

Systeme für Aquakultur,  
Aquaristik, Labore und  
zur Wasseraufbereitung

Systems for aqua culture,  
sea water aquaria, labs and  
water desalination and purification

Systèmes pour aquacultur,  
aquariums eau de mer,  
laboratoires et traitements d'eau



AquaCare GmbH & Co. KG  
Am Wiesenbusch 11  
D-45966 Gladbeck  
Tel.: +49-2043-375758-0  
Fax: +49-2043-375758-90  
<http://www.aquacare.de>  
e-mail: [info@aquacare.de](mailto:info@aquacare.de)

## Instruction manual of Ozone Reactor OZR size 250 and larger



modifications possible

---

# Content

<b>1.</b>	<b>Safety Instructions .....</b>	<b>3</b>
1.1.	General information .....	3
1.2.	Indication of information .....	3
1.3.	Qualification of the personnel.....	3
1.4.	Dangers if safety information are not minded .....	3
1.5.	Safe working .....	3
1.6.	Safety information for the operator .....	3
1.7.	Safety information for maintaining and assembling personnel .....	3
1.8.	Arbitrary reconstruction and spare parts production .....	3
1.9.	Illegal operation .....	4
1.10.	Linked aggregates .....	4
<b>2.</b>	<b>Transport .....</b>	<b>4</b>
2.1.	Mechanical conditions .....	4
<b>3.</b>	<b>Designated use .....</b>	<b>4</b>
<b>4.</b>	<b>Configuration .....</b>	<b>4</b>
4.1.	I O diagram .....	4
4.2.	Basic equipment.....	4
<b>5.</b>	<b>Principle of function .....</b>	<b>5</b>
<b>6.</b>	<b>Installation .....</b>	<b>6</b>
6.1.	Setting up .....	6
6.2.	Assembly of the system .....	6
6.3.	Water connections.....	6
<b>7.</b>	<b>Start up the unit .....</b>	<b>6</b>
7.1.	Filling up with water .....	6
7.2.	Adjusting the system.....	7
<b>8.</b>	<b>Maintain the unit .....</b>	<b>7</b>
8.1.	Cleaning the trickling filter bed .....	7
<b>9.</b>	<b>Trouble shooting .....</b>	<b>7</b>
9.1.	The ORP is too low .....	7
9.2.	The ORP is too high.....	7
<b>10.</b>	<b>Warranty .....</b>	<b>7</b>
<b>11.</b>	<b>Technical data .....</b>	<b>8</b>

# 1. Safety Instructions

## 1.1. General information

This manual contains basic information that are important for assembly, operation, and maintenance. This should be read before mounting by the assembly operator and the responsible operator and/or qualified personnel. This instruction must be disposable the at unit at any time.

Pay attention to this safety instruction as well as to the special instructions within the other chapters. In addition local laws and safety instruction must be minded.

## 1.2. Indication of information



If safety information are important for life or health for persons they are marked with the relevant hazard symbol according DIN 4844-W9.



Safety information marked with this symbol can cause danger for the machine and its function if not respected.



This hints can ease the work with the machine and its maintenance.

At the machine directly marked information as rotation arrow, fluid connections and setting points should be noticed. These marks should be readable at any time.

## 1.3. Qualification of the personnel

The staff for operation, maintaining, inspection and assembly must be qualified for these work. Responsibility and controlling of the personnel should be directed by the operator.

## 1.4. Dangers if safety information are not minded

If safety information are not minded persons, environment, and the machine can be endangered. Failure of observe lead to loss of the warranty.

Failure of observe can coarse:

- Failure of important functions of the machine.

- Failure of stipulated methods for maintenance.
- Endanger of persons with electric, chemical or mechanical impacts.

## 1.5. Safe working

Working with the machine is only allowed if all safety information of this manual, national laws and rules for preventing accidents and internal working, operating and safety rules of the operator must be minded.

## 1.6. Safety information for the operator

Contact protection for rotating or moving parts should not be removed while operation.

Risks of electrical energy must be averted. Please pay attention to the local laws and information, too.

## 1.7. Safety information for maintaining and assembling personnel

The operator must take care that all works for assembling, inspecting and maintaining are made by authorized and qualified personnel. These persons must be informed about the machine and the works by reading the manual or otherwise.

Working at the machine is only permitted if unit is out of operation. The described procedure of putting out of operation must be redeemed. Immediately after the work safety and protection facilities must be mounted and put into function.

Before starting again all issues treated in the chapter “putting into operation” must be minded.

## 1.8. Arbitrary reconstruction and spare parts production

Reconstruction or modifying the unit are only proper if the manufacture agrees. Original spare parts and authorized accessories by the manufacture are made for the safety. The use of other parts can destroy the warranty demands.

## 1.9. Illegal operation

Safety is only guaranteed if the unit is running within the field of application described in „designated use“ in this manual. The technical limits mentioned in manual (chapter “Technical data and unit protocol”) must be redeemed.

## 1.10. Linked aggregates

The listed information dealing with safety and operation in manuals of linked aggregates must be redeemed, too.

