



Cell cultivation under control

OPTIMUM GROWTH CONDITIONS FOR YOUR PROCESS

We make ideas flow.

bürkert
FLUID CONTROL SYSTEMS

Why Bürkert is your partner

- Efficient and precise automation of bioreactors and fermenters
- For over 10 years we have been successfully optimising fermentation applications
- Over 50 satisfied OEMs, end customers and plant manufacturers in the Biotech sector

PURIFIED WATER & STEAM

PROCESS AUTOMATION

FERMENTATION





CIP

FILTRATION & SEPARATION

Data and information on all levels

Our open communication solutions support all common communication protocols. We can therefore guarantee simple, consistent communication including via Cloud. Our experts will advise you about the automation of valve islands and control heads without bias toward any manufacturer.



EtherCAT®
EtherNet/IP

PROFINET®
PROFIBUS®

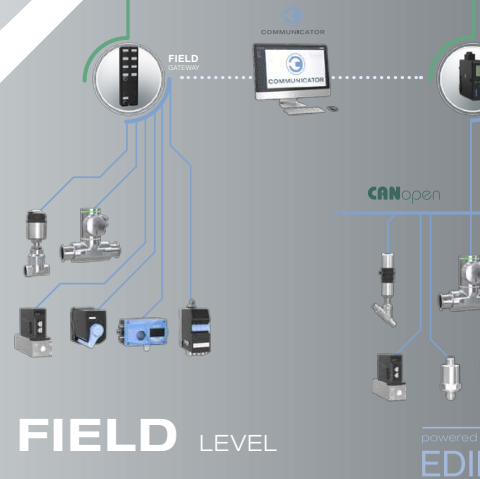
CANopen
IO-Link

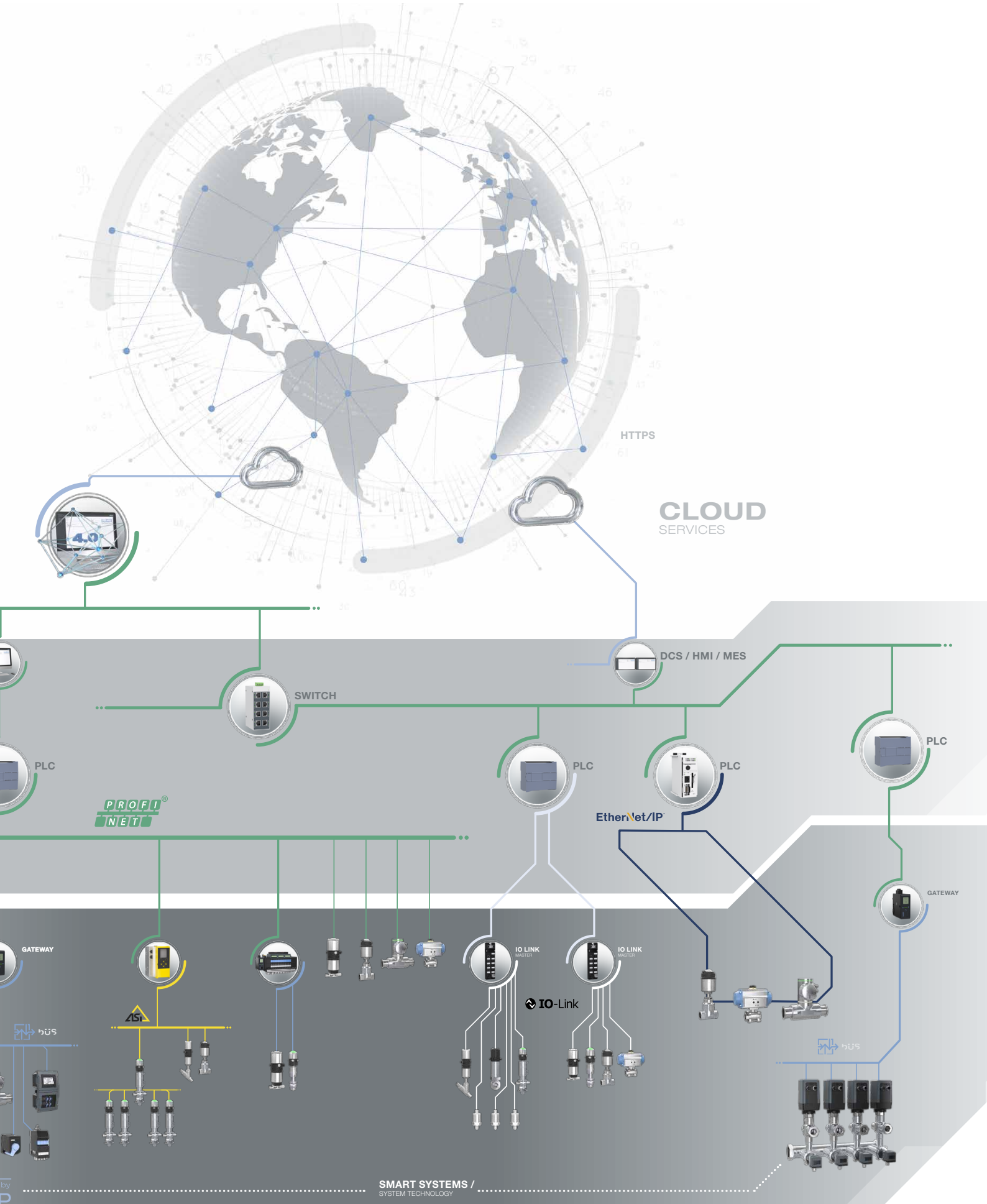


