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1. General

1.1 Swimming Pool Filters

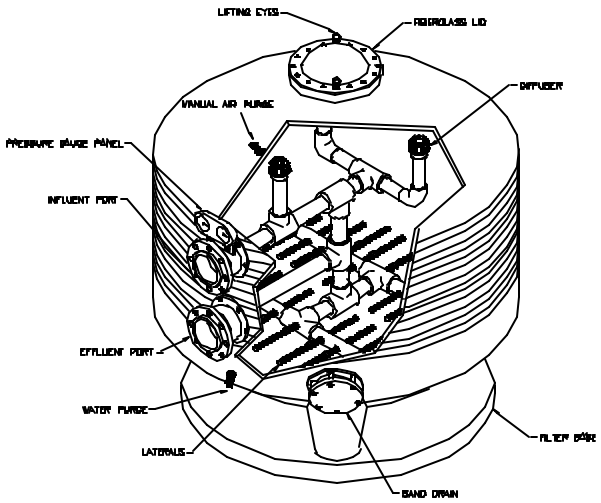


FIGURE 1-1

Filters are, without a doubt, the most important accessory used in the treatment of swimming pool water. Their purpose is to eliminate suspended particles from the circulating water, thus improving the clarity of the water.

The principle of operation consists of passing the swimming pool water through a bed of sand which will retain any particles that are suspended in the water.

It should be kept in mind that the filtration system consists of a number of elements, such as metering equipment, pumps, pool shell fittings and pipe work which ensure the correct suction and return flows that will affect the resultant condition of the treated water.

Normally each country (possibly each state) will have its own standards for public and private pools. It is the responsibility of the installer to be aware of these codes before designing, specifying or installing any piece of equipment for a swimming pool.

The quality of filtration depends on various factors: the size and shape of the media, the media bed depth, characteristics of the media such as granular size, density etc. A most important parameter is the water filtration rate. Other factors affecting the selection of a filter are the materials used for its construction, the working temperature, and the working pressure.

1.2 Astral Filters

Manufactured from polyester resin and fiberglass, they are virtually corrosion-proof. The internal fittings (diffuser and lateral system) are manufactured from PVC and polypropylene. They are unaffected by salt water and are normally manufactured for a working pressure up to 50 psi and a maximum working temperature of 122° F.

Depending on the filtration velocity, filters are classified into three groups:

- SLOW RATE FILTERS: Filtration velocities 5 to 10 GPM per sq. ft.
- MEDIUM RATE FILTERS: Filtration velocities 10 to 15 GPM per sq. ft.
- HIGH RATE FILTERS: Filtration velocities in excess of 15 GPM per sq. ft.

For good filtration results, we recommend that filtration velocities of 15 GPM per sq. ft. are not exceeded, bearing in mind that the filtration velocity is dependent on the granular size of the media and the bed depth. It is also important to check all state and local codes that pertain to water filtration for swimming pools.

VERY IMPORTANT: We recommend a first layer of gravel with a minimum granular size of 1 to 2 mm (.04 to .08"). This layer should just cover the lateral arms. The second layer should be .4mm to .55 mm granular size up to the level suggested for each size of filter.

1.3 Selection of filters and installation

1.3.1 Filter Characteristics

Astral recommends that the filtration system should filter at least 50% of the water from the surface of the pool as well as 50% from the lower levels of suction. The maximum turnover time for a public pool should not exceed 4 hours, and for semi-public pools 6 hours. In the case of pubic pools for children the turnover should not exceed 1 ½ hours. The times will vary from state to state and all local and state codes must be satisfied when using any filtration system.

Example:

If we have a public pool with a capacity of 150,000 gallons we need a filter capable of filtering this water in 4 hours:

150,000 gal / 4 hours = 37,500 gal/hour or 625 GPM

To obtain a high quality of water filtration we recommend that the filtration velocity should comply with the following:

Water parks 10 GPM per sq. ft. Commercial Pools 15 GPM per sq. ft.

625 GPM / 10 GPM per sq. ft. = 62.5 sq. ft. of filtration required

Now chose the filter or filters that meet this requirement. Remember it is possible to add filters together to obtain the correct amount of filtration area required. It is also a good idea to oversize the surface area required by 10% or more, this will allow for better water quality. Whenever possible use more than one filter in conjunction, this will allow one filter to be serviced while one is still functioning.

When sizing the plumbing for a filtration package be sure to keep in mind that the velocity of the water in the pipes is very important. Each state or country may have different maximums for velocity in the plumbing. The recommendations of Astral are as follows: the return line should not exceed **6.5 ft/s** and the suction line should not exceed **5 ft/s.**

1.3.2 Installation characteristics

To insure the correct pump size, the required flow must be obtained by taking the system head into consideration. The system head is the added difficulty to move water through the system presented by using elbows, piping, tees, changes in elevation, etc. Normally, **34 ft of water (34' of head)** is sufficient but will depend upon each individual system.

It is advisable to use the same number of pumps as filters, each pump producing the required flow for one filter. It is also recommended that the discharge from each pump is brought together in a single manifold to the filters. This will allow for greater flow rates for the backwash cycle.

For each suction side, it is also recommended that the supply to each pump come from either a general suction manifold or balance tank. The suctions should be taken from both the surface and from the bottom of the pool.

2 Characteristics and Dimensions

2.1 Dimensions and media requirements

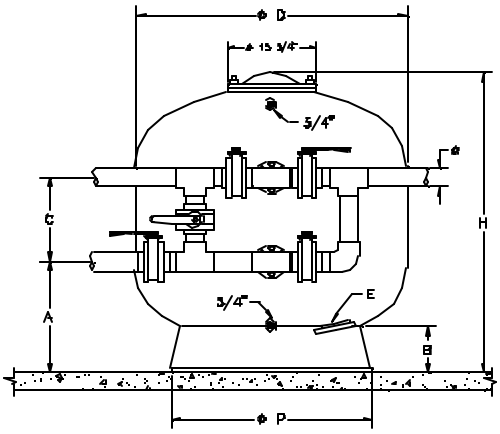


Fig. 2-1

DIAMETER	mm	1050	1200	1400	1600	1800	2000	2350
FILTER	Sq. Ft.	9.26	12.16	16.58	21.64	27.34	33.8	46.69
AREA	Sq. meters	0.8	1.13	1.54	2.01	2.54	3.14	4.33
SAND BED DEPTH		3	3	3	3'	3'	3'	3'
H (Ft)		5'-5"	5'-10"	5'-10"	6'-0"	6'-1 3/4"	6'-8 1/2"	8'-6"
B (Ft)		8"	9"	9 1/2"	10"	11"	11 7/8"	13 1/4"
A (Ft)		1'-9 1/4"	1'-10 1/2"	1'-11"	2'-2 3/4"	2'-4 3/8"	2'-7"	3'-2"
C (Ft)		2'-1 3/8"	2'-1 1/4"	2'-0"	1'-8 5/16"	1'-6 5/16"	1'-8"	2'-0"
P (Ft)		2'-5 1/2"	3'-1"	3'-6 1/2"	4'-0"	4'-6"	5'-1"	6'-0"
E (in)		3"	3"	3"	5"	5"	5"	5"
VOLUME	Gallons	277	396	528	687	898	1162	2125
OF FILTER	Liters	1050	1500	2000	2600	3400	4400	8045
NET	Lbs.	330	365	495	595	695	915	1124
WEIGHT	Kg.	150	165	225	270	315	415	570
SILICA	Lbs.	2975	3690	5235	7055	8490	10910	17360
SAND	Kg.	1350	1675	2375	3200	3850	4950	7875
SILICA	Lbs.	660	660	1100	1650	1650	2535	5730
SAND	Kg.	300	300	500	750	750	1150	2600
+	Lbs.	2315	3030	4135	5405	6840	8375	11629
GRAVEL	Kg.	1050	1375	1875	2450	3100	3800	5275

Table 2-1

2.2 Single Filter Systems

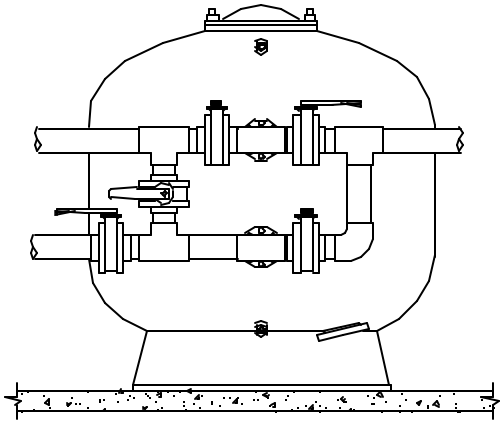


Fig. 2-2

Filter flow rate GPM per sq. ft.	TANK DIAMETER		FILTER AREA		PIPE MANIFOLD SIZE		FLOW RATE		POOL CAPACITY TURNOVER RATES 4 HOURS		6 HOURS		8 HOURS		MODELS			Shipping Weight		Operating Weight	
	Inches	mm.	Sq. Ft.	sq. m	inches	mm.	GPM	cubic m/h	Gal	cubic meters	Gal	cubic meters	Gal	cubic meters	No manifold	4-vavle	5-vavle	Lbs.	Kg.	Lbs.	Kgs.
10	42"	1050	9.32	0.86	2.5	62	93	21.1	22320	84	33480	127	44640	169	06635	06685	06698	385	175	4120	1869
	47"	1200	12.17	1.13	2.5	62	122	27.2	29280	111	43920	166	58560	222	06676	06686	06699	445	202	5500	2495
	55"	1400	16.56	1.54	3	75	166	37.7	39840	151	59760	226	79680	302	06677	06687	06700	530	240	8160	3700
	63"	1600	21.63	2.01	4	100	216	49	51840	196	77360	294	103680	392	06632	06688	06701	685	310	11100	5035
	71"	1800	27.38	2.54	4	100	273	62	65520	248	98280	372	131040	496	06678	06689	06702	795	360	13540	6050
	79"	2000	33.8	3.14	4	100	338	76.6	81120	306	121680	460	162240	613	06679	06690	06703	905	410	17130	8042
	93"	2350	46.69	4.33	6																
15	42"	1050	9.32	0.86	2.5	62	93	21.1	33360	126	50040	190	66720	253	06635	06685	06698	385	175	4120	1869
	47"	1200	12.17	1.13	2.5	62	122	27.2	43680	165	65820	248	87360	330	06680	06691	06704	480	218	5530	2508
	55"	1400	16.56	1.54	3	75	166	37.7	59760	226	89640	339	119520	452	06681	06692	06705	560	254	8220	3728
	63"	1600	21.63	2.01	4	100	216	49	78000	295	150000	443	156000	590	06632	06688	06701	685	310	11100	5035
	71"	1800	27.38	2.54	4	100	273	62	98400	372	149600	559	196800	744	06633	06693	06706	860	390	13500	6123
	79"	2000	33.8	3.14	4	100	338	76.6	121680	460	182520	691	243360	920	06634	06694	06707	970	440	17860	8100
	93"	2350	46.69	4.33	6																
20	42"	1050	9.32	0.86	2.5	62	93	21.1	44640	169	66960	253	89280	398	06682	06695	06708	420	190	4200	1905
	47"	1200	12.17	1.13	2.5	62	122	27.2	58560	222	87840	332	117120	443	06683	06696	06709	510	231	5580	2531
	55"	1400	16.56	1.54	3	75	166	37.7	79680	302	119520	452	159360	603	06681	06692	06705	560	254	8220	3728
	63"	1600	21.63	2.01	4	100	216	49	103680	392	155520	589	207360	785	06684	06697	06710	750	340	11240	5098
	71"	1800	27.38	2.54	4	100	273	62	131040	486	176560	744	262080	992	06633	06693	06706	860	390	13500	6123
	79"	2000	33.8	3.14	4	100	338	76.6	162240	614	243360	921	324470	1128	06634	06694	06707	970	440	17860	8100
	93"	2350	46.69	4.33	6																

