FLUIDRA USA

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Astral - Shallow and Standard Bed Vertical Commercial Sand Filtration System Specification

FEATURES

- Simplified trouble free operation
- Outstanding filtration efficiency
- Greatest level of convenience compared to other filter types
- Rugged non-corrosive, weather resistant design
- 50 psi operating pressure
- Patented 360° ABS slotted lateral and PVC diffuser provide balanced water flow through filter bed
- 10 year limited warranty
- Shallow, Standard and deep filter bed options
- Single, multiple and stacked tank configurations
- Reliable and efficient operational accessories
- NSF Certified

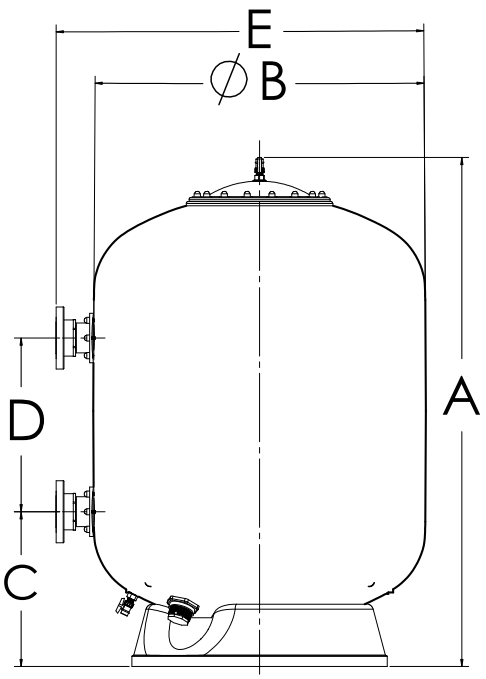
Form no. Astral Vertical-spec
Effective 02/16

DESCRIPTION

Fluidra vertical filtration systems are manufactured in Jacksonville, Florida using CNC controlled filament winding equipment. The tanks are constructed with a dual laminate process consisting of a non-continuous strand and roving inner structure combined with a filament wound outer structure. The tanks superior construction is resistant to fatigue associated with operational cycling, corrosion and scaling and will provide decades of reliable service.

The vertical filters are designed for 50 psi operating pressures, available in 8 tank diameters providing 19 models. The filters are available in shallow, standard and deep filter bed configurations with single or multiple tank piping options. The filter(s) come standard with a 16" round manway opening and cover, flanged influent/ effluent ports, manual air vent and media/water drain combination port. The filters are NSF listed for filtration rates from 5 to 20 gpm/ ft² of filter area with operating flows from 45 to 935 gpm in a single tank. The tanks come fully assembled with an imbedded U.V. protection for outdoor installations.

Operational accessories including standard and custom manifold systems with or without unilever operation, semi and fully automatic backwash control systems and filter media can be purchased individually or with the filter tanks when ordering a system.



