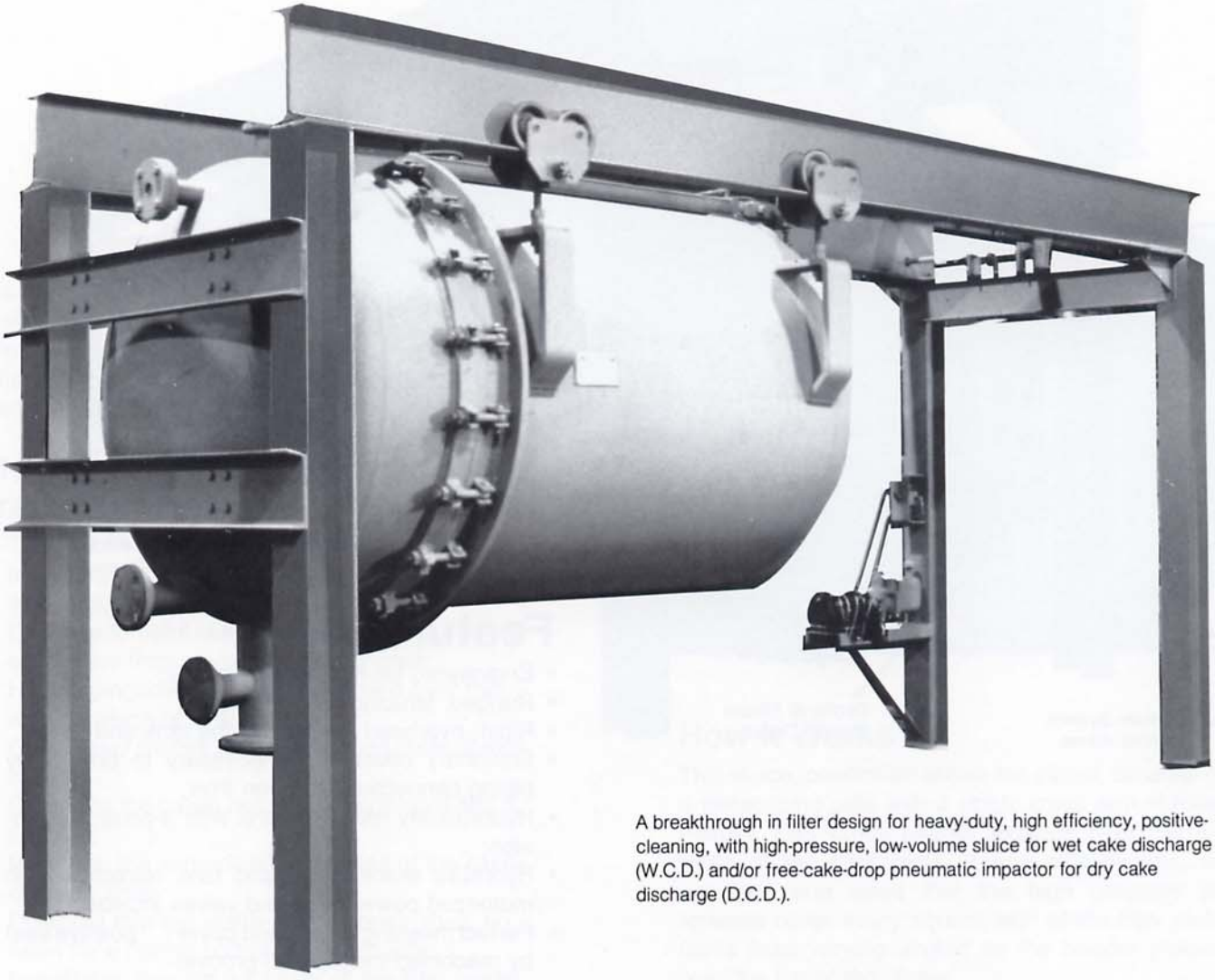
Sparkler

MCRO



A breakthrough in filter design for heavy-duty, high efficiency, positive-cleaning, with high-pressure, low-volume sluice for wet cake discharge (W.C.D.) and/or free-cake-drop pneumatic impactor for dry cake discharge (D.C.D.).

Vertical Plate Self-Cleaning Filter with Horizontal Retractable Tank

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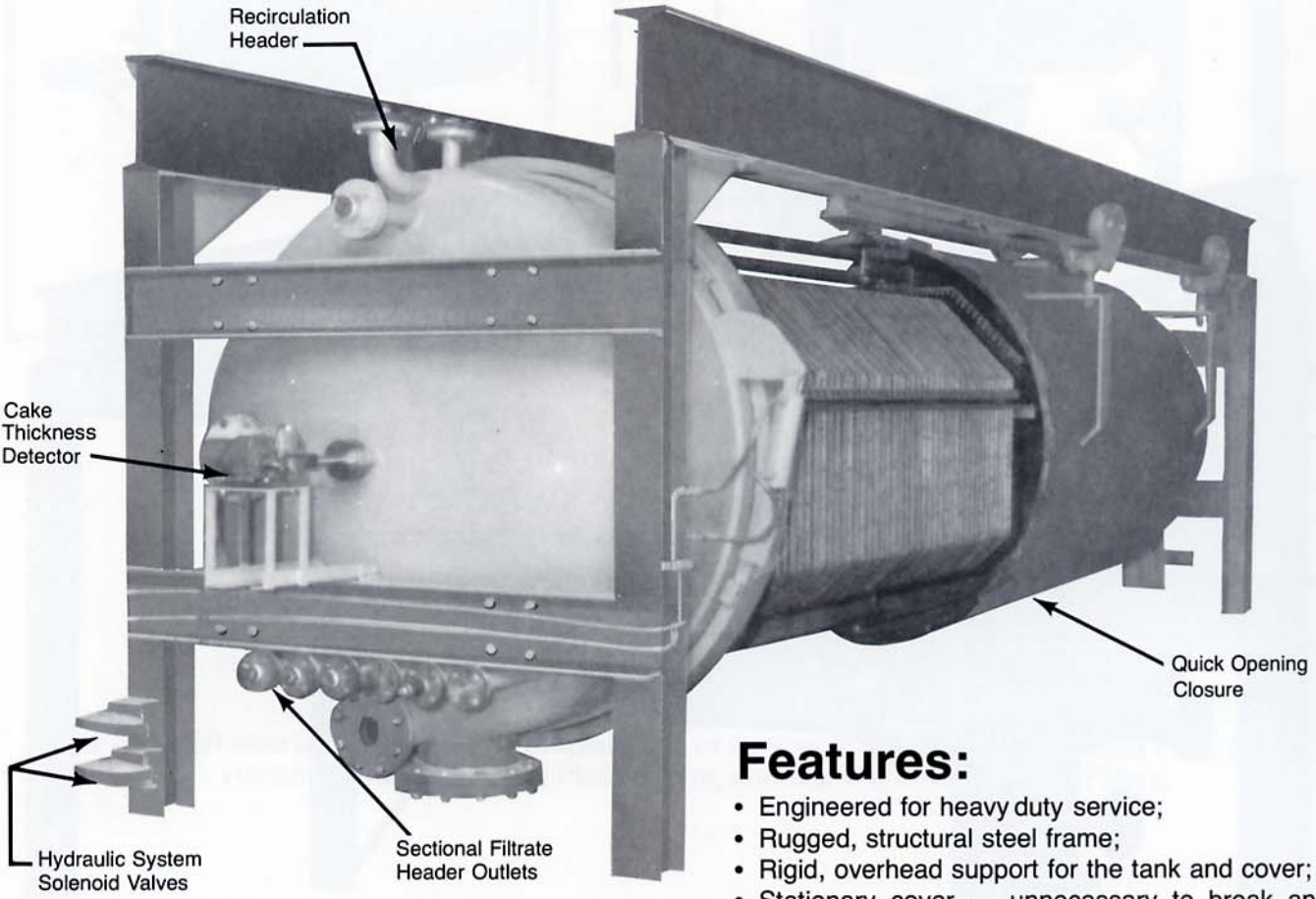
Sparkler MCRO Filters

