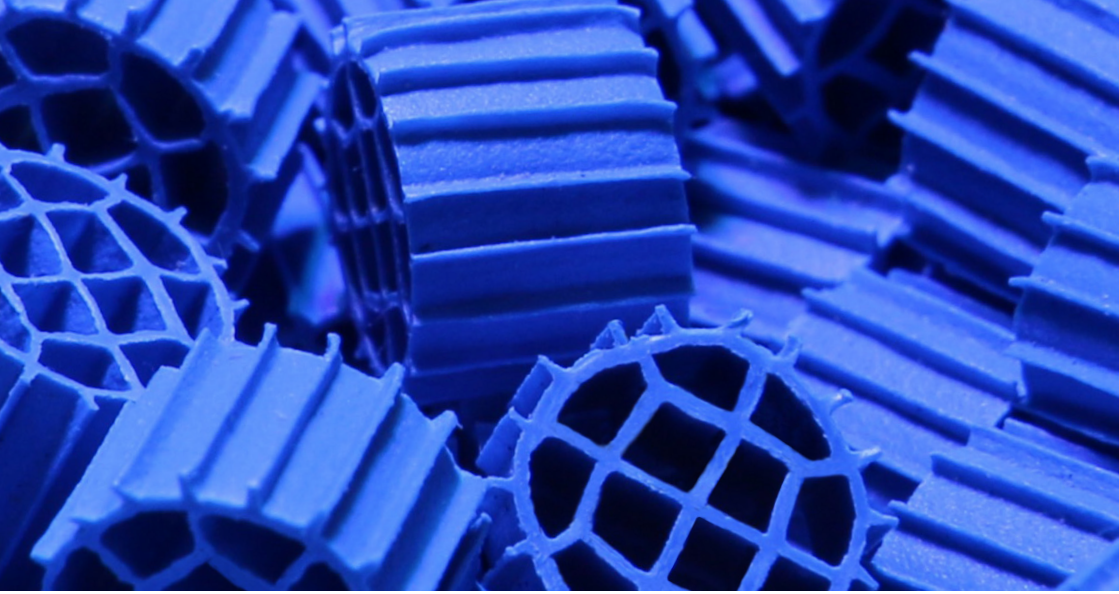
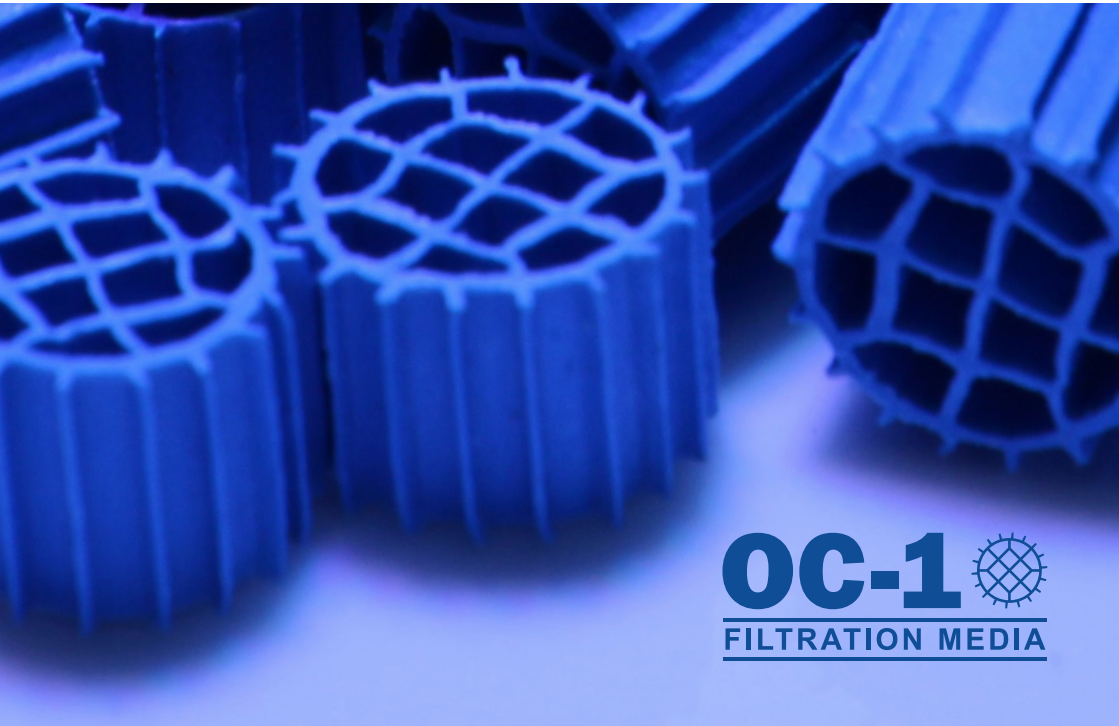


