

OWNER'S MANUAL

Xtract™ Drum Topper

Portable Offline Filtration



Dear Valued Customer,

Thank you for choosing Lubrication Engineers and for placing your trust in us for your fluid handling needs.

At LE, we understand the importance of fluid cleanliness and the role it plays in reliability optimization. Our goal is to pioneer solutions specific to your applications that help maintain lubricant quality and maximize equipment reliability.

We appreciate the opportunity to provide you with high-quality products and excellent customer service. If you have any questions, please call 1-800-537-7683 or send us an email at info@le-inc.com.

Sincerely,
Lubrication Engineers, Inc.



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Limited Warranty

Lubrication Engineers, Inc. warrants its filter systems and assemblies to be free from defects in material or workmanship under normal use and service for one year from the date of purchase, with LE’s obligations under this warranty being limited to repairing and/or replacing the purchased unit. Lubrication Engineers reserves the right to examine all parts and records that are subject to a warranty claim.

This warranty shall not apply to any system or assembly that has been subject to misuse, negligence or accident, or that has been altered or repaired outside of the directives of Lubrication Engineers and/or established safety practices. This includes components not certified by Lubrication Engineers and/or installed later by the buyer/owner. Installing uncertified components nullifies this warranty, and the purchaser assumes all responsibility as to rating and performance.

This warranty is made expressly in lieu of tort liability and any other warranties or conditions, expressed or implied, including any implied warranty or condition of merchantability or fitness for a particular purpose and any other obligations or liability on the part of the manufacturer without limitations of the foregoing consequential and incidental damages.

To obtain warranty service, contact LE at 800-537-7683.



Important Information & Notices

For your safety, read this manual before using your system.

Although this system is designed to be safe, it is highly recommended that you read this *Owner's Manual* and labels on the equipment before operation. Instructions, safety warnings and restrictions are listed throughout this manual and on the equipment; they are important for your safety and must be followed during operation and maintenance of this system. By operating this system, you are deemed to have read, understood and agreed to the instructions, terms and conditions relating to the system.

This system has been examined and tested for safety; however, it must be understood that this does not guarantee absolute and permanent safety of this equipment. This unit is designed and manufactured for today's highest safety standards. Users are requested not to overestimate safety arrangements that may have deteriorated in use, and users are requested to pay full attention to safety requirements of these units.

Safety Warnings

Follow this *Owner's Manual* to ensure proper use of this equipment.

- All wiring, electrical connections and system grounding must comply with the National Electric Code (NEC) and with any applicable local codes and ordinances.
- Do not operate this equipment with damaged electrical cords or connections. Always have a qualified electrician replace damaged electrical wiring. Electric shock or fire can result from wiring insulation damage.
- This equipment should be properly grounded to a suitable earth ground. Failure to properly ground this equipment can result in serious electric shock and possible explosion.
- Always disconnect power supply before servicing.
- Do not use your hands to test for leaks; the oil circulating through this system is pressurized and can penetrate skin. Always use cardboard to search for leaks.
- Always wear eye and hearing protection while operating this system. Also wear gloves, as the system and its components may be hot to the touch.
- Do not wear loose clothing while operating.

