

WE LEARN FROM YOU EVERY DAY –
AND THINK OUTSIDE THE BOX.

Handling particles in liquid media

Media separation ensures continuous and safe processes

When it comes to dealing with liquids and gases, Bürkert has become a sought-after partner all over the world. Why? Probably because we have been learning for and from our customers for more than 70 years now. This enables us to always think that crucial step ahead – or even sideways.

For your added value. Let us prove it to you – we look forward to your challenge.

We make ideas flow.

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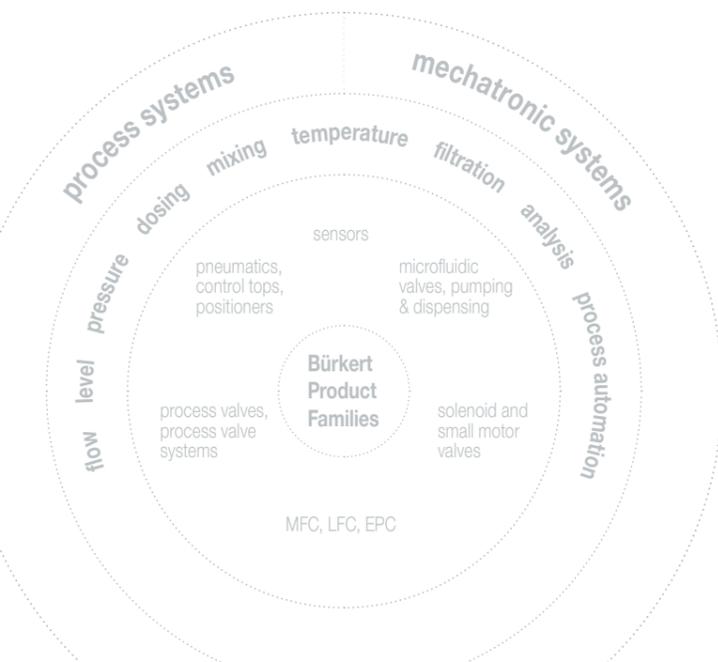
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WE SPEAK YOUR LANGUAGE. FLUENTLY.

We love a good challenge. That is because we are simply fascinated by everything that flows. No matter if our customers require solutions for measurement, control or both – we always find unconventional ways of developing individual solutions.

Whether it is about flow, level, pressure, dosing, analysis, filtration, temperature, mixing or the automation of processes – liquids and gases have to be measured and controlled. These are the fundamental fluidic variations upon which industrial process technology is based, and Bürkert's specialty with its expertise and entire range of solutions and services.

What makes us special? At Bürkert, we start with your fluidic challenge and draw on the basic physical principles. This way we make use of the fluidic relationships and our experience with physics, duplicating them across the most diverse applications and industries and hence solving the same or similar challenges. You in turn benefit from a deep pool of expertise, which we accumulate from multiple industries and apply individually to your needs. For the ideal solution to your specific challenge.



THE IDEAL MEDIA-SEPARATED SOLENOID VALVE FOR YOUR APPLICATION

Media-separated solenoid valves are key to controlling fluids in process plants and are deployed in a wide range of applications. Seeing as their reliability depends crucially on the actual process conditions and media properties, choosing the correct valve type is a complex undertaking. In terms of media-separated valves, no other parts except for the fluid housing and the separating diaphragm are wetted by the medium. Various valve types are used in real-life contexts depending on the process and the medium.

4 **Mixing and dosing paints precisely**

The Type 0330 valve is also resistant to aggressive and abrasive paint additives and ensures continuous production.

5 **Suppressing dust effectively**

The dust generated by surface coal mining is suppressed immediately by a fine film of water. Effective help is provided by the Type 5282 valve.

6 **Extinguishing fires reliably**

Automatic sprinkler systems play a crucial role in protecting people and plants. The Type 5282 valve is also endorsed by insurance companies.

7 **Cleaning bar screens perfectly**

Deployment of the Type 5282 valve in extreme environments is possible due to the high corrosion resistance of the material involved.