Table 2-2

2.3 Double Filter Systems

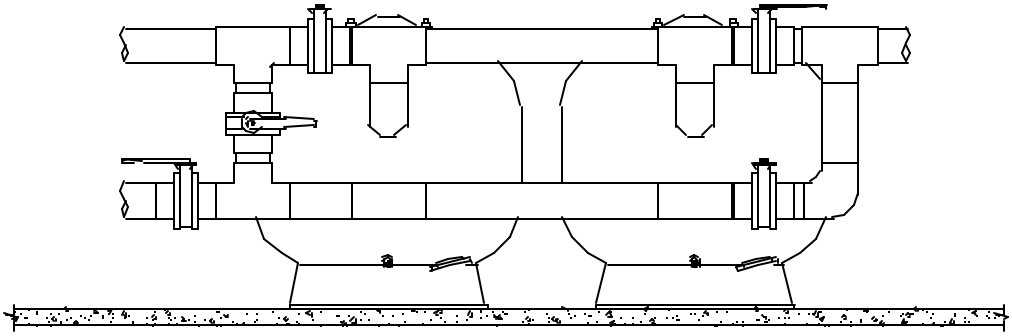


Fig. 2-3

Filter flow rate GPM per sq. ft.	TANK DIAMETER		FILTER AREA		CONNECTION SIZE		PLUMBING SIZE		FLOW RATE		POOL CAPACITY TURNOVER RATES 4 HOURS		6 HOURS		8 HOURS		MODELS		Shipping Weight		Operating Weight	
	Inches	mm.	Sq. Ft.	sq. m	inches	mm.	inches	mm.	GPM	cubic m/h	Gal	cubic meters	Gal	cubic meters	Gal	cubic meters	4-vavle	5-vavle	Lbs.	Kg.	Lbs.	Kgs.
10	42"	1050	18.52	1.72	2.5	62	4	100	186	42.8	44640	168	66960	254	89280	338	06711	06726	800	363	8400	3810
	47"	1200	24.32	2.26	2.5	62	4	100	244	55.4	59560	222	87840	332	117120	444	06712	06727	925	420	11070	5021
	55"	1400	33.16	3.08	3	75	6	150	332	75.4	77680	302	119520	452	159360	604	06713	06728	1150	522	16650	7552
	63"	1600	43.28	4.02	4	100	6	150	432	98	103680	392	155520	588	207860	784	06714	06729	1400	635	22420	10170
	71"	1800	54.68	5.08	4	100	6	150	546	124	131040	496	196560	744	262080	992	06715	06730	1600	725	26900	12200
	79"	2000	67.6	6.28	4	100	8	200	676	153.2	112240	612	243360	920	324480	1226	06716	06731	2000	907	36200	16420
	93"	2350	93.38	8.66																		
15	42"	1050	18.52	1.72	2.5	62	4	100	278	63.2	66720	252	100080	380	133440	506	06711	06726	800	363	8400	3810
	47"	1200	24.32	2.26	3	62	6	150	364	82.6	87360	330	131040	496	174780	660	06717	06732	1040	472	11350	5148
	55"	1400	33.16	3.08	4	100	6	150	498	113	114520	452	179280	678	239080	904	06718	06733	1050	476	16650	7552
	63"	1600	43.28	4.02	4	100	8	200	650	147.6	156000	590	234000	886	312000	1180	06719	06734	1550	703	23000	10433
	71"	1800	54.68	5.08	6	150	8	200	820	186.2	196800	744	205200	1118	393600	1488	06720	06735	1760	798	27450	12450
	79"	2000	67.6	6.28	6	150	8	200	1014	230.2	243360	920	365040	1382	485720	1840	06721	06736	2000	907	36200	16420
	93"	2350	93.38	8.66																		
20	42"	1050	18.52	1.72	2.5	62	6	150	372	84.4	92280	338	133920	506	178560	676	06722	06737	925	420	8620	3910
	47"	1200	24.32	2.26	2.5	62	6	150	488	110.8	117120	444	175680	664	234270	886	06723	06738	1040	472	11350	5148
	55"	1400	33.16	3.08	4	100	8	200	664	150.8	159360	604	239040	904	318720	1206	06724	06739	1300	590	17200	7800
	63"	1600	43.28	4.02	6	150	8	200	864	196.2	207360	784	311040	1178	414720	1570	06725	06740	1550	703	23000	10433
	71"	1800	54.68	5.08	6	150	8	200	1092	248	262080	992	393120	1488	524160	1984	06720	06735	1760	798	27450	12450
	79"	2000	67.6	6.28	6	150	8	200	1352	307	324480	1228	486720	1842	648960	2456	06721	06736	2000	907	36200	16420
	93"	2350	93.38	8.66																		

Table 2-3

3. Installation

3.1 General Installation notes

BEFORE DOING ANY INSTALLATION IT IS VERY IMPORTANT TO READ THIS ENTIRE SECTION.

Note: Filters are supplied, pallet mounted and plastic shrink wrapped, with lifting eyes on the top. Due to their weight and size it is recommended that mechanical means be employed to move the filters into position. It is also very important to inspect the filters carefully before unwrapping. Polyester filters can be damaged easily during transportation and is the responsibility of the installer to inspect at the time of delivery. Damages to filters from transportation that are not noted on the bill of lading are not covered by Astral's warranty policy and all costs to repair will be the responsibility of the owner.

Never put the media into the filter until it is in its final working position and all prior steps are complete.

The filters should be accessible for periodic maintenance or media change. It is absolutely necessary to leave a minimum access space around the filter(s). The following diagram below illustrates the minimums that are recommended for space, of course it is always better to have more space if possible.

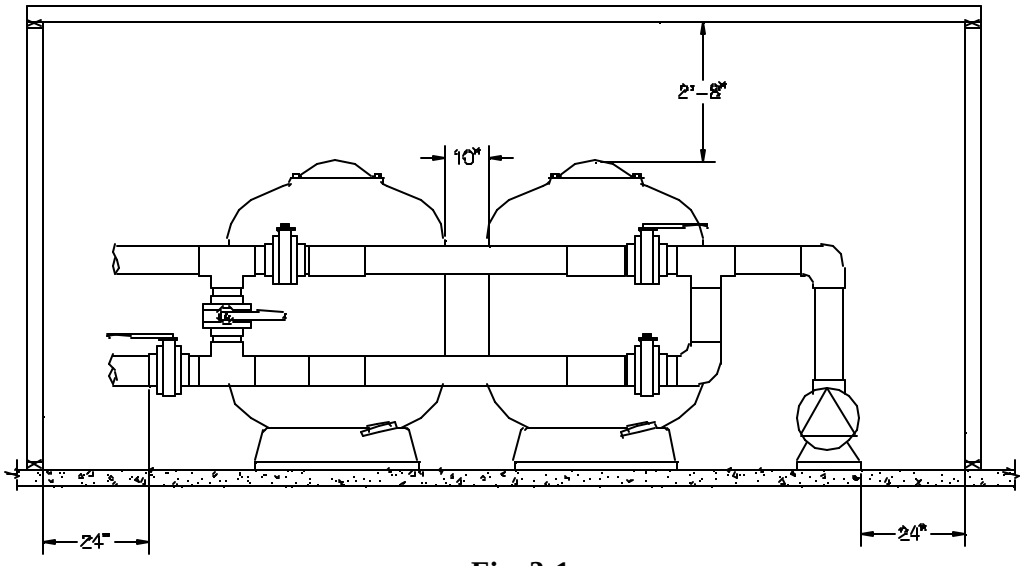


Fig. 3-1

It is recommended that the filters be installed below the level of the pool surface and as a near as possible to the balance tank or the pool itself.

The equipment room should be well ventilated and provided with adequate drainage capabilities so that should an emergency occur, resulting in flooding from a pipe, filter or pump, the water can be easily removed to avoid property damage. If drainage cannot be supplied directly from the equipment room, consideration should be given to the installation of an alternate system to remove water from the mechanical room.

3.2 Filter Installation

Move the filter(s) into place using the eye hooks that are located at the top of the filter. Be sure to use both eye hooks at the same time, this will prevent the filter from swinging side to side. Be careful not to hit the filter against something solid while positioning. Before continuing, be sure that the filter(s) are in the desired location with the connections facing the direction necessary for proper installation. It is also very important to make sure that the filter is sitting on a level hard surface.

It is possible that during transportation, some of the internal components have loosened. It is now necessary to remove the filter lid and enter the filter, being careful not to break any of the connections. By hand, check the tightness of all the laterals in the bottom of the filter making sure they are firmly tightened. Also, while in the filter, check for any cracks or breaks in the body of the filter or the PVC internals that might have occurred during transportation using a flashlight.

Inside the components box that is included with the filter there are two ¾" ball valves and gaskets for them. Install these valves with the gaskets onto the filter. One is for the top air purge nozzle located between the port connections and the manhole of the filter. The second is located below the port connections and above the base of the filter. Refer to Figure 1-1 for specific locations.

