

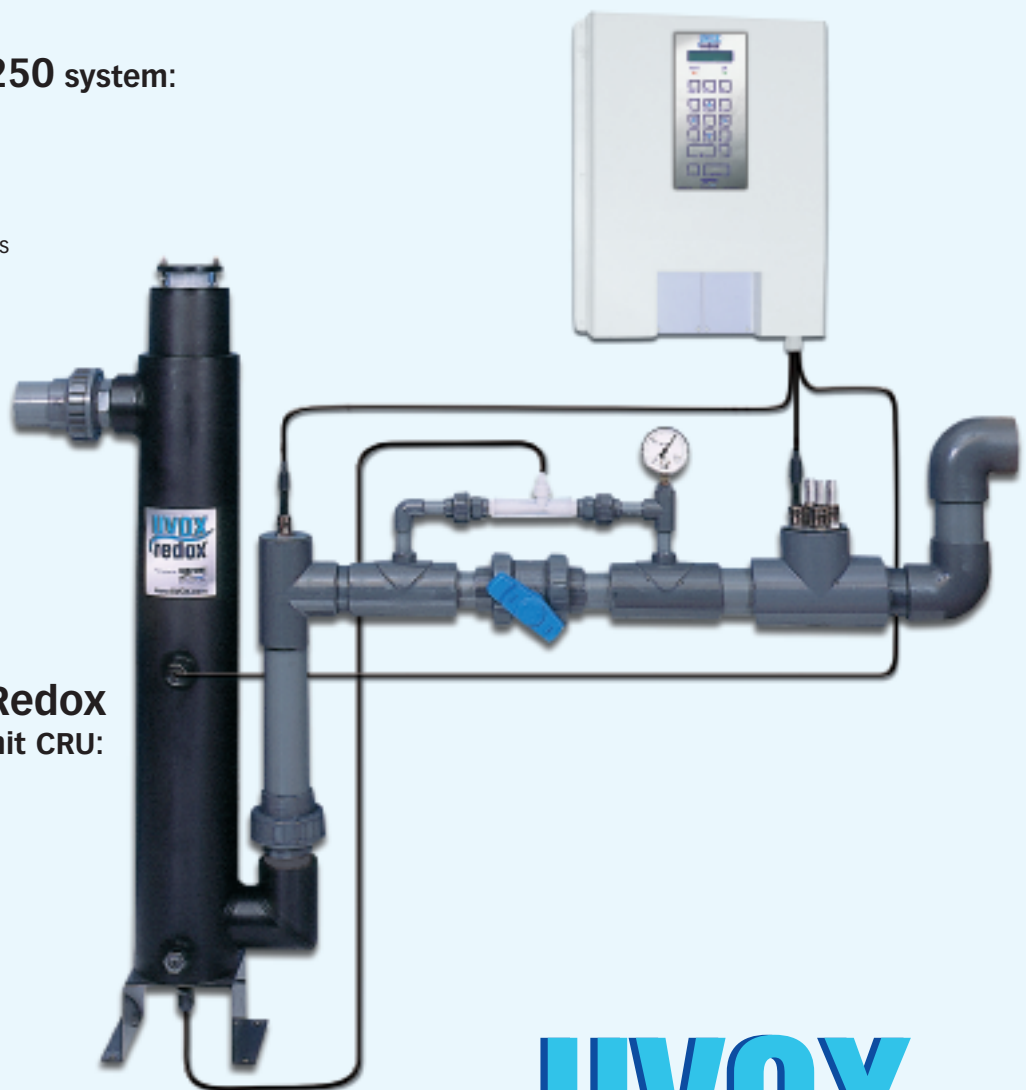
The trendsetting UVOX process combines the oxidising effect of ozone with the disinfecting effect of ultraviolet light all in one!

