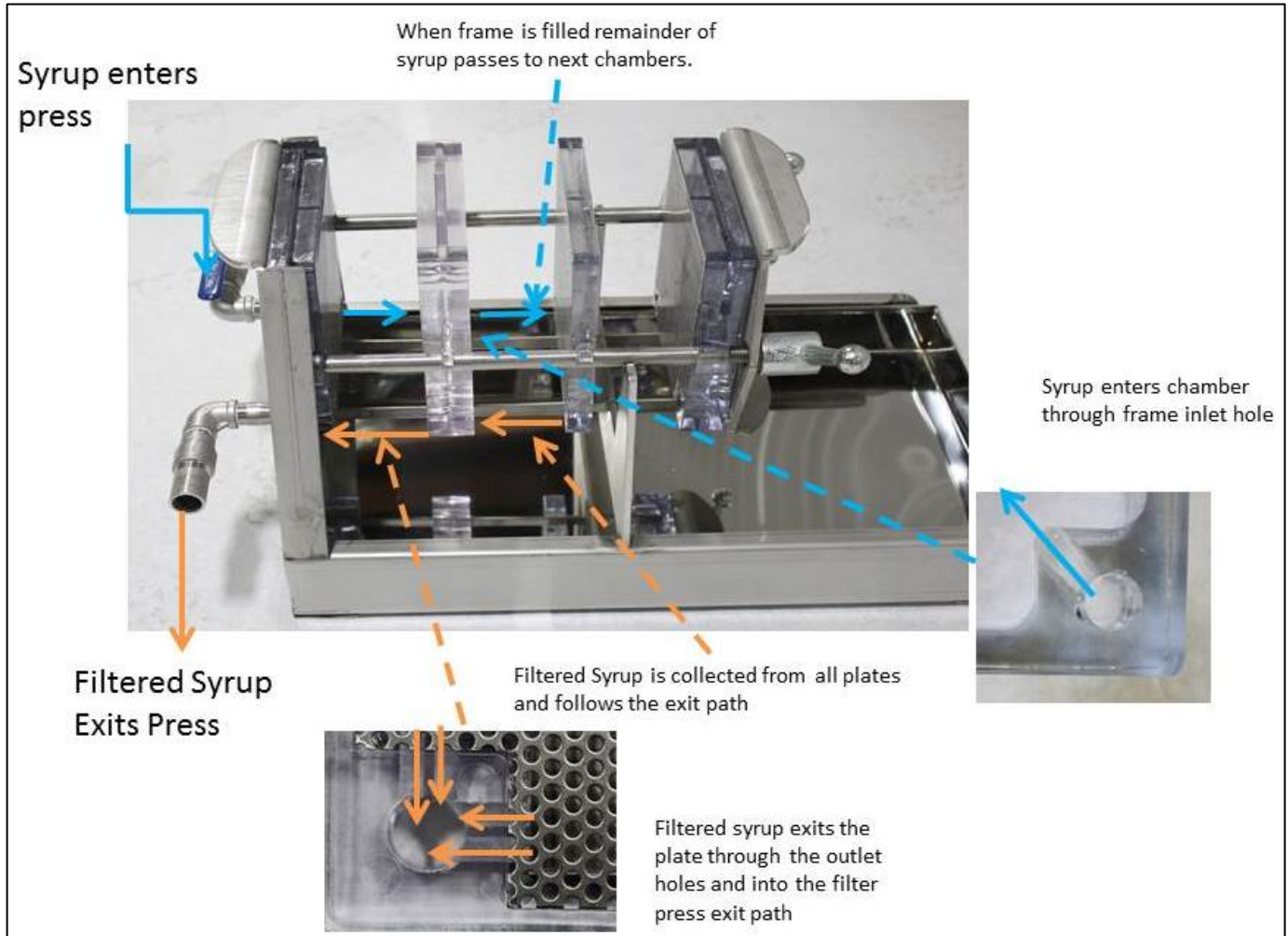
Optional Setup Equipment, Supplies And Spare Parts

ITEM	LEADER ORDER #	DESCRIPTION / PHOTO
Filter Press Hose	60028	Sold by the foot
Food Grade Grease	55095	14.5 oz tube
Filter Aid	64046	50# bag
Stainless Steel 7.5" Filter Press Stop Plate	68744	
Medium Draw-Off Tank – 19 Gallon Capacity	55171	
Filter Press 7.5" Thrust Bearing (located between handle and filter press body)	55127	

ITEM	LEADER ORDER #	DESCRIPTION / PHOTO
Stainless Steel Band Clamp #24	60046	
HD Filter Press Paper 7.5"	64048	Package of 400 pcs.
Stainless Steel Wisk for Filter Aid 30" Length	64042	
Small Draw-Off Tank - 13 Gallon Capacity	55172	
Large Draw-Off Tank – 39 Gallon Capacity	55170	
7.5" Filter Press Handle	55128	

DESCRIPTION OF OPERATIONS

A filter media (filter press paper) is placed between each frame and plate of the filter press. Additional filter media (DE – diatomaceous earth) is added to the syrup to be filtered. The pump then pushes the syrup mix through the inlet side of the filter press. As the syrup mix enters the filter press frame it passes out the inlet of the frame into the frame “chamber”, passes through the filter press paper coating the filter press paper with DE and the materials to be removed, then collects in the plate and exits through the outlet of the plate. This process occurs at the same time down the length of the filter press (i.e. at each frame and plate), which means the input side of the filter press is essentially a manifold. The filtered syrup exits the filter press through the outlet in the entrance plate.



