

SPIN CLEAN FILTERS



World Leader in Irrigation Technology



"I like Jain Spin Clean Filters
because of the simplicity,
service, and reliability."

Steven Emmert, Madera, CA
Almond, Grape, and Pistachio Grower





Spin Clean Filters Product Features

- No moving parts
- Unique Spin Clean action keeps the screen clean during operation
- All welded steel housing with 3M Scotchkote fusion bond epoxy coating and SS threaded outlets
- Bonded three layer stainless steel screen with a choice of five different filtration mesh sizes
- No backwashing down time
- Easy screen accessibility
- 150 PSI maximum operating pressure
- Only 5 to 8 PSI pressure loss (4 to 6.5 PSI for 4E-6HF) required across filter to ensure self cleaning action
- Includes 3-way valve kit, liquid-filled pressure gauge, air vent and brass ball valve for basin
- Optional Continuous or Automatic Purge Kit available for heavy loads or automatic purge operation

The JAIN Spin Clean Filter is a unique screen filter that stays clean during operation. It effectively keeps debris moving across the screen towards the basin, where it is collected and can be drained to atmosphere.

The 4E Spin Clean Filter is best suited for applications where the contaminants are heavy particles like sand, commonly found in well water.



The JAIN 4E Filter differs significantly from other standard screen filters because of a key component: The Spin Plate. This circular plate fits at the top of the screen and has multiple nozzle holes at an angle. The angle and size of the nozzles cause the incoming water to jet through into the filter screen, spinning and sweeping the particles around and down the inside. The spin plate itself does not spin. The angle of the nozzles is optimized for handling heavy particles like sand, or light loads of algae and organic matter. For moderate to heavier loads of algae and/or organics, the use of a Jain Disc or Media Filter is recommended.

The effect of the spin plate is that contaminant particles are not allowed to stick in the mesh openings of the screen, but are continuously moved around and down the screen surface into the basin. The basin collects the particles just below the bottom of the screen. The basin can be flushed periodically during operation to discharge the collected debris or, with more contaminated water, the basin valve can be partially opened during system operation. By opening this valve, a small amount of water can discharge through a hose and remove debris from the basin continuously. By not allowing the contaminants to settle on the screen and by flushing them away through the basin drain valve, the maintenance interval (the time period between filter disassembly for screen cleaning) can be greatly extended.

By comparison, standard screen filters collect contaminants on the screen surface until most or all of the available mesh openings are filled. The operator will notice that the system pressure starts to fall as the screen becomes clogged with debris. The system must be shut down, the cap or basin removed from the end of the filter and the screen removed and cleaned.

Spin Clean Filters have a longer maintenance interval than standard screen filters. It is not unusual for a Spin Clean Filter to run months without disassembly for cleaning, whereas a standard screen filter might need this cleaning every other day or weekly.

Key Operating Requirements for 4E Filters

To power the spin plate nozzles to ensure cleaning, a certain amount of additional pressure must be applied to the filter.

The difference in pressure from inlet to outlet under normal operation conditions is 5 to 8 PSI (4 to 6.5 PSI for 4E-6HF). Example: If 50 PSI is the inlet pressure, the outlet pressure must be from 42 to 45 PSI (or 43.5 to 46 PSI for 4E-6HF).

It is critical to maintain this operating pressure differential to achieve the longest maintenance interval. Furnished with each filter is a pressure gauge with 3-way valve kit to enable checking the inlet pressure against the outlet pressure with just the turn of a valve.

Some applications will have a system flow rate below the optimum flow range of the filter. For this reason, Flow Plugs or Flow Inserts are provided with each filter so they may be installed as necessary in the spin plates to maintain the correct pressure drop and nozzle velocity at reduced flow rates.