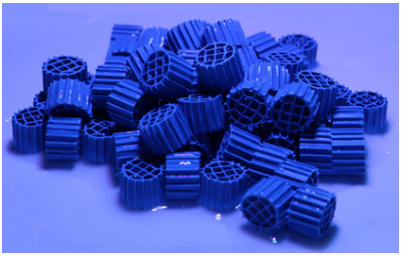
OC-1 FILTERS

Commercial Filter Instructions



Congratulations on purchasing an OC-1 filter, the revolutionary new filter media that can save you energy and water.

OC-1 Media



OC-1 is not a traditional filter media that relies on trapping dirt between particles, OC-1 works by reducing the velocity of the dirt passing through the bed until it settles out in a quiet void. This difference in the way it works means it will behave differently to what you might be used to with an old-fashioned filter.

Save Water

The pressure will not rise with OC-1 no matter how much debris is in the filter. Therefore, backwashing should be done on a time basis. For a normally used commercial pool this would mean a maximum of once a week, probably less, saving water and time.

Save Energy

OC-1 has less resistance than traditional filter medias, so it should be possible to use a smaller pump or reduce the speed with a variable speed pump and maintain the same flow that you would through a traditional media (this is dependent on existing restrictions through your pipework). This will save you electricity and money. For example, if you can reduce the speed of the pump by 20% this will equate to an electrical saving of 48.8% (using the pump affinity law).

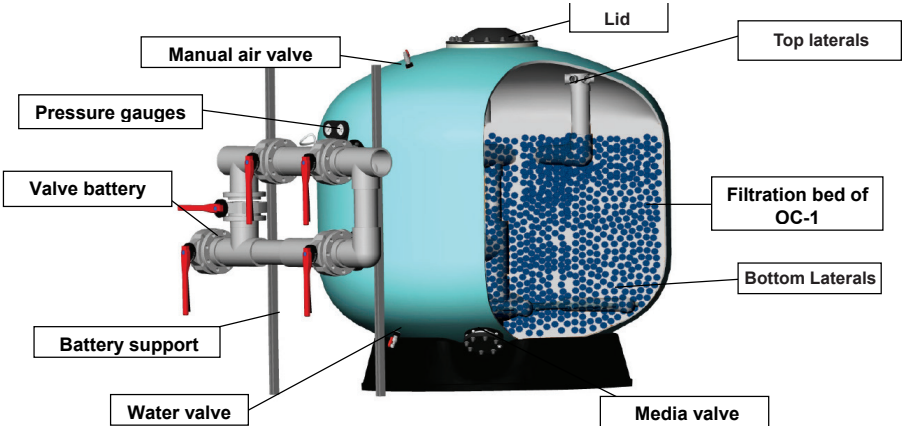
This booklet will take you through the basics of filtration, for further information on OC-1 please visit: www.ocmproducts.com

CHECK THE PACKAGING

Check that the filter and all its components are in good condition after transportation. There is a box with the filter, which contains pressure gauges, along with other accessories. There will also be a guarantee.

1. GENERAL

1.1 Pool Filters



Filters are, without doubt, the most important accessory for water clarification. Their purpose is to remove the suspended materials that pollute the swimming pool water.

The effectiveness of the filtration will also affect the effectiveness of the water disinfection.

The physical principle of OC-1 filtration is settlement, as debris passes through the OC-1 bed it loses its kinetic energy and settles in one of the many areas of low flow / low pressure within the filtration bed.

The water filtration and purification process includes a whole variety of elements, besides the filter, that needs to be taken into account:- pumps, chemical water treatments, pool structure accessories for ensuring the return and suction of the water, as well as other elements capable of ensuring proper circulation and the maintenance of water quality.