SETUP OF PLASTIC FILTER PRESS

1. A filter press pump either gear driven or air driven is supplied with a 48" stainless steel braided hose to connect between the pump and the filter press. Locate the pump so it can be connected to the press and a compressed air source and is convenient for the operator to use.

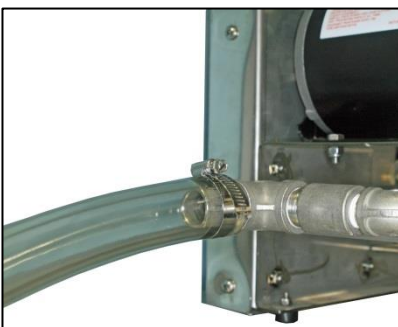
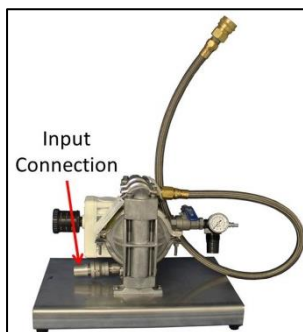


2. Connect the pump to the filter press by sliding the fitting on the end of the stainless steel braided hose onto the matching fitting on the filter press.
3. Connect the input side of the pump assembly to the syrup source. In order to prevent failure of the material used to connect the source, it is recommended that 1" ID, 1.50" OD, food grade hose (such as LEADER order #60028) be used to make the connections. Ensure you have sufficient length of hose to reach between the source and the filter press. Secure the hose to the pump fitting with a #24 stainless steel band clamp. Attach and secure the other end of the hose to the syrup source.

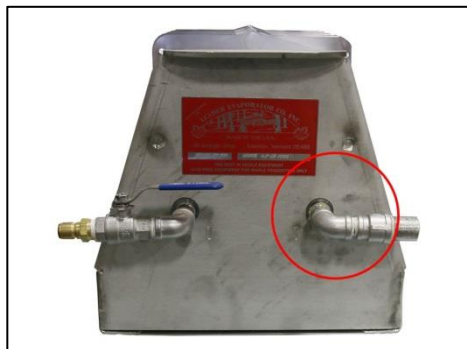
NOTE: LEADER EVAPORATOR includes 6 feet of LEADER order #60028 hose and two #24 stainless steel band clamps with the filter press.

Input Hose Connections:

Air Pump on left / Gear Pump on right



4. Connect the filter press outlet to 1" ID x 1.50" OD food grade hose of sufficient length to reach between the filter press and the final collection container. Secure the hose to the press outlet with a stainless steel #24 band clamp.



Output location for clear filter presses

OPERATION

Preparation of Filter Press

The filter press must be prepared by inserting filter paper between each plate and frame. To prevent damage, handle the parts of the filter press with care. Remember in handling the filter press parts, the syrup passing through the press is hot and parts of the filter press (especially the metal parts) will become heated.

NOTE: Frames and plates must be aligned correctly for the filter press to work properly. Place the plates and frames on the filter press so the hook sides of the parts are on the outlet side of the filter press. The hooks would go on the left side of the filter press as you face it on the end with the handles (wing nuts). The label on the handle (wing nut) end of the filter press offers a guideline.



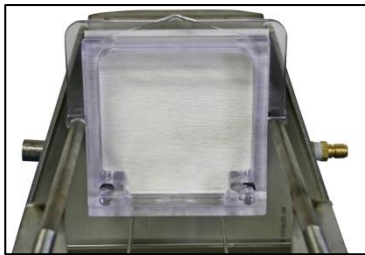
“Hook” of frame



“Hooks” shown on outlet (left) side of filter press



1. Loosen the handle (wing nut) on each side of the filter press to expose approximately 1” of the rod.
2. Remove a plate and a frame and set them near the filter press.
3. Slide the remainder of the plates and the frames toward the handles (wing nuts). Ensure the filter press does not become unstable.
4. Place a piece of filter paper on the entrance plate. Align the holes in the paper with the holes at the base of the plate.



5. Slide a frame, properly aligned, on the rack against the entrance plate taking care to keep the filter paper positioned in place.



6. Place a piece of filter paper against the frame aligning the holes in the paper with the holes in the bottom of the frame.



7. Slide a plate, properly aligned, on the rack against the frame taking care to keep the filter paper positioned in place.



8. Place a piece of filter paper against the plate aligning the holes in the paper with the holes in the bottom of the plate.

9. Slide a frame, properly oriented, on the rack against the plate taking care to keep the filter paper position in place.

10. Repeat Steps 6 through 9 until the last frame has a piece of filter paper in place.

11. Slide the end plate against the last frame. Check the bottom of the end plate to make sure it is properly seated against the last frame. If it is at an angle, lift up slightly on the bars of the rack and reposition the end plate.

12. When all the filter papers are aligned, tighten the handles (wing nuts) of the filter press. Check the alignment of the plates and frames, and ensure the filter paper appears to be positioned approximately the same across the filter press.



