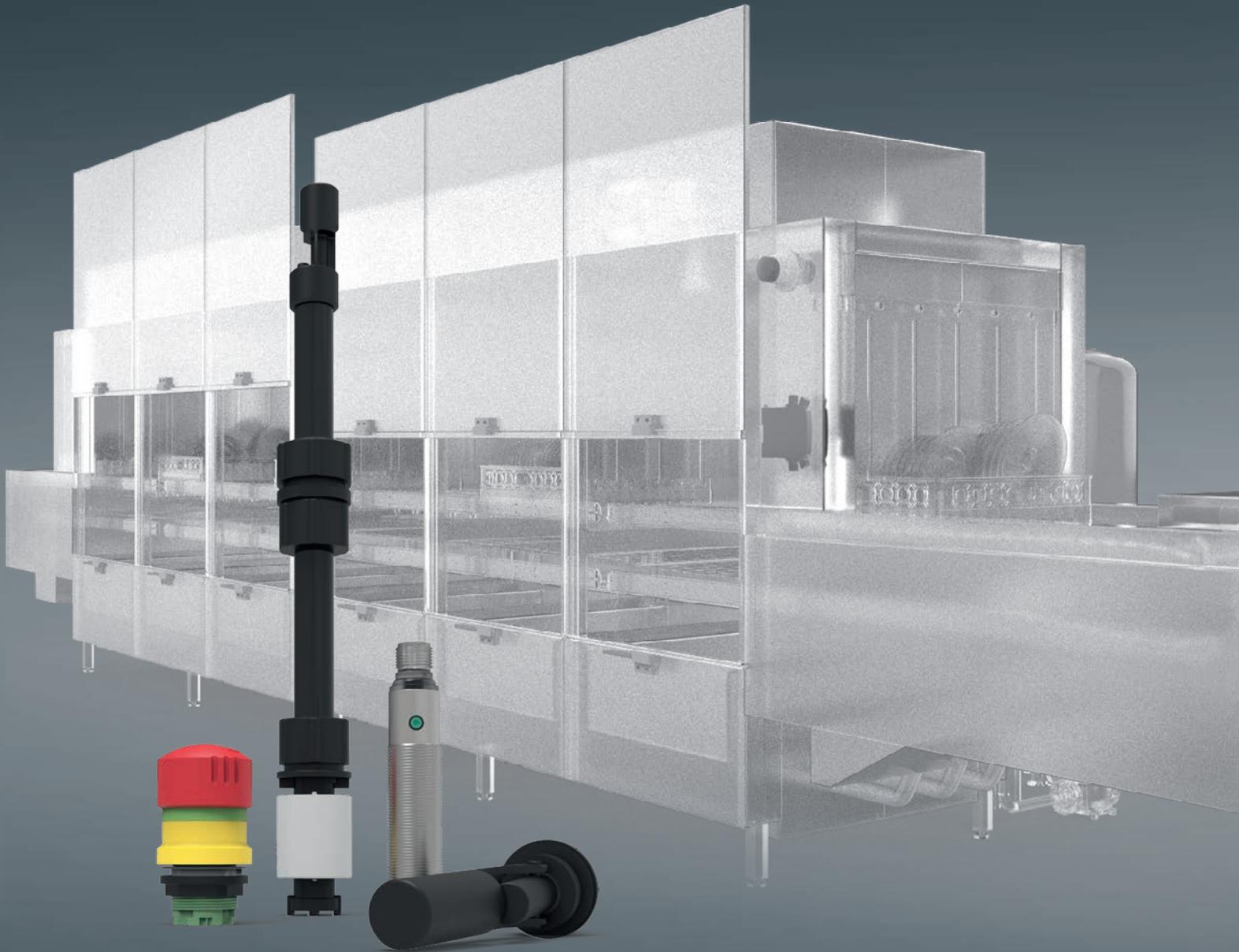
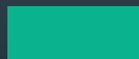


