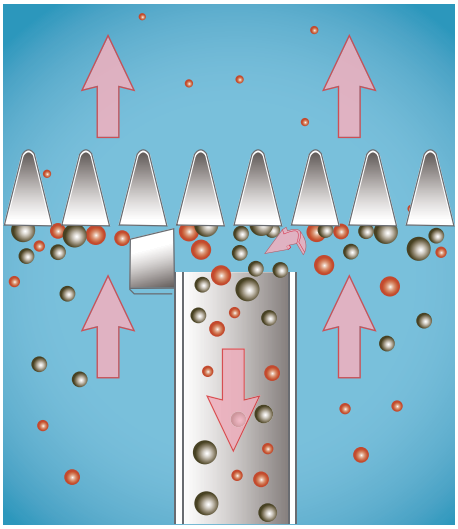
FEATURE®

Automatic Strainers

The SAS Series Strainer

The SAS Strainer is a motorized automatic self–cleaning strainer, providing continuous debris removal from fluid piping systems that require uninterrupted flow.
The SAS Strainer is particularly effective in high solid loading fluid applications that require automatic, uninterrupted processing; the basket strainer involving manual maintenance is unable to meet these requirements.
When applied correctly, any SAS Series Strainer is an efficient and cost effective solution compared to simplex/duplex strainers or other automatic straining systems.



Port / straining element interface during backwashing cycle.