Initial Clean

1. Prepare the filter press as stated in section Preparation of Filter Press (see page 8).
2. Run a volume of clean, non-chlorinated well or spring water through the filter press. Start the filter press pump and run a minimum of 5 to 10 gallons of water through the filter press.
3. Stop the filter press pump, drain the filter press and remove the filter papers.

Optional Setup (Shortening the Filter Press)

A filter press can be setup with what is termed a “short bank”. This is done when you are not going to run to the capacity of the filter press. Never set the filter press up with less than 3 frames and 2 plates for a 5 or 10 frame bank or 7 frames and 6 plates for a 15 frame bank. There are two methods for shortening the filter press; Use of a Stop Plate and Addition of Pipes.

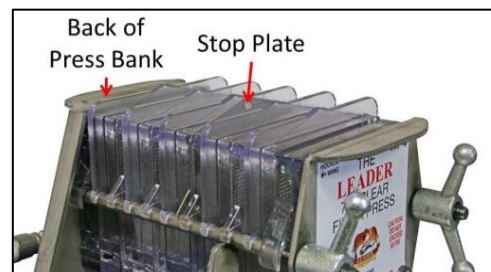
Use of a Stop Plate



1. Obtain a 7.5” stop plate (Leader Order # 68744)



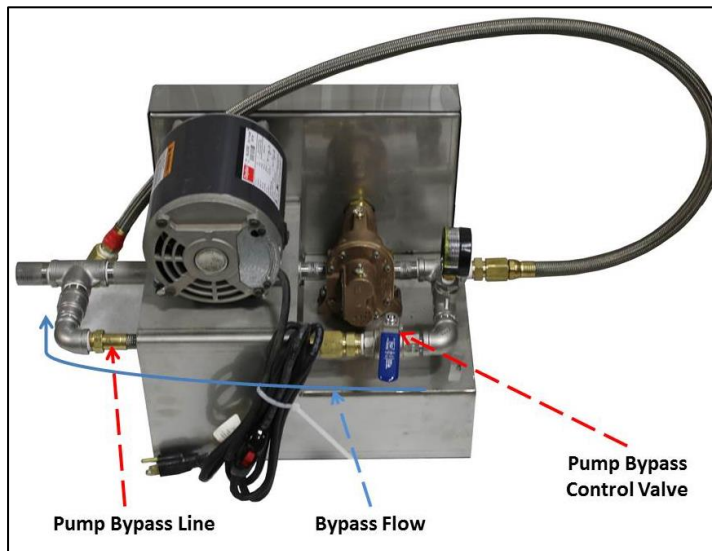
2. Loosen the filter press handles (wing nuts) then insert the stop plate. The stop plate can be inserted on either side of a frame. For maximum efficiency it should be inserted on the side closest to the back end of the bank. NOTE: Always ensure there is a minimum of 3 frames and 2 plates active for a 5 and 10 frame press and 7 frames and 6 plates for a 15 frame press.



3. When the stop plate is fully inserted tighten the handles (wing nuts).

Filter Press Pump Bypass (Gear Pumps Only)

In order to minimize the pressure in the filter bank when starting a cool filter bank or using a filter bank that is approaching need of maintenance i.e. filter paper change, the pump assembly is constructed with a bypass. The bypass allows all or part of the maple syrup to be diverted away from the filter bank thus reducing the pressure on the outlet side of the pump.



Example of bypass flow

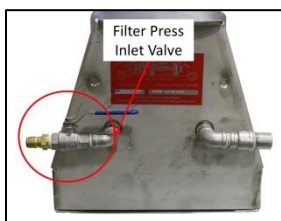
FILTERING OF SYRUP

NOTE: In the following sections the *recommended* additions of filter aid (DE) will need to be adjusted to meet the requirements of the syrup being filtered. It will depend on the niter and sugar sand present.

NOTE: Syrup to be filtered should be hot – generally filtered as soon as a sufficient size batch is ready after draw off from the evaporator.

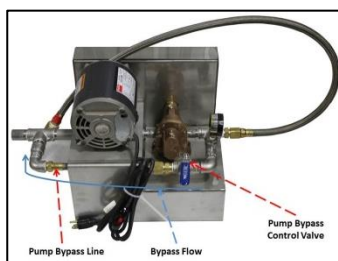
CAUTION: DO NOT EXCEED 50 PSI

1. The filter press needs to be heated in order to process most efficiently. The filter press is heated by the hot syrup passing through it. The minimum recommended batch size for the first batch is 3 gallons. In general the larger the batch processed, the more efficient the filter press will work.
2. In the source container, thoroughly mix DE (diatomaceous earth)/filter aid with the syrup to be filtered. For the first batch filtered through after a filter paper change, mix 2/3 of a cup of filter aid per gallon of syrup.

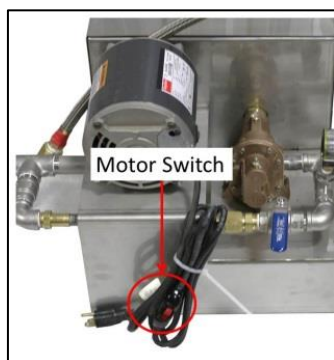


3. Open the inlet valve on the filter press.

Gear Pump



1. Open the bypass valve of the gear pump until it is approximately $\frac{3}{4}$ open ($\frac{1}{4}$ of syrup is going through the filter press).