The Sparkler MCRO Filter has a revolutionary design which emphasizes simplicity, efficiency, economy, and minimum maintenance.

Overhead Suspension Design

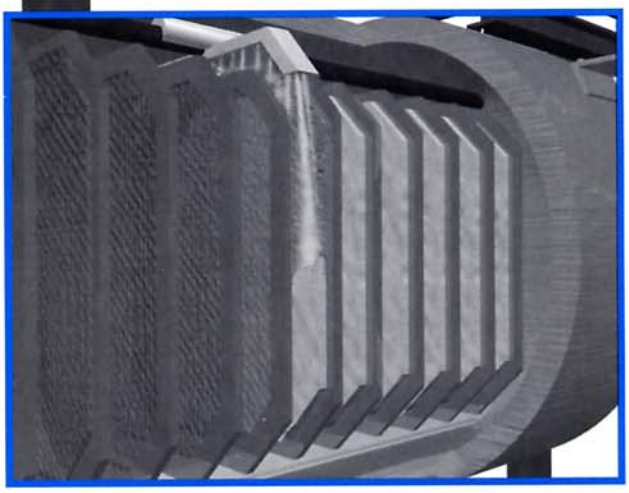
Ease of Maintenance . . . The internal parts of the filter are exposed when the filter tank shell is hydraulically retracted.



Features:

- Engineered for heavy duty service;
- Rugged, structural steel frame;
- Rigid, overhead support for the tank and cover;
- Stationary cover — unnecessary to break any piping connections to open filter;
- Hydraulically retracted tank with 4-point suspension;
- Hydraulic sluice travel and tank retraction with motorized power pack and valves included;
- Perfect meshing of tank and cover . . . positive seal by machined tongue and groove;
- No cake disturbance in opening . . . plates remain stationary, tank only is retracted;
- Internal self-sluicing with filter closed;
- Dry cake removal either by retracting tank or optional internal conveyor screw;
- Simple to completely automate;
- Capacity of 10 to 2,000 sq. ft. filter area;
- Tank diameters to 72″;
- Heavy duty filter plate design assures highest flow rates with lowest pressure drop.

Wet Cake Discharge (W.C.D.)



Concentrated Sluice Volume Results in Disintegration of Cake for Removal. Thick or thin...sticky or brittle...fibrous or friable...makes no difference to the Sparkler high pressure sluice mechanism.

The Sparkler Automatic Transplate Sluice:

- The sluice travels the length of the tank, concentrating the full force of the sluice on each plate as it passes;
- Directs a forceful sluice of liquid to the surface of each plate from several angles at once;
- High impingement sluicing is applied over the entire surface of every plate;
- Completely sluices the stickiest and most fibrous cakes;
- Dislodges the cakes both by impingement and by flushing;
- Removes the immediately disposes of the cakes one at a time;
- Does not drip the entire cake at once, thus, no need for a trough bottom or trough jets;
- Penetrates through the pores of the filter media (wire or fabric cloth) and prevents "blinding";
- Completely washes out the interior of the filter tank;
- Uses a minimum amount of sluice liquid;
- Cleans rapidly . . .4 ft./min. travel;
- Simple to automate;
- Sluice rate of travel and velocity can be adjusted by fingertip controls.

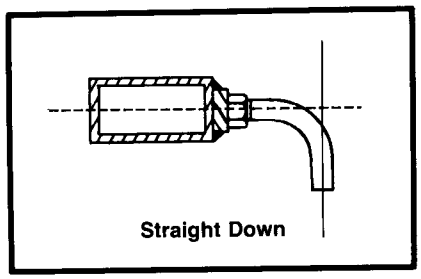
How It Works

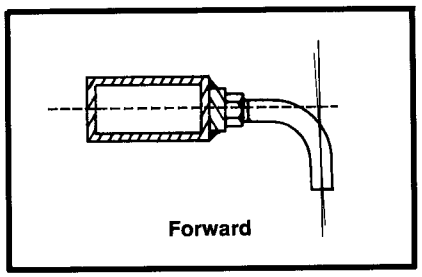
This sluice, positioned above the plates, consists of a telescoping pipe with a single cross arm sluicing header. This cross header extends over the full width of the filter plate. It has multiple jets, so arranged and sized that the high pressure jet streams cover every square inch of the filter plate faces from varying angles as the header passes over the top of the plates.

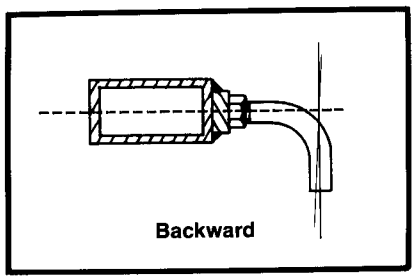
During the filtering cycle, this header is retracted to the front of the horizontal filter tank. At the end of the filter cycle, the tank is drained in the closed position; approximately 150 psig pressure is applied to the sluice mechanism and the pipe is extended all the way to the back of the tank and then fully retraced again (one complete cycle) at the rate of 4 ft./min.

Wet Cake Discharge (W.C.D.)

