



Screen Filtration

OPERATION,
INSTALLATION AND
MAINTENANCE
MANUAL

SF Series

Where water
means business.



SF Series SCREEN FILTER - OPERATION MANUAL

The SF Series Screen Filter is a highly efficient, stainless steel strainer which features a large conical screen offering substantially more screen surface area versus traditional basket or "Y" strainers. As water enters the bottom of the strainer housing and flows upward, heavier debris and particulate is accelerated downward, away from the conical screen, into the large debris reservoir at the base of the strainer. Particulate can be flushed from the reservoir via the flush port either manually or automatically with optional flush package. All models operate with less than 1-psi pressure loss at maximum flow when clean.



Serial #

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

Table of Contents

Safety Considerations	1
Receiving & Installation	2
Strainer Operation, Maintenance, & Storage	2
Torque Recommendations	3
Information Concerning Water Hammer	4
Spare Parts	5
Optional Equipment	6

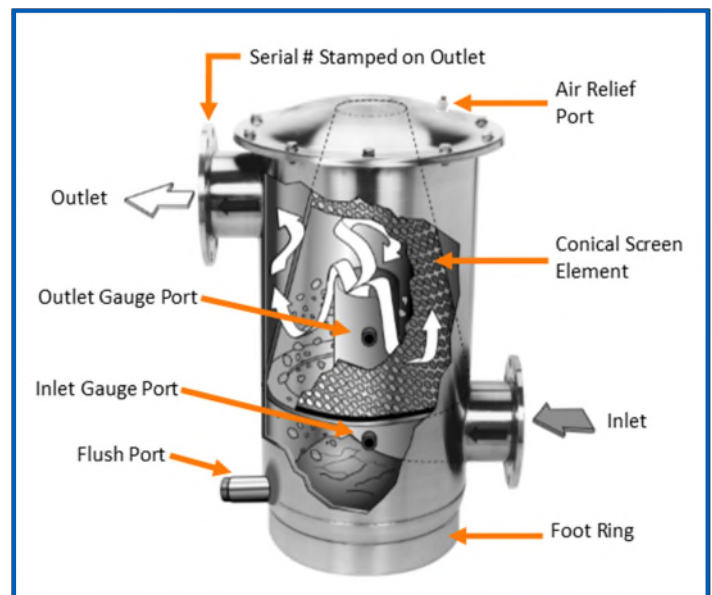
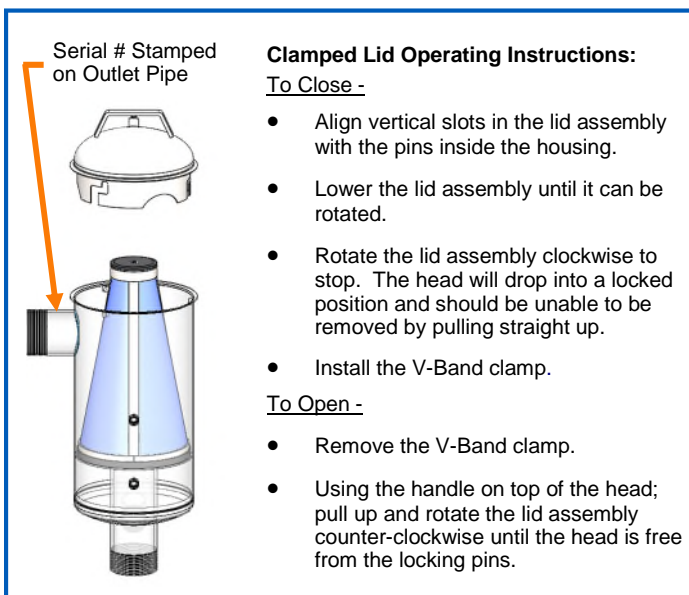
SAFETY CONSIDERATIONS

	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.
	CAUTION
	Personal Protective Equipment (PPE) - eye protection, ear protection, gloves, and protective footwear - must be worn when operating and servicing the strainer.