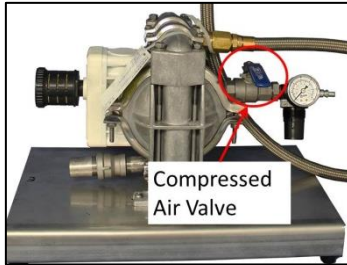


2. Turn on the pump to start the flow of syrup through the filter press. The pump switch is located on the motor cord.

3. As the filter press warms gradually close the bypass valve.
4. When running the filter press, periodically check the pressure by looking at the gauge on the pump assembly. It is recommended when a pressure of 40 psi is reached, change the filter papers. **NOTE:** If you need to run a batch of syrup to completion, slowly open the bypass valve to keep the pressure under 40 psi.
5. Run the filter press until only a small stream of syrup is flowing from the outlet hose. Turn off the filter press pump.

6. For each subsequent batch of syrup to be filtered, add filter aid in the ratio of $\frac{1}{4}$ cup to 1 gallon of syrup.
7. When starting the second and all subsequent batches of syrup, open the bypass valve on the gear pump halfway to preheat the filter press then slowly close the bypass valve. Be sure to check the pressure gauge so it does not exceed 40 psi.
8. Repeat steps 2 through 7 to filter each subsequent batch of syrup. Try to minimize the time (20 minutes or less) between running batches in order to keep the filter press warmed.

Air Diaphragm Pump



1. Open the compressed air valve of the pump approximately halfway.
2. As the filter press warms, gradually open the compressed air valve.
3. When running the filter press, periodically check the pressure by looking at the gauge on the pump assembly. It is recommended when a pressure of 40 psi is reached, change the filter papers. NOTE: If you need to run a batch of syrup to completion, slowly close the compressed air valve to keep the pressure under 40 psi.
4. Run the filter press until only a small stream of syrup is flowing from the outlet hose. Turn off the filter press pump.
5. For each subsequent batch of syrup to be filtered, add filter aid in the ratio of $\frac{1}{4}$ cup to 1 gallon of syrup.
6. When starting the second and all subsequent batches of syrup, open the compressed air valve on the pump halfway to preheat the filter press then slowly continue opening the valve. Be sure to check the pressure gauge so it does not exceed 40 psi.
7. Repeat steps 1 through 6 to filter each subsequent batch of syrup. Try to minimize the time (20 minutes or less) between running batches in order to keep the filter press warmed.

Using The Filter Press Pump To Transfer Syrup

The filter press pump can be used as a syrup transfer pump. NOTE: Prior to using the pump to transfer filtered syrup, flush the pump with either hot water or “sweet” to clean it.

1. Remove the pump inlet hose from the unfiltered syrup source.
2. Connect the pump inlet hose to the source of the syrup to be transferred.
3. Change the location of the pump outlet hose to the container to receive the syrup.
4. Start the pump and run until the transfer is complete.
5. Reconnect the pump hoses to their original connection points.

MAINTENANCE

The filter press has an approximate frequency of filter paper change. This frequency *will vary dependent* on the quality of the syrup (niter and sugar sand content) and the use of filter aid.

NUMBER FRAMES IN FILTER PRESS	EXEPCTED GALLONS BETWEEN PAPER CHANGES
5	25 - 40
10	60 – 80
15	120 - 160

Daily Maintenance

NOTE: The daily maintenance may be postponed if the press has not been run to expected capacity – check the table above and the pressure indicated on the pump gauge. If the daily maintenance is not performed make sure you follow the warm up procedure using the pump bypass when you start up the next day.

The pump and press should be flushed each day. This will remove contaminants from the pump and the filter press.

1. Obtain either hot water or “sweet” from the evaporator.

NOTE: If using hot “sweet” you can recycle the syrup back to the evaporator from the flushing of the filter press. Hot “sweet” can be obtained from the evaporator either by drawing off as close to the concentrated side of the flue pan as possible or by inserting the intake hose from the filter press pump into the concentrated side of the flue pan.

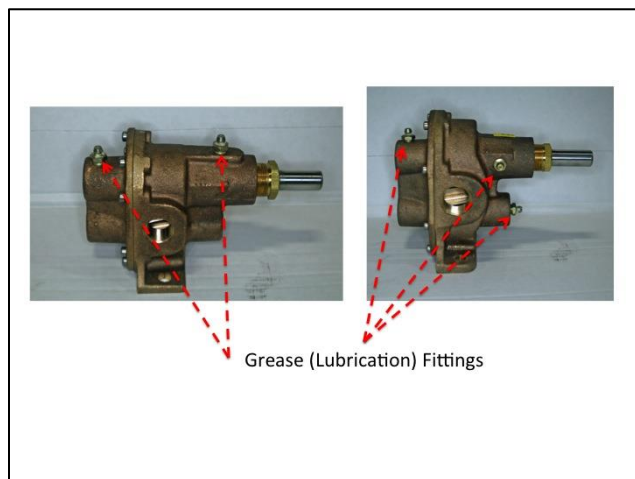
2. Place the filter press outlet hose into a collection container. If using hot “sweet” you can return the fluid to the flue pan).
3. With the filter press intake hose in the “cleaning” source (hot water of hot “sweet”), start the filter press pump.
4. Run the filter press pump until the liquid exiting the filter press is as clear as the liquid from the source.
5. Drain the hoses then reconnect them to the normal operating locations.