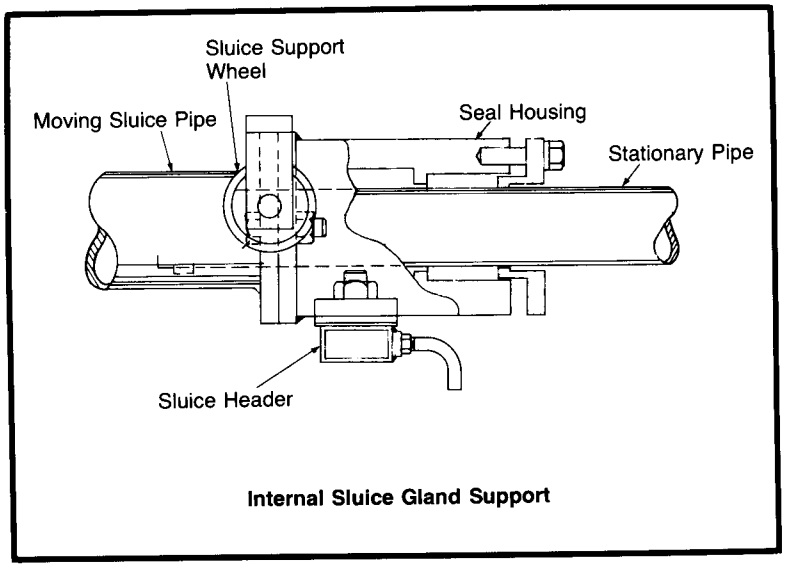
Sparkler's Unique Spray Jets



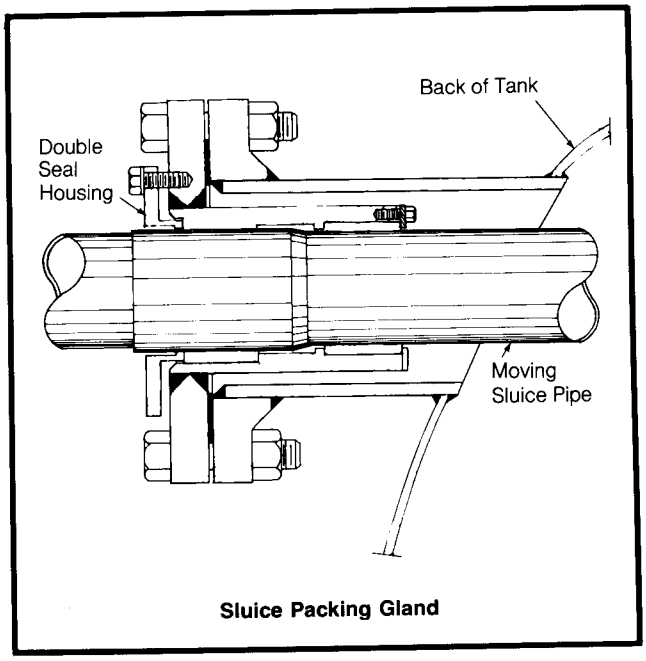




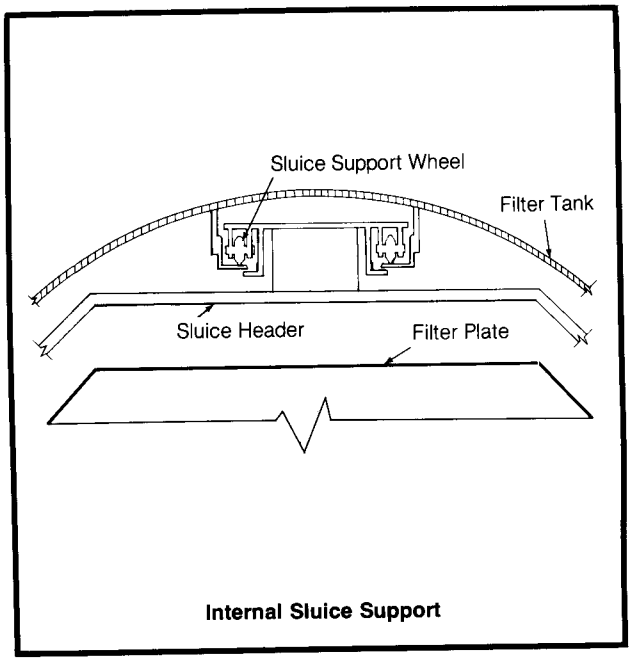
Spray header jets have three different angle orientations for full coverage to split the filter cake in half and wash filtrate manifold and tank bottom.



Internal Sluice Gland Support

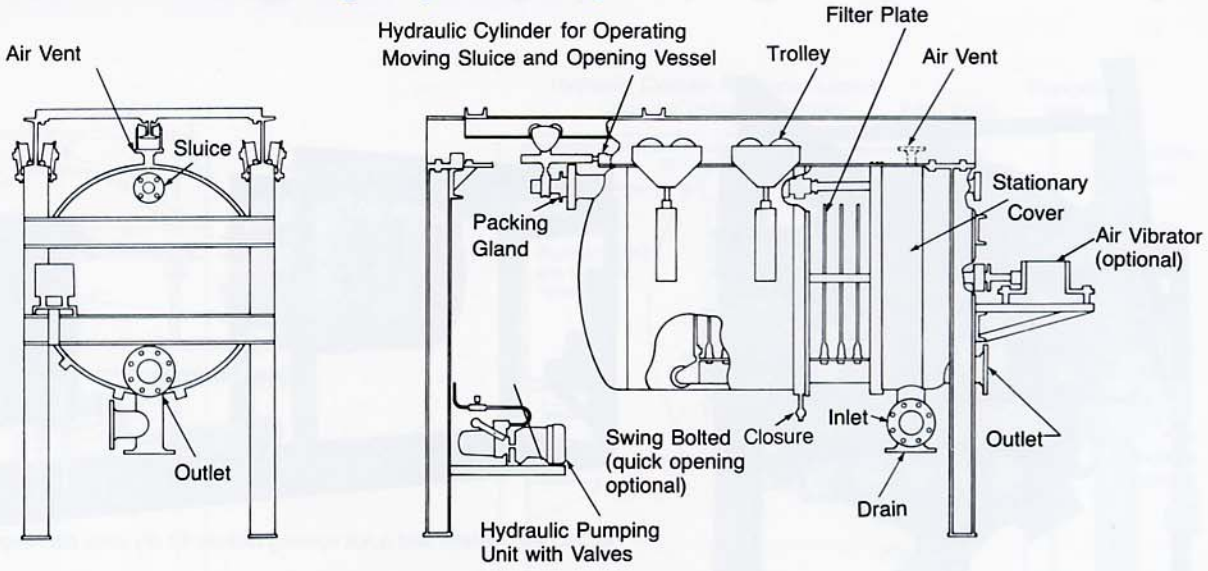


Sluice Packing Gland



Internal Sluice Support

Wet Cake Discharge (W.C.D.)



Cake capacities and length dimensions are based on a maximum cake thickness of 1 inch (2.5 cm.) at a plate center distance of 3 inches (7.5 cm.). If more cake capacity is required, the center distance of the plates can be increased to 4, 5, or 6 inches (10, 13.5, or 15 cm.). Standard materials of construction are Carbon Steel, Carbon Steel Rubber Lined, and Types 304 and 316 Stainless Steel. Alternate materials: Monel, Nickel, Hastelloys, Inconel, Titanium, Polypropylene, and Polyester.