8 **Draining rail car water tanks exactly**

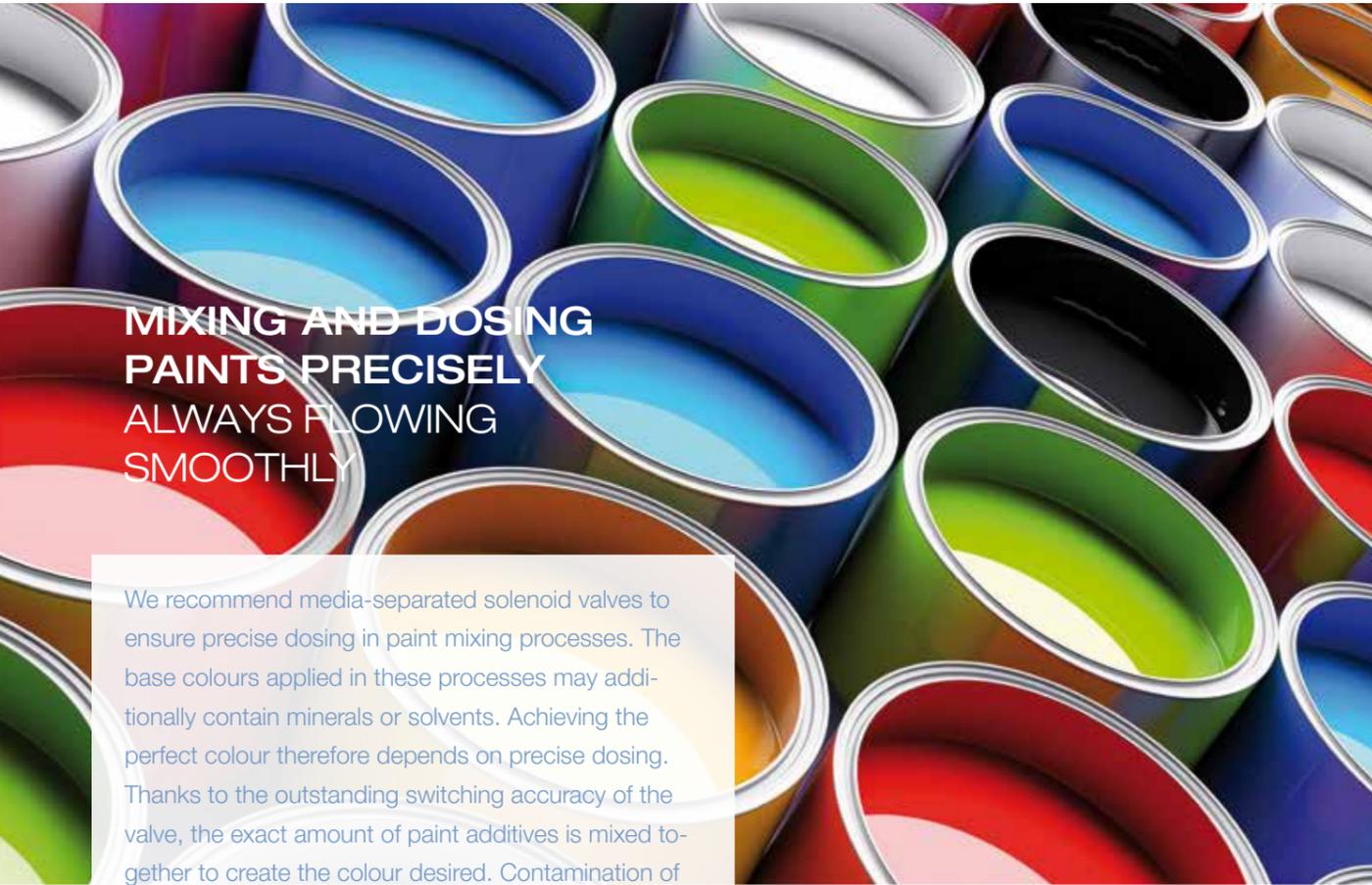
The power-reducing "Kick & Drop" electronics of the Type 0131 valve enables the drainage of rail car water tanks, also without power connection.

9 **Your solution**

Media-separated solenoid valves offer greater reliability for your application with particle-loaded liquid media.

10 **Practical example**

The Type 0330 and Type 0131 valves have been featured on trains for many years and reliably drain the fresh water tanks of galley cars.