ORDERING INFORMATION & DIMENSIONS

Model No.	Tank Dia.	Port Size	Filter Area Ft²	Filter/ BW Rate 15 gpm	Filter Rate 20 gpm	Capacity			Cu. Ft. ?" - ¼" Gravel Ft³ GRAVEL-14	#20 Sand Ft³ 00596	Total Media Ft³	Approx Ship Wt. Lbs.	Approx Oper Wt. Lbs.	Overall Height "A"	Tank Width "B"	Floor to Outlet "C"	Inlet to Outlet "D"	Overall Width "E"
						Gals. Per 60 Min	Gals. Per 120 Min	Gals. Per 240 Min										
SHALLOW BED																		
06804	42.0	2.5	9.26	138.9	185.2	8,334	16,668	33,336	4.0	12.4	16.3	292	2,980	50.5	42.6	20.0	10.8	47.5
06805	47.0	3.0	12.16	182.4	243.2	10,944	21,888	43,776	6.2	20.6	26.8	330	4,450	54.6	48.3	22.4	12.2	52.4
STANDARD BED																		
06682	42.0	3.0	9.26	138.9	185.2	8,334	16,668	33,336	4.0	21.0	25.0	292	2,980	66.1	42.6	20.0	25.2	47.5
06680	47.0	3.0	12.16	182.4	243.2	10,944	21,888	43,776	6.2	30.5	36.7	428	5,960	71.3	48.3	22.4	25.2	52.4
06683	47.0	4.0	12.16	182.4	243.2	10,944	21,888	43,776	6.2	30.5	36.7	428	5,960	71.3	48.3	22.4	25.2	53.1
06681	55.0	4.0	16.58	248.7	331.6	14,922	29,844	59,688	10.0	42.0	52.0	463	8,175	69.6	56.3	23.0	24.0	61.1
06632	63.0	4.0	21.64	324.6	432.8	19,476	38,952	77,904	15.0	47.5	62.5	681	10,900	73.3	64.3	26.8	20.3	69.1
06684	63.0	6.0	21.64	324.6	432.8	19,476	38,952	77,904	15.0	47.5	62.5	681	10,900	73.3	64.3	26.8	20.3	68.3
06633	71.0	6.0	27.34	410.1	546.8	24,606	49,212	98,424	16.5	62.0	78.5	693	13,500	73.8	72.3	28.4	18.3	76.3
06634	79.0	6.0	33.80	507.0	676.0	30,420	60,840	121,680	23.5	84.0	107.5	818	17,550	81.3	80.3	31.1	20.1	84.3
06686	86.0	6.0	40.30	604.5	806.0	36,270	72,540	145,080	38.5	137.5	176.0	1,168	26,480	108.0	87.3	40.0	26.0	91.3
06687	86.0	8.0	40.30	604.5	806.0	36,270	72,540	145,080	38.5	137.5	176.0	1,168	26,480	108.0	87.3	38.0	29.0	94.1
11821	93.0	6.0	46.72	700.8	934.4	42,048	84,096	168,192	40.0	143.0	183.0	1,669	27,700	100.0	93.3	38.0	23.6	97.3
11816	93.0	8.0	46.72	700.8	934.4	42,048	84,096	168,192	40.0	143.0	183.0	1,669	27,700	100.0	93.3	38.0	23.6	100.1

General Notes:

1) Filters ship complete with overhead distribution assembly, lower collection assembly, two pressure gauges manual air relief, combination media/drain port.
2) Filters DO NOT include face piping manifolds and filter media which must be ordered separately
3) All dimensions shown are in inches.
4) Filter Sand is a #20 Silica Sand with an Effective Size of , 45mm to .55mm
5) Support Gravel is 1/8" x 1/4" Rounded & Washed

FILTER MANIFOLDS & ACCESSORIES

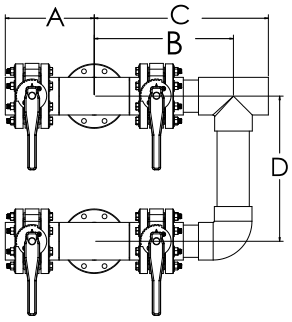
- Sch. 80 PVC pipe construction
- CEPEX PVC butterfly valves
- Zinc plated hardware
- Preassembled and hydro tested
- NSF Certifie

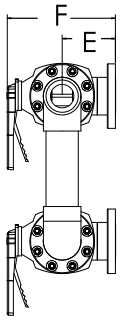
- FRP pipe supports
  - Vertical support pole & base
  - 2 pipe clamps & hardware
- Single lever linkage
  - Arms & linkage tie all valves together
  - Simplified operation

- Electric Actuator
  - 110 VAC
  - Manual override & visual position indicator
  - Torque limiter
  - BSR safety brake
  - Digital positioning system