*creating  
sustainable  
solutions*



**The clean solution**



# Solutions for industrial

## Sustainability and efficiency, thanks to smart technology

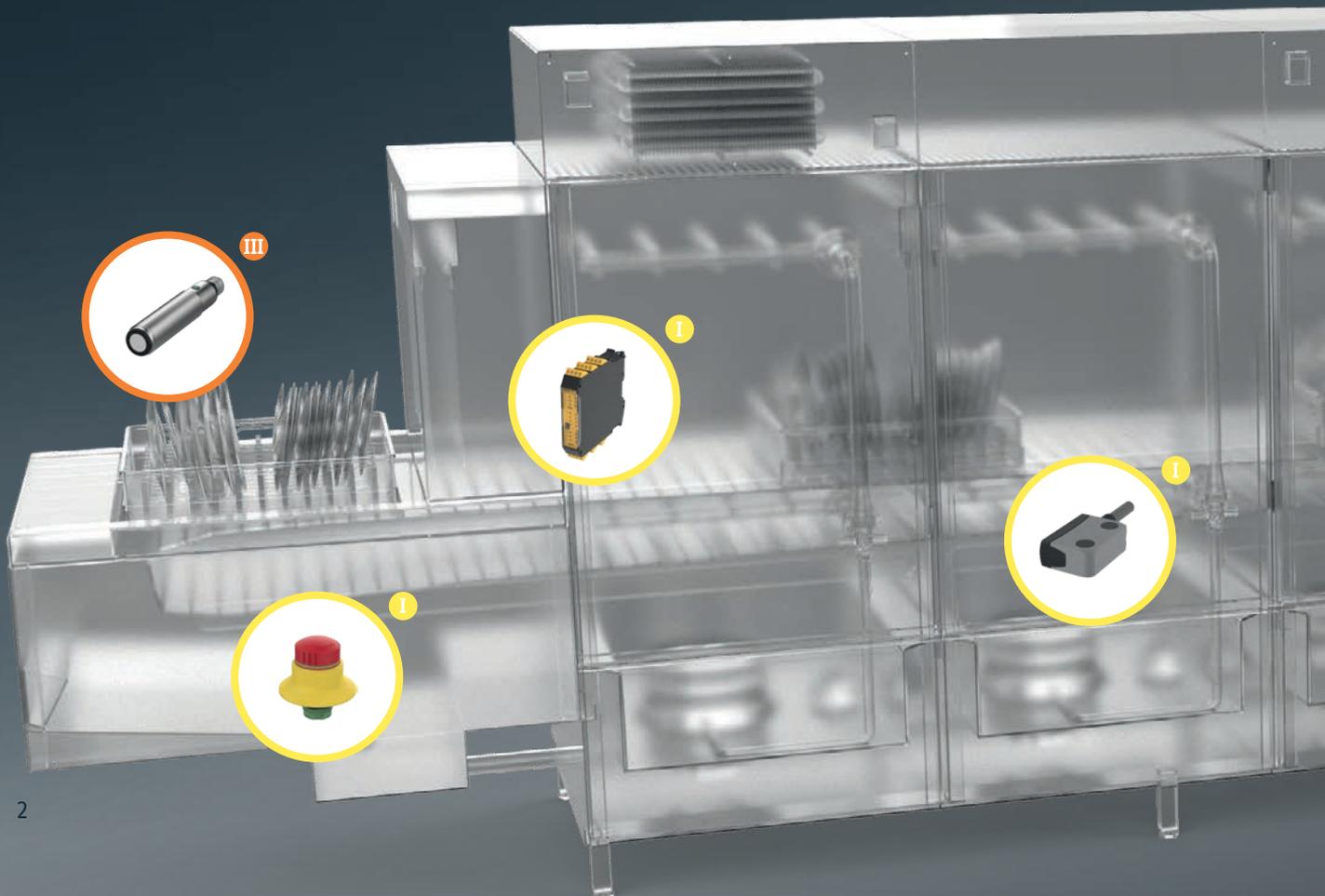
Commercial cleaning is constantly improving. Machines are becoming more efficient and better at preserving resources. Reduced consumption of water and electricity, as well as a reduction in the quantity of chemicals required - thanks to technical innovations are not only good for the environment, but also reduce the costs of kitchen washing-up facilities. With automation technology increasing, the most significant cost, namely working time, can be dramatically reduced.

On top of this, when it comes to cleanliness and hygiene, the requirements are ever increasing. To increase efficiency even more, human-machine interactions regarding economics and communication are increasingly being optimised. Networking and further digitalisation is the focus for future generations of devices. As in many other systems, a variety of sensors in dishwashers ensure that the process is safe and cost-effective. As such, products from elobau offer a sustainable solution.

Sensors based on Reed, Hall, ultrasonic and capacitive technology are highly reliable and can withstand the challenging conditions in kitchen washing-up facilities, thanks to contactless measuring technology.

### **I** Machine safety

**Operation, service and maintenance** – various safety components, such as E-stop push buttons, protect both human and machine in the event of an emergency. Product solutions from elobau's machine safety range provide the ideal components for a reliably functioning safety system. Safe cover monitoring with protection against manipulation is ensured with a safety sensor based on Reed or RFID technology. Status monitoring is undertaken by a safety control unit.



