

Solutions for wastewater treatment plants



## Wastewater treatment plants

Reliable solutions for energy-efficient and safe wastewater treatment

**DOLD**   
Our experience. Your safety.

# Solutions for trouble-free and efficient operation in wastewater treatment plants

In recent years, the situation in local and industrial wastewater treatment has changed dramatically. In addition to the restoration, modernization and maintenance of wastewater treatment plants, sewage disposal companies today have to face new challenges.

For example, the treatment of residues such as microplastics or pharmaceuticals, the reduction of energy consumption, the increase of own power generation by means of block-type thermal power stations or the use of unused potentials (sludge digestion, sewage sludge dewatering etc.).

Preventive maintenance measures are also becoming increasingly important. Early fault detection can prevent unplanned failures and thus avoiding time-consuming and costly repairs. This increases the efficiency and availability of the plant and reduces operating costs.

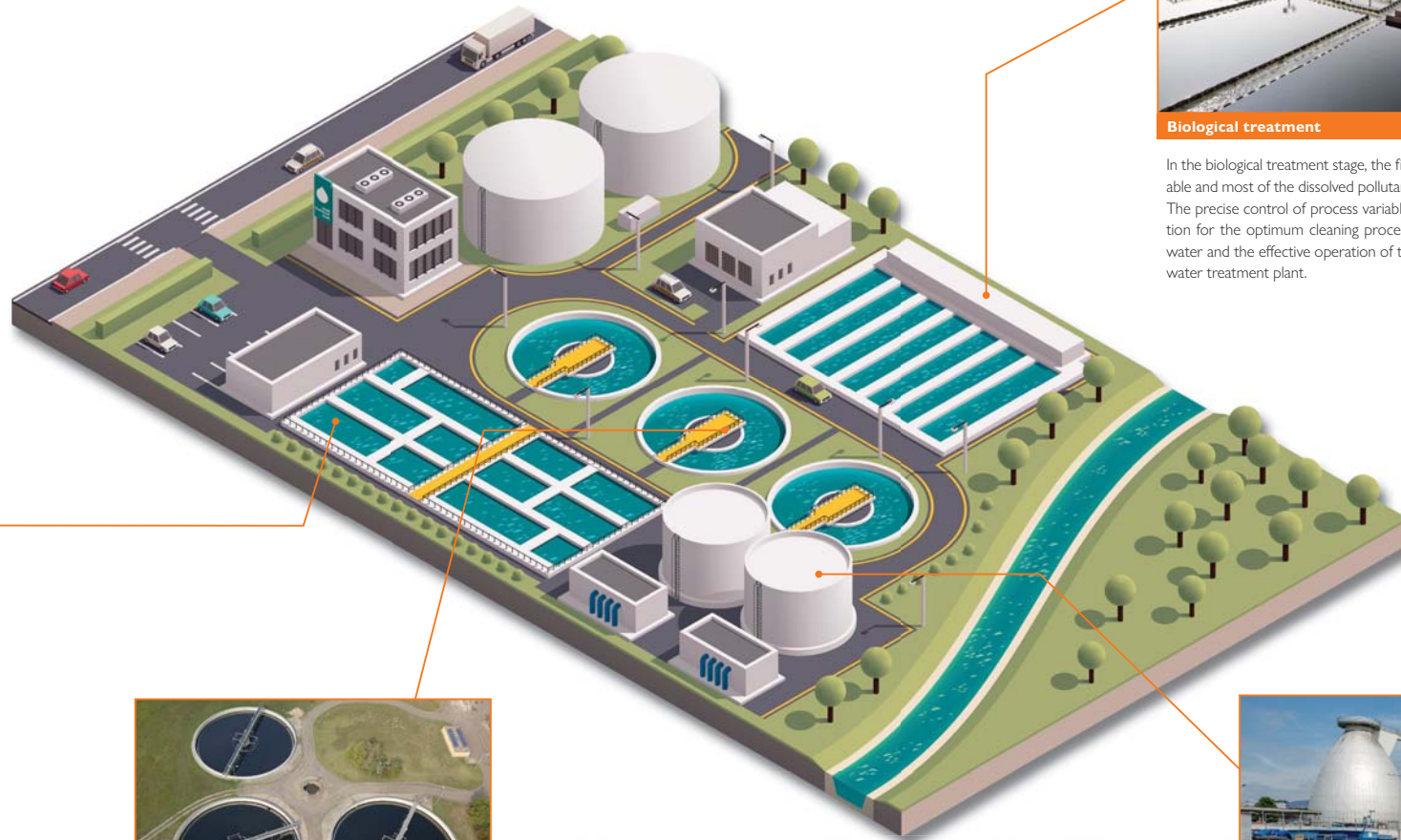
The Federal Government also puts new challenges to wastewater treatment plant operators as a result of the new Sewage Sludge Ordinance. In future, many of them will have to recycle sewage sludge instead of spreading it in agriculture.