! WARNING	
	Do not operate unless properly trained

! DANGER	
	High Voltage

! DANGER	
	This equipment must be grounded

! DANGER	
	Connect ground wire before using

! DANGER	
	Disconnect before servicing

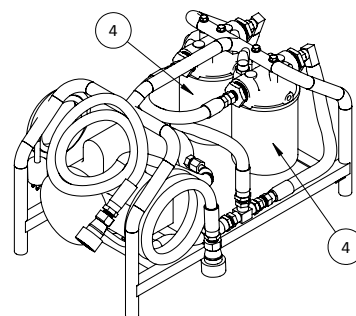
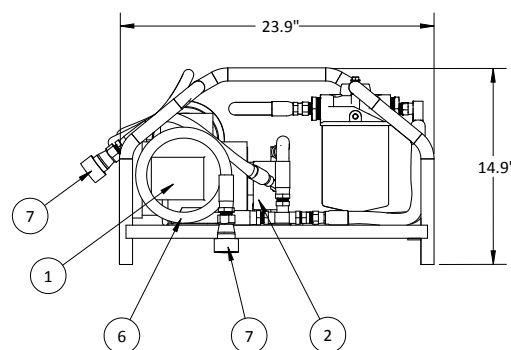
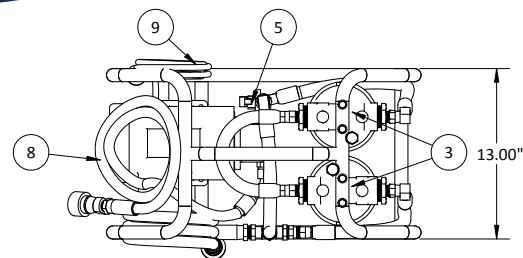
! WARNING	
	Eye & ear protection required while operating this equipment

! WARNING	
	Gloves required while operating this equipment



General Information

Item No.	Description	Qty.
1	Motor	1
2	Gear Pump	1
3	Filter Head	2
4	Filter Element	2
5	Filter Bypass (3 Way Ball Valve)	1
6	½" Outlet Hose	1
7	Quick Connect	2
8	½" Inlet Hose	1
9	Electric Cord	1



Complementary Products

Your Xtract Drum Topper is the first step in achieving top-quality lubrication standards. To further enhance your lubrication standards, we recommend using our Xtract Adapter Kits. These kits incorporate quick connect fittings, desiccant breather filters and vacuum indicators, along with other customizable features, to function as the connection between your application and filtration system.

Pairing fluid handling filtration with breather protection allows for maximum system integrity – requiring less labor while reducing system contamination. See p. 15 for more about our breathers.

Fill Port Adapter Kits



Tote Adapter



Drum Adapter



Gearbox Adapter



Hydraulic Adapter



Performance & Specifications

General Performance

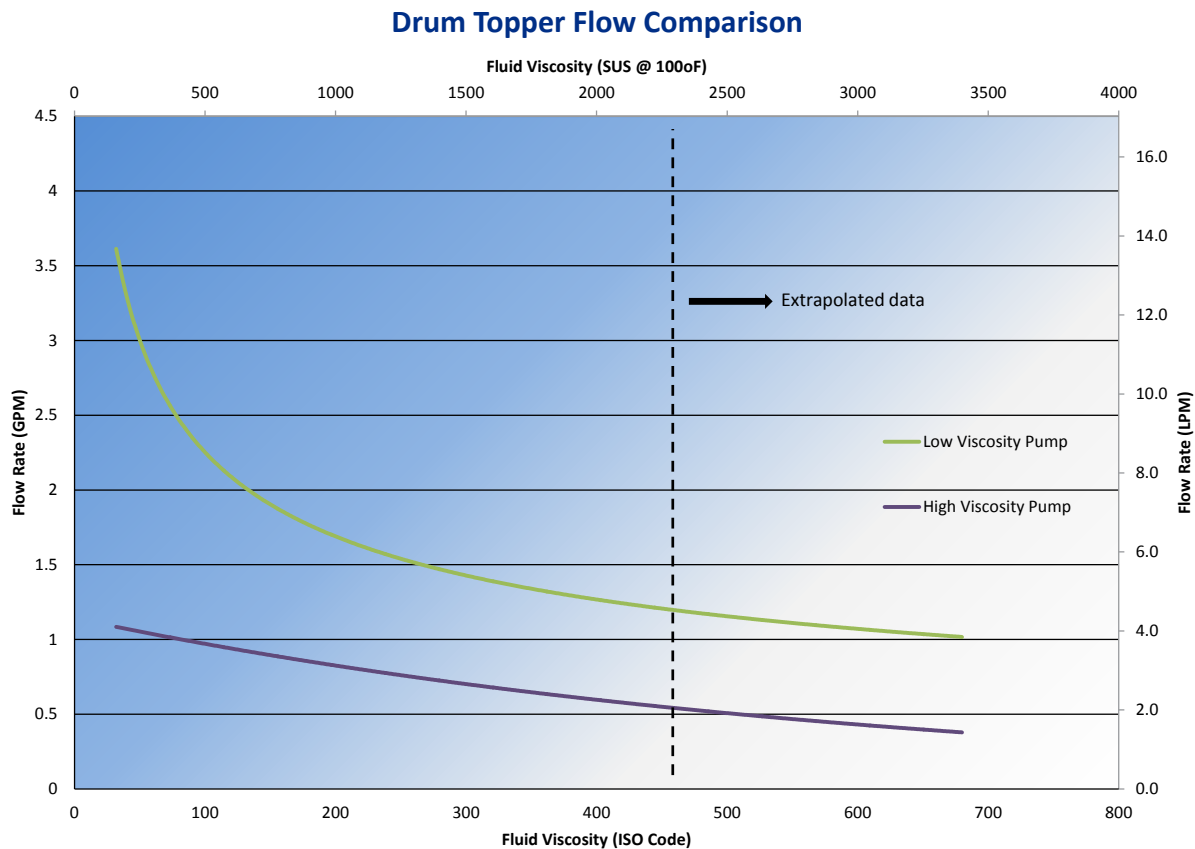
- 1. Operating temperatures:
 - -15 to 150°F (-26 to 66°C) for standard unit with clear PVC hoses
 - -20 to 212°F (-28 to 100°C) for custom unit with hydraulic hoses and Viton® or EPDM seals
- 2. Pump relief opens at 65 psi (5.49 bar) pump pressure.
- 3. Materials:
 - Frame: Carbon steel
 - Paint: Industrial powder coat
 - Filter heads: Aluminum
 - Fittings: Zinc-plated steel and/or brass, bronze, stainless steel
 - Pumps: Aluminum/steel
 - Hoses: Clear PVC w/ steel wire or hydraulic hose

