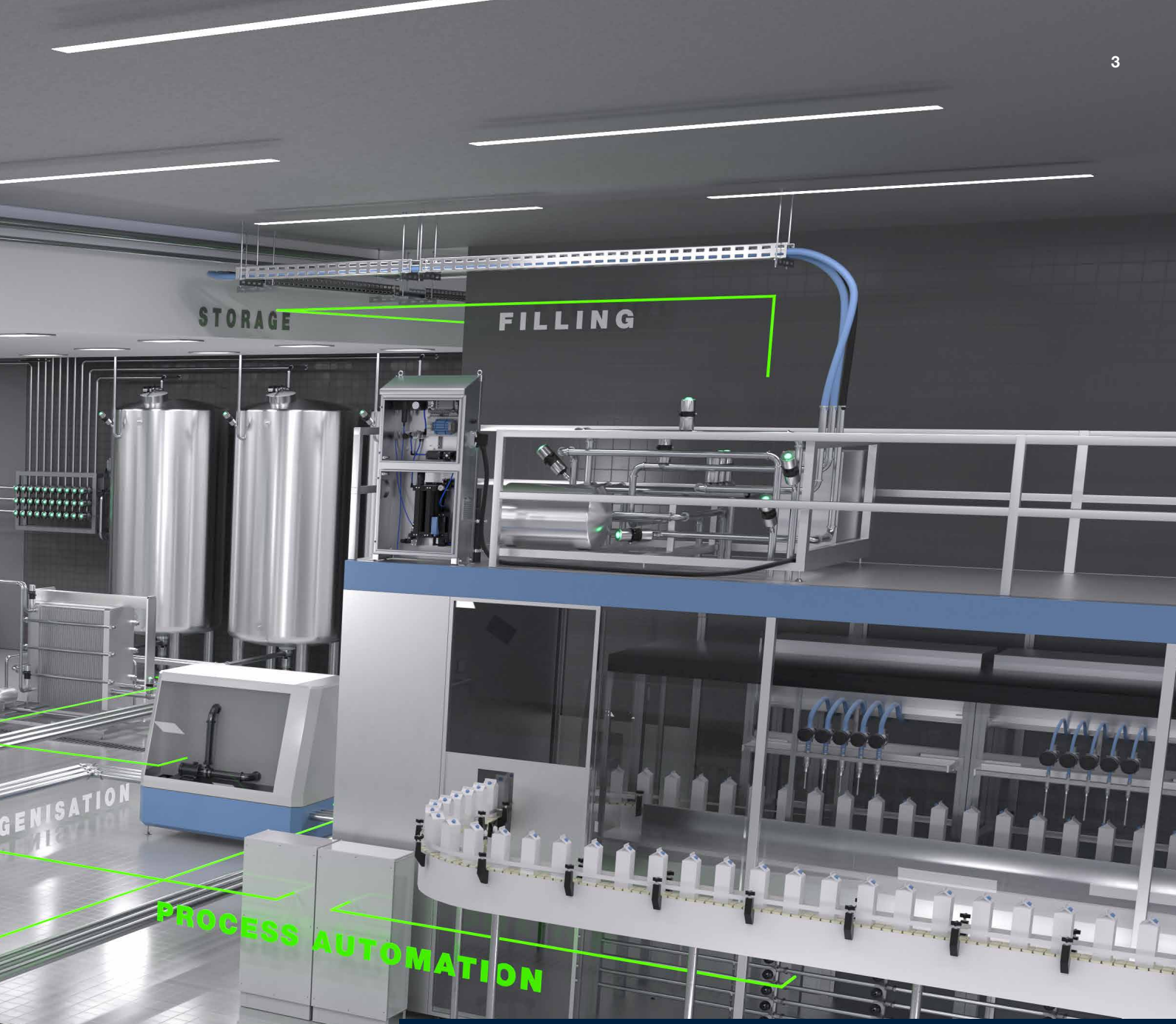
Efficient production processes in dairies

ENSURE PRODUCT QUALITY WITH COORDINATED AUTOMATION CONCEPTS

We make ideas flow.