Advantages of the UVOX-250 system:

- absolutely safe and natural water
- double effect using an ultraviolet lamp
- up to 99.9% killing-off of pathogens
- oxidation of many persistent substances
- increase in the oxygen content
- improvement in the performance of the (bio)filter
- economical and ecological water preparation
- savings on chemicals, water and energy
- promotion of the wellness experience
- minimum maintenance without endangering the quality of the water

Advantages of the UVOX Redox measurement and control unit CRU:

- automatic control of up to two UVOX-250 systems
- monitoring and control of the ozone supply via the redox potential
- monitoring of the ultraviolet intensity (254 nm) by means of an UV-sensor
- five further measurement and control units can be connected
- up to 16 (TTL) switching outputs for controlling and regulating



UVOX redox



manufactured by: **WAPURE**
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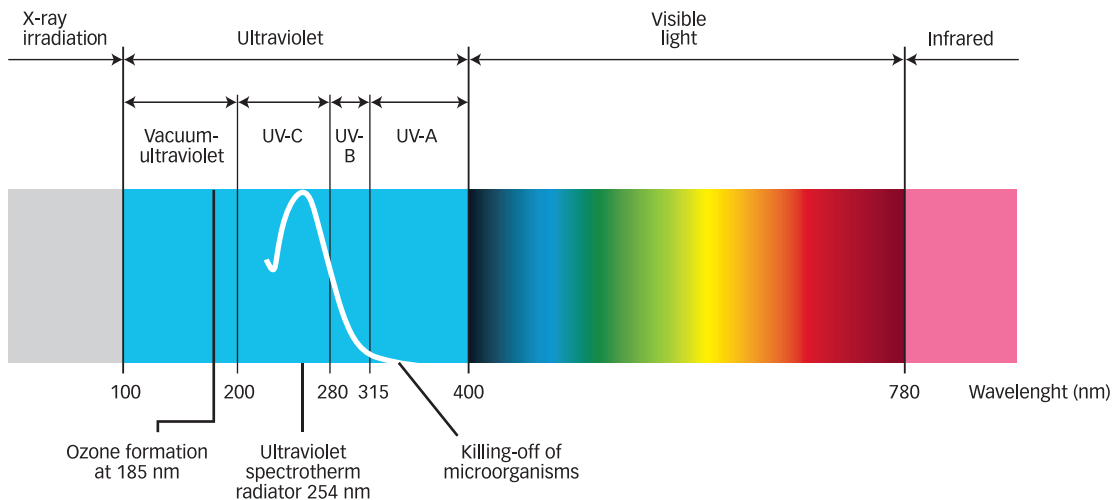
The sun as a role model

The sun radiates light in different wavelengths (nanometer nm) to the earth. Some of this is visible light (colour spectrum) and some is not visible to the human eye. For the preparation of water, however, only ultraviolet light with a wavelength of 185 to 315 nm is of importance.

The ultraviolet rays of the sun kill off morbidiferous microorganisms within seconds, thus preventing further spreading. The primary damage to the microorganisms during ultraviolet irra-

diation is based on a photosensitive alteration of the nucleic acids that prevents cell division. A very effective disinfection is achieved through this. The most efficient disinfection is achieved by ultraviolet rays with a wavelength of 254 nm.

Ozone (O₃) is formed due to ultraviolet irradiation at 185 nm. It breaks down easily upon formation of oxygen and is thus deemed to be a good disinfectant and oxidant of many water-soluble, (partly persistent) substances.



The UVOX process

The **UVOX** process was invented by Mr. ing J.J. Berson as a further development of the ultraviolet technology. By means of an ultraviolet lamp produced especially for **Wapure**:

air is irradiated with ultraviolet light with a wavelength of 185 nm.

- The oxygen in the air is converted into ozone by means of this ultraviolet irradiation. Ozone leads to oxidation of the pathogenic germs in the water (bacteria, viruses and algae) and parasitic dissolved matter (such as nitrite, cyanide, plant protectants/pesticides, chlorinated hydrocarbons, hydrosulphides/other odours, humic substances, pharmaceutical products).

This air mixture is injected into the water cycle via a Venturi injection system.

Water and the air mixture are irradiated again with ultraviolet light (254 nm) in the UVOX-250 reaction chamber. Through this, two types of processes take place:

- The ozone in the water is converted into OH⁻ radicals, whereby the relative oxidation potential is increased from 1.52 (ozone value) to 2.05 (OH⁻ radicals value). The remaining ozone content is destroyed.