3.3 Valve manifold and supports installation

There are many different styles of manifolds that are available from Astral Products: 4 valve, 5 valve, single filter, dual filter, triple filter, and automatic for each style. If the manifold is purchased from Astral, it will come with a specific set of installation instructions inside the box. These instructions will cover all necessary steps to installing the manifold. If an additional copy is required please contact Astral customer service.

3.4 Installation of the Pressure Gauges

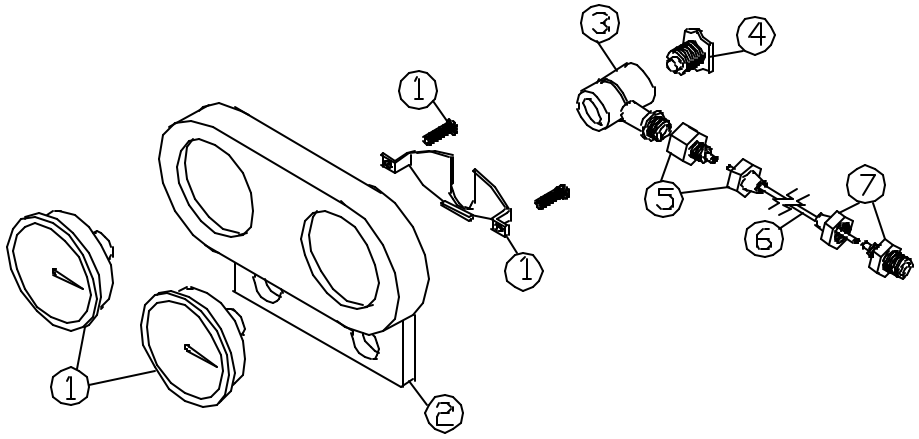


Fig. 3-2

Descriptions:

1. Pressure gauge and mounting bracket and hardware (Qty 2)
2. Gauge panel body (Qty 1)
3. Pressure gauge tee (Qty 2)
4. Air purge screw (Qty 2)
5. Female hose connector (Qty 2)
6. Pressure tubing (Qty 2 – 1 short & 1 long)
7. Male hose connector (Qty 2)

The pressure gauge assembly and panel body will come already pre-assembled. The pressure gauge panel is to be mounted on the top port of the filter using the same bolts that connect the filter to the manifold. If there was a manifold purchased with the filter, there will already be pre-drilled holes in it to insert the male hose connectors. Using teflon tape, thread the pressure gauge tee onto the threaded end of the pressure gauge. Thread the air purge screw into the back of the pressure gauge tee (without teflon). With teflon tape, thread the female hose connector onto the tee as shown in fig. 3-2. Remove the end of the female hose connector and slide the clear plastic tubing through the end and onto the end of the connector. Replace the end that was removed and tighten sufficiently (hand tight only). Using teflon tape, insert the male hose connectors into the pre-drilled hole in the manifold and tighten (being careful not to over tighten). Remove the end of the male connector and slide the clear plastic tube through the end and onto the end of the connector and replace the end.

There are two lengths of hose provided with the kit. The short length will be used for the connection closest to the gauge panel and the other (longer piece) will be used for the other port. Once the system is operational, the air purge screw is used to purge the air out of the lines for a more accurate reading. Loosen the air purge screw until water comes out, do not remove all the way. When the air is purged from the clear plastic line, retighten to stop the water leaking. It may also be necessary to put the pressure gauge panel on the lower port for some dual manifold systems. Once the system is started, the inlet pressure should be between **12 to 15 psi** and the outlet pressure will be **6 to 8 psi**.

3.5 Testing of filter

Before adding any sand to the filter**, it is very important to test the system with water only!!!** All filters are tested with high pressure before leaving the factory. It is possible that during transportation, the filter was damaged. It can be difficult to see some types of damaged may have occurred. It is important to test the system without sand first to check for leaks. Fill the system with water, replace the lid and gasket. Run system as normal and check of leaks. **If there is a problem with the test, contact Astral customer service immediately.** If sand is added before the test and there is a problem with the filter, the sand will need to be evacuated for inspection. Astral will **not** pay for the removal and replacement of the sand for warranty or repair work, nor will Astral provide the labor to evacuate and replace the sand for repair work done due to transportation. This is also a good chance to check all of the plumbing for the system. **Do not drain the water from the filter after the testing sequence.**

3.6 Installation of the media

After the testing has been finished and the system is 100% operational, we need to add the filtration media required. Remove the lid and gasket from the filter as before. The filter should be full of water at this time. If the filter is not full of water, the filter needs to be filled at least to the diffusers before adding the media. The proper amounts of media for each filter is listed in **Fig. 2-1.** If a diffuser head is directly underneath of the manhole cover, cover it with plastic and tape to prevent media from entering the plumbing.
Load the required amount of gravel into the filter. This layer should just cover the laterals in the bottom of the filter. Add the required amount of #20 silica sand to the filter. Remove the plastic from the diffuser(if

required). Now, replace the lid and gasket to the top of the filter. Be sure that the manhole cover is free of sand. If this is not free of sand, the gasket will not seat properly and could cause the filter to leak at the lid. Put the filter into backwash mode (see next section) and run for about 5 to 6 minutes. This will level the sand inside the filter. Put the valves into filter position and the system is ready for operation.

4 Normal Operation

4.1 Filtration

Note: There are many different styles of manifolds available for the Astral line of filters. This section will only discuss two different styles: 4-valve and 5 valve manual systems (is the same for dual or single filter systems).

With the pump off, arrange the valves for filtration(see tables 4-1 and 4-2). Normally, while a filter is running, the inlet pressure is 12 to 15 psi and the outlet pressure is 6 to 9 psi. This are normal pressures when the filter is clean. As the filter media cleans the water, it traps particles of debris from the water inside the filter. These particles will make it more difficult for water to pass through resulting in less water flow and a higher filter pressure. When this pressure difference is between 12 and 15 psi , it is time to backwash the system. Simply subtract the outlet pressure from the inlet pressure to determine your pressure differential.

Example:

Inlet pressure: 21 psi
Outlet pressure: 7 psi
Pressure differential: 14 psi

Conclusion: The filter requires a backwash cycle.

4.2 Backwash

In filter beds, there are thousands of channels for water to pass through, trapping particulate matter. As time passes these channels become blocked and it becomes necessary to clean the filter bed to restore the filter to its optimum working condition by discharging the trapped particles to drain. The velocity of the water for the backwash cycle should be the same as for the filtration mode. This velocity should never exceed 20 GPM per sq. Ft. of surface area to prevent discharging sand to drain and possibly damaging the filter.

The backwash cycle should be run for 3 to 5 minutes. It is advisable to fit a sight glass in the drain line close to the filter so that when a backwash is being carried out, one can see the water clearing and stop the backwash when the water is clean to avoid an unnecessary waste of water.

To carry out a backwash, stop the pump, set the valves into the backwash configuration (from Table 4-1 and 4-2), and restart the pump.

4.3 Rinse

Note: The rinse cycle is only available on a manifold that contains 5 valves. The 5^{th} valve allows for the rinse cycle.

It is recommended that the rinse cycle should be carried out immediately following a backwash. After a backwash cycle, there is debris and dirty water on top of and in the sand bed. The object of the rinse cycle is to send this dirty water and debris to waste. This will prevent cloudy water from entering the pool after each backwash cycle. To carry out a rinse cycle, turn the pump off, put the valves into the configuration

located in Table 4-2 , and restart the pump. Allow the pump to run for about 1 minute. Now, stop the pump and change the valve positions to the filtration mode from table 4-2. Now the system is ready for filtration once again.

4.4 Empty

When it is necessary to empty the pool, it is possible to empty it through the filter system. The water can be redirected to waste using the manifold on the filter. The valve configurations are contained in Tables 4-1 and 4-2 for each type of manifold.

4.5 Isolate / Close

As the name implies, all valves on the system are closed. This position is used for filter maintenance, cleaning and general shut down of the facility. See table 4-1 and 4-2 for the valve positions for both manifolds.

4.6 Valve manifold tables of operation

4.6.1 4-valve manifold table

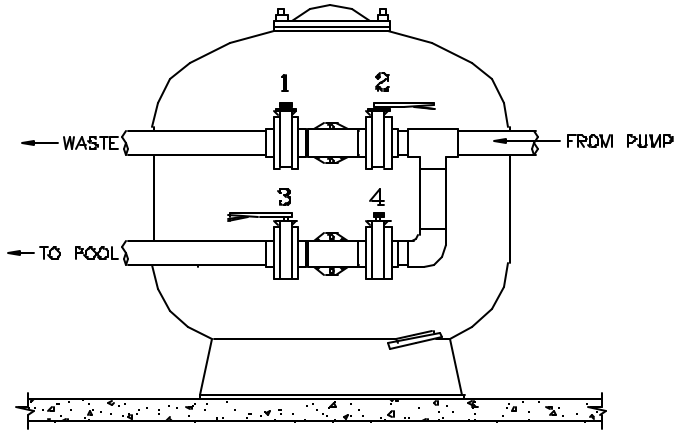


Fig. 4-1

Position	Valve #1	Valve #2	Valve #3	Valve #4
Filtration	closed	open	open	closed
Backwash	open	closed	closed	open
Empty	open	open	closed	closed
Isolate	closed	closed	closed	closed

Table 4-1

4.6.2 5-valve manifold table

Fig. 4-2

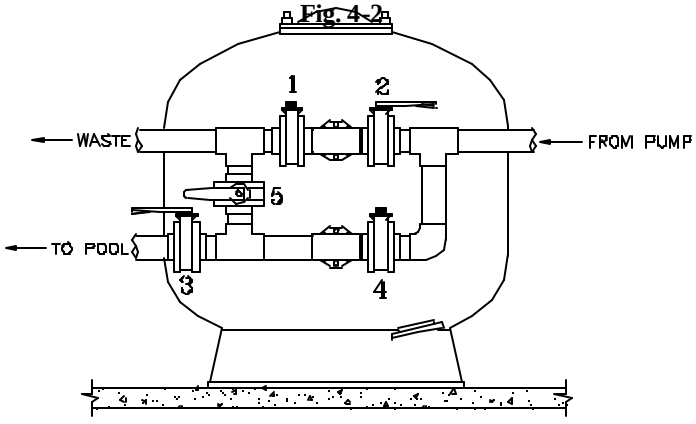


Table 4-2

Position	Valve #1	Valve #2	Valve #3	Valve #4	Valve #5
Filtration	closed	open	open	closed	closed
Backwash	open	closed	closed	open	closed
Rinse	open	closed	closed	open	open
Empty	open	open	closed	closed	closed
Isolate	closed	closed	closed	closed	closed

Attention: It is very important to turn off the filter pumps prior to changing valve positions.