DIGITAL
SERVICES

CONTROL LEVEL

FIELD LEVEL





CLOUD SERVICES

DCS / HMI / MES

SWITCH

PLC

PROFI NET

PLC

EtherNet/IP

PLC

PLC

GATEWAY

GATEWAY

hüS

ASi

IO LINK MASTER

IO LINK MASTER

IO-Link

hüS

From idea to series

If you want sustainable solutions for your individual requirements, Bürkert is your partner. Our experienced teams combine the necessary know-how from applications, development and series production.

We will support you throughout the entire value-added chain – from the first idea to start-up and closed-loop control mode. We can therefore guarantee maximum savings and process reliability. We can support a quick time-to-market with our high vertical range of manufacture.



Idea & concept

- Demonstrably creative, quick, reliable and economical
- With guide price offer and project plan

1

System development

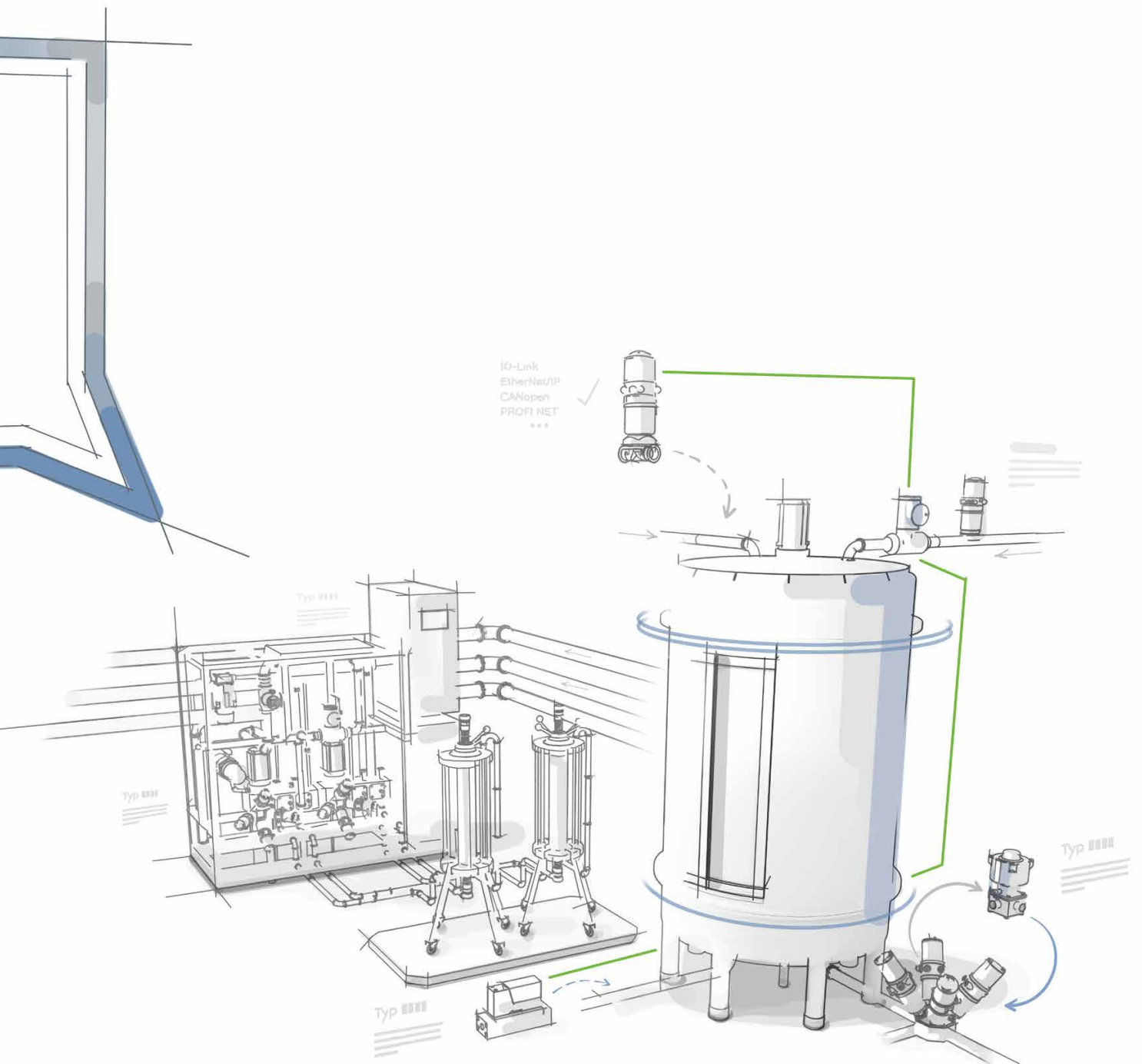
- Series design
- Pilot series and tool production