bürkert
FLUID CONTROL SYSTEMS


YOGHURT
FERMENTATION
RAW MILK
RECEIVING
CIP
PASTEURISATION
SEPARATION

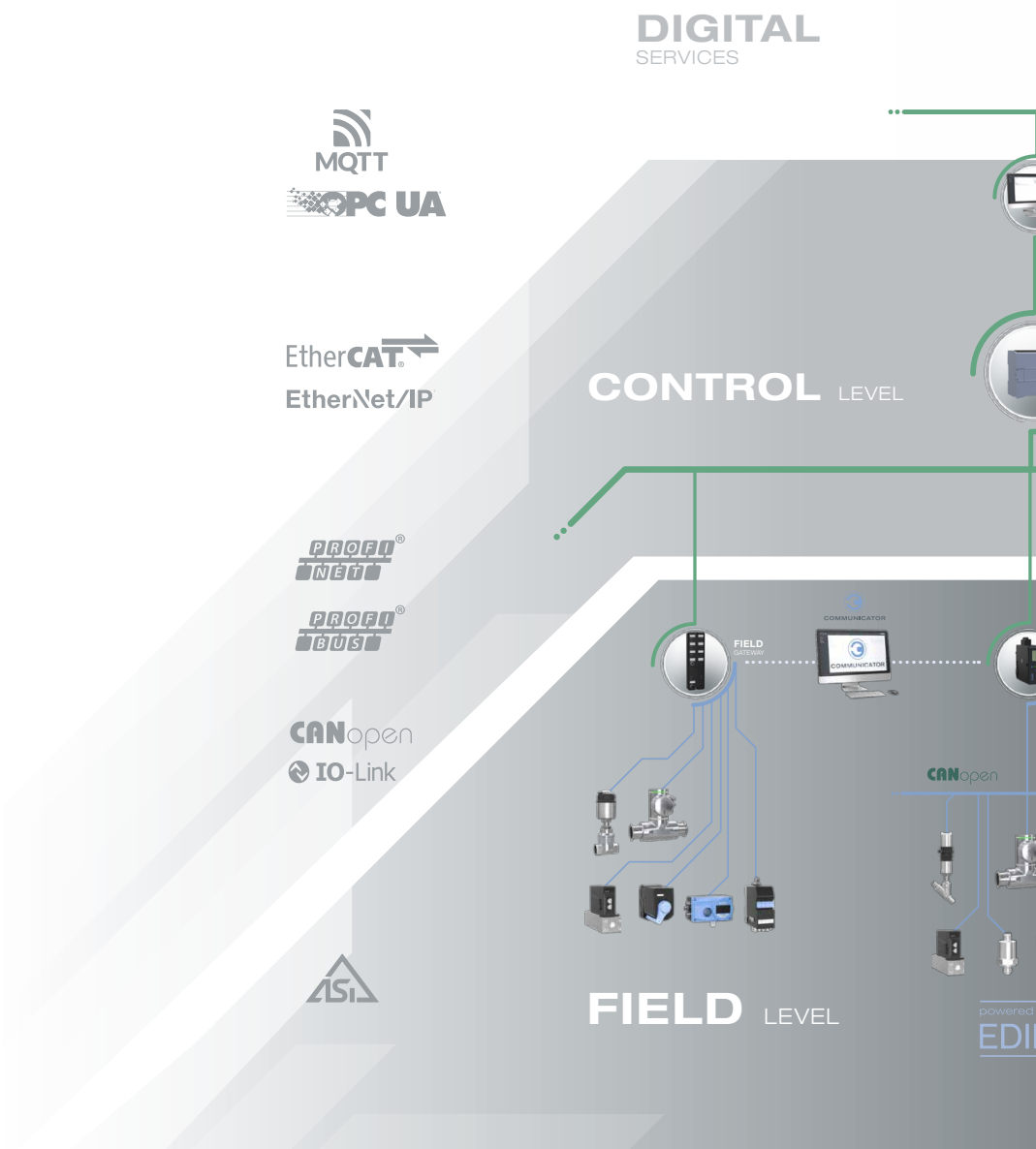


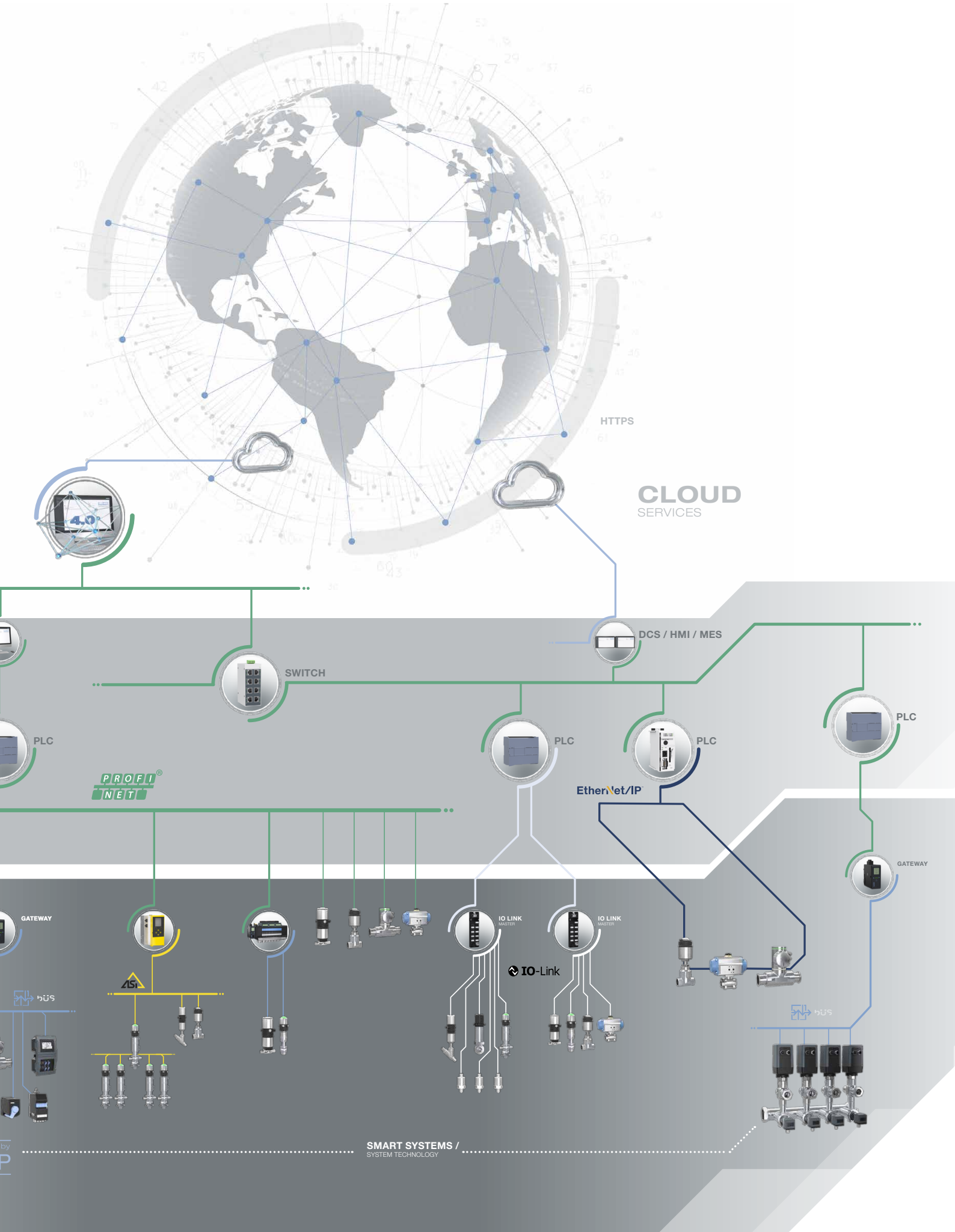
Why Bürkert is your partner

- Ensure product quality with coordinated automation concepts
- We have been automating the production of dairy products for over 40 years
- Over 7200 satisfied customers in the food and beverage sector

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.