In the majority of cases, an activated carbon filter for elimination of the ozone is therefore not required. OH⁻ radicals have the greatest oxidation power and can reduce a variety of very persistent substances.

- Very efficient killing-off (up to 99.9%) of the germs and pathogens takes place by means of ultraviolet light irradiation (254 nm).

Basic pre-requisite for the UVOX-250 system

A pre-requisite for the **UVOX-250** system is a defined irradiation dose rate of at least 25 mJ/cm² at the end of the service life of the ultraviolet lamp, which is calculated from the irradiance as a function of the layer density and the clouding of the water as well as the duration of irradiation or dwell time of the cells in the ultraviolet light, which results from the flow rate.

This minimum ultraviolet irradiation dose rate of the **UVOX-250** leads to the killing-off of up to 99.9% of the pathogens in the water, such as bacterial, viruses and algae.

UVOX Redox measurement and control unit

In addition, the **UVOX Redox** PC measurement and control unit was developed. This unit ideally pilots the **UVOX-250** system and can take over complete monitoring of the water quality. The standard **UVOX Redox CRU** equipment measures the redox value at two points and monitors the ultraviolet intensity in percentages. The ultraviolet monitor controls the minimum irradiation dose rate.



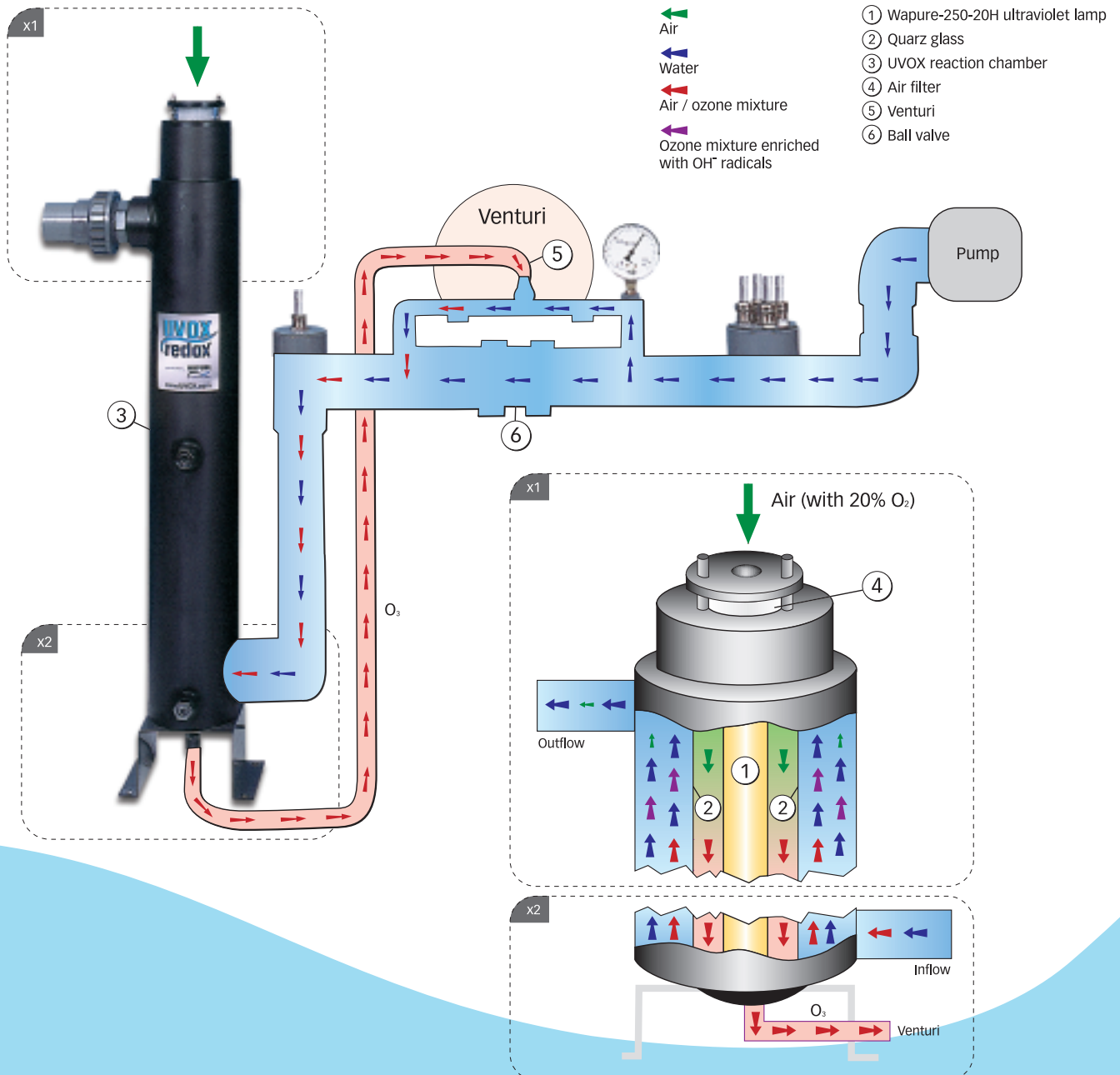
Moreover, further measurement modules can be connected in accordance with the modular design principle, for example pH values, oxygen content and temperature.