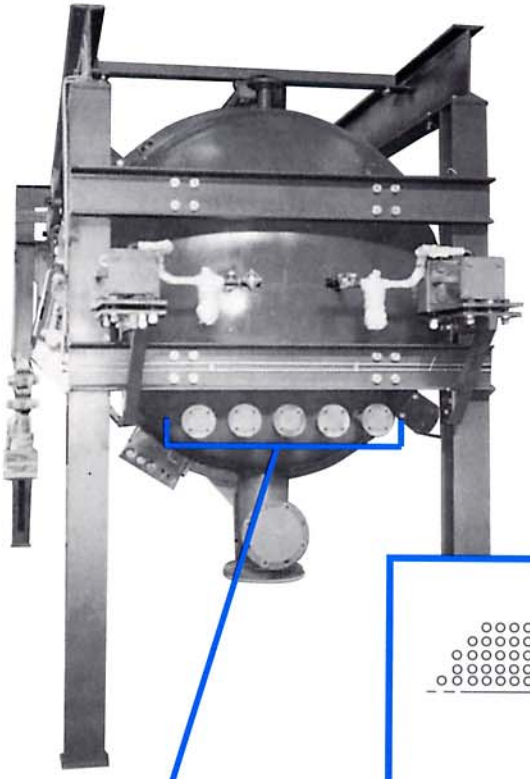
Alternate features: Steam Jackets, Internal Distribution Headers, and many others are available on request. Standard vessels are built to A.S.M.E. specifications with coded materials and code stamp. The National Board Stamp and other codes are available on request. The standard design pressure is 75 psig. (5Kg/sq.cm.) and higher design pressures are available as required. The standard design temperature is 650˚F. (345˚C.) for Carbon Steel and 350˚F.(117˚C.) for Stainless Steel.

Engineering Specifications — MCRO-W.C.D.

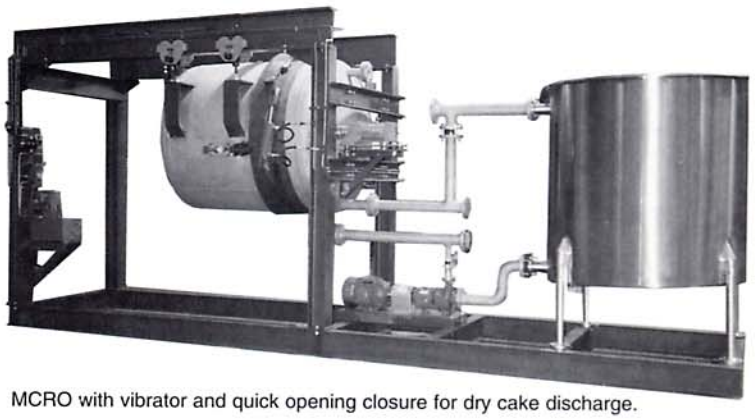
For More Dimensional Details Refer To Drawing F-4002

Model Number	Number of Plates	Tank Diameter		Filtration Area		Cake Capacity		Overall Dimensions					
								Length		Width		Height	
		In.	Mm.	Sq. Ft.	Sq. M.	Cu. Ft.	Liters	In.	Cm.	In.	Cm.	In.	Cm.
MCRO- 100	12	36	950	99.6	9.25	8.7	246	131	333	42.5	108	78	198
MCRO- 150	18	36	950	149.4	13.88	12.4	352	167	424	42.5	108	78	198
MCRO- 200	10	54	1350	210.0	19.51	17.5	495	132	335	61.7	157	103	262
MCRO- 250	12	54	1350	252.0	23.41	21.0	594	144	366	61.7	157	103	262
MCRO- 300	15	54	1350	315.0	29.26	26.2	743	162	411	61.7	157	103	262
MCRO- 400	19	54	1350	399.0	37.07	33.2	941	186	472	61.7	157	103	262
MCRO- 500	24	54	1350	504.0	46.82	42.0	1189	216	549	61.7	157	103	262
MCRO- 600	29	54	1350	609.0	56.58	50.8	1436	246	625	61.7	157	103	262
MCRO- 700	28	60	1530	700.0	65.03	58.3	1651	245	622	67.7	172	117	297
MCRO- 800	32	60	1530	800.0	74.32	66.7	1886	269	683	67.7	172	117	297
MCRO- 900	36	60	1530	900.0	83.61	75.0	2122	293	744	67.7	172	117	297
MCRO-1000	40	60	1530	1000.0	92.90	83.3	2358	317	805	67.7	172	117	297
MCRO-1000	27	72	1836	999.0	92.80	83.2	2357	245	622	79.7	202	131	333
MCRO-1100	30	72	1836	1110.0	103.12	92.5	2620	263	668	79.7	202	131	333
MCRO-1200	33	72	1836	1221.0	113.43	101.8	2882	281	714	79.7	202	131	333
MCRO-1300	35	72	1836	1332.0	123.74	111.0	3144	293	744	79.7	202	131	333
MCRO-1400	38	72	1836	1406.0	130.62	117.2	3318	311	790	79.7	202	131	333
MCRO-1500	41	72	1836	1517.0	140.93	126.4	3580	329	836	79.7	202	131	333
MCRO-1600	44	72	1836	1628.0	151.24	135.7	3842	346	879	79.7	202	131	333
MCRO-1700	46	72	1836	1702.0	158.12	141.8	4016	359	912	79.7	202	131	333
MCRO-1800	49	72	1836	1813.0	168.43	151.1	4279	377	958	79.7	202	131	333
MCRO-1900	52	72	1836	1924.0	178.74	160.3	4540	395	1003	79.7	202	131	333
MCRO-2000	54	72	1836	1998.0	185.61	166.5	4715	407	1034	79.7	202	131	333

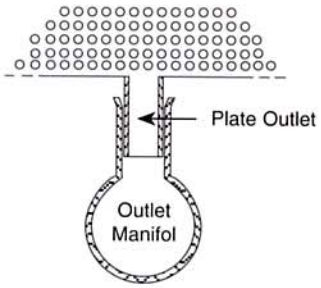
Dry Cake Discharge (D.C.D.)

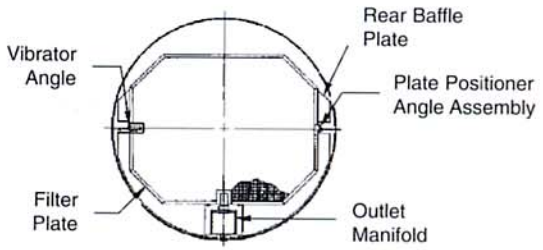


Sectional filtrate header outlets allow individual filter plate sections to be inspected. Dual vibrator standard on models 300 sq. ft. and larger to enhance cake discharge.