# dishwashers from elobau

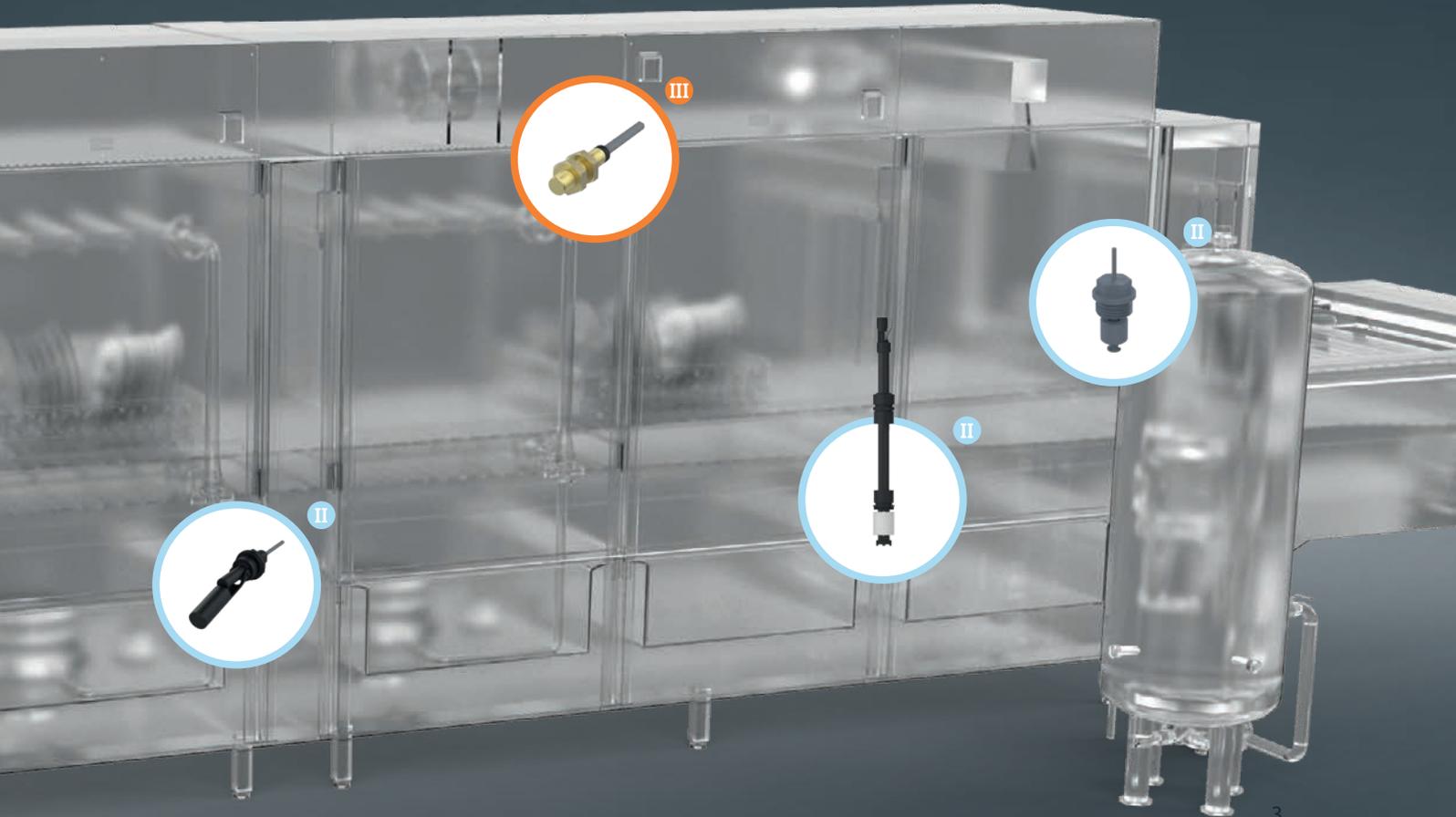
## II Level measurement

**Chemical dosing and monitoring** – for an optimum, hygienic washing result, it is vital to use the correct rinsing chemicals. The chemicals are dosed by metering pumps. Suction pipes from elobau make clean, reliable removal from canisters possible, ensuring no washing process is undertaken with insufficient chemicals.

**Level monitoring in the boiler and water treatment systems** – the water quantity and quality have a direct influence on the rinsing process. elobau float switches monitor the levels in the boiler and water treatment systems. Here they prevent the heating element from overheating or pumps from running dry.

## III Sensors

**Basket detection and spray arm monitoring** – to optimise the processes in modern washing-up facilities, different control functions are integrated into the machine, such as automatic basket detection or spray arm rotation, and these use contactless sensor technology monitoring.

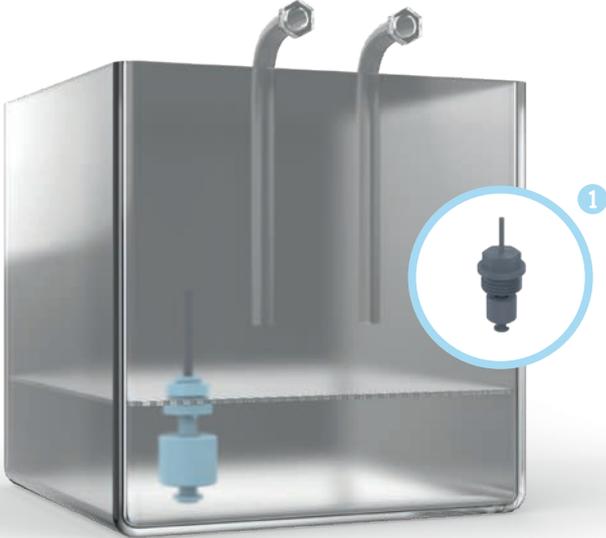


# Pure water – brilliant results

## WATER TREATMENT

### 1 Level monitoring in water softening and desalination systems

The result matters. The items to be washed, such as crockery, cutlery or glasses, should be clean, hygienic and free of streaks after the washing-up process. To this end, tap water is desalted in advance, to remove surface tension from the water. By doing so, the water pearls on the surface of the items to be washed and makes subsequent polishing unnecessary. A float switch monitors the fill level in the desalination system. The fill level in the water softening system is also detected by means of float switches.

