



Serial #



The Serial # is located on the top of the outlet flange or pipe.

OWNER'S MANUAL

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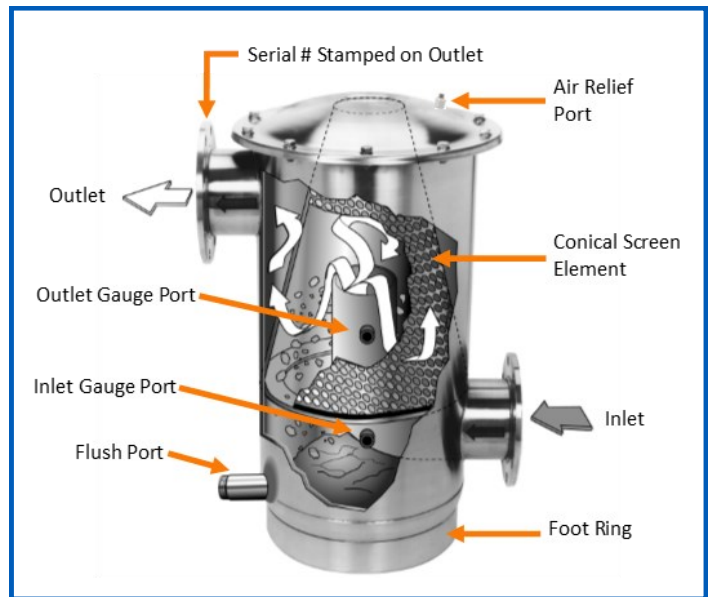
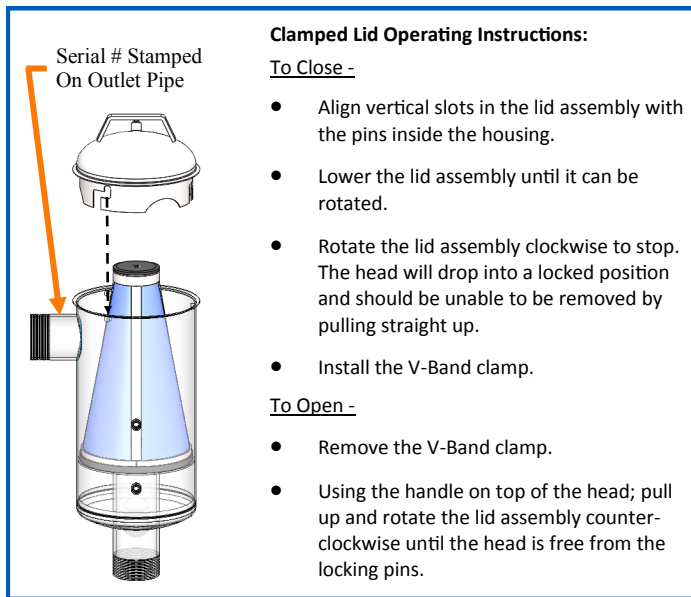
I. SAFETY CONSIDERATIONS

	GENERAL WARNING
	Ensure all appropriate personnel read owner's manual prior to installation and/or operation of strainer. Failure to Comply with instructions and safety precautions could lead to personal injury or product damage. Please call (386)248-0500 and ask to speak with one of our customer service representatives if there are any questions.
	CAUTION
	Always wear Personal Protective Equipment (PPE) - eye protection, ear protection, gloves, and protective footwear.

- AT NO TIME SHOULD THE INTERNAL PRESSURE EXCEED THE MAXIMUM RATED PRESSURE OF THE STRAINER.**
Refer to maximum pressure rating decals located on the strainer.
- Under no conditions should the strainer lid or pressure gauges be removed while the strainer is pressurized.**
- All strainers with a side inlet and a bottom foot ring must be placed on a firm supporting surface. DO NOT suspend the strainer by the inlet and outlet connections. All strainers with vertical inlet piping must be plumbed into properly supported piping.
- Units with damaged or missing parts should **NEVER** be operated. Contact customer service representatives for replacement parts.
- Back-flow prevention devices should be installed upstream of the inlet and downstream of the outlet of the strainer to prevent back flow or vacuum effects that can be damaging to the strainer.
- Pressure relief valves of a sufficient size and volume should be installed upstream of the inlet and downstream of the outlet of the strainer. They should be set so the system never exceeds the maximum rated pressure. It is recommended that the set point is approximately 20% higher than the operating pressure. Failure to install relief valves could lead to personal injury or product damage.