With its products for safe automation, electrical safety and power electronics, DOLD offers a wide range of automation solutions for efficient and resource-saving wastewater treatment.

Rely on complete solutions for energy-efficient and safe wastewater treatment in these areas:

- ▶ Mechanical pre-treatment
- ▶ Secondary sedimentation
- ▶ Sludge treatment
- ▶ Biological treatment

Efficient wastewater treatment is essential to protect the environment and water resources.



**Biological treatment**

In the biological treatment stage, the finest, non-settleable and most of the dissolved pollutants are removed. The precise control of process variables is a precondition for the optimum cleaning process of the wastewater and the effective operation of the entire wastewater treatment plant.



**Mechanical pre-treatment**

During mechanical pre-treatment, the solid components contained in the wastewater are retained by a grid and separated by means of a screen and then disposed of.



**Secondary sedimentation**

In the secondary sedimentation in a funnel-shaped tank, the dirt from the sludge-water mixture sediments at the bottom. A clearing device conveys the settled sludge to the top of the hopper, where it is pumped off.



**Sludge treatment**

The solids resulting from wastewater treatment are further treated in the form of sludge. The aim is to process or dispose of this sludge as efficiently as possible.





## SAFEMASTER W

– Safe, reliable radio communication

UH 6900

### Safe and wireless transmission of emergency stop signals

On circular or sand scrapers equipped with 1 or 2-fold scraper bridges, safe data communication was previously only possible using expensive and complex slip ring technology. With the radio controlled safety system UH 6900, you can protect moving or difficult-to-access automation devices simply, reliably and conveniently and transmit emergency stop signals in a safety-related, bidirectional way. Use Wireless Safety from DOLD as a cost-effective alternative.



UH 6900



### Wireless and ergonomic maintenance

Frequently, persons must work in a hazardous area also during the operation of a system, e.g. during inspections, maintenance and repair work. DOLD offers solutions for the wireless control of moving plant components such as sand traps, screens, etc. The radio controlled safety system SAFEMASTER W with enabling switch and mobile emergency stop enables safe operation and shutdown of systems in hazardous situations and ensures maximum mobility.

### Simple and economical modernization

The modernization of facilities, such as the equalization tank, creates high costs for the retrofitting of wiring. Wireless communication via radio enables safe and simple transmission of data from the field to a central control centre. At the same time, wiring and installation costs are reduced to a minimum.

## SAFEMASTER

– Emergency stop module with power failure detection



BH 5903

### Restart after power failure

Wastewater treatment plants require high availability. An automatic restart after a power failure (e.g. due to thunderstorms) must be guaranteed, otherwise the emergency service is automatically activated. However, if the emergency stop was activated before the power failure, no automatic restart is permitted. The emergency stop module BH 5903 with power failure detection is the optimum solution for this application. The device differs between a mains failure and the actuation of an emergency stop button and can be used up to Cat. 4, PL e (EN ISO 13849-1) or SIL 3 (IEC EN 61508).



UF 6925

## SAFEMASTER

– Safety switching devices from 17.5 mm

### Emergency shutdown with minimum space requirement

The emergency stop module, which is only 17.5 mm wide, serves to interrupt a safety circuit in a safety-related manner and can be used to protect persons and plants in applications with emergency stop buttons and safety doors. For example, in mechanical pre-cleaning to protect moving components such as sand and grease traps. The UF 6925 is characterised by maximum safety for personnel and machine with minimum space requirements and allows time-saving wiring thanks to the integrated push-in cage clamp terminals at the front.



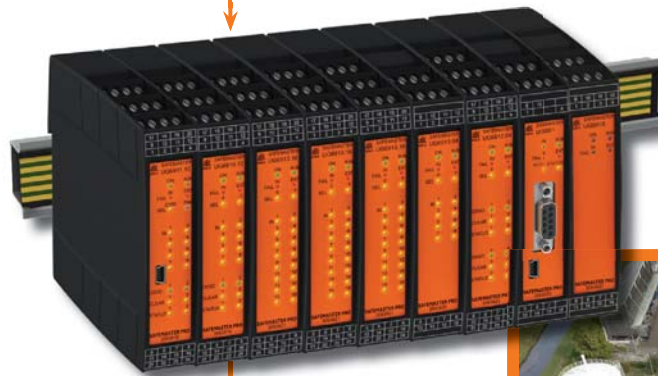
## SAFEMASTER PRO – Collect and transmit signals

### Monitor information centralized

With the configurable safety system SAFEMASTER PRO, signals can easily be collected from distant wastewater plants and transmitted to the central control system using common bus systems (Profinet, Profibus DP, CANOpen, Ethernet/IP, EtherCat, Modbus, USB, etc.).