3

Prototyping & simulation

- Prototype and design
- Specifications
- Series offer

2



System implementation

- Implementation of logistics
- Production handover

4

System & process qualification

- Zero series
- Preparation for series production

5

6

Controlled operation

- Customer training
- Installation and start-up

Reproducible fermentation processes

Bürkert expertise

Digitalisation & process automation / hygienic control technology / temperature control / flow measurement and control / gas control / vessel pressure control



In order to obtain a high yield of a required product, fermentation must occur under specifically adapted conditions - whether it's animal cells for cultivated meat, mammal cells for cultivated milk or organic cells for the cultivation of fungi, yeast or algae. Our customised fluid control solutions ensure your processes are efficient and automated.

PRECISE GAS CONTROL

Our precise and calibrated mass flow controllers (MFCs) control common fermenting gases such as air, oxygen, nitrogen and carbon dioxide depending on what your cultures need - automated and with a high level of repeatability. Mass flow meters and controllers configured to your requirements are compact and save space. The system solutions, previously checked for tightness, pressure and electrical function, are integrated in seconds and make engineering easier. Thanks to the wide setting range, both the smallest and the largest gas quantities can be controlled precisely.



MFC Types 8741 and 8745 (Ethernet)

- Nominal flow ranges from 0.010 l/min to 2500 l/min
- High accuracy in measurement and repeatability
- Configuration memory for easy device replacement



FLOWave Type 8098 + 2/2-way bellow control valve Type 2380 incl. positioner

- Low weight and low energy consumption
- Ideal for liquids with low or no conductivity
- Hygienically absolutely safe operation (CIP/SIP-compatible)

SAFE, CONTINUOUS NUTRIENT SUPPLY

Our hygienic system solutions consisting of flow meters, control valves and positioners are the basis of a flexible, compact system design. They guarantee continuous quality assurance - directly in the process. Thanks to their small size and low weight, they minimise your installation and start-up expenses. The closed control loop ensures that the nutrients are always dosed exactly in accordance with the prescribed set-point values. In the process, valve sizing and control loop arrangement can be complex and time-consuming. We are also happy to take on these tasks for you.

ULTRA-COMPACT PRESSURE CONTROL

Tank blanketing systems ensure a stable chemical equilibrium via the medium and, subsequently, hygienic safety for pressure, flow and filling controls. The robust stainless steel design prevents corrosion and increases the availability and productivity of your system. Thanks to the integrated functionality of valves and sensors, reaction time is increased by up to tenfold compared to conventional solutions. Our compact valves also weigh up to 50% less and save valuable space.



Tank blanketing system

- High control characteristics with reproducible automation
- Fully autonomous operation, thanks to integrated process controllers
- Reduced maintenance costs

Reliable filtration and separation

Bürkert expertise

Digitalisation & process automation /
control technology / flow measurement
and control / level control



A consistently high product quality requires the constant careful and precise separation of solid materials from the liquid. For example, during filtration, the reliable recognition of flow rates and media used is essential. Meaningful quality management and seamless traceability also require certified systems that enable production times and methods to be documented exactly.

HYGIENIC CONTROL TECHNOLOGY

Diaphragm block valve solutions tailored to your application needs prevent the mix-up of mediums in the process. Dead space is reduced to a minimum. This makes drainage and cleaning easier, and minimises media consumption. Optimised diaphragm valve bodies at a lower pilot pressure, which increases the service life of the diaphragms and reduces energy consumption. The block solutions can be used flexibly and installed easily.