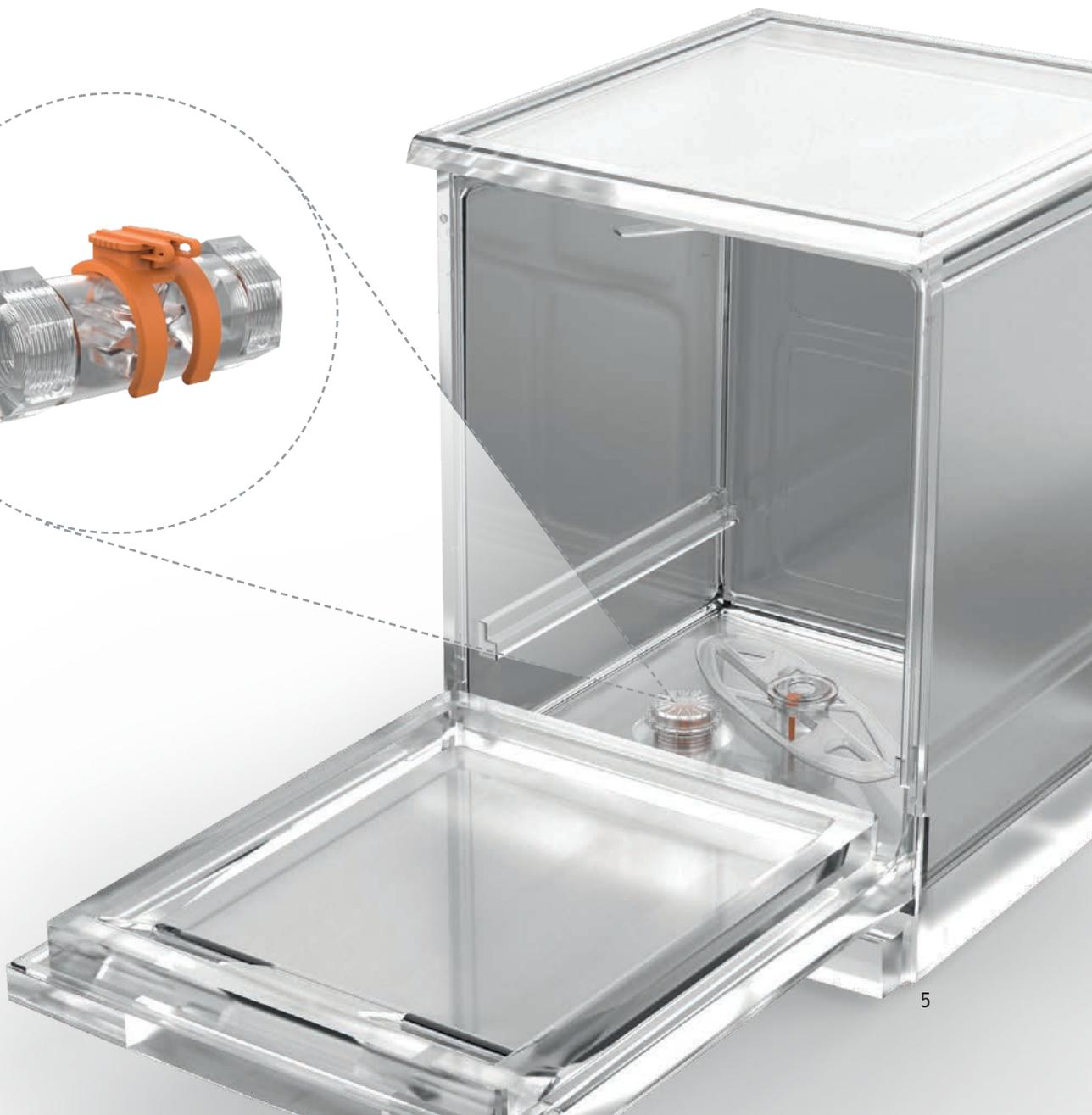


### 2 Level monitoring in the boiler

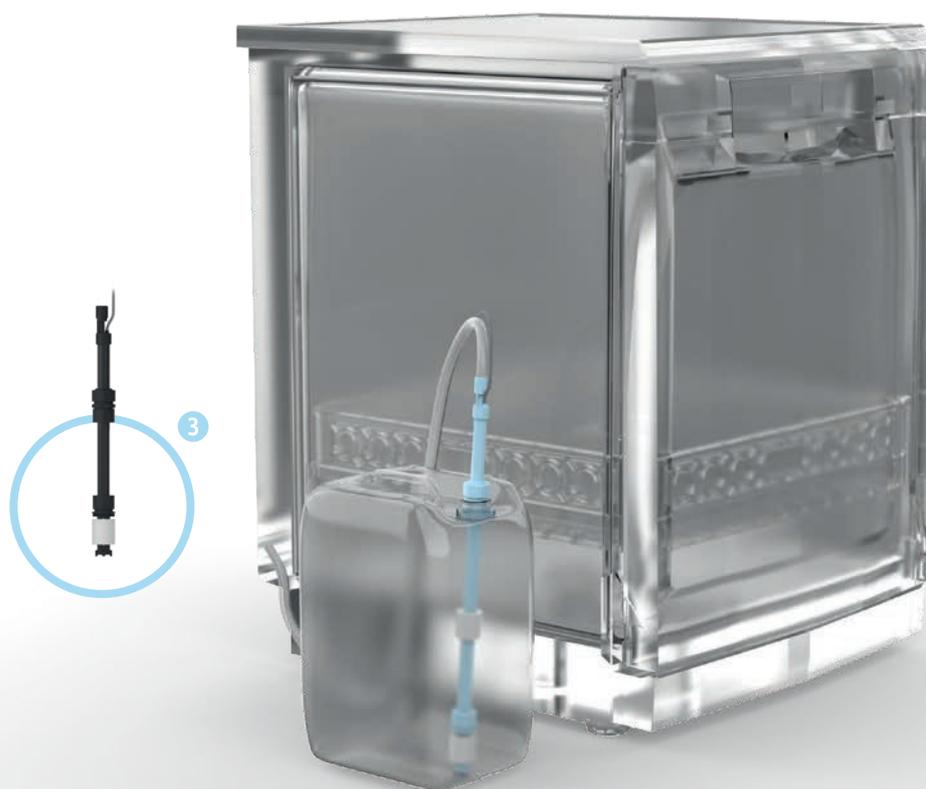
Never too hot. The water is heated by a heating element in a boiler. To prevent the heating element from overheating, a minimum amount of water must be present in the boiler before the element is activated. With the help of a float switch side mount, the level of the water is monitored and the heating element is prevented from heating up, if the water is too low.

### 1 Flow measurement in softening systems

Not too much and not too little. Precise measurements of the flow volume in desalination plants are undertaken with a contactless Hall pulse measuring device. This records every rotation of a bucket wheel equipped with a magnet, allowing the flow to be closed. Measurement is contactless by means of the pipe system.



# Clean dosing system



## DOSING CHEMICALS

For optimal, hygienic results, it is vital to use the correct rinsing chemicals. Surfactants that dissolve fat ensure cleanliness. The rinsing aid ensures that dishes dry without streaks. It is usual to use a high concentration. High concentrates allow more rinsing operations per container and keeps shipping and handling costs to a minimum. Rinsing chemicals are added via special dosing pumps. Chemicals are removed from canisters that are located either under or next to the dishwasher. Smaller systems have built-in chemical tanks, whereas larger ones can be supplied by a central dosing system.