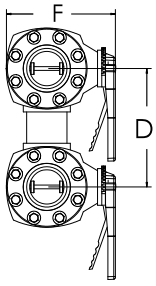
Manifold Support Kit

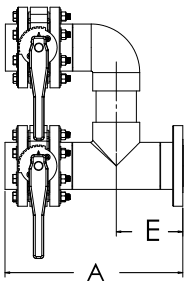
Actuator





4 Valve Manifolds





2 Valve Manifolds

MANIFOLD ORDERING INFORMATION & OUTLINE DIMENSIONS

Model No.	Tank Dia.	Tank Model No.	Number of Filter Tanks	Number of Valves	Max. Flow GPM	Manifold Valve & Port Size	Tank Port Size	Manifold & Valve Material	Pipe Support Kit	Single Lever Linkage Kit	Electric Actuator	A	B	C	D	E	F
50225	N/A	N/A	1	2	128	2.5	2.5	PVC	08843	50225-SSL	A1011	15.0	N/A	N/A	10.0	6.0	8.6
50203	N/A	N/A	1	2	205	3	3	PVC	00844	50203-SLL	A1012	16.2	N/A	N/A	11.4	7.0	10.0
50204	N/A	N/A	1	2	355	4	4	PVC	00845	50204-SLL	A1013	19.9	N/A	N/A	11.4	8.0	11.9
50206	N/A	N/A	1	2	800	6	6	PVC	00848	50206-SLL	A1016	26.9	N/A	N/A	14.8	10.0	14.1
50208	N/A	N/A	1	2	1400	8	8	PVC	00850	50208-SLL	A1017	33.7	N/A	N/A	16.4	13.0	16.9
06797	42	6804	1	4	128	3	3	PVC	08843	06797-SLL	A1011	9.5	16	13	10.8	6.0	10.2
06743	42	6682	1	4	205	3	3	PVC	00844	06743-SLL	A1012	10.3	18	14	25.2	7.0	10.7
06798	47	6805	1	4	205	3	3	PVC	00844	06798-SLL	A1012	10.3	18	14	12.2	7.0	10.7
06744	47	6680	1	4	205	3	3	PVC	00844	06744-SLL	A1012	10.3	18	14	25.2	7.0	10.7
06746	47	6683	1	4	355	4	4	PVC	00845	06746-SLL	A1013	19.1	25	20	25.2	8.0	14.8
06747	55	6681	1	4	355	4	4	PVC	00845	06747-SLL	A1013	19.1	25	20	24.0	8.0	14.8
06748	63	6632	1	4	355	4	4	PVC	00845	06748-SLL	A1013	19.1	25	20	20.3	8.0	14.8
06751	63	6684	1	4	800	6	6	PVC	00848	06751-SLL	A1016	19.4	32	24	20.3	10.0	18.0
06752	71	6633	1	4	800	6	6	PVC	00848	06752-SLL	A1016	19.4	32	24	18.3	10.0	18.0
06753	79	6634	1	4	800	6	6	PVC	00848	06753-SLL	A1016	19.4	32	24	20.1	10.0	18.0
*	86	6686	1	4	800	6	6	PVC	00848	*	A1016	19.4	32	24	26.0	10.0	18.0
08392	93	11821	1	4	800	6	6	PVC	00848	08392-SLL	A1016	19.4	32	24	23.6	10.0	18.0
*	86	6687	1	4	1400	8	8	PVC	00850	*	A1017	24.4	38	29	29.0	13.0	22.8
11986	93	11816	1	4	1400	8	8	PVC	00850	11986-SLL	A1017	24.4	38	29	23.6	13.0	22.8
06799	42	6804	1	5	128	3	3	PVC	08843	N/A	A1011	9.5	23	13	17.7	6.0	10.2
06756	42	6682	1	5	205	3	3	PVC	00844	N/A	A1012	10.3	24	14	32.7	7.0	10.7
06800	47	6805	1	5	205	3	3	PVC	00844	N/A	A1012	10.3	24	14	19.7	7.0	10.7
06757	47	6680	1	5	205	3	3	PVC	00844	N/A	A1012	10.3	24	14	32.7	7.0	10.7
06759	47	6683	1	5	355	4	4	PVC	00845	N/A	A1013	19.1	30	20	34.6	8.0	14.8
06760	55	6681	1	5	355	4	4	PVC	00845	N/A	A1013	19.1	30	20	33.4	8.0	14.8
06761	63	6632	1	5	355	4	4	PVC	00845	N/A	A1013	19.1	30	20	29.6	8.0	14.8
06764	63	6684	1	5	800	6	6	PVC	00851	N/A	A1016	19.4	40	24	34.0	10.0	18.0
06765	71	6633	1	5	800	6	6	PVC	00851	N/A	A1016	19.4	40	24	32.1	10.0	18.0
06766	79	6634	1	5	800	6	6	PVC	00851	N/A	A1016	19.4	40	24	33.8	10.0	18.0
*	86	6686	1	5	800	6	6	PVC	00851	N/A	A1016	19.4	40	24	39.8	10.0	18.0
08933	93	11821	1	5	800	6	6	PVC	00851	N/A	A1016	19.4	40	24	37.4	10.0	18.0
*	86	6687	1	5	1400	8	8	PVC	00853	N/A	A1017	24.4	50	29	46.4	13.0	22.8
11987	93	11816	1	5	1400	8	8	PVC	00853	N/A	A1017	24.4	49.9	29.0	41.0	13.0	22.8