Normally, each country has its own legislation, and the installers should consult these before carrying out any design or installation. For this reason, the elements and materials of the project should be designed and defined respecting the local established standards.

Filtration quality depends on various parameters: the model of the filter, the height of the filtration bed etc. It should also be noted that the filtration speed / velocity is a determining factor for obtaining good filtration quality.

Other important concepts to keep in mind when choosing a filter are the characteristics of the materials used in its manufacture, its working temperature and its working pressure.

1.2 Filters

For manufacturing the filter, materials like polyester resins and fiberglass are used. The laterals found inside it, are made of ABS.

It is designed to withstand a pressure and temperature as shown on the filter label. The pressure and temperature stated must never be exceeded, as these are maximum values. The working pressure should always be a minimum of 20% below the maximum allowable pressure.

EXCLUSIVE FOR SWIMMING POOL

1.3 Choosing the filters and the type of installation

1.3.1 Characteristics of the filters

In order to correctly filter pool water, we recommend that the turnover times should be as below:

Competition pools 50m long	3-4 hours
Diving pools	4-8 hours
Hydrotherapy pools	30-90 mins
Interactive water features	20 mins
Leisure water bubble pools	5-20 mins
Leisure waters up to 0.5m deep	10-45 mins
Leisure Waters 0.5-1m deep	30-75 mins
Leisure waters 1-1.5m deep	1-2 hours
Leisure water over 1.5m deep	2-2.5 hours
Public pools up to 25m long, 1m shallow end	2.5-3 hours
Spas – commercial	6 mins
Teacher / learner / training pools	30-90 mins
Waterslide splash pools	30-60 mins

Another important parameter that directly affects filtration quality is the speed of the water passing through the filters. We recommend the following speeds:

Commercial Pools	20 – 30 $m^3/h/m^2$)
Residential Pools	Up to 50 $m^3/h/m^2$)

For other applications, filtration velocity will depend on the effluent water velocity, application and the installation design. Territorial legislation should always be checked.

Filters are designed to work under pressure. If there is some possibility a vacuum can occur, it is essential to install a double effect air relief valve.

1.3.2 Characteristics of the installation

For choosing a pump, you must make a head loss calculation and size the pump accordingly.

It is necessary to have installed an appropriate prefilter for the installation.

We advise placing the same number of pumps as there are filters, each one with the flow necessary to obtain the desired filtration flow in a filter.

However, the discharge of each pump should flow into the pipework manifold that is directed towards the filters. In this way, when the filters are filtering the pool water, all the pumps are operating. When you back wash the filters, they are done alternately, so that with all the pumps operating, a determined number of filters will be closed (in order to obtain a back wash speed from 40 to 45 $m^3/h/m^2$). Once the first group of filters is back washed, these will close and then the second group will be back washed.

With this set-up, we eliminate the need for having spare pumps for back washing the filters.

As with the return, we recommend that the suction pipework of each pump comes via a general pipework manifold from the pool.

To obtain good pool water quality, it is necessary to design the installation in such a way that the water, to be filtered, comes from both the surface and the bottom of the pool.

When calculating the return and suction pipework for the pool water, the velocities below should be used:

Return line of filtered water to the pool	Maximum speed in the line: 2 m/sec
Suction line of water to be filtered	Maximum speed in the line: 1.5 m/sec

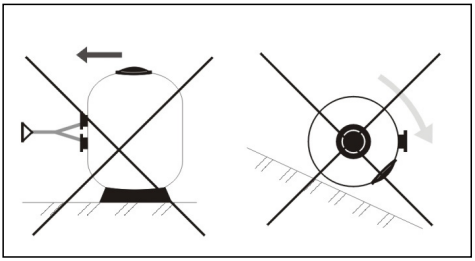
It is important to design the installation to maintain pressure stability (avoid excessive starting up and stopping of pumps) in order to avoid unnecessary pressure variations in the filter as this can cause fatigue and will reduce its life span.

In addition, to reduce this effect, it is recommended to use an inverter on the pump during start up and stopping in order to make the pressure increase or decrease as more linear as possible. There are also advantages of using inverters for day to day use with OC-1, as the flow will not decrease over time these can be set lower than with sand and therefore save considerable amounts of electricity.