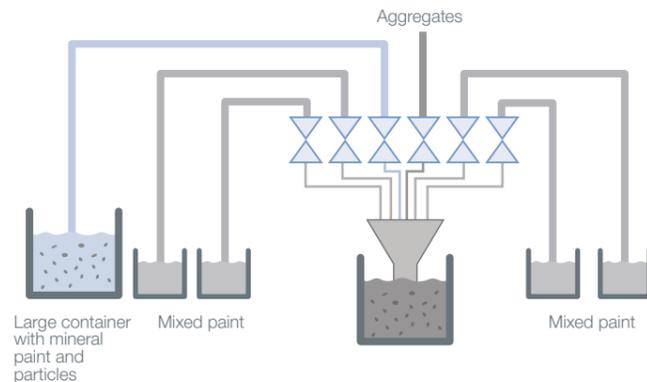


**MIXING AND DOSING
PAINTS PRECISELY
ALWAYS FLOWING
SMOOTHLY**

We recommend media-separated solenoid valves to ensure precise dosing in paint mixing processes. The base colours applied in these processes may additionally contain minerals or solvents. Achieving the perfect colour therefore depends on precise dosing. Thanks to the outstanding switching accuracy of the valve, the exact amount of paint additives is mixed together to create the colour desired. Contamination of the colour is avoided through rinsing processes after each mixing process. The media-separated diaphragm seals off the fluid chamber, thus ensuring the ideal conditions for residue-free cleaning in the valve. Mineral paints deliver good coverage, offer natural mould protection and are also suitable for outdoor application. Nonetheless, the abrasive minerals contained in the paints may damage the valve. To avoid this problem, we apply wear-free ceramic valve seats, which are also resistant to aggressive media. The valve orifices, measuring 2 mm to 5 mm in width, prevent any blockages in the fluid channels caused by pigments.

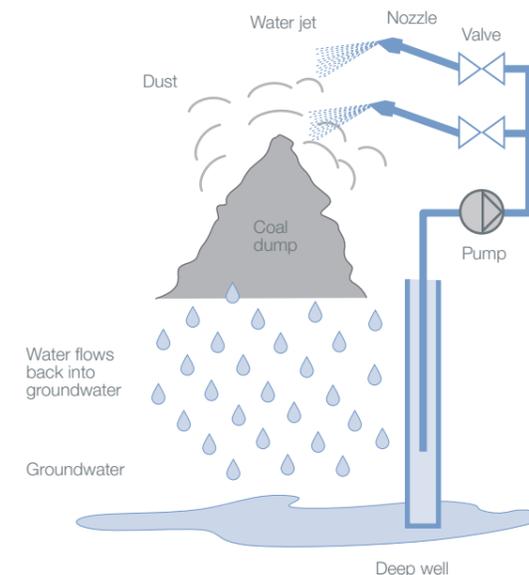
YOUR BENEFITS

- An exact switching process guarantees high paint quality at all times
- High process reliability, as the valve is extremely resistant to minerals, paints and additives
- Cost cutting thanks to increased longevity due to abrasion-resistant ceramic valve seats



**SUPPRESSING
DUST
CLEAN AIR FOR
COAL PRODUCTION**

Surface coal mining or tunnel excavation work creates airborne dust. The dust has to be suppressed quickly upon creation to prevent atmospheric pollution or an explosive dust mixture. The applied water mist simultaneously ensures good visibility. Valves control the fine film of water which is used for dust suppression. The water is pumped from surface or deep wells and constantly reused, which means it can also contain larger particles of dirt. Servo-assisted solenoid valves featuring a media-separated pilot valve offer the ideal solution for this task, since they are insensitive to particles and minerals while providing large orifices up to DN50.



YOUR BENEFITS

- Reliable operation thanks to soiling-resistant valve
- Effective dust suppression due to increased volume of water throughput
- Ease of use in dust ex zones, also in harsh environments
- Power and thus cost-reducing “Kick & Drop” electronics