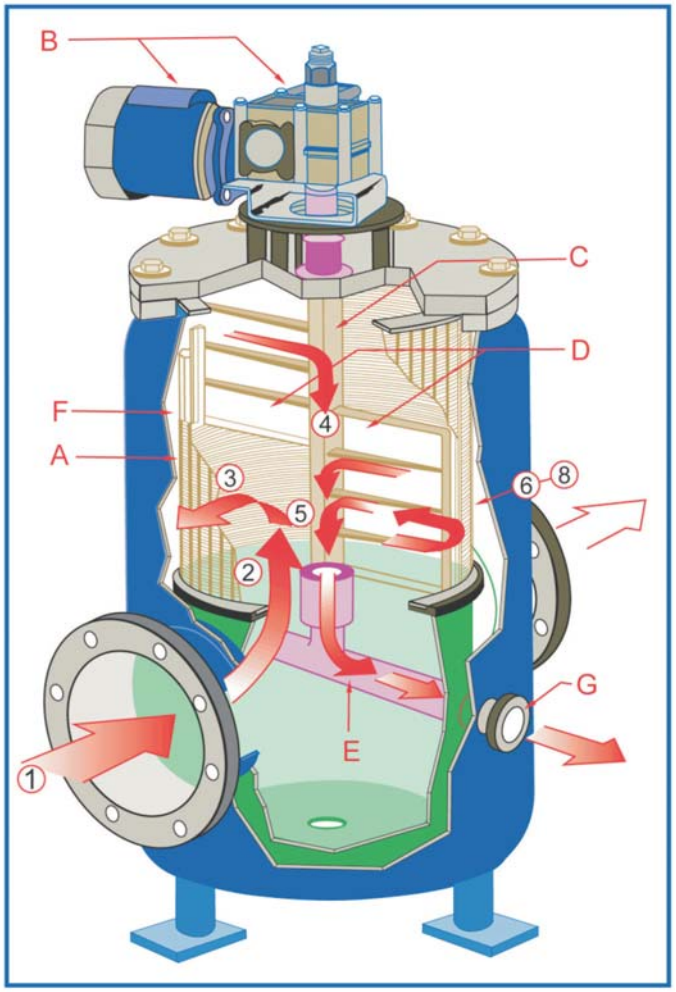


Figure 1: Cross section of Strainer Showing Fluid Flow during Operation

Sequence of Operation

1. Debris laden fluid enters through inlet to inner chamber. (Fig. 1)
2. Dirty fluid flows upward and outward through the strainer element (A).
3. Debris is retained on the flat face of the strainer element, while strained fluid continues to outer chamber and exits through strainer outlet. (See inset)
4. During backwash or cleaning cycle, the motor/ gear reducer (B) is engaged and drives the hollow drive shaft (C) and hollow port (D) around the inner circumference of the strainer element.
5. The backwash assembly (E) is opened to atmospheric pressure by opening the backwash control valve (not shown).
6. Flow reversal occurs at the port/straining element (F) interface because of the pressure differential described in 5.
7. Debris is effectively vacuumed from the full length of the straining element by a vigorous reverse fluid flow and into the hollow port; down the hollow drive shaft and out the backwash outlet (G).
8. The hollow port continues to sweep the full length of the strainer element until the cleaning cycle has ended.
9. The strainer will provide continuous uninterrupted fluid flow during the cleaning operation.
10. The cleaning cycle can be set for continuous or intermittent backwash.

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Automatic Self–Cleaning Strainers

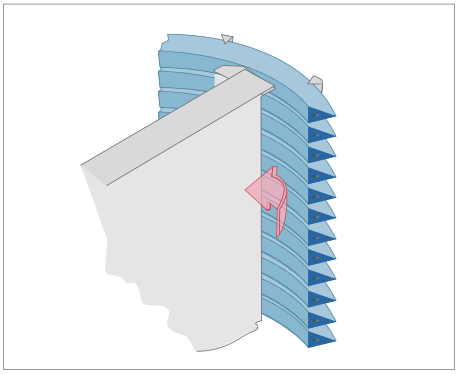

Figure 2: Cross section of Wedge Wire Straining Element

Application

The SAS straining element's unique patented design permits installation in virtually any pressurized piping system.

The SAS Strainer can operate in a wide range of pressure (minimum 5 psig) for effective solid removal and backwashing across a range of pressures. Only one drain/backwash connection is required for installation, effectively eliminating the cost of a separate backwash connection.

Strainers are used to protect equipment such as valves, pumps, meters, heat exchangers or spray nozzles, as well as in–feed water and process water applications or virtually any similar application.

The Eliminator SAS Series Automatic Self–Cleaning Strainers are fabricated in pipe sizes ranging from 1" to 48" to suit most application requirements.

Features:

- Patented rugged screen and mechanically assisted backwash mechanism extend service life.
- Unique clog–resistant straining element reduces maintenance downtime.
- All internal replacement parts supplied in corrosion resistant material.
- Efficient new design reduces maintenance requirements; requires fewer parts.
- Low rpm backwash mechanism provides more efficient cleaning, less wear of internals.

Straining Element

SAS Strainers feature a revolutionary reverse rolled wedge–wire straining element (Fig. 2) which is extremely rugged and more clog–resistant than conventional strainers using perforated plates or wire mesh screens.

This proven state–of–the–art straining media is fabricated by wrapping vertical rods with wedge shaped profile wire. Each intersection of rod and wire is welded to produce an extremely rugged one–piece element. This forms a continuous slot that allows only two point contact with debris particles to reduce clogging.

The wedge shaped profile wire reduces the possibility of retaining debris smaller than the screen opening, which is the common cause of premature clogging or failure in other screen designs.

Advantages of Wedge Wire Straining Element

- Maximum effective flow and operating efficiency is maintained throughout service life.
- Maintenance costs reduced significantly due to reduced clogging or stapling of fibrous material.
- Long service life element reduces operating cost.
- Rigid element prevents flexing, which causes premature element failure.
- Efficient, effective solids collection at media/screen interface.

Strainer Element Selection

Straining Element Selection

The SAS Series Straining Element (Fig. 3) is an extremely rugged, single–piece unit available in a variety of standard and custom openings and materials.

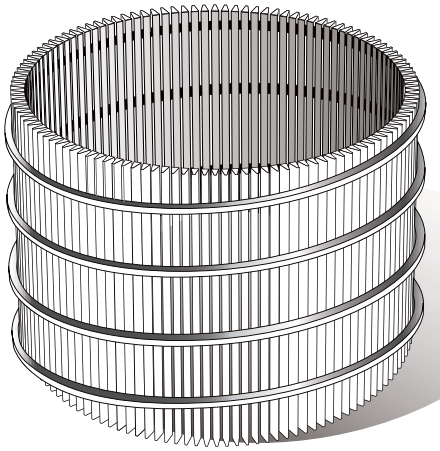

Figure3-Wedge Wire Straining Elements

Screen opening should be selected based on the required protection necessary, not the smallest opening available. By specifying a smaller opening than required, more solids will be retained, resulting in longer cleaning durations and increased backwash fluid loss. Smaller than necessary screen openings reduce screen area available and increase pressure loss.

