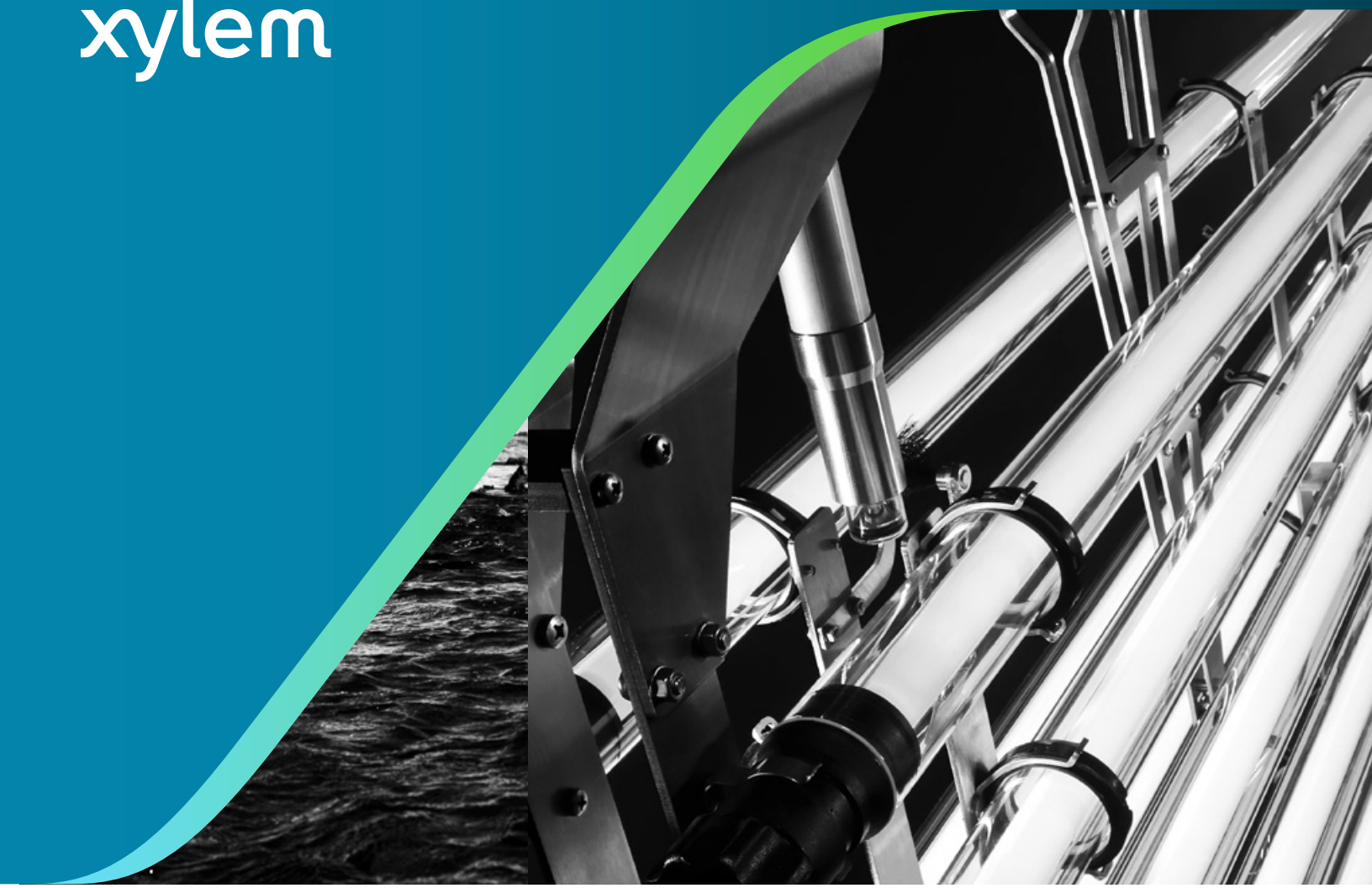
xylem



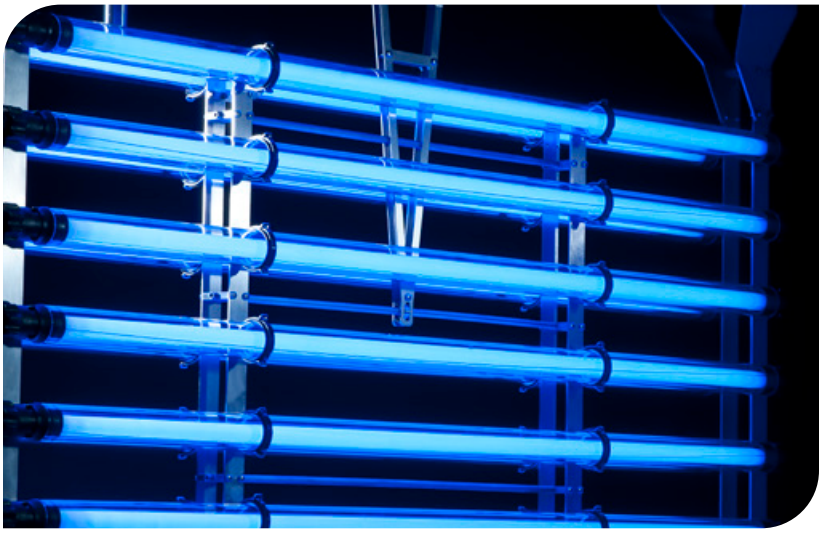
WEDECO® TAK 55

WEDECO
xylem

Wastewater treatment using UV light

Wherever water is used for bathing or drinking, or process water is to be recycled—e.g. in agriculture—targeted treatment is required. The modularly designed UV system WEDECO® brand TAK 55 series systems provides energy-efficient treatment for water or wastewater no matter how high a flowrate.

Irradiation with ultraviolet light is a tried, tested, recognized and environmentally friendly method of water and wastewater treatment.



Schematic of a typical wastewater treatment facility incorporating a WEDECO brand TAK 55 UV system as a final treatment stage.

The reliable choice:
WEDECO® TAK 55

The UV system WEDECO TAK 55 is Xylem's solution for highly reliable operation and performance for wastewater and process water treatment. Systems have been validated according to recognized standards across the globe such as NWRI and UVDGM.[1]