HTTPS
CLOUD
SERVICES
DCS / HMI / MES
SWITCH
PLC
PLC
PLC
PLC
PROFINET
EtherNet/IP
GATEWAY
GATEWAY
IO LINK
MASTER
IO LINK
MASTER
IO-Link
bus
bus
SMART SYSTEMS /
SYSTEM TECHNOLOGY

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

System development

- Series design
- Pilot series and tool production

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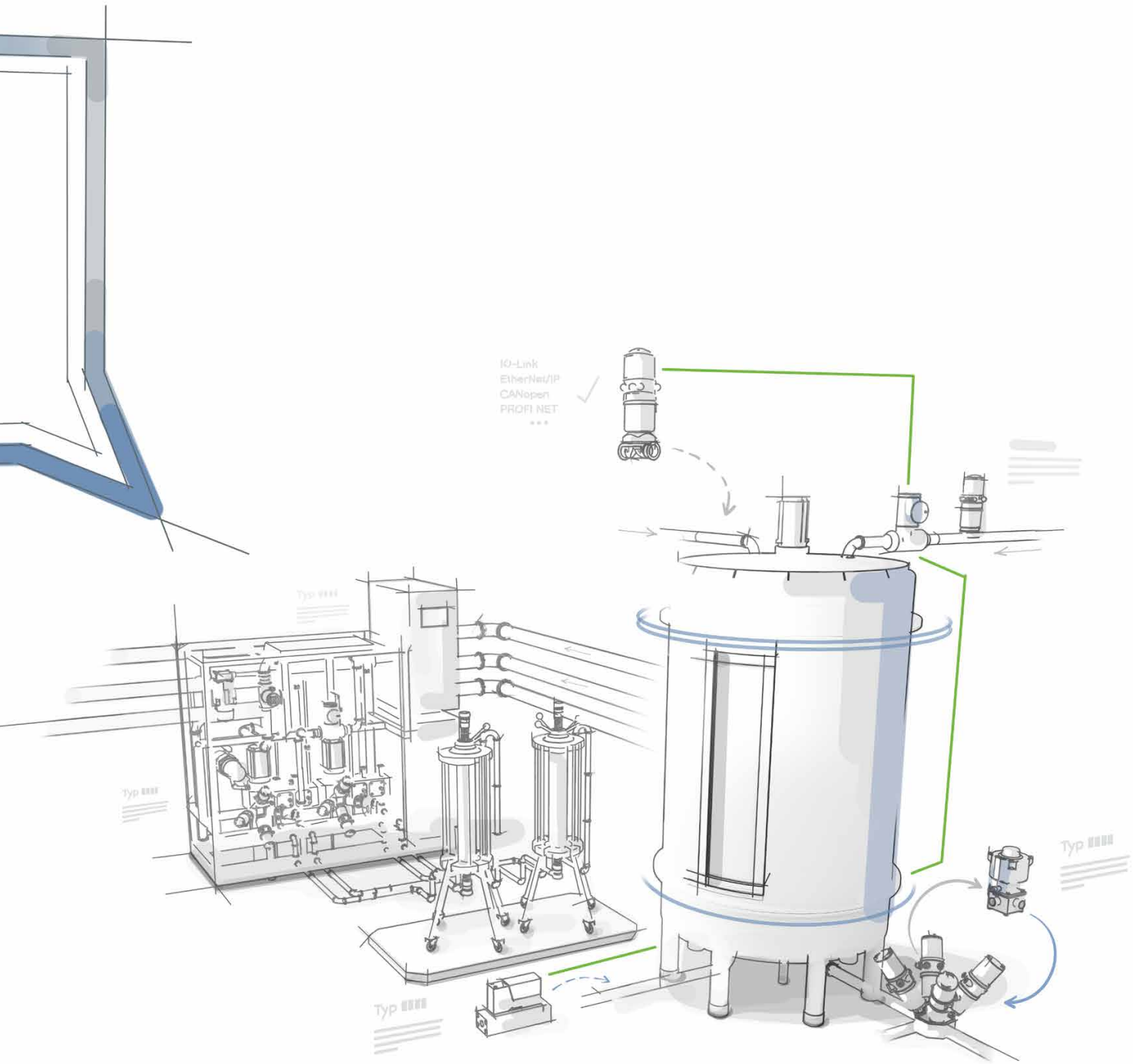
Prototyping & simulation