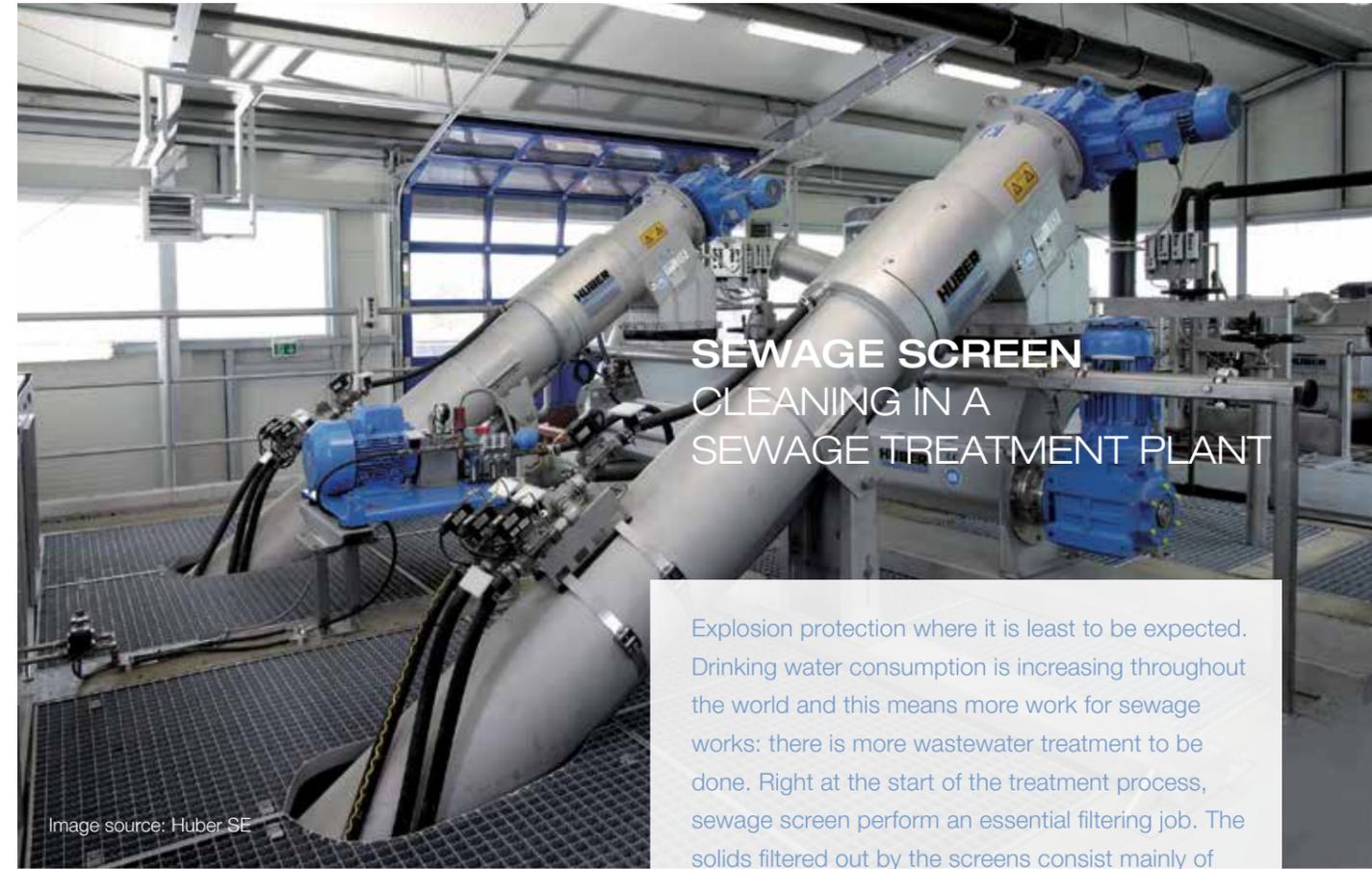
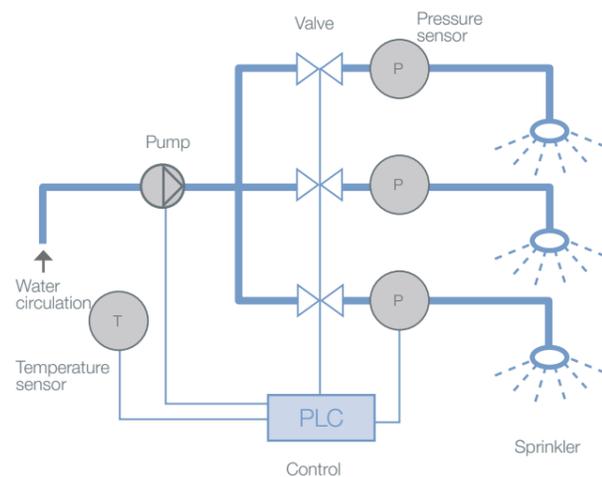