The WEDECO TAK 55 UV system is ideal for the treatment of wastewater from clarification plant processes. Installed within the effluent channel, the modular and compact construction of the TAK plant allows for the treatment of practically unlimited flow quantities.

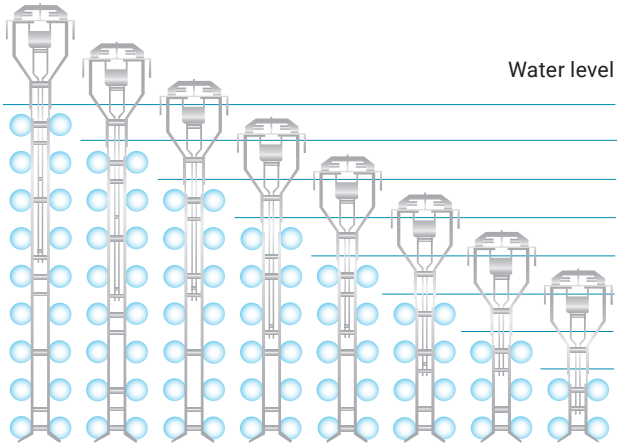
The advantages at a glance

- Chemical-additive-free treatment of large volumes of wastewater
- Simple to install in open wastewater channels
- Reliable, long-term operation
- Validated disinfection performance[1]
- Compact design, low space requirements

WEDECO® TAK 55 lamp module

The WEDECO TAK 55 lamp modules stand out because they are designed for long term use, and hydraulically optimized. The compact UV lamp arrangement allows for highly concentrated power in a very small space. The result is treatment performance secured at all times even with larger volume flows and low UV transmission.