- Prototype and design
- Specifications
- Series offer



System implementation

- Implementation of logistics
- Production handover

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6

System & process qualification

- Zero series
- Preparation for series production

Controlled operation

- Customer training
- Installation and start-up

Stable yoghurt fermentation

Bürkert expertise

Digitalisation & process automation / temperature control / pH value measurement / filling level measurement / control technology

The skimmed milk is mixed with cream, homogenised, pasteurised and offset with starter cultures, so that the yoghurt keeps its typically tart taste and a creamy consistency. The ratio of bacteria added determines the taste. Part of the lactose in the milk is broken down during fermentation and lactic acid is produced. Our solutions for the precise control and monitoring of all processes guarantee stable production of yoghurt with the desired properties.

Type 8201 pH measuring system

- Glass-free pH probe, specially suitable for food processing
- CIP-capable, inline sterilisable
- Long service life, long calibration intervals

HYGIENIC **PH VALUE DETERMINATION**

Our robust, glass-free measuring system is optimally suited to monitoring progress in yoghurt fermentation. The durable sensor provides stable measured values. The extremely smooth and easy-to-clean email surface of the probe also reliably prevents the adhesion of viscous dairy media. Of particular advantage: the probe can also be left in place during the CIP and SIP processes.

CONTINUOUS **FILLING LEVEL MEASUREMENT**

The filling level must be continuously measured to keep the fermentation process stable. Our contactless radar filling level meter with encapsulated antenna system meets the hygienic requirements. Thanks to the small process connectors, precise measurement results can be achieved in a wide variety of container shapes, as the risk of disruption due to installations and superstructures and tank walls is greatly reduced.

Type 8139 radar filling level meter

- Continuous filling level measurement and high measurement dynamics
- Precise measurement results regardless of process conditions
- Maintenance-free operation due to wear-free and contactless measuring procedure

Type 8619 multiCELL controller

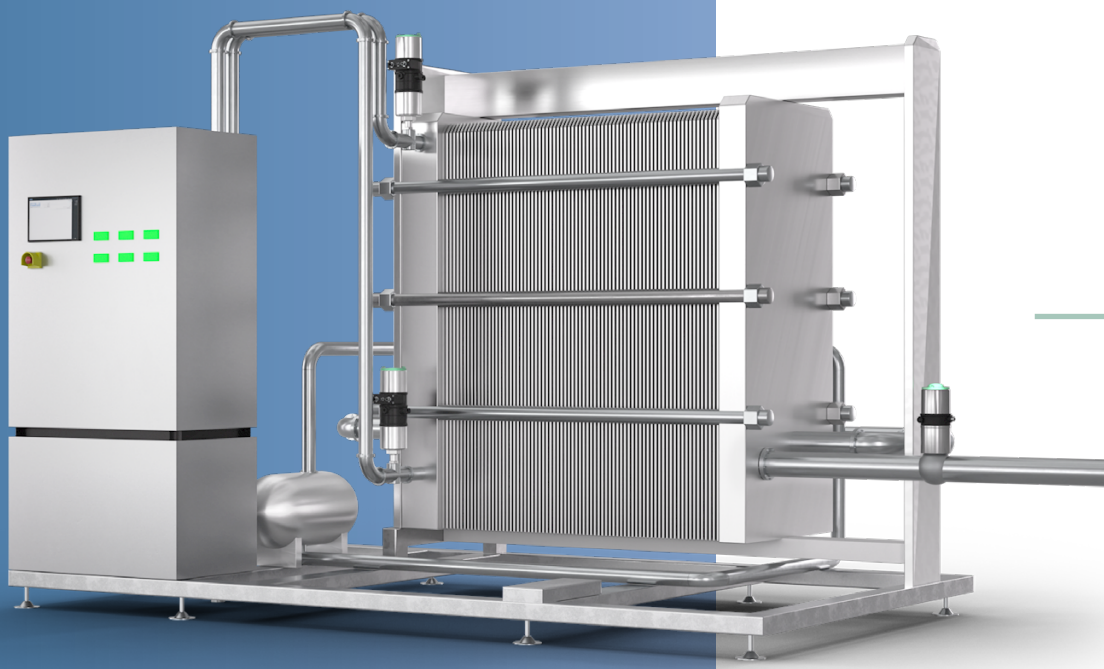
- High process reliability due to intelligent monitoring and control
- High efficiency thanks to automation via digital interfaces
- Stable process control thanks to precise dosing of starter cultures