### OTHER AREAS OF APPLICATION:

- 1 Level monitoring in water softening and desalination systems (Page 4)
- 2 Level monitoring in the boiler (Page 4)
- 1 Flow measurement in softening systems (Page 5)

### 3 Removal, empty message and dosing

Always keep it clean! The dosing pumps draw detergents and rinsing agents out either via a hose from the tanks or in more modern systems, via suction pipes. These combine removal with an empty and low-level messages and have a filter element and return protection. The suction pipe message is displayed on the machine, enabling the tanks to be changed or filled when required. No washing process can be undertaken without a cleaning agent, in order to always provide the desired cleanliness.

The suction pipes are optionally available with colour coding. This means that the most common operator mistakes with dishwashers can mostly be avoided – confusing detergent and rinse aid when

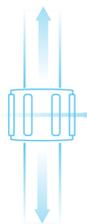
changing the canister. A suction pipe also prevents anything remaining in the hose from leaking out, thanks to leak protection.

### 4 Analogue monitoring of chemicals

Checking is good, but planning is better. It is possible to check the fill level and therefore the quantity of chemicals in an analogue way, in order to calculate how long they will last and order new rinsing agents in good time. The modular system of analogue fluid level sensors provides a range of solutions for just this purpose.

#### TANK MOUNTING

The position of the suction pipe can be adjusted to the height of the tank by actuating the pressure nut



#### REMOVAL

There are various ways of removal, using different connection sets, for different hose diameters

#### COLOUR CODING



#### LOW-LEVEL MESSAGE

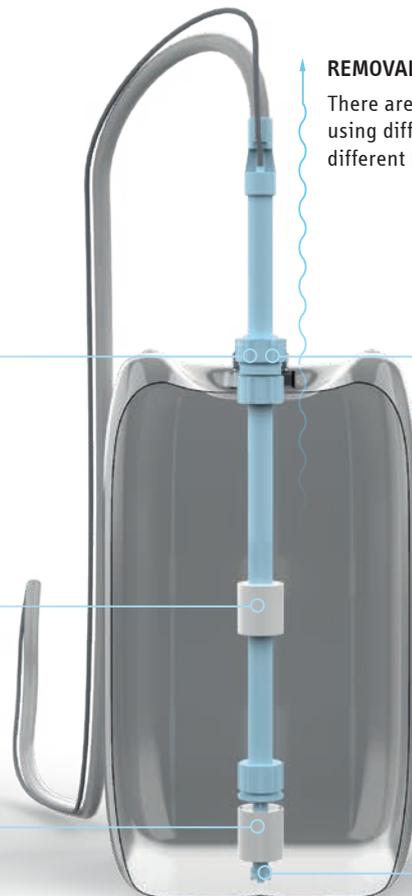
Various switching contact types

#### EMPTY MESSAGE

Various switching contact types

#### FILTER FUNCTION

Filter with leak protection



# No compromises – compact and powerful

When it really matters... If there's a shortage of space, if the noise is annoying, if time is of the essence – then restaurateurs often choose undercounter dishwashers for the bar area. These machines are compact, quiet and quick.

It's a solution with no compromise – this requirement can also be applied to elobau components. Customer-specific adaptations to existing products or unique developments; from design, to prototypes and tests, right through to series production – elobau offers sustainable solutions for challenging measurement and monitoring tasks in the field of industrial dishwashing.

## OTHER AREAS OF APPLICATION:

- 1 **Level monitoring in water softening and desalination systems** (Page 4)
- 2 **Level monitoring in the boiler** (Page 4)
- 3 **Removal, empty message and dosing** (Page 7)
- 4 **Analogue monitoring of chemicals** (Page 7)
- 1 **Flow monitoring in water softening systems** (Page 5)





## 2 Spray arm rotation monitoring

Keep moving. A permanent magnet is integrated into the spray arm, which is actuated by a magnetic proximity switch each time the arm rotates. The magnetic proximity switch is firmly mounted to the spray arm mount and detects the magnet without any contact. This means that it can detect, for example, if the spray arm is blocked by dishes or dirt. If this is the case, an error message is displayed on the machine's control panel.

Alternatively, this monitoring can also be recorded by means of a Hall sensor. By detecting the rotational movement, the speed of the spray arm can also be calculated.

Consequently, it is possible to compare the actual speed and the target speed specified for good cleaning results.

# Flexible, versatile solutions

## PROCESS OPTIMISATION

In a modern kitchen washing facility, ergonomics plays a crucial role. In addition to proper layout planning, with prior capacity calculation, a coordinated process flow is a hugely important aspect. The modern dishwasher fits perfectly into the flow and tackles additional tasks automatically.

### 3 Automatic basket detection

Place in the starting area. In a covered dishwasher, the presence of the dishwasher basket is detected by a magnetic proximity switch, which is triggered via a mechanical actuator.

### 4 Cover monitoring with automatic closure

Ready - set - go! For machines with automatic closure, once the basket is detected, the cover is lowered and the washing process starts immediately, as soon as the magnetic proximity switch has detected the end position.





#### OTHER AREAS OF APPLICATION:

- 1 Flow monitoring in water softening systems (Page 5)
- 2 Spray arm rotation monitoring (Page 9)
- 1 Level monitoring in water softening and desalination systems (Page 4)
- 2 Level monitoring in the boiler (Page 4)
- 3 Removal, empty message and dosing (Page 7)
- 4 Analogue monitoring of chemicals (Page 7)

# Powerful concepts for

## INDUSTRIAL SAFETY

### 1 Cover monitoring on the conveyor belt and side cover monitoring

Play it safe. In large kitchen washing-up facilities, the items to be washed are moved by conveyor belts. The sides of these are covered with a coated sheet metal, to ensure any potentially dangerous areas are inaccessible. Safety sensors with magnetic actuators contactlessly monitor way whether the protective cover has been correctly fitted after maintenance work. The side doors or covers are also monitored with safety sensors. Unauthorised opening of doors or covers leads to the entire system shutting down immediately and protects the user against injuries.