2. INSTALLATION

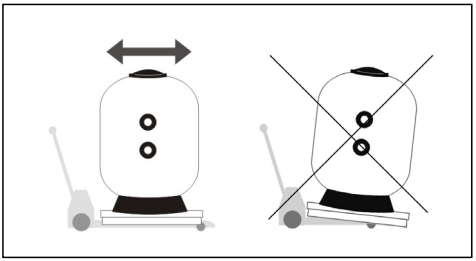
2.1 Filter handling

NOTE: Filters are delivered conveniently packed. Due to their weight, size and difficulties arising in placing them, we recommend that their handling and movement be done with mechanical apparatus (forklifts, cranes, etc.).

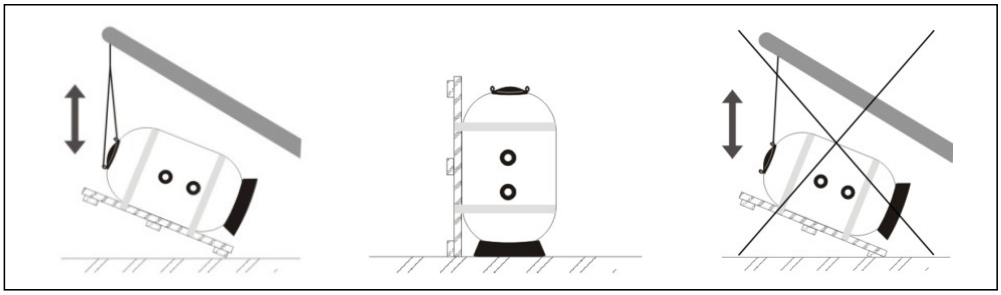


Never drag the filter

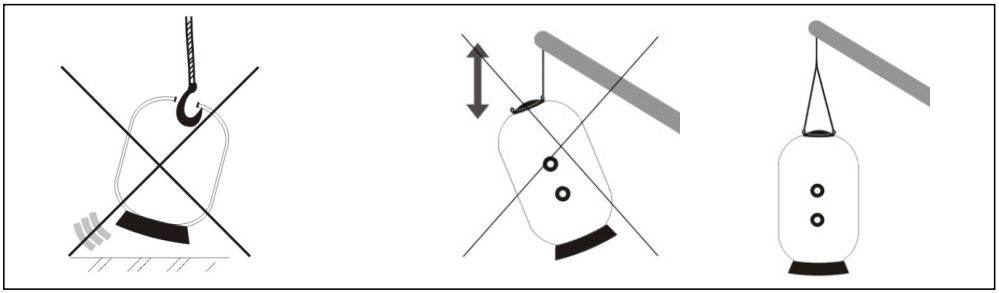
Never roll the filter



Use an appropriate forklift to move the filter



Use both elevation rings to place the filter delivered in an horizontal position to vertical position



Hooks are FORBIDDEN for moving filters

Use both elevation rings to move the filters

2.2 Filter installation

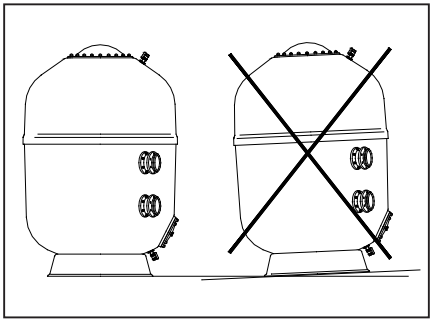
To correctly install the filters, follow the below steps:

a. Install the filter(s) into its (their) exact location

We recommend that the housing, where the filters are installed, has ventilation and adequate drains so that, in case of an accident, the water can escape through any pipe, filter, pump, etc. By being able to remove the water, the risk of damaging existing installations (pumps, control panels, etc.) is avoided.

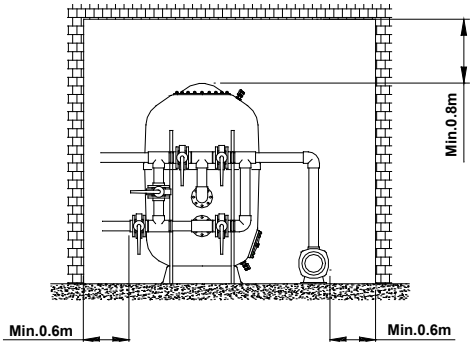
If for any reason, these drains are unavailable, an alternative automated system should be installed for removing water from the chamber.