SAFE **MONITORING**

Our Type 8619 multi-channel and multifunction transmitter/controller enables the direct connection of pH, temperature and filling level sensors. This means that the intelligent multiCELL transmitter does not only record the sensor values. It also accurately performs dosing tasks and communicates the values to higher levels. This means that all processes during the fermentation of yoghurt can be reliably monitored.

Pasteurisation at consistent temperatures

Bürkert expertise
Digitalisation & process automatisation /
Temperature control



Unwanted microbiological growth must be avoided and the level of acidity controlled when milk is pasteurised. Only in this way can food safety be achieved and the taste and nutritional properties maintained. You can reliably control all pasteurisation processes with our valve and sensor solutions: LTLT, HTST and UHT.

SAFE **TEMPERATURE CONTROL**

Our modular control solution ensures the desired process temperature during the heat treatment of milk. The compact, highly integrated system consisting of a control valve, automation unit and sensor precisely controls and regulates the temperature in heat exchangers. Thanks to the fieldbus connection and integrate diagnostic functions, you can always view the operating conditions of the control valve.

Type 8802 control valve system + 8418 temperature sensor

- Flexible integration of digital automation units
- Long service life and maintenance-free operation
- Easy start-up via Tune function of positioner and process controller

Type 8692/8693 positioner/ process controller

- Easy start-up with automatic X-Tune function
- Integrated pilot air duct and spring chamber aeration
- Connection to EtherNet/IP, PROFINET, Modbus TCP, PROFIBUS DP-V1 or Bürkert system bus (büS)

ASEPTIC **PROCESS CONTROL**

Aspetic processes are ensured with the harmoniously coordinated system consisting of positioners and process controllers. The solution can be hygiene-safely combined with our pneumatic actuators. The automated system will give you an overview, thanks to the large display. The operating conditions of the control valve can be monitored and recorded using the integrated diagnostics functions.

CONTINUOUS **FLOW MEASUREMENT**

Our magnetic-inductive flow sensor is idel for applications with low flow. It ensures a consistent flow quantity and precise measurement when combined with the associated transmitter. Flow and total meter values, and information on the device status, are transmitted digitally or analogue. They are clearly presented in the version with display at a glance.

Flowmeter SO56

- High measuring accuracy (0.5 % of measured value)
- Compact design
- Body variations with and without display

Precise separation

Bürkert expertise
Digitalisation & process automation /
Flow measurement and control

Cream globules must be separated from the skimmed milk and the fat content must be precisely adjusted in dairy processes. Our solutions ensure that the cream fat content is continuously measured, adjusted precisely and kept consistent. Developed specifically for the hygiene environment, our system solutions ensure the quality of your product and guarantee full process control for you.

Type 8802 control valve system + 8418 temperature sensor

- Long service life and maintenance-free operation
- Easy start-up via Tune function of positioner and process controller
- Reliable tightness of resistance thermometer

EFFICIENT **FLOW AND TEMPERATURE CONTROL**

The milk is specifically processed further, depending on the desired product. The flow and temperature must be controlled exactly in order to do this. Our solution consisting of a control valve, temperature sensor and automation unit precisely and continuously fulfils this task. Thanks to the fieldbus connection, you will have access to measured values, device status and settings, and will always be able to view the operating conditions of the control valve.

PROCESS-RELIABLE **AUTOMATION**

An exact overview of the status of your system guarantees process reliability and subsequently, efficient production. Our Type 8653 valve island presents all diagnostic information clearly on the display, while communicating it to the upstream control unit. This ensures reliable operation and makes start-up and maintenance easier.

Type 8653 valve island

- Process automation near actuator
- Reliable processes due to integrated safety functions and check valves
- Intelligent, flexible assembly system

Flowmeter SO56

- Compact design
- High measuring accuracy (0.5 % of measured value)
- Body variants with and without display

CONTINUOUS **FLOW MEASUREMENT**

Exact flow measurement represents a decisive process step when separating the cream from the heavier skimmed milk. Our magnetic-inductive flow sensor ensures a consistent flow quantity in combination with the associated transmitter. Flow and total meter values, and information on the device status, are then transmitted digitally or analogue.