### 2 E-stop push buttons

Just in case. A conveyor dishwasher is controlled via an operator terminal or touch display. Each conveyor dishwasher is equipped with at least one E-stop button. By pressing this in an emergency, the entire system can be stopped immediately.

### 3 Safety relay

Everything under control. The corresponding safety relays are located in the dishwasher's switch cabinet, to monitor the safety functions. This allows multiple E-stop buttons and safety sensors to be monitored. On the output side, up to four volt free contacts can be used to control the machine.

## MEASURING AND MONITORING

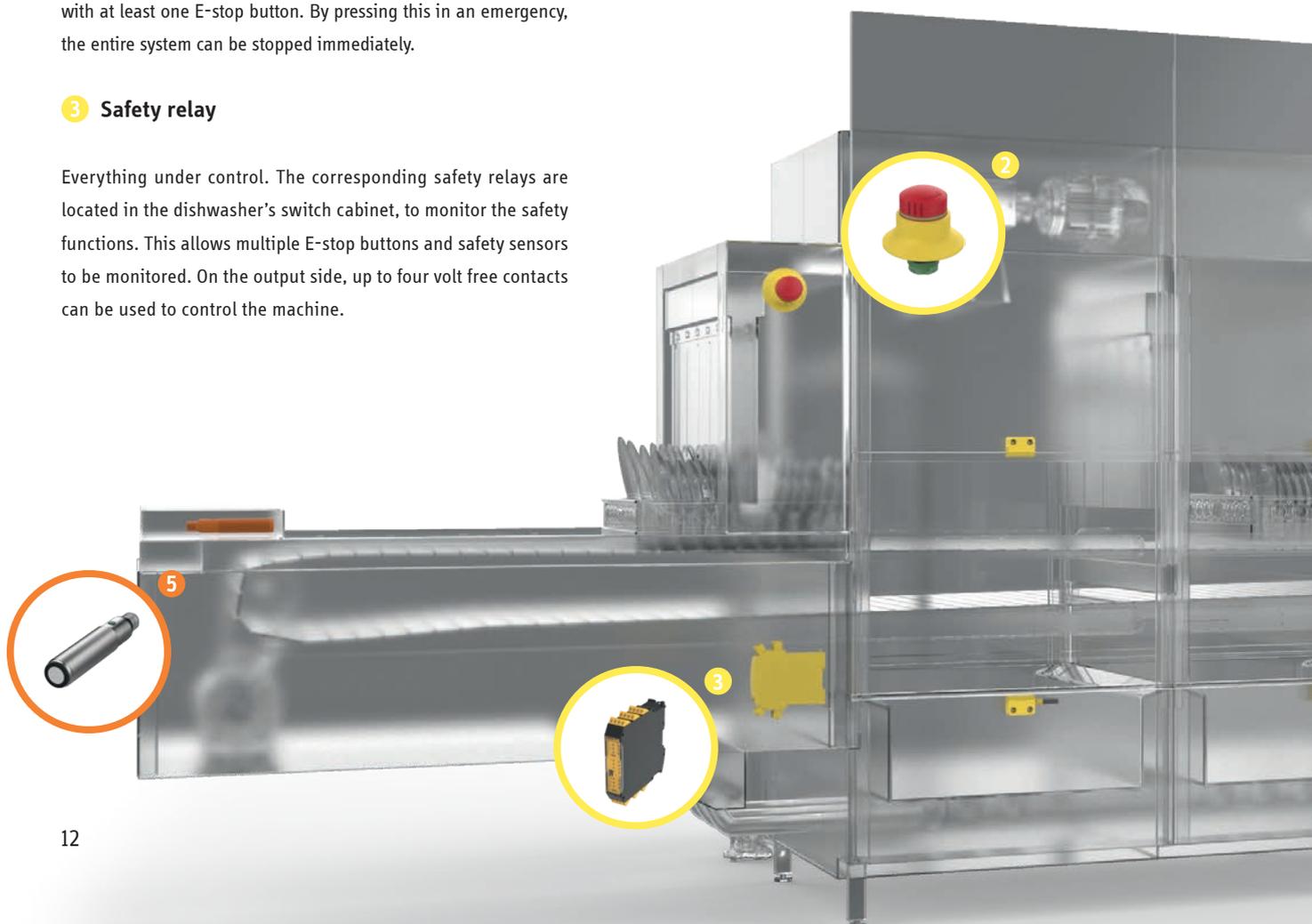
### OTHER AREAS OF APPLICATION:

#### 1 Level monitoring in water softening and desalination systems (Page 4)

#### 2 Level monitoring in the boiler (Page 4)

#### 3 Removal, empty message and dosing (Page 7)

#### 4 Analogue monitoring of chemicals (Page 7)



# the toughest tasks

## AUTOMATION

### 5 Position monitoring of the dishwasher basket

Always in the right place. In conveyor dishwashers, the dishwasher basket is transported by a conveyor belt. The precise position on the conveyor belt can be detected by ultrasonic sensors or magnetic proximity switches, so as to control the different zones in the machine accordingly.