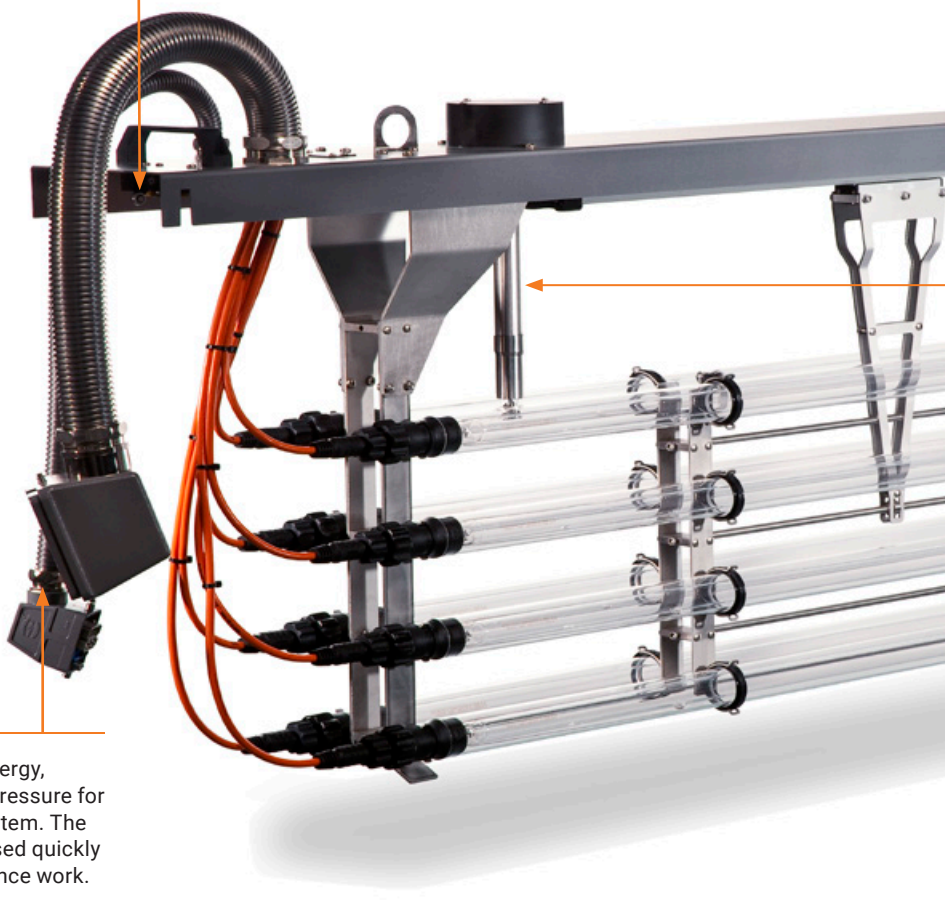
Depending on local circumstances and performance requirements, both the entire TAK system and the arrangement of the individual UV lamp modules can be customized—the number and arrangement of the modules, number of lamps per module and the distance of the UV lamp from one another.



The advantages at a glance

- Robust and hydraulically optimized design
- High power density thanks to compact lamp arrangement
- Simple maintenance without special tools
- Individual, client-focused design

If a module is removed from the channel, a trigger switch automati-cally switches the UV lamps off.

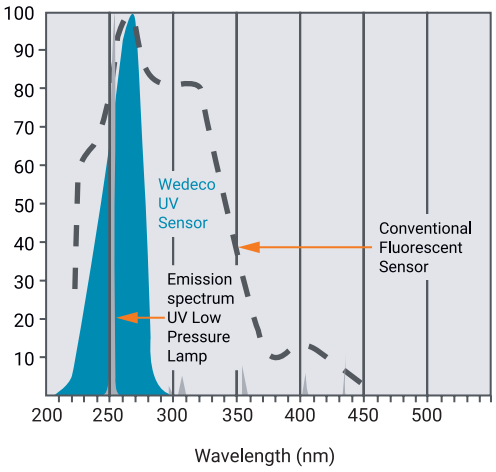


Connectors transmit energy, sensor signals and air pressure for the automatic wiper system. The connector can be released quickly and easily for maintenance work.