MCRO with vibrator and quick opening closure for dry cake discharge.





Features:

- Bottom outlet manifold for gravity flow of filtrate;
- Full drainage of all liquid from the filter plate while draining the tank;
- Sparkler Pneumatic Vibrator; the top and bottom of the filter plates are shaken instantaneously while vibrating at the sides to dislodge the cake;
- Plate outlet connection: machined nozzle into machined couplings with "O" ring seals.

Alternates:

The Sparkler MCRO (D.C.D.) is cleaned with speed and efficiency by means of the Pneumatic Vibrator, but it can also be cleaned by any of the following methods:

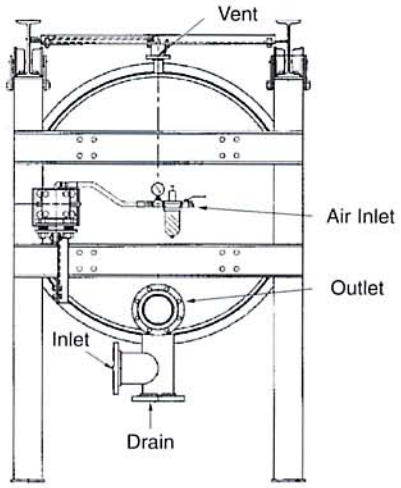
(1) By manual shaking;
(2) By manual scraping;
(3) By manual tapping;
(4) By compressed air lance.

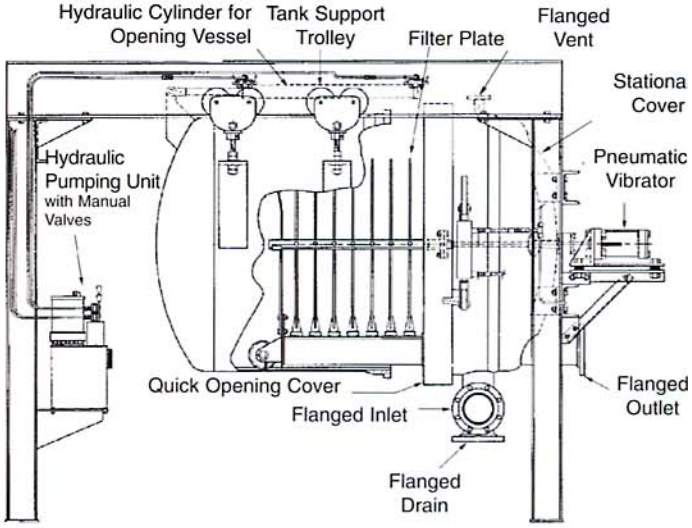
As dry cake removal is peculiar to each filter process, we suggest that you consult your Sparkler engineer for detailed information.

How It Works

After drying the filter cake on the filter plates, the tank is opened (or may remain closed if furnished with trough and screw conveyor in bottom of tank). The Pneumatic Vibrator valve is opened to let air to actuate the vibrator. The vibrations are transmitted through the vibrator bar which is mounted alongside of the filter plate bundle. The filter plates are vibrated and the cake fall off in pieces. Since the plates have a vibrator connection on the side, the top side shakes and the bottom side shakes. The Vibrator should be operated for a minute at a time. Vibrator operation continues until the cake is discharged.

Dry Cake Discharge (D.C.D.)





Cake capacities and length dimensions are based on a maximum cake thickness of 1.5 inch (3.8 cm) at a plate center distance of 4 inches (10.0 cm). If more cake capacity is required, the center distance of the plates can be increased to 5 or 6 inches (12.7 or 15 cm). Standard materials of construction are Carbon Steel, Carbon Steel Rubber Lined, and Types 304 and 316 Stainless Steel. Alternate materials: Monel, Nickel, Hastelloys, Inconel, Incoloy, Titanium.

Alternate features: Steam Jackets, Bottom Trough with Screw Conveyor, and many others are available on request. Standard vessels are built to A.S.M.E. specifications with coded materials and code stamp Section VIII Div. I and National Board Stamp. The standard design pressure is 75 psig (5Kg/sq. cm.) and higher design pressures are available as required. The standard design temperature is 650˚F (345˚C) for Carbon Steel and 350˚F (117˚C) for Stainless Steel.

Engineering Specifications – MCRO-D.C.D.

For More Dimensional Details Refer to Drawing F-4425

Model Number	Number of Plates	Tank Diameter		Filtration Area		Cake Capacity		Overall Dimensions					
								Length		Width		Height	
		In.	Mm.	Sq Ft.	Sq.M.	Cu.Ft.	Liters	In.	Cm.	In.	Cm.	In.	Cm.
MCRO- 100	12	36	950	99.6	9.25	12.4	352	146	371	42.5	108	78	198
MCRO- 150	18	36	950	149.4	13.88	18.7	529	194	493	42.5	108	78	198
MCRO- 200	10	54	1350	210.0	19.51	26.2	743	140	356	61.7	157	103	262
MCRO- 250	12	54	1350	252.0	23.41	31.5	892	156	396	61.7	157	103	262
MCRO- 300	15	54	1350	315.0	29.26	39.4	1115	180	457	61.7	157	103	262
MCRO- 400	19	54	1350	399.0	37.07	49.9	1412	212	539	61.7	157	103	262
MCRO- 500	24	54	1350	504.0	46.82	63.0	1784	252	640	61.7	157	103	262
MCRO- 600	29	54	1350	609.0	56.58	76.1	2155	292	742	61.7	157	103	262
MCRO- 700	28	60	1530	700.0	65.03	87.5	2478	289	734	67.7	172	117	297
MCRO- 800	32	60	1530	800.0	74.32	100.0	2832	321	815	67.7	172	117	297
MCRO- 900	36	60	1530	900.0	83.61	112.5	3186	353	897	67.7	172	117	297
MCRO-1000	40	60	1530	1000.0	92.90	125.0	3540	385	978	67.7	172	117	297
MCRO-1000	27	72	1836	999.0	92.80	124.8	3534	286	726	79.7	202	131	333
MCRO-1100	30	72	1836	1110.0	103.12	138.7	3928	310	786	79.7	202	131	333
MCRO-1200	33	72	1836	1221.0	113.43	152.6	4322	334	848	79.7	202	131	333
MCRO-1300	35	72	1836	1332.0	123.74	161.8	4582	348	884	79.7	202	131	333
MCRO-1400	38	72	1836	1406.0	130.62	175.7	4976	374	950	79.7	202	131	333
MCRO-1500	44	72	1836	1517.0	140.93	189.6	5369	398	1011	79.7	202	131	333
MCRO-1600	41	72	1836	1628.0	151.24	203.5	5763	422	1072	79.7	202	131	333
MCRO-1700	46	72	1836	1702.0	158.12	212.7	6024	438	1113	79.7	202	131	333
MCRO-1800	49	72	1836	1813.0	168.43	226.6	6417	462	1173	79.7	202	131	333
MCRO-1900	52	72	1836	1924.0	178.74	240.5	6811	486	1234	79.7	202	131	333
MCRO-2000	54	72	1836	1998.0	185.61	249.7	7072	502	1275	79.7	202	131	333

Sparkler MCRO Filters

Filter Plates:

Sparkler filter plates are constructed for sturdiness and durability. Standard construction filter plates offer a choice of the V-rim, the Tubular Slit Keyhole Channel, or the Spiral Conveyor Mesh Support design. The T-Bar plate is available as a special construction.

