GEMÜ®

VALVES, MEASUREMENT AND CONTROL SYSTEMS

GEMÜ butterfly valves at the Trollmühle Waterworks

Uranium removal and partial deionization using Uranex® and Carix® procedures

Currently, the waterworks at the Trollmühle water supply authority in Windesheim near Bingen am Rhein supply approximately 43,000 people in 14,000 households with 2.2 million m^3 drinking water per year. At peak times, this means a daily dispensing volume of up to 8500 m^3.

On the one hand, Krüger WABAG / VWS Deutschland GmbH implemented the URANEX® system, which is used to minimise the water's geologically caused uranium content by means of ion exchange. On the other hand, partial deionization by ion exchange is achieved using the CARIX® procedure.

URANEX® procedure

The URANEX® plant in the Trollmühle waterworks is the largest plant of its kind worldwide. On average, the uranium content is reduced from 14 µg/l to below 0.1 µg/l in this plant.

Using the URANEX® procedure, uranium is highly selectively removed from the water. The raw water flows into the adsorption filter from above and passes through it. The uranium-reduced water exits the filter at the bottom and remains otherwise unchanged in composition, as uranium is selectively adsorbed. Depending on the raw water quantities and values, the filter material is replaced after a specific period of time. There is no or very little waste water during this treatment process, as backwashing is seldom required.

Photo: Krüger WABAG / VWS Deutschland GmbH

Regeneration, CARIX, bypass pumps and GEMÜ butterfly valves

Photo: Krüger WABAG / VWS Deutschland GmbH

URANEX® and CARIX® ion exchangers

CARIX® procedure

The nitrate, sulphate and chloride ions, as well as the hardness components calcium and magnesium, are minimised during this procedure using ion exchange for the partial deionization of drinking water. The total hardness is reduced from 22°dH to 12°dH and the nitrate content is reduced from 35 mg/l to below 25 mg/l.

The CARIX® procedure (Carbon Dioxide Regenerated Ion Exchangers) is particularly environmentally friendly, as the resins are not regenerated with acids and alkalis as they are during a conventional ion exchange. In this case, the regeneration agent is carbon dioxide (CO_2) dissolved in water, up to 95 % of which can be reclaimed and reused for the procedure. This means that substances which were previously removed from the raw water can be found in the waste water in concentrated form only.

GEMÜ butterfly valves among the ion exchangers

GEMÜ products

Pneumatically and manually operated GEMÜ butterfly valves are used in all treatment processes at the Trollmühle waterworks to distribute raw and treated water.
The EPDM liner of the GEMÜ 480 butterfly valve is particularly suited to drinking water applications and has DVGW approval. Optionally, the stainless gaskets can be adapted individually to the respective operating conditions, e.g. for low pressure ranges below 4 bar.
The GEMÜ 480 butterfly valve is available as standard in the lug design, as end-of-line valves are also often required in drinking water treatment plants.
Besides metal butterfly valves in nominal sizes up to DN 400, the waterworks at Trollmühle also uses GEMÜ butterfly valves and ball valves made of plastic.

GEMÜ 480 butterfly valve

GEMÜ 717 ball valve

GEMÜ 450 butterfly valve

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6-8 · D-74653 Ingelfingen-Criesbach
Phone +49 7940 123-0 · Fax +49 7940 123-224
info@gemue.de