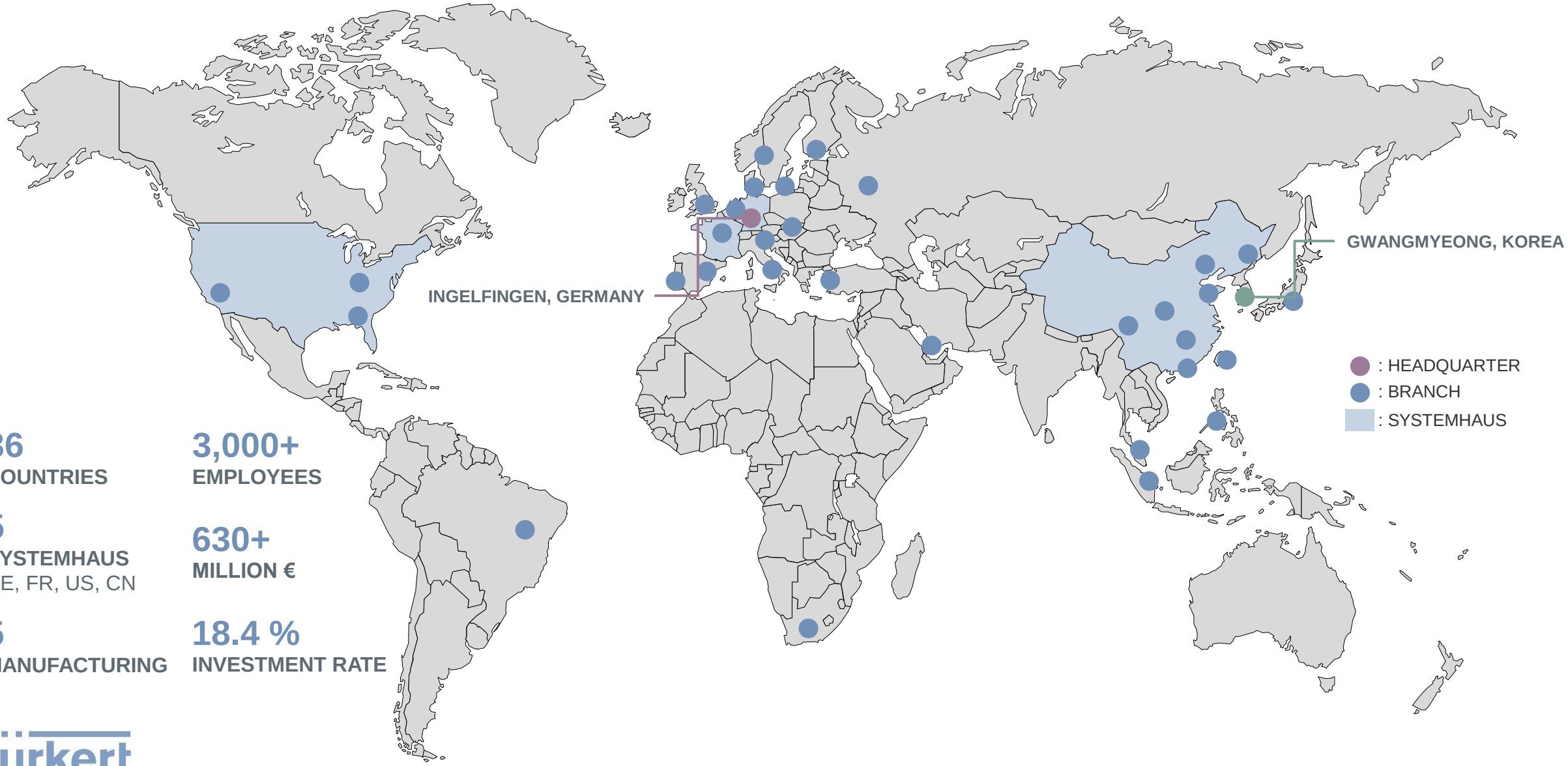

bürkert
FLUID CONTROL SYSTEMS
BURKERT KOREA
WE MAKE IDEAS FLOW

# Welcome to the World of Burkert Fluid Control Systems.

Burkert is one of the world's leading manufacturers of measurement and control systems for fluids.

# WORLD-WIDE BURKERT GROUP




**36**
**COUNTRIES**

**5**
**SYSTEMHAUS**
DE, FR, US, CN

**5**
**MANUFACTURING**

**3,000+**
**EMPLOYEES**

**630+**
**MILLION €**

**18.4 %**
**INVESTMENT RATE**

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# BURKERT FOOTPRINT & GOALS

**100%**
FAMILY BUSINESS

**1946**
FOUNDED BY
CHRISTIAN BÜRKERT

1
FINANCIAL
INDEPENDENCE

2
MASSIVE
INVESTMENT IN
TECHNOLOGY

3
INVESTMENT IN
PEOPLE

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# CERTIFICATES & CONFORMANCE

## HOLISTIC CERTIFICATES

- US Pharmacopeia (USP) for diaphragms
- Passivation and electro-polish process traceability
- ASME Bioprocessing Equipment Standard (BPE) Standard Process Test Conditions (SPTC)
- ISO 9001, 14001:2015
- OHSAS 18001:2007
- RoHS Directive 2011/65/EU, 2015/863/EU
- CRN
- Pressure Equipment Directive (PED) welding compliance
- WEEE Directive 2012/19/EU

## REGULARTORY COMPLIANCE

- cGMP from local areas
- FDA for processes & procedures
- US Pharmacopeia (USP)
- ASME Bioprocessing Equipment Standard (BPE)
- EU Directive 2006/42/EC on machinery
- DIN EN ISO 14159 (Machine hygiene)


## TRACEABILITY OF RIGID MATERIALS

- 3.1 Metal Traceability as per EN10204
- Material Traceability Report (MTR)
- Surface Finish Report (SFR's)
- Passivation Certificate
- Electro-polish Certificate
- Individual Serialisation

## ELECTRONICS APPROVALS

- Underwriter's Laboratories (UL)
- Device to be used in Explosive Area(ATEX)
- CE marking for the European Economic Area
- KOSHA Explosion Proof

## SEALS

- USP Class VI, Chapter 87/88 compliant
- FDA 21CFR177 and CFR compliant
- Devoid of any TSE's, BSE's and ADI's
- Free from Extractables and Leachables
- RoHS and REACH compliant

# FLUID CONTROL IN ALL INDUSTRIES

## PARTNERS

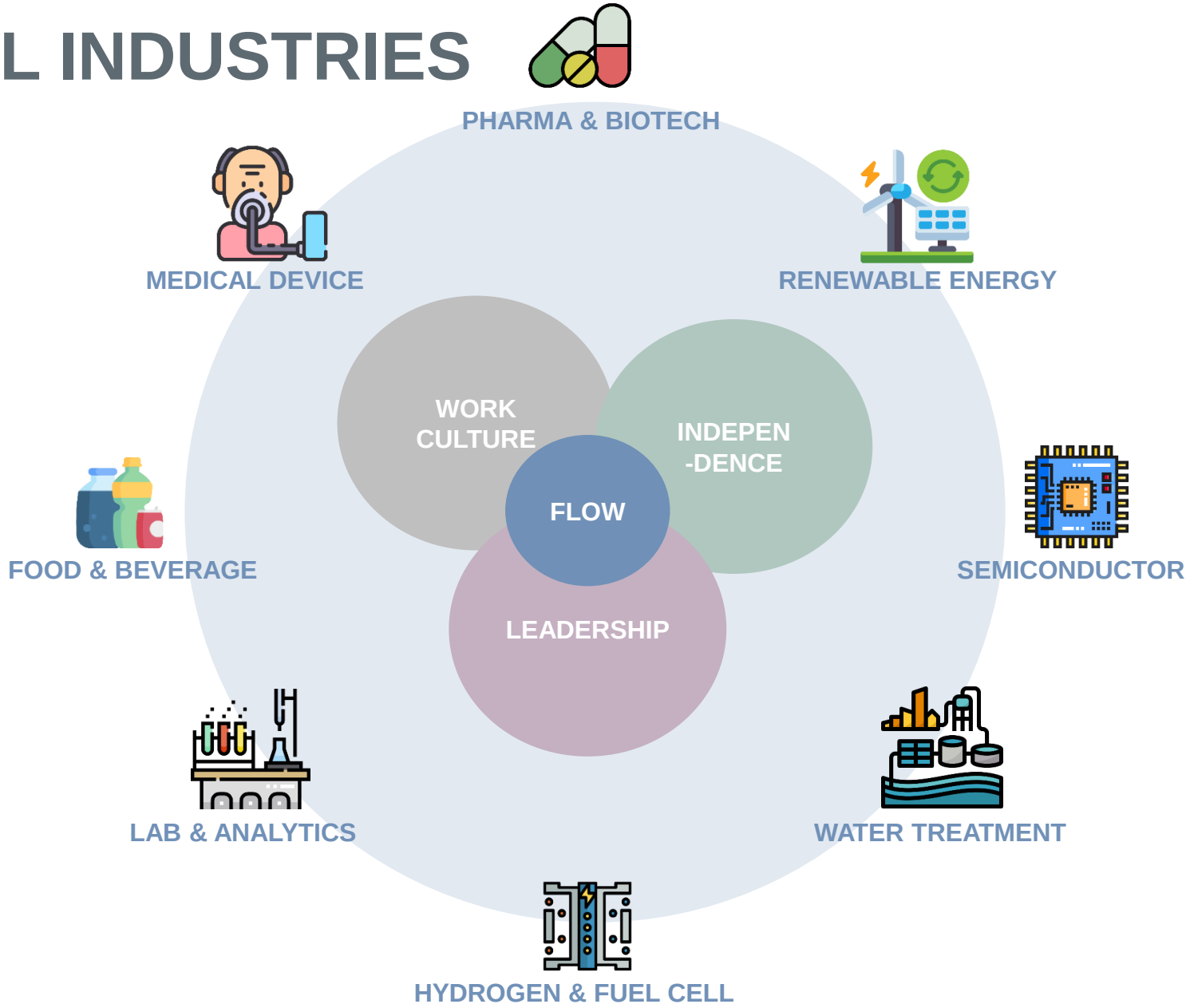
We do not perceive customers as object – We see them as partners to whom we actively listen to understand their concerns