5.0 Changing of The Media

The procedure for changing the filter media is as follows:

1. Turn off pumps.
2. Remove lid and gasket from filter.
3. Fill filter about ¾ full of water.
4. Remove sand drain cap at bottom of filter (being careful not to get wet).
5. Make sure that the sand does not block the sand passage.
6. Using a hose from above, spray the sand as the filter drains to keep a steady flow.
7. It may be necessary to enter the filter to remove the final ¼ of the sand.
8. Replace sand drain lid, making sure the "o" ring is in good condition.
9. Add the filtration media as described in section 3.6 of this manual.

6.0 Other recommendations of Interest

- Astral filters are virtually corrosion resistant and need very little maintenance. It is advisable to clean the surface of the filter every 2 years, or whenever dirty, with a mild soap and water to maintain the looks of the filter.
- Every filter is equipped with a manual air vent fitted in the top of the filter. In addition, each filter has a water drain located in the bottom of the filter which can be connected directly to a drain.
- When installing the valve manifold system it is advisable to use adequate pipe supports to support the weight of the manifold and the water flowing through it. Supports can be purchased from Astral if not already.
- All Astral filters can be completely automated. All manifolds manufactured by Astral can be retro-fitted with an automatic system without much change to the existing plumbing. Please contact Astral if interested.
- If the installation is to be shut down for long periods of time, it is advisable to drain the water during the period of non-use.
- Where freezing can occur, be certain to drain the filter before the opportunity to freeze can occur. Freezing of the water in a full filter will result in permanent damage to the fiberglass shell.
- Custom variations of the Astral filters are available, please contact Astral with any questions.

7.0 Graph of Filter Head Loss for Filters with Manifolds

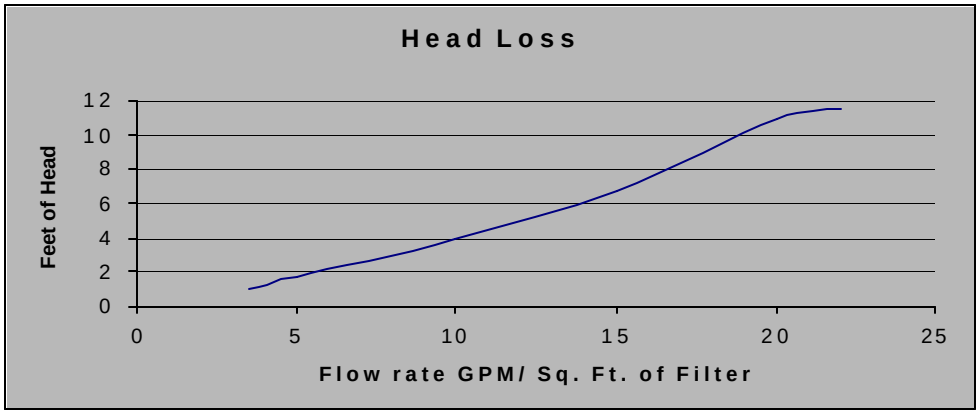
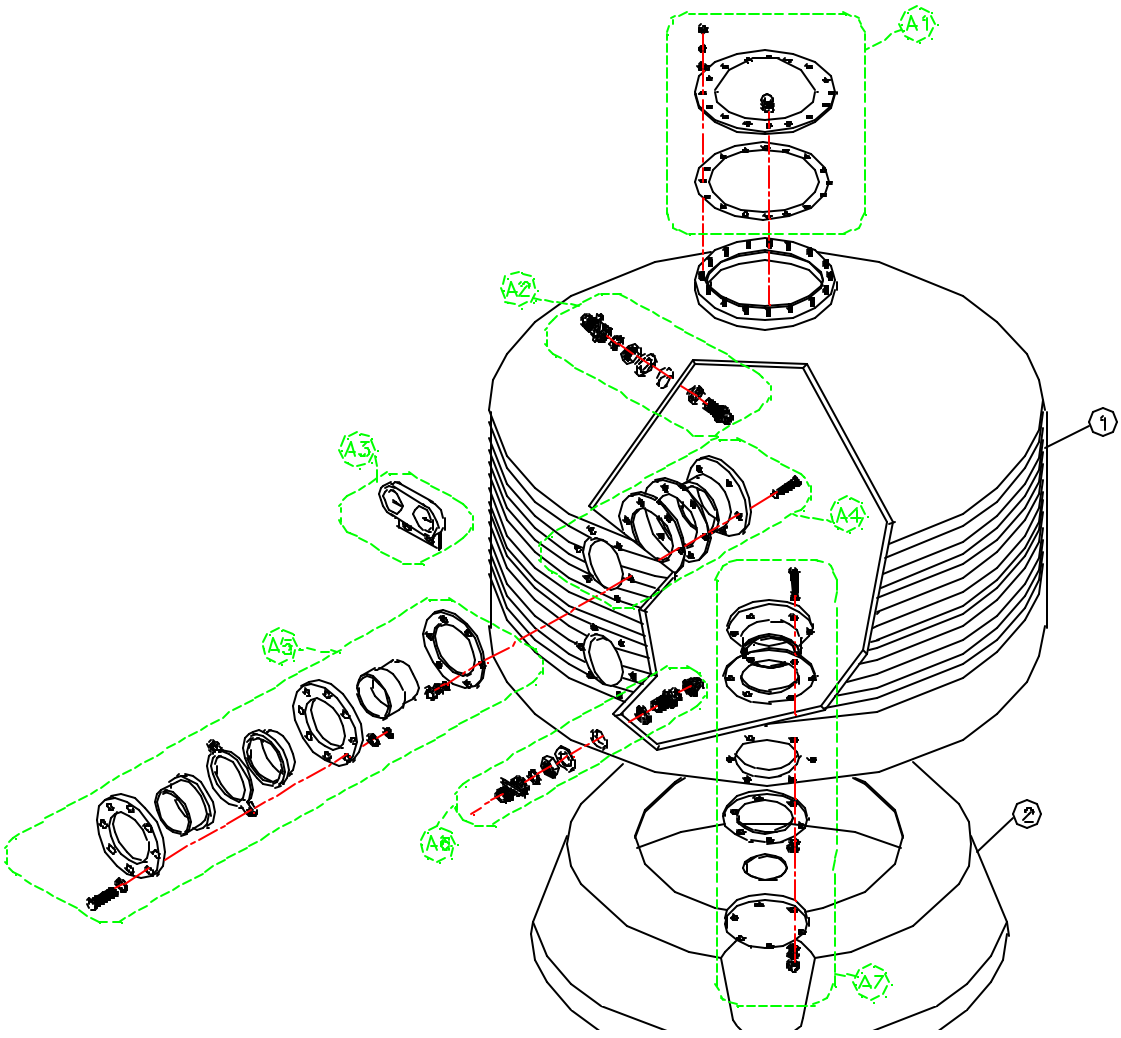
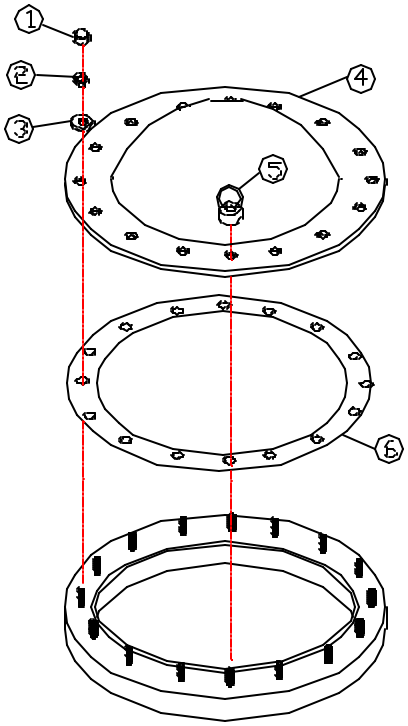


Fig. 7-1

8.0 Replacement Part Drawings and Numbers



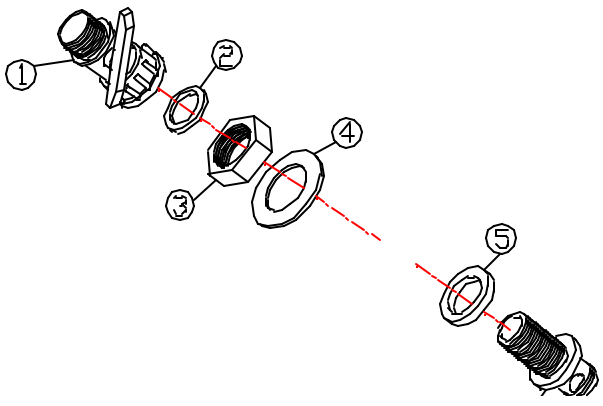


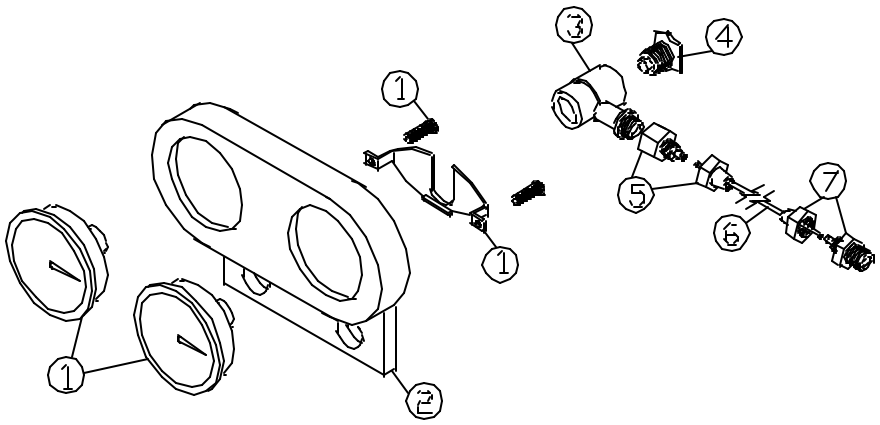
~~SECTION A-1(SAME FOR ALL COMMERCIAL FILTERS)~~

FIG.	PART #	DESCRIPTION
1	00545 R 0212	NUT CAP
2	70121 R 12000	M 12 STAINLESS NUT
3	70119 R 12000	M 12 STAINLESS WASHER
4	07134 R 0206	FIBERGLASS FILTER LID, BLACK
5	00545 R 0210	M12 EYE HOOK
6	788 R 4140120	FILTER LID GASKET