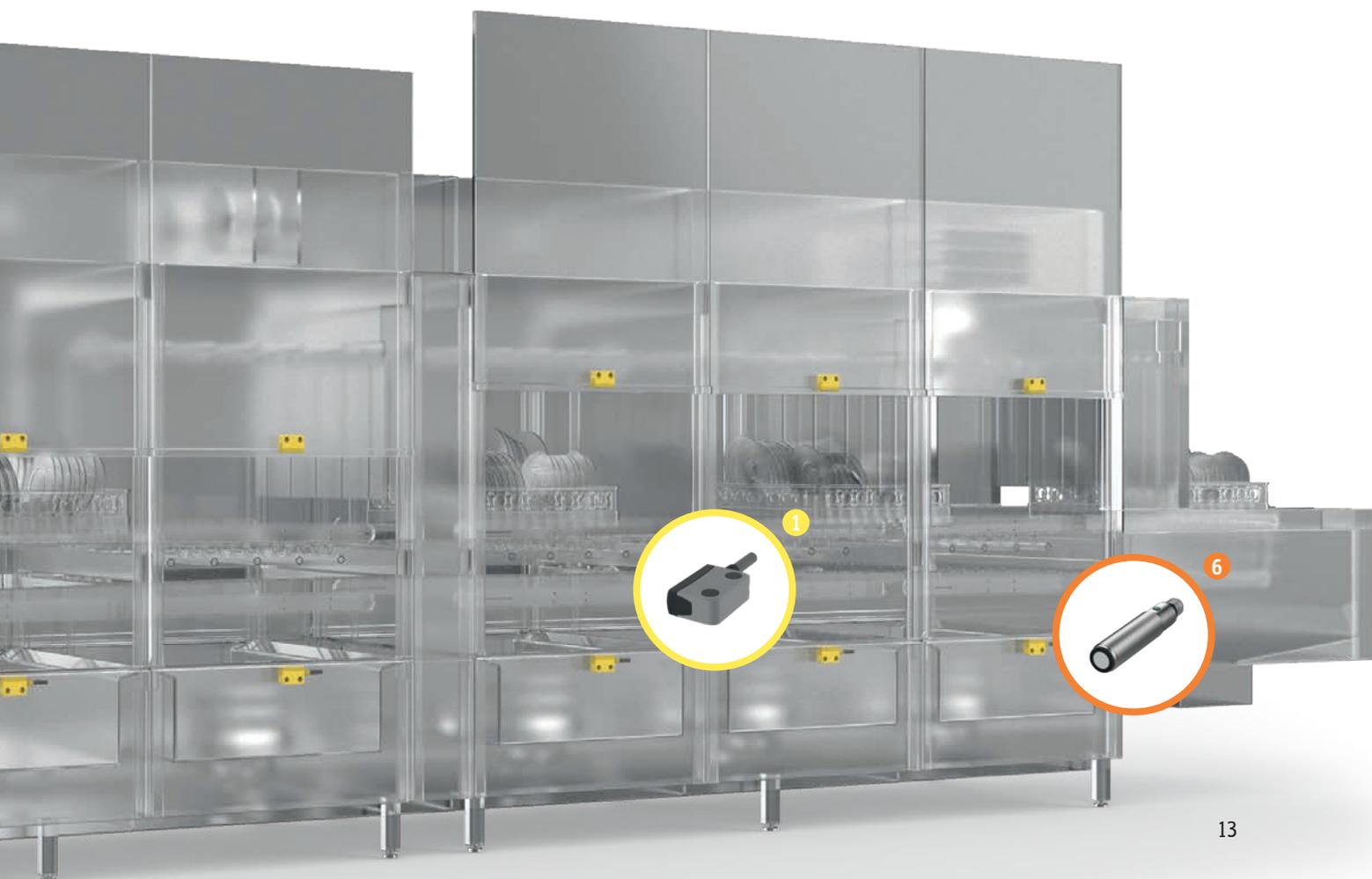
### 6 Sensor configuration in operation – intelligently adapts to the washing programme

Always the right setting. IO-Link provides the option to change the parameters of the ultrasonic sensor via a master, during operation. The parameters can be mirrored via the master directly on the sensor. For example, the ultrasonic sensor can be configured, according to the selected programme. In the

rapid programme, the conveyor belt runs more quickly and the ultrasonic sensor can shorten the measuring intervals. By saving a master, the configuration can be easily transferred to other sensors.

### OTHER AREAS OF APPLICATION:

- 1 Flow monitoring in water softening systems (Page 5)
- 2 Spray arm rotation monitoring (Page 9)
- 3 Automatic basket detection (Page 10)
- 4 Cover monitoring with automatic closure (Page 10)