General Notes:

1) Single Tank Manifolds Require 2 Pipe Supports
2) Electric Actuators are Used with Semi Automatic or Automatic Backwash Systems. Each Valve in the System Requires an Actuator
3) Semi Automatic and Automatic Backwash Control Information Available in Separate Data Sheet
4) Contact the factory for multiple tank manifold systems

MATERIALS & DESIGN

FILTER SYSTEM

The filter system specified under this section shall be a pressurized Hi-Rate Permanent Media Filter design as manufactured by Fluidra USA.

The filter system shall be of the vertical type suitable for a single grade of media and shall be certified for swimming pool/ spa use by NSF International to NSF/ ANSI Standard 50. The filter certification shall be for a maximum flow of 20 gallons per minute per square foot of filter area.

The filter tank system shall consist of a _____ vertical filter tank(s), internal distribution system, internal air vent, manway opening/ cover, external vent and drain assembly. The tank(s) shall be manufactured in a fully assembled state with the external air vent disassembled for shipping. The filter(s) shall be designed and manufactured in a manner to allow for shipping under normal conditions without internal damage to the filter.

FILTER AREA

The filter plant shall consist of ____, _____ Diameter Vertical Hi-Rate Permanent Media Filter(s) with a total effective filter area of _____ square foot each. When operating at _____ gpm per square foot of filter area, the filter system will have a capacity of filtering _____ gallons in _____ minutes.

FILTER TANK(S)

The filter tank(s) shall be_____ in diameter with a total height of ____" and shall be constructed Fiberglass resin with a maximum working pressure of 50 psi, hydrostatically tested to 1.1 x maximum working pressure and designed to a minimum of 5:1 safety factors.

Each filter tank(s) shall consist of a body and two dished heads manufactured with a dual wall structure consisting of a contact molded inner structure and a filament wound outer structure. The inner structure shall be manufactured with Woven Roving and Chop Strand Mat on a male mold in a two or three-piece design, depending on length, and joined together with secondary joint(s) before applying the outer structure. The outer structure shall be filament wound in both radial and axial geometric patterns to provide maximum strength in all load directions. The dished heads and body thicknesses shall be designed according to ASME Section X requirements confirmed through calculations and a Finite Element Stress Analysis. The outer structure of the tanks shall be seamless and constructed of pigmented resin to provide a professional exterior finish.

The filter tank(s) shall be mounted on a FRP base supports that is permanently bonded to the tank through the use of a structural adhesive system. The tank support base shall be designed in compliance to all relevant seismic code requirements when anchored to the manufacturer's specifications.