SECTION A2 (NOT APPLICABLE FOR MODEL # 06804 & 06805

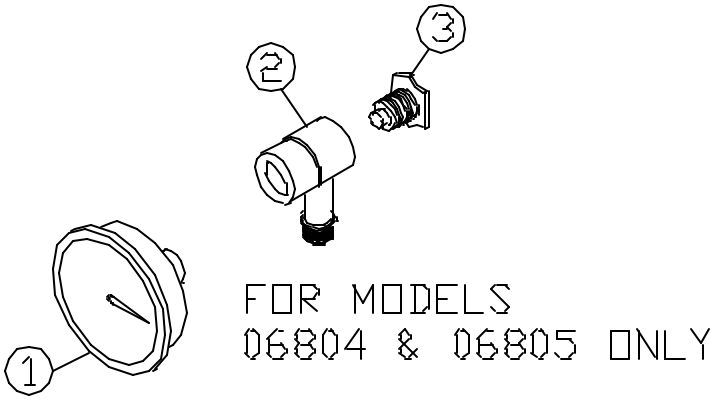
FIG.	PART #	DESCRIPTION
1	02579	3/4" BALL VALVE
2	04659 R 0603	FLAT GASKET FOR BALL VALVE
3	00545 R 0213	3/4" PURGE NUT
4	00545 R 0204	PLASTIC WASHER
5	07406 R 5012	FLAT GASKET FOR PURGE FITTING
6	00473 R 0408	AIR PURGE FITTING





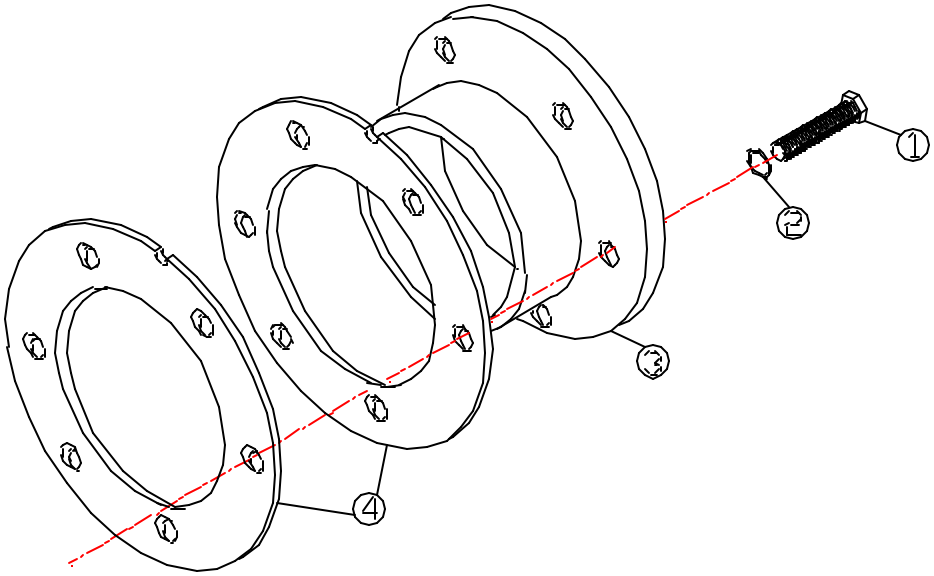
SECTION A-3 (NOT APPLICABLE FOR MODEL # 06804 & 06805

FIG.	PART #	DESCRIPTION
1	0073 R 0001	PRESSURE GAUGE & MOUNTING KIT
2	00729 R 0003	GAUGE PANEL BODY
3	00730 R 0001	GAUGE TEE
4	00470 R 0108	AIR PURGE NUT
5	00729 R 0006	FEMALE TUBE FITTING
6		CLEAR PLASTIC TUBING
7	01413 R 0200	MALE TUBE FITTING



SECTION A-3 FOR MODELS 06804 & 06805 ONLY

FIG.	PART #	DESCRIPTION
1	07407 R 8013	PRESSURE GAUGE
2	00555 R 0401	PRESSURE GAUGE TEE
3	02121	GAUGE TEE



~~SECTION A-4 FOR FILTERS WITH 2 1/2" CONNECTIONS~~

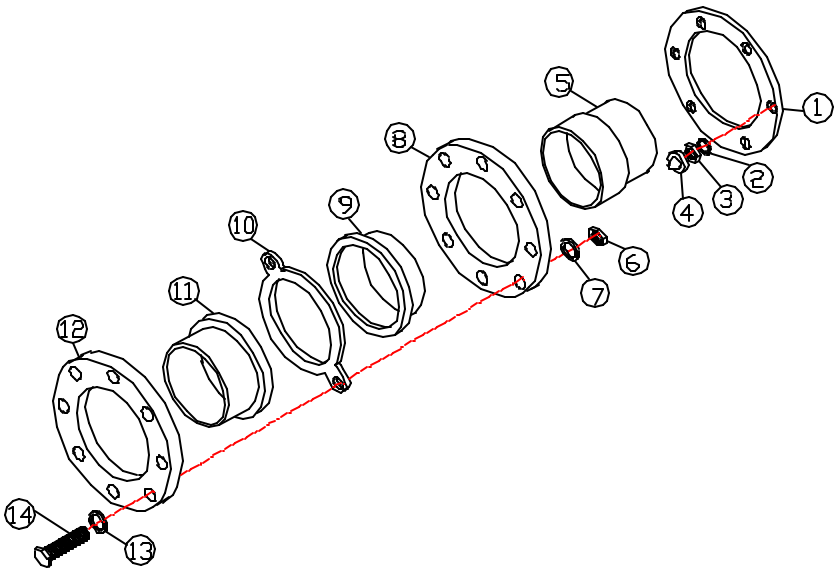
FIG.	PART #	DESCRIPTION
1	70101 R 10050	M10 X 50 STAINLESS BOLT
2	721 R 0089019	BOLT "O" RING - M10
3		2 1/2" BULKHEAD FITTING
4	00545 R 0305	2 1/2" PORT GASKET

~~SECTION A-4 FOR FILTERS WITH 3" AND 4" CONNECTIONS~~

FIG.	PART #	DESCRIPTION
1	70101 R 10065	M10 X 65 STAINLESS BOLT
2	721 R 0089019	BOLT "O" RING - M10
3		3" / 4" BULKHEAD FITTING
4	00546 R 0202	3" / 4" PORT GASKET

~~SECTION A-4 FOR FILTERS WITH 6" CONNECTIONS~~

FIG.	PART #	DESCRIPTION
1	70101 R 10065	M10 X 65 STAINLESS BOLT
2	721 R 0089019	BOLT "O" RING - M10
3		3" / 4" BULKHEAD FITTING
4	00710 R 0402	6" PORT GASKET



SECTION A-5 FOR FILTERS WITH 2 1/2" CONNECTIONS

FIG.	PART #	DESCRIPTION
1	00545 R 0303	EXTERIOR BULKHEAD FLANGE
2	70119 R 10000	M10 STAINLESS WASHER
3	70121 R 10000	M10 STAINLESS NUT
4	00545 R 0307	M10 NUT CAP
5		PORT EXTENDER
6	70321 R 16000	M16 NUT
7	70319 R 16000	M16 FLAT WASHER
8	02034	75mm PVC FLANGE
9	02022	75mm FLANGE HUB
10	02063	75mm FLAT GASKET
11	0510907	2 1/2" FLANGE HUB
12	02034	75mm PVC FLANGE
13	70319 R 16000	M16 FLAT WASHER
14	70301 R 16080	M16 X 80 ZP BOLT

SECTION A-5 FOR FILTERS WITH 4" CONNECTIONS

FIG.	PART #	DESCRIPTION
1	00546 R 0201	EXTERIOR BULKHEAD FLANGE
2	70119 R 10000	M10 STAINLESS WASHER
3	70121 R 10000	M10 STAINLESS NUT
4	00545 R 0307	M10 NUT CAP
5		PORT EXTENDER
6	70321 R 16000	M16 NUT
7	70319 R 16000	M16 FLAT WASHER
8	02036	110mm PVC FLANGE
9	02024	110mm FLANGE HUB
10	02065	110mm FLAT GASKET
11	0510910	4" FLANGE HUB
12	02035	90mm PVC FLANGE
13	70319 R 16000	M16 FLAT WASHER
14	70301 R 16090	M16 X 90 ZP BOLT

SECTION A-5 FOR FILTERS WITH 3" CONNECTIONS

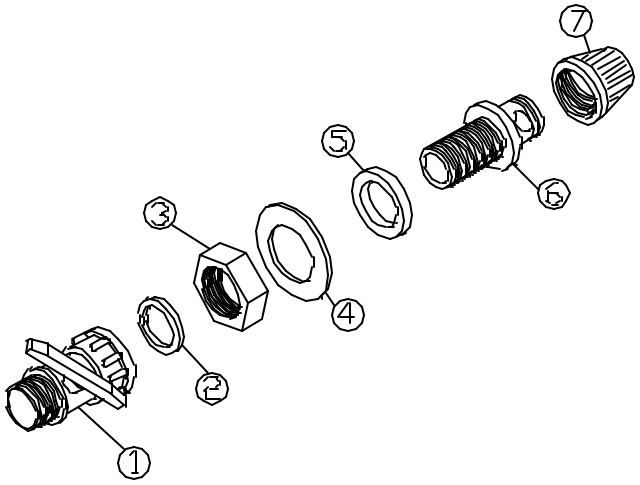
FIG.	PART #	DESCRIPTION
1	00546 R 0201	EXTERIOR BULKHEAD FLANGE
2	70119 R 10000	M10 STAINLESS WASHER
3	70121 R 10000	M10 STAINLESS NUT
4	00545 R 0307	M10 NUT CAP
5		PORT EXTENDER
6	70321 R 16000	M16 NUT
7	70319 R 16000	M16 FLAT WASHER
8	02035	90mm PVC FLANGE
9	02023	90mm FLANGE HUB
10	02064	90mm FLAT GASKET
11	0510908	3" FLANGE HUB
12	02035	90mm PVC FLANGE
13	70319 R 16000	M16 FLAT WASHER
14	70301 R 16090	M16 X 90 ZP BOLT