## TECHNOLOGIES

We convince our partners by a profound consulting service, which is based on our sound technological competence

## PROCESSES

To achieve and actively implement customer centricity, the entire organization focuses on the customer

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# 01

# SOLUTIONS FOR YOUR BUSINESS

Burkert is one of the world’s leading manufactures of measuring, control and regulating systems for fluids and gases. With a portfolio of more than 30,000 products Bürkert is the only supplier to offer all fluid control system components to drive performance throughout your business.

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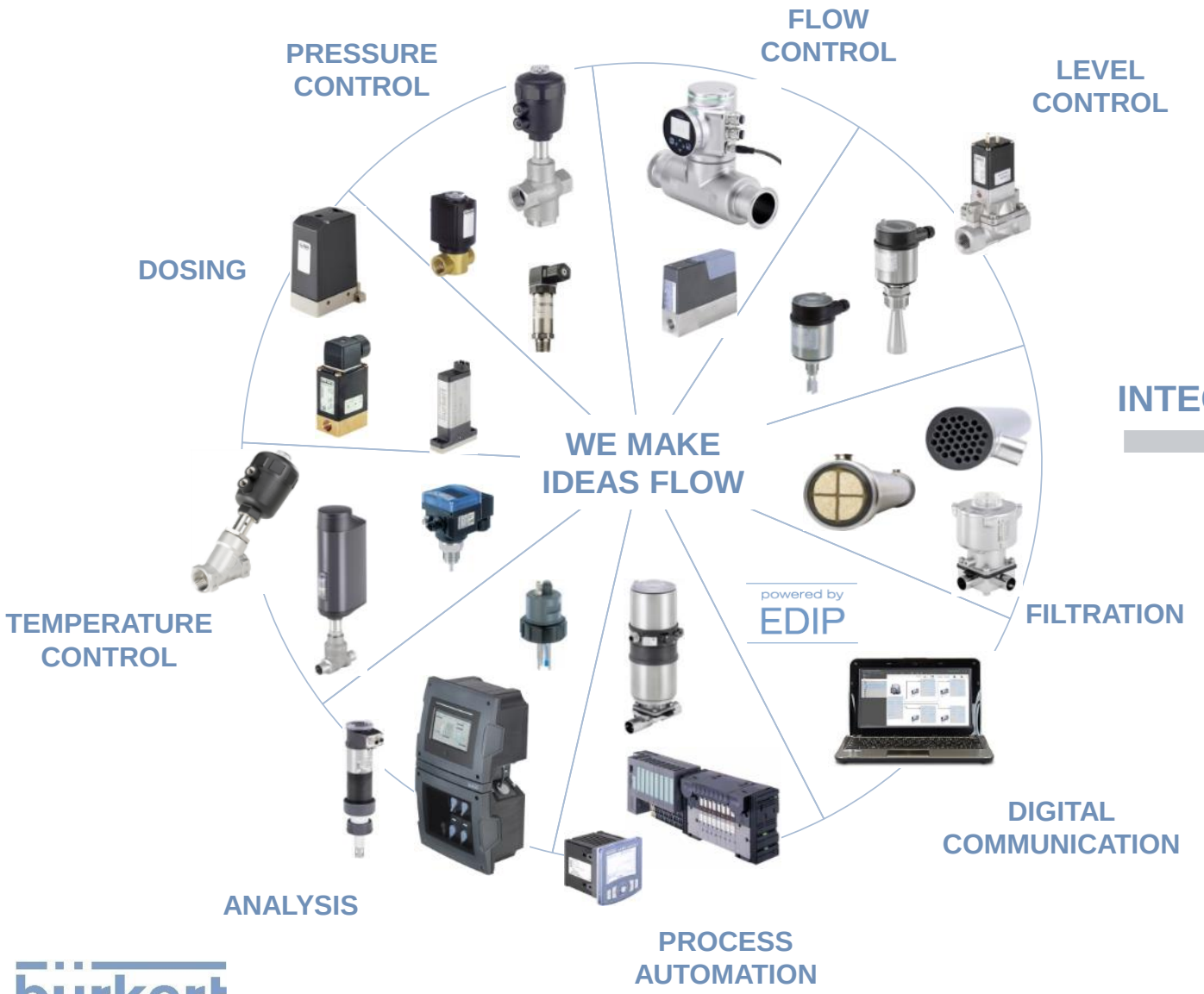
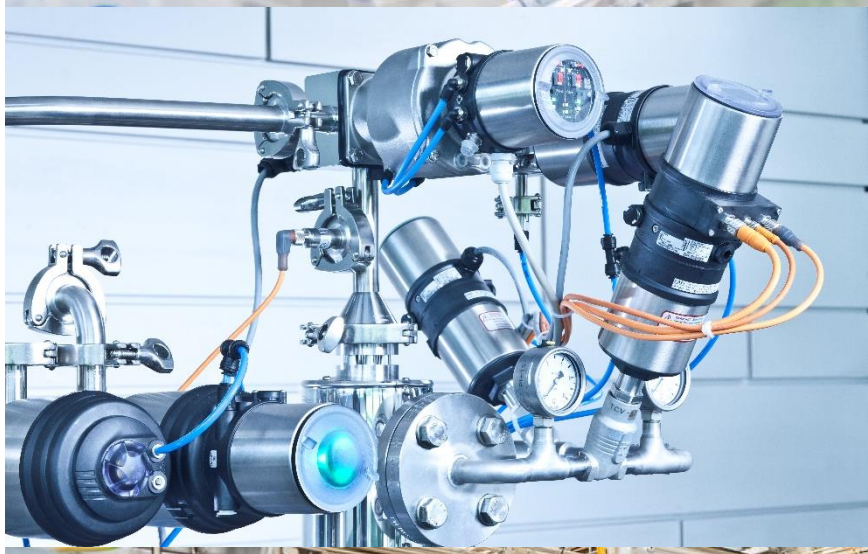
# ALL ABOUT FLUID CONTROL




INTEGRATION



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# PROCESS VALVES: ON/OFF & CONTROL

**Type 8692**

**Type 8693**

- *Compact, robust stainless-Steel design*
- *Easy start-up by Tune function for position and process controller*
- *Contact-free position sensor*
- *Integrated control air routing with spring chamber aeration*
- *PROFIBUS DP-V1, DeviceNet, EtherNet/IP, PROFINET, Modbus TCP or büS (Bürkert System Bus)*

**Type 8690**

**Type 8691**

**Type 8697**

**Type 8695**

*Pneumatic control unit including pilot valve and mechanical or inductive limit switches*

*Control head with integrated pilot valve, teachable, contact free position feedback sensor and colored high-power LED for status indication, communication via AS-interface, DeviceNet, IO-Link or büS*

**Type 2000**

*2/2-way angle-seat valve, DN 13-65, pneumatically operated, gunmetal or stainless-steel body.*

**Type 2100**

*2/2-way angle-seat valve with ELEMENT design, DN 13-50.*

**Type 2012**

*2/2-way globe valve, pneumatically operated, stainless steel body, DN 10-100.*

**Type 2101**

*2/2-way globe valve with ELEMENT design, DN 10-50.*

**Type 2031**

*2/2-way diaphragm valve pneumatically operated, stainless steel body, DN 4-100..*

**Type 2103**

*2/2-way diaphragm valve with ELEMENT design, DN 4-50.*

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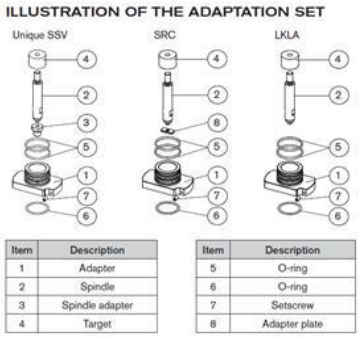
# 8681 CONTROL HEAD: UNIVERSAL DESIGN