- 4. Filter indicator pops at 22 psid (1.55 bar) as warning that filter element needs to be replaced
- 5. Weight: Approximately 100 to 150 lb (45 to 68 kg) (will vary depending on options selected)
- 6. Noise level at operator’s position does not exceed 70 dB in normal operation.

NOTE: In the case of custom models, these specifications can vary. Before using, check the specifications of the system that was ordered.

Recommendations

The flow rate at which each system is capable is mostly dependent on the viscosity of the fluid. Flow restriction is also created by the filters and will increase as the filters become saturated. Please see *Drum Topper Flow Comparison* chart below for an illustration of how flow rates can change.





Intended Use

- To be used for offline secondary filtration; not for inline filtration
- General industrial environments, both indoors and outdoors (IP rating of 54)
- Filtering mineral-based industrial oils and most synthetic oils with a maximum operating viscosity range of ISO 680 at 100°F (38°C) (3,000 ssu / 648 cSt) within ambient temperature ranges of -15 to 150°F (-26 to 66°C)
- Place at same level or below equipment being filtered and within reach of recommended standard 6-foot hoses.
- System should be stored and used on level surface, right side up, in low-traffic area, and connected to appropriate power source.

Product Restrictions

IMPORTANT: This system should never be used to remove particulates from volatile fluids, such as gasoline, because the pump cannot be used for solvents with low lubricity. In addition, it should not be used on liquids with flash point below 200°F (93°C).

If there is any possibility that the oil being purified is contaminated with a solvent or materials that could be considered hazardous – either toxic or flammable – the drum topper should not be used unless precautions are taken to vent the vapors in a safe manner according to local, state and federal codes, and the flash point is above 200°F (93°C). This caution is necessary to prevent the possibility of fire, explosion, or toxic injury to persons and property.

NOTE: Based on toxicity of the fluid that will be used, select appropriate personal protective equipment.