II. RECEIVING & INSTALLATION

1. Inspect strainer to ensure there is no damage from transit.
2. Confirm all dust plugs/flange protectors (inlet, outlet, gauge ports, etc.) are removed.
3. Locate serial number on top of outlet flange or pipe (see diagrams below) and record in the box on page 1.
4. Position the strainer into the piping system using the red arrows to indicate flow path.
5. All strainers with a side inlet and a bottom foot ring must be placed on a firm supporting surface. DO NOT suspend the strainer by the inlet and outlet connections. All strainers with vertical inlet piping must be plumbed into properly supported piping.
6. Installation of isolation valves on both the inlet and outlet sides of the strainer is recommended to isolate the strainer during maintenance.
7. Install a valve on the drainage port located at the bottom of the strainer body (see diagram below). The valve must be plumbed to atmosphere and the flush line should not have any elevation or be piped to a pressurized line. Ensure flush line is plumbed to prevent operator from contact with flush water.
8. Install pressure gauges (sold separately) in the gauge ports located on the strainer body (see diagram below) to allow monitoring the pressure differential across the screen.
9. Review all safety considerations from Section I. to determine if they have all been addressed. Review procedures for safe operation specific to your application.
10. Ensure all strainer openings are properly connected.
11. Ensure the lid is properly installed. See diagram below and Section IV. Torque Recommendations for instructions.



III. STRAINER OPERATION, MAINTENANCE, & STORAGE



CAUTION

Check gauges to ensure the internal pressure of the strainer is relieved before removing the retaining bolts/clamp of the lid.

Start Up

Open the downstream valve, then slowly allow fluid to flow through the strainer by opening the upstream valve.

Flushing

Periodically (depending on liquid quality) the debris that settles at the bottom of the strainer will need to be flushed out. Open the flush port valve while the strainer is in operation to flush out debris. Flow rate, pressure, and amount of debris determine how long the valve should be open to flush the debris from the strainer tank. It is the user's discretion to determine the frequency that the valve should be opened.

Never allow debris to accumulate beyond the capacity of the reservoir.

Cleaning

A pressure differential of approximately 5-7 PSI from the clean condition indicates that the screen requires cleaning.

1. Remove strainer from service by shutting off system valves to ensure no flow or pressure.
2. Check gauges to ensure the internal pressure of the strainer is relieved before removing the retaining bolts/clamp of lid.
3. Open flush port valve to drain fluid from strainer and relieve strainer pressure.
4. Open air relief valve to break vacuum for faster draining and to relieve any remaining strainer pressure.
5. Remove the lid of the Thompson Strainer.
6. Lift the strainer element (conical screen) out of the strainer body.
7. Carefully scrub down the strainer element with a rigid nylon brush until all matter is loosened. *Do not use a steel brush.*
8. Wash the strainer element off with clean water. *Do not use a pressure washer.*
9. Rinse gaskets and clean the inner-ring where the bottom of the strainer element seals.
10. Make sure the U-shaped gasket is fitted securely to the bottom of the strainer element. Position strainer element into the strainer body.
11. Make sure the strainer head gasket is installed on the upper flange of the top of the housing. On clamp models, the o-ring should be seated completely in the head assembly. Position the strainer lid back on the strainer body. Tighten lid following Torque Recommendations.
12. Ensure flush port valve and air relief valve are in closed position before returning strainer to service.

Storage (Not in Service)

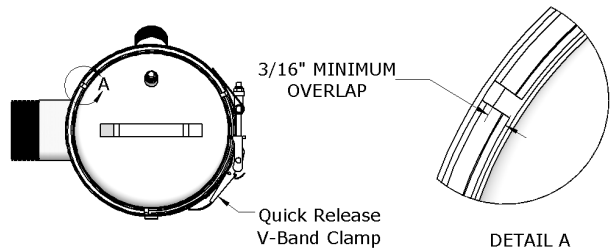
When the strainer is not in service, Miller-Leaman recommends the following to prevent premature deterioration of the strainer housing and screen.

- Isolate the strainer to ensure no flow and release pressure.
- Drain the strainer body by opening the flush port. Remove the internal screen and gaskets, and thoroughly rinse them with clean fresh water. Rinse out the inside of the strainer body with clean fresh water. Remove any excess water.
- The strainer is not freeze protected. Proper freeze protection steps must be taken to ensure the strainer will not be damaged if exposed to freezing conditions.

