

Aeration basin air flow monitoring



Water and Wastewater Case Study 304-1

Application

Wastewater treatment plants use a number of different processes to remove pollutants from the wastewater before the water is released back into the environment. The activated sludge process is a biological treatment that uses large tanks divided into aeration basins. Compressed air delivers air to the aeration basins and a diffuser system distributes the air uniformly. The diffuser systems in turn supply air for microorganism growth and provide mixing of the suspended solids within each aeration basin. Micro-organisms decompose the biologically degradable organics in the wastewater and flocculate into a mass that settles along with the non-biodegradable solids.

Because the aeration requires large amounts of compressed air, the cost of the compressed air becomes a big expense. It is also critical to manage the microorganism growth by controlling the amount of air that is supplied to the basins. Consequently, accurate control

of the air flow is essential to the cost-effective operation and energy efficiency of an aeration basin system.

Challenge

At a wastewater treatment plant in Stockholm, Sweden, each aeration basin has several diffuser systems. Each diffuser system requires individual air flow monitoring and independent control. The air flow pipes leading to the diffusers typically do not have much straight run of pipe. This makes accurate measurement of the air flow more difficult. In addition, the air flow coming from the compressors is inconsistent. Compressors operate around the clock and the air flow demand changes throughout the day.

In order to assure accurate measurement and control of air flow to the aeration basins, operators at the plant realized they needed a flowmeter that could effectively measure and control wide flow ranges, tolerate significant drops in pressure throughout the system,

communicate with their control system, and withstand temperature ranges of 68°F to 150°F [20°C to 65°C].

Project parameters

User	Wastewater treatment plant
Location	Stockholm, Sweden
Media	Air
Flow Range	1.5 to 150 SFPS [0.46 to 46 NMPS]
Pressure Range	0.8 to 17.6 psig [0.6 to 1.2 bar(g)]
Temperature Range	-68° to +150°F [-20° to +65°C]

Solution

FCI's ST98 FlexMASter® thermal mass flow meters were chosen for installation in the aeration basins because of their ability to detect wide flow ranges, provide direct mass flow measurement, tolerate system pressure drops and interface with their distributed control system. Their ability to detect flow rates as low as 0.75 SFPS [0.21 NMPS] was critical to balancing the control system and preventing the diffusers from opening and closing too often or too quickly. The ST98 was also able to meet the system temperature and pressure requirements.

FCI flow meter specifications

Model	ST98 FlexMASter®
Media	Air
Flow Range	0.75 to 600 SFPS [0.21 to 172 NMPS]
Pressure Range	0 to 250 psig [0 to 17 bar(g)]
Temperature Range	-40° to +500°F [-40° to +260°C]

Your local FCI representative:



Web: www.fluidcomponents.com | Email: info@fluidcomponents.com

1755 La Costa Meadows Drive, San Marcos, California 92069 USA | Phone: 760-744-6950 | Toll free: 800-854-1993 | Fax: 760-736-6250

European Office: Persephonestraat 3-01 5047 TT Tilburg, The Netherlands | Phone: 31-13-5159989 | Fax: 31-13-5799036

FCI is ISO 9001 certified/conformance to AS9000