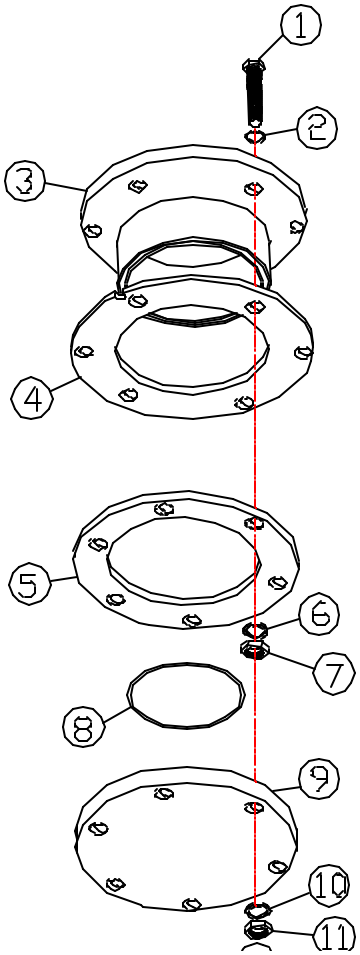
SECTION A-5 FOR FILTERS WITH 6" CONNECTIONS

FIG.	PART #	DESCRIPTION
1	00710 R 0401	EXTERIOR BULKHEAD FLANGE
2	70119 R 10000	M10 STAINLESS WASHER
3	70121 R 10000	M10 STAINLESS NUT
4	00545 R 0307	M10 NUT CAP
5	05083 R 0201	PORT EXTENDER
6	70321 R 16000	M16 NUT
7	70319 R 16000	M16 FLAT WASHER
8	02040	160mm PVC FLANGE
9	02027	160mm FLANGE HUB
10	02068	160mm FLAT GASKET
11	0510914	6" FLANGE HUB
12	02040	160mm PVC FLANGE
13	70319 R 16000	M16 FLAT WASHER
14	70301 R 16090	M16 X 90 ZP BOLT

SECTION A-6 (APPLICABLE FOR ALL COMMERCIAL FILTEF

FIG.	PART #	DESCRIPTION
1	02579	3/4" BALL VALVE
2		FLAT GASKET FOR BALL VALVE
3	01414 R 0601	3/4" PURGE NUT
4	00545 R 0204	PLASTIC WASHER
5	0706 R 5012	FLAT GASKET FOR PURGE FITTING
6	00473 R 0408	WATER PURGE FITTING
7	00473 R 0407	DRAIN HEAD





SECTION A-7 (APPLICABLE FOR 42" THRU 55" FILTERS)

FIG.	PART #	DESCRIPTION
1	70101 R 10100	M10 X 100 STAINLESS BOLT
2	721 R 0089019	BOLT "O" RING - M10
3	00687 R 0302	SAND DRAIN PORT 90mm
4	00687 R 0303	SAND PORT GASKET 90mm
5	00546 R 0201	EXTERIOR BULKHEAD FLANGE
6	70119 R 10000	M10 STAINLESS WASHER
7	70121 R 10000	M10 STAINLESS NUT
8	773 R 0950050	SAND DRAIN COVER GASKET
9	00687 R 0301	SAND DRAIN CAP 90mm
10	70138 R 10000	M10 STAINLESS WASHER (LARGE)
11	70121 R 10000	M10 STAINLESS NUT
12	00545 R 0307	NUT CAP

SECTION A-7 (APPLICABLE FOR 63" THRU 93" FILTERS)

FIG.	PART #	DESCRIPTION
1	70101 R 10100	M10 X 100 STAINLESS BOLT
2	721 R 0089019	BOLT "O" RING - M10
3	00690 R 0401	SAND DRAIN PORT 140mm
4	00690 R 0402	SAND PORT GASKET 140mm
5	00710 R 0401	EXTERIOR BULKHEAD FLANGE
6	70119 R 10000	M10 STAINLESS WASHER
7	70121 R 10000	M10 STAINLESS NUT
8	773 R 1450050	SAND DRAIN COVER GASKET
9	00687 R 0301	SAND DRAIN CAP 140mm
10	70138 R 10000	M10 STAINLESS WASHER (LARGE)
11	70121 R 10000	M10 STAINLESS NUT

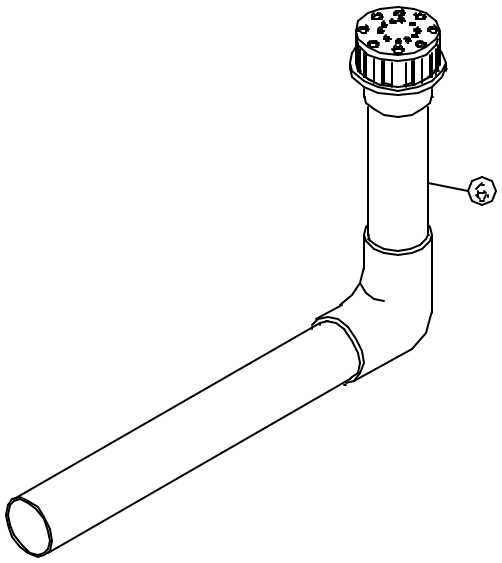


FIG. B-1 - DIFFUSOR ASSEMBLY FOR 42" AND 47" FILTERS

FIG.	PART #	DESCRIPTION
1	00545 R 0500	DIFFUSOR ASSY FOR MODEL # 06804
1	00546 R 0400	DIFFUSOR ASSY FOR MODEL # 06805
1	00694 R 0300	DIFFUSOR ASSY FOR MODEL # 06635
1	00707 R 0200	DIFFUSOR ASSY FOR MODEL # 06682
1	00688 R 0200	DIFFUSOR ASSY FOR MODEL # 06676
1	00702 R 0200	DIFFUSOR ASSY FOR MODEL # 06680
1	00683 R 0200	DIFFUSOR ASSY FOR MODEL # 06683

Fig. B-1

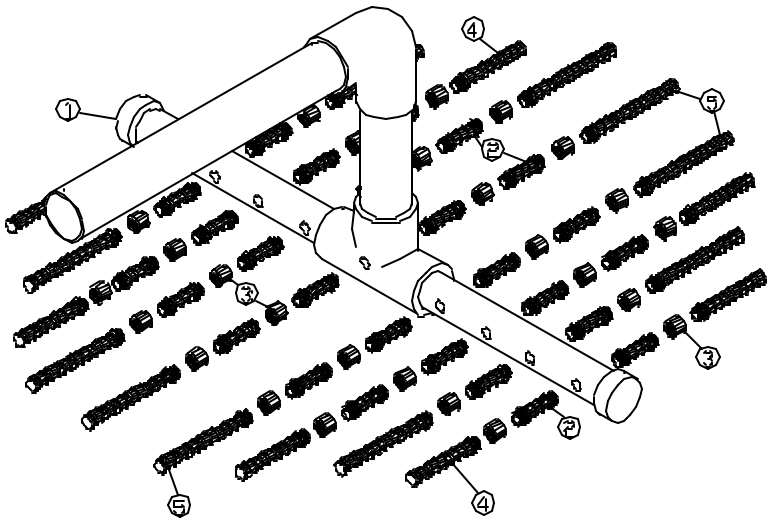


FIG. B-2 - COLLECTOR ASSEMBLY FOR 42" AND 47" FILTERS

FIG.	PART #	DESCRIPTION
1	00545 R 0400	LATERAL BODY FOR MODEL # 06804
1	00546 R 0300	LATERAL BODY FOR MODEL # 06805
1	00694 R 0400	LATERAL BODY FOR MODEL # 06635
1	00707 R 0300	LATERAL BODY FOR MODEL # 06682
1	00688 R 0200	LATERAL BODY FOR MODEL # 06676
1	00702 R 0300	LATERAL BODY FOR MODEL # 06680
1	06683 R 0300	LATERAL BODY FOR MODEL # 06683
2	00629	LATERAL ARM EXTENSION - 100mm
3	00630	LATERAL ARM COUPLING - 3/4"
4	00627	LATERAL ARM - 160mm
5	00626	LATERAL ARM - 225mm

Fig. B-2

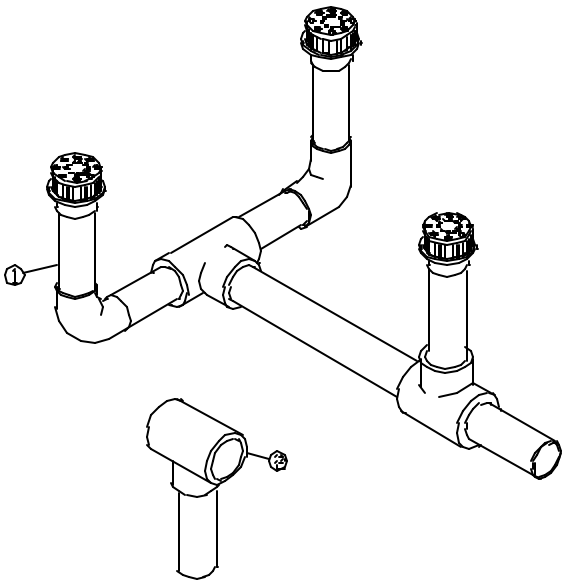


Fig. B-3

FIG. B-3 - DIFFUSOR ASSY FOR 55", 63", 71", AND 79"-4" FILTERS

FIG.	PART #	DESCRIPTION
1	00696 R 0200	DIFFUSOR ASSY FOR MODEL # 06677
1	0703 R 0300	DIFFUSOR ASSY FOR MODEL # 06681
1	00697 R 0200	DIFFUSOR ASSY FOR MODEL # 06632
1	06684 R 0200	DIFFUSOR ASSY FOR MODEL # 06684
1	00698 R 0200	DIFFUSOR ASSY FOR MODEL # 06678
1	06633 R 0300	DIFFUSOR ASSY FOR MODEL # 06633
1	00692 R 0200	DIFFUSOR ASSY FOR MODEL # 06679
2	00696 R 0400	DIFFUSOR SUPPORT - 55" - 3"
2	00703 R 0500	DIFFUSOR SUPPORT - 55" - 4"
2	00697 R 0400	DIFFUSOR SUPPORT - 63" - 4"
2	00710 R 0500	DIFFUSOR SUPPORT - 63" - 6"
2	00698 R 0200	DIFFUSOR SUPPORT - 71" - 4"
2	06633 R 0300	DIFFUSOR SUPPORT - 71" - 6"
2	00692 R 0200	DIFFUSOR SUPPORT - 79" - 4"

