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HYDROCYCLONE SAND SEPARATORS

OPERATION, INSTALLATION & MAINTENANCE GUIDE

**HYDROCYCLONE &
SEDIMENTATION TANK**

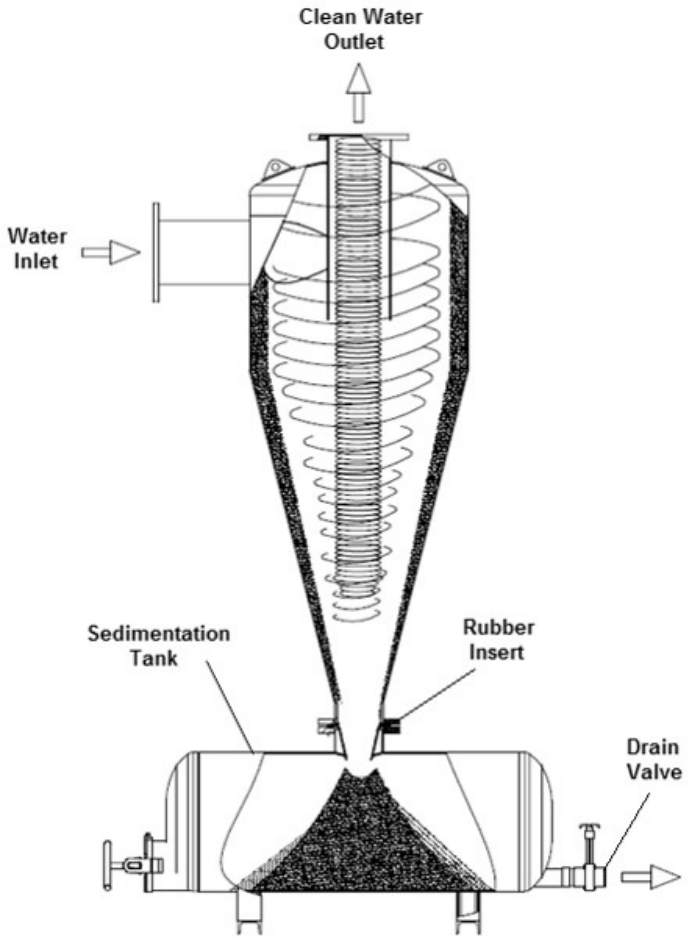
DESCRIPTION

A Hydrocyclone separates sand and other solid matter from water with very little head loss and 90% or better efficiency. There is no head loss build up and no clogging when the solids are separated. Hydrocyclones are easy to operate and maintain, and have no moving parts or screens.

Versatility in system configurations and ease of installation are some of its great advantages.

A Hydrocyclone uses a tangential injection flow process, enhancing the centrifugal forces and moving solid particles outwards. The dispersed particles move downward in a spiral path into an underflow chamber (sedimentation tank) while clean liquid moves upwards to the center of the spiral, towards the top outlet.

A specially designed rubber insert protects the neck of the Hydrocyclone from erosion and increases separation efficiency. The Sedimentation Tank can be drained automatically with an automatic flushing kit (an electric valve, controller and small command filter). Automatic flushing will not interfere with the proper functioning of the Hydrocyclone. The Hydrocyclone has a 100 micron protective coating of extra durable polyester applied electrostatically and oven cured on a zinc-phosphate layer for maximal anti-corrosion protection.



Hydrocyclone Flow and Mode of Separation

SPECIFICATIONS

As a rule, the separation efficiency improves as the Hydrocyclone diameter decreases and the head loss increases. Miniature Hydrocyclones may be used for easy sampling of liquids, for determining filter (including larger Hydrocyclones) operation and efficiency and for testing the feasibility of operation for the problem at hand.

Each filter is designed and manufactured in order to achieve the highest standard of quality and finish.