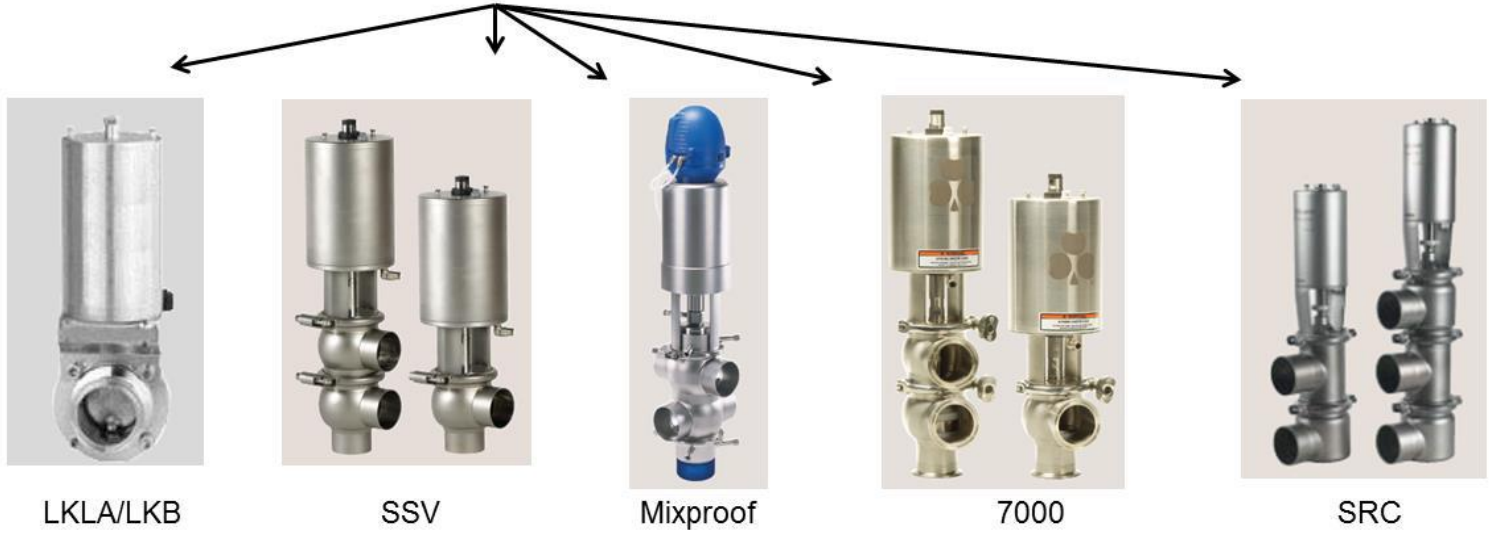


## Type 8681

- Universal adapter for hygienic process valves
- Contactless position measurement system with 3 switching points (Teach-in function)
- Colored status display
- Manual override to be used with closed housing
- Communication interfaces AS-interface and DeviceNet







# ELECTROMOTIVE: PRECISE, HYGIENIC, DYNAMIC

## CLASSIC: PAST

- High flow rate
- Long service life
- Various modular programs

## ELEMENT: PRESENT

- Long service life
- Control units can be mounted directly without external tubing
- Stainless steel housing with various connections
- Hygienic solutions

## ELECTROMOTIVE: FUTURE

- No more compressed air needed
- Great and fast control
- Weather, impact, vibration resistant design
- Easy cleaning by its design according hygienic demands
- Position controller and process controller available
- Versatile diagnostic options

# DIAPHRAGM VALVES

**Type 8806**

*Robolux multiway mulitiport diaphragm valve control and feedback head*

**Type 2103**

**Type 2063**

*2/2-way in stainless steel*

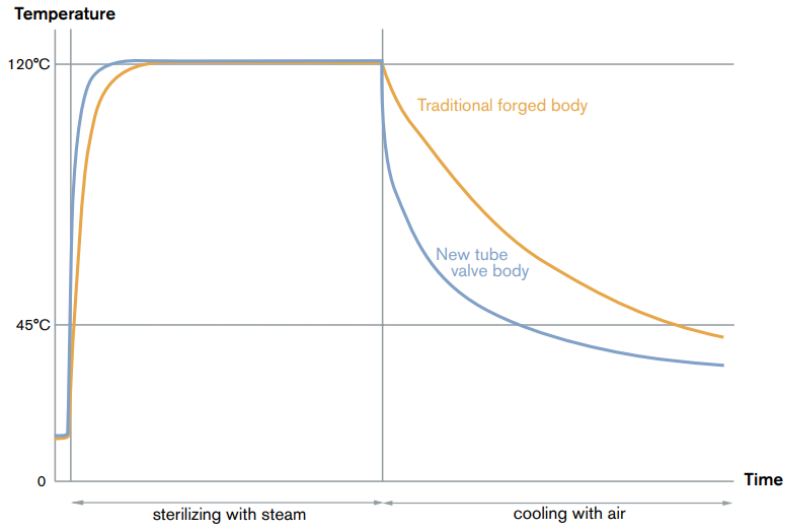
**Type 3234**

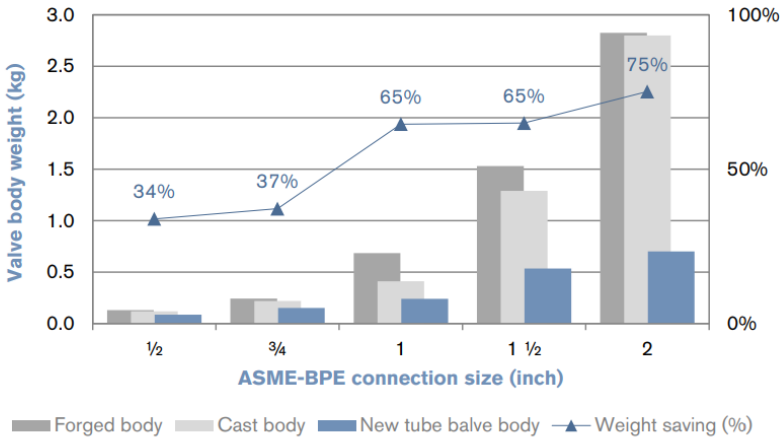
*T diaphragm valve*

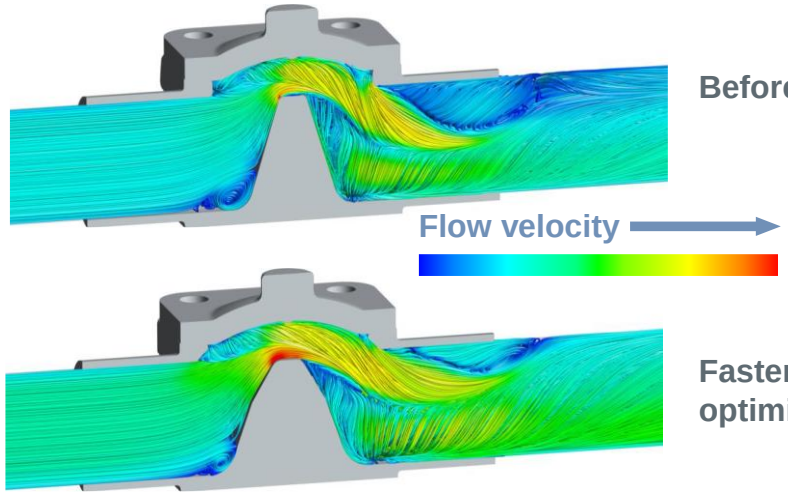
**Type 2034**

*Multifunction block and weld solution*

# HYDROFORMED: ENVIRONMENT-FOCUSED




**Before reference model**

**Faster flows after design optimization**

- Burkert's unique tube valve body has a remarkably lighter thermal mass than forged and cast alternatives: up to 75% for a 2" valve.
- Tube valve body is lighter, energy efficient and patented.
- SIGMA new design – improved high flow Kv value
- During laboratory testing: Steam rate savings of up to 53.8% per valve (with a temperature delta of 100K).
- When manufacturing a DN 25 sized, each process releases:
  -. Cast body: 7,000g
  -. Tube valve body: 2,000g

# MASS FLOW CONTROLLERS

| Type | 8741 (MFC / MFM) | 8742 (MFC / MFM) | 8745 (MFC / MFM) Standard | 8746 (MFC / MFM) |
|---|---|---|---|---|
| Full scale ranges (273.15 K, 1013.25 mbar) | 0.01 - 160 l / min (N2) | | 20 - 2500 l / min (N2) | |
| Sensor technology | MEMS Sensor Inline | | Inline Sensor | |
| Body material | Stainless steel, aluminium | | Stainless steel, aluminium | |
| Media | Neutral, non-contaminated gases Neutral, non | | Neutral, non-contaminated gases | |
| Turn-down Ratio | 1:50, optional 1:100 | | 1:50 | |
| Pressure / bar | 25 bar | | 25 bar | |
| Gas temperature | -10 to +70 °C | | -10 to +70 °C | |
| Accuracy | ± 0.8 % o. R. ± 0.3 % F. S. ± 1.5 | | ± 1.5 % o. R. ± 0.3 % F. S. | |
| Repeatability | ± 0.1% F. S. | | ± 0.1% F. S. | |
| Settling time | < 300 ms | | < 500 ms | |
| Protection class | IP20 | IP65 and IP67 | IP20 | IP65 and IP67 |
| Communication | Standard signal, PROFINET, PROFIBUS-DP, EtherNet/IP, EtherCAT, Modus TCP, CANopen or CAN-based büS | Standard signal, PROFIBUS-DP, CANopen or CAN-based büS | Standard signal, PROFINET, PROFIBUS-DP, EtherNet/IP, EtherCAT, Modbus TCP | Standard signal, PROFIBUS-DP, CANopen or CAN-based büS |
| Conformity | USP Class VI, FDA, EGV 1935:2004 | | USP Class VI, FDA | |
| Special features | Sensor in contact with medium | | Sensor in contact with medium | |
| | Real gas calibration Real gas | | Real gas calibration | |
| | Little sensitivity of the sensor to humidity and particles | | Low pressure drop and little sensitivity of the sensor to humidity and particles | |

