

# MONOCON *HIGH RATE SAND FILTERS*



*INSTALLATION AND MAINTENANCE MANUAL*

*Version: 1.0*





### WHAT HAPPENS TO THE WATER IN YOUR POOL ?

This should be a question of prime consideration for all pool owners. In the past some pools did not use filtering systems, the owner was faced with the problem of refilling the pool with clean water when this became necessary. Refilling the pool was laborious, meanwhile the owner had an unsanitary pool with unpleasant bathing owing to the poor clarity of the water.

Today's pool owners demand absolute hygiene, crystal clear water and economy of effort. These objectives are achieved by effective filtration and chemical treatment of the pool water.

### Typical Problems

- 1- Biological contamination. The water is contaminated by micro-organisms which may be airborne or introduced by bathers. These parasites reproduce rapidly in stiff warm water and algae may form giving a greenish appearance to the pool water.
- 2- Rainfall and wind may introduce dust, while leaves and seeds which muddy and pollute the pool water.

### Solutions to the Problem

- 1- Maintain the correct level of residual chlorine in the water to combat existing micro-organisms by its disinfecting action. There are other chemicals that may be used such as iodine, bromine, ozone and ionic interchange. Chlorine based compounds are usually the most economical.
- 2- Provide a pool filter to remove suspended particles from the water.

### 1. pH Level

The pH level is an indicator of acidity or alkalinity in the water. The neutral value is 7.0 a pH of 0 - 7 gives levels of acidity whilst 7 - 14 gives levels of alkalinity. The pools usual readings vary between 6.8 and 8.4.

#### 1.2. Why pH is Important?

**“The ideal pH value in a pool should be between 7.2 and 7.6”**

- As previously stated, sufficient residual chlorine must exist in the pool to destroy unwanted microorganisms, in fact the chlorine will only act as a bactericide when the pool water has a pH of between 7.2 and 7.6.
- There are other reasons which call for a correct pH level: Once above 7.6, calcium in the pool will precipitate to a visible cloudy form (accentuated in hard water areas).
- This gives a milky appearance to the water, and hinders the filtering, deposits may also appear on the pool walls and fittings.
- Once the pH level falls below 7.0 the pool water becomes corrosive causing eye irritation and affecting mucous membranes. There is also a long term threat to metallic parts in the pool.
- The quality of the pool water is highly dependent on maintaining the correct pH level.

### 2. CHLORINE

Standards for the amount of residual (free) chlorine in the pool water may vary from country to country, depending on health authority regulations. Typical legal requirements are between 0.2 and 0.6 parts per million, (i.e. 0.2 - 0.6 milligrams per litre).

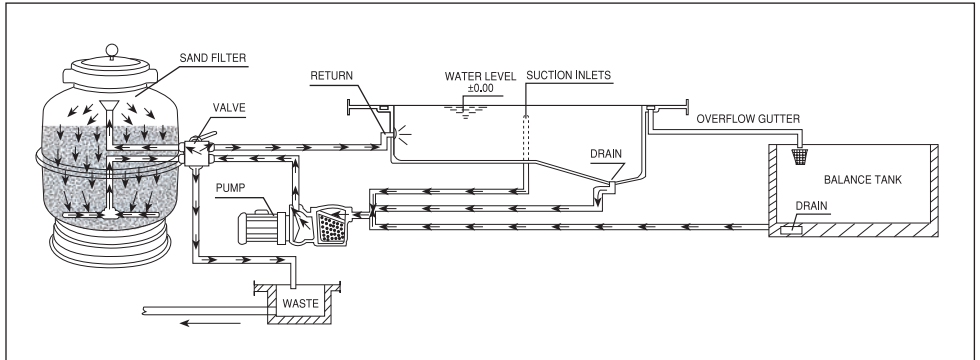
#### 2.1. What is Understood by Free or Residual Chlorine?

- Even after the filtering process, certain bacteria remains to be destroyed by the disinfecting action of the chlorine which is usually acting on the bacteria in the form of hyperchloric acid. A quantity of chlorine that is added to the water (in excess of that needed to destroy bacteria and oxidize organic material) remains free to combat new bacteria introduced by bathers or atmospheric agents.
- This chlorine remaining in the water in the form of hyperchloric acid is known as free, residual chlorine.

### 3. FILTRATION

It is essential that the filtration is accompanied by chemical treatment of the pool water. The two processes are complimentary to each other.

#### 3.1. Operation Principles



- A suction is taken from the main drains (1) on the bottom of the pool and the skimmers (2) at the pool surface and fed via separate pipework with their corresponding valves (3), through the pump (4) to the sand filter (5).
- After filtration, the water is returned to the pool via return inlets (6), which are installed on the opposite side of the pool to the skimmers and main drains.
- Once in the filter, the water is circulated downwards through silica sand and suspended particles are retained.
- The filter sand needs to be washed at intervals to remove the particles it has retained backwash.
- This is achieved by reversing the flow through the filter and directing the water containing the dislodged particles to drain. When the filter pressure increased by 0.5 kg/cm<sup>2</sup> or more with respect to the initial pressure means that the sandfilter needs to be backwashed.
- Bearing these principles in mind, the following installation and operation instructions should not represent any problem.



#### 3.2. Installation

The filter should be installed as close as possible to the swimming pool and preferably at a level of 0,50 metres below the surface of the water in the swimming pool. Make sure there is drainage available at the place where the filter is to be installed.

### 3.3. Important

Do not use an iron and hemp pipe for the selector valve connection, it is essential to use plastic accessories and TEFLON tape. Pipe terminals are available threaded fixing in 1 1/2" and 2". Always leave enough space round the filter in order to perform the necessary examinations and maintenance during the filter's life.