- Recommended head loss for effective operation: 3-7 psi
- Maximum recommended working pressure: 120 psi
- Maximum pressure: 150 psi
- Water inlet and outlet: horizontal and vertical
- Inserts: standard on all sizes except 3", 4", 6" and 8" (74HC8)
- Protective coating: polyester on zinc-phosphate layer
- Pressure relief valve: must be inserted before the filtering installation if pressure is not controlled
- Available sizes: 3", 4", 6", 8", 12", 16", 20", 24" and 30"
- End connections: Thread (TH), Flange (FL), Groove (GR)
- Sedimentation Tank connections:
  - Thread: 3", 4", 6" and 8" sizes
  - Flange: 12", 16", 20", 24" and 30" sizes
  - Groove: 8" sizes

RECOMMENDED FLOW RATES

MODEL	INLET/OUTLET DIAMETERS	HYDROCYCLONE FLOW RANGE (GPM)	STANDARD SEDIMENTATION TANK CAPACITY (GAL)
74HC3	¾ TH	11 - 17	0.4
74HC4	1 TH	15 - 26	0.4
74HC6	1½ TH	29 - 44	2.5
74HC8V	2 TH	48 - 84	2.5
74HC8HGR3	2 GR	88 - 154	2.5
74HC8HGR3H	2 GR	154 - 200	2.5
74HC12FL4	3 X 4 FL	198 - 321	16
74HC16FL4	4 FL	264 - 409	32
74HC20FL6	6 FL	409 - 683	60
74HC24FL6	6 FL	638 - 990	60
74HC30FL6	8 FL	1,012 - 1,629	60

OPERATION

Based on the centrifuge principle, the particles are spun against the outside wall of the Hydrocyclone and gravitate towards the bottom into the Sedimentation Tank. The velocity at which the water flows through the Hydrocyclone determines the efficiency at which the particles are separated from the water.

- Normal working conditions are achieved when headloss on the Hydrocyclone is not less than 3 psi with a recommended range of 3-7 psi.
  - A headloss of less than 3 psi will reduce the separation efficiency and a headloss of more than 7 psi might induce increased erosion.
- The Hydrocyclone is designed for a maximum recommended working pressure of 120 psi and should not exceed 150 psi.

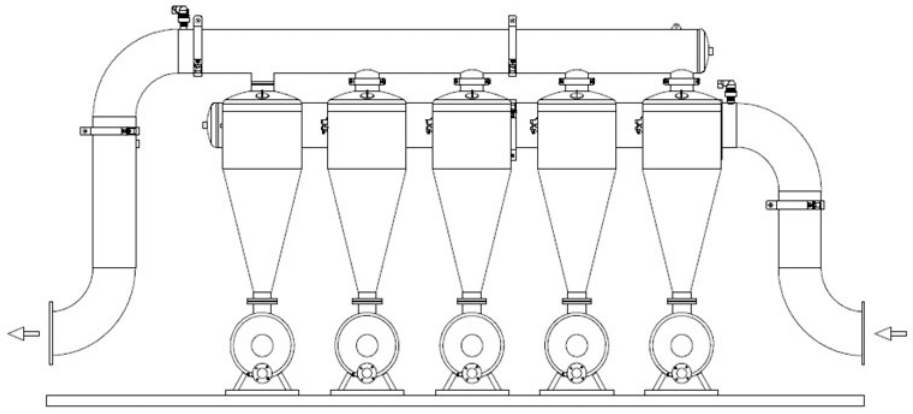
INSTALLATION

INSTALLATION GUIDELINES

- Install and connect the Hydrocyclone vertically with the Sedimentation Tank underneath the Hydrocyclone.
- Special attention must be given to the correct flow direction: horizontal inlet and top vertical outlet are clearly marked by arrows.
- Install the manual ball valve to the flush port of the Sedimentation Tank.
- Check that the actual flow rate through the Hydrocyclone is within the recommended range. Inadequate flow rate will result in reduced performance.
- If more than one Hydrocyclone is installed, leave sufficient space between units to facilitate maintenance.
- Specially designed manifolds are available for mounting multiple filters.
- A pressure relief valve must be installed upstream of the Hydrocyclone if the pressure is not controlled effectively.

INSTALLATION WITH OPTIONAL AUTOMATIC FLUSHING KIT

- Automatic Flushing Kit includes an electric valve, controller and small command filter.
- Install the electric valve on the outlet opening of the Sedimentation Tank.
- Connect the controller to the electric valve.
- Insert the batteries inside the controller (or plug in for AC) and close the cover tightly.
- Adjust the controller as follows:
  - Flushing time for Sedimentation Tanks with 0.4-16 gallons: 15-20 seconds
  - Flushing time for Sedimentation Tanks with 32-60 gallons: 30-40 seconds
  - Time between flushings: 30-120 minutes
  - If the water contains high loads of dirt, shorten the time between flushings.