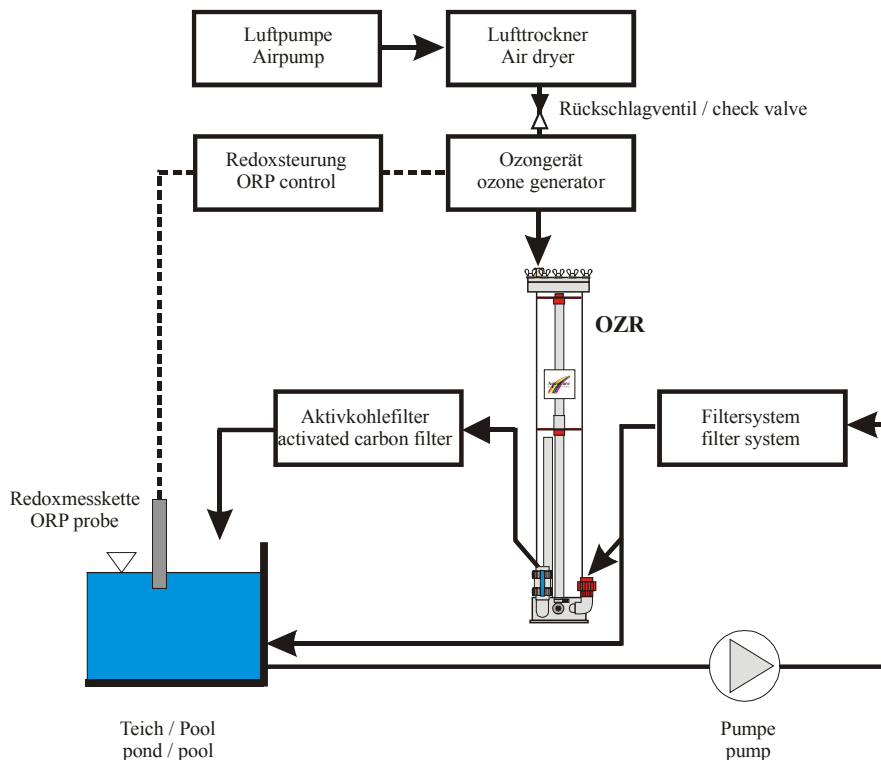
# 2. Transport

## 2.1. Mechanical conditions



The unit may transported only with suitable lifting tools. Pay attention to the transport weight listed in chapter “Technical data”.

## 4.1. I O diagram



## 4.2. Basic equipment

	<b>A</b>	Water inlet
	<b>B</b>	Water outlet

Do not tilt the unit more than 10% out of the horizontal position.

Before transporting the unit it must be totally empty (this does not apply to the filter bed).

# 3. Designated use

AquaCare ozone reactors are made only for filtering water of aquaria, ponds water and aqua culture units. Other purposes are only allowed after consultation with AquaCare.

# 4. Configuration

The unit is completely delivered. The unit has to be erected and supplied with water and ozone source. Please control the delivery if it is complete and not broken.

	<b>A</b>	Water inlet
	<b>B</b>	<del>Water</del> outlet
	<b>C</b>	Air with ozone inlet
	<b>2</b>	Ball valve
	<b>3</b>	Main tube: lower part (3. chamber)
	<b>4</b>	Lower grid
	<b>5</b>	Central tube
	<b>6</b>	Main tube: upper part (2. chamber)
	<b>7</b>	Upper grid
	<b>8</b>	Mixing chamber (1. chamber)
	<b>9</b>	Main flange
	<b>10</b>	Cap

## 5. Principle of function

Ozone is a strong oxidizing agent and cracks heavy degradable substances. The organic fragments may be easily consumed by the bacteria in the bio-filter. ‘Gelbstoffe’ (tannins) are destroyed and the water gets crystal clear. At the same time the water gets more oxygen – espe-

cially at high water temperatures this fact is important.



But to deal with ozone you must take care. If too much ozone is in the water fishes and other organisms get hurt.



So we recommend urgently, that the outlet water flows through an activated carbon filter or

the ORP (Redox) is controlled by a ORP controller.



Ozone is unhealthy and should be used only in good ventilated room or outside of closed rooms. Pay attention to the manual of the ozone generator, too.

The OZR is divided into three compartments:

I. In the first compartment (8.) the inlet water (connector A) coming through the central tube (5) is mixed very turbulently with the air-ozone flow coming from connection (C).

II. The pre-enriched water flows down the trickling filter material. This second chamber (6.) is filled (after a while) with air and ozone. The large surface of the trickling material provides a good enrichment of ozone.

III. The lower parts (3.) of the reactor is filled with water all the time. In the water are very small bubbles that stay a long time there. The rest ozone will get into the water.

## 6. Installation

### 6.1. Setting up



To guarantee a faultlessly operation of the filter the unit should be erected on an even and stable ground. Uneven parts of the floor must be flattened with floor pavement or a suitable base.

If sunlight reaches the main tube it should be covered with a black foil to prevent early aging of the material.

### 6.2. Assembly of the system



To prevent corrosion nearly all parts are made of plastic. So you must take care during transport, assembly and operation of the unit.



It is very important to screw the M10-plastic bolts with not more than **2 Nm** torque. Higher forces may destroy screws, tapped holes and flanges.