4E Spin Clean Filter: Construction and Components

Characteristic	4E	Comments
Housing Material	Mild steel pipe with 3M Scotchkote fusion bond epoxy coating	Internal 3M Scotchkote helps protect steel pipe from the harsh effects of corrosion
Screens Available	30, 50, 100, 150, 200 mesh	See Basic Square Weave Screening Information
Screen Construction	304 stainless steel perforated outer cylinder, sintered with 316L stainless steel middle and inner mesh wire screen	316L is extremely resistant to corrosion and extends the life of thin wire mesh. Sintered construction is a fusion bonding process making the entire element an integrated unit for strength and durability.
Flow Plugs and Flow Inserts	2 Flow Plugs with each filter	A Flow Plug is solid and plugs off each nozzle. A Flow Insert is hollow, reducing the flow from each nozzle.
Pressure Gauge	One pressure gauge and 3-way valve assembly on each filter	Moving the lever on the 3-way valve allows reading inlet and outlet pressure with the same gauge for accuracy.
Air Vents	Either 1" or 2" APV Air/Vacuum relief valve with each filter	Because the filter is generally a high point in the system, an air vent is needed to eliminate as much air as possible during startup.
Purge	Manual 1" or 2" Purge Ball Valve supplied with every filter. Optional automatic or continuous purge options are available	The Manual 1" or 2" Purge Ball Valve is suitable for most applications. However in remote locations, or water with medium to high levels of silt or organics, the optional automatic or continuous purge option is recommended.

4E Spin Clean Filters: Models and Specifications

Type	Inlet/Outlet Size (in)	Maximum Flow Rate (gpm)	Maximum Working Pressure (PSI)	Screen Mesh Size* (openings/in)	Inlet/Outlet Type	Drain Basin Retention
4E-02	2	103	150	30, 50, 100, 150, 200	Flanged or Grooved	T-Handle
4E-03	3	210	150	30, 50, 100, 150, 200	Flanged or Grooved	T-Handle
4E-04	4	365	150	30, 50, 100, 150, 200	Flanged or Grooved	T-Handle
4E-06	6	550	150	30, 50, 100, 150, 200	Flanged or Grooved	T-Handle
4E-6HF	6	1000	150	30, 50, 100, 150, 200	Flanged	Flange w/ Hex Nuts
4E-08	8	1300	150	30, 50, 100, 150, 200	Flanged	Flange w/ Hex Nuts
4E-10	10	2200	150	30, 50, 100, 150, 200	Flanged	Flange w/ Hex Nuts
4E-12	12	2800	150	30, 50, 100, 150, 200	Flanged	Flange w/ Hex Nuts

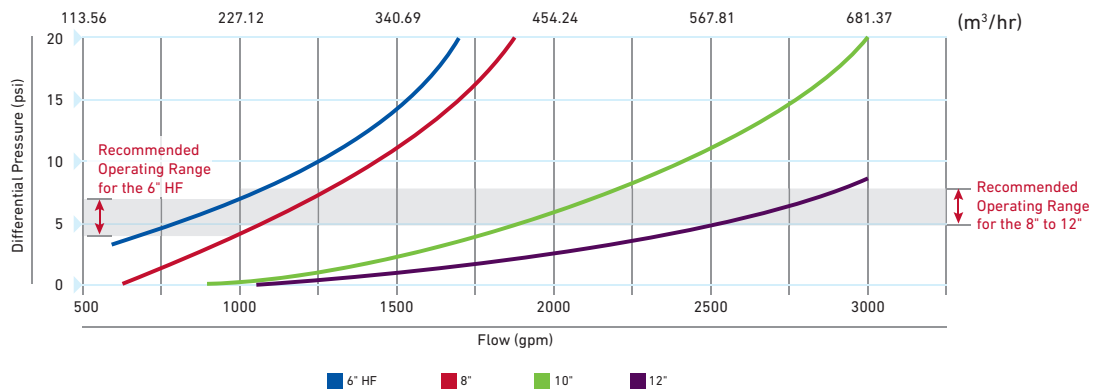
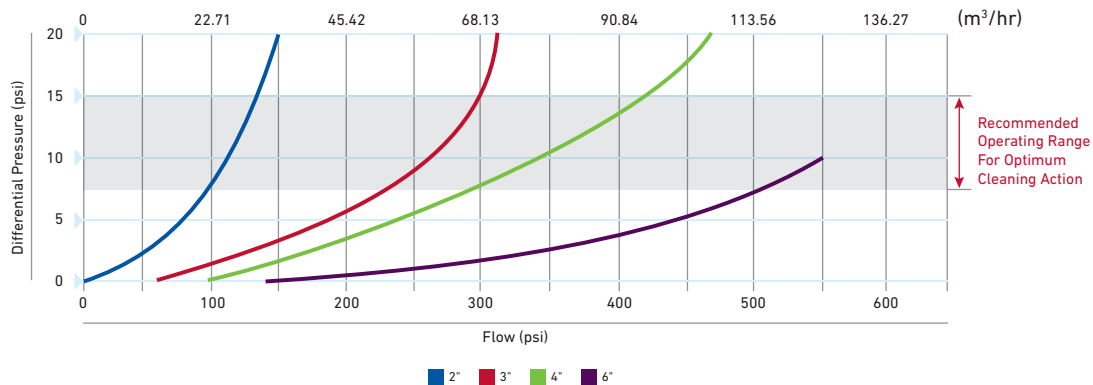
Ordering Information Outlet Type / Connection (f = flanged) / screen mesh