Multiple Hydrocyclone and Sedimentation Tank Installation

MAINTENANCE

SEDIMENTATION TANK FLUSHING

- The Sedimentation Tank can be flushed manually or automatically with an irrigation controller or computer at periodic intervals.
- When a manual valve is installed, drain the Sedimentation Tank at periodic intervals according to the recommendations.
- The Sedimentation Tank should be drained when it is ⅓ full.
- Do not let the Sedimentation Tank get filled more than ½ of its volume, otherwise the sand will not flush properly. As a result, the sand will spin, have no place to drain, and cause pin holes in the neck of the Hydrocyclone.

SEDIMENTATION TANK PERIODIC CLEANING

- Check that the rubber insert is not worn or damaged and replace if necessary. When separating sand, the rubber insert may need to be replaced every 2-3 years. When separating silt, the rubber insert may need to be replaced every year.
- Close the valve at the inlet of the Hydrocyclone.
- Open the drain valve located at the bottom of the Sedimentation Tank to release pressure and drain.
- Take off the cover.
- Remove all the sediments collected in the Sedimentation Tank.
- Thoroughly rinse the inside of the empty Sedimentation Tank.
- Replace the cover on the Sedimentation Tank so that the cover gasket fits over it.
- Mount tightening bracket and tightening handle properly.

WARNING: Do not tighten or open cover during operation or under pressure.

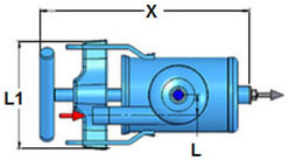
MAINTENANCE

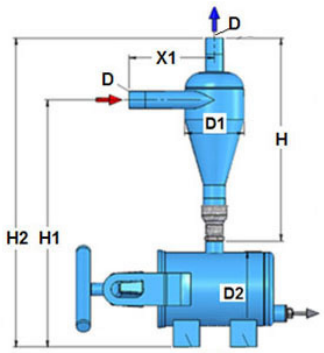
- Apply a layer of grease to handle threads once a year.
- Immediately repair any damage to the tank's protective coating.

TECHNICAL INFORMATION

HYDROCYCLONE MICRON/MESH

MESH	120	140	180	200	270	325	600
MICRON	130	105	90	75	53	44	25





HEADLOSS (FLOW VS. PRESSURE)

MODEL NUMBER	Q-Cv	GPM or Hf		
HEADLOSS @	1 PSI	3 PSI	7 PSI	8 PSI
74HC3	6.4	11	17	18
74HC4	8.7	15	23	24.5
74HC6	16.7	28.5	44.5	47
74HC8	27.7	48	74	78
74HC8HGR3	50.8	88	135	144
74HC8HGR3H	88.9	154	236	252
74HC12FL4	114.3	198	305	324
74HC16FL4	152.4	264	405	432
74HC20FL6	236.1	409	625	669
74HC24FL6	368.3	638	975	1,043
74HC30FL6	571.6	995	1,510	1,620

Recommended headloss for optimum particle separation

Recommended range is 2.8 to 7.2 psi
Maximum recommended headloss for 74HC4 and 74HC8 is 8 psi

HYDROCYCLONE DIMENSIONS & WEIGHT

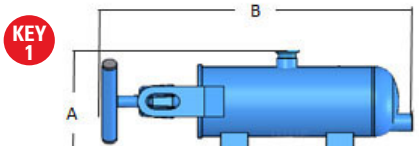
MODEL	D	D1	D2	X	X1	L	L1	H	H1	H2	WEIGHT
74HC3	¾"	3"	4"	12.51"	5.12"	1.24"	6.48"	12.30"	14.96"	18.70"	17 LBS.
74HC4	1"	4"	4"	12.51"	6.30"	1.59"	6.48"	17.20"	18.11"	23.62"	21 LBS.
74HC6	1½"	6"	6"	28.02"	10.24"	2.36"	9.00"	22.64"	25.77"	31.52"	37 LBS.
74HC8	2"	8"	6"	28.02"	11.81"	3.13"	9.00"	26.35"	29.72"	35.24"	48 LBS.
74HC8HGR3	3"	8"	6"	28.02"	11.81"	2.56"	10.7"	23.23"	27.76"	34.06"	80 LBS.
74HC8HGR3H	3"	8"	6"	28.02"	11.81"	2.56"	10.7"	23.23"	27.76"	34.06"	80 LBS.
74HC12FL4	3X4"	12"	20"	29.22"	18.31"	4.14"	18.78"	43.01"	53.24"	63.68"	154 LBS.
74HC16FL4	4"	16"	20"	40.69"	19.88"	5.42"	27.56"	48.58"	65.87"	76.50"	200 LBS.
74HC20FL6	6"	20"	20"	62.82"	23.62"	6.08"	27.56"	50.47"	65.59"	78.39"	496 LBS.
74HC24FL6	6"	24"	20"	62.82"	25.79"	8.69"	27.56"	62.20"	76.14"	90.31"	595 LBS.
74HC30FL6	8"	30"	20"	62.82"	27.76"	10.45"	27.56"	79.92"	91.89"	107.64"	727 LBS.