Prohibited

1. Filtering toxic, volatile or combustible fluids
2. Filtering oils with a viscosity of less than 10 centistokes
3. Filtering water, diesel, water glycol, phosphate ester or other solvents
4. Using in explosive or hazardous environment
5. Anyone other than qualified electrician opening, touching or handling switch box, motor or any electrical parts of system
6. Using near pools of water

Fluid Compatibility

IMPORTANT: For standard systems, the processed fluid must be compatible with Buna-N seal material and PVC hoses, with a maximum oil temperature of 100°F (38°C). It is generally recommended for lubricating oils, fuel oils, and hydraulic oils. Custom systems that have Viton® seal or EPDM seals with hydraulic hoses work with oils that have a maximum oil temperature of 175°F (79°C).

NOTE: Never mix oil types. Be sure to thoroughly flush the system before processing different oil type if the same system must be used for different oil types.



Product Use & Application

Applications for Your Drum Topper

- Decontaminating systems
- Flushing new or repaired systems
- Dispensing new oil
- Pre-filtering new oil
- Evacuating used oil
- Topping off reservoirs
- Collecting oil samples for analysis

Offline Filtration

Portable filtration units are ideal tools to remediate contaminated systems, flush new equipment during commissioning, or periodically decontaminate systems that have inadequate on-board filtration to meet target cleanliness levels.

Tips for Offline Filtration

- It is highly recommended to fit all reservoirs with appropriate quick connect fittings to facilitate filtration activities. Our adapter kits are designed to make such modifications safe and effective.
- When possible, make sure suction and return locations are on opposite ends of the reservoir to maximize circulation and efficiency.
- The system must be connected with reservoir sump being filtered and not the pressure line.
- Select filtration units with appropriate flow rate for a given system.
- When filtering an operating system, the flow rate should not exceed 10 percent of the sump volume in one hour or less.
- When filtering systems that are not operating, the flow rate should be as high as is reasonable to maximize agitation in the reservoir.
- If more than one lubricant type is to be filtered with the same unit, make sure to effectively flush the system of old oil before switching product types. It is typically more cost effective to procure different units for different oil types.

Fluid Transfers

Although drum toppers were designed for system decontamination, they also happen to be the best way to cleanly dispense and transfer new oil to machinery or other transfer containers. In addition to providing a suitable level of cleanliness for new oil applications, it is also a safer, more efficient, and more pleasant way to transfer new oil. If a reservoir is appropriately equipped, oil additions or oil changes may be performed without ever exposing the sump to atmospheric contamination.

Tips for Fluid Transfers via Drum Topper

- It is highly recommended to fit all reservoirs with appropriate quick connect fittings to facilitate fluid transfer activities. Our Xtract™ adapter kits are designed to make such modifications safe and effective.
- If oil is to be dispensed to top-up containers via gravity fed spigots, use the drum topper to pre-filter the oil before the container is placed for dispensing. Also, make sure to add an appropriate breather to the vent port.
- It is recommended to dedicate drum toppers to particular oil types to avoid cross-contamination and eliminate labor-intensive flushing activities.
- When using the drum topper to drain used oil, bypass the filter element to avoid unnecessary saturation of the element. This can be done using the manual bypass. It is also important to flush the used oil from the system with new oil (approximately 3 to 5 times the system volume should effectively remove a sufficient quantity of old oil).
- Remember to wipe fittings and use dust covers to prevent contamination during fluid transfers.



System Flushing

Drum toppers can be effective tools for flushing systems in situations where only mechanical separation is required. A new hydraulic system or one that has had components such as pumps, motors or piping replaced is an excellent candidate for flushing. The amount of particle contamination that can be built into a system or added during repair activities can be significant.

Hydraulic valve failures upon start-up are common when proper flushing procedures are not followed. Although hydraulics, as a machine category, are very sensitive to contamination and require initial flushing, you should not overlook other lubricated machines, such as pumps and gearboxes. Any sealed, lubricated component should be flushed before or shortly after start-up. In fact, offline filtration can be much more effective at eliminating run-in debris than changing the oil at the first scheduled interval.