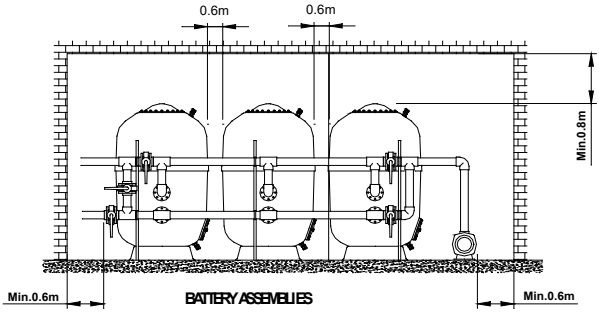
The filters should be installed in such a way that the base lies completely stable upon a totally horizontal surface.



Set the filter on a completely horizontal surface.

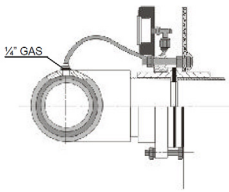
The filters will require periodic inspections and therefore access will be require to all areas of the filter, leaving a minimal amount of free space around and above the filter is ESSENTIAL

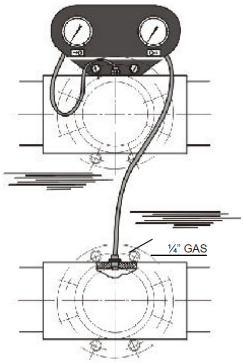




b. Assemble the battery(s) or selector valve and the pressure gauges correctly onto the filter(s)

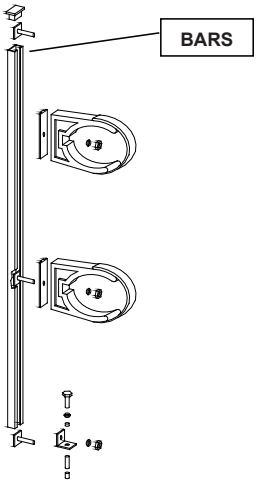
Installed the pressure gauge panel on to the flange of the filter connection, note the flexible plastic and transparent pipes that must be connected between the pressure gauges and the ¼" threaded holes in the battery tees, as the illustration shows. The pressure gauge panel clearly identifies the pressure gauge that controls the inlet and outlet pressures.





c. Install the adequate supports and adjust them (height)

Once the battery has been installed, special supports should also be used to support the weight of the battery and the water that circulates through it.



We recommend installing the following height-adjustable supports:

ZINC-COATED STEEL TUBE (BARS)	
Height of 1.85 m	
Height of 2.30 m	
Height of 3.00 m	
ACCESSORY BOX	
2 anti-vibration brackets, anchor plug and accessories	
For tube D 75	For tube Ø160 - 4 valves
For tube D 90	For tube Ø200 - 4 valves
For tube D 110	For tube Ø225 - 4 valves
For tube D 125	For tube Ø160 - 5 valves
For tube D 140	For tube Ø200 - 5 valves
	For tube Ø225 - 5 valves

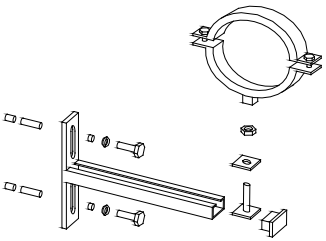
- When choosing the bar, check out the height of the chosen filter's connections.
- For the accessory box, check out the diameter of the batteries and the number of valves.
- For the battery of just one filter, two bars and two accessory boxes are necessary, for batteries of two or more filters; we recommend at least one bar and box per filter.

For installation, first adjust the height of the brackets in relation to the battery and then fasten the support on the floor with the corresponding anchor.

Tubing supports

During installation of the valve battery, place supports on the pipework sections in order to avoid vibrations and buckling that could damage or break them.