IV. TORQUE RECOMMENDATIONS

BAND CLAMP MODELS:

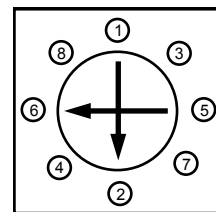
The over-center latch clamp is used on the band clamp models and is installed by placing the clamp around the strainer, latching the T-bolt with the receiver, then pushing the latch handle towards the strainer body until the safety catch engages. The over-center clamp does not require adjustment to be installed and removed. The lock nut is set at the factory for proper clamp compression and normally requires no initial field adjustment. Minor adjustments may be necessary over time. When tightening the lock nut, ensure that the clamp is compressing the o-ring to seal joint while not creating an excessive amount of latch handle closing force. When the clamp is closed, there should be a minimum overlap of 3/16" between the clamp inside diameter and the outside diameters of both the lid and housing flanges (see diagram).



BOLTED LID MODELS:

The bolted lid Thompson Strainers require that the attachment bolts be tightened sufficiently to make a complete seal without damaging the bolts or the strainer head. Bolts, nuts and washers are used to attach the heads to these strainers. The size and recommended torque of the bolt is dependent on the strainer size. The following table shows the bolt size and torque rating for each strainer.

<u>Model</u>	<u>Bolt Size</u>	<u>Bolt Quantity</u>	<u>Torque</u>
4" Bolted	(3/8"-16)	10	15 to 25 ft. lbs.
6"	(1/2"-13)	10	45 to 55 ft. lbs.
8"	(1/2"-13)	16	45 to 55 ft. lbs.
10" / 12" / 14"	(5/8"-11)	20	80 to 100 ft. lbs.



Recommended Torquing Sequence

NEVER operate the strainer unless all bolts are properly fastened. It is important to follow the torque recommendations as over-torquing may result in premature failure of the bolt. When tightening the bolted lid, follow the recommended torque sequence above. Complete the torque sequence 2 times.

V. INFORMATION CONCERNING WATER HAMMER

WHAT IS WATER HAMMER?

Water hammer is a phenomenon that can occur in fluid systems with long pipes between the fluid source and the outlet. The term itself refers to the sound made when water hammer occurs which resembles banging a hammer on a long pipe. Water hammer is a rapid change of pressure caused by a rapid change in velocity. When the velocity is changed a pressure wave that travels at the speed of sound is initiated and travels in the upstream direction until it reaches some stationary energy level, like a reservoir. A rarefaction wave (at the pressure of the water source) then travels downstream at the same speed. If the flow has been shut off down stream the pressure wave impacts the blockage and the pressure in the entire system is raised very quickly.

WHAT CAUSES WATER HAMMER?

Any action that can cause a rapid change in the velocity of the flow can set off a water hammer - closing a downstream valve, pipe fracture, pump stoppage, etc. The critical time for which a valve may be closed depends on the length of piping between the valve and the source reservoir. The longer the distance, the greater the time required to shut the valve safely. Typically for short lengths of pipe (below 500 ft) the critical time is less than 1/10 second.

WHAT CAN WATER HAMMER DO?

Pressure spikes from water hammer can raise fluid pressures to very high values (in excess of 1000 PSI depending on the situation). Such pressure spikes can result in mechanical failures such as broken valves, pipes, strainers, joints, etc. Water hammer does not have to occur fully to raise the pressure. A partial hammer can occur that raises the pressure to a certain percentage of the theoretical maximum. The Thompson Strainer is rated to an absolute maximum pressure of 150 PSI for bolted lid models, 125 PSI for band clamp lid models. A water hammer pressure spike that raises the pressure higher than the maximum rated pressure may result in strainer damage.

WHAT CAN I DO TO PREVENT WATER HAMMER?

There are precautions that can be taken to prevent or decrease the effect of water hammer. A pressure relief valve that leads to a surge tank or accumulator may protect other key components from water hammer. A close adherence to operational policies will also help prevent valves or pumps from being accidentally shut off thereby causing a water hammer. A close examination of a system will inform you of potential hazards.