Tips for System Flushing

- Maximum flow rates do not really apply here. The more turbulence in the fluid the better.
- Although drum toppers are not typically capable of circulating oil through the piping in hydraulic or lube oil systems, they can be effectively utilized at the reservoir while using system pumps to circulate oil through piping.
- When flushing new hydraulic systems, it is recommended to isolate valves and other sensitive components with jumpers.
- When flushing a new or repaired system, it is helpful to use the minimum allowable oil viscosity to maximize turbulence.

Collecting Oil Samples

While using drum toppers to obtain oil samples is not the most efficient method, it can be the only method in some cases. A good example is a cooling tower fan gearbox where the oil fill and drain ports are piped outside the fan housing.

For this type of application, circulating the oil with the drum topper and taking the sample from the built-in valves is ideal. When customized with sample valves, LE's Xtract Drum Toppers are accessorized with two valves: one upstream of the filters and one after the filters.

To obtain a representative oil sample for analysis, begin by circulating the oil with the filters in bypass and then collect the sample upstream of the filters.



Operating Instructions for Electric Motor Systems

Unpacking Your System

- Inspect system upon delivery. If there is a defect, please advise your LE consultant or call Lubrication Engineers at 800-537-7683 before use.
- All damage attributed to handling and delivery of unit must immediately be brought to attention of shipping company.

Safety Warning

- Always wear eye protection.

Offline Filtration (Kidney Loop)

1. Remove dust cover from reservoir drain plug and suction coupler of drum topper. Wipe fittings with clean cloth and connect suction line of drum topper to drain port of reservoir.
2. Repeat step one for reservoir fill plug and drum topper discharge coupler.
3. Check to ensure that connections are properly and securely fitted and connected to the right ports before turning on the system, and during use.
4. Ensure that motor start switch is set in OFF position and connect power cord to correct power supply.
5. Turn start switch to ON position and inspect the clear hoses to confirm fluid flow. It will take about 60 seconds for filters to fill with fluid before discharging into pressure hose.
6. Circulate entire reservoir volume at least seven times.
7. Shut off system pump, disconnect power source, and check that the pressure gauge reads 0 psi/bar to ensure stored energy has been released from system.
8. Disconnect fluid coupler fittings, wipe fittings with clean cloth, and replace all dust covers.

Oil Drain & Fill

CAUTION: Unit should be supervised during drain and fill.

Drain and Disposal of Oil

1. Remove dust cover from reservoir suction coupler, wipe fitting with clean cloth, and attach suction line fitting from filtration unit.
2. Attach discharge hose fitting to a suitable waste oil container.
3. Check to ensure that connections are secure and adjust filtration unit valve to bypass filter elements.
4. Ensure that motor start switch is set in OFF position and connect power cord to power outlet.
5. Turn start switch to ON position and inspect the clear hoses to confirm fluid flow.
6. Shut off pump when all fluid has been evacuated from reservoir.
7. If flushing: Remove suction hose from reservoir and attach it to new oil container. Start system and flush enough new oil through drum topper to flush out old oil; 10-15 gallons (37.9-56.8 liters) should suffice.

Oil Fill

8. Shut off pump, remove discharge fitting from waste container, and attach it to reservoir fill fitting. Adjust filtration unit's bypass valve to engage filter elements, check hose connections, and start pump to begin filling system.
9. When oil level in reservoir reaches desired level, shut down unit.
10. Reconfigure hoses for offline filtration and circulate oil in reservoir (this step is optional).
11. Circulate entire reservoir volume at least seven times.
12. Shut off system pump and disconnect power source.
13. Disconnect fluid coupler fittings, wipe fittings with clean cloth, and replace all dust covers.

NOTE: Replace filter elements when differential pressure reaches 22 psid (1.55 bar) or when filter indicators pop up and turn red. Before replacing filters, release any stored energy from the system by ensuring it is off, pressure gauge reads 0 psi/bar, and hoses are disconnected.



Operating Instructions for Air Motor Systems

Unpacking Your System

- Inspect system upon delivery. If there is a defect, please advise your LE consultant or call Lubrication Engineers at 800-537-7683 before use.
- All damage attributed to handling and delivery of unit must immediately be brought to attention of shipping company.