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# SENSORS A TO Z

*Level*

**Type 8111**

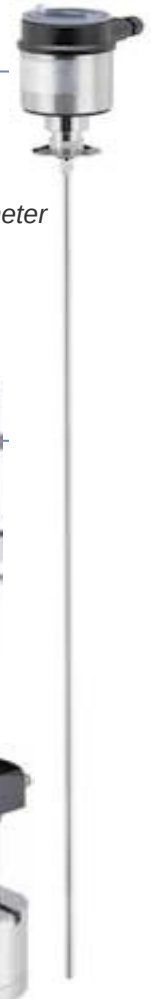
*Vibrating level Switch*

**Type 8139**

*Radar level meter*

**Type 8189**

*Guided microwave level meter*



*Analysis*

**Type 8228**

*pH/ORP meter with temperature sensor with/without display*

**Type 8222**

*Conductivity meter with temperature sensor with/without display*

**Type 8228**

*Inductive conductivity meter with temperature sensor and optional display*

*Flow*

**Type 8026**

*Paddle wheel flowmeter insertion*

**Type 8036**

*Paddle wheel flowmeter inline*

**Type SE36 & S077**

*Oval gear flowmeter*

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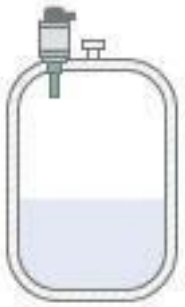
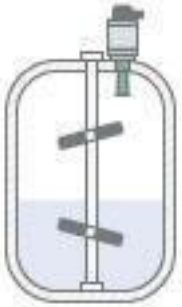
# LEVEL METER: VARIOUS METHODS



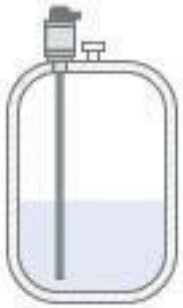
## ULTRASONIC

- Liquids
- Paste-lie media
- Powders
- Bulk materials



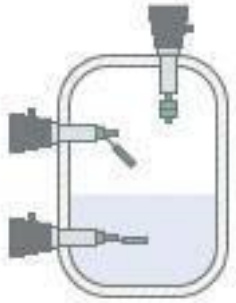
## RADAR

- Liquids
- Paste-lie media
- Powders
- Bulk materials



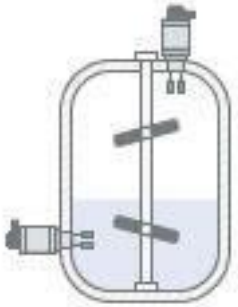
## GUIDED RADAR

- Liquids
- Paste-lie media
- Powders
- Bulk materials



## FLOAT SWITCH

- Liquids
- Internal Magnet and reed contacts
- Independent of Influences



## TUNING FORK

- Liquids
- Installed in Tank
- Frequency change detected by oscillator and turned into switching command

# SOLENOID VALVES: ON/OFF & PROPORTIONAL

*Direct-acting plunger Valves*

**Type 7011**

**Type 6013**

**Type 6027**

*Direct-acting pivoted armature valves*

**Type 0330**

**Type 0331**

**Type 0121**

*Direct-acting proportional valves*

**Type 2871**

**Type 2873**

**Type 2875**

*Universal controller*

**Type 8611**

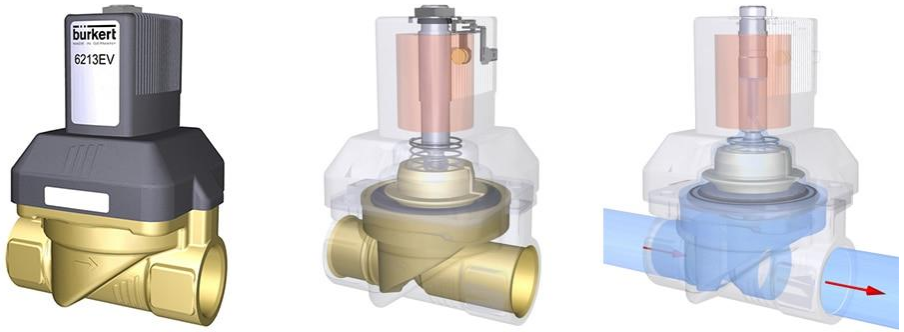
**Development by Systemhaus**

**System Module**

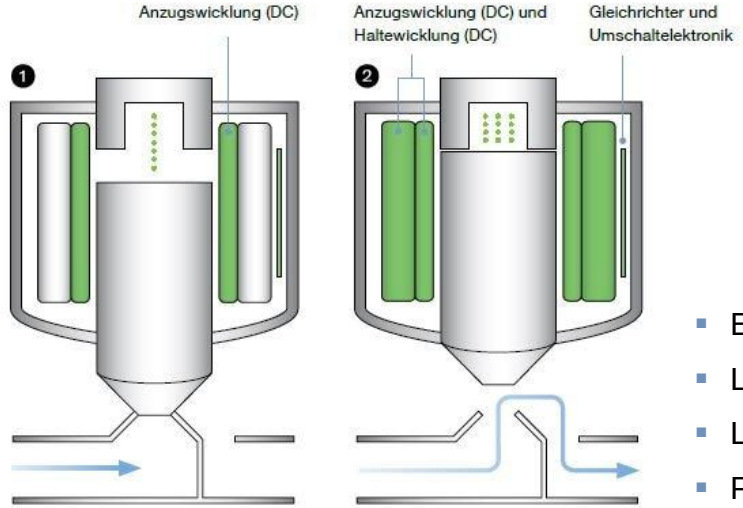
*Gas Control System*

*Vacuum Control Unit*

# KICK & DROP: SAVE YOUR ENERGY




- The coil is initially overexcited by a high voltage pulse to generate the high starting power required to open the valve.
- After a few milliseconds, the electronics switch to an energy-saving holding power, thus drastically reducing power consumption.




- Energy efficiency
- Lower noise
- Long maintenance interval
- Performance improvement

- Due to double coil winding, the KD coil can deliver up to 200% more power and still save up to 70% energy compared to a standard coil.
- Volume saving 35% of the volume is saved compared to a typical coil.
- The KD coil reduces self-heating by around 40%
- The core guide tube having a max. 55˚C.

## Theoretical Experiment: Tap Water

- Size: 3/4 ~ 1”
- AC19 Kick & Drop coil consumes appx. 9~20W less compared to a standard coil. On average this corresponds to 15W.
  -. 15W X 2880h = 43.2kWh
  -. Industrial electricity price X 0.19ct/kWh = €8.21/year

# VALVE ISLANDS

Type 8652

Type 8653

*AirLINE the valve island optimised for process automation*

- Safety-related shut-off of valves possible
- Easy diagnostics via LC display
- Process reliability through pneumatic functions
- Optimised for installation at the bottom of the control cabinet
- Explosion-proof variants according to ATEX / IECEx Zone 2

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# FLOWave: JUST A SINGLE TUBE

### Maximum precision

- 0.4% accuracy

### Meets the highest hygiene requirements

- Certificates: ASME BPE, 3A, EHEDG

### Consistent processes and product quality

- Acoustic Transmission Factor detects bubbles, particles in liquid

### Easy to handle and install

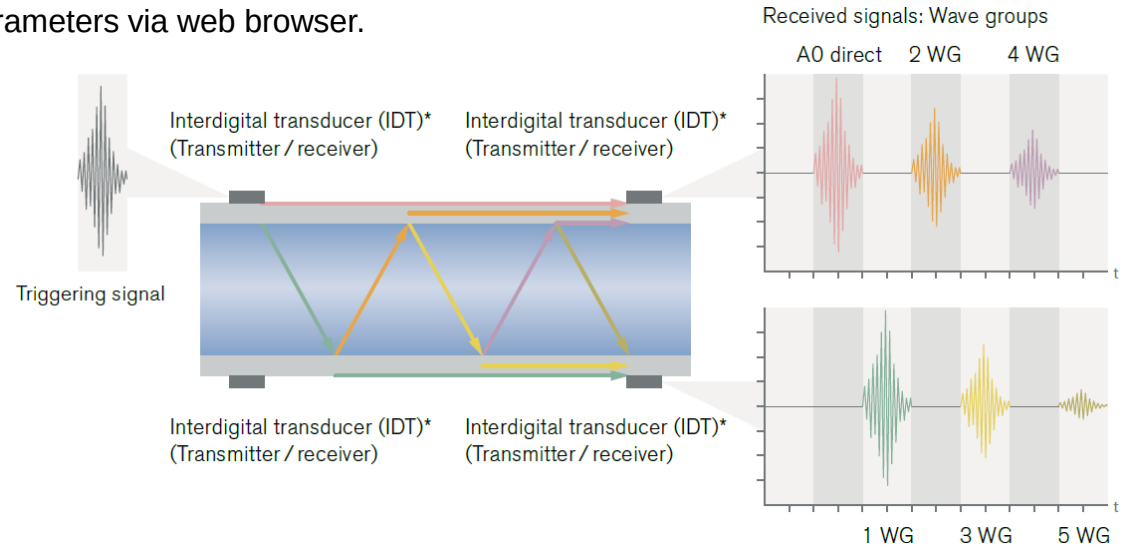
- 2-inches of FLOWave weighs just 3.4kg

### Fast start-up and easy operation

- 2.4-inches display offers flexible operation. The WiFi module allows remote access to measurement parameters via web browser.

