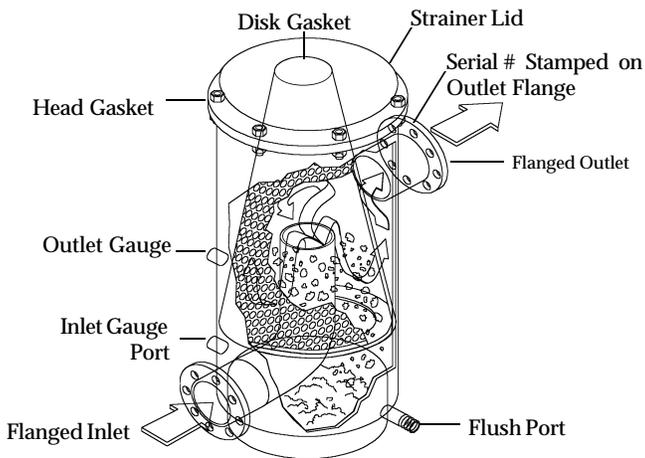


Conair

MLS FULL FLOW STRAINER OWNER'S MANUAL



Record in the space below the Serial # of your unit. The Serial # is located on the top of the outlet flange or pipe.

Serial # _____

IMPORTANT

Please make certain that persons who are to use this strainer thoroughly read and understand these instructions prior to operation. Should you have any questions regarding the operation of this strainer, please call _____ and ask to speak with one of our customer service representatives.

I. SAFETY CONSIDERATIONS

Safety precautions are essential when any filtration equipment is involved. These precautions are necessary when using, storing, and servicing your strainer. If safety precautions are overlooked or ignored, personal injury or product damage may occur. Your strainer was designed for specific applications. It **should not** be modified and/or used for any application other than originally specified. If there are any questions regarding its application or installation, write or call Milacron.

Always heed the following precautions, as they are essential when using your *MLS Full-Flow Strainer*.

- 1) Read this manual carefully. Consider the applications, limitations, and the potential hazards specific to your strainer.
- 2) (Flanged units only) The strainer must be placed on a firm, supporting surface. The inlet or outlet flanges should not suspend the strainer.
- 3) **Absolutely, under no conditions, should the strainer lid or pressure gauges be removed while the strainer is pressurized.** Standard models should never exceed 150 PSI, V-Band clamp models should never exceed 125 PSI.
- 4) Units with damaged or missing parts should **never** be operated. Contact our customer service representatives for replacement parts.
- 5) Back flow prevention devices should be installed upstream of the inlet and downstream of the outlet of the strainer as to prevent back flow or vacuum effects which may be damaging to the strainer element.
- 6) 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 to relieve pressure at 1.2 times the maximum operating pressure (not to exceed the maximum rated pressure). This helps prevent damage to the strainer and element if severe stoppage or water hammer occurs.

AT NO TIME SHOULD THE INTERNAL PRESSURE EXCEED THE MAXIMUM RATED PRESSURE FOR YOUR STRAINER

II. BEFORE STRAINER OPERATION...

There are a few tasks that must be accomplished before your *MLS Full-Flow Strainer* is ready for operation. Please review the following checklist. When all tasks are complete the strainer is ready to be used.

1. (Flanged Units Only) Is your *MLS Full-Flow Strainer* placed on a firm, supporting surface? Failure to do this may cause stress on the weld joints. Milacron recommends a concrete pad be poured under the base of the strainer.
2. Are the inlet and outlet connections securely fastened to the in-line pipe? The arrows clearly depict flow direction (see

above diagram).

3. Have you installed a check valve/back flow prevention device upstream of the inlet and downstream of the outlet of the strainer as to prevent back flow or vacuum effects which may be damaging to the strainer element?
4. Have you installed a quick pressure relief valve upstream of the inlet and downstream of the outlet of the strainer set to relieve pressure at 1.2 times the maximum operating pressure (and not exceeding the maximum rated pressure of your strainer)? This is to prevent damage to the strainer element when and if severe clogging or water hammer occurs. Pressure relief valves are available in various sizes, consult your local dealer or valve manufacturer to obtain the proper valve for your application.
5. Have you installed a valve on the drainage port located at the bottom of the strainer body (see above diagram)? This valve, when opened, will allow debris to escape the strainer body.
6. Make sure back-mount pressure gauges are installed in the gauge ports located on the front of the strainer body (see above diagram). These gauges will allow you to monitor the pressure differential on each side of the screen so as to know when and if the strainer element is clogging.

III. TORQUE SPECIFICATIONS

7. Is the *MLS Full-Flow Strainer* lid securely fastened? Each bolt should be tightened to ensure safety and an adequate seal.

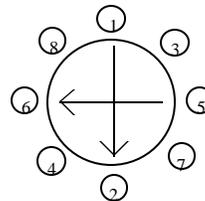
BAND CLAMP MODELS: (MLS-2, -3, and -4C)

The Over-center latch clamp is used on the MLS-2, -3, and -4C units and is installed by placing the clamp around the strainer, latching the T-bolt with the receiver, and 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 washer is set at the factory for proper clamp compression and normally requires no field adjustment. Minor tightening may be necessary over time. (NOTE: The MLS-4 strainer is available with both a bolted lid and clamped lid. These are differentiated by a "B" for the bolted lid and a "C" for the clamped lid version.)

BOLTED LID MODELS: (MLS-4B, -6, -8, -10)

The bolted lid *MLS Full-Flow Strainers* require that the attachment bolts be tightened sufficiently to make a complete seal without damaging the bolts or the strainer head. Stainless steel bolts with brass nuts and stainless steel 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 with a bolted lid.