V-Rim (F-2674) See Fig. A
Sparkler Heavy Duty Construction, V-Rim, consists of two perforated sheets with channel support and V-Rim capping channel over wire mesh or under cloth cover. The plate is of full welded construction and provides free drainage and low pressure drop. This is our most rigid filter plate design for wet cake and dry cake discharge.

Tubular Slit Keyhole Channel (F-4038) See Fig. B
Sparkler lighter duty construction, Tubular Slit, consists of an expanded slot perforated sheet with solid round rods inserted at each point where the sheet is welded to the drainage channel. Rods are also welded along the face of the plate, on both sides, for added rigid support. The heavy gauge keyhole channel allows full flow and minimum restriction. For wet cake discharge only.

Spiral Conveyor Mesh Support (F-4039) See Fig. C
Sparkler alternate lighter duty construction, consists of spiral conveyor mesh and channel supports between two perforated sheets with a V-Rim capping channel over wire mesh or under a cloth cover. The plate is of full welded construction and provides free drainage and a low pressure drop. This is a lower cost, rigid filter plate for wet cake and dry cake discharge.

T-Bar (18575-A) See Fig. D
The Sparkler T-Bar has heavy duty construction with removable wire mesh media for on-the-spot, quick replacement. It has all of the same features as the V-Rim design. For wet cake and dry cake discharge.

Positive Plate Outlet Seal (20320-A) See Fig. E
Flange bolted outlet connection for wet cake discharge units. Threaded on for cloth covered plates and welded on for wire mesh covered plates.

The Sparkler rigid plate is bolted to the specially designed manifold and sealed with a simple, machined seal. This eliminates the most frequest source of plate leakage. It provides these benefits:

- Positive seal;
- Plate held rigid;
- Sealing arrangement visible to operator while assembling;
- Can be inspected at a glance;
- Gasket inexpensive and readily available in emergency.

NOTE: If a filter process requires the O-ring design, it can be supplied at no extra cost.

Fig. A

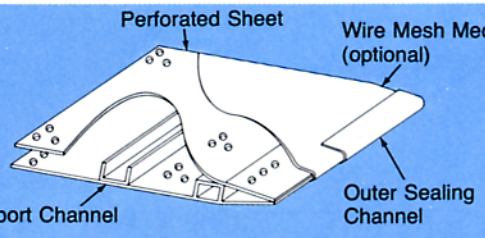


Fig. B

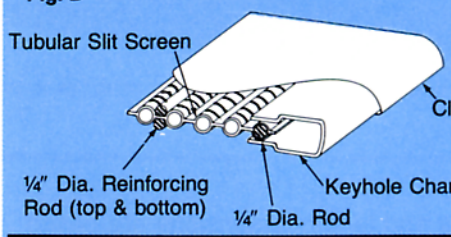


Fig. C

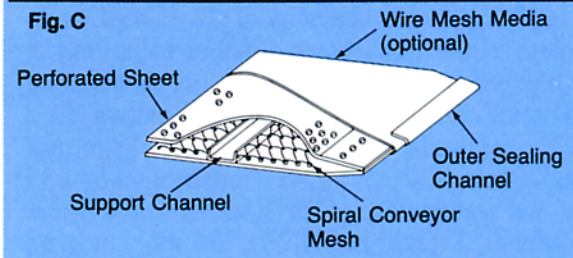


Fig. D

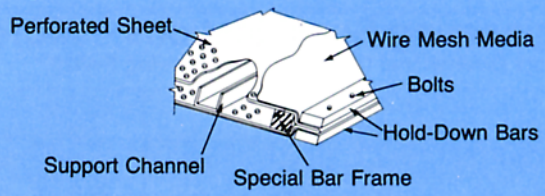
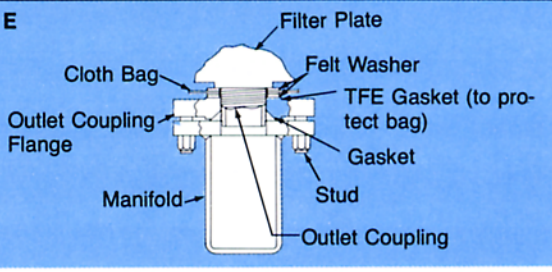


Fig. E



Special Features:

- Sparkler Cake Detector
  Programmed to operate continuously during filter cycle or at given times.
  Adjustable cake thickness detect or will trip signal/alarm to end cycle.
- Sparkler Wedgelock Quick Opening Closures
  For quick turn-around and minimum labor on dry cake discharge units. Hydraulically operated using same pumping unit as the tank retraction system.
- Sparkler Sectional Filtrate Manifold
  For separating the filter plate bundle into individual sections so that filtrate from filter plate sections may be inspected through sight glasses at the outlets.

Special Designs:

Units available with special design and construction for specific applications:

- High pressure or temperature — filter tank may be designed for operating pressures or temperatures higher than standard.
- Sulphur — fully jacketed unit, manual or self-cleaning dry cake discharge, bottom filtrate manifold.
- Winterizing oils — internal jacketed unit, minimum heel. Stainless steel cooling/heating coils in plates for maximum thermal efficiency and high production.
- Sanitary construction — special finishes and sanitary construction available to suit specific needs.