Examples

4E-02-200	2" Grooved 4E Steel Filter with 200 mesh screen
4E-6HF-100F	6" Flanged High Flow 4E Steel Filter with 100 mesh screen
4E-10-30F	10" Flanged 4E Steel Filter with 30 mesh screen

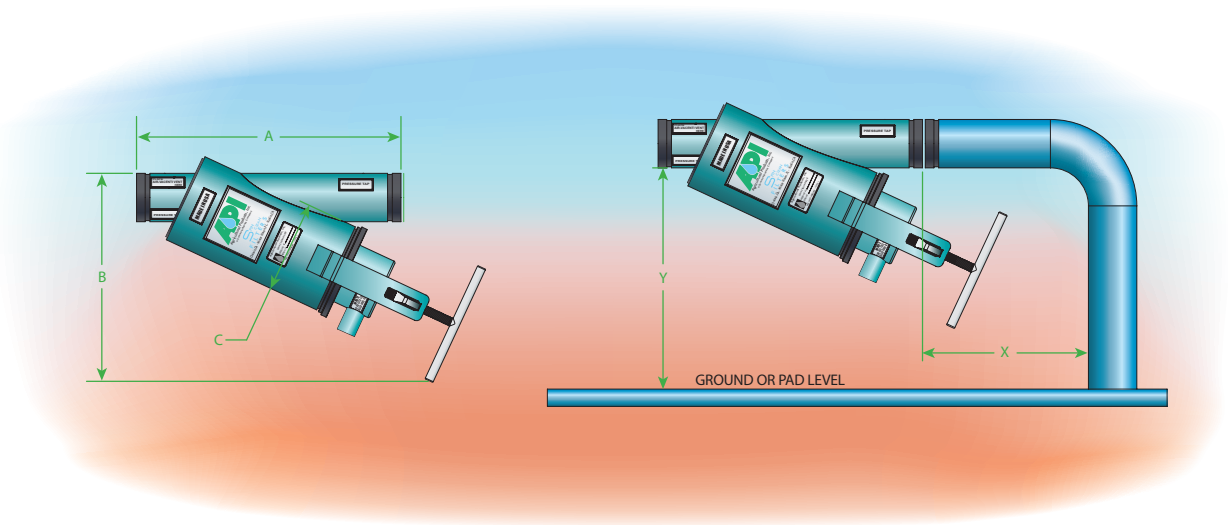
* 80 and 120 Mesh Screens Available on Request