State-of-the-art standardisation

Bürkert expertise
Digitalisation & process automation / Control technology / Flow measurement and control

To guarantee an appropriate shelf life and even product quality, it is important to offset fluctuations in the temperature and fat content of the milk, and to send the cream back precisely. The air content of the milk must also be kept at a consistently low level. Our innovative solutions standardise these processes and guarantee high product quality for you, from the milk to the viscous yoghurt.

COMPACT **PROCESS CONTROL**

Robust process control is essential in order to observe all required parameters during milk processing. Our digital pneumatic positioner and/or process controller is suitable for mounting on actuators designed in accordance with different standards. Equipped with diagnostic functions for valve monitoring, you will always have the operating conditions of the control valve under control.

Type 8792/8793 digital electro-pneumatic position/process controller

- Easy start-up using Tune function
- Optional fieldbus connection
- Easy to operate, dynamic actuating system with no air consumption

Flowmeter SO56

- High measuring accuracy (0.5 % of measured value)
- Different body shapes
- Compact design, with or without display

CONTINUOUS **FLOW MEASUREMENT**

Viscous milk products call for special flow measurement. Our magnetic-inductive flow sensor enables consistent and precise measurement. Flow and total meter values, and information on the device status, are transmitted digitally or analogue. The optional display enables clear presentation on the device.

AUTOMATED SUPPLY TO DAIRY TANKS

Our universal control heads enable the proper hygienic structure of compact valve clusters for the automatic supply of milk into different tanks. They can be combined with conventional hygienic process valves on the market, and are equipped with a mechanical manual override.

Type 8681 universal control head

- Universal attachment for hygienic process valves
- Contact-free position sensor
- Easy-to-clean body

Safe storage

Bürkert expertise
Digitalisation &
process automation /
Temperature control /
Gas pressure control system

Temperature control is of maximum priority for consistent quality of dairy products during storage. Energy consumption and CO_2 emissions during cooling should then be reduced, for sustainability and cost efficiency purposes. We offer you efficient solutions with our valve and control systems and contribute to safeguarding product quality.

ULTRA-COMPACT **PRESSURE CONTROL**

Tank blanketing systems ensure a stable chemical equilibrium via the dairy product and, subsequently, hygienic safety during storage. The robust stainless steel design prevents corrosion and increases the availability and productivity of your system. Our seat valves in the pressure control system weigh less than half of conventional solutions and save valuable space.

Tank blanketing system

- High control characteristics with reproducible automation
- Fully autonomous operation, thanks to integrated process controllers
- Hygienically absolutely safe operation (CIP-compatible)

Type 8802 control valve system + 8418 temperature sensor

- Good overview of the conditions, thanks to fieldbus connection and the integrated diagnostic functions
- High service life and maintenance-free operation
- Easy start-up via Tune function of positioner and process controller

SAFE **TEMPERATURE CONTROL**

Our compact control solution ensures the desired temperature during cooling and storage. The highly integrated system consisting of a control valve, automation unit and sensor precisely controls and regulates the temperature in heat exchangers. The risk of leakages is minimised with the welded connection. This then protects you from unnecessary energy costs and system contamination caused by corrosion. With its simple and compact design, the system enables a flexible plant design.

EFFICIENT **VALVE ISLAND AUTOMATION SYSTEM**

Multiple valves are needed in order to cool and store dairy products safely. Our valve islands offer up to 48 valve functions. They allow for a targeted pneumatic control unit and reduce fault sources. The pneumatic valves with safety shutdown enable easy retrofitting to each valve position on the islands – regardless of the switch signal control. This increases system safety. As individual valves can be changed during operation, your maintenance efforts and costs will be reduced.