1. **DO NOT EXCEED THE MAXIMUM RATED PRESSURE OR TEMPERATURE OF THE STRAINER. Refer to decals located on the strainer.**
2. **Under no conditions should the strainer lid or pressure gauges be removed while the strainer is pressurized.**
3. 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.
4. Units with damaged or missing parts should **NEVER** be operated.
5. 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.
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 so the system never exceeds the maximum rated pressure. Failure to install relief valves could lead to personal injury or product damage.

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 ports are properly connected.
11. Ensure the lid is properly installed. See diagram below and Section IV. Torque Recommendations for instructions.
12. The strainer is not freeze protected. Proper freeze protection methods must be utilized to ensure the strainer will not be damaged if exposed to freezing conditions.



STRAINER OPERATION, MAINTENANCE, & STORAGE



CAUTION

The internal pressure of the strainer must be relieved to zero 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.

STRAINER OPERATION, MAINTENANCE, & STORAGE (continued)

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 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. Fit the U-shaped gasket securely to the bottom of the strainer element. Position strainer element into the strainer body.
11. Fit the strainer head gasket onto the upper flange of the top of the housing. On clamp models, the O-ring should be seated completely in the head assembly. Follow instructions in Torque Recommendations (Section IV).
12. Ensure flush port valve and air relief valve are in closed position before returning strainer to service.

Storage (Not in Service)

For storage or extended downtime follow these steps 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; rinse with clean fresh water. Rinse out the inside of the strainer body with clean fresh water and remove any excess water. Replace all components securely when completely dry.

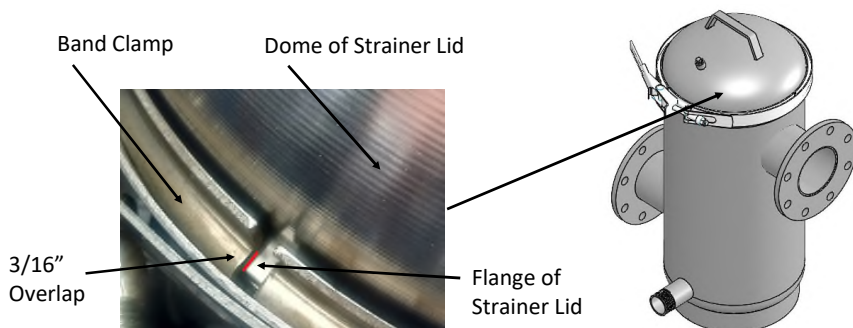
TORQUE RECOMMENDATIONS

BAND CLAMP MODELS:

The over-center latch clamp is used to secure the lid to the housing on clamp lid models. Replacement clamps are shipped with the lock nut not pre-set and must be adjusted upon installation. Under no conditions should the strainer lid or pressure gauges be removed while the strainer is pressurized. Clamp installation instructions: Ensure O-Ring is properly installed on the lid. Place the lid on the strainer housing, align pins with slots in the lid, and twist to lock into place. Place the clamp around the flared edges of the housing and lid. Latch the T-bolt with the receiver. Push the latch handle towards the strainer body until the safety catch engages.

Adjust the lock nut until the clamp Inner Retainer fits securely and is fully engaged around the flared edges of the lid and housing flange.

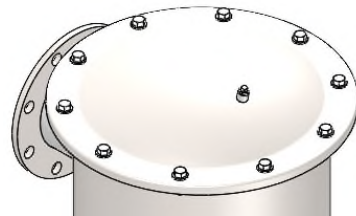
The engagement can be inspected at the separation gaps of the Inner Retainer and should have a minimum of 3/16" overlap onto the flange of the strainer lid (see diagram). Reclip safety warning tag to the clamp.



BOLTED LID MODELS:

Bolted lid models 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. **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. Tighten and torque bolts in an opposing pair "star" pattern according to ASME PCC-1-2019 Guidelines for Pressure Boundary Bolted Flange Joint Assembly or MIL-HDBK-60 Threaded Fasteners Tightening to Proper Tension.

Model	Bolt Size	Bolt Quantity	Torque
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.



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 downstream 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?

