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Wignity
Water Dignified

Wignity, adj. - to add
dignity to the world of
water management



Dear Water Warriors,

While Chemistry reactions and Settling processes excite a wastewater engineer, a whole lot of knowledge of physics specialty electrical engineering both AC and DC is also essential.

That's what we wish to highlight when we talk of UV and a whole lot of measuring instruments that we cover.



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While we have lots of technologies, one is motivated out of nature most in comparison to others. Do you know why old civilizations used to fetch water from ponds and other resources at the sunrise.

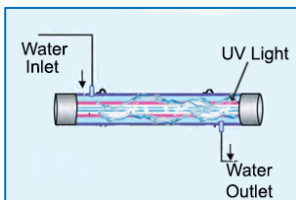
The UV radiations emitted by sun travel almost parallel to water surface, thereby having higher contact time and make water pure by killing microorganism.

Furthermore, how would you know the efficacy of a process without MEASUREMENT and instruments play key role in confirming our ideas of an effective treatment as well as provide Numeric Justification of our treatment goals.

This edition lets enjoy this knowledge available with the key vendors who are engaged in prorogation of such knowhow.

What is UV Disinfection System ?

UV Disinfection System is an extremely effective way to combat microbial contamination in water. However, microbes have to be exposed to UV-C light in the proper amount in order to effectively disinfect the water.



UV sanitization is useful in almost any application where microbial-free, safe and pure water is required; and where there is a chance of the water being contaminated before it reaches the final point of use.

In UV water disinfection technology, Ultraviolet light of wavelength 253.7 nanometers is used for the disinfection of bacteria, viruses, molds, algae, and other microorganisms, which multiply and grow.

Ultraviolet disinfection technology destroys the DNA of microorganisms which leaves them dead and unable to grow further. UV disinfection technology can be used for drinking water disinfection, process water disinfection, wastewater disinfection, and surface disinfection.

Other than disinfection applications, UV water filtration systems can also be used for TOC removal and Ozone destruction. Plus, there is a UV sterilizer for hospitals, factories, and offices.

We thank Alfaa UV an ISO 9001 certified company that has contributed technical points for this edition of Wignity. With close to two decades of rich experience, Alfaa UV is the leader in UV purification systems for Water (ranging from 100 LPH to 2,30,000 LPH) and Air (UV for coil cleaning and In-duct purification).

Below are the key products used in Water Treatment :

1. BioPure UV Series
2. Api UV Series
3. HiFlo Series
4. WWR Series
5. UltraPool UV
6. Ecostream UV





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INDUSTRIAL APPLICATIONS



DRINKING WATER
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FRUITS/VEGETABLES
WASHING



SURFACE
DISINFECTION



AQUACULTURE



AIR FUMIGATION



COOLING
TOWERS



STP, ETP &
RO PLANTS



WWR Series



UltraPool



EcoStream

How Does UV Disinfection System Work?

In UV water disinfection technology, the UV light disinfects by penetrating microorganisms and destroying their DNA. DNA plays an important role in organisms' functions and reproduction hence destroying the DNA prevents the organism from being active and multiplying. This UV energy (wavelength of 240-280 nm) is also naturally found in sunlight in very small quantities. The same energy is produced at stronger intensities with the help of high mercury discharge lamps, commonly known as UV lamps.

No bacteria, viruses, molds, or spores can survive when exposed to the correct dose of UV light.

Working philosophy or Operating principle

Design of a UV System:

UV is a very specialized & complex subject requiring experts in that field who understand the functioning & limitations of the systems with reference to the electrical, electronic, mechanical, hydraulic, physics, chemistry & microbiology parameters to be able to design an effective UV system.

There is a common misconception that UV is a subject, which can be handled by the water treatment company who supplies the other water treatment equipment. However, that is not true since most of the systems which are fabricated by local manufacturers are done without any design data or understanding the fundamentals of the UV subject, which is highly technical & specialized.

These types of manufactures would be unable to provide proper advice & backup support to achieve the required standards of microbial quality in the water. You would not get yourself operated for a heart ailment by your general practitioner who, is also a doctor but you would go to a heart specialist.

Similarly, it is advisable to talk to professionals & experts in the UV field when you are considering a UV system for pharmaceutical applications where the quality of water is very critical.

Key data required for selection of the right product

Sizing of UV System:

This is dependent on:

1. The quality of input water to the system (Physics & Chemical characteristics)
2. The type & quantity of microorganisms present in the water
3. The end application of the purified water
4. The peak hour flow rate
5. Location of the system

Since all these factors are critical to ascertain a suitable UV configuration for a particular application, it is important to deal with a UV application specialist for proper advice & guidance.

