Water protection

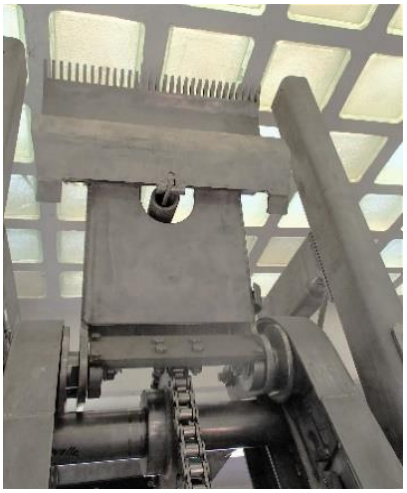
bgu-Umweltschutzanlagen GmbH

Equipment for wastewater treatment plants (WWTP)

The bgu products in the field of mechanical technology for sewage treatment plants have been established as reliable and proven solutions in wastewater treatment for over 50 years with our partner company Kraus. With their inlet screen and screenings-wash-press, they offer robust and efficient systems worldwide that help to effectively clean wastewater. We would like to highlight the long-standing success story of these products and highlight their important role and function in maintaining clean water and a healthy environment.

Inlet screen and screenings-wash-press

The Rake-Bar-Screen System Kraus is used on sewage treatment plants for cleaning industrial or municipal wastewater. It´s a significant part inside of the pre-treatment step in WWTP and removes gross solids out of the water and separates the screenings for a further treatment or direct disposal.



This automated process of mechanical removal of gross solids is a precondition to get an undisturbed sewage treatment process in the next parts of the cleaning process of WWTP and finally guarantees a good protection of the receiving water courses against pollution.

The Screenings-Wash-Press System Kraus

The Screenings-Wash-Press System Kraus is used for the dewatering and compressing of screenings and was particularly developed for the above-mentioned Rake-Bar-Screen.

The washing and compressing leads to a rest sludge of screenings which is reduced to a minimum of organics and water so that the final disposal can be done with smaller amounts and reduced costs. Dry residue components of 30 to 50% can be obtained easily.
The contaminated washing water is guided towards the biological stage of the WWTP, whereas the compressed screenings-sludge is falling into a container for the disposal.

Storm water treatment equipment

To protect our receiving watercourses there can be done much more than just installing a sewage treatment plant. Inside of the whole sewer system there are many possibilities to drive down the corresponding hydraulic loads towards the WWTP and also into rivers. For 50 years there were done considerable investments for the storm water treatment. In the future there will be a need of more investments.
Weak spots in combined sewer systems, where rainwater and wastewater flow together in the same sewers, are stormwater overflows. On heavy rain events the collected water in sewers exceeds the capacity of the downstream sewer system and / or the capacity of the WWTP. Water that cannot be treated has to run into the receiving watercourse. Later on in this event the pollution of the water will be lower. The load of the discharge gets lower and has not so much impact on the environment.
To improve this situation, in the late seventies the idea came up to build retention tanks to store the first flush of highly polluted water and to pass forward this water slowly to the WWTP but with a defined flow rate.
Around these retention tanks there is a variety of technical equipment necessary to guarantee an optimal and economic storm water treatment.
bgu has specialised in developing and manufacturing equipment for storm water treatment. One main aspect is to develop devices which will use just the kinetic or the static energy of water or both where possible, means without the need of electrical energy.

1. Cleaning systems for tanks and sewers

Stormwater and CSO systems require automatic cleaning systems to get rid of the settled debris. The debris causes dangers for the maintenance staff and odour. There are several solutions for this cleaning, like a flushing system (cleaning with a wave.

This can be done e.g. with **Flushing Drums** or **Flushing Gates**.

Picture 1: flushing drum

Sometimes they don't require electrical energy and can be easily adapted / retrofitted in existing tanks. They use normally the stormwater of the tank for flushing.

Picture 2: Flushing Gates

An alternative could be **Swinging Jet Cleaners (SCU)** or as jet pumps or **Swinging Mixers (SM)** with propeller mixers. These swinging options are especially recommended for difficult structures in circular or rectangle tanks.

Picture 3: Swinging Clean- Picture 4: Swinging Mixer ing Unit

2. Screening combined sewer overflows

As mentioned before: the stormwater discharge at combined sewer overflows (CSO) can be a critical place in sewer system because of gross solids getting into the rivers during heavy rain events.
Today, in some areas, there are legal requirements for the retention of floating and suspended matter in stormwater. Bgu provides different baffles and screens, recommended to hold back these materials inside of the sewer.

The **bgu-Stormwater Overflow Fine Screen** is designed for all stormwater discharge systems and can even be retrofitted / adapted at overflow weirs of existing storm water tanks. Very low electrical power is required to drive the automatic cleaning system of this screen. Floating and suspended matter is efficiently retained and screened material is reliably returned into sewer leading to sewage treatment plant (screen openings 5 x 25 mm).