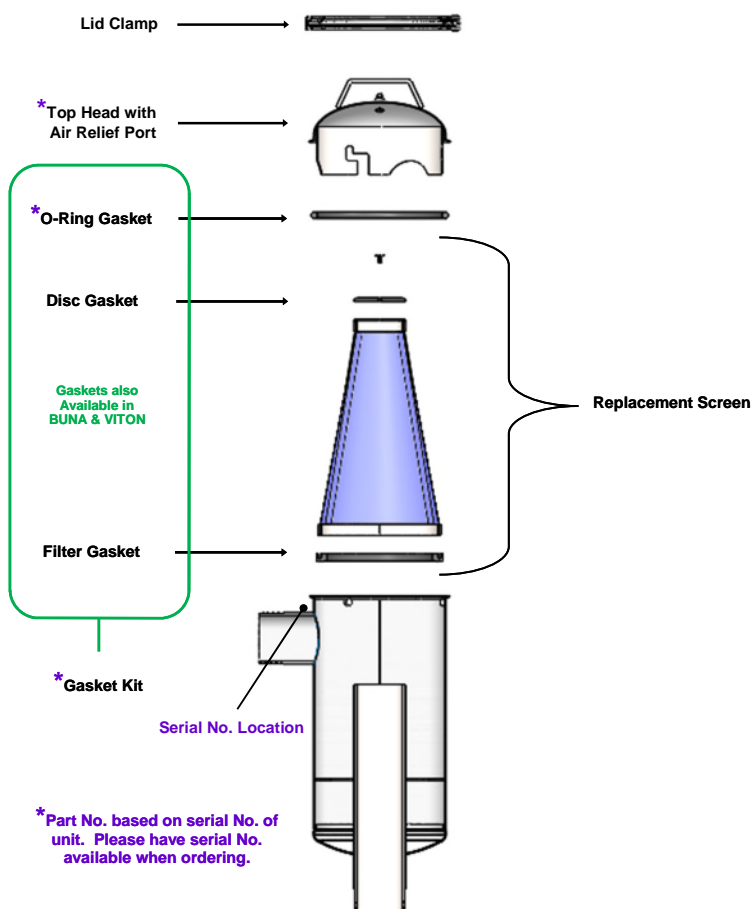
Pressure spikes from water hammer can raise fluid pressures to very high values (in excess of 1000 PSI depending on the situation). Such pressure spikes can result in mechanical failures such as broken valves, pipes, strainers, joints, etc. Water hammer does not have to occur fully to raise the pressure.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

WHAT CAN I DO TO PREVENT WATER HAMMER?

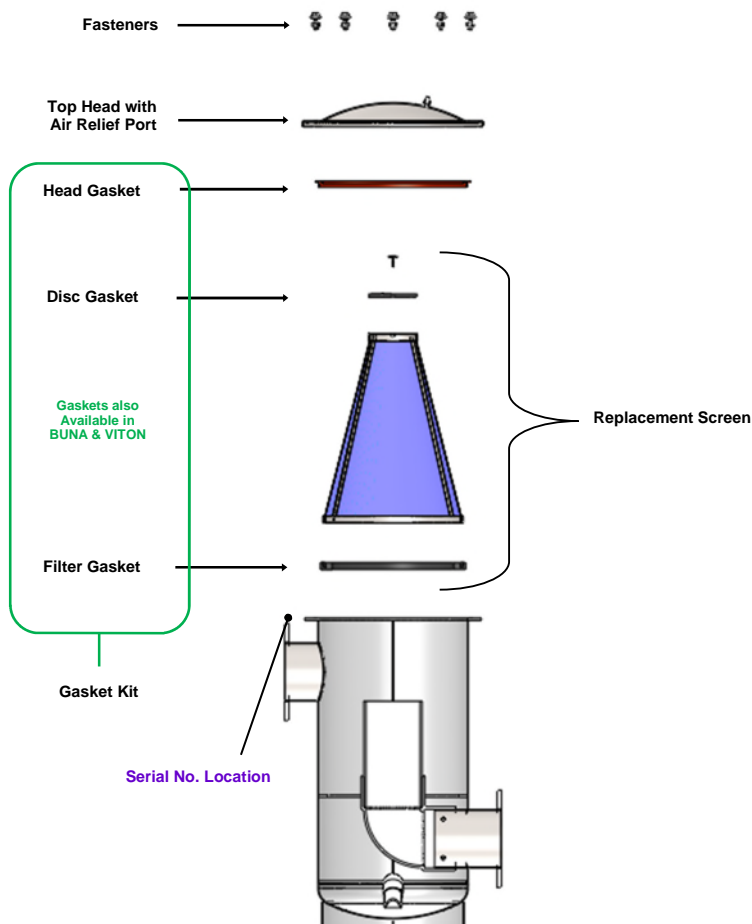
There are precautions that can be taken to prevent or decrease the effect of water hammer. A pressure relief valve that leads to a surge tank or accumulator may protect other key components from water hammer. A close adherence to operational policies will also help prevent valves or pumps from being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