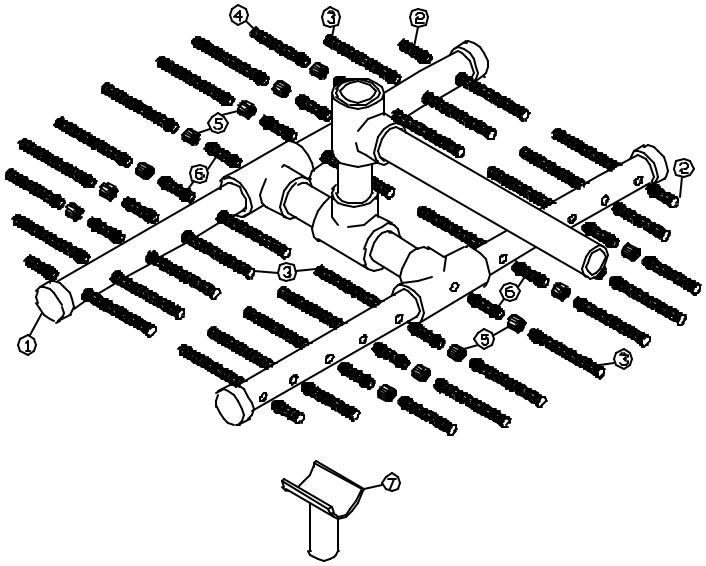


Fig. B-4

FIG. B-4 - COLLECTOR ASSY FOR 55"-3" & 55" - 4" FILTERS

FIG.	PART #	DESCRIPTION
1	00696 R 0300	LATERAL BODY FOR 55" - 3"
1	00703 R 0400	LATERAL BODY FOR 55" - 4"
2	00628	LATERAL ARM - 110mm
3	00626	LATERAL ARM - 225mm
4	00627	LATERAL ARM - 160mm
5	00630	LATERAL ARM COUPLING - 3/4"
6	00629	LATERAL ARM EXTENSION - 100mm
7	00696 R 0500	LATERAL SUPPORT - 3"

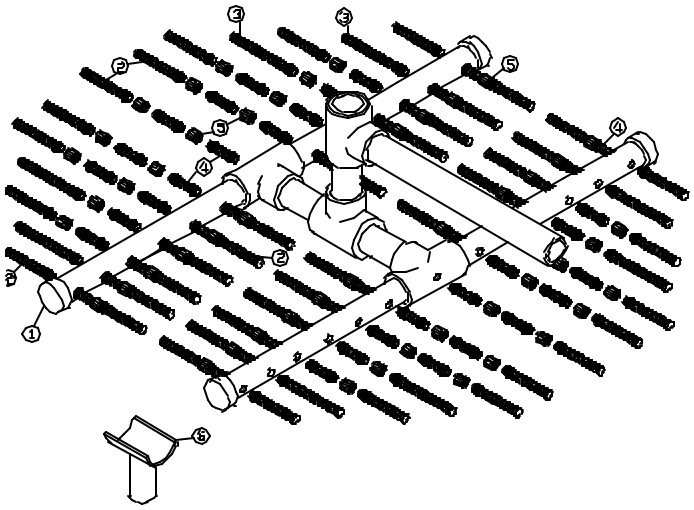


Fig. B-5

~~FIG. B-5 - COLLECTOR ASSY FOR 63" - 4" FILTER~~

FIG.	PART #	DESCRIPTION
1	00647 R 030(	LATERAL BODY FOR 63" - 4"
2	00627	LATERAL ARM - 160mm
3	00626	LATERAL ARM - 225mm
4	00629	LATERAL ARM EXTENSION - 100mm
5	00630	LATERAL ARM COUPLING - 3/4"
6	00697 R 060(	LATERAL SUPPORT - 4"

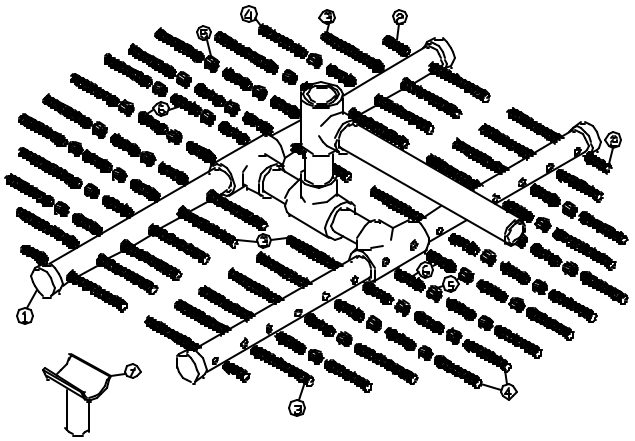


Fig. B-6

~~FIG. B-6 - COLLECTOR ASSY FOR 63" - 6" FILTER~~

FIG.	PART #	DESCRIPTION
1	00710 R 0300	LATERAL BODY FOR 63" - 6"
2	00628	LATERAL ARM - 110mm
3	00626	LATERAL ARM - 225mm
4	00627	LATERAL ARM - 160mm
5	00630	LATERAL ARM COUPLING - 3/4"
6	00629	LATERAL ARM EXTENSION - 100mm
7	00710 R 0600	LATERAL SUPPORT - 6"

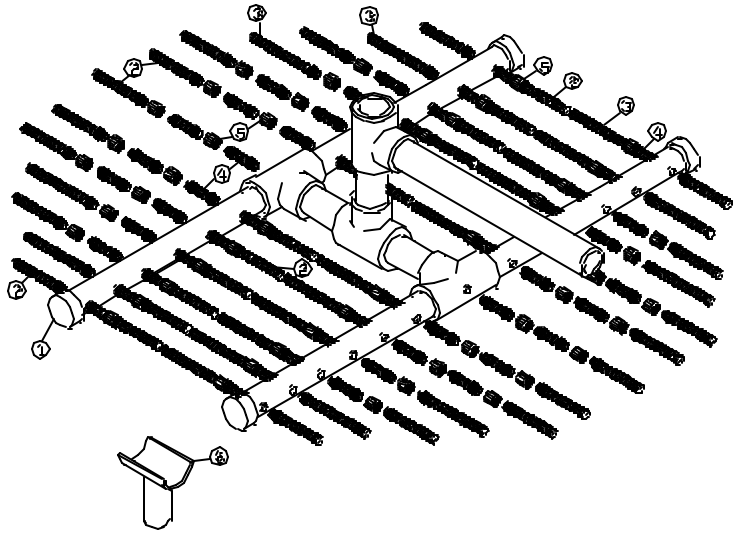


Fig. B-7

FIG. B-7 - COLLECTOR ASSY FOR 71" - 4" FILTER

FIG.	PART #	DESCRIPTION
1	00698 R 0300	LATERAL BODY FOR 71" - 4"
2	00627	LATERAL ARM - 160mm
3	00626	LATERAL ARM - 225mm
4	00629	LATERAL ARM EXTENSION - 100mm
5	00630	LATERAL ARM COUPLING - 3/4"
6	00698 R 0500	LATERAL SUPPORT - 4"

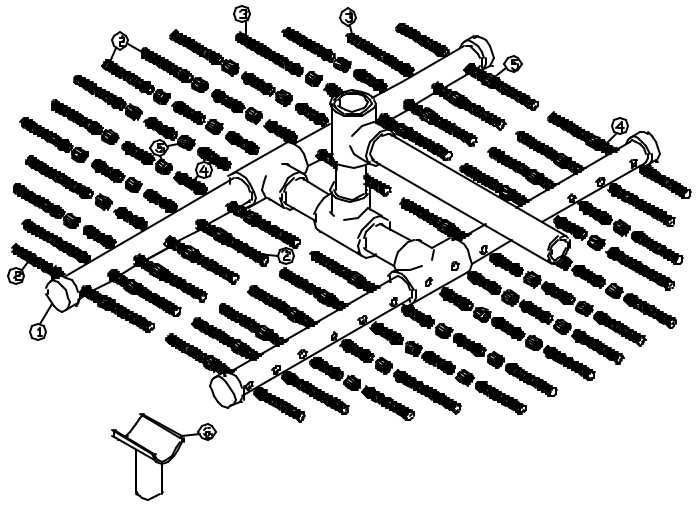
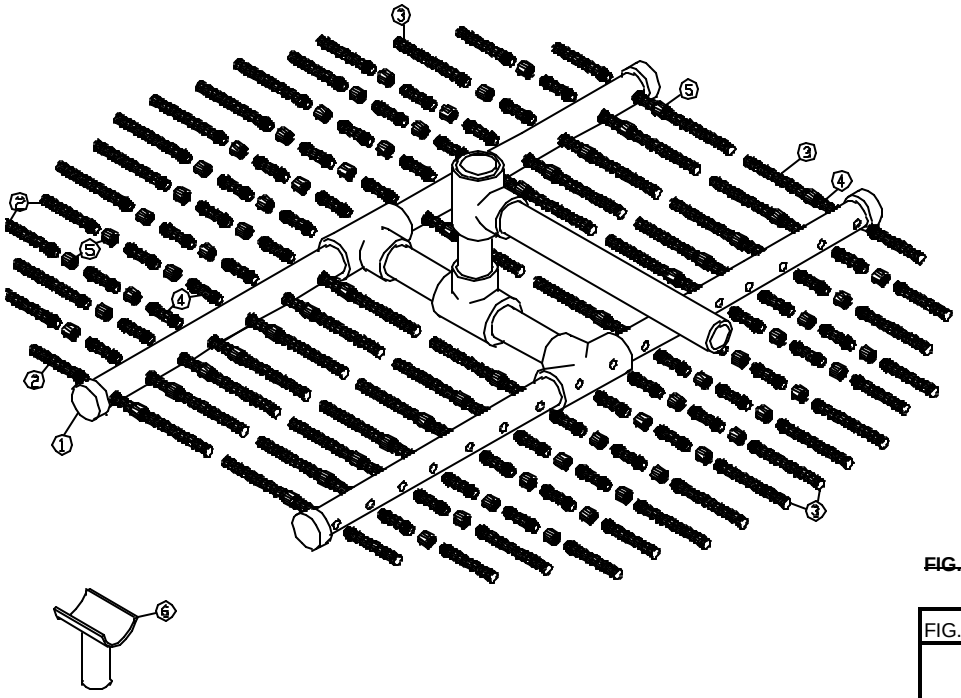


