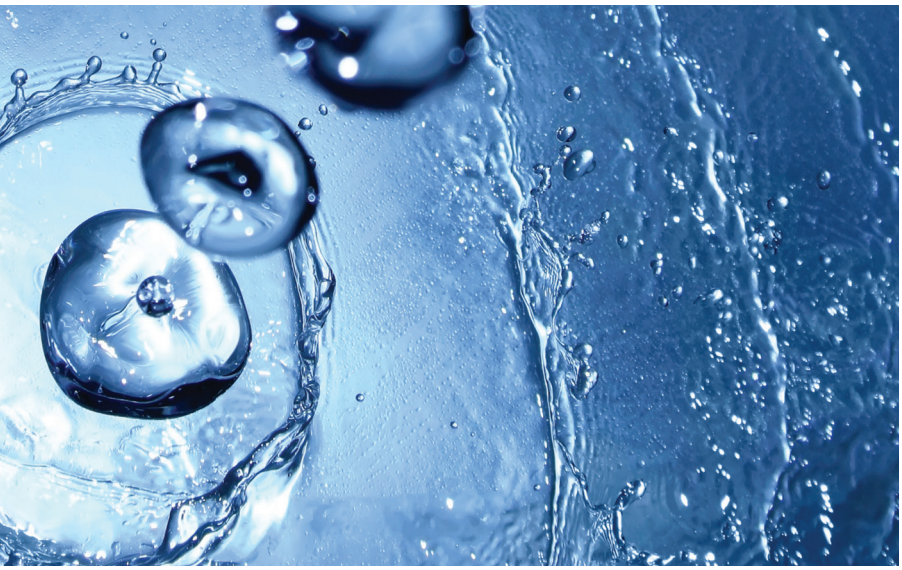
ABB MEASUREMENT & ANALYTICS | APPLICATION NOTE

Recording & Control in coagulant dosage applications for potable water treatment



Coagulant dosage for potable water treatment using the RVG200 paperless recorder

Measurement made easy

2 billion people do not have access to safe drinking water

Introduction

Potable water or drinking water as it is also known, is water that is safe to drink or to be used in food preparation. Typically, in developed countries, tap water meets the required drinking water standards although only a small proportion is actually drunk or used in food preparation.

The World Health Organisation considers access to safe drinking water a basic human right. In 2015, 71 % of the global population had access to a safely managed drinking water service. This means one that is located on the premises, available as required and free from contamination. However, an estimated 2 billion people continue to lack access to safe drinking water and must use water sources that may be contaminated.