Screen openings should be approximately a third (1/3) to half (1/2) of the largest sized particle allowed to enter downstream processes.

Example: A strainer protecting spray nozzles with a 1/16" orifice should be supplied with a 1/32" screen opening.

Straining Element Selection Guide

Standard					Custom			
Slot Opening (inches)	Fraction Equivalent inches (mm.)	Mesh Equivalent	Micron Equivalent	% Open Area	Slot Opening (inches)	Fraction Equivalent inches (mm.)	Mesh Equivalent	Micron Equivalent
0.015	1/64(0.4)	40	385	24	0.003	–(0.8)	200	75
0.031*	1/32(0.8)	20	795	40	0.006	–(0.15)	100	149
0.062*	1/16(1.6)	10	1590	51	0.010	–(0.25)	50	250
0.125*	1/8(3.2)	6	3205	67	0.020	–(0.5)	35	500
0.187	3/16(4.8)	4	4795	72	0.040	–(1.0)	18	1000
					0.156	5/32(4.0)	5	4000
					0.250	1/4(6.4)	3	6410

* Available from stock
Standard screen material is 304 Stainless Steel.
316 Stainless Steel, 316L Stainless Steel, Monel and other materials are available upon request.

MONARCH INDUSTRIAL PRODUCTS

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The Pressurized SAS Advantage

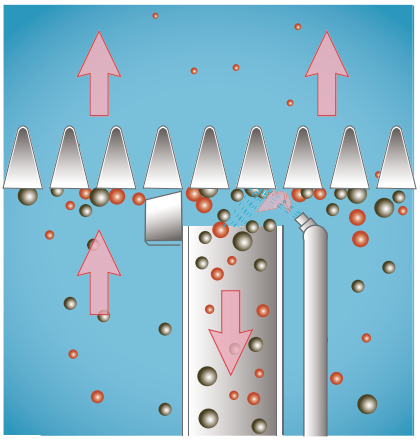
Pressurized SAS

The Pressurized SAS is a motorized, automatic self–cleaning strainer, very effective in system applications of low operating pressure (under 5 psig) or containing difficult to remove solids.
The SAS Series strainer provides unattended service with the addition of external backwash to enhance the self–cleaning attribute over other automatic strainers.

Figure 4: the Pressurized SAS innovative internals show ease of maintenance

Application:

The Pressurized SAS' s unique patented backwash system is compatible with a wide range of applications. It is suitable for low and high pressure processes, effectively removing coarse, fine and sticky contaminants.
In a low pressure mode (such as on the suction side of a pumping system), the Pressurized SAS system is mounted on the leading edge of the strainer backwash arm. External fluid is directed at an incident angle over the inside surface of the straining element through the high pressure nozzle assembly. The high velocity of this spray assists the cleaning of the straining element. External source backwash pressure must be a minimum of 30 psi over operating pressure.
Pressurized SAS strainers are used to protect equipment such as pumps, motors, heat exchangers or spray nozzles, as well as process applications such as cooling towers or virtually any similar application.
Pressurized SAS strainers are available in pipe sizes ranging from 1" to 36" according to customers' requirements.



Cross-Sectional View of Port/Straining Element During Backwash Cycle

The Unique Pressurized SAS Advantage

The external source of backwash fluid is introduced by opening the control valve (not shown) connecting the spray nozzles (A) at the leading edge (B) of the backwash assembly.
A "SAS," spray action occurs at the straining element inside surface (see insert) in addition to the flow reversal at the port/straining element interface.
Debris is effectively removed from the full–length of the straining element by a vigorous "Pressurized SAS" fluid flow into the hollow port; down the hollow drive shaft and out the backwash outlet.