4E Filter Performance Flow Characteristics



FLOW RANGE (m³/hr)				
Filter Size	Fully Open Spin Plate (gpm)	1 Hole Plugged (gpm)	2 Holes Plugged (gpm)	3 Holes Plugged (gpm)
2"	84 to 103 (19 to 23)	72 to 90 (16 to 20)	60 to 75 (13 to 17)	47 to 57 (10 to 12)
3"	170 to 210 (38 to 47)	148 to 180 (33 to 40)	113 to 145 (25 to 32)	87 to 107 (19 to 24)
4"	284 to 365 (64 to 82)	228 to 290 (51 to 65)	182 to 232 (41 to 52)	130 to 163 (29 to 37)
6"	470 to 550 (106 to 124)	412 to 481 (93 to 109)	344 to 412 (78 to 93)	296 to 344 (67 to 78)
6" HF	720 to 1000 (163 to 227)	600 to 790 (136 to 179)	480 to 630 (109 to 143)	360 to 475 (81 to 107)
8"	1050 to 1300 (238 to 295)	900 to 1100 (204 to 249)	825 to 950 (187 to 215)	625 to 700 (141 to 158)
10"	1800 to 2200 (408 to 499)	1500 to 1850 (340 to 420)	1250 to 1550 (283 to 352)	1050 to 1300 (238 to 295)
12"	2300 to 2800 (522 to 635)	2000 to 2400 (454 to 545)	1700 to 2100 (386 to 476)	1450 to 1750 (329 to 397)

Dimensions, Weights and Clearance



DIMENSIONS				WEIGHT (lbs)		MINIMUM CLEARANCE	
Type	A	B	C	Flanged	Grooved	X	Y
4E-2	19 1/8" (48.6 cm)	16" (40.6 cm)	6 5/8" (16.8 cm)	48	38	12" (30.5 cm)	16" (40.6 cm)
4E-3	19 1/8" (48.6 cm)	17" (43.2 cm)	6 5/8" (16.8 cm)	53	43	12" (30.5 cm)	16" (40.6 cm)
4E-4	22 3/4" (57.8 cm)	19" (48.3 cm)	6 5/8" (16.8 cm)	75	50	14" (35.6 cm)	16" (40.6 cm)
4E-6	29 1/2" (74.9 cm)	22" (55.9 cm)	8 5/8" (21.9 cm)	122	98	15" (38.1 cm)	20" (50.8 cm)
4E-6HF	40" (101.6 cm)	27" (68.6 cm)	12 3/4" (32.4 cm)	300	n/a	22" (55.9 cm)	26" (66.0 cm)
4E-8	44" (111.8 cm)	29" (73.7 cm)	12 3/4" (32.4 cm)	330	n/a	17" (43.2 cm)	38" (96.5 cm)
4E-10	58" (147.3 cm)	42" (106.7 cm)	18" (45.7 cm)	545	n/a	19" (48.3 cm)	39" (99.1 cm)
4E-12	63" (160.0 cm)	46" (116.8 cm)	18" (45.7 cm)	640	n/a	21" (53.3 cm)	40" (101.6 cm)

4E Filter Performance Flow Characteristics

INSTALLATION

The Spin Clean Filter should be installed with the inlet-outlet horizontal, the screen chamber hanging down and the flush valve at the bottom. In all cases the flush valve must be located at the low point. Refer to the chart for Minimum Clearances required for screen removal.

The filter should be supported independently of the inlet and outlet piping. The combined weight of the filter and water must be taken into consideration when building supports for the filter and related piping.

The Spin Clean Filter is designed to stay clean while operating and it is important that debris is removed continuously from the debris basin. A hose (or other piping) should be connected to the flush valve for disposal away from the immediate location.

Install the provided Jain Air Vent (APV-1" or 2") into filter housing and 3-way pressure gauge assembly. A Jain pressure relief valve should be installed between the pump and filter to prevent over pressurization of the screen which could cause it to rupture. Some pumps can produce very high static pressures and if the filter screen becomes occluded, a pressure differential across the dirty screen will occur.

If the pressure differential is above 90 PSI, this will cause the screen to expand and shorten, allowing dirty water to bypass. To prevent this from occurring, a high-pressure switch—or a high differential pressure switch that will shut off the pump—should be installed.



OPERATION

Incoming unfiltered water from the inlet is forced through the nozzles of a stationary spin plate at the top of the filter screen. These nozzles blast water across the inside screen surface, continuously sweeping the screen clean, spinning debris toward the basin where it is collected.

Each filter model is designed to self-clean over a flow range corresponding to pressure differentials between the inlet and outlet of the filter from 5 to 8 PSI (4 to 6.5 PSI for 4E-6HF model). As long as the flow through the filter is sufficient to produce these pressure differentials, a strong self-cleaning action will be maintained. These flow ranges are shown for each filter model in the Flow Range charts.

These pressure differentials are critical for the filter to run long periods without maintenance. Operating the filter at less than the minimum pressure differential will reduce the cleaning action, resulting in more frequent screen clogging and disassembly to remove and clean the screen.

4E Spin Clean filters usually require only periodic flushing of contaminants from the drain basin. With higher loading of contaminants like sand it may be necessary to flush more frequently or on a continuous basis with a low flow of water.

For moderate to high concentrations of algae and organic matter, a continuous flushing with a low flow rate to reduce the concentration of organic contaminants within the basin and screen area is required. Approximately 1% of the total flow through the filter is an adequate continuous flush flow from the basin drain valve.

For very high loadings of sand, installing Spin Plate with Sand Guard is recommended, to protect the screen from excessive wear.

Operating With Flow Rates Lower Than Required Minimum

If it is known that the Spin Clean Filter will be operating at lower flow rates than required, or if it is discovered that the flow rate of a system is insufficient to give the filter the minimum pressure differential required, modification to the spin plate is required to assure full self cleaning action.

For 4E Filters, up to three plugs can be installed into the spin plate nozzle holes as required, according to the flow range required. These plugs should be evenly distributed rather than all used on the same side of the spin plate. The Flow Range chart showing the flow rates corresponding to the number of plugs installed should be used as a guide.

Models 4E-2, 3, 4 and 6 use a solid vinyl plug that can be solvent welded into the rigid PVC spin plate using PVC cement for welding flexible PVC to rigid PVC (such as IPS Weld-On #2795). These plugs should be installed all the way into the nozzle holes, trimming off any of the plug that protrudes above the surface of the spin plate.

Models 4E-6HF through 4E-12, use molded rubber plugs which simply press fit into the nozzle openings in the aluminum spin plate.



4E Spin Plates
(4" Pictured 13180072)



Spin Plates with Sand Guard
(10" Pictured 13180015)



Flow Plug for 4E Filters
(6" Pictured 13180087)



4E Spin Plates
(12" Pictured 13180027)

4E Filter Performance Flow Characteristics

MAINTENANCE

Care should be taken to keep the operating pressure differential across the filter between 5 to 8 PSI (4 to 6.5 PSI for 4E-6HF). Pressure reading should be monitored sufficiently to detect any build up of pressure differential during normal operation, which indicates the start of filter screen plugging. When this occurs, the system should be shut down, the filter drained and disassembled. The screen should be washed thoroughly using a high pressure spray washer, spraying from outside in.



Several steps can be taken to extend the maintenance interval:

1. Start with a thoroughly clean screen element. Rinsing with garden hose pressure IS NOT adequate to clean a fine mesh screen. Use a pressure washer
2. Make sure the filter never runs with less than a 5 PSI differential (4 PSI for 4E-6HF)
3. Use Flow Plugs or Flow Inserts to boost operating differential to 8 PSI if not already achieved, to further increase cleaning action
4. Increase flush flow rate for continuous flushing filters
5. Pre-screen heavy organic/aquatic loads with a coarse screen filter at the pump inlet for surface water installations
6. Open flush valve fully on start-up to prevent sudden loading from a surge of contaminants

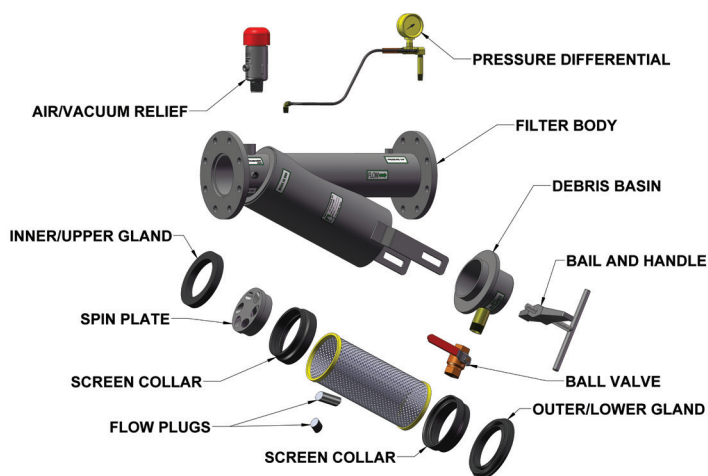
4E Steel Filter Screen Dimensions

Size	Diameter		Length		Length w/ Collars	
	in	cm	in	cm	in	cm
2" & 3"	5 3/8"	13.65	9 1/4"	23.50	N/A	N/A
4"	5 3/8"	13.65	12"	30.48	N/A	N/A
6"	6 3/8"	16.19	16 5/8"	42.39	N/A	N/A
6"-HF	9 3/8"	23.81	19"	48.26	21 1/2"	54.61
8"	9 3/8"	23.81	25 15/16"	65.88	28 1/2"	72.39
10"	14 1/2"	36.83	28 15/16"	73.50	31 9/16"	80.17
12"	14 1/2"	36.83	36 3/16"	91.92	38 7/8"	98.74

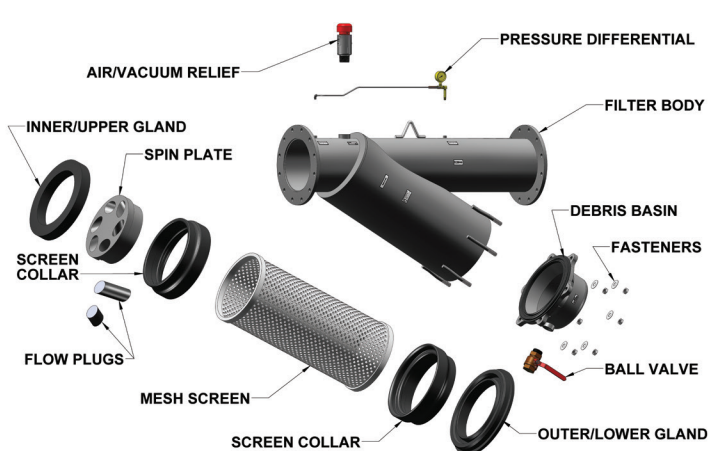
Basic Square Weave Screening Information

Color Coded Ends	Tyler Mesh	Micronic Rating	Aperture	Opening Percentage	Wire Diameter
Orange	30	540	0.021"	40.8	0.012
Yellow	50	380	0.011"	30.0	0.009
Blue	100	140	0.0055"	30.2	0.0045
Black	150	104	0.0041"	37.4	0.0026
Red	200	74	0.0029"	33.6	0.0021

4E Flanged and Grooved 2"-6"



4E Flanged 6" HF-12"





Jain is a fully integrated global food / plant production company recognized by Harvard Business to be one of five global sustainability champions, the G-20 for lifting people out of poverty, and Fortune magazine for being a "Change the World Company." Our irrigation manufacturing capabilities include everything from behind the pump to the flush valve at the end of the lateral and everything in between. We lead the industry in manufacturing technology, owning both our extrusion and mold manufacturing equipment providers.

Jain leads plant science research globally across a variety of food crops and is staffed with some of the world's leading research scientists. With the Gandhi Library, Jain now houses the leading collection of the world's best plant science knowledge in a single facility. Our agronomic knowledge is integrated from our world class plant tissue culture operations through our food processing businesses. We research, educate, advance, manufacture, finance, propagate plants, and purchase produce for processing all in an effort to fulfill the Jain mission:

Jain Irrigation, Inc.

www.jainsusa.com

Jain Customer Service

Phone: (559) 485-7171

Fax: (800) 777-6162

Western Manufacturing Facility

2851 E. Florence Ave.

Fresno, CA 93721

Southeastern Manufacturing Facility

3777 East State Road 544

Haines City, FL 33845

Northeastern Manufacturing Facility

740 Water St.

Watertown, NY 13601

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