SPARE PARTS

Clamp Lid Models



Bolted Lid Models



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) (EPDM)	Top Head		Lid Clamp or Fasteners
BAND CLAMP LID	SF100	2" NPT	P/N: 2S-XXX	OR-02	FG-02	DG-02	GK-02	TH-02	Select P/N from Table 1	BC-02
	SF200	3" NPT	P/N: 3S-XXX	OR-02-2			GK-02-2	TH-02-2		
				OR-03	FG-03	DG-03	GK-03	TH-03		
SF350-C	4" Flanged	P/N: 4S-XXX	OR-03-2	GK-03-2			TH-03-2			
			OR-04	FG-04	DG-04	GK-04	TH-04C	BC-04		
OR-04-2	GK-04-2									
BOLTED LID	SF350-B	4" Flanged	P/N: 4S-XXX	HG-04	FG-04	DG-04	GK-04B	TH-04B	FASTENERS-04	
	SF750	6" Flanged	P/N: 6S-XXX	HG-06	FG-06	DG-06	GK-06	TH-06	FASTENERS-06	
	SF1300	8" Flanged	P/N: 8S-XXX	HG-08	FG-08	DG-08	GK-08	TH-08	FASTENERS-08	
	SF2000	10" Flanged	P/N: 10S-XXX	HG-10	FG-10	DG-10	GK-10	TH-10	FASTENERS-10	
	SF3000	12" Flanged	P/N: 12S-XXX	HG-12	FG-12	DG-12	GK-12	TH-12	FASTENERS-12	
	SF4000	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
SF100	0001-4999	OR-02 / GK-02 / TH-02	5000 & higher	OR-02-2 / GK-02-2 / TH-02-2
SF200	0001-1999	OR-03 / GK-03 / TH-03	2000 & higher	OR-03-2 / GK-03-2 / TH-03-2
SF350-C	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"