Block solution Type 2034

- Minimum dead space for full drainage
- Variable block and welded connection
- Long service life and energy saving operation reduces production costs and carbon footprint



FLOWave Type 8098

- Compact, low maintenance solution with low energy consumption
- Documented, consistent product quality
- CIP/SIP-compatible, hygienically absolutely safe operation

DOCUMENTED FLOW RATE MEASUREMENT

Media changeover must be reliably recognised in order to exclude contamination and defects in the filter. Our FLOWave efficiently measures the volume flow of the medium without any parts in the measurement tube. Thanks to the integrated measurement of the density factor, temperature and acoustic transmission factor, you can identify contaminations from cleaning and rinsing media immediately. This enables a consistently high product quality. Integration into your existing fieldbus system enables simplified documentation.

HIGHLY INTEGRATED PROCESS CONTROL

Our electro-pneumatically controlled valves enable easy integration of digital automation units - be it simple positioners, positioners with optional fieldbus interfaces or digital process controllers operated via graphic display. The compact system is characterised by integrated pilot air channels as well as maximum service life, tightness and chemical resistance.



Process control valve Type 8802

- Excellent control accuracy
- Protection class IP65 / IP67 / NEMA 4X
- Long service life and maintenance-free operation

Consistently purified water

Bürkert expertise

Digitalisation & process automation /
control engineering / flow measurement and control /
inlet water monitoring system / level measurement



Water for injection (WFI) is a significant cost factor in the manufacture of medical products. However, it should also be used sparingly for ecological reasons. With our monitoring and control systems, you will have around the clock control of water quality and availability in your WFI circuit. Process failures and missing batches will then be a thing of the past. The precise control prevents overdoses and the efficiency of the system increases. Our solenoid valve technology also reduces energy consumption and operating costs.



FLOWave Type 8098

- Efficient flow measurement, regardless of medium conductivity and flow direction
- Reliably meets the highest hygiene requirements
- Low weight and low energy consumption

CLEAN FLOW MEASUREMENT

FLOWave ensures efficient system operation and guarantees the quality of your pharmaceutical ingredients: the flowmeter measures the volume flow without any sensor elements in the measurement tube – even for non-conductive media. The smooth surface ensures germ-free cleaning. FLOWave therefore meets the highest level of hygiene requirements. Thanks to its low weight the flowmeter can be easily and quickly installed by one person. Its small dimensions create free space in your system structure.

CONSISTENTLY HIGH WATER QUALITY

Our compact Type 8905 online analysis system allows you to monitor all key water parameters continuously and accurately, without excessive maintenance. You can always view all measurement data thanks to the easily readable display and digital interfaces.

Parameters are constantly documented. The system significantly reduces water consumption used for analysis compared to conventional solutions. Other water parameters can be analysed at any time by adding additional sensor cubes. Thanks to the Hot Swap function, you can also remove the modular cubes for cleaning and replace them while the system is in operation.