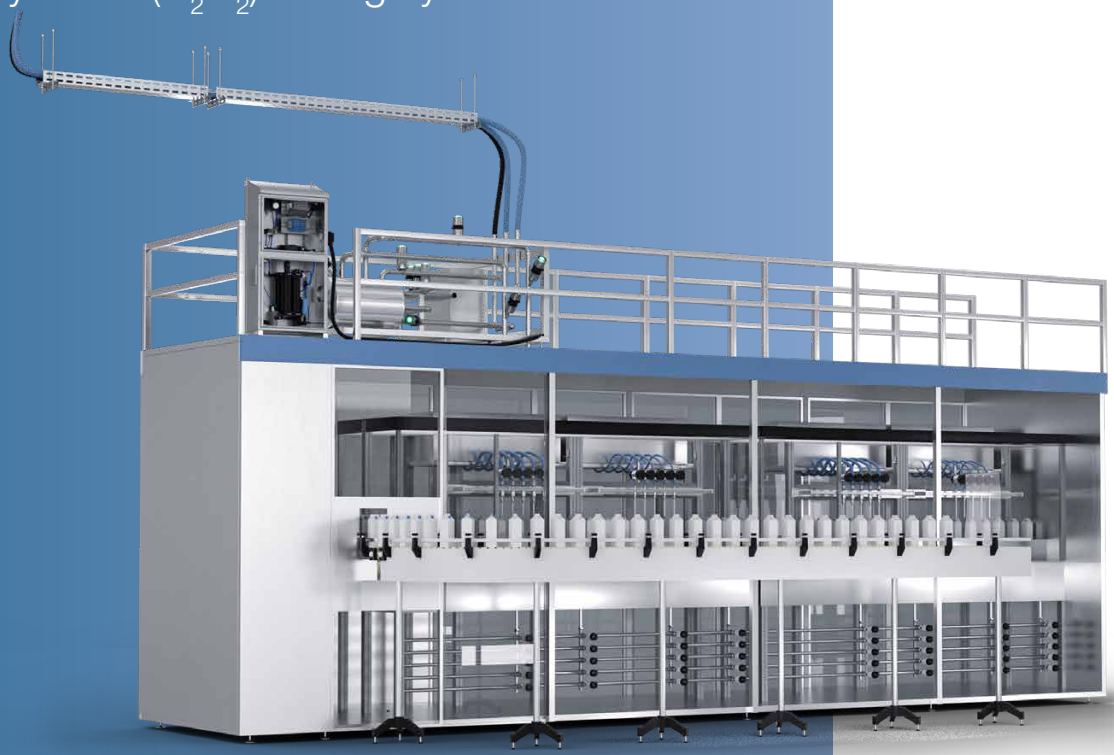
Type 8614 valve island

- Lower material requirements and installation costs due to close-to-process placement in hygiene-critical areas
- Optimised cleaning result due to proper hygienic stainless steel valve body
- High process reliability through P shut-off, check valves (R+S) and safety-related shutdown

Contamination-free filling

Bürkert expertise

Digitalisation & process automation / control technology / flow measurement and control / disinfection systems (H_2O_2) / filling systems



Speed and absolute repeat accuracy are crucial when filling the dairy product, meaning that maximum hygiene must be guaranteed at all times. Waste is avoided with secure process control. Efficient packaging sterilisation ensures freedom from germs, while maintaining the high quality of the filled product.

CONTINUOUS **FLOW MEASUREMENT**

Our magnetic-inductive flow sensor is ideal for the aseptic filling of milk products. The system ensures precise filling with a high level of repetition accuracy, in combination with the batch control unit. Flow and total meter values, and information on the device status, are transmitted digitally or analogue.

Flowmeter SO56 with ME43/ ME63 batch controller in combination with filling valves

- Industrial Ethernet gateway or fieldbus gateway with integrated batch function
- Simple integration into the system
- Compact design, with or without display

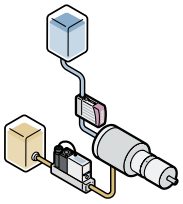
System solution

- Consistent and documented degree of inactivation
- Easily scalable thanks to flexibly adjustable dosing quantity (even when machine is in operation)
- Space-saving system, easily adaptable for different device sizes

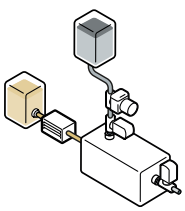
SAFE **STERILISATION**

Our system solution mixes hydrogen peroxide (H_2O_2) and air into a fine aerosol for even, efficient sterilisation. As well as time, this also saves hydrogen peroxide, compressed air and electrical energy. With our turnkey systems for the H_2O_2 sterilisation of plastic, glass and cardboard boxes, you can rely on both high efficiency and perfect sterilisation.

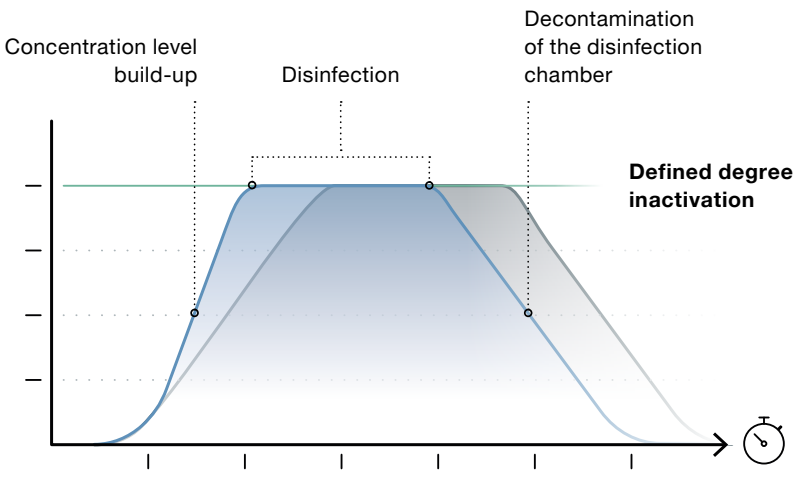
Comparison with conventional solution



Bürkert system solution



Conventional solution



Residue-free CIP cleaning

Bürkert expertise

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

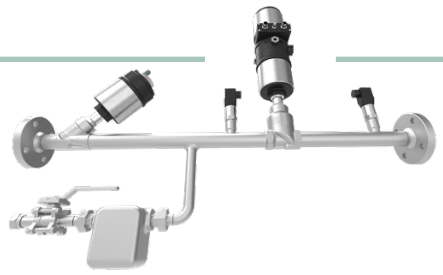
Only the careful cleaning of all system parts in the dairy guarantees process reliability and efficiency. It is worth reducing the consumption of water, chemicals and energy for environmental and cost reasons. Contamination of the end product with cleaning agents should be avoided in all circumstances, which is why the separation of the production and cleaning phase and/or a media changeover must be reliably detected.