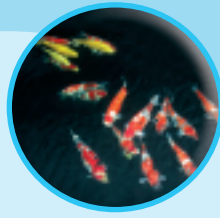
Furthermore, 16 (TTL) switching possibilities are available, for example in order to shut down the ozone supply by means of a solenoid valve, to pilot automatic dosing pumps or to even forward measured values via SMS.

Quality assurance from Wapure International GmbH

Wapure International GmbH has more than 30 years experience in the preparation of water by means of ultraviolet technology and attaches particular importance to the quality assurance of its performance. All systems are produced in Germany in accordance with DIN standards and ISO 9001.

The **UVOX** systems have been tested for remaining ozone by an internationally leading and independent test institute for the preparation of drinking water (KIWA in the Netherlands).





Areas of application

By means of the combination of the oxidising effect of ozone with the disinfecting effect of ultraviolet light in one item of equipment, the **UVOX-250** is able to guarantee very economical and ecological water preparation at an extremely low consumption rate.

Thus the **UVOX-250** areas of application are varied. **Wapure International GmbH** has developed unique system components for the following areas of application, which guarantee automatic monitoring of the water quality.

Drinking water

A 99.9% guarantee Killing-off of the microorganisms

The killing-off of 99.9% of the microorganisms is a pre-requisite for the preparation of drinking water. **Wapure International GmbH** developed an ultraviolet monitor that measures the ultraviolet intensity in the water and renders this as percentages.

The **UVOX-250** is used successfully in the preparation of drinking water for private households, hotels, hospitals, ships and trains.

Swimming pools

A swimming pool without the negative side effects of chlorine

The decisive advantage of the **UVOX** process for swimming pools is that it breaks down monochloramines, dichloramines and trichloramines.

Chloramines arise due to the chemical reaction of chlorine with organic substances (such as urine, particles of skin, perspiration and sun protection cream). They cause red eyes, irritation of the skin, allergies and an unpleasant chlorine odour. All the negative side effects of chlorine are reduced by the degradation of chloramines, thus promoting the true wellness experience of the pool user.

The preparation of the pool water is completely finalised when it leaves the **UVOX-250** system. In order to maintain a depot effect in the swimming pool, extremely small quantities of chlorine (0.1 – 0.3 mg per litre) are automatically injected into the pool water in order to avoid for instance algae growth in recesses and corners.

(Koi carp) ponds and aquariums

Effectively coming to the aid of the ecosystem

Even in the case of the intensive keeping of animals in ponds the **UVOX** process, in combination with a biological filter, also guarantees a natural habitat for plants, fish and water animals – without the use of chemicals. The **UVOX** process reduces germ exposure and oxidises a multitude of extremely persistent substances (for example nitrite, hydrosulphides/other odours, organic substances and pesticides). It offers a disinfectant against all pathogens such as VHS, IPN, UDN, PKD, furunculosis and vibro.

UVOX redox

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