### WHAT IS SAW (Surface Acoustic Waves)?

Interdigital transducers are triggered by an electrical signal and generate the surface acoustic waves. These waves spread over the pipe surface and couple into the liquid at a specific angle. The waves thereby generate reception signals with single and multiple passes through the liquid.





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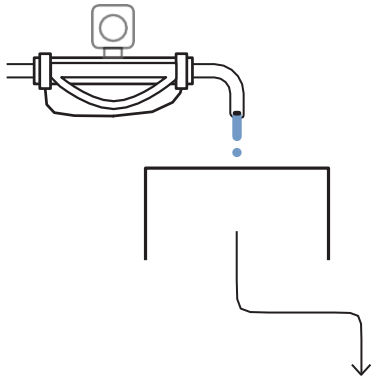
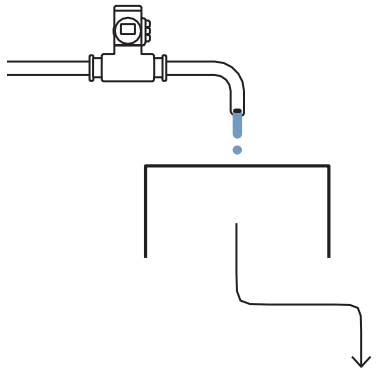
# FLOWave: JUST A SINGLE TUBE

**Solution with Coriolis**



Volume flow 0.06 l/s – **3.6** l/min

**Solution with FLOWave**



Volume flow 2.2 l/s – **132** l/min

Coriolis : FLOWave = **1:30**

The flow velocity increases
by a factor of 30 with FLOWav..

100 litres of oil = **28** minutes with Coriolis

100 litres of oil = < **1** minute with FLOWave

## Conventional solutions

**Electromagnetic flowmeters (EMF)** are not usually suitable: This is because the conductivity of many oils is too low.

**Mechanical flowmeters** – such as paddle wheels or oval gear meters – do not meet the hygiene requirements of the food industry.

**Conventional Coriolis measuring devices** are less energy efficient due to the “tapering” of the pipeline.
This is because the pump has to work harder to deliver the same quantity of medium through the thinner pipeline.

# 02

# SYSTEMHAUS CUSTOMIZED SOLUTIONS

Burkert Systemhaus offers the customized engineering solution from consulting to delivery. Our project team consists of reliable sales consultants, qualified industry specialists and dedicated engineers and supports your individual development plan.

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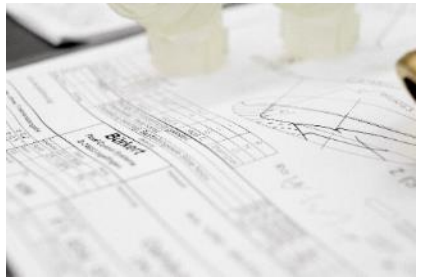
# SYSTEMHAUS: A BEST CONSULTANT

## CONCEPT

- Outlined Concept
- Preliminary Offer
- Create Project Plan
- Feasibility Study
- Workshops



## PROTOTYPE DEVELOPMENT

- Prototype & Design Simulation
- Define Specification
- Serial Offer with Possible Tool & Equipment Costs

## SYSTEM DEVELOPMENT

- Produce & Verify Preproduction Batch
- Implement Production Process
- Produce Tools & Equipment

## SYSTEM & PROCESS QUALIFICATION

- Validate Initial Batch
- Prepare Serial Production
- Qualify Production Process

## PROJECT CLOSURE

- Product Review
- Implementation of Logistic Process
- Transfer Products to Assembly

# FROM SMALL MODULES TO COMPLETED MACHINES

- **Swift realization of your requirements**

Through short coordination procedures

- **Exceptional product characteristics**

Thanks to qualified materials and production conditions

- **Transparent deadline and cost control**

Due to a single contact partner for the entire product creation process

- **Optimized project duration and minimum project risk**

By early ensuring the required characteristics, already in prototype

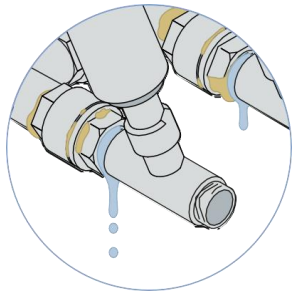
- **Efficient implementation of your product ideas**

Thanks to flexible production processes

**DEGREE OF FUNCTIONAL INTEGRATION**

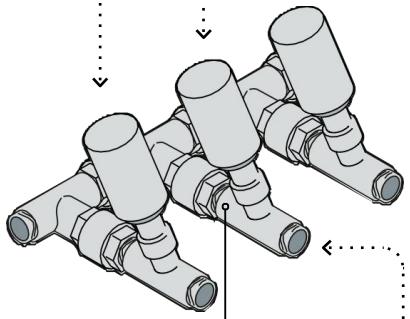
**Basic Systems** | **Engineered Systems** | **Complex Systems** | **Complete Systems**

# MODULAR VALVE CLUSTER AS REQUIREMENTS



Frequent leaks

Complex cleaning

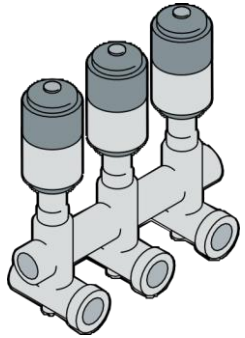


Many sealing points

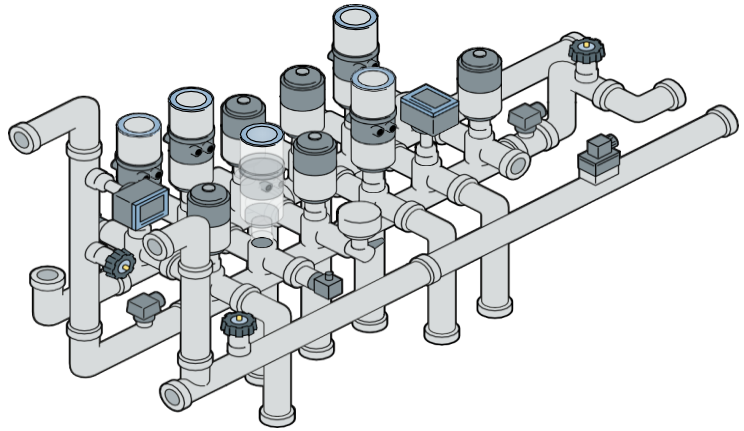
Costly and complex piping

Required fluidics know-how

- No fittings
- No piping
- No leakage
- Smaller installation space



Conclusion: up to **75%** less space required



**Compact & Modular**

- Space-saving systems with a long service life

**Leakage-free**

- No screw connection,

**Customized configuration**

- System configuration to meet your requirements

**Service friendly & easy to assemble**

- The individual fluidics platform eliminates any effort for piping and connection

**Reliable and durable**

- The valve technology is so robust and insensitive to kickbacks that your system runs trouble-free and with maximum availability

**Reproducible processes**

- Ready-to-install distribution system can be automated an important step towards reliable and reproducible processes

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# 03

# DIGITALIZATION A NEW STEP

The transformation of the industry offers fascinating opportunities and new challenges in equal measurement. Process automation solutions must fit into existing structures and be future-proof and flexible so that the digitalization steps do not lead to a dead end.