Ø Tubing
75
90
110
125
140
160
200
225



For installation, follow the steps below:
• Take apart the bracket so you have two halves.
• Set the inner half of the bracket onto the iron supports.
• Mark the position of the support.
• Drill the holes into the wall.
• Fasten the support onto the wall.
• Fasten the pipework with the flange

3.START-UP

Connect the battery or multiport valve to the pump discharge, the return pipe to the pool and the waste pipe

ATTENTION: Do not clean the plastic components with products that can damage the material.

3.1

If OC-1 has not been pre-filled into the filters please follow the following instructions:

Checking

1. After finishing the installation and before placing OC-1 inside the filters, you should carry out a hydraulic check of both the filters and the installation in order to make sure that it is assembled properly. Drain the filter.
2. Remove the filter lid, being careful not to damage any of the fixings.
3. Make sure all the filter components (laterals, etc.) are in good condition and nothing has been damaged in transit.

Starting-Up

4. Fill the filter with OC-1 carefully.
5. Fill OC-1 to the correct level in the filter (this will be to approx. ¾ of the filter).
6. Clean the surface of the filter and re-close the lid ensuring a good seal.

Before starting to filter, the filter should be rinsed to remove any debris in the filter. In order to do so, please follow the instructions in the back wash section.

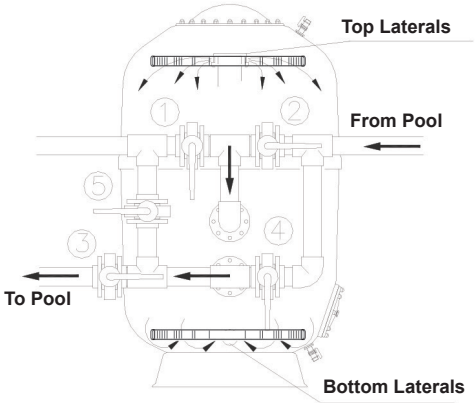
NOTE: The manufacturer is not responsible for any damage caused to the filter on handling, installation and starting up operations

4. NORMAL OPERATION CYCLE

4.1 FILTER

WITH THE PUMP STOPPED, place the valves in the filter position indicated in the diagram. Or move the Multiport valve to FILTER.

ATTENTION: NEVER EXCEED THE FILTER'S MAXIMUM ALLOWABLE PRESSURE

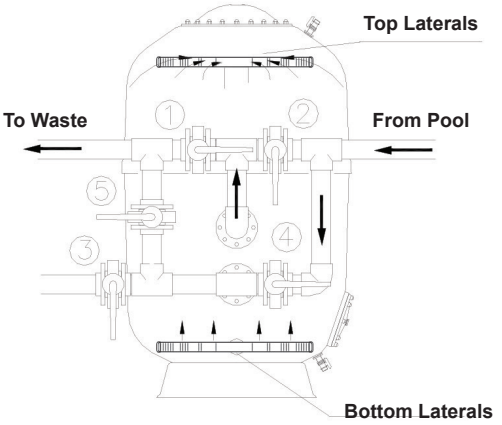


4.2 BACKWASH

For performing a back wash, ALWAYS STOP THE PUMP and then place the valves in the backwash position indicated in the diagram or move the multiport valve to Backwash.

See information under Backwash and Rinse Procedure for full details.

We advise placing a sight glass in the drainage pipework in order to observe the dirtiness of the water coming from the filter when cleaning and to determine the length of the washing time.



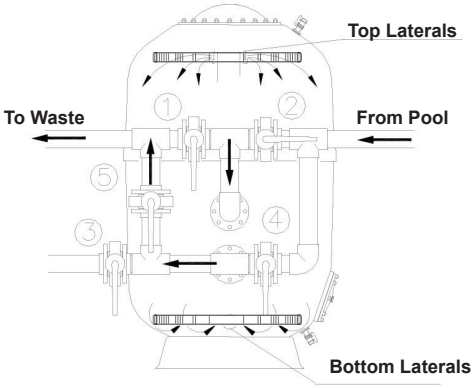
4.3 RINSE

This operation is required after the BACK WASH.

See information under Backwash and Rinse Procedure for full details.

For performing this operation, place the valves into the rinse position indicated in the diagram, ALWAYS WITH THE PUMP STOPPED, and immediately after, place them to the filter position or move multiport to rinse.

