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## WINTERHAUSEN WATER TREATMENT PLANT (95,000 PE)

### Job Report: Aqualogic® Control System – Increasing Process Efficiency

About 60% of the energy consumed by water treatment plants is used to generate compressed air for the biological purification process. The aeration system is usually operated with a constant pressure in the collector pipe. A possible approach to save energy during this process is to adjust the pressure to the actual requirements. During a period of low load, a lower pressure is sufficient to convey the amount of air necessary for the decomposition processes.

The Aqualogic® control system offers this option with the Enerlogic® pressure control. Based on Fuzzy Logic, the optimal pressure is calculated based on the ammonium load and the compressor power is automatically adjusted.

#### Problem

Optimizing the control of the aeration system using the Aqualogic® control system. The biological treatment stage of the water treatment plant in Winterhausen consists of two parallel aeration canals. The compressed air is generated by two turbo compressors and distributed to the canals by four diaphragm control valves.

#### Solution

With the Aqualogic® control system, the valve's degree of openness is calculated and controlled depending on the current load. In parallel, the Enerlogic® pressure control module is started. This module adjusts the pressure in the system in relation to the load and regulates the power of the turbo compressors accordingly. There is an interaction between the optimal degree of openness of the valve, the actually necessary pressure, and the corresponding compressor power in a single controller. In addition, operation of the two canals is alternated. This may cause the turbo compressors to run for a longer time, but they also run more efficiently.



Water Treatment Plant in Winterhausen



## Results

Since the installation of the Aqualogic® control system, the aeration system at the water treatment plant in Winterhausen has been regulated in a safe and stable manner. The Aqualogic® control system's efficient regulation of the turbo compressors has reduced current peaks. The alternating operating mode reduces the number of starts and stops of the turbo compressors, leading to energy savings. The customer is very satisfied. The operating personnel found the settings options directly on the Aqualogic® control system to be particularly convenient.

## Technical Details

2 x Aqualogic® control system with Enerlogic® (energy-efficient control)  
1 x Enerlogic® variable pressure control

## Benefits

- Efficient regulation of the entire compressed air supply for the biological process (valve, pressure, and compressors) in a single system based on Fuzzy Logic.
- Optimization of the biological purification process and energy savings.
- Various settings options directly on the Aqualogic® controller.
- Aqualogic® can be successfully operated regardless of the manufacturer of the measuring technology or installed aerator, and can be used with the existing programmable logic controller.
- Option of a multi-month test of the Aqualogic® control system.

The screenshot shows the 'Druckregelung EnerLogic - Leitstand - aktiviert - Benutzer:' interface. It features a top navigation bar, a central display area with a large '575' indicating the current pressure, and a left sidebar with a tree view of settings. The bottom status bar shows the current phase as 'xRegelung belüftet' and provides timing information for 'Dauer belüftet' (00:01:40) and 'Dauer unbelüftet' (00:00:00). The Aqualogic logo and version information (Version 10, Aqseptence Group) are visible in the bottom left corner.

Messwerte	Wert	Stellwerte	Wert
Ammonium-Aktiv (mg/l) :	0,0	Luftleistung Soll (%) :	0
Überdruckgesamt (mbar) :	0		

Drucksollwert (mbar): 575

Betriebsart:  
 Regelung  
 Manuell belüftet  
 Manuell unbelüftet

Buttons: Login, Logout, Belüftet, Unbelüftet

Log: 17.04.19 10:22 \*\*\* Belüftungsphase gestartet!  
17.04.19 10:22 Druckkonstanthaltung: Warte auf Sicherheitsnetz  
17.04.19 10:22 Druckkonstanthaltung: Sicherheitsnetz: Ereigniserkennung aktiviert.  
17.04.19 10:22 Prozesskommunikation: Verbindung ist aufgebaut.  
17.04.19 10:22 Prozesskommunikation: Versuche zu verbinden...

Statusbar: 17.04.19 | 10:24:16 | Aktuelle Phase: xRegelung belüftet | Dauer belüftet 00:01:40 | Dauer unbelüftet 00:00:00

Control console of the Aqualogic® control system – Pressure control

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