Signals

extendable



SAFEMASTER PRO

common bus systems  
can be used



Guidance system

## SAFEMASTER PRO – Easy handling and programming

### Simple and fast configuration

The TÜV-certified system can be configured quickly and easily via PC using the free SAFEMASTER PRO Designer software. Select safety functions, reserve inputs and outputs and wire them conveniently via PC. Then transfer the tested safety logic to the safety module via USB cable. Done!



UH 6932

## SAFEMASTER S – Speed monitoring

### Comfortable speed monitoring

The new speed monitors of the SAFEMASTER S series monitor the standstill and the speed of machines and plants in automatic as well as in set-up mode. Up to 4 speed modes with different response values can be activated during operation. DOLD offers efficient and economical solutions for safe sensorless drive monitoring as well as speed / standstill monitoring via initiators and encoders.



UH 6937

UG 6946

### Safe maintenance of screw conveyors

The sensorless standstill monitor UG 6946 of the SAFEMASTER S series detects the standstill of motors independent of the direction of rotation without the need for additional external sensors such as encoders or proximity switches. For example, a large screw conveyor can be safely accessed for maintenance and service work. Standstill detection is achieved directly by evaluating the voltages at the motor connection terminals.

## SAFEMASTER S – Safe sensorless drive monitoring



### Reversing function for eccentric and screw pumps

When pumping waste water, the substances it contains can lead to malfunctions in pumps and systems. Accumulations of tear-resistant fibrous materials often lead to pump blockages, which require manual troubleshooting. The reversing function of the UG 9256 allows the eccentric or screw pumps to be unblocked without the need for manual intervention by maintenance personnel on site.



### Soft start of motors

The gentle start protects the mechanics of the screw conveyors and reduces the sludge turbulence in the tank to a minimum.



UG 9256

## MINISTART – Smooth, gentle start of motors



UG 9411

UG 9410

### Simple and reliable communication via fieldbus

The smart motorstarters UG 9410 and UG 9411 offer up to 7 functions in a compact enclosure with only 22.5 mm width. They combine the functions of reversing, soft start, soft stop and protection of 3- or 1-phase asynchronous motors in a single device and enable simple control and diagnostics via the Modbus RTU interface.

### High drive power

High drive power is required to control pumps, blowers and mixers. Only powerful softstarters such as the GF 9016 can meet these requirements. Additional features such as kickstart function, root 3 circuit, adjustable parameter settings complete the motorstart system.



IE3  
ready

GF 9016

### Also suitable for use in pump sump

The softstarter PF 9015 is a smart, user-friendly 3-phase controlled softstarter with extensive monitoring and protection functions. The adjustable kickstart function (breakaway torque) is particularly suitable for use with submersible pumps that can get stuck in the pump sump.



### Vibration-free soft start / soft stop of pumps

The mechanical gentle soft start / soft stop reduces the pressure surges in the pipelines caused by the water impact to a minimum. The downstream filters are also subject to considerably less wear and tear and the non-return valves are exposed to a lower load.



PF 9015

## VARIMETER RCM – Early fault detection

### High system availability in rainwater retention basin

A rainwater retention basin is an artificial basin designed to temporarily store large quantities of rainwater for a short period of time, so that it is discharged at a slower rate into the subsequent receiving water (drainage channel), which leads to the wastewater treatment plant. Precipitation water can be discharged, for example, via submersible pumps or rainwater screw pumps. Since the pumps, which must have a very high availability when required, are relatively rarely switched on, the MK 5880N/200 is suitable as a preventive protective measure for monitoring the motor windings for earth faults.

## VARIMETER IMD – Insulation monitoring of switched off pumps



**Signalling instead of switching off in earthed systems**  
In earthed mains, residual current monitors of the VARIMETER RCM series guarantee reliable fault current monitoring. The residual current monitors can be used universally as they detect both direct and alternating currents.



### Monitoring of switched off devices in TN mains

The permanent monitoring of switched off consumer load in earthed mains for insulation faults is strongly recommended for safety reasons in numerous applications. A malfunctioning drive, on a gate valve or on a submersible motor pump, can have serious consequences. However, availability should also be ensured for other drives, which are kept in reserve, for example. Otherwise, costly system downtimes can occur. Monitoring with the insulation monitors MK 5880N/200 and MH 5880 ensures safety even in earthed systems.