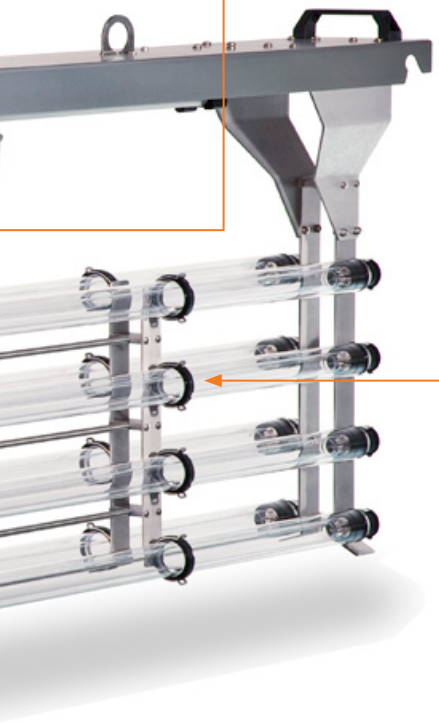
Leading sensor technology

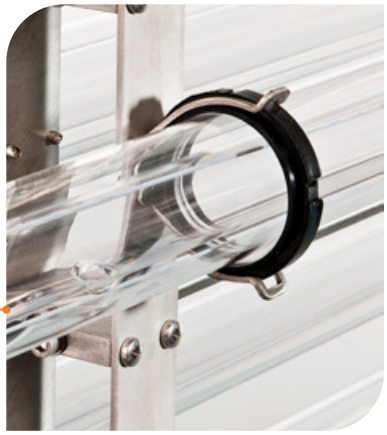
The UV intensity in the water is influenced by the age of the lamp, the cleanliness of the quartz tube and the UV transmission in the water. This is why the WEDECO® TAK 55 system monitors and measures the actual UV radiation emitted using integrated sensors constantly.

The WEDECO UV intensity sensor is integrated into the TAK module in such a way that it is automatically purified. This calibrated sensor stands out with its high UV wavelength selectivity, highly stable operating performance and a long service life.



The highly selective UV sensor measures optimal treatment wavelengths.





Fully-automatic preventive cleaning

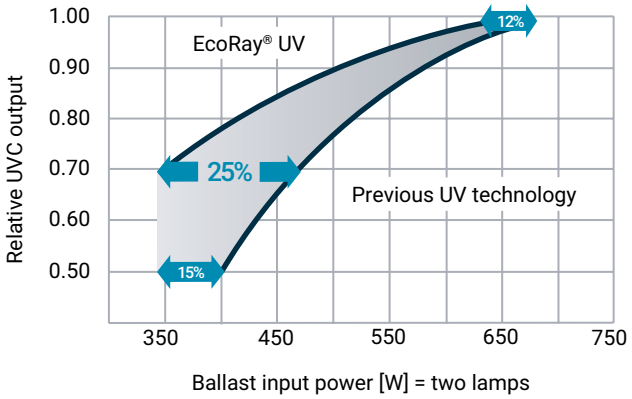
Depending on water quality, organic or inorganic deposits may form on the quartz protection tubes of the lamps, which can limit the performance the UV light. The fully-automatic TAK wiping system mitigates this problem by providing excellent cleaning performance that significantly reduces the formation of deposits.

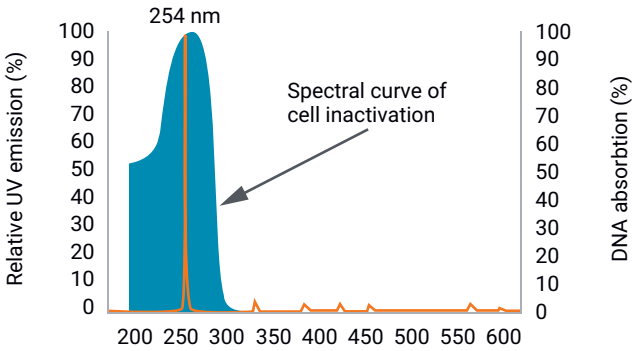
The wiping system is equipped with specially designed PTFE wiper rings which do not interfere with the treatment process and clean without the addition of chemical additives. The continuously operational wiper frequency can easily be adapted to the properties of the wastewater.