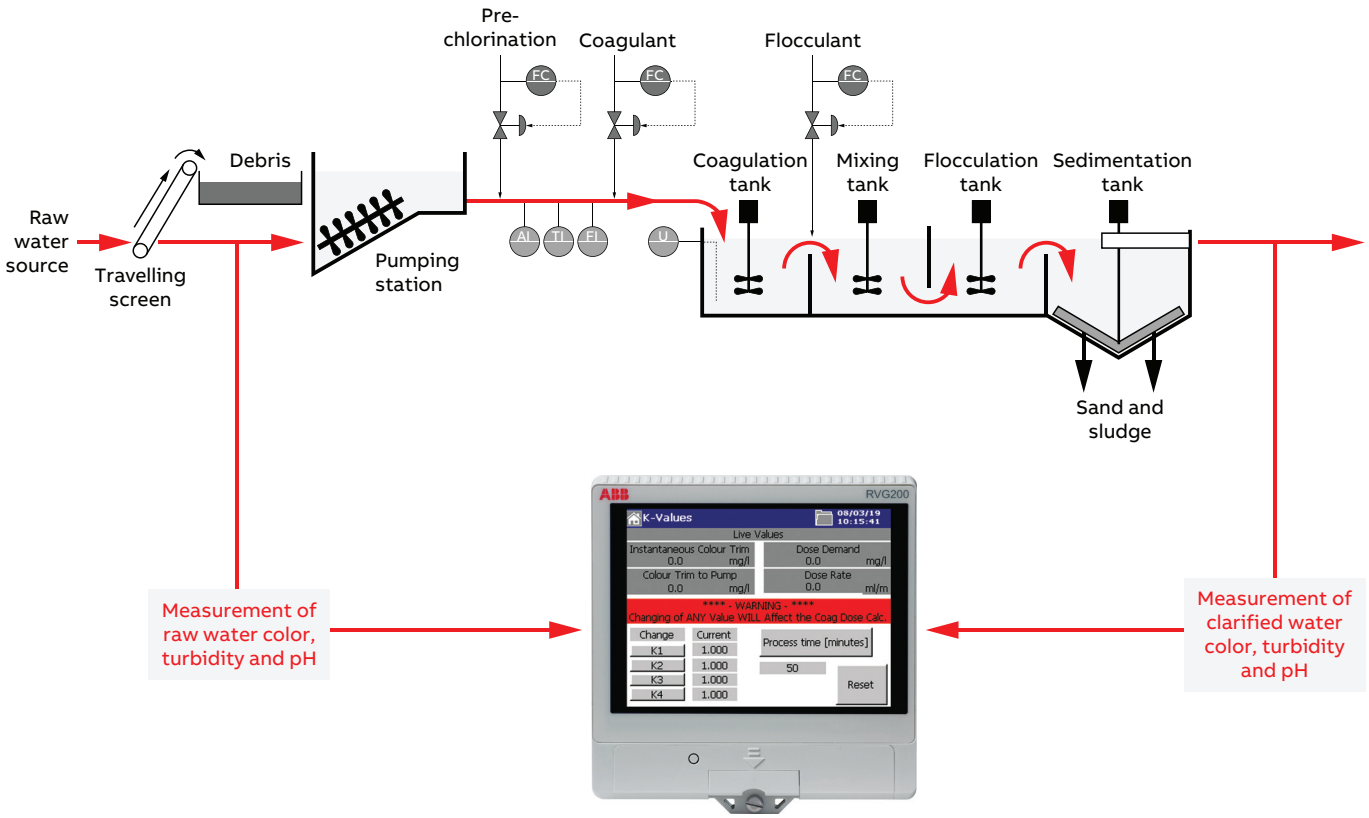
Where potable water is readily available but not naturally sourced (for example, from a spring), it will have undergone treatment to remove contaminants so that it complies with the local quality standards. These standards detail the levels of minerals, chemicals, pH, turbidity and the overall water color that is considered acceptable to make the water fit for human consumption. Failure to comply with the local standards can result in prosecution.

Coagulant is added to potable water as part of the treatment to create suspended solids that are large enough to be removed through the process of sedimentation. The amount of coagulation required depends upon the color of the water (both before and after treatment), its pH and its turbidity (amount of suspended solids).

The process

The number of factors that must be considered when adding coagulant to raw water during treatment mean that achieving a safe and consistent final product is a complex process. The quality of incoming untreated (raw) water can differ greatly depending on where the water has come from and what it was used for previously. A dosing system must be able to react quickly to ever-changing conditions.

To add the correct amount of coagulant to the process, measurements of the water's color, pH and turbidity are taken both before and after coagulant is added. This enables the coagulant dosing system to predict accurately the amount of coagulant to be added. The prediction is performed by a set of mathematical calculations within the system that use real-time and operator-set constant values that change depending on the type of coagulant chemical used.



The coagulation process

What ABB products are suitable?

ScreenMaster RVG200

- A 24 input touch screen recorder featuring swipe gesture control provides fast and intuitive operation.
- Process data (for example, water color, pH and turbidity) is displayed clearly to the local operator in a variety of formats, including chart, bar graph and digital indicator.
- Custom-generated operator views enable easy adjustment of operator K values via the touch of a button and on-screen entry.
- Up to 24 math equations can be created to perform the required calculations for establishing the dose rate and dose demand. Equations can be nested or bracketed for more complex functionality.
- Up to 24 logic equations can be created to perform the required logic for system status indication and failure hold.
- All process data can be accessed remotely using Ethernet communications. Using FTP, process data can be transferred from remote locations to a PC for review in ABB's Datamanager Pro review software. The process can also be monitored remotely by a PC, tablet or mobile phone using the recorder's inbuilt Web server.
- IP66/NEMA 4X environmental protection make the RVG200 ideal for hose-down locations.
- Process alarms and relay outputs enable local process monitoring indication and email functionality allows notification of process limit exceeding or process issues
- 21 CFR part 11 compliant data recording provides confidence that data is secure and accurate.
- ABB's Datamanager Pro data review software provides clear display for data review and long term data storage, as well as clear chart and tabular data display and excel export for reporting purposes.

For more information on the RVG200 Paperless Recorder go to:
www.abb.com/recorders

For more detail on how to configure the RVG200 Paperless recorder to perform this functionality, refer to Technical Description: TD/RandC/021-EN – ScreenMaster RVG200 paperless recorder | Online prediction of the optimum coagulant dosage for potable water treatment using the RVG200.

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