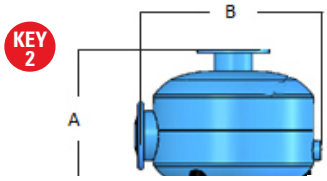
GR = Groove FL = Flange

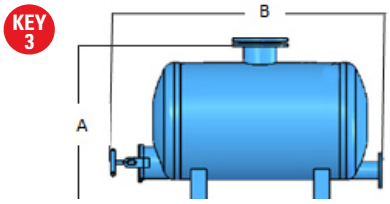
TANK DIMENSIONS & WEIGHT

KEY	MODEL	SIZE	A *	B	CAPACITY	WEIGHT
1	74ST004	4"	6.48"	12.51"	0.4 GALLONS	12 LBS.
1	74ST025	6"	9.0"	28.02"	2.5 GALLONS	24 LBS.
1	74ST025GR3	6"	10.7"	28.02"	2.5 GALLONS	57 LBS.
2	74ST160FL4	20"	18.78"	29.22"	16 GALLONS	66 LBS.
3	74ST320FL4	20"	27.56"	40.69"	32 GALLONS	187 LBS.
3	74ST600FL6	20"	27.56"	62.82"	60 GALLONS	253 LBS.

* Height with legs



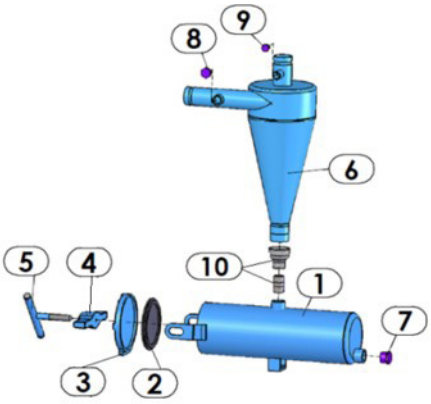


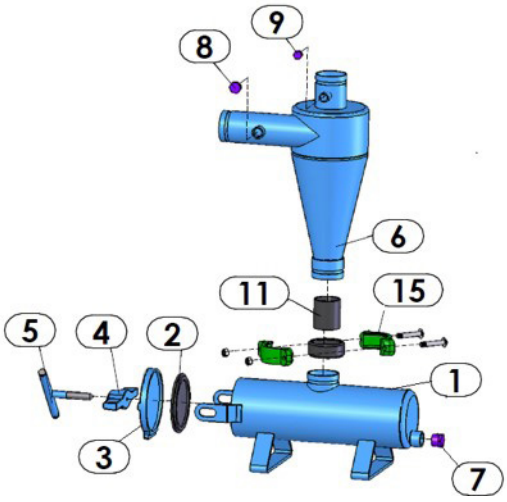


REPLACEMENT PARTS

HYDROCYCLONE & SEDIMENTATION TANK PARTS

KEY	DESCRIPTION	HYDROCYCLONE MODEL					
		74HC3 (3")	74HC4 (4")	74HC6 (6)	74HC8 (8")	74HC8HGR3H (8")	74HC8HGR3 (8")
1	SEDIMENTATION TANK	74ST004	74ST004	74ST025	74ST025	74ST025GR3	74ST025GR3
2	COVER GASKET	79YP1300010	79YP1300010	79YP1300040	79YP1300040	79YP1300040	79YP1300040
3	COVER	79YPP108440	79YPP108440	79YPP108460	79YPP108460	79YPP108460	79YPP108460
4	TIGHTENING BRACKET	79YPP108240	79YPP108240	79YPP108260	79YPP108260	79YPP108260	79YPP108260
5	HANDLE	79YPP108040	79YPP108040	79YPP108068	79YPP108068	79YPP108068	79YPP108068
6	HYDROCYCLONE BODY	-	-	-	-	-	-
7	SEDIMENTATION TANK MALE PLUG	2520085	2520085	2520087	2520087	2520087	2520087
8	INLET MALE PLUG	-	-	2520085	2520086	2520086	2520086
9	OUTLET MALE PLUG	-	-	2520085	2520085	2520085	2520085
10	INSERTS	79YPM200605N	79YPM200605N	79YPM200610N	79YPM200615N	79YPM200615N	79YPM200615N