WEDECO® EcoRay® lamp and ballast technology

TAK55 units are equipped with Xylem's latest EcoRay UV lamp and ballast technology. In combination with the option of variable power output control, EcoRay lamps and ballasts feature excellent energy efficiency under a variety of operating conditions.

In dim mode, EcoRay lamps realize average energy savings of up to 20 percent.[2] EcoRay lamps also use up to 80 percent less mercury than the previous lamp generation, making them a sound choice for the environment.





The monochromatic EcoRay UV lamp emits at a nominal wavelength of 254 nm, which has been identified in the maximum range of targeted microbial inactivation.

Long-life and energy efficient Xylem EcoRay UV lamp 6

Intelligent electronics: optimally arranged

Effectiveness of EcoRay® UV lamps is further improved using Xylem's specially adapteds intelligent ballast modules. Output is controlled and continuously adjustable.

UV intensity is adapted in real-time to changing flow and water quality transmittance for optimization of the dose levels needed for effective treatment, and for providing reliability in performance, energy savings, and longer lamp life.

As with all of the critical electronic components for the TAK 55 system, EcoRay ballasts are housed in readily accessible and separate control cabinets to keep them dry and protected from temperature, humidity and transient voltage damage. An optional cooling system for heavy load or hot ambient climates is also available for further electrical element protection.

The advantages at a glance

- High UVC output with maximum efficiency
- Long lamp life guaranteed for up to 14,000 hours[3]
- Low mercury bulb technology
- Reduced formation of deposits on the quartz tubes
- Stable UVC output even with varying water temperatures
- Continuous adjustment of lamp power
- Automatic restart and ignition
- Electronics arranged safely in separate control cabinets
- Easy to maintain with front access

Ideally arrange electronics for constant maximum performance even under extreme conditions.

WEDECO® TAK 55 system design

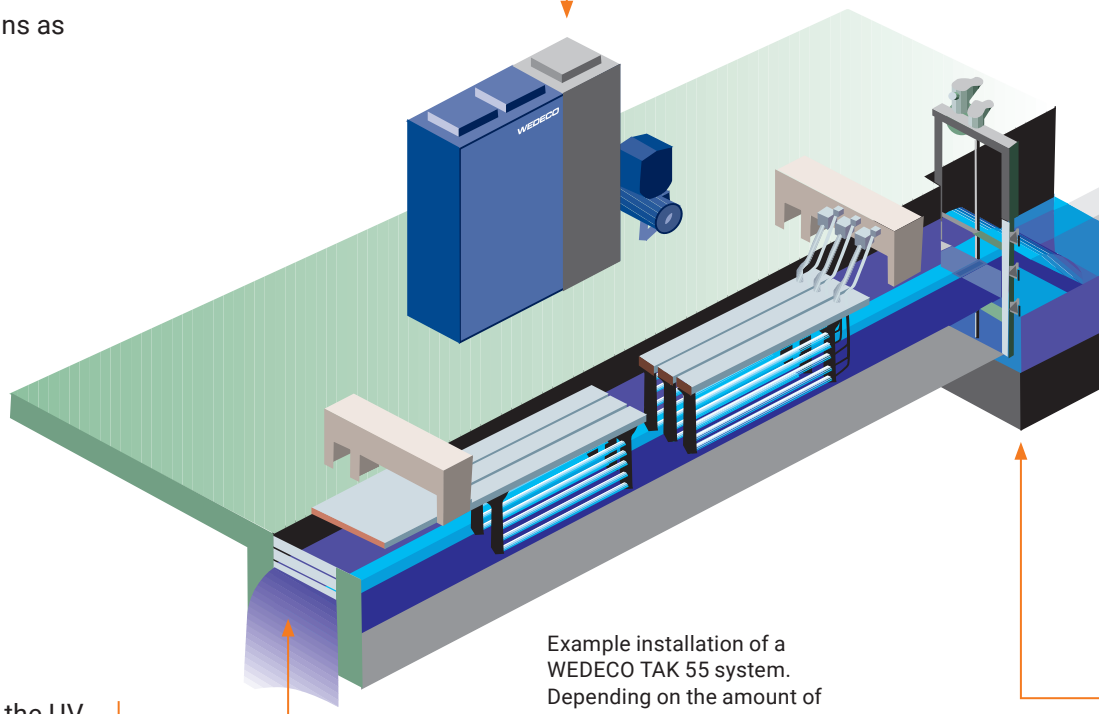
WEDECO TAK Smart™ UV system

The WEDECO TAK Smart UV system makes the disinfection of low wastewater flows as easy and cost-effective as possible, without any compromise in quality or flexibility.