SAS Series Self–Cleaning Strainer Typical Backwash Flow Requirement

Strainer Size	1",1–1/2" 2" or 3"	4"	6"	8"	10/12"	14/16"	18/20"	24"	30"	36"
Backwash Line Size	1–1/2"	1–1/2"	1–1/2"	1–1/2"	2"	3"	3"	4"	4"	6"
Backwash Flow in GPM (Gal. Per Minute)	8–12	15–20	30–40	60–75	110–150	170–210	250–310	400–490	550–700	750–900
External Backwash Source GPM	3–5	3–5	5–10	10–15	15–25	25–35	35–45	55–65	80–90	115–130
External Line Size	3/4"	3/4"	3/4"	1"	1"	1"	1–1/4"	1–1/2"	1–1/2"	2"

MONARCH INDUSTRIAL PRODUCTS

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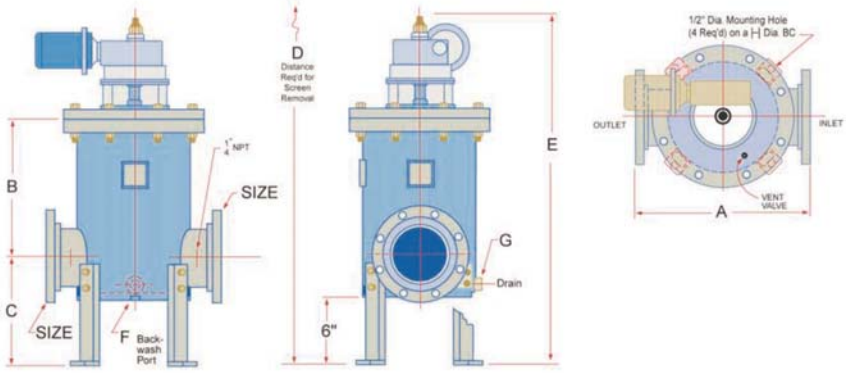
Specifications–Dimensions/Weight

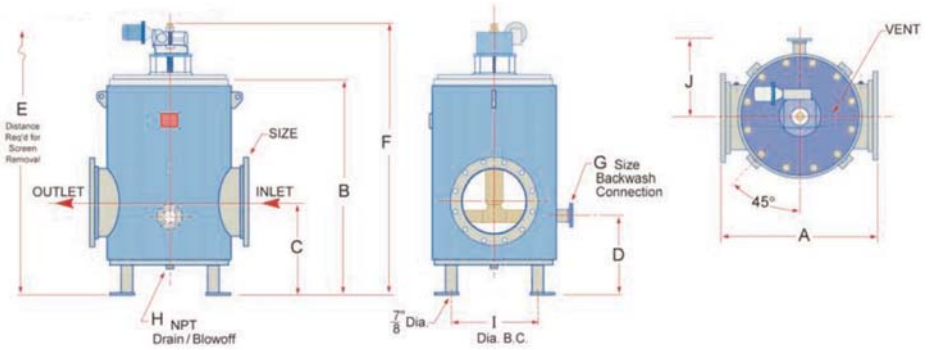
SAS 1"–10"Series



Model No.	Size (In.)	A (In.)	B (In.)	C (In.)	D (In.)	E (In.)	F (In.)	G (In.)	H (In.)	Approx. Dry	Wts. Wet	Lbs. Cov.	Motor H.P.
SAS–010	1–150	16–1/2	14–1/4	10	53	30–1/2	1 NPT	1 NPT	11–1/4	320	466	142	1/4
SAS–015	1 1/2–150	16–1/2	14–1/4	10	53	30–1/2	1 NPT	1 NPT	11–1/4	323	469	142	1/4
SAS–020	2–150	16–1/2	14–1/4	10	53	30–1/2	1 NPT	1 NPT	11–1/4	327	473	142	1/4
SAS–025	2 1/2–150	16–1/2	14–1/4	10	53	30–1/2	1 NPT	1 NPT	11–1/4	336	482	142	1/4
SAS–030	3–150	16–1/2	14–1/4	10	53	30–1/2	1 NPT	1 NPT	11–1/4	338	484	142	1/4
SAS–040	4–150	16–1/2	14–1/4	10	53	30–1/2	1 NPT	1 NPT	11–1/4	348	494	142	1/4
SAS–060	6–150	20	15–5/8	11	58–5/8	32	1–1/2NPT	1 NPT	15–1/2	511	700	176	1/4
SAS–080	8–150	28	18	16	74	41	1–1/2 NPT	1 NPT	20–3/4	797	1030	200	1/4
SAS–100	10–150	28	18	16	74	41	1–1/2 NPT	1 NPT	20–3/4	830	1060	200	1/4