At Or Over Pressure

Use caution whenever handling filter press parts. The filter press is used to filter hot syrup resulting in the filter press becoming hot. The plastic parts are resilient but should be handled with care.

1. Change the filter papers when the gauge on the pump indicates the pressure is 40 PSI or higher.
2. When draining the remaining syrup from the filter press, the inlet hose can be disconnected from the filter press and the syrup mix drained back to the source container. Do NOT disconnect the inlet hose until the source container is positioned to receive the syrup from the filter press.
3. When changing the filter paper, clean the frames and plates:
 - a. Loosen the handles (wing nuts) and remove and discard the filter papers.
 - b. Immerse the frame and plates one at a time into a container of hot water. This is best done immediately after use. Ensure the intake holes in the frame and the outlet holes in the waffle plates are clean.
 - c. If necessary to remove the sugar sand and niter, scrub the plate and frames with a soft nonabrasive brush.

Periodic Maintenance



1. The Oberdorfer pump should be lubricated every 500 to 1000 gallons of syrup processed. It is also recommended the pump be lubricated at the start of the producing season.
 - a. To lubricate the pump, inject a light, non-toxic lubricant such as food grade grease (Leader Evaporator order #55095). A small amount of lubrication is needed. The pump can be lubricated through the installed grease fittings:
 - i. ½" pump – 2 fittings
 - ii. ¾" and 1" pump – 3 fittings

2. Lubricate thrust bearings with food grade grease.
3. After lubricating ensure you clean off any excess lubricant.
4. Inspect all hoses and fittings for leaks. Tighten or replace as necessary. See ATTACHMENT #1 for replacement parts available from Leader Evaporator.

End Of Season Maintenance

1. Prior to disassembly of the filter bank, flush with hot water until the water exiting the bank appears clean. This will flush the pump.
2. Loosen the handles (wing nuts) and remove all filter paper.
3. Remove all plates and frames and clean with hot water. Dry the parts as best possible.
4. Wipe down all exposed parts using water only.
5. Drain and remove the drip tray then clean with hot water and dry.
6. If using a gear pump, lubricate as described in the sections titled Pump Maintenance.
7. Reassemble and cover the filter press. Covering will minimize the collections of contaminants on the filter press during the off season and will hasten the startup the next season.

FEEDBACK

Please use the following e-mail address (feedback@leaderevaporator.com) to suggest improvements or enter comments on this document. Reference the document title in your note. You may also contact LEADER Customer Service.

ATTACHMENT #1 ASSEMBLY PARTS LISTS

Filter Press Gear Pump General Overview Parts

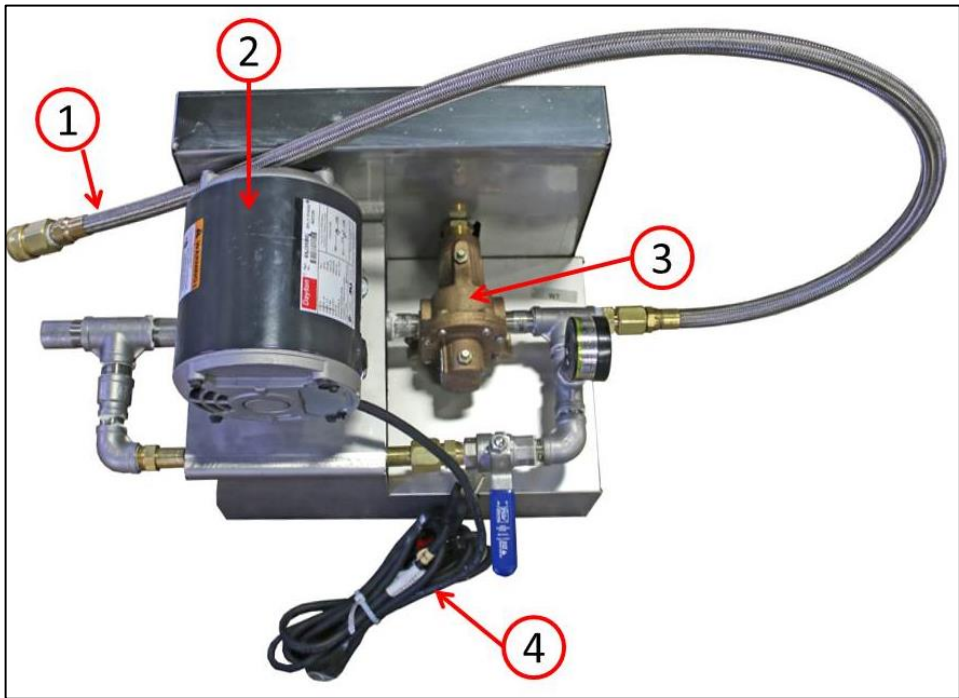


Diagram ID	Item Description	Leader Order #	Further Information
1	Filter Press Hose ½" X 48"	55112	
2	¼ HP Filter Press Motor (5 and 10 frame presses) / ½ HP Filter Press Motor for 15 frame presses)	55125 / 55113	Use only the motor designated for your style of filter press
3	½" Oberdorfer Gear Pump	63075	
4	Filter Press Motor Cord	55116	