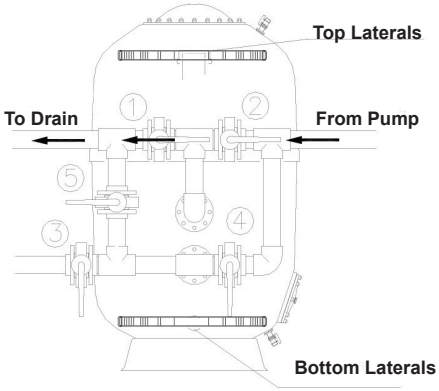
The rinse operation can only be performed if the battery has 5 valves or if we have a selector valve on the filter.



4.4 WASTE

Empty the pool when necessary and in case the pool does not have a drain on the bottom directly connected to the sewer system, drainage can be carried out by using the filter pump. Place the valves in drainage position indicated in the diagram or move multiport to waste.

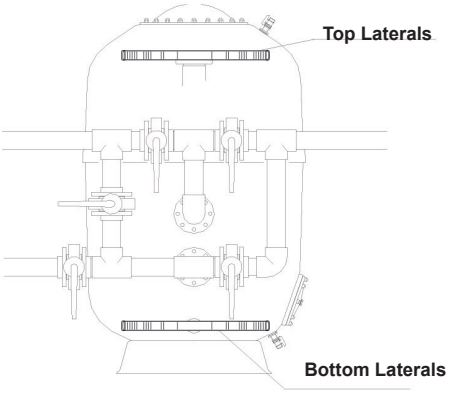
For this end and before connecting the waste line, the skimmer valves, the overflow channel and the bottom cleaner must be closed



4.5 CLOSE

As its name indicates, all the battery valves are closed. Move multiport to close.

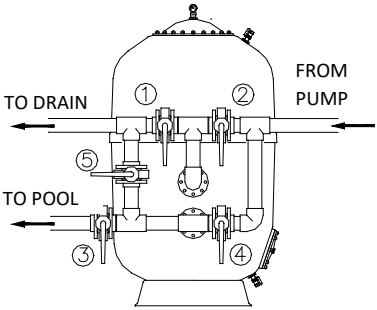
This operation is used for maintaining the filter, cleaning the pre-filter, etc.



5.2 5-VALVE BATTERIES

Control diagram for 5-valve batteries.

Position	1	2	3	4	5
Filter	Closed	Open	Open	Closed	Closed
Backwash	Open	Closed	Closed	Open	Closed
Rinse	Closed	Open	Closed	Closed	Open
Waste	Open	Open	Closed	Closed	Closed
Close	Closed	Closed	Closed	Closed	Closed



6. HEAD LOSS THROUGH OC-1

There is no discernible head loss through OC-1.

7. MAINTAINING THE POOL FILTERS

- Keeping the filters in good condition is important, as the quality of the water depends on it.
- Having all the components in good condition is also important. To this end, they should be checked regularly and deteriorated joints and pieces should be replaced when necessary.
- To clean the filter, do not use solvents, as they can damage components made with plastic. The filter can be easily cleaned with water and soap.
- Media should be changed periodically. Check with your supplier.
- The OC-1 media and the inlet/outlet connections should be maintained in good condition to avoid any polyester degradation.

7.1 Removing OC-1 from the filter

Pay attention to any warnings

To empty OC-1 from the filter, proceed in the following way:

1. Drain the water from the filter and open the air relief valve. To avoid any vacuum in the filter.
2. Remove the lid
3. Remove the OC-1 from the filter with a vacuum cleaner or by hand.
4. It will be necessary for someone to enter the filter through the lid in order to bring the OC-1 out from the bottom of the filter.
5. To re-fill OC-1 please refer to section 3.1.

7.2 Winterising the filter

In order to not damage the filter and its components during the winter, the following steps are necessary:

- Carry out a back wash and rinse, according to the instructions.
- Stop the pumps.
- Drain the water from the filter.
- Close the valve of the suction and return pipework in order to isolate the filter.
- Remove the lid from the filter in order to keep the filter ventilated during the period of inactivity.
- We advise draining all the pipework in order to prevent them from bursting in case of frosts.