Safety Warnings

- Always wear eye protection.
- Use only clean, dry, filtered, lubricated compressed air to operate this product. Do not use any liquids to power this product. Only use atmosphere air from non-hazardous locations to power this product.
- Do not exceed 100 psi (7.91 bar).
- This product requires lubrication. Check oil level of air regulator and oiler at least every eight hours and maintain correct oil level.

Offline Filtration (Kidney Loop)

1. Verify that oil reservoir in air line lubricator has adequate oil supply.
2. Remove dust cover from reservoir drain plug and suction coupler of drum toppler. Wipe fittings with clean cloth and connect suction line of drum toppler to drain port of reservoir. Repeat step two for reservoir fill plug and drum toppler discharge coupler.
3. Ensure that connections are secure.
4. Ensure that regulator is turned to OFF position, and connect to clean, dry air supply line. Failure to provide clean, dry air will cause rust to develop inside motor.
5. Regulate air pressure by adjusting regulator until desired pump flow is achieved (do not exceed 100 psi/7.91 bar) and inspect the clear hoses to confirm fluid flow. It will take about 60 seconds for filters to fill with fluid before discharging into pressure hose.
6. Adjust lubricator to allow approximately one drop of oil per minute.
7. Circulate entire reservoir volume at least seven times.
8. Shut off system pump with regulator, disconnect air source, and check that pressure gauge reads 0 psi/bar to ensure stored energy has been released from system.

9. Disconnect fluid coupler fittings, wipe fittings down with clean cloth, and replace all dust covers.

Oil Drain & Fill

CAUTION: Unit should be supervised during drain and fill.

Drain and Disposal of Oil

1. Verify that oil reservoir in air line lubricator has adequate oil supply. This supply lasts approx. eight hours when calibrated correctly.
2. Remove dust cover from reservoir suction coupler, wipe fitting with clean cloth and attach suction line fitting from filtration unit.
3. Attach discharge hose fitting to suitable waste oil container.
4. Ensure connections are secure and adjust filtration unit's valve to bypass the filter elements.
5. Ensure that regulator is turned to OFF position and connect to clean, dry air supply line. Failure to provide clean, dry air will cause rust to develop inside motor.
6. Regulate air pressure by adjusting regulator until desired pump flow is achieved (do not exceed 100 psi/7.91 bar) and inspect the clear hoses to confirm fluid flow.
7. Adjust lubricator to allow approx. one drop of oil per minute.
8. Once all fluid has been evacuated from reservoir, shut off system pump, disconnect power source, and check that pressure gauge reads 0 psi to ensure stored energy has been released from system.

Flushing

9. Remove suction hose from reservoir and attach it to new oil container. Start system and flush enough new oil through drum toppler to flush out old oil; 10-15 gallons (37.9-56.8 liters) should suffice.

Filling

10. Shut off pump, remove discharge fitting from waste container and attach it to reservoir fill fitting. Adjust filtration unit's bypass valve to engage filter elements, check hose connections and start pump to begin filling system.



11. When oil level in reservoir reaches desired level, shut down unit.
12. Reconfigure hoses for offline filtration and circulate oil in reservoir (this step is optional).
13. Circulate entire reservoir volume at least seven times.
14. Shut off system pump, disconnect air source, and check that pressure gauge reads 0 psi/bar to ensure stored energy has been released from system.
15. Disconnect fluid coupler fittings, wipe fittings with clean cloth, and replace all dust covers.

Maintenance & Service:

- Disconnect supply of compressed air.
- Vent all pressure/vacuum from system.
- Clean or replace exhaust element in product muffler at regular intervals.
- Only use GAST lubricating oil part number UK5220 or equivalent.
- Fill oil reservoir of oiler to correct level.

Troubleshooting – Electric Motor

WARNING: Do not attempt any maintenance work on this system without first reading this manual. Maintenance operations should be performed with both the fluid and electricity supply disconnected. Eye protection and gloves are recommended to prevent accidental contact with lubricant or hot surfaces.