Fig. B-8

FIG. B-8 - COLLECTOR ASSY FOR 71" - 6" FILTER

FIG.	PART #	DESCRIPTION
1	06633 R 0400	LATERAL BODY FOR 71" - 6"
2	00627	LATERAL ARM - 160mm
3	00626	LATERAL ARM - 225mm
4	00629	LATERAL ARM EXTENSION - 100mm
5	00630	LATERAL ARM COUPLING - 3/4"
6	06633 R 0600	LATERAL SUPPORT - 6"



~~FIG. B-9 - COLLECTOR ASSY FOR 79" - 4" FILTER~~

FIG.	PART #	DESCRIPTION
1	00692 R 0300	LATERAL BODY FOR 79" - 4"
2	00627	LATERAL ARM - 160mm
3	00626	LATERAL ARM - 225mm
4	00629	LATERAL ARM EXTENSION - 100mm
5	00630	LATERAL ARM COUPLING - 3/4"
6	00692 R 0500	LATERAL SUPPORT - 4"

Fig. B-9

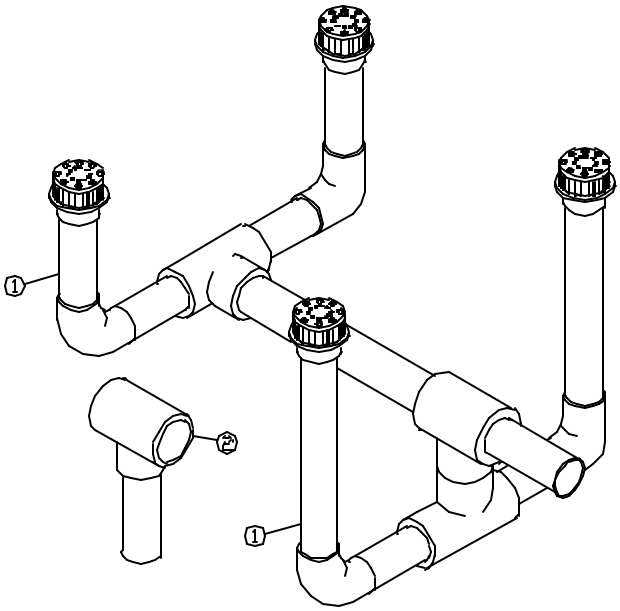


FIG. B-10 - DIFFUSOR ASSEMBLY FOR 79"-6" FILTER

FIG.	PART #	DESCRIPTION
1	05083 R 0300	DIFFUSOR ASSY FOR 79" - 6"
2	05083 R 0500	DIFFUSOR SUPPORT 6"

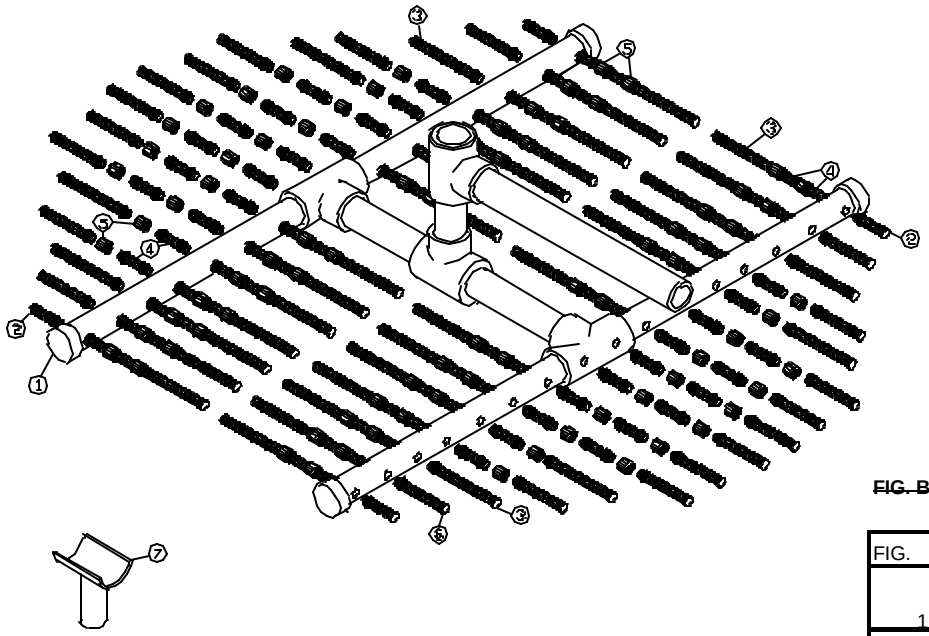


FIG. B-11 - COLLECTOR ASSY FOR 79" - 6" FILTER

FIG.	PART #	DESCRIPTION
1	05083 R 040(	LATERAL BODY FOR 79" - 6"
2	00628	LATERAL ARM - 110mm
3	00626	LATERAL ARM - 225mm
4	00629	LATERAL ARM EXTENSION - 100mm
5	00630	LATERAL ARM COUPLING - 3/4"
6	00627	LATERAL ARM - 160mm
7	00692 R 050(	LATERAL SUPPORT - 4"

Fig. B-10

Fig. B-11

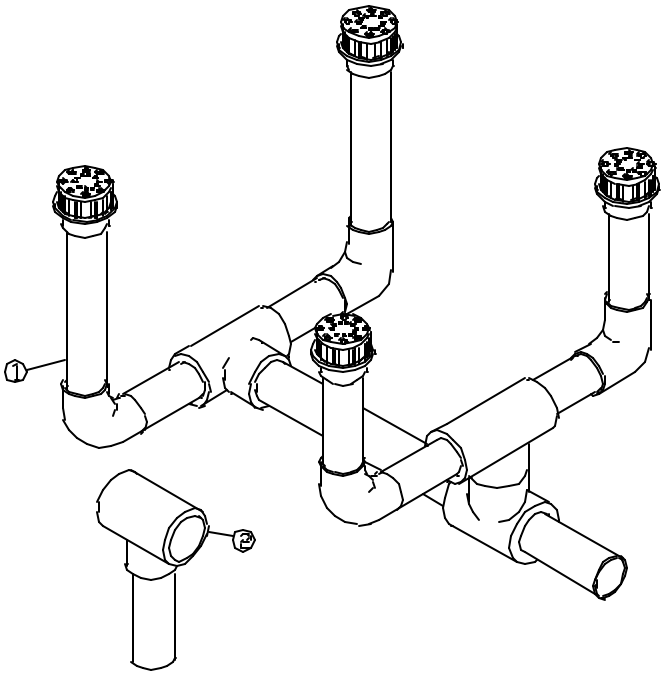


FIG. B-12 - DIFFUSOR ASSEMBLY FOR 93" FILTER

FIG.	PART #	DESCRIPTION
1	00700 R 020(	DIFFUSOR ASSY FOR 93" - 6"
1	04938 R 030(	DIFFUSOR ASSY FOR 93" - 8"
2	00700 R 040(	DIFFUSOR SUPPORT - 6"
2	04938 R 050(	DIFFUSOR SUPPORT - 8"

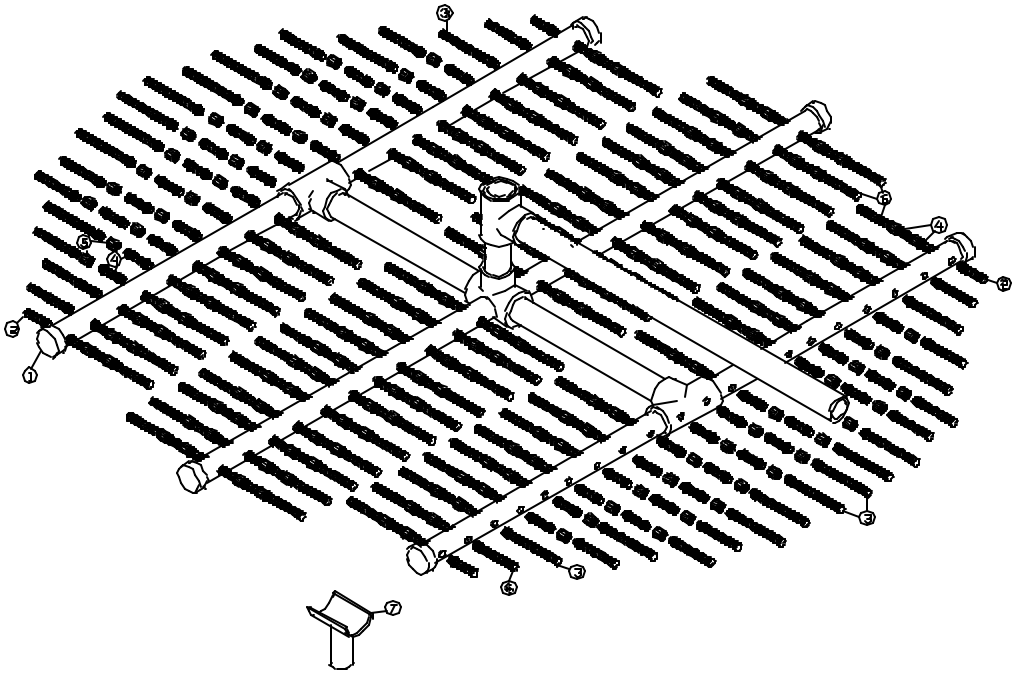


Fig. B-12

Fig. B-13

FIG. B-13 - COLLECTOR ASSY FOR 93" - 6" & 93"- 8" FILTER

FIG.	PART #	DESCRIPTION
1	00700 R 0300	LATERAL BODY FOR 93" - 6"
1	04938 R 0400	LATERAL BODY FOR 93" - 8"
2	00628	LATERAL ARM - 110mm
3	00626	LATERAL ARM - 225mm
4	00629	LATERAL ARM EXTENSION - 100mm
5	00630	LATERAL ARM COUPLING - 3/4"
6	00627	LATERAL ARM - 160mm
7	00700 R 0500	LATERAL SUPPORT - 6"
7	04938 R 0600	LATERAL SUPPORT - 8"