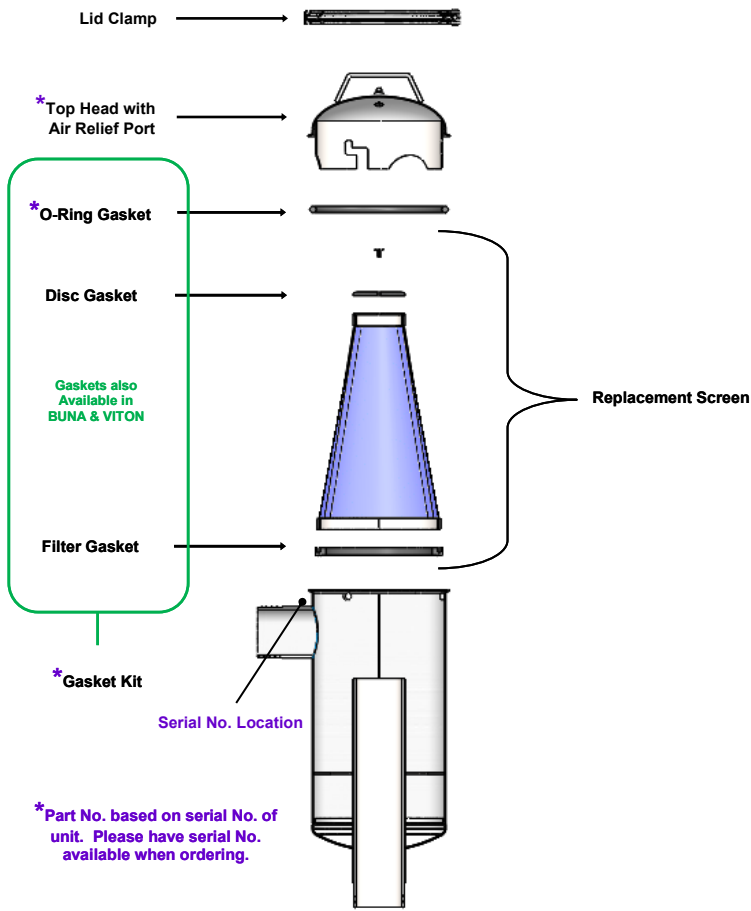
VI. WARRANTY

This warranty is given by Miller-Leaman, Inc. (MLI) and is governed by the Laws of the State of Florida. Venue and jurisdiction of any case or controversy related to the use of this product or this warranty shall lie exclusively in the State Courts of Volusia County, Florida. MLI warrants its Products against defects in material and workmanship, as per the product warranty schedule listed below, if properly installed, maintained and operated in accordance with MLI instructions and good industry practice, excluding ordinary wear, corrosion, erosion, chemical or abrasive action. This warranty shall not apply to any Products or parts of Products that (a) used or operated in any application outside the stated specifications or design limitations of said Products; or (b) have been damaged or in any way altered due to misuse, negligence or accidents; or (c) have been repaired or altered in any manner outside of MLI factory, unless by express authorization of MLI; or (d) have been used in a manner contrary to MLI instructions or recommendations, including without limitation with respect to site preparation, maintenance or environmental conditions.

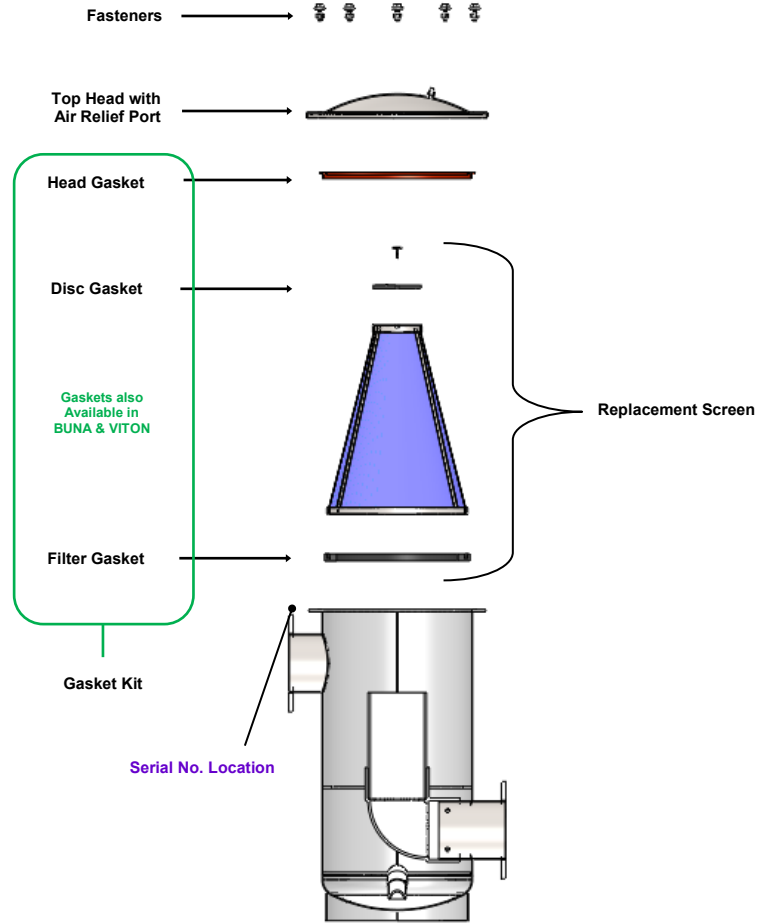
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VII. SPARE PARTS