OPTIONAL EQUIPMENT

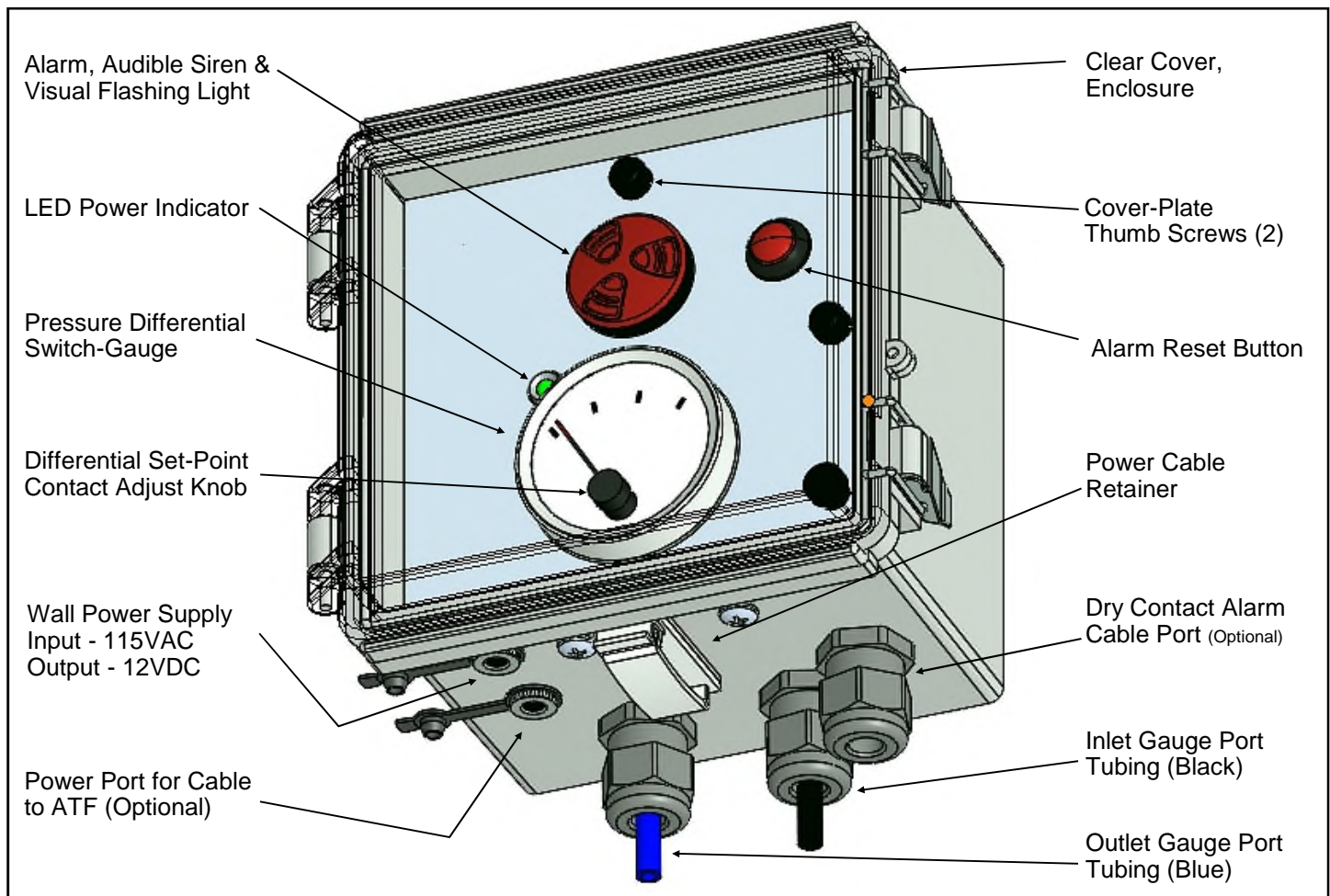
The following equipment is available for purchase separately from this strainer. Please call for information and pricing.

PRESSURE DIFFERENTIAL ALARM PACKAGE (PDA2)

The pressure differential alarm package (PDA2) continually monitors and displays the screen strainer inlet and outlet differential pressure. When the conical screen element becomes significantly clogged, the pressure differential switch-gauge will trigger an audible siren and a visual flashing alarm light. These alarms are intended to alert maintenance personnel that the strainer element must be removed and cleaned as per the strainer operation manual.

Features:

- Continuously monitors the Differential Pressure across the conical screen
- Audible and Visual alarm
- Dry Contact connection



OPTIONAL EQUIPMENT

The following equipment is available for purchase separately from this strainer. Please call for information and pricing.

AUTOMATIC TIMER FLUSH VALVE (ATF2)

The Automatic Timer Flush Valve (ATF2) is an automated flush valve that is designed for use with the SF Strainer. The ATF2 has a digital timer that allows the operator to set the frequency and duration of valve opening in order to allow more effective and efficient flushing of the collected debris from the strainer.

Control Box: The digital timer is located inside a NEMA 4 enclosure that includes an Auto and Manual Valve function switch.

Ball Valve/Actuator: The valve body has a 316SS ball inside a UV modified, glass-filled Nylon housing. The actuator has high torque motor gears and solid state components for increased durability and maintenance free performance contained inside a NEMA6P enclosure.