Installation of a UV System:

Since UV as a principle provides disinfection on contact & has no residual disinfection properties, care should be taken to install the system as close as possible to the point of use to avoid chances of subsequent contamination. Here again it is important to realize that need of providing a return closed looped line which is in constant circulation to prevent any stagnation & have a standard procedure of sanitation of the pipelines to reduce the biofouling which takes place in the pipeline.

Maintenance of UV Equipment:

This involves replacement of the lamps at regular intervals, cleaning of the quartz glass based on the quality of input water & cleaning of the purification chambers regularly.

It is advisable to maintain a set spares always to enable quick & timely replacements. Here it is important to deal with a company which provides dependable service.

Monitoring of A UV System:

This is the most important factor to ensure consistency of the UV units Performance to make it reliable.

Monitoring has to be on-line to determine the UV dosage, which is available to any organism, since the UV dosage will determine the disinfection efficiency of the system.

The on-line monitoring is important since there are factors, which are not apparent but likely to occur at any time & adversely effect the quality of output water.

Here again care has to taken to ensure that the monitoring system will indicate the level of 254 nm UV dosage available in the equipment. Most systems have lamp indicators or a visible light monitor, which will not determine the amount of UV dosage in the system.

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Instrumentation in Water & Wastewater Treatment

Instrumentation plays a crucial role in water and wastewater treatment processes by providing real-time monitoring, control, and optimization, thereby ensuring the effectiveness, efficiency, and safety of these treatment systems. Here are some key aspects highlighting the importance of instrumentation in water and wastewater treatment:

1. Process Monitoring
2. Quality Assurance
3. Process Control
4. Early detection of contaminants
5. Energy Efficiency
6. Data Analysis & Decision Support
7. Safety and Risk Mitigation
8. Remote Monitoring & Automation

Overall, instrumentation plays a critical role in optimizing the performance, reliability, and sustainability of water and wastewater treatment facilities, ultimately contributing to the protection of public health and the environment.

Team Wignity thanks “Nivo Controls” an Indian company engaged in the designing, manufacturing and marketing of instruments for process measurement for sharing their valuable knowledge.

Below are the product range for Water & Wastewater Industry:

1. Electromagnetic Flowmeter
2. Ultrasonic Level Transmitter
3. Ultrasonic Open Channel Flowmeter
4. RF Capacitance Level Transmitter
5. Conductivity Level Switch
6. Loss of Head Indicator



Working philosophy or operating principle

Electromagnetic Flowmeter

The instrument works on the principle of Faraday's law of Electromagnetic Induction. A magnetic field is generated by the instrument in the flow tube.



The fluid flowing through this magnetic field generates a voltage that is proportional to the flow velocity. This voltage is measured by electronics and a corresponding output is provided.

The performance of magnetic flowmeter is not affected by the properties of the material such as corrosiveness, viscosity, density, acidity and alkalinity.

Key Data required for the selection of the product:

- Line Size
- Conductivity
- Media Property
- Flow Rate
- Mounting
- Operating Temperature & Pressure
- Input & Output

Ultrasonic Level Transmitter

The instrument works on the principle of transmission of ultrasonic waves in air. A pulse is transmitted from the sensor face into the tank.

This pulse travels through the air, gets reflected by the liquid surface and returns back to the sensor.

The on board electronics measures this total travel time of the pulse and the liquid level is computed. The ultrasonic level transmitter can also be used for accurate and reliable flow measurement of liquids in open channels.



Key Data required for the selection of the product:

- MOC of Tank & Height of the Tank
- Operating Temperature & Pressure
- Media & Process Connection

Conductivity Level Switch

The system comprises of a sensor which is partly insulated rod or rope probe and a controller.

The sensor senses a decrease in electrical resistance due to the presence of conductive liquid between the sensor and ground terminal which is a reference point and results in flow of electrical signal which ultimately operates the relay.



Overall, instrumentation plays a critical role in optimizing the performance, reliability, and sustainability of water and wastewater treatment facilities, ultimately contributing to the protection of public health and the environment.

Key Data required for the selection of the product:

- Required Output
- MOC of Tank and Height of the Tank
- Fluid must be conductive
- Probe length of switching point

RF Capacitance Level Transmitter

The instrument works on the field proven RF technology. A RF signal is applied to the probe and the tank (reference).

A change in the level results in a change in the admittance between the probe and the tank. This change is measured by electronics and a corresponding output is provided.



The performance of RF Capacitance Level Transmitter is not affected by the properties of the material such as conductivity, corrosiveness, and viscosity. The capacitive sensor is offered with a wide variety of rod & rope probes to meet the needs of different applications.

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STRONGER
Together

Strength in Unity

Collaborative Excellence in Water Treatment



Join us in embracing the "Stronger Together"
This initiative aims to unite us all in our efforts, emphasizing collaboration, support, and synergy within our community.

Let's join hands and make a difference together!