THREADED (NPT) INLET/OUTLET CONNECTIONS AVAILABLE

SAS 10"–20"Series



Model No.	Size (In.)	A (In.)	B (In.)	C (In.)	D (In.)	E (In.)	F (In.)	G (In.)	H (In.)	I (In.)	J (In.)	Approx. Dry	Wts. Wet	Lbs. Cov.	Motor H.P.
SAS–100	10–150	36	43	17 1/2	14 1/2	75	58 1/2	2 NPT	1/2NPT	26	14 3/4	1450	2100	290	1/4
SAS–120	12–150	36	43	17 1/2	14 1/2	75	58 1/2	2 NPT	1/2NPT	26	14 3/4–	1520	2175	290	1/4
SAS–140	14–150	44	51 1/2	19 1/2	15 1/2	94	69	3–150	1/2NPT	32	21 3/4	2375	3650	460	1/4
SAS–160	16–150	44	51 1/2	19 1/2	15 1/2	94	69	3–150	1/2NPT	32	21 3/4	2450	3725	460	1/4
SAS–180	18–150	48	66	24	21	113	87	3–150	2 NPT	38	25 1/4	3290	5535	580	1/4
SAS–200	20–150	48	66	24	21	113	87	3–150	2 NPT	38	25 1/4	3375	5625	580	1/4

DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE. APPLY FOR CERTIFIED DRAWINGS

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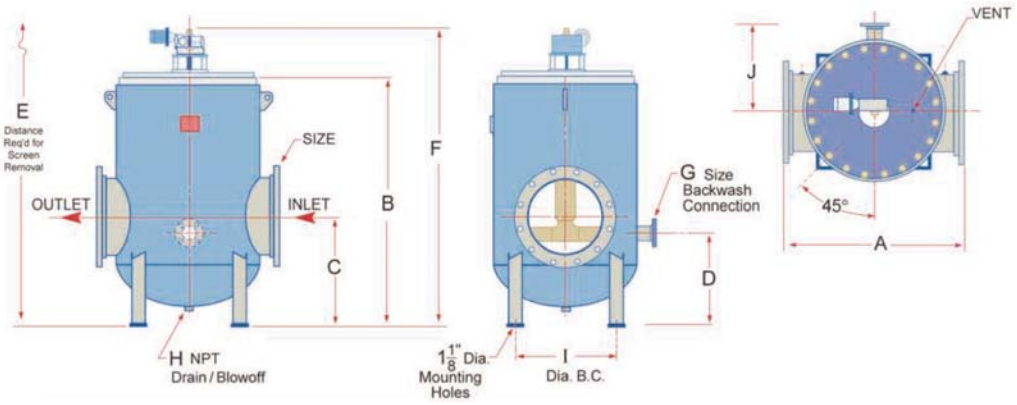
Specifications– Dimensions/Weight