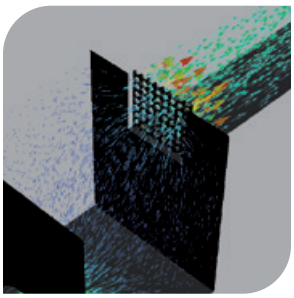
Similar the TAK 55, 'TAK Smart' systems, feature the same UV lamp configuration and set of common equipment options. Fully preassembled including the disinfection channel, it is available in five sizes and can be customized with different types of channel material, an optional automatic wiping system, various cabinet designs as well as sophisticated UV monitoring and control features.

Electronic components installed to ensure protection

Electronic com-ponents can be housed in separately erected control cabinets that suit local conditions.



Example installation of a WEDECO TAK 55 system. Depending on the amount of waste water, the number of uV modules, module banks and parallel wastewater channels may vary.



Flow regulation

Special baffle plates installed before the UV units regulate the flow of water and allow waste water to pass the UV lamps evenly. The baffles also protect the UV lamps from damage caused by solid bodies in the water.

Monitoring and control system

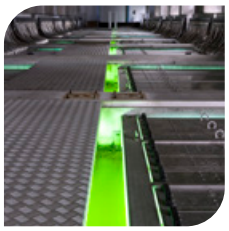
WEDECO® TAK 55 systems are fitted with an integrated PLC system for maximum flexibility in system control and data acquisition and transmission, adaptable to client specifications. System monitoring is available for local or remote control.

Water level control

An important factor in assuring treatment performance is a consistent water level under varying volume flow conditions. Weirs are installed after the UV unit for this purpose. Depending on the design of the entire system, fully-automated penstocks or fixed weirs can be installed. Both variants provide a low head loss and prevent interferences or “wave build-up” in the water, as may occur when utilizing flap gates.

References across the globe

Xylem has more than 40 years of experience in the development and production of UV systems for wastewater treatment. More than 1,000 WEDECO brand TAK systems installed worldwide demonstrate their performance and reliability every day.



Manukau, New Zealand
The 12 channels in the UV gallery contain a total of 7,776 UV lamps with a maximum discharge rate of 16,000 l/s (365 MGD). It is one of the largest and most sophisticated UV installations in the world.

Munich, Germany
To improve water quality of the river Isar, all sewage treatment plants south of Munich were equipped with a WEDECO brand UV treatment step. One of them is the largest UV plant in the area, treating a maximum flow of 21,600 m³/h, including rain flow. The project has contributed to a remarkable improvement in the water quality of the Isar.

Lincoln (California), USA
The UV system is designed to meet California Title 22, one of the most stringent standards for water reclamation Up to 900 lamps, installed in 5 channels, are required to treat the max flow of 30 MGD (4,732 m³/h).