Filter Press Gear Pump - Right Side Parts

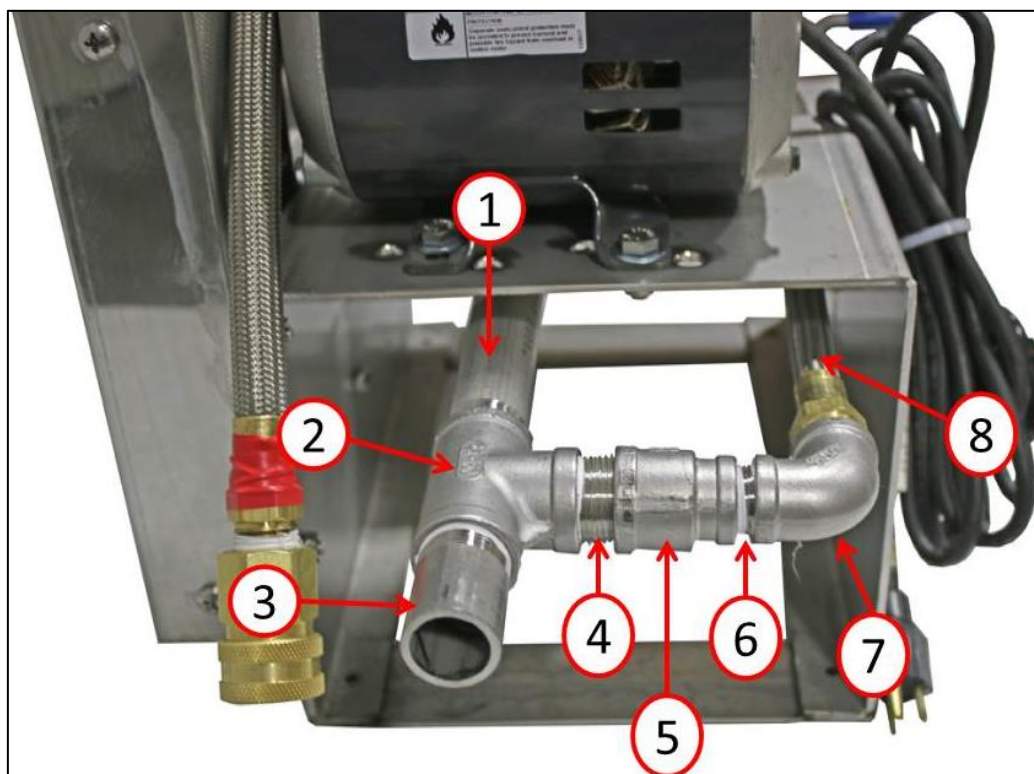


Diagram ID	Item Description	Leader Order #	Further Information
1	$\frac{3}{4}$ " X 8" Stainless Steel Nipple	72124	
2	$\frac{3}{4}$ " Stainless Steel Tee	72333	
3	$\frac{3}{4}$ " X 2" Stainless Steel Half Nipple	72187	Cut from a $\frac{3}{4}$ " X 4" stainless steel Nipple
4	$\frac{3}{4}$ " Stainless Steel Close Nipple	72106	
5	$\frac{3}{4}$ " to $\frac{1}{2}$ " Stainless Steel Reducing Coupling	72301	
6	$\frac{1}{2}$ " Stainless Steel Close Nipple	72101	
7	$\frac{1}{2}$ " Stainless Steel 90° Elbow	72321	
8	$\frac{1}{2}$ " X 12" Filter Press Pipe	55121	

