

Aeration Control in Effluent Treatment



Sewage treatment is the process of removing contaminants from wastewater, primarily from household sewage. It includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safe treated wastewater

An important stage of most treatment processes is the use of microbes to break down and consume pollutants rendering the water sufficiently clean for discharge to rivers and lakes.

These microbes require oxygen for effective growth. Traditionally this oxygen is supplied from the air in the environment and is pumped in to form air bubbles or introduced by agitation. Both of these processes are expensive from an energy perspective and wasteful as only a small proportion of the air is used by the microbes.



A recent innovation is the use of *Membrane Aerated Biofilm Reactors (MABR)* to control the biological treatment through an attached growth system made of an array of hollow fibre gas permeable membranes. The MABR habitat creates an ideal environment to support a robust biofilm which absorbs and consumes carbon and nitrogen based pollutants.

Air from the environment is supplied at low pressure and oxygen required by the microbes is supplied directly by diffusion.

The MABR is deployed in a modular cage design which is supplied as a packaged plant or retrofitted directly into an existing aeration tank.

The successful operation of this system depends on the careful monitoring of air supplied and oxygen consumed.



A leading manufacturer of these systems has turned to Flowcon and their partner M+W instruments GmbH (Part of the Bronkhorst High Tech B.V. Group) to provide Mass Flow metering technology for their control systems.

The M+W Mass-stream™ thermal mass flow meter offered the ideal solution where the air from the environment was sometimes dusty and damp and where reliable, accurate and repeatable measurements were required.

A minimal pressure drop across the instrument was vital to optimise air supply costs and insure the membranes received air within a tight operating pressure range.



Air flow entering and exiting the bank of membranes is metered and together with pressure and oxygen sensors the mass of oxygen diffusing through the membranes is calculated and carefully controlled

M+W Mass-Stream™ instruments utilise the CTA (Constant Temperature Anemometry) sensing technique and benefit from a relatively low pressure drop and IP65 ingress protection

The M+W Mass-Stream are modern digital instruments offering RS232 and Analog signals as standard. Profibus-DP®, DeviceNet™ and Modbus-RTU™ are available as options.

Air and Gas flows from 10mln/min up to 5000ln/min can be monitored using the 6 instruments sizes in the Mass-Stream range.

All instruments have an inbuilt PID control system that can be utilised to offer flow control features in combination with an appropriate proportional flow control valve

An attractive feature available as an optional extra is an integral TFT display with push button controls. This offers local readout and control of important parameters such as Set point (flow control applications). Instantaneous flow rate reading, Low or High Flow Alarms and totalised flows

The Mass stream offers a robust and economic solution to gas metering and control requirements.

Please contact us to discuss your application!