11	RUBBER INSERT	-	-	-	-	79YP1300450	79YP1300450
12	BOLT	-	-	-	-	-	-
13	WASHER	-	-	-	-	-	-
14	NUT	-	-	-	-	-	-
15	QUICK COUPLING	-	-	-	-	79YP2411030	79YP2411030
-	SEDIMENTATION TANK CAPACITY	0.4 GALLONS	0.4 GALLONS	2.5 GALLONS	2.5 GALLONS	2.5 GALLONS	2.5 GALLONS

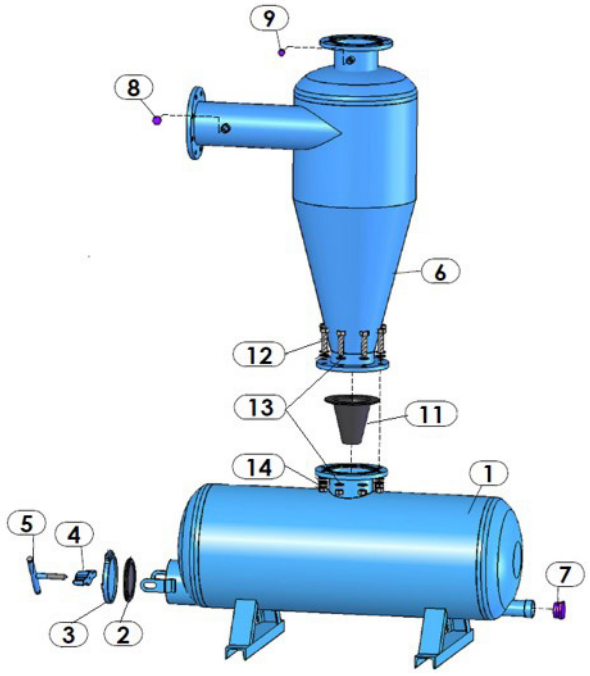




REPLACEMENT PARTS

HYDROCYCLONE & SEDIMENTATION TANK PARTS

KEY	DESCRIPTION	HYDROCYCLONE MODEL				
		74HC12FL4 (12″)	74HC16FL4 (16″)	74HC20FL6 (20″)	74HC24FL6 (24″)	74HC30FL6 (30″)
1	SEDIMENTATION TANK	74ST160FL4	74ST320FL4	74ST600FL6	74ST600FL6	74ST600FL6
2	COVER GASKET	79YP1300045	79YP1300045	79YP1300045	79YP1300045	79YP1300045
3	COVER	79YPP108461	79YPP108460	79YPP108460	79YPP108460	79YPP108460
4	TIGHTENING BRACKET	-	79YPP108260	79YPP108260	79YPP108260	79YPP108260
5	HANDLE	-	79YPP108068	79YPP108068	79YPP108068	79YPP108068
6	HYDROCYCLONE BODY	-	-	-	-	-
7	SEDIMENTATION TANK MALE PLUG	2520088	2520088	2520088	2520088	2520088
8	INLET MALE PLUG	2520086	2520086	2520086	2520086	2520086
9	OUTLET MALE PLUG	2520085	2520085	2520085	2520085	2520085
10	INSERTS	-	-	-	-	-
11	RUBBER INSERT	79YP2691365	79YP2691365	79YP2691366	79YP2691366	79YP2691366
12	BOLT	2213080	2213080	79YP2214080	79YP2214080	79YP2214080
13	WASHER	79YP2230010	79YP2230010	79YP2230020	79YP2230020	79YP2230020
14	NUT	79YP2220304	79YP2220304	79YP2220354	79YP2220354	79YP2220354
15	QUICK COUPLING	-	-	-	-	-
-	SEDIMENTATION TANK CAPACITY	16 GALLONS	32 GALLONS	60 GALLONS	60 GALLONS	60 GALLONS



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