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 Type 8221 sensors withstand both the frequent and high temperature changesand aggressive cleaning solutions. Thanks to the smart control algorithms and connection options for the Type 8619 multiCELL controller, you can continuously keep your cleaning processes under control, with minimum expenses.

Type 8221 conductivity sensor + Type 8619 multiCELL controller

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



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

- Avoid unnecessary energy costs
- The easiest start-up
- Diagnostics and monitoring thanks to digital fieldbus connection

SAFE
TEMPERATURE CONTROL

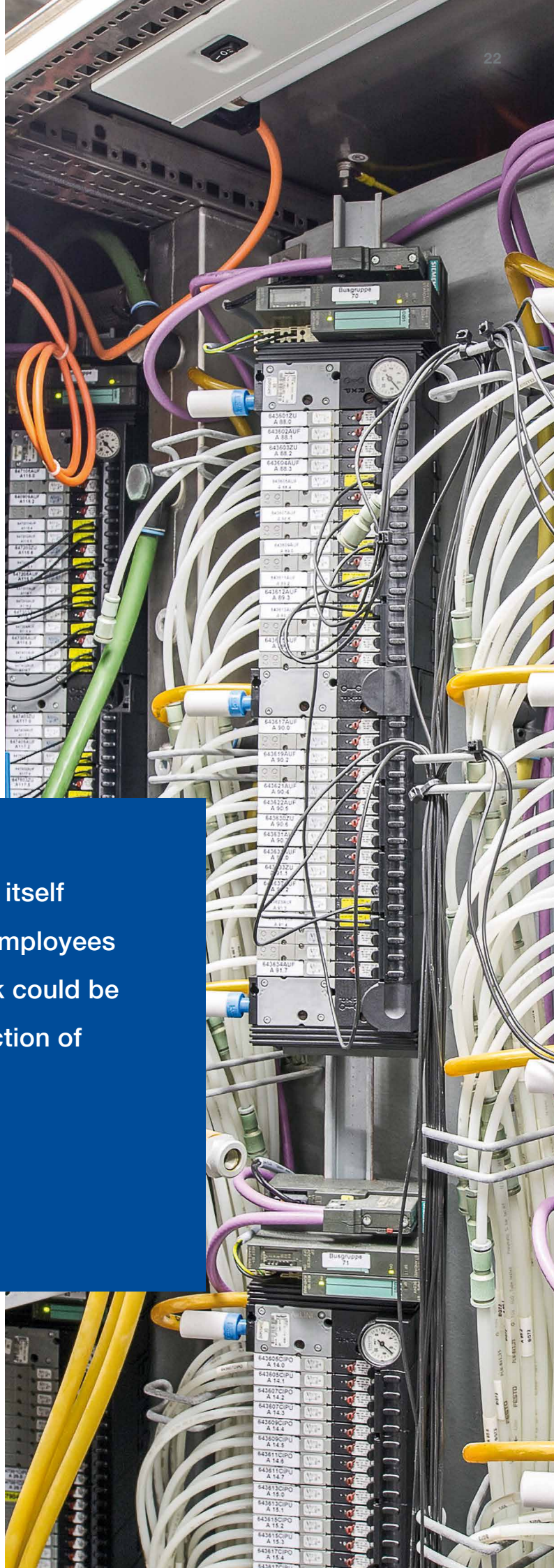
Precisely temperature-controlled cleaning media is needed to clean systems reliably. Our modular temperature control solution continuously ensures an optimal temperature for CIP media and protects you from unnecessary energy costs. The weld end connection minimises the risk of leakage and provides protection against contamination from corrosion. Thanks to its compact shape and low weight, the solution enables flexible system design.

DOCUMENTED
FLOW MEASUREMENT

Media changeovers must be recognised quickly in order to prevent contamination. FLOWave efficiently measures the flow rate of the cleaning media without contact. You can identify contamination caused by cleaning media immediately, thanks to the recording of the differentiation factor and temperature. This enables a consistently high product quality. Our clean-in-place (CIP) solution ensures efficiency thanks to reduced chemical and water consumption.

FLOWave Type 8098

- Compact, low maintenance solution with low energy consumption
- Hygienically absolutely safe operation
- Integration into your existing fieldbus system enables simplified documentation



The smart retrofitting solution proved itself worthy in practice and the safety of employees while working on the pipeline network could be significantly increased, to the satisfaction of the operator.

The collaboration with Danone

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

www.burkert.com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