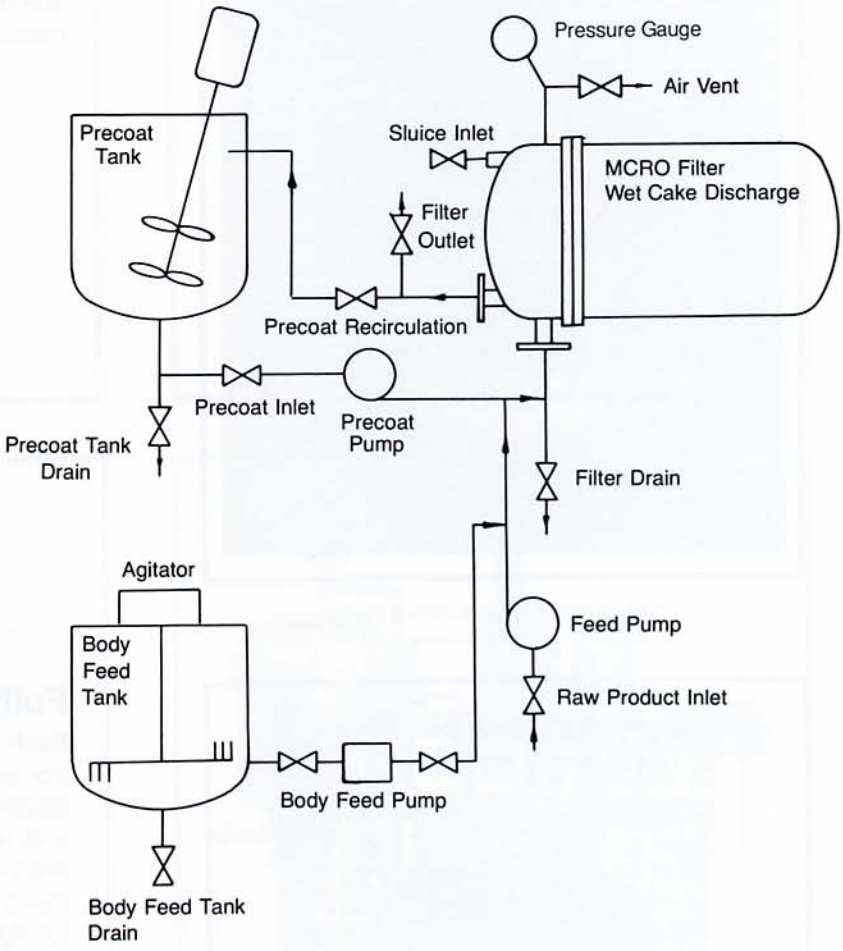
Sparkler MCRO Filter Stations

Sparkler designs and supplies complete filter stations including all pumps, valves, piping, and auxiliary tanks that are necessary. Only first-class components are used. Client just supplies the piping to and from filter.

MCRO D.C.D. with dual vibrator

MCRO D.C.D. with single vibrator

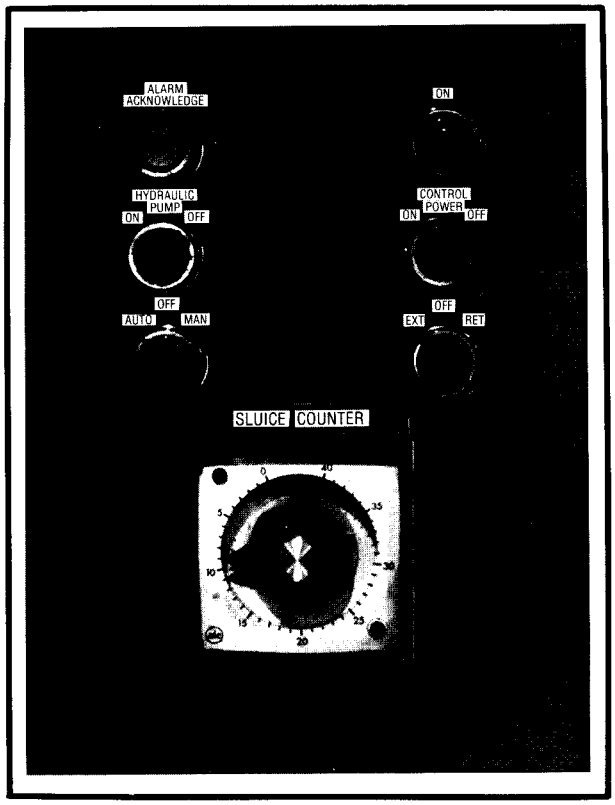
MCRO-W.C.D. Filter Station



Typical Flow Diagram

Typical MCRO-D.C.D. Sulphur Filter

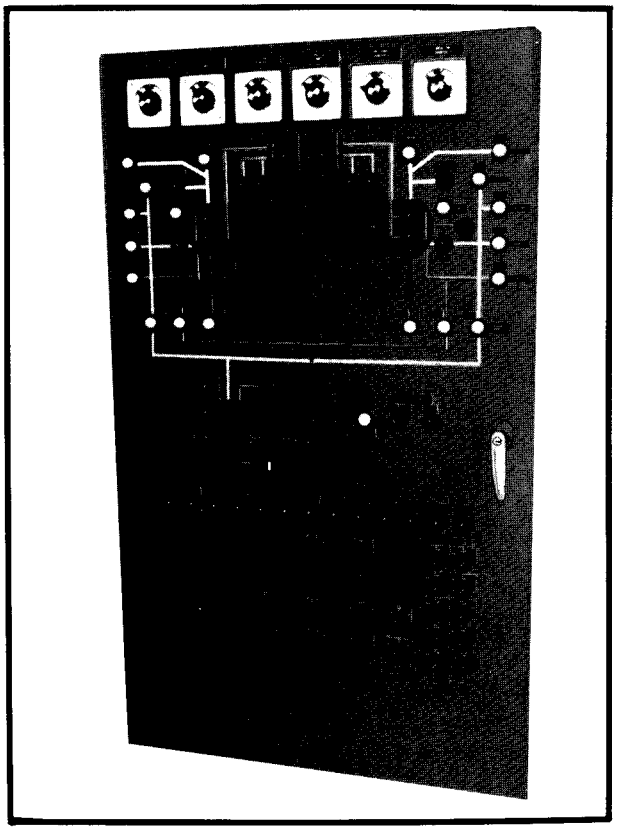
Sparkler MCRO Automated Filters



Typical MCRO-W.C.D.-Sluice Panel

Cake Discharge Control Panel

Ideal for manually operated filter systems, the panel is designed to control the MCRO filter cake discharge whether wet or dry or both. It is push-button initiated with motor control for the hydraulic system, indicator lights, and alarm. Designed to automatically operate the cake discharge in a manual system.