### Reliable blockage monitoring

The solids contained in the fatty water often cause a blockage of the faecal screen, which can be destroyed. The load monitor MK 9397N switches off the screen drive quickly and reliably due to impermissible overload.



## VARIMETER EX – Explosion protection in wastewater treatment plants

### Monitoring of Ex-areas

It is almost impossible to determine the composition of wastewater discharged into wastewater treatment plants in advance. Unauthorized discharges, accidents, digestion processes, etc. can lead to contamination and thus to explosion hazards at any time. These hazardous areas in wastewater treatment plants must be monitored by special ATEX-certified measuring devices. The thermistor motor protection relay MK 9163N ATEX of the VARIMETER EX series is particularly suitable for monitoring drives such as pumps, fans and mixers in hazardous areas.

### Sensorless monitoring to protect against dry running and cavitation

Load monitors in the water/sewage industry are suitable for monitoring electrical industrial drives with variable motor loads and for monitoring the function of electrical consumers. The devices detect signs of wear at an early stage, such as wear on pump impellers, and protect the drive systems against breakage and blocking. In the case of blowers, they can monitor the drive system for broken belts, for example. In preventive maintenance, the devices are also used for filter monitoring (contamination). The main advantage is that the load monitors do not require any sensors, as they use the motor as a sensor.

## VARIMETER – Reliable monitoring of motors



# POWERSWITCH

## – Switching LED lightings

### High current peaks with LED technology

For LED and energy-saving lamps with their capacitive characteristics, inrush current pulses can be found in the  $\mu\text{s}$  range, which can be 1000 times the rated current and more. Welded contacts are often the result. The hybrid relay IK 3070/200 is particularly suitable for intercepting these extremely short but very high current peaks when switching LED lighting.

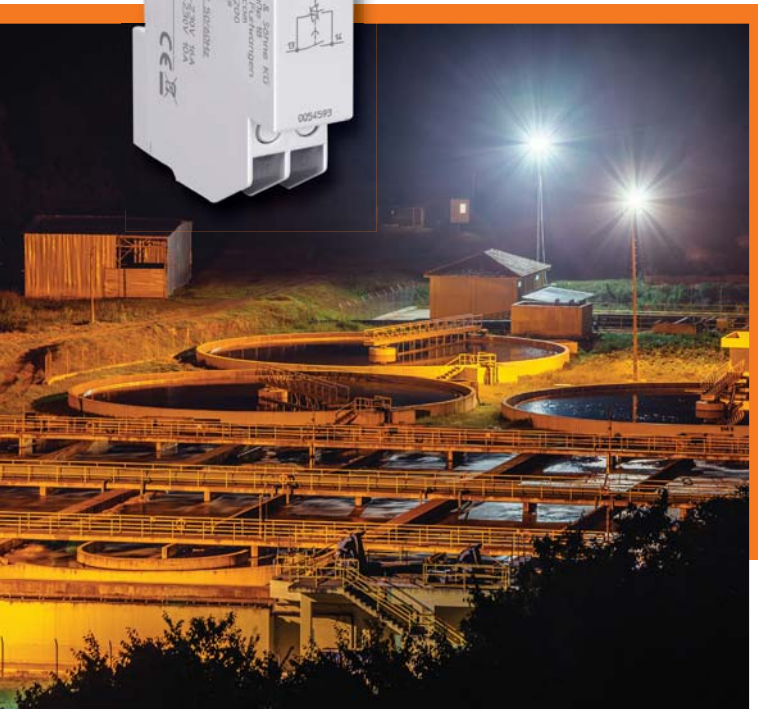


IK 3070/200



### Efficient LED technology for indoor and outdoor lighting

The main electricity consumers of a wastewater treatment plant are electrical drives of compressors, conveyors and scrapers. However, indoor and outdoor lighting also accounts for a significant proportion of total electricity consumption and thus offers a high potential for saving energy costs. Conversion from inefficient high-pressure mercury lamps, for example, which have a high total connected load of several kilowatts in use, to modern LED lighting technology significantly reduces electricity consumption.



# SAFEMASTER STS

## – Modular safety switch and key transfer system

### Protection of plant parts without wiring

The modular safety switch and key transfer system SAFEMASTER STS is used to protect safety guards of machines and plants. It is also suitable for wiring-free protection of applications in harsh and extreme environmental conditions.



M10A



**E. Dold & Söhne GmbH & Co. KG**  
 Bregstraße 18 • D-78120 Furtwangen  
 T +49 7723 654-0 • F +49 7723 654-356  
 dold-relays@dold.com • www.dold.com