Filter Press Gear Pump – Left Side Parts

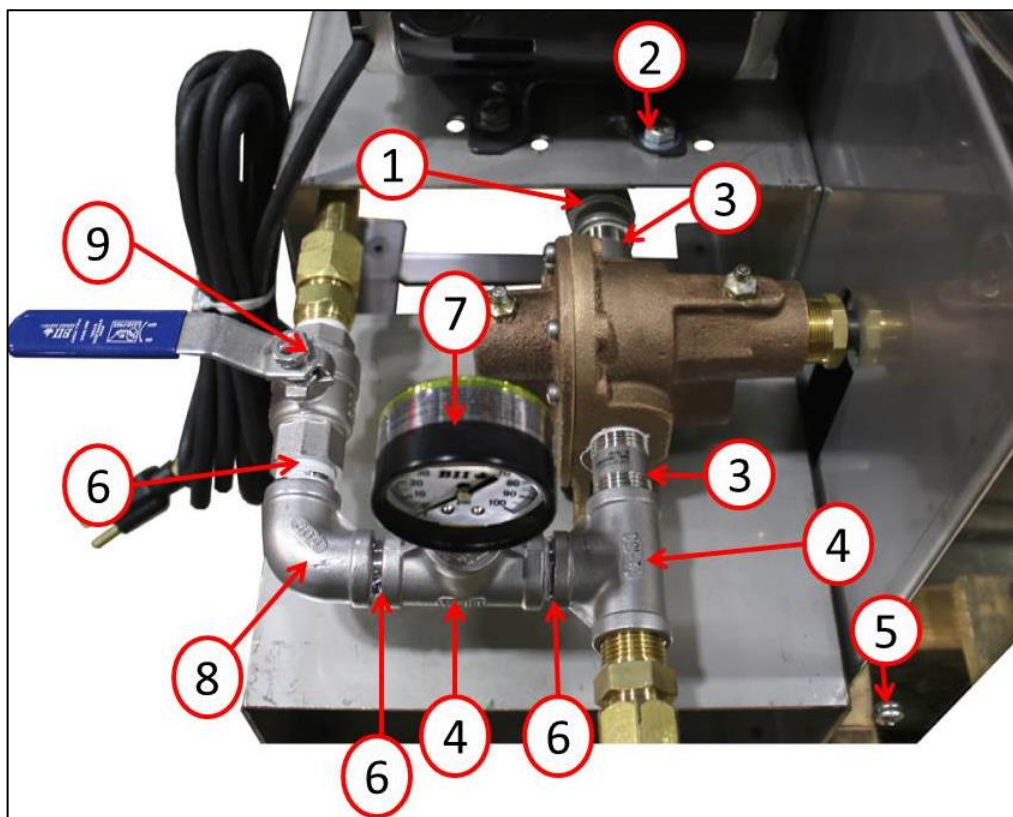


Diagram ID	Item Description	Leader Order #	Further Information
1	¾" to ½" Stainless Steel Reducing Bushing	72301	
2	¼"-20 X ½" Stainless Steel Hex Head Screw	68200	
Not Shown	5/16" Stainless Steel Washer	72494	
Not Shown	5/16" Stainless Steel Lock Nut	68152	
3	½" X 2" Stainless Steel Nipple	72103	
4	½" Stainless Steel Tee	72331	
5	¼"-20 X ½" Stainless Steel Screw	72455	
6	½" Stainless Steel Close Nipple	72101	
7	Filter Press Pressure Gauge	55110	
8	½" Stainless Steel Elbow 90°	72321	
9	½" Stainless Steel Ball Valve	60100	

Filter Press Gear Pump ¼ HP (5 and 10 Frame)– Drive Parts

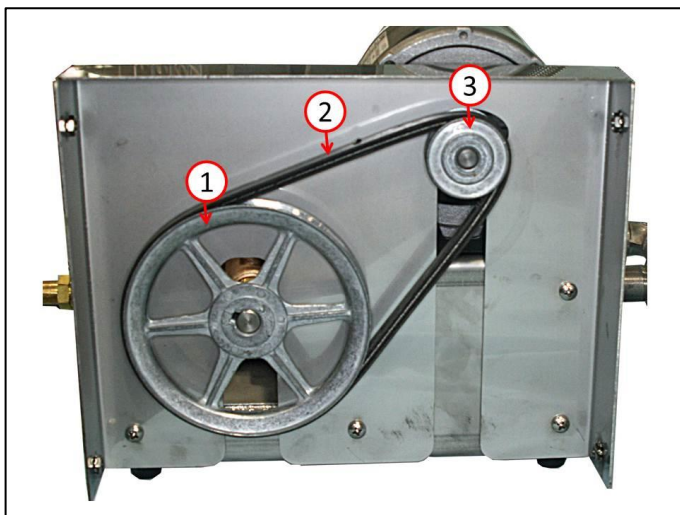


Diagram ID	Item Description	Leader Order #	Further Information
1	Filter Press Pulley 8"	55108	
2	Belt 29"	55126	
3	Filter Press Pulley 2"	55101	

Filter Press Gear Pump ⅓ HP (15 Frame)– Drive Parts

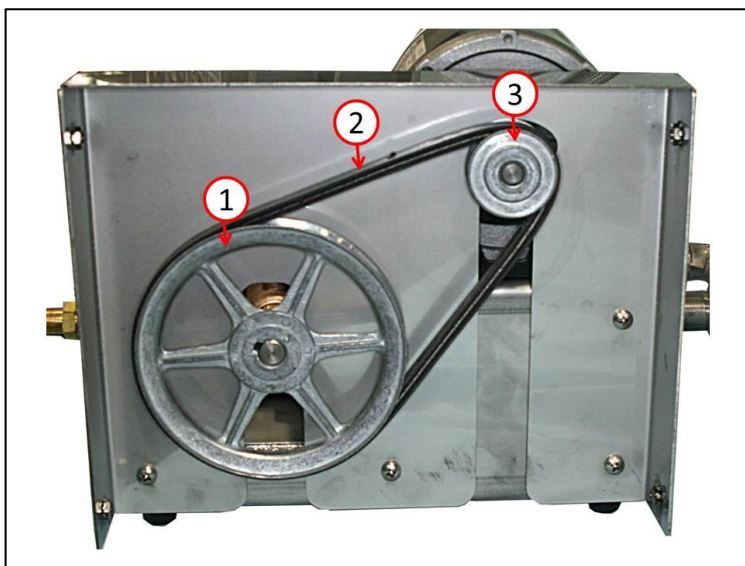


Diagram ID	Item Description	Leader Order #	Further Information
1	Filter Press Pulley 6"	55104	
2	Belt 27"	55107	
3	Filter Press Pulley 2"	55101	

Filter Press Air Pump (5, 10 and 15 Frame)