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# DIGITAL WORLD

OF BÜRKERT

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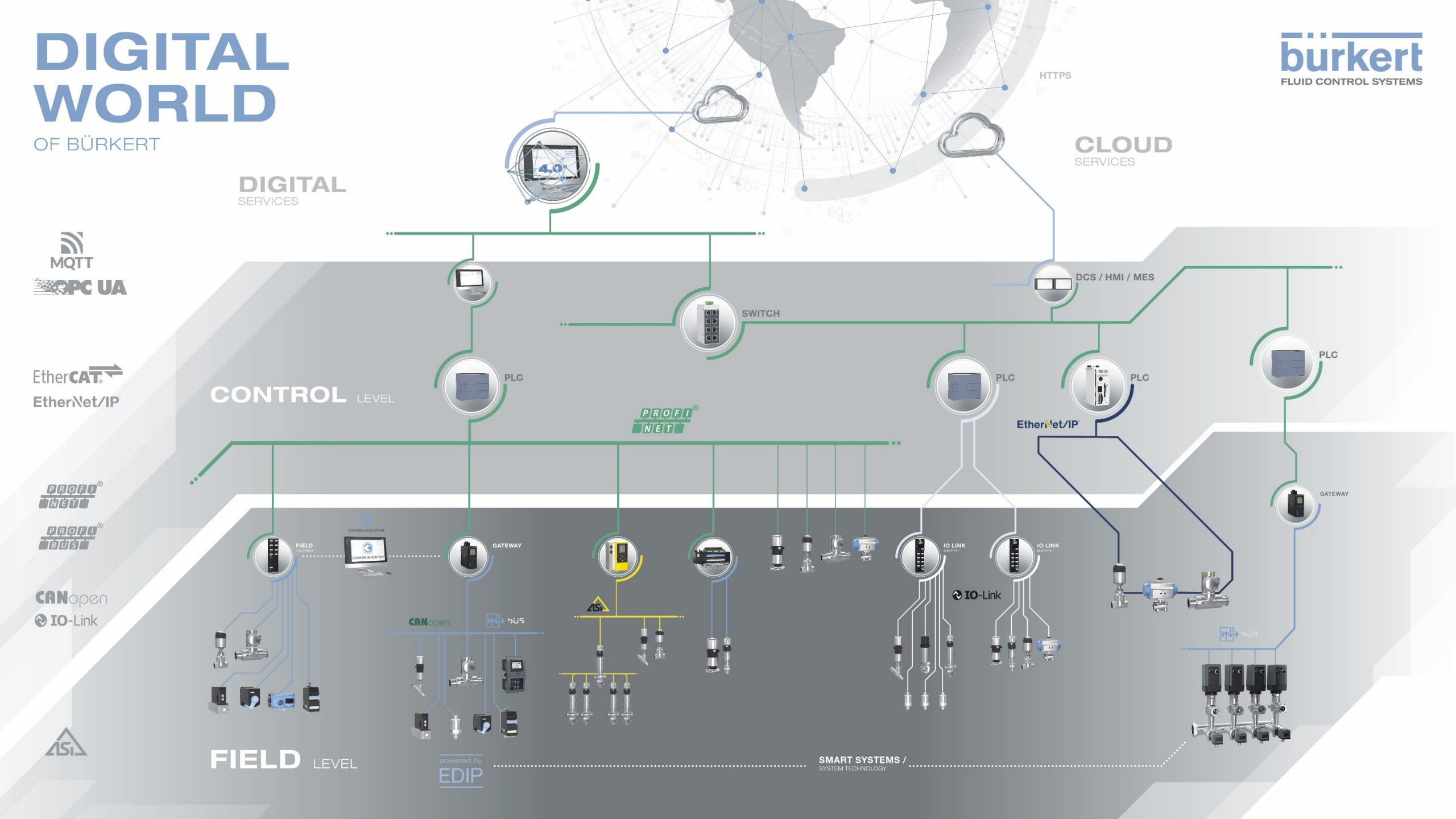
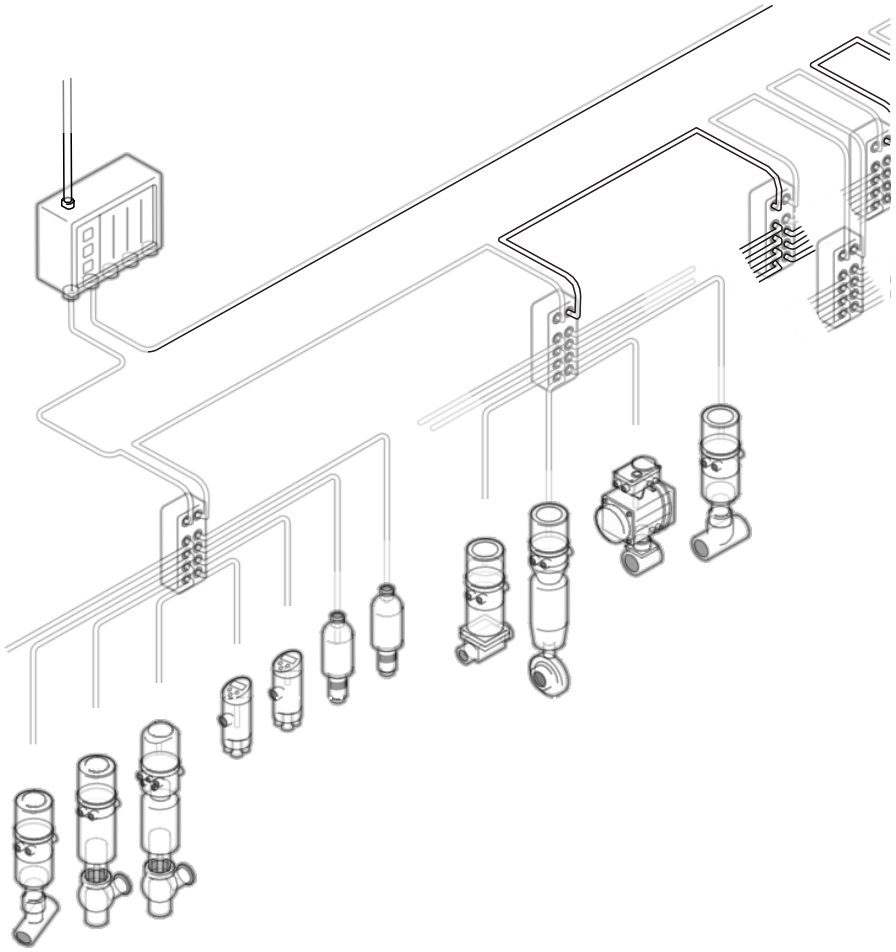


# ALL IN ONE SOLUTION

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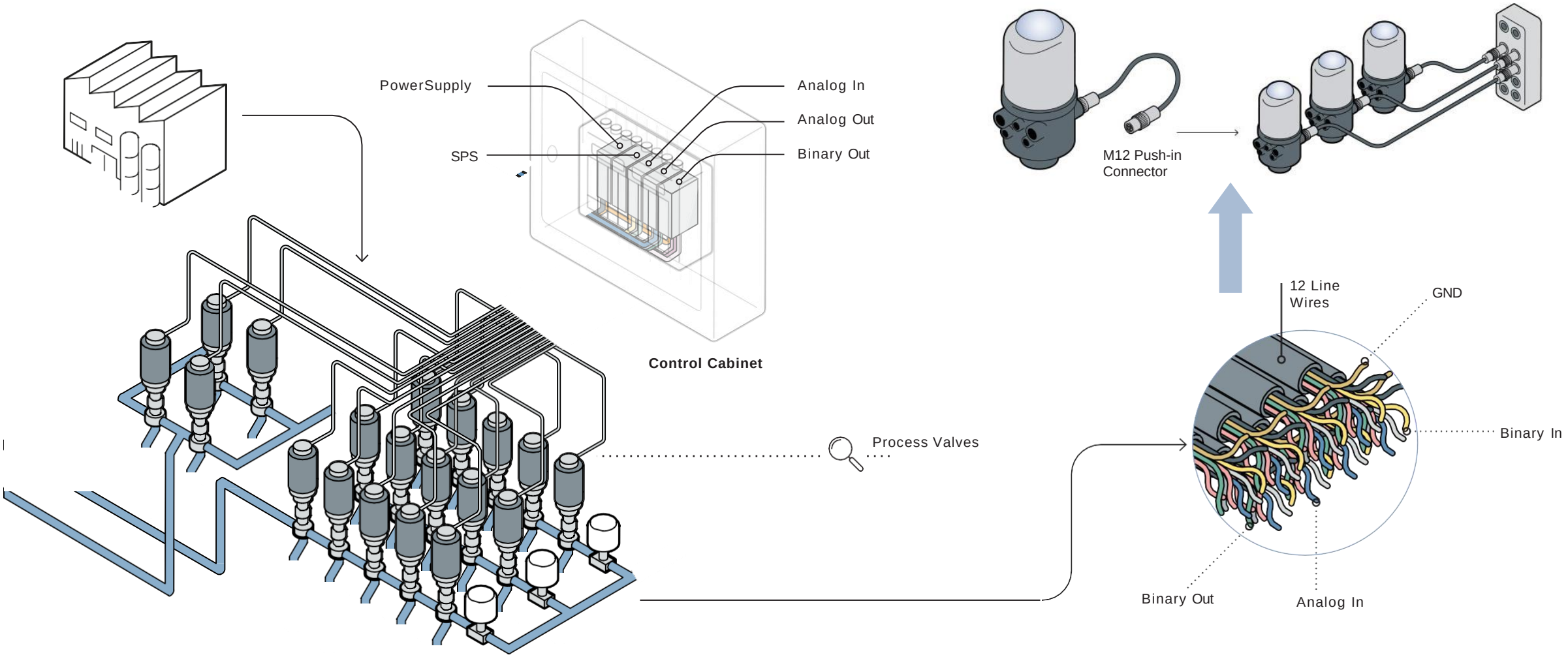
# CONVENTIONAL ANALOG SYSTEMS




- High cabling and wiring effort
- Lengthy, error-prone installation
- Too much space required for control cabinet

