

Recording and control in water dosing processes

Achieving accurate, flow-paced dosing



Accurate, stable control by matching dosing to flow

Measurement made easy

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Optimizing the dosing process to maintain a set concentration

Introduction

Water dosing accuracy and stability are an important part of the treatment of water, whether clean or waste. Various chemicals are added throughout these treatments that must be carefully regulated to eliminate potentially adverse effects, either to health or to the environment. Dosing involves adjusting the levels of chemicals added to a batch or process stream to maintain a set concentration. This is achieved by continuously monitoring the process using on-line instrumentation that automatically regulates chemical dosing to ensure levels are maintained without over- or under-dosing.

One example of a dosing process that must be carefully controlled is fluoridation. There are many different international standards for fluoridation. For example, in the U.S., the decision to fluoridate is made by the state or local municipality and in some parts of the world, fluoride is added to public water supplies to help improve dental health. Studies have

shown that the addition of low concentrations of fluoride of 1 mg/l can assist in reducing the incidence of tooth decay. However, the addition of fluoride to water is a controversial subject, with doses above 1.5 mg/l being linked to medical disorders such as dental and skeletal fluorosis and osteoporosis.

In the UK, the addition of fluoride to drinking water is governed by the Code of Practice on the Technical Aspects of Fluoridation of Water Supplies 2005. Responsibility for ensuring compliance with the code rests with the Drinking Water Inspectorate (DWI). The DWI has the power to take action against any water company that is found to exceed the permitted maximum fluoridation dose of 1.5 mg/l, the limit specified by the Water Supply (Water Quality) Regulations 2000. It is therefore essential that water companies are able to accurately monitor and regulate fluoride doses within the prescribed limits.

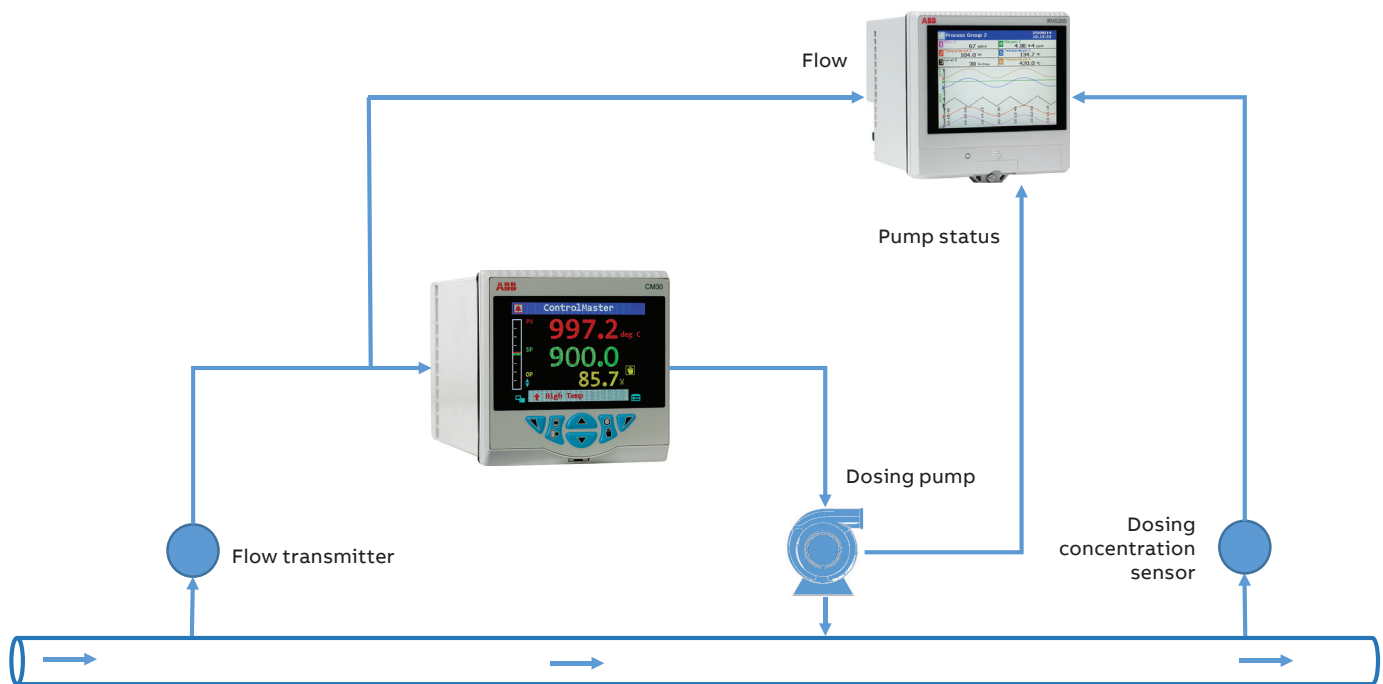
The process

Achieving dosing control stability that results in a final product that is both safe and consistent can be difficult. This is especially the case where flow rates vary rapidly and there is a significant delay between the moment of dosing and seeing the results. These conditions can often leave the control system struggling to achieve acceptable end product quality.

Using one of ABB's ControlMaster series of PID controllers, accurate and stable control can be achieved by changing the dosage control according to the measured flow. This enables the dosing of variable flows to be controlled effectively. Additionally, by using ABB's ScreenMaster range of paperless recorders, operators can obtain a secure record of the process that can be easily stored and retrieved for future reference to prove that quality and legal requirements have been met.

When used together, ABB's ControlMaster and ScreenMaster devices can deliver the following key benefits:

- Accurate process control
- Secure data recording
- Process alarming
- Remote web monitoring
- Full integration with telemetry
- Quality reporting



Dosing process overview

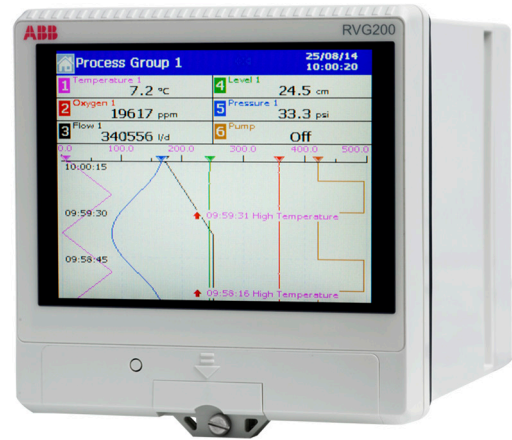
What ABB products are suitable?

ControlMaster controllers



ABB's ControlMaster range of PID controllers are widely deployed in dosing applications. The CM10, CM30 and CM50 controllers offer a wide range of control functions and feature straightforward operator controls. With their full-color TFT displays, all controllers in the ControlMaster range provide engineers with a clear and comprehensive overview of process status and key information. These displays can be tailored to show specific process data, while a chart display provides short-term trending information.

ScreenMaster RVG200



The RVG200 paperless recorder provides a versatile and secure solution for data recording. It is ideal for recording the dosing concentration level and monitoring pump status and fluid flow rate. The RVG200 is capable of collecting data onto a Master using Modbus™ communications, without the need for an analog input card.

RVG200 features include:

- Intuitive and easy-to-use operation featuring touchscreen technology.
- High visibility process displays.
- Remote access and operation via Ethernet.
- Hosedown protection to IP66 and NEMA 4X.
- Automated process data management using ABB's DataManager Pro PC-based historical data analysis tool.

Acknowledgements

MODBUS is a registered trademark of the Modbus-IDA organization

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