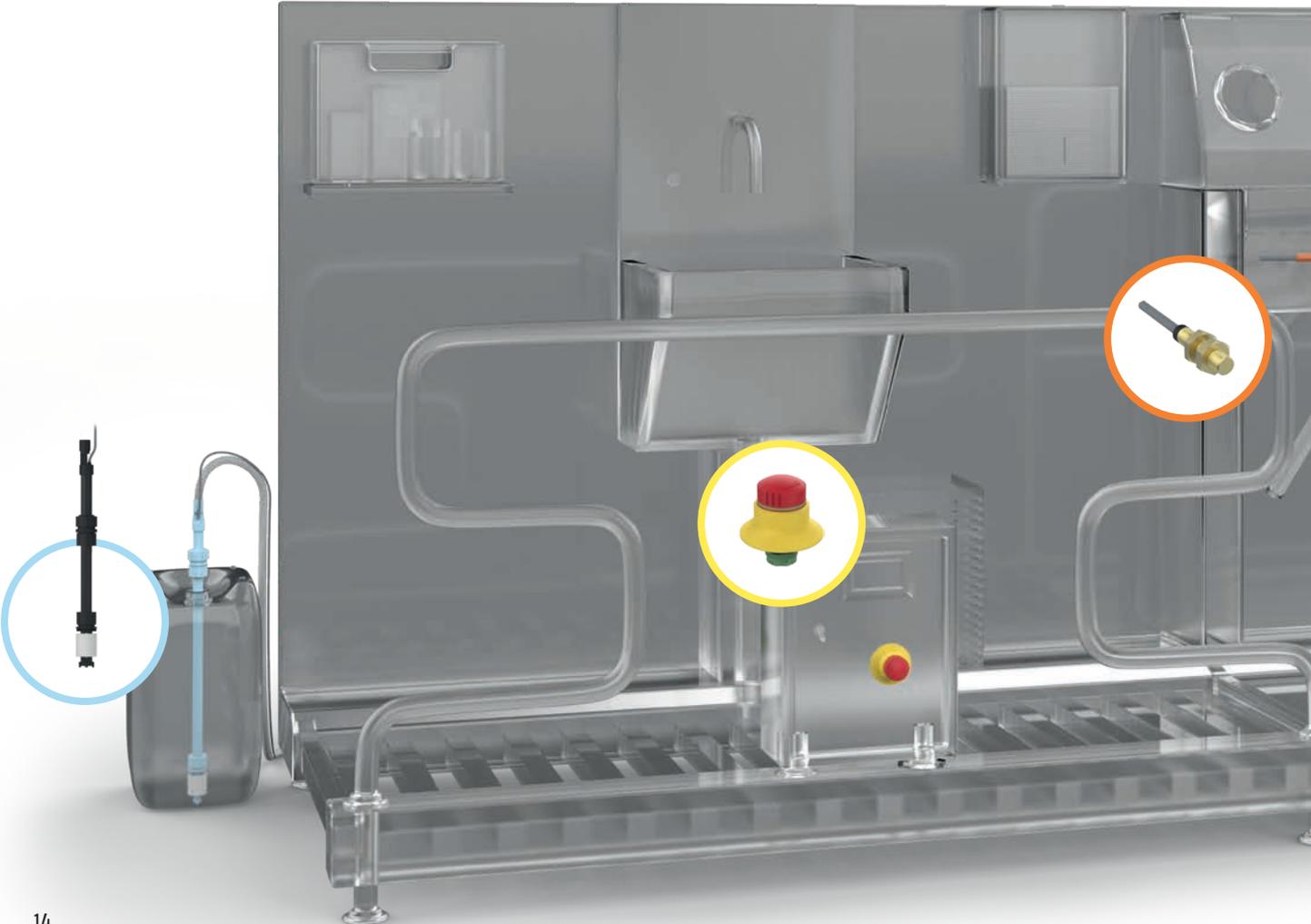
# Customer-specific development and adaptation

## MEDICAL AND LABORATORY TECHNOLOGY

### Endoscopy preparation, autoclaves and hygiene sluices

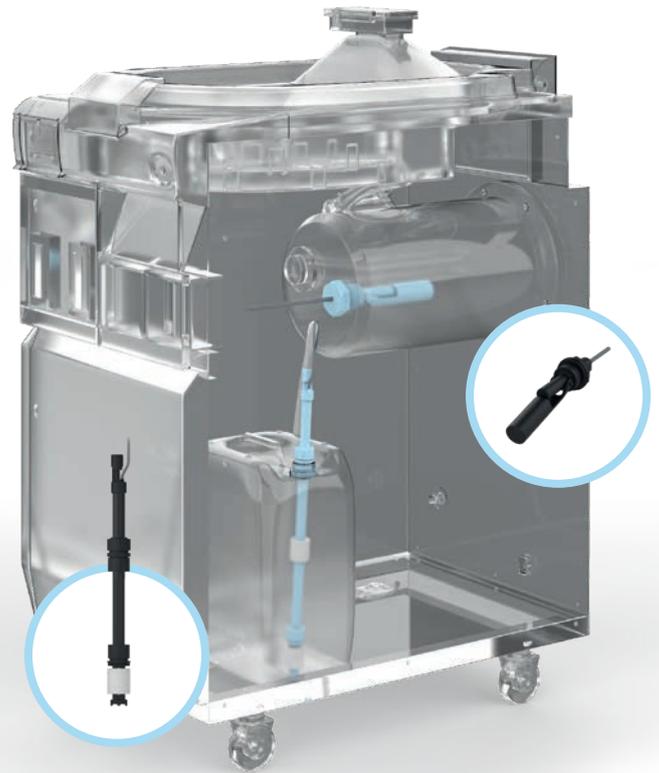
It's not just dishes, cutlery and glasses that need to be cleaned. Medical devices have to be clean, too. There is a variety of cleaning and dishwashing machines for different apparatus, devices and instruments. But the goal is always the same - a specific hygiene status must be achieved. Hygiene sluices for

people are also used for this purpose. The devices often have a similar structure and share many similarities with industrial dishwashers. Many components have the same construction or are even identical. Rugged stainless steel sensors with hygienic design, with a high leak-proof capacity of up to IP6K9K and individually adjustable material output on the connection side fulfil the highest demands.



### Other requests?

The medical and laboratory technology often places high demands on material quality and durability. Many of the elobau products can be adapted to individual requirements, such as specially approved materials.



### Special requirements for production and documentation

We make that. elobau combines all development and production stages in house. Special requirements or documentation or component production is therefore easier to implement.



## The company

As an expanding, globally active foundation company with over 950 employees, we develop and manufacture sensor technology and operating systems for mechanical engineering and off-highway vehicle manufacturers. Our high-quality products truly stand out, thanks to very high vertical integration, and are made in Germany, in a carbon-neutral manner. Thanks to our innovative, contactless sensor technology products, we support our customers around the world in building machines and vehicles that set the standards when it comes to performance, operating comfort, safety and quality.

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Select your direct contact person

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