Will Not Start

- Check power switch and power cord connection.
- Press heat switch button located either on underside of power switch box or on side of motor.

No Inlet Flow

- Check system fluid level and suction hose connection to reservoir.
- Allow pump to operate for 10 to 20 seconds.
- Check for suction leaks.
- Verify hose length is not greater than 6 feet (~ 3.7m) and is the appropriate size.

No Outlet Flow

- Check pressure gauges for above normal pressures. This may be caused by dirty filters or other restrictions.
- Check for inlet flow.
- Wait about 60 seconds for empty filters to fill.

Intermittent Oil Flow and Aeration

- Check system fluid level.
- Check suction line for leaks.
- Check for foam in reservoir.

Leaks or Blockages

- If hose has a leak, replace it.
- For filter elements, ensure that gasket has been properly fitted to filter head and that filter element does not need changing.
- To check for blockage, shut off system pump, disconnect power source, and check that pressure gauge reads 0 psi/bar to ensure stored energy has been released from system; then disconnect hoses and check suction line.



Troubleshooting – Air Motor

WARNING: Do not attempt any maintenance work on this system without first reading this manual. Maintenance operations should be performed with both the fluid and electricity supply disconnected. Eye protection and gloves are recommended to prevent accidental contact with lubricant or hot surfaces.

Motor Runs Hot

- Potential causes include shaft misalignment or poor lubrication.

Motor Will Not Run

- Potential causes include poor lubrication, debris in motor, internal rust, or jammed system.

Motor Runs at Low Speed

- Potential causes include inadequate air supply, clogged system, poor lubrication, internal rust, debris in motor, or restricted exhaust.

No Inlet Flow

- Check system fluid level and suction hose connection to reservoir.
- Allow pump to operate for 10 to 20 seconds.
- Check for suction leaks.
- Verify hose length is not greater than 6 feet (~3.7m) and is the appropriate size.

No Outlet Flow

- Check pressure gauges for above normal pressures. This may be caused by dirty filters or other restrictions.
- Check for inlet flow.
- Wait about 60 seconds for empty filters to fill.

Intermittent Oil Flow & Aeration

- Check system fluid level.
- Check suction line for leaks.
- Check for foam in reservoir.

Leaks or Blockages

- If hose has a leak, replace it.
- For filter elements, ensure that gasket has been properly fitted to filter head and that filter element does not need changing.
- To check for blockages, shut off system pump, disconnect power source, and check that pressure gauge reads 0 psi/bar to ensure stored energy has been released from system; then disconnect hoses and check suction line.