### 3.4. Sand Load

In order to obtain maximum efficiency from your filter, it should be filled with silica sand with a grain size classification of 0.5 to 0.7 mm. With the quantity indicated on the plate specifying the characteristics; proceed as follows:

1. Load up when the filter is installed in position and the connecting pipes have been joined.
2. Take off the lid and joint.
3. Pour the required quantity of sand inside the filter.
4. Clean the seating of the lid joint.
5. Fix the filter lid in place.

#### 3.4.1 Operation

When the filter has been loaded, the sand must be washed, so proceed as follows:

1. Place the selector valve in the "BACKWASH" position.
2. Open the valves controlling the swimming pool suction pipes and run the pump for 4 minutes.
3. Stop the pump and place the handle of the selector valve in the "FILTER" position. When this has been done, the filter will be ready to start the filtering cycles for the water in the swimming pool.

**Important:** The pump should be switched off when the position of the selector valve handle is being changed.

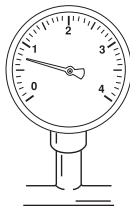
## 4. MULTIWAY VALVE

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### 4.1. Filtration

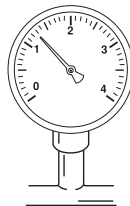
With the pump switched off, place the handles of the selector valve in the FILTER position. Switch on the pump. During this operation, it is advisable to observe the pressure gauge from time to time as this indicates the degree of saturation of the filter. When the pressure reaches a %50 higher value of starting pressure "BACKWASH" should be carried out. The valves at the bottom of the swimming pool and the skimmers will be regulated according to the quantity of floating material found on the surface of the water. Bear in mind that with the catch basin valve fully open there will be little suction from the skimmer. If the surface sweep of the skimmers is to be stronger, it is sufficient to reduce the pitch of the catch basin.

**0.8 Kg/cm<sup>2</sup> - 11.4 PSI**



Normal pressure at the beginning of a filtering cycle.

**1.2 Kg/cm<sup>2</sup> - 17.0 PSI**



(50% higher than starting pressure)

This pressure indicates that it is necessary to do a "BACKWASH"

## 4.2. Backwash

Each load of sand forms thousands of channels which pick up all the material contained and caught up in the filtering process, the number of free channels allowing the water to pass is continually decreasing. This is why the pressure rises progressively until an increase of 0.5 kg/cm<sup>2</sup>. At this pressure the filtering sand is unable to collect any more impurities and must be cleaned as follows:

Turn the selector valve to the "BACKWASH" position and with the main drain and return valves open, switch on the pump and run it for 2 minutes. When this operation is completed, the dirt blocking the filter will have been removed.

### Example:

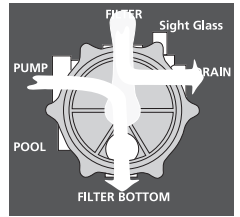
#### 0,8 kg/cm<sup>2</sup> - 11,4 PSI

Initial pressure of the filter at the start of a filtering cycle.



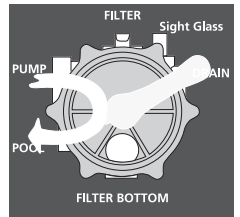
#### 1,3 kg/cm<sup>2</sup> - 18,5 PSI

The pressure is 0.5 kg/cm<sup>2</sup> more than the initial pressure, indicating that WASHING is required.



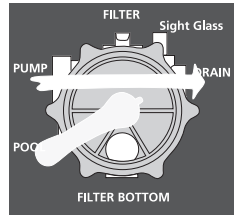
## 4.3. Recirculate

In this position, the selector valve allows the water from the pump to go directly to the swimming pool without passing through the inside of the filter.



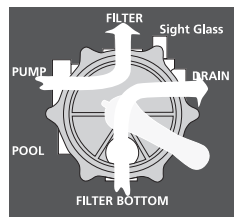
## 4.4. Waste

If the swimming pool needs to be drained, this can be done using the filter pump. In order to do this, the selector valve should be in the "WASTE" position. The motor is run with the main drain valve fully open, for the pump to have sufficient suction. For the pump to suction, keep the prefilter and the main drain pipes full of water. Before drainage, make sure that the skimmer valves and the bottom cleaner valves are closed.



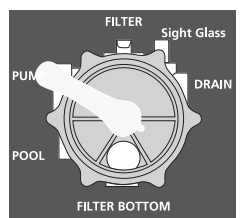
## 4.5. Rinse

After the carrying out the "BACKWASH" operation on the filter and placing the installation in the "FILTER" position, the water flowing into the swimming pool will be cloudy for a few seconds, so to prevent it from reaching the swimming pool there is a "RINSE" position for the selector valve which is operated as follows: immediately after the "BACKWASH" put the valve in the "RINSE" position and switch on the pump for 1 minute, after which the pump is switched off and the valve placed in the "FILTER" position. This position ensures that the filtered water goes directly to the drain.



## 4.6. Closed

As its name indicates, this position is for closing off the water from the of the filter pump and it is used for opening the collector prefilter of the pump.



## 5. THE MOST COMMON PROBLEMS

EFFECT	POSSIBLE CAUSE	SOLUTION
The filter only provides a small volume of the filtered water Vacuum heads have poor suction	Prefilter blocked	Clean filter
	Motor turning the wrong way	Check by the arrow on the body of the prefilter which way the motor is turning, if this is not correct, reverse the motor connection
	Suction pipes are blocked	Proceed to clean
The pressure gauge varies considerably	The pump is taking in air	Check for leaks in the prefilter and suction pipes
	Suction is half closed	Check that the suction valves are completely open

\* If there is no arrow, the direction of the motor can be checked as follows;  
Stand in front of the pump, i.e. where the inlet pipe is situated (with the motor behind).  
Make sure that direction of the motor is anticlockwise.



**CE**

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