Process Instrumentation and Analytics

Process control for energy-efficient operations

Wastewater

Answers for industry.
Wastewater treatment processes continue to improve. To take advantage of their full potential, they require process measurement and control as robust and long-lasting as they are. Our cost-effective process instrumentation gives you the reliability, ease of integration and automation you need to deliver the best treatment efficiency, optimized energy consumption and safe processes, whether you are modernizing existing treatment plants or developing new ones.

Wastewater treatment plants require efficient process control to make sure that effluent is treated cost-effectively while also meeting environmental regulations. Partnering with Siemens provides the reassurance of best-in-class products, and the precision, integration and reliability in process automation to help you deliver optimum efficiency and productivity.

Our technology provides solutions to the challenges of wastewater treatment, where constant change in flow rates, rapid changes in level, chemical dosing and storage and remote locations are commonplace. Reliability in hostile applications is paramount, and Siemens products are designed to meet the challenge.

Higher process efficiency through
- Precise control of inlet, process and outlet flows to keep pumping to a minimum
- Monitoring of slugde rise, Return Activated Sludge flow, and air flows to diffusers

Efficient asset management through
- Quick, easy installation and commissioning
- Predictive maintenance features reducing breakdown and preventative maintenance costs
- Higher availability of instrument life cycle data

Improved energy efficiency through
- Accurate control of energy-intensive pumping systems based on ultrasonic level monitoring technology
- Precise control of inlet, process and outlet flows to keep pumping to a minimum
- Monitoring of slugde rise, Return Activated Sludge flow, and air flows to diffusers

Efficient asset management through
- Quick, easy installation and commissioning
- Predictive maintenance features reducing breakdown and preventative maintenance costs
- Higher availability of instrument life cycle data

In order to ensure that Warsaw’s growth remains healthy, a new wastewater treatment plant is being built so that all of the city’s wastewater can be treated. The plant is engineered, purchased and installed by Siemens.

The wastewater automation solution for the whole plant is based on the SIMATIC PCS 7 process control system. A redundant architecture with highly available SIMATIC S7-400 systems and communications via PROFIBUS provides the required plant availability and offers room for functional enhancements.

In the final installation, process data will be captured by the SIMATIC PCS 7 automation system, which is interfaced with the plant Energy Management System via PROFIBUS. More than 200 Sitrans flowmeters, more than 100 MultiMagnet continuous level controllers and Foxboro level switches, and numerous ULTRAMAT gas analyzers are installed in the plant. All of the communication of these instruments was done via SIMATIC PDM (Process Device Manager) which is a universal, vendor-independent tool for the configuration, parameter assignment, commissioning, diagnostics and servicing of intelligent field devices (sensors and actuators) and field components for the configuration, parameter assignment, commissioning, diagnostics and servicing of intelligent field devices (sensors and actuators) and field components

Solutions for Process Control

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Solutions to match your needs
From wastewater collection to wastewater treatment and bio-solids (sludge) treatment facilities, we have process instrumentation and analytic solutions to meet your needs. The following pages will provide you with the best instrumentation solution for your application. To find more about our key products for the wastewater industry, including case studies, references and interactive process charts, please visit: www.siemens.com/sensors/water
The monitoring of water level in the wastewater treatment plant is crucial for controlling the flow of the variable frequency driving pumps. The process involves detecting water levels and controlling the speed of the pumps accordingly. The pump control system is typically configured with sensors that provide real-time feedback to the control system. These sensors may include ultrasonic, radar, or acoustic level sensors that are specifically designed for use in wastewater applications.

The sensors are typically installed in the tanks or basins to measure the water level. The data from these sensors is transmitted to the control system, where it is processed to determine the flow rate and make the necessary adjustments to the pump speed. This ensures that the pump is working at an optimal speed to maintain the desired flow rate while minimizing energy consumption.

The process control system also includes advanced features such as automatic recalibration and alarm systems. For instance, the SENSORPROM unit automatically uploads calibration data, ensuring that the sensor remains accurate over time. There are also options for communication with various protocols such as HART, FOUNDATION Fieldbus, PROFIBUS PA/DP, Modbus, and others, allowing for easy integration with the existing control system.

To enhance the reliability of the process, the system also supports hazardous area and overspill protection approvals. This ensures that the system remains operational even in hazardous environments and prevents overspill of foam, which could lead to pollution or safety hazards.

Overall, the process control system plays a critical role in managing the flow rate in the wastewater treatment plant, ensuring that the water is treated efficiently and effectively.
Siemens process instrumentation has a comprehensive, proven product portfolio. This overview shows the entire spectrum of our process instrumentation and analytics portfolio for the wastewater industry.

### Level
Whether you are measuring liquids, slurries, or bulk solids in wastewater collection, wastewater treatment, and bio-solids treatment, Siemens provides level measuring technology for both continuous and point level measurements. Siemens offers a comprehensive range of ultrasonic, radar, guided wave radar, capacitance, hydrostatic, differential pressure, and electromagnetic type level measuring technologies.

### Flow
Siemens offers a wide range of electronic flow measuring technologies based on principles of Electromagnetic, Coriolis, In-line Ultrasonic, Clamp-on Transit time and Doppler, Differential Pressure, Vortex and Variable Area to measure liquids, slurries, gases and steam flows. Electromagnetic flow measuring technology is the most used technology to measure flow in the wastewater industry.

### Pressure
Siemens offers a comprehensive range of pressure transmitters to measure absolute, gauge, differential and hydrostatic pressure for level, flow, pressure and head loss measuring applications in wastewater industry. The product highlight is SITRANS P DS III that has outstanding accuracy, robust long-term performance and large installed base in the wastewater industry.

### Temperature
Siemens temperature transmitters SITRANS T covers head, rail and field transmitters. They support all common RTDs, thermocouples, resistance and millivolt-sensors and specific sensors to match all applications in the wastewater industry.

### Weighing
The comprehensive Siemens weighing portfolio includes belt scales, weighfeeders, solids flowmeters and static weighing. Milltronics MSI belt scales are a preferred solution for continuous weighing of in-line sludge transportation for optimizing truck loading operation in sludge disposal facilities across the world.

### Process protection
A wide range of rugged and reliable process protection devices such as motion sensors ensures that mechanical equipment like screw conveyors in sludge disposal facilities maintain their set speed, informing operators in case of breakdown or failure, helping improve availability of assets.

### Gas analysis
Siemens offers a comprehensive range of products and systems for process analytics. It includes continuous gas analyzers for stand-alone and system solutions.

### WirelessHART communication components
Our WirelessHART portfolio includes battery-powered transmitters, adapters as well as a gateway. With our WirelessHART solutions, users profit not only from lower total cost of ownership but also from significantly improved process diagnostics, productivity and security.

### Remote Data Manager
The remote data manager SITRANS RD500 is equipped with Ethernet, GSM / GPRS as well as cellular or landline connectivity. It provides integrated web access, alarm handling and data capture for instrumentation.
Find out more:
www.siemens.com/pia-portal

Learn more about our process instrumentation products for your industry in the PIA Life Cycle Portal, the tool for engineering, ordering, installation and operation. Just click on “Selection by Industry.”

Scan to explore the PIA Life Cycle Portal

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