<u>Strainer</u>	<u>Bolt Size</u>	<u>Torque</u>	Recommended
MLS-4B	3/8 - 16	11 ft. lbs	11 ft. lbs (132 in. lbs)
MLS-6	1/2 - 13	25 ft. lbs	25 ft. lbs
MLS-8	1/2 - 13	25 ft. lbs	25 ft. lbs
MLS-10	5/8 - 11	45 ft. lbs	45 ft. lbs



It is important to follow the torque specifications as over torquing may result in premature failure of the bolt. Another important procedure when tightening the bolted lid is to follow a star wheel torque pattern. This is similar to the tightening of an automobile wheel in that the next bolt to be tightened is located opposite to the bolt just tightened (see figure above). Most likely the strainer lid will not seat down completely after one series of torquing, this is especially evident on the larger series strainers (MLS-8 and larger). A second tightening of the bolts in the same pattern as the first should seat the lid securely to the body. On MLS-8 and -10 models a 1/8 inch lid ring can be seen and should rest flush against the body flange when the head is properly tightened. The

IV. STRAINER OPERATION

MLS-4B and -6 lids also have this ring but it is hidden by the edge of the head. The MLS-4B and -6 head will seat completely after two torquing sequences.

At this point the *MLS Full-Flow Strainer* is ready for operation. Periodically (depending on liquid quality) the debris that settles out at the bottom of the strainer will need to be flushed out. The drainage port located at the bottom of the strainer is what makes this possible. Upon receiving your strainer, you must install a valve on the drainage port. It is the user's discretion how often the valve should be opened. It strictly depends on how much debris is being captured by the screen and falling into the strainer reservoir. Over time, one should be able to accurately determine how often the valve should be opened. **It is important that you never allow debris to accumulate beyond the capacity of the reservoir.**

Larger series strainers (MLS-4, -6, -8, and -10) are equipped with a flush port extension inside the strainer to allow for a nearly complete cleaning of the strainer reservoir every time the strainer is flushed. The drainage port valve should be opened while the strainer is in operation. Flow rate and pressure determine how long the valve should be open to flush the debris from the strainer tank. A good rule of thumb is to leave the valve open until the liquid being expelled flows free of debris. This should take from 15-30 seconds depending on the flow, pressure, and amount of debris.

Larger strainers require higher flushing pressures to achieve complete cleaning: the MLS-4 can be flushed as low as 15 - 20 PSI; the MLS-6 can be flushed as low as 30 - 35 PSI; and the MLS-8 and -10 should be flushed at 40 PSI or greater if possible.

(Note: After operation, open the drainage port to allow the water contained in the strainer body to drain. If there is sulfur

V. STRAINER ELEMENT CLEANING

content in the water, it tends to corrode the strainer element. Also, in winter months, the water may freeze and expand putting unnecessary stress on the strainer body).

The back mount pressure gauges that you have installed can be used to monitor the pressure differential between the inlet and outlet sides of the strainer. When there is a pressure loss of 5-10 PSI between the inlet and outlet side of the strainer, the strainer element may require cleaning.

CAUTION: Make sure that the system is completely shut down when the strainer element is to be taken out and cleaned. No pressure should remain in the system.

Follow these steps when cleaning the *MLS Full-Flow Strainer* element:

THERE SHOULD BE ZERO LBS. PRESSURE IN YOUR UNIT BEFORE BEGINNING THESE INSTRUCTIONS.

- Step 1: (Bolted Lid Models)** Remove the top of the *MLS Full-Flow Strainer* by removing the stainless steel bolts from the strainer lid.
- Step 1: (Band-Clamp Lid Models)** Remove the top of the *MLS Full-Flow Strainer* by taking off the band-clamp assembly.*
- Step 2:** Lift the strainer element (conical screen) out of the strainer body.
- Step 3:** Carefully scrub down the strainer element with a rigid nylon brush until all matter is loosened. **Do not use a steel brush.**
- Step 4:** Wash the strainer element off with clean water. It is preferred to use a hose with a significant amount of water pressure. **DO NOT USE A PRESSURE WASHER.**
- Step 5:** Wash all matter from the strainer gaskets and clean the inner ring where the bottom of the strainer element rests.
- Step 6:** Make sure U-shaped gasket is fitted securely to the bottom of the strainer element. Reposition the strainer element into the body of the strainer.
- Step 7:** Make sure the strainer head gasket is secure on the top of the strainer body. On V-Band models, O-rings should be seated completely in the body flange. Reposition the strainer lid back on the strainer body. *Tighten the lid securely either with the bolts or with the band clamp.*

* For the Over-Center Latch band-clamp models, opening and closing is achieved without adjusting the lock nut. It is tightened at

VI. WATER HAMMER

the factory to the correct compression. (Minor tightening may be necessary if the gasket loses memory over time.) To open the clamp, depress the safety latch and pull the over center lever outward. To close the clamp, make sure the T-Bolt is seated in its receiver and push the over-center lever back toward the strainer housing. *Be sure that the safety latch is engaged before putting the unit to use.*

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 slower the valve may be shut to cause a water hammer. 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 *MLS Full-Flow 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.

FAILURE TO FOLLOW INSTRUCTIONS AND WARNINGS CAN RESULT IN SERIOUS BODILY INJURY.

VII. COMPANY INFORMATION

WHAT CAN I DO TO HAMMER? There are taken to prevent or hammer. A pressure surge tank or other key components close adherence to operational valves or pumps from being causing a water hammer. A inform you where potential

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PREVENT WATER precautions that can be decrease the effect of water relief valve that leads to an accumulator may protect from water hammer. A policies will also help prevent accidentally shut off thereby close examination of a system will hazards are.