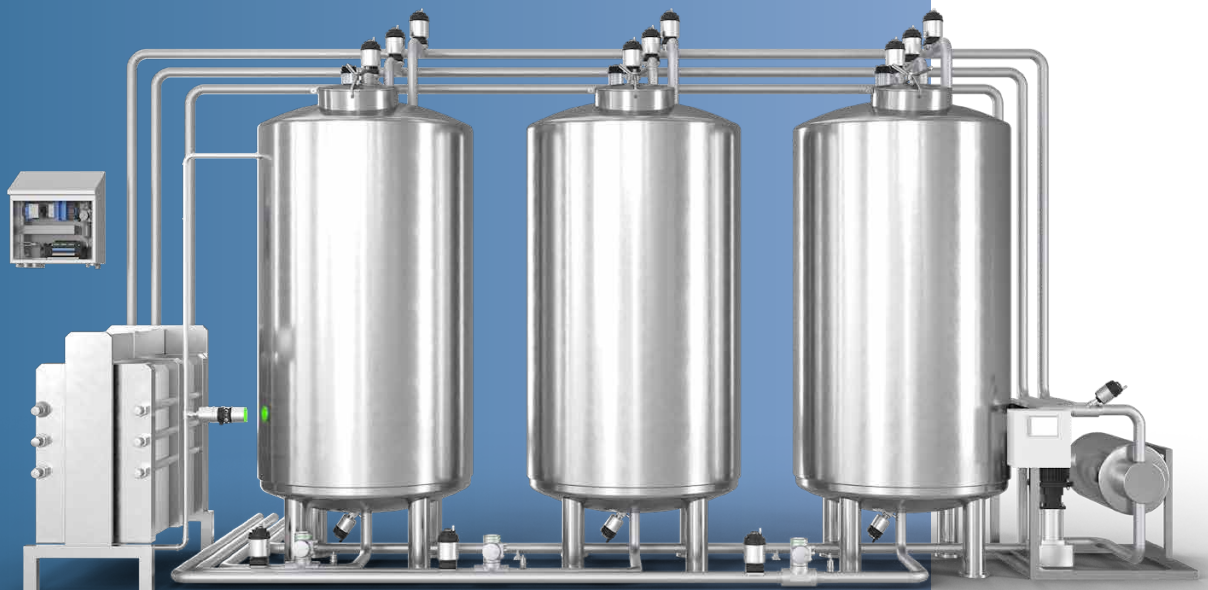
Online analysis system Type 8905

- Lower costs, thanks to low sample water consumption and reduced maintenance costs
- Easy on-site operation and remote monitoring
- Effortless extension of additional process parameters

Residue-free CIP cleaning

Bürkert expertise

Digitalisation & process automation /
control technology / flow measurement and control /
conductivity measurement / temperature control



Food and beverage manufacturers usually process several products in a single plant. The components in our cleaning-in-place (CIP) solutions provide the perfect proportion of cleaning media in the batch process and ensure a high level of process safety and efficiency. Our systems quickly recognise media changeovers. This saves water and cleaning agents, reduces waste and prevents contamination of the end products with cleaning solutions. Less product in the waste water also saves on water treatment costs.

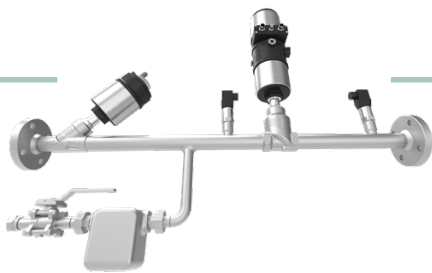
CONTINUOUS CONDUCTIVITY MEASUREMENT

A reliable conductivity measurement sheds light on the products for cleaning and cleaning product concentrations in rinsing water after each cleaning step. Our robust sensors withstand both the frequent and high temperature changes and aggressive cleaning solutions. Thanks to the smart control algorithms and connection options for the multiCELL controller, you can continuously keep your cleaning processes under control, with minimum expenses.



Conductivity sensor Type 8221 + multiCELL controller Type 8619

- Flexible adjustment to suit individual requirements thanks to modular structure
- Safe process control thanks to highly developed algorithms and easy integration into industrial Ethernet environments
- Hygienic and robust sensors with wide conductivity range and outstanding linearity



Digital temperature sensor Type 8412 + electro-pneumatic process controller Type 8693 with seat valve Type 2301

- Avoid unnecessary energy costs
- Simple start-up of the compact, lightweight system design
- Reliable monitoring thanks to the digital fieldbus connection with integrated diagnosis function.

SAFE TEMPERATURE CONTROL

Our modular temperature control solution continuously ensures an optimal temperature for CIP media and a reliable supply of steam for sterilising-in-place (SIP) processes. This saves you unnecessary energy costs. The weld end connection minimises the risk of leakage and provides protection against contamination from corrosion. Start-up can be performed effortlessly with the tune function of the position and process controller. The fieldbus connection allows you to constantly have an eye on operating conditions.

DOCUMENTED FLOW RATE MEASUREMENT

Conventional systems use time control for the media changeovers. Due to tolerance the valve opens too early - significant quantities of your product go down the drain. Our compact FLOWave flow meter recognises the media changeover by means of the measured differentiation factor and the valve closes at the right moment. The increased product yield and decrease in water and chemical consumption allows you to maximise your profits. Aside from homogenous, low or non-conductive liquids, viscous media can also be measured. We also offer a variant with ATEX approval.



FLOWave Type 8098

- Safe recognition of media changeover and contamination
- Without any parts in the measurement tube, therefore no leakage, no maintenance and simple cleaning
- Effortless installation, low weight and low energy consumption

The right partner for your application





“Burkert’s support and devices were key to improving the Bovogen centrifuge application process – with the right equipment and smart automation controls – enabling ongoing production while ensuring a consistently high quality of product.”

Matthew Bartlett, General Manager at Bovogen Biologicals

You can find out more about this and other projects in your industry at:

www.burkert.com

The right partner for your application

“The automation upgrade for the indoor production facility allows precise and remote control of microalgae cultures to produce high-quality biomass.”

Dr. Juliane Wolf, Research Officer and Project Manager, University of Queensland

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