Picture 4: Overflow Fine Screen

3. Flow regulators

Avoiding hydraulic overload of WWTP, sewers and even rivers require a good, efficient flow regulation. If possible the flow should be constant above the whole water column.
For the control of the flow bgu provides different hydro mechanical flow regulators. They use the kinetic energy of water for the regulation. There is no need for electricity.

Balance Regulator, Jet Regulator, Compact Regulator or RW-Regulator
are some examples and they all have simple working principles, which make them reliable for operation in wastewater and rainwater. All the regulators have a vertical flow curve, a high discharge accuracy that is independent of the up-stream water level and all of them have got an automatic self-flushing effect (opens automatically in case of a blockage)! All of them can be adjusted to a different flow rate within a certain flow range depending on the nominal size. Both, Balance and Jet regulator, are installed semi-dry whereas Compact and RW-Regulator will have to be wet installed.

Balance/Jet regulator
Balance and Jet Regulator are installed semi-dry in a separate chamber behind the tank. This makes maintenance easier and safer and therefore best for mixed water. Flow rates between 2 and 1000 l/s on max water heads up to 12 m

Picture 5: Jet regulator

Picture 6: Balance regulator

Compact Discharge and RW-Regulator
The Compact Discharge Regulator and the RW-Regulator can be installed directly in front of the outlet inside of the tank and are acted submerged by the upstream water level. A separate chamber like for a semi-dry are not needed. It is recommended first of all for rainwater projects. Flow rates between 5 and 450 l/s on max water heads up to 8 m.

Picture 7: Compact regul.

Picture 8:RW-regulator

4. Water level control

When a storm water tank has reached its max. capacity, any additional water must be discharged over the overflow weir into the river. Bgu provides several self-regulating weirs out of stainless steel, developed to avoid the disadvantages of fixed weirs (increased water pollution, lower usable volume and no backflow protection from the receiving watercourse like a river).

There are two types of self-regulating **Stormwater Overflow Weirs:** type U (underflowed) and the type O (overflowed).

Picture 9: Overflow Weir type S

Both ensure a constant maximum storage level in the head water and a full use of all the available upstream storage volume, but prevent the discharge of highly polluted water to the receiving stream. With overflow weirs it is possible to lower construction costs because of smaller basin volumes (on fixed weirs you can utilize only 70-80% of the total storage volume). By means of stormwater overflow weirs it is possible to reduce the costs of tank construction owing to smaller tank volumes (the overflow weir allows for 100% utilization of storage tank volume as opposed to only 70-80% for conventional weirs).

Picture 10: Overfl. Weir type U

5. Backflow protection

The **Nonreturn Gate** allows water to pass only in one direction.
Thus, it can be prevented that water from the receiving water reaches back into the basin or the sewer system during floods.
As soon as the level on the canal side is higher than in the receiving water, water can pass through the flap into the receiving water

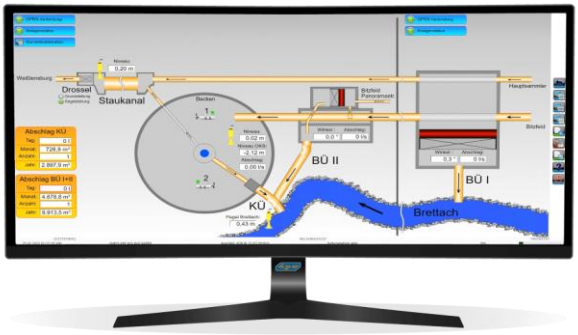
Picture 11: Non Return Gate

The **Check Flap** works according to the same principle as the nonreturn gate does, but it´s simpler in design and mounting and suitable for smaller flow cross-sections.

Picture 12: Check flap

6. Remote control with bgu-MoRIS

Today, many plant operators as well as owners need to have the ability to monitor and operate their equipment remotely. Using mobile devices such as smartphones as well as desktop computers, notebooks and tablets, the plant's existing electronic systems can be easily and economically monitored and controlled. **bgu-MoRIS** mean **M**obile **R**emote- and **I**nformation-**S**ystem based on SCADA FlowChief. It is a new concept in mobile monitoring and operating technology which enables these portable devices to accurately perform these functions.



Picture 13: Overview MoRIS

bgu-MoRIS allows information to be instantly displayed from anywhere at any time using smartphones. Whenever a malfunction occurs, a report is sent via SMS, Email, Fax or Voice Mail to these devices allowing plant operators to quickly perform control functions remotely such as switching equipment on and off, thus optimizing the working reliability of their plants.

Picture 14: Section view MoRIS

Picture 15: Solarversion with visualisation on mobile phone

bgu-MoRIS allows operators to remotely connect to the plant using their smartphones (LTE,GSM, WiFi Bluetooth etc…) and have the received data displayed graphically on their devices' screens. It is also possible to connect with a stationary desktop computer via DSL, ISDN, CSD etc.

As a provider of storm and waste water treatment equipment, CSO systems and process automation systems for more than 40 years, bgu now has a long list of satisfied customers with more than 10000 installations worldwide.

For more information about our products please scan the OR-code

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