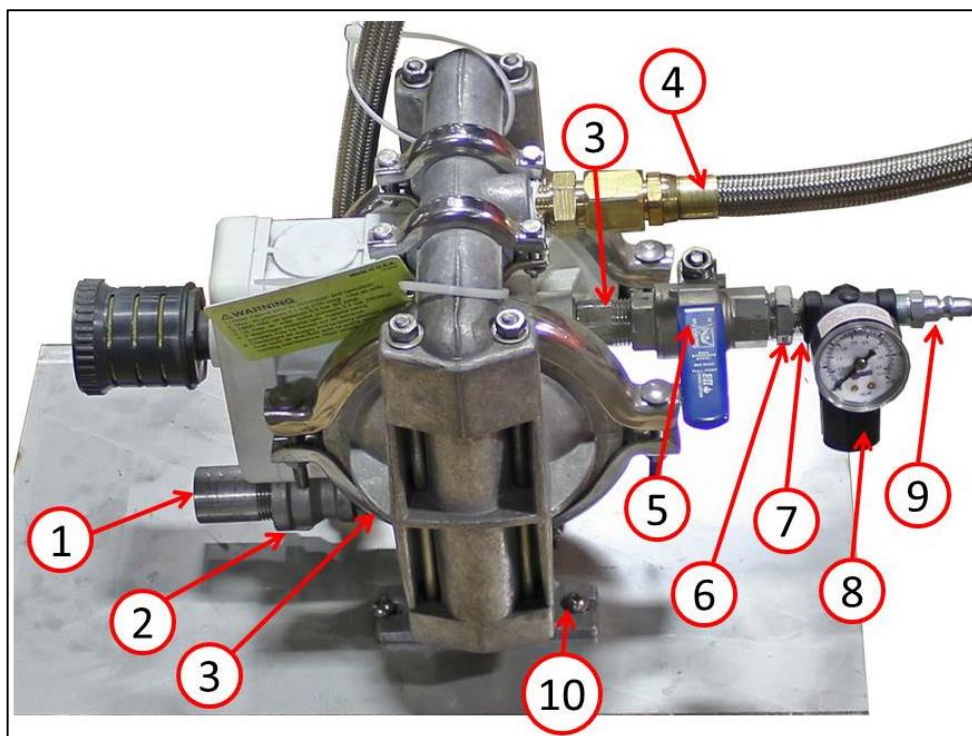


Diagram ID	Item Description	Leader Order #	Further Information
1	¾" X 2" Stainless Steel Half Nipple	72187	Cut from a ¾" X 4" stainless steel Nipple
2	¾" to ½" Stainless Steel Reducing Bushing	72301	
3	½" X 2" Stainless Steel Nipple	72103	
4	Filter Press Hose ½" X 48"	55112	
5	½" Stainless Steel Ball Valve	60100	
6	½" to ¼" Stainless Steel Reducing Bushing	72311	
7	¼" Stainless Steel Close Nipple	72140	
8	Regulator 0 – 50 PSI	68709	
9	Connector ¼" MPT X ¼" CHP	65720	
10	¼"-20 X ½" Stainless Steel Screw	72455	
Not Shown	¼"-20 Stainless Steel Hex Nut	72551	

Remote Filter Press Connection End Parts

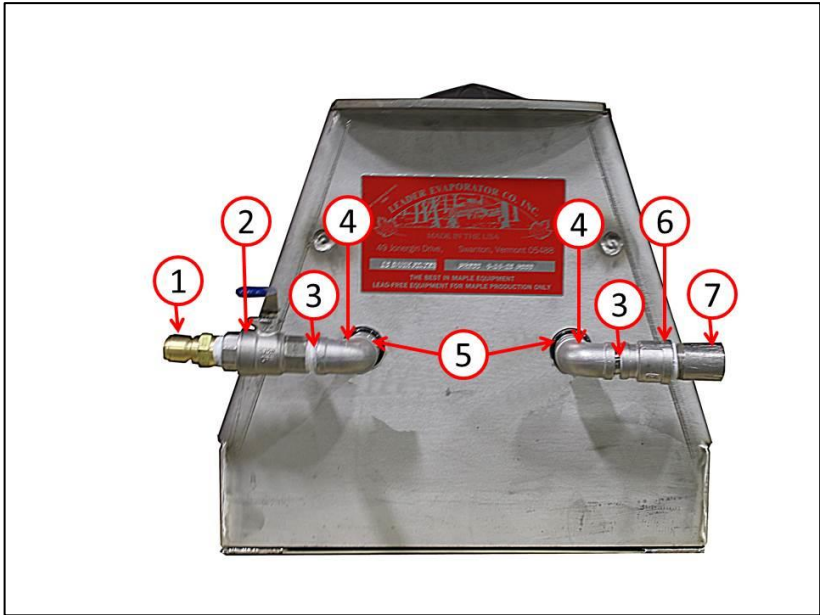


Diagram ID	Item Description	Leader Order #	Further Information
1	½" Male Filter Press Quick Coupler	55115	
2	½" SS Ball Valve	60100	
3	½" SS Close Nipple	72101	
4	½" SS Elbow 90°	72321	
5	½" X 2" SS Nipple	72103	
6	¾" to ½" SS Reducing Bushing	72301	
7	¾" SS Half Nipple	72187	Cut from a ¾" X 4" stainless steel Nipple