EXTINGUISHING FIRES RELIABLY ALWAYS READY FOR SERVICE IN CASE OF EMERGENCY

Sprinkler heads have seals held in place by glass bulbs that break if heated above a set temperature. The level of gas pressure within a sprinkler system is constant and monitored by a pressure sensor. If the bulb breaks due to a fire or if it is damaged, the level of gas pressure drops and the pressure sensor activates the water valve. Seeing as the bulb may be damaged accidentally during daily operation, the water valve is additionally monitored by a smoke alarm during daily operation. As a result, damage does not automatically lead to activation of the water supply to the sprinkler. The formation of particles, scale or corrosion is not uncommon as the water pressure sits in the pipeline and at the valve without moving. Nevertheless, the media-separated solenoid valves ensure sprinkler systems have the capacity to supply contaminated extinguishing water reliably whenever it is required. Property insurers have complete trust in the high level of switching accuracy.

YOUR BENEFITS

- Highest level of functional performance, since the valves are insensitive to corrosion and scale particles
- Fast fire extinguishing due to high levels of pressure and large orifices (DN50)
- Time and cost savings, as direct installation in the extinguishing line is possible
- Highest level of safety performance, since the valve can be opened manually (e.g. in case of a power outage)



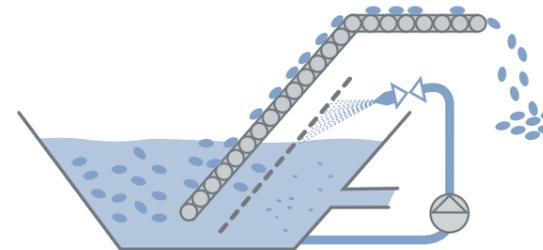
SEWAGE SCREEN CLEANING IN A SEWAGE TREATMENT PLANT

Image source: Huber SE

Explosion protection where it is least to be expected. Drinking water consumption is increasing throughout the world and this means more work for sewage works: there is more wastewater treatment to be done. Right at the start of the treatment process, sewage screens perform an essential filtering job. The solids filtered out by the screens consist mainly of organic substances such as toilet paper, faeces and food waste. The decomposition processes that ensue produce explosive gases. The filters are cleaned with the aid of a high-pressure water jet. The robust and stable Type 5282 solenoid valve allows for precise control of the water jet and explosions can be avoided.

YOUR BENEFITS

- No maintenance thanks to a high degree of resistance to the effects of dirt particles
- Extreme media resistance against, e.g., fermentation gas and UV radiation – wide range of usages
- Maximum corrosion resistance thanks to the media-separated encapsulated solenoid coil
- Safe use in the plant, as the solenoid valves offer Zone 1 approvals
- No clogging thanks to media separation in the valves

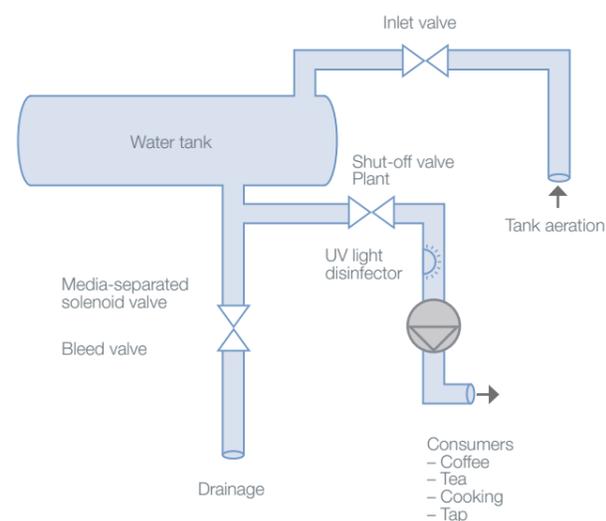


DRAINING WATER TANKS EXACTLY CLEAN WATER IN RAIL CARS AT ALL TIMES

The roof section of the galley car contains a drinking water tank with a volume capacity of 1.5 m³. The sun's rays can heat up the water in the tank considerably. This leads to oxygen depletion and scaling. As a result, the water is corrosive and contaminated with particles. New water of different qualities is added to the tank, which can ultimately cause the drinking water to become an aggressive, mineral mixture. This puts specific demands on the media resistance of the valve. The compact Type 0131 media-separated valve and power-reducing "Kick & Drop" electronics provide the ideal solution in this situation. After the opening switch-on pulse, the valve is kept open with one tenth of the output. If the car stands on the tracks during the winter months without a power supply and the outside temperature drops below 4 °C, the tank must be force-drained automatically to ensure it is not damaged. In this case, the battery-backed control opens the valve automatically. Alternatively, it can also be operated manually.