# IO-LINK: INTELLIGENT NETWORKING

## LOWER COSTS THORUGH INDIVIDUAL CONCEPTS

Short wiring ensures fast valve switching times and fast installation

## SPACE-OPTIMIZED SOLUTIONS WITH SMALL CONTROL CABINETS

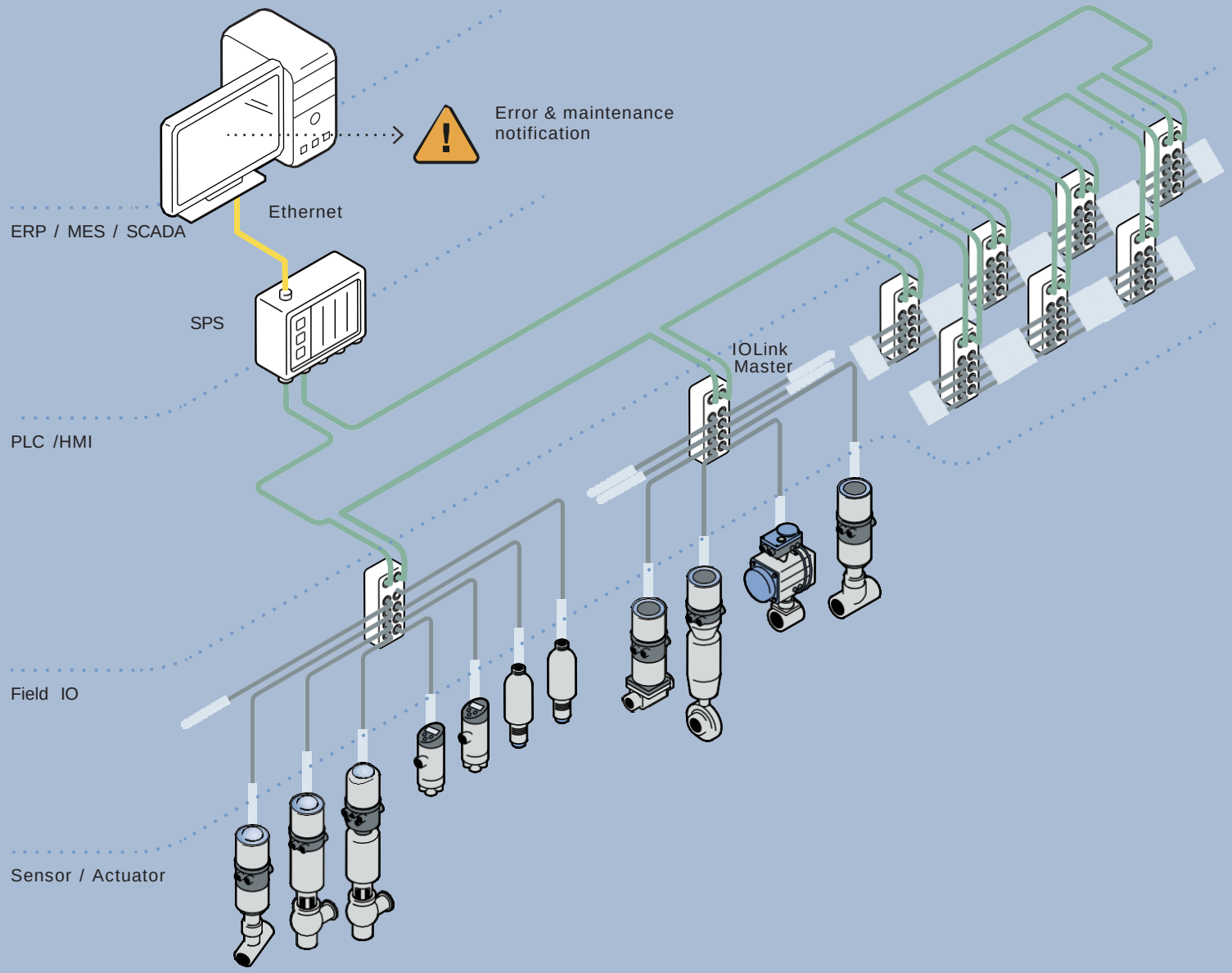
Small control cabinets can be close to the filed devices and the actual production process

## FAST ERROR IDENTIFICATION AND AVOIDANCE

Process reliability increases since accidental operating errors are excluded

## SOLUTION-ORIENTED, OBJECTIVE ADVICE ON VALVE AUTOMATION

Flexible concept makes it possible to add more devices

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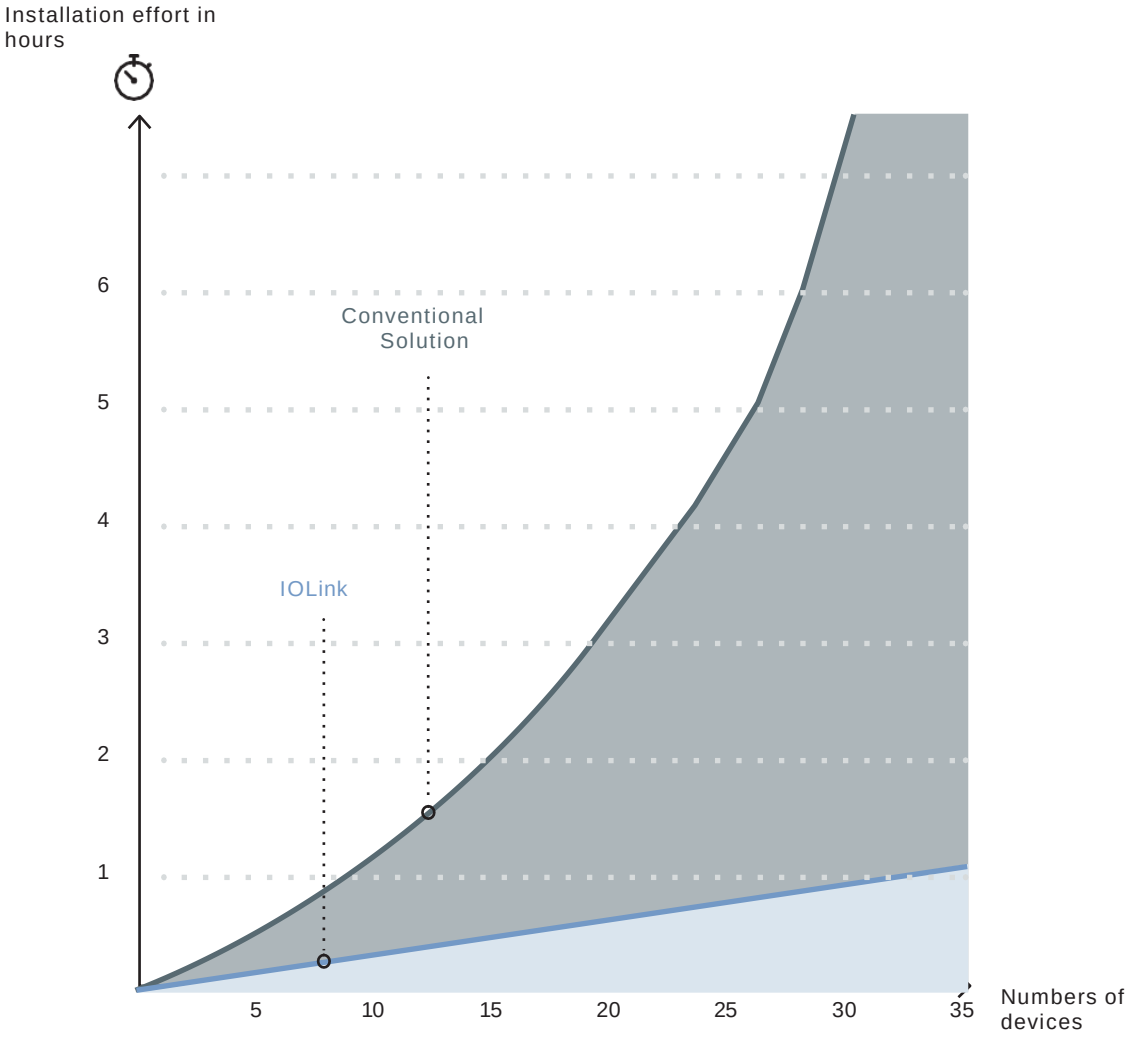
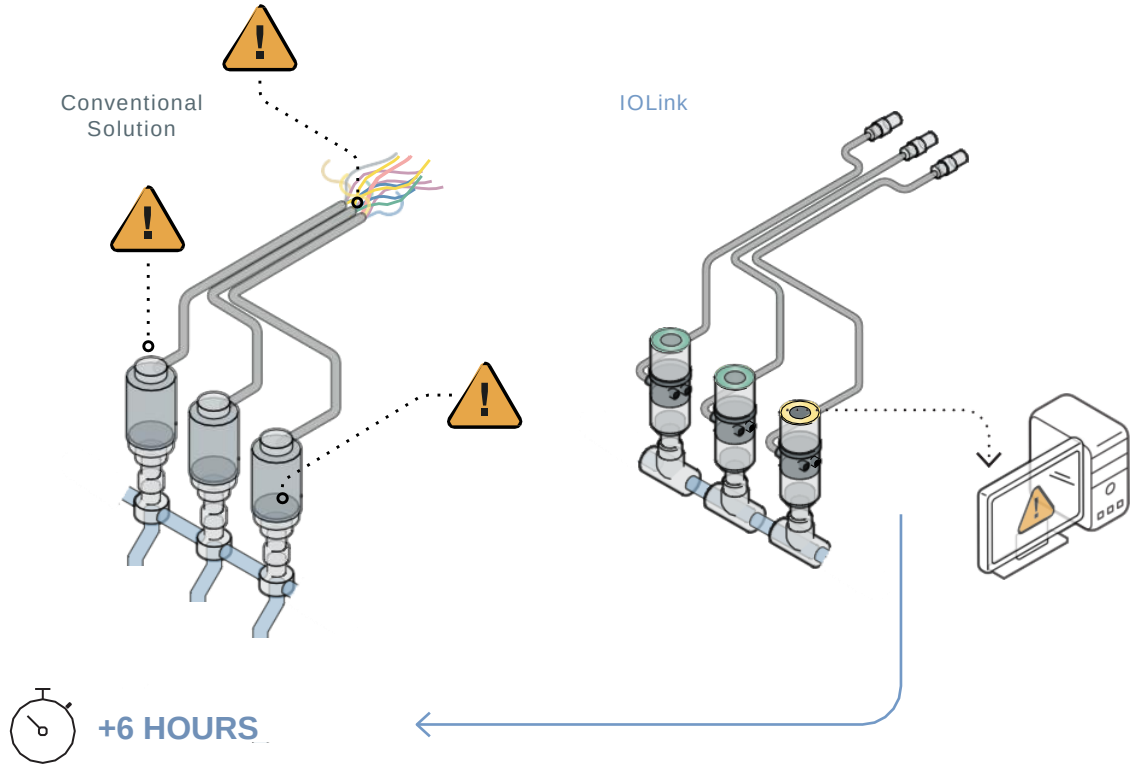
# CONVENTIONAL ANALOG SYSTEMS