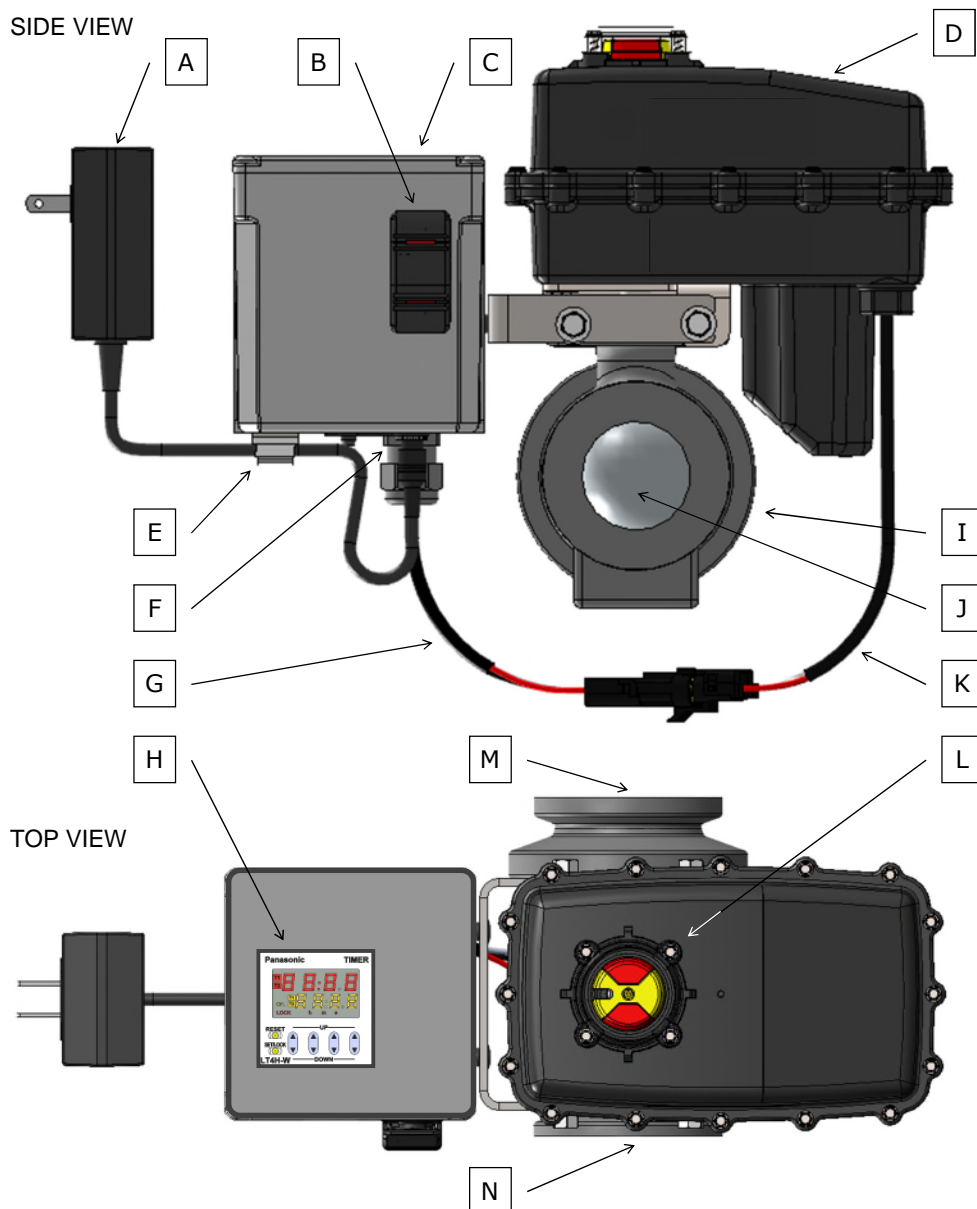
Features:

Purges particles from strainer at user defined intervals
Manual flush control switch with indicator

Adjustable flush frequency and duration
Stainless Steel ball valve designed for dirty water use

Primary Components:

A	POWER SUPPLY
B	CONTROL TOGGLE SWITCH, 3-POSITION, LIGHTED
C	CONTROL BOX
D	ACTUATOR HOUSING
E	POWER CORD CLIP
F	POWER SUPPLY JACK
G	ACTUATOR CABLE
H	DIGITAL TIMER (inside control box)
I	VALVE HOUSING
J	STAINLESS STEEL BALL
K	CONTROL BOX CABLE
L	VALVE POSITION INDICATOR, LIGHTED
M	INLET PORT
N	OUTLET PORT





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