YOUR BENEFITS

- No loss of earnings, as the dining car operates reliably
- Fast and safe draining of the tank thanks to the large valve orifice
- Cost-efficient operation due to the power-reducing and battery-friendly high-performance coil



ROBUST - VERSATILE - RELIABLE MEDIA-SEPARATED SOLENOID VALVES



Type 0330 direct-acting pivoted armature valve

This valve is available as a 3/2 and 2/2-way version. The 3/2-way version can be used either as a distributor or a mixing valve. The standard brass body meets all European drinking water requirements. Depending on the actual application, there are suitable diaphragm materials available and various circuit functions can be selected. The body comes in brass as standard but is also available in stainless steel (316L), PVDF and polypropylene.

- Maintenance-free pivoted armature technology
- Vibration-proof, block screwed coil system
- Suitable for aggressive liquid media
- Orifice DN5



Type 5282 servo-assisted diaphragm valve

A minimum differential pressure is needed to operate this 2/2-way valve. Depending on the actual applications, there are various diaphragm materials and circuit functions available. The standard brass body meets all European drinking water requirements. The range of bodies additionally includes stainless steel and grey cast iron versions. The valve can accommodate orifices up to DN65.

- Ideal for applications with system pressures up to 10 bar
- Individually adjustable closing and opening times
- Explosion proof versions (Cat. 2)
- Service-friendly manual override



Type 0131 direct-acting toggle valve

Depending on the actual application, there are various sealing material combinations available for the Type 0131 valve. Thanks to the diaphragm separation between the actuator and the fluid housing, aggressive media, such as acidic or alkaline solutions, can also be controlled safely. The plastic body is available as either a PVC or a PVDF version. Energy-saving electric power reduction is provided for all DC variants through the "Kick & Drop" electronics.

- Orifice up to DN25
- Increased safety due to electric position feedback
- Robust and service-friendly manual override
- Degree of protection IP65



DRINKING WATER TANKS IN THE GALLEY FAST DRAINAGE JUST IN TIME

In galley rail cars, fresh water stored in tanks is used to prepare food and drinks. The tanks contain 200-400 litres of fresh water and are situated in the roof section of the car. At various locations along the route, they are filled with water of different qualities and are subject to temperature fluctuations. This results in the formation of deposits in the tanks, such as scale which spreads throughout the entire pipe network.

Why reliable drainage is important

If a galley car is sidelined, the water tank must be drained, especially in the winter at temperatures below 4°C, as it might otherwise be damaged. Thanks to complete drainage of the tank, including the pipe network, all accumulated dirt and deposits are flushed out. These particles may lead to

subsequent sealing problems at the valves, e.g. constant leakage which causes an above-average level of water consumption during refilling or even water damage in the galley located beneath the tank.

Correct valves are essential

Valves for rail car fresh water tanks must demonstrate exceptional features in various areas: when used in rail applications, they must meet a range of standards. They must be able to cope with deposits, both in the tanks and in the mains. When the cars are parked up without a locomotive and thus without a power supply, it is imperative that the valves can also be operated manually. Since they have to operate at various locations with varying levels of pressure (static pressure or approx. 3 bar of system pressure

depending on the pressure boosting module), direct-acting solenoid valves with large orifices are required. Furthermore, they must consume less power to reduce the impact on resources. In close cooperation with our customers, railway companies, two media-separated solenoid valve types were selected for this precise task. Thanks to their graduated performance, the Type 0330 and Type 0131 valves can be very easily adapted to the individual applications. In addition, the installation situation of the valves in the fresh water tank and the mains was optimised to ensure the defined drainage time is met and all accumulated dirt and deposits are also flushed out. Thanks to this successful cooperation, we were able to develop a joint solution that has been demonstrating its worth in real-life contexts for many years.

Type 0330 and Type 0131 valves – Ideal for draining rail car fresh water tanks



AT A GLANCE

Application	Effective drainage of rail car water tanks
Requirement	Adherence to standards, Complete drainage and get batteries last longer
Solution	Adapted solenoid valve types, which can also be operated manually and meet all relevant standards
Added values	Reduced costs due to a minimised level of maintenance for robust media-separated solenoid valves.