A 16" round flanged manhole complete with FRP cover, O-ring and bolts shall be located in the top dished head of the filter tank(s). All o-ring contact points on the manhole flange and cover shall have a smooth finish to provide a continuous watertight seal.

A molded 4" combination media dump port and drain complete with a ABS media retainer and flange type closure shall be located in the bottom dished head of the filter tank(s).

A molded ¾" external air relief complete with PVC ball valve shall be located in the manway cover of the filter tank(s).

The influent and effluent ports shall be flanged to facilitate proper connection of both internal and external piping. The influent/ effluent ports shall consist of PVC flanges designed according to ANSI standard with a 150 lb. bolt pattern.

INTERNAL DISTRIBUTION/COLLECTION SYSTEM

The filter tank equipment shall include an upper distribution system and lower collection system, hydraulically balanced to prevent filter media migration during filter operation and/ or backwash.

The upper distribution system shall include hydraulic diffusers manufactured of injection molded PVC plastic, located over the filter bed. They shall be piped to a Schedule 80 PVC distribution header with Schedule 80 PVC pipe and fittings appropriately sized to maintain proper flow velocities throughout the entire distribution system.

The lower collection system shall consist of a Schedule 80 PVC header and molded ABS plastic laterals with .009" tapered slots designed to retain a single grade of filter media with .23 mm particle size. The internal collection system shall be designed to promote media bed circulation during backwash while providing minimal head loss during filtration.

FILTER MEDIA

Filter media shall consist of a carefully selected grade of hard, uniformly graded silica with a minimum combined mean percent of silica by weight of 90%, which shall be free of limestone or clay. The silica shall be angularly shaped particles with a particle size between .45mm and .55 mm and a roundness value between 0.0 and 0.15. Round or Sub-rounded particle shapes will not be acceptable. The uniformity coefficient shall not exceed 1.50 with a specific gravity of not less than 2.5 with a minimum hardness of 7 mhos. Support media shall be hard, water rounded silica material, uniformly graded ⅛" – ¼" gravel, no limestone or clay shall be present. Alternate media must be approved by the filter manufacturer.

PRESSURE GAUGE PANEL

The pressure gauge panel shall consist of two 2½" diameter Flutter Guard gauges scaled from 0-100 PSIG. The pressure gauges shall be mounted in an injection molded panel. The pressure gauges shall be connected to influent and effluent pressure points with air relief cocks, compression fittings and semi-rigid PVC tubing.

The filter system as outlined herein shall be Fluidra USA Model No. _____.

FACE PIPING

The face piping shall be fabricated in a fully assembled state by the filter manufacturer of Schedule 80 PVC pipe and fittings. Flanges shall be located to allow for easy disassembly to prevent damage during shipping.

The butterfly valves shall be constructed of PVC with aluminum handles. The valve shall have EPDM and PE that provide shut off up to 150 psi while sealing the valve stem from exposure to internal liquids. The face piping shall be certified by NSF International as an operational component for the filter system carrying the same pressure and flow ratings as the filter tank.

SINGLE LEVER LINKAGE

A clevis and rod linkage system shall connect the butterfly valves provided with the face piping. Simplified operation shall be achieved through the raising or lowering of a single operating handle.

Connecting components shall vary in length to provide suitable mechanical advantage to operate the system. All valves shall operate simultaneously to eliminate the possibility of water hammer. The linkage components shall be constructed of T304 stainless steel designed to allow for individual valve adjustment to ensure proper positioning of the valves.

ELECTRIC ACTUATOR

An electromechanical actuator shall be mounted on each valve of the face piping kit. The actuator shall be automatically operated during initiation of the backwash cycle and return to filter cycle through the use of 115-volt AC totally enclosed motor sized at a 2:1 safety factor to the seating torque of the butterfly valve with a torque limiter. The actuator shall have a closure time of 15 seconds/ 90 degrees with a manual override, BSR safety brake to prevent valve slippage and visual position indicator. The actuator shall have a digital positioning system with dual open and close limit switches for feed back to the backwash control system.