SAS 24"–36"Series



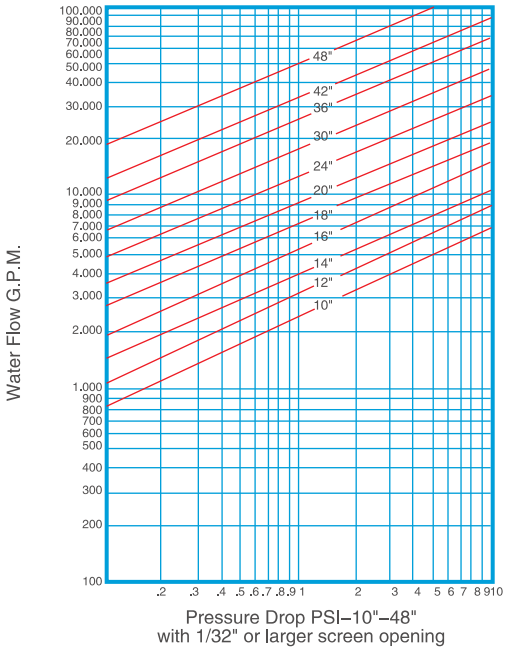
Model No.	Size (In.)	A (In.)	B (In.)	C (In.)	D (In.)	E (In.)	F (In.)	G (In.)	H (In.)	I (In.)	J (In.)	Approx. Dry	Wts. Wet	Lbs. Cov.	Motor H.P.
SAS–240	24–150	56	77	33	28	122	98	4–150	2NPT	44	28	4,375	8,350	610	1/3
SAS–300	30–150	66	94	39	34	150	115	4–150	2NPT	54	33	6,525	13,625	1,125	1/3
SAS–360	36–150	86	158–5/8	47–5/8	40–5/8	210	130	6–150	2NPT	72	43	12,050	26,975	1,490	1/2

LARGER SIZES AVAILABLE UPON REQUEST

DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE. APPLY FOR CERTIFIED DRAWINGS

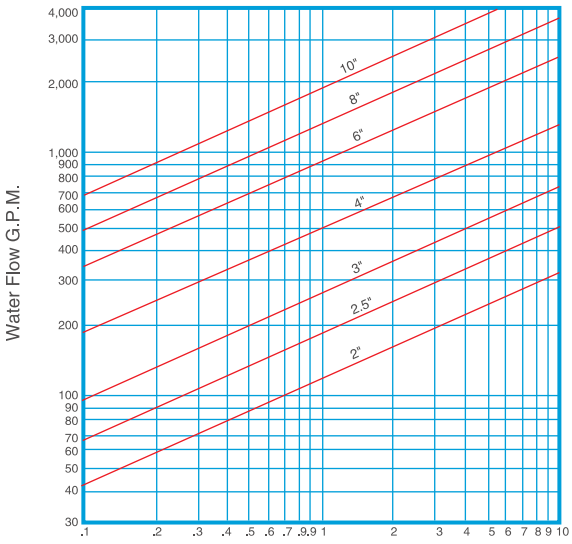
Specifications – Pressure Drop Charts

10"–36"Series



Pressure Drop PSI–10"–48"
with 1/32" or larger screen opening

1"–10"Series



Pressure Drop PSI–2"–10"
with 1/32" or larger screen opening

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Specifications and Options

General Specifications

The SAS Series Strainer (Fig. 4) is a motorized, self cleaning candle type. The body and cover can be designed, fabricated and tested to ASME Sec. VIII Standards, with qualified ASME Sec. IX welders or CE,GB codes Housings are available at a design pressure of 150 psig, with flanged inlet and outlets according to ANSI B16.5 standards. Each set of candle have a single backwash connection/large drain connection at the vessel bottom. For high flowrate,extended candle or dual open candle can be used .

All internal parts can be made uses corrosion resistant steel,super duplex candle,SS316L,SS304,Hastelloy etc.

The wide (flat cross section) area of wedge wire faces the flow direction, providing a smooth, flat continuous surface to trap contaminants. Straining media do not have pockets, tubes, etc that may accumulate dirt. SAS Strainer are provided with a drive shaft and hollow port assembly with all necessary bearings and seals.

The drive arm and hollow port assembly will be free running at a maximum speed of 10 rpm and not contact with screen surface. Port assembly shall be factory and field adjustable for positive effective cleaning and shear capability. Note: Sizes 1" thru 20" have (1) backwash hollow port. Sizes 24" and up will have (2) backwash hollow ports. Drive shaft will be supported at the top with roller bearings located in a double reduction gear reducer and at the bottom with a water lubricated guide bearing.