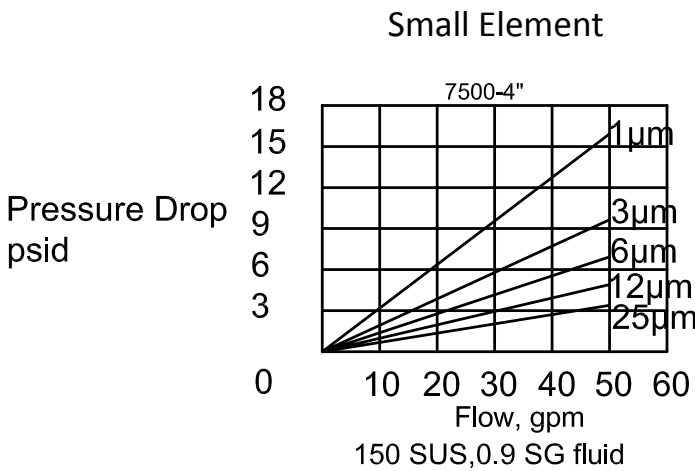
Filters

Particulate Removal Filters

Particulate Removal Filters

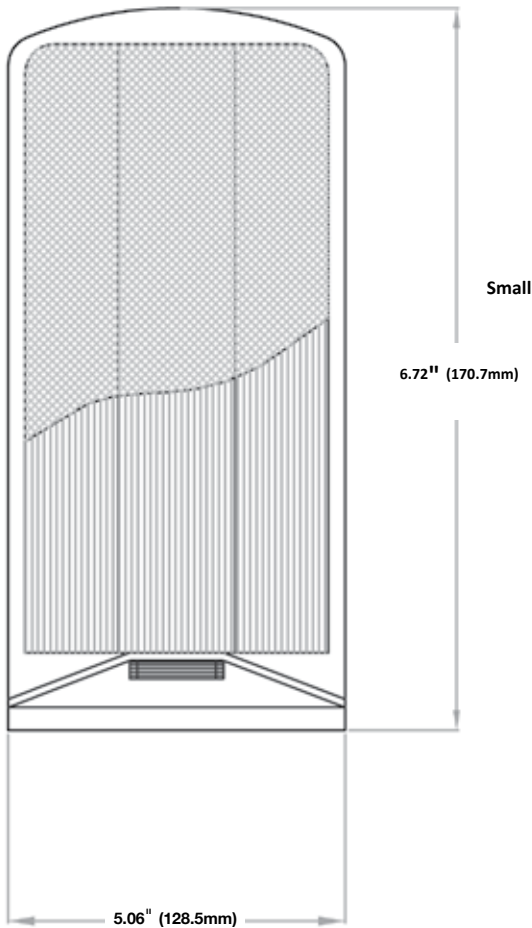
	Absolute Filter Rating	Part #	µm Rating for Beta Value							Dirt Holding Capacity
			ISO 4572	ISO 16889						
			β _x >200	β _x >2	β _x >10	β _x >75	β _x >100	β _x >200	β _x >1000	grams (lbs)
Small	3µ	FC-KF	3	<2	<2	3.1	3.3	3.8	5	58 (0.128)
	6µ	FC-LF	6	2.1	3.4	5	5.2	5.7	7	82 (0.181)
	12µ	FC-MF	12	3.2	5.5	8.3	8.7	9.7	12	97 (0.214)
	25µ	FC-NF	25	7.2	11	15.8	16.5	18.2	22	102 (0.225)

*Other micron ratings available upon request.



Water Removal Filters

Type	Filter	Part #
Small Spin-On	W	FC-WF





Filter Instructions

1. Shut down system, disconnect power source, and check that pressure gauge reads 0 psi/bar to ensure stored energy has been released from system.
2. Drain fluid from filter elements.
3. Remove old filter and gasket while filtering system is in upright position.
4. Lubricate new gasket with same oil filtered through system.
5. Place new gasket in channel on filter head. If gasket doesn't stay in place, apply petroleum jelly to gasket to keep it in place while spinning on new filter.
6. Spin on new filter until it just touches gasket.
7. Spin filter another 1/4 turn to finish installation of new filter.

CAUTION: Over-tightening can cause filter to leak.

Options Index

Manual Filter Bypass

A manual filter bypass allows the user to transfer fluid without filtering. This option can be used when removing used fluid from a system for disposal. It also can be used for transferring fluid that has already been filtered. Do not remove filters while operating in bypass mode.

Sample Valves

Sample valves – located upstream and downstream of the filters – allow for sampling without exposing fluids to ambient contamination. Samples should be taken during operation of filter cart. Two locations allow for fluid to be sampled before or after filtration process.

Pump Relief

A pump relief is included as a standard feature on Xtract Standard Filtration systems. The pumps used on filter carts are capable of producing very high pressures. The relief valve opens at 65 psi (5.49 bar) to relieve pressure.





Did You Know?

Lubrication Engineers is an industry-leading distributor of desiccant breathers, available in a wide array of shapes and sizes that can be easily adapted to replace the standard breather or ventilation systems on nearly all types of industrial equipment and storage tanks. LE's Xclude™ breathers protect the headspace of your equipment, ensuring that the air surrounding lubricants is clean and dry.

LE also offers consulting and training to assist companies in detecting issues and identifying steps to address them. Included in that are practical machinery lubrication management and cost-benefit analysis for a complete lubrication reliability program.

Visit www.lelubricants.com to learn more.