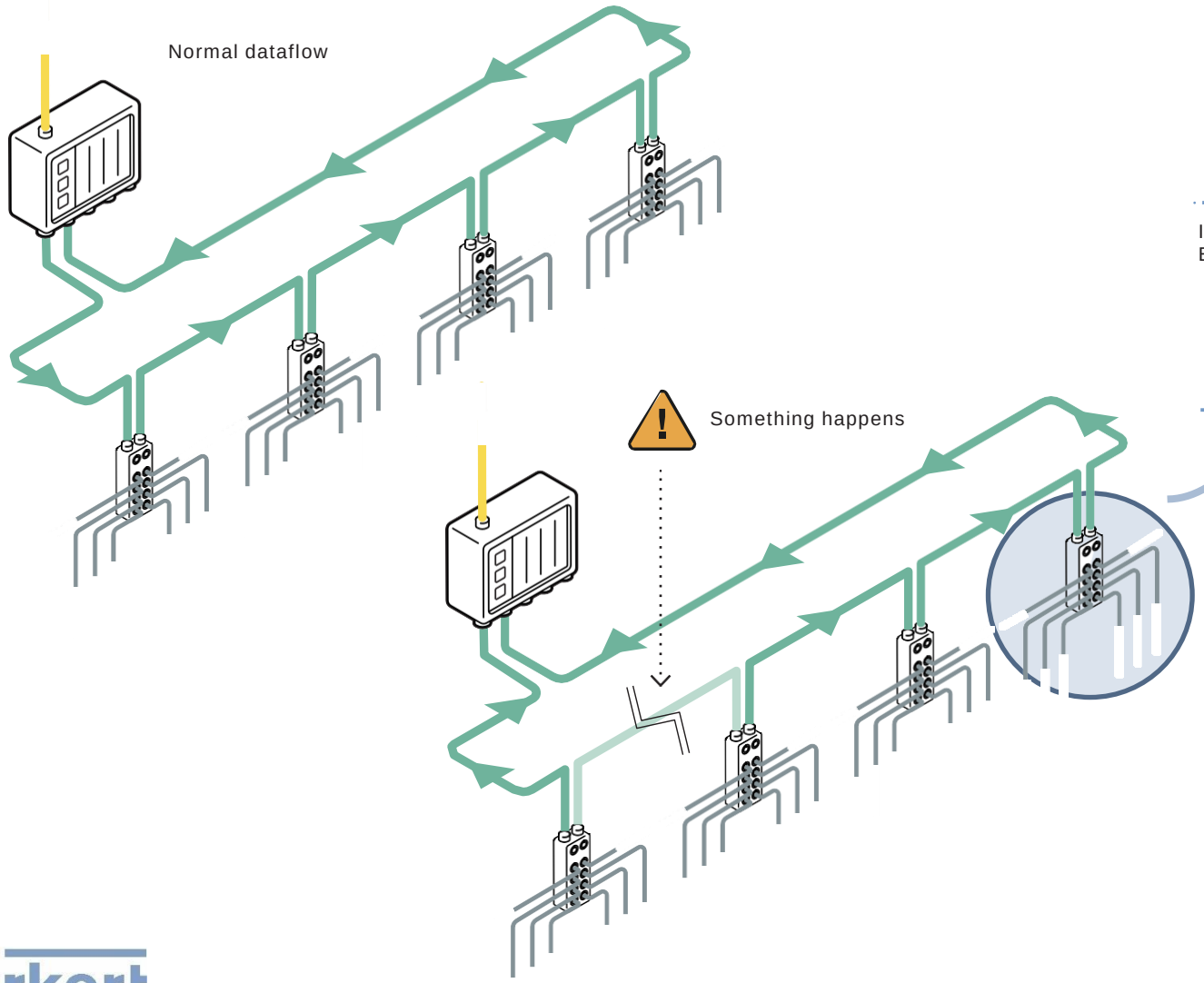


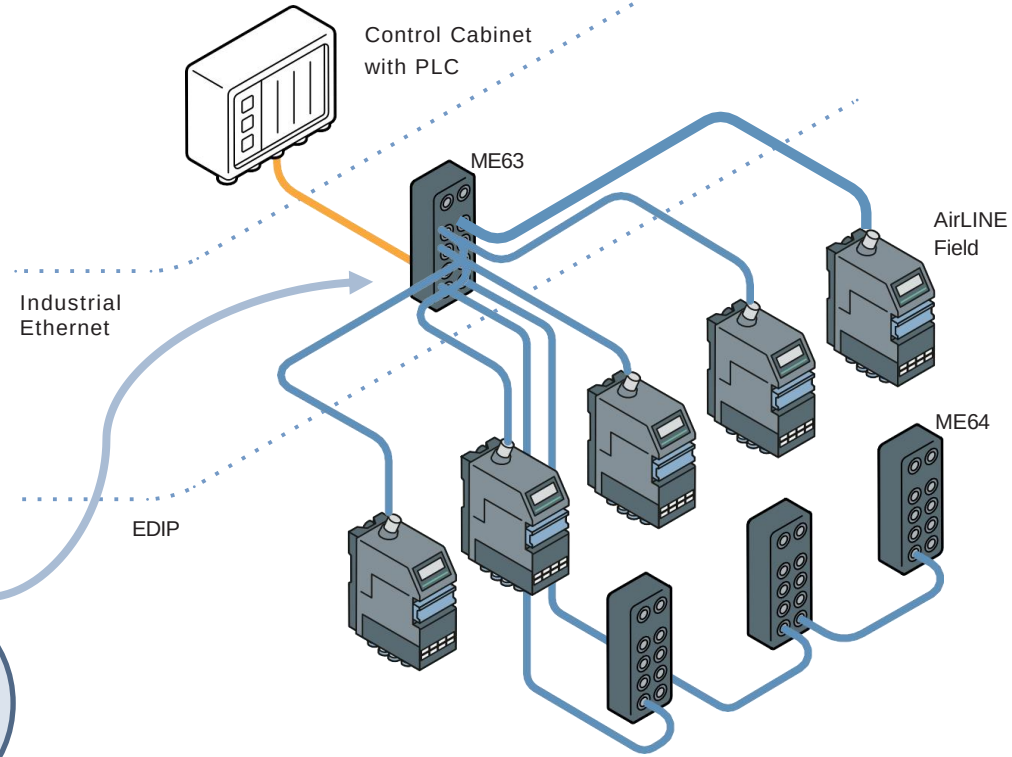




**Installation in 60 minutes instead of 7 hours**

A filling machine needs different components, for example, drives, flow meters, pressure & temperature sensors that are coordinated and contributed to the desired productions results

# IO-LINK: GUARANTEED HIGH PROCESS RELIABILITY




- Trouble communication reduces downtimes and costs
- Burkert solutions are designed as a loop in which PLC can communicate clockwise and counter-clockwise
- In the event the line breaks, the production can continue
- The solutions are connected via the system redundancy S2 or MRP (Media Redundancy Protocol)

# 04

# BURKERT IN ALL INDUSTRIES

Analysis technology, automotive industry, biotechnology, chemical industry, electronics, energy, genetic engineering, semiconductor industry, cosmetic, food & beverage and pharma industry, engineering, medical, sanitary engineering, textile industry, packaging and water treatment

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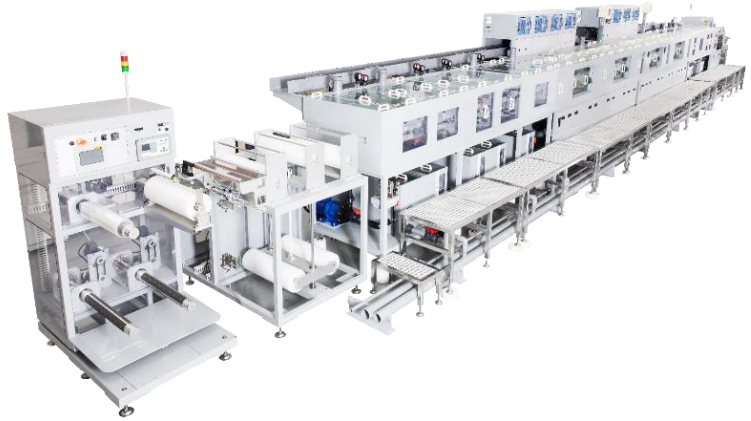
# ELEC&SEMICON: PLATING



## Equipment