### 6.3. Water connections

For operation the unit you must install the water connectors with the aquarium or filter system. See above I-O-diagramm, too.



The connection with PVC-U must be glued only with approved adhesion. The processing regulation of the adhesion should be minded.

The water inlet (A) should be connected with a pump (for water flow and pressure please look to "Technical data").

The water outlet (B) must flow back to the aquarium system (if an ORP control is used) or to an activated carbon filter (if an ORP control is not used).

The connector (D.) is only for draining the system. You can connect a tube to a drain or you can use a hose adapter for a provisional connection.

Connector (C.) is the air/ozone inlet. Please use an source with high ozone concentration (low flow, high concentration).



ozone is harmful to your health. Pay attention to all hints and laws for working with ozone.

To prevent backflowing water please use an ozone resistant check valve.

## 7. Start up the unit



Before start up the unit check out of all connections are done well. Make sure that all PVC-unions are tight and their o-ring seals are in the correct position.



Check out if the electrical connection of the supply pump is made correctly.

### 7.1. Filling up with water

Open the ball valve (2.) of the outlet (B.). Start the supplying pump carefully.

Look at all connections if they are tight. Check the check valve in the air supplying tube.

If everything is tight, throttle the outlet valve to raise the operation pressure.



Make sure that it is impossible to get more than 1 bar (15 psi) into the system: choose the right inlet pump or use a pressure relief valve.

## 7.2. Adjusting the system

- Adjust the right water inlet flow (see technical data)
- Raise the internal pressure by reducing the ball valve (2.) of the outlet (B.). – The higher the pressure the better the ozone dissolving process.
- Start the air pump. Make sure that it is stronger than the internal pressure of the OZR. Otherwise reduce the internal water pressure of the system by opening the ball valve (2.) of the outlet (B.). – Adjust the minimum air inlet flow described for the ozone generator.



- Start the ozone generator. Take care of all safety instruction lists above and listed in the instruction manual of the ozone generator.

## 8. Maintain the unit

The OZR system is maintaining free.

Except the case if a lot of fibres are in the inlet water and the trickling filter bed will block.

### 8.1. Cleaning the trickling filter bed



Before opening the OZR system make sure that the ozone generator is shut down 1 hour before!

Shut down the inlet pump and open the outlet (B.) by opening the ball valve (2.).

Drain the system by opening the ball valve (D.).

Open the plastic screws at the cap (10.) of the OZR.

Take out the upper grid (7.).

Take out the lower grid (4.) by pulling out the central tube (5.). Take care with the trickling filter material.

Clean the trickling filter material by e.g. using a high pressure cleaner.

Assemble the system after cleaning and put it into operation as described before.

## 9. Trouble shooting

If you cannot eliminate the disturbance ask your service partner or AquaCare.

### 9.1. The ORP is too low

- the water inlet flow is too low: raise the water flow to the maximum flow listed in the “Technical Data”.
- Raise the inlet pressure, if possible
- Check the air pump
- Check the ORP controller if connected
- Check the ozone generator
- Take a stronger ozone generator

### 9.2. The ORP is too high

- Reduce the power of the ozone generator
- Adjust the maximum ORP at the ORP controller if connected

## 10. Warranty

You have 24 months warranty on all AquaCare units excepts spare parts like pump bearings and rotors. You have no warranty if parts are broken by violent (for example totally closed water inlet). For consequential losses AquaCare is not liable.

## 11. Technical data

Type	PZR250	OZR300	OZR400	OZR500	OZR600	OZR800	OZR950	OZR1500
Order number	380-025	381-030	381-040	381-050	381-060	381-080	381-095	381-150
System	3-stage reactor							
Maximum* size of pond / pool in m <sup>3</sup> at 10 / 50 / 100 kg fish/m <sup>3</sup>	150 30 15	250 50 25	400 80 40	600 120 60	900 180 90	1500 300 150	2400 480 240	6000 1200 600
Diameter tube in mm	250	315	400	500	600	800	950	1500
Height in cm	185	185	250	250	250	250	250	250
max. ozone needs in g/h	2,5	4	6,5	10	15	25	40	100
Footprint size in mm	430 × 370	430 × 370	500 × 500	700 × 700	700 × 700	900 × 900	1000 × 1000	1600 × 1600
Water inlet in m <sup>3</sup> /h	5...10	8...16	13...26	20...40	30...60	53...106	75...150	185...370
Air inlet in m <sup>3</sup> /h		0,08...0,2	0,1...0,3	0,3...0,4	0,3...0,6	0,5...1,0	0,8...1,5	1,9...3,7
Materials	PVC transparent, PA screws, PVDF, silicone		PVC-U, PE, PA screws, silicone					
Connector water		d50	d63	d75	d90	d125	d140	d225
Connector ozone	d8	d8	d20	d20	d32	d32	d40	d40
* you can read out the maximum size of ponds, ornamental fish tanks and bathing ponds at 10 kg/m <sup>3</sup> ; aquaculture systems should be calculated with their fish load; this information is supplied without liability.								

[www.aquacare.de](http://www.aquacare.de)