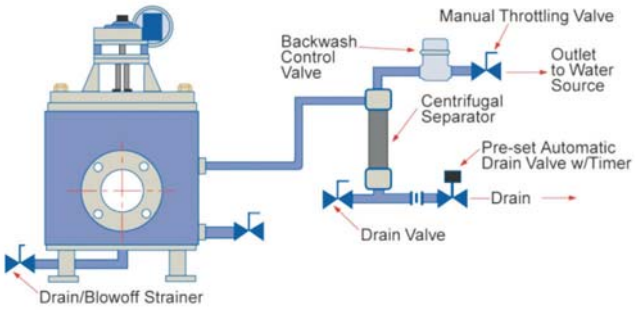

Fig. 5 – Series 24”–36”–Water Saver Package

Strainer Options Available

Cover Lift Assemblies–	Recommended for remote locations.
Design Code –	ASME / CE / GB / DOSH etc.
Materials of Construction–	Consult our engineers for stainless steel, CS,SS304,SS316L copper, monel super duplex or other requirements.
Control Package –	Control Panel with Nema 4 Enclosure, Backwash Valve with Electric Operator, Single Element Differential Pressure Switch.
Design –	Consult our engineers for high pressure applications.
Hyper–Jet–	Low Pressure and Special Application.
Skid Packages –	All equipment desired, including strainers, valves, controls, wiring, piping and skids may be combined as a complete, custom package. Size of the project has no limitation.
Water Saver Package –	The Water Saver Package (Fig. 5) can be used on most applications where the strained liquid is scarce or valuable. The strainer backwash fluid is directed to a centrifugal separator where only a fraction of the strainer backwash is discharged to waste. The separator backwash can be manually operated and/or automated with a pre–set timer controlled valve.

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Sequence Controller

Design and Construction

The sequence controller is designed with the customers' specific requirements in mind.The Sequence Controller provides an automatic, effective backwashing cycle with a minimum loss of water.

The Sequence Controllers are constructed with state–of–the–art industrial type components which permits replacing individual components without having to replace an entire circuit board. The industrial type components are more durable and reliable and adjustments can be made with ease.

Standard Features

- Enclosure – Nema 4
- Adjustable Cycle Timer
- Off–delay Timer
- Motor Starters with Auxiliary contact and overload relay
- Selector Switch
- Indicating Lights
- Fuses
- Terminal Block

Modes of Operation

There are basically two modes of operation – intermittent and continuous. By turning the selector switch, the mode of operation can be selected.

Automatic Intermittent Operation

In automatic operation, the backwash valve opens as determined by the adjustable cycle timer or through a differential pressure switch.

The differential pressure switch is factory set at for clean pressure drop applications . Accordingly in the event of a high differential pressure before the cycle timing is reached, the differential pressure switch overrides to commence backwashing until an operational differential pressure is reached. Backwashing will continue for a further 60 seconds after reaching the required pressure.

As the SAS Strainer starts a backwash cycle based on the adjustable timer sequence selected, timing sequences should be determined based on installation and process conditions. Cycle timers can be adjusted as required by the process conditions.

Codes/ Standards

The sequence controller is manufactured according to UL listings, with CSA approval, JIC & NEMA standards etc.

Continuous Operation

In the continuous mode, the Automatic SAS Strainer continuously backwash with an open backwash valve and a running drive motor. This operation mode is required for processes with high solid content.

In both operation modes, the backwash assembly is specifically designed to rotate at 10 RPM maximum, providing effective backwashing in a shorter duration, with lesser fluid loss.

Standard Control Package

The Sequence Controller Control Package consists of:

- Control Panel with Nema 4 Enclosure
- Backwash Valve with Electric Operator
- Single Element Differential Pressure Switch

Options

- 230V, 380V, 460V, 575V
- 50 or 60 hertz
- Dual Element Differential Pressure Switch
- Nema 4X (Fiberglass or Stainless Steel), Nema 7 or 9 (Explosion Proof), Nema 12, Nema 3 Enclosures
- Circuit Breakers, Disconnect Switch, Transformer
- Reset Buttons
- Alarms
- PLC Interface and/or Pump Interlock
- Extra Contact and Relays
- Backwash valve can be supplied with Pneumatic Operator
- Backwash Valve available in numerous materials
- Differential Pressure Switches available with Mercury, Snap Action, Diaphragm or piston contacts.