8. SAFETY WARNINGS

- Before manipulating the filter or valves, make sure that the pump is stopped and the filter has no pressure. For greater safety, disconnect the pump and possible electric installations connected to the mains
- Never connect the filter directly to the water supply, since its pressure can be higher than the maximum pressure of the filter
- Always evacuate the air from inside the filter before starting a cycle.
- The unions are made with joints therefore fastening the nuts very tightly is not necessary.
- Do not clean plastic pieces with solvents, they could lose their properties.
- Do not let children manipulate the filter or play near them.
- Protect the filter from freezing.
- Before connecting the pump, make sure that the filter lid is properly closed.
- Install the filter in an area provided with ventilation, adequate drains, as close as possible to the pool tank and below the water level of the pool in order to avoid causing a vacuum inside it.

POSSIBLE FAULTS

PROBLEM	CAUSE	SOLUTION
Little filtration flow	Pump pre-filter is dirty	Clean the pre-filter
	The pump motor rotates backward	Reverse the rotation direction of the pump motor
	Pipework blocked	Clear pipework
	The pump taking in air	Check the entire system and eliminate possible leaks
The pressure gauge oscillates violently	The pump taking in air	Check for leaks in the pre-filter and suction pipework valves are open
	Suction is semi-closed	Make sure the suction valves are open
The pump takes in air	Algae in the pool	Chemically treat
	Water pH is high (cloudy water)	Lower the pH
	Lacking chlorine (greenish water)	Add chlorine
Rapid rise in pressure: bubbles in the nozzles	Low level of pool water	Fill the pool
	Suction valves are partially closed	Check and open the valves
	Pump pre-filter is dirty	Clean the pre-filter
OC-1 is entering the pool from the filter	There is something broken in the lateral system	Repair the lateral system
OC-1 is escaping down the drain during backwash	Excessive water flow during backwash	Reduce the flow rate during backwash
Leaks in the connections or lids	Loose screws, dirty joints or not sealed properly.	Tighten the screws, being careful not to break any plastic pieces, clean or install the joint correctly. If the problem is not resolved, phone technical support

• When in doubt, consult your pool service provider.

• In case of a breach of the manual, the manufacturer is not liable for any damage caused

Commercial Backwash and Rinse Procedure

Please note: ***OC-1 media is designed to operate in commercial pools at a constant filtration rate of between 20-30m³/m²/hr.***

The backwash and rinse procedures are exactly the same as for sand or glass media, in terms of the positioning of the valves. However, with OC-1, we recommend doing a quick backwash and rinse followed by a longer backwash and rinse. This allows for more debris to be removed from the filter.

1) First Backwash

The backwash rate of OC-1 should be between 40-45m³/m²/hr. This first short backwash, of approx. 1 minute, will change the direction of flow through the filter. This allows the debris to come out of settlement so it can be removed via the waste line.

2) First Rinse

The rinse rate of OC-1 should be between 40-45m³/m²/hr. The first rinse helps remove the debris that's come out of settlement in the bottom half of the filter, so it can be removed down the waste line.

3) Second Backwash

The second backwash should take between 3-4 minutes or until the sight glass runs clear, whichever is longer. The period between backwashes, unlike that of sand or glass, is not based on differential pressure but on time. We recommend backwashing a filter, a MAXIMUM of once a week. You may need to additionally dump water to waste, to satisfy the PWTAG bather/water replenishment recommendation.

4) Second Rinse

The second rinse should also take approximately 3-4 minutes or until the sight glass is clear, whichever is longer.
The rinse function should be carried out every time the system is backwashed and also importantly should be done on any start up, if for any reason the pumps have stopped unexpectedly or if there is an airlock in the system.

Clarifier

We recommend the use of a clarifier and not a PAC flocculent. The top of the OC-1 bed is not solid unlike sand or glass, so there is not a solid base for the PAC flocculent to sit upon. The PAC if used will end up in the bottom of the swimming pool. The clarifier should be dosed in the same method as a PAC system. Clarifier causes very small particles to bind together in the swimming pool allowing them to be taken out at a faster rate by the OC-1 media.

Do's and Dont's

Don't use PAC or an Aluminium based flocculant.
If in doubt e-mail support@ocmproducts.com

Use clarifier if the pool is looking hazy

Always start up the pumps with the filters on rinse.
Only revert to filter when sight glass runs clear.

Change media after 5 years.

Follow the backwash instructions.