Thompson Strainer - 2" thru 4C"



Thompson Strainer - 4B" thru 14"



STRAINER		REPLACEMENT PARTS							
Model Number	Inlet/Outlet Size & Type *	Replacement Screen (a)	Head/O-Ring Gasket (EPDM)	Filter Gasket (EPDM)	Disc Gasket (EPDM)	Gasket Kit (b)	Top Head	Lid Clamp or Fasteners	
BAND CLAMP LID	MLS-02-XXX	2" NPT	P/N: 2S-XXX	OR-02 OR-02-2	FG-02	DG-02	GK-02 GK-02-2	TH-02 TH-02-2	BC-02
	MLS-03-XXX	3" NPT	P/N: 3S-XXX	OR-03 OR-03-2			FG-03	DG-03	
	MLS-04C-XXX	4" Flanged	P/N: 4S-XXX	OR-04 OR-04-2	FG-04	DG-04			GK-04 GK-04-2
BOLTED LID	MLS-04B-XXX	4" Flanged	P/N: 4S-XXX	HG-04	FG-04	DG-04	GK-04B	TH-04B	FASTENERS-04
	MLS-06-XXX	6" Flanged	P/N: 6S-XXX	HG-06	FG-06	DG-06	GK-06	TH-06	FASTENERS-06
	MLS-08-XXX	8" Flanged	P/N: 8S-XXX	HG-08	FG-08	DG-08	GK-08	TH-08	FASTENERS-08
	MLS-10-XXX	10" Flanged	P/N: 10S-XXX	HG-10	FG-10	DG-10	GK-10	TH-10	FASTENERS-10
	MLS-12-XXX	12" Flanged	P/N: 12S-XXX	HG-12	FG-12	DG-12	GK-12	TH-12	FASTENERS-12
	MLS-14-XXX	14" Flanged	P/N: 14S-XXX	HG-14	FG-14	DG-14	GK-14	TH-14	FASTENERS-14

REPLACEMENT PARTS NOTES:

- (a) Replacement Screen includes: Screen, Filter Gasket (U-Gasket, bottom of screen), & Disc Gasket (top of screen).
 - (b) Gasket Kit includes complete set for Strainer:
- (1) Head Gasket or O-Ring, (1) Filter Gasket, & (1) Disc Gasket.

Table 1
Select O-Ring, Gasket Kit, and/or Top Head corresponding to serial number stamped on strainer outlet pipe/flange.

Model	Serial No.	Part Number	Serial No.	Part Number
MLS-2	0001-4999	OR-02 / GK-02 / TH-02	5000 & higher	OR-02-2 / GK-02-2 / TH-02-2
MLS-3	0001-1999	OR-03 / GK-03 / TH-03	2000 & higher	OR-03-2 / GK-03-2 / TH-03-2
MLS-4C	0500-1999	OR-04 / GK-04	2000 & higher	OR-04-2 / GK-04-2

SCREEN OPTIONS: "XXX" (in above part numbers) = MESH or PERFORATED SIZE OF SCREEN

Complete Filter and Replacement Screen orders must specify mesh or perforated size of screen. See catalog for micron equivalent to mesh.

Screen Mesh Options: Standard Mesh - 16, 20, 30, 40, 50, 60, 80, 100, 120, 150, 200

Heavy-Duty Mesh - 24x110, 30x150, 40x200, 50x250 (Dutch-weave screens: heavier wire gauge, lower open area %)

Perforated Options: 1/4", 1/8", 1/16"

VIII. OPTIONAL EQUIPMENT

OPTIONAL EQUIPMENT

Please note that the following equipment is not included with the purchase of the strainer. Please call for information and pricing.



Pressure Differential Alarm Package (PDA)

- Continuously monitors the pressure drop across the conical screen.
- Visual and audio alarm.
- Auxiliary output contact.



Automatic Timer Flush Package (ATF-EA-1.5)

- Automatically purges particles that have gravitated down into the debris reservoir at the base of the strainer.
- Dial in frequency and duration.
- 110V / 12VDC power supply included.



Full Cone Spray Nozzle Assembly Option

- Rinse particles off the screen.
- Decrease frequency of screen maintenance.



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The Thompson Strainer is a product of Miller-Leaman, Inc. and is protected under patent #5,132,013