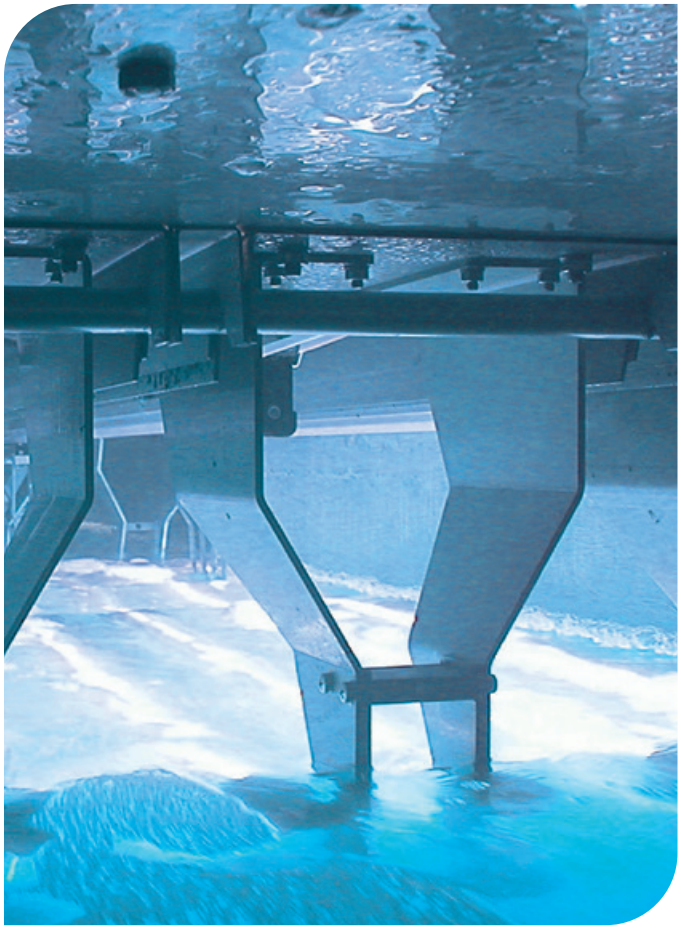
Validated performance

The existing microbial content (number and type) and the maximum permissible fit for purpose levels after UV treatment are important parameters in the design of most UV systems. A key to treatment success in that regard is the application of optmim UV dosage.

The powerful Xylem UV lamp technology with adjustable output, combined with superior sensor monitoring technology, helps avoid excessive or insufficient dosages. The ensures success in treatment and saves valuable resources.

Whatever the performance demands—Xylem can demonstrate reliable and objective performance data for the entire dosage range for the WEDECO® TAK 55 system. The system is validated in accordance with leading international standards such as USEPA UVDGM and NWRI. UV treatment for a wide range of applications is available from re-introduction into open waters to recycling for use in agriculture or drinking water supplies.

In special cases Xylem can validate performance on-site before making long-term investments. Our mobile pilot plants provide real, meaningful data while taking individual local circumstances into consideration.



The advantages at a glance

- Extensive experience in the design of UV treatment plants
- Use of recognised dose response calculation methods
- NWRI bioassay sizing for high dose reuse and virus control
- USEPA UVDGM validated and IUVA bioassay sizing for normal discharge applications
- Pilot plants for validation on site

Simple maintenance, less cost

Ease of maintenance is by design for the WEDECO® TAK 55 system

The use of state-of-the-art solutions such as opti- mized dose lamp modules, separately installed electro nics, an effective wiping system and ease of access ensure that maintenance time and effort is minimized.

More performance = fewer UV lamps = less maintenance and handling

The high power input of each EcoRay® UV lamp and the dense lamp arrangement in each module results in fewer UV lamps and fewer modules

Separation of UV modules and electronics

Separate control cabinets set up away from the treatment channel enable rapid, comfortable access to all electronic components, including ballast devices.

Less cleaning required

The optimized design of the modules and an effective, non-chemical wiping system minimize the manual cleaning required.

Maintenance without special tools

Easy replacement of lamps, quartz tubes and wiper rings with a practical clip mechanism—no need to dismantle the UV module.

Easy module removal with no need to use force

The lamp modules can be lifted individually using a lift or all together in the bank magazine (optional).

No manual adjustment of the weirs

Motor-driven penstocks together with the water level sensors automatically regulate the water level and flow volume.

1 WEDECO® brand TAK 55 UV disinfection systems have undergone third-party validation testing in accordance with NWRI and UVDGM (USEPA, 2006). Validated products are tested to confirm a minimum inactivation equivalent of 3 log (99.9%) for target microorganisms in accordance with the UVDGM. Performance is not claimed nor implied for any product not yet validated; unvalidated products use single point summation calculations to provide delivered dose recommendations. Performance limitations depend on feed conditions, overall installed system design, and operation and maintenance processes; please refer to Operations Manuals. For more information contact treatment@xylem.com.
2 Energy savings depend on a number of factors. For more information contact treatment@xylem.com.
3 Lamp life is affected by a number of factors. For details on life calculations, contact treatment@xylem.com.

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