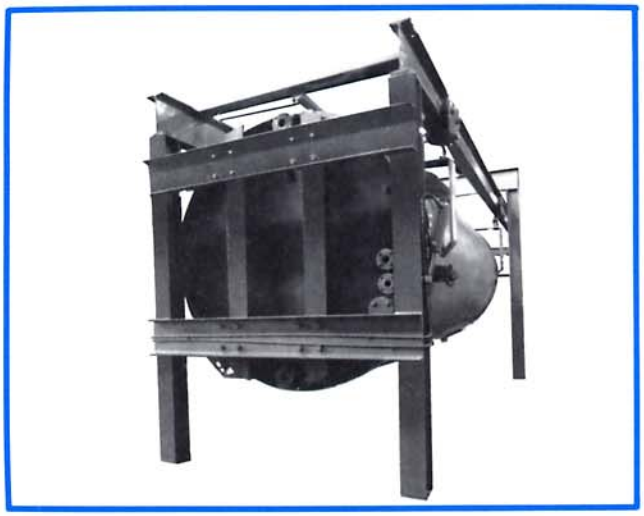
Control Panel

Fully Automatic Control Panel

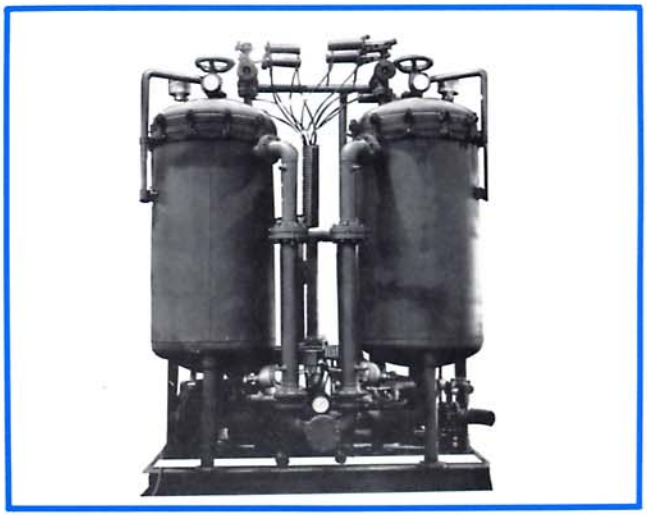
Each filter is available with a fully automated control system designed to control each step of the filtration process, plus allow ease of maintenance and reduced labor in operation. Fail-safe features are included in each system along with total automatic sequence operation panels to include indicator lights, push-button controls, step switch, and an integrated alarm system to indicate the end of the filter cycle on predetermined signals. The system is interlocked with a differential pressure switch, cake detectors, and other instruments. System graphics are available on request.

Other Sparkler Filters

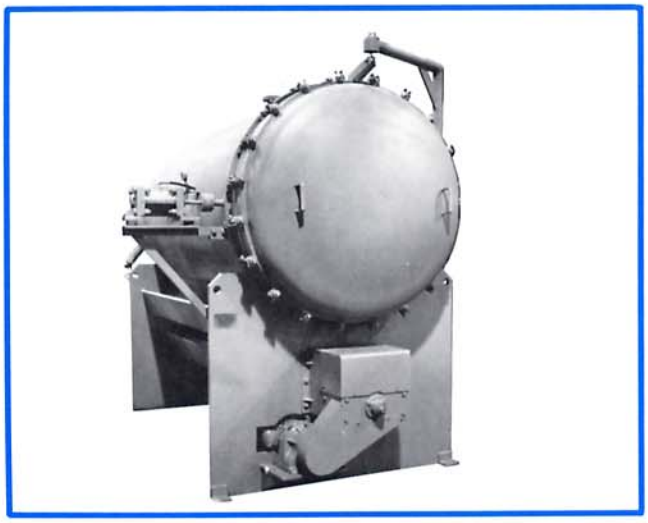
Sparkler also manufactures a complete line of horizontal plate filters, horizontal-vertical (dual position) plate filters and trap filters.



MCRO Winterizing Filter



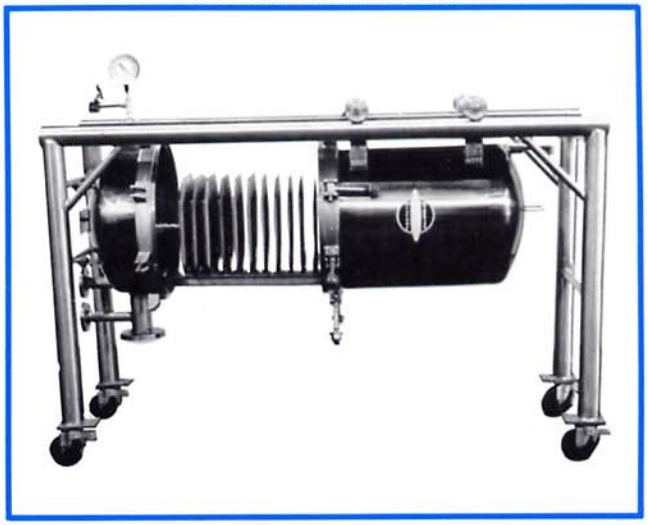
Dual VF Filter Station



HRC Filter

Horizontal Plate Filter Station

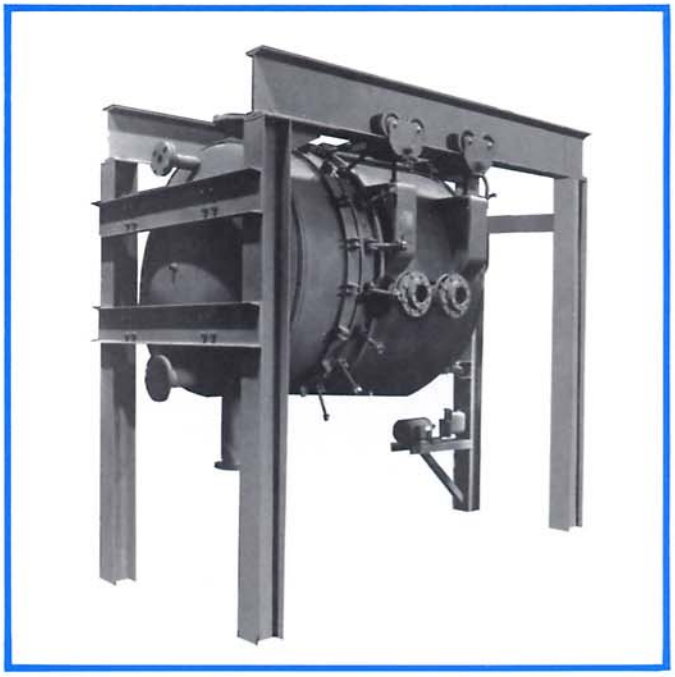
Horizontal Plate Filter



MCRO Pilot/Demonstration Unit

Other Sparkler Filters-MCRO Units

MCRO-W.C.D. with Sectional Outlets
Model MCRO-1100-6-72



MCRO-W.C.D. with Tank-Mounted Sightglasses
Model MCRO-100-6-54

NOTE: 50 sq. ft. MCRO-W.C.D./D.C.D. filter rental units are available for your pilot plant research projects. Also, arrangements can be made to test your product samples in our laboratory. A full scale demonstration of the many features available on the MCRO filters can be arranged in conjunction with a visit to our plant. Contact your local Sparkler Filters representative, or call us.

SPARKLER also manufactures a complete line of Horizontal Plate Filters, Vertical Plate Filters, Horizontal (dual position) Plate Filters, and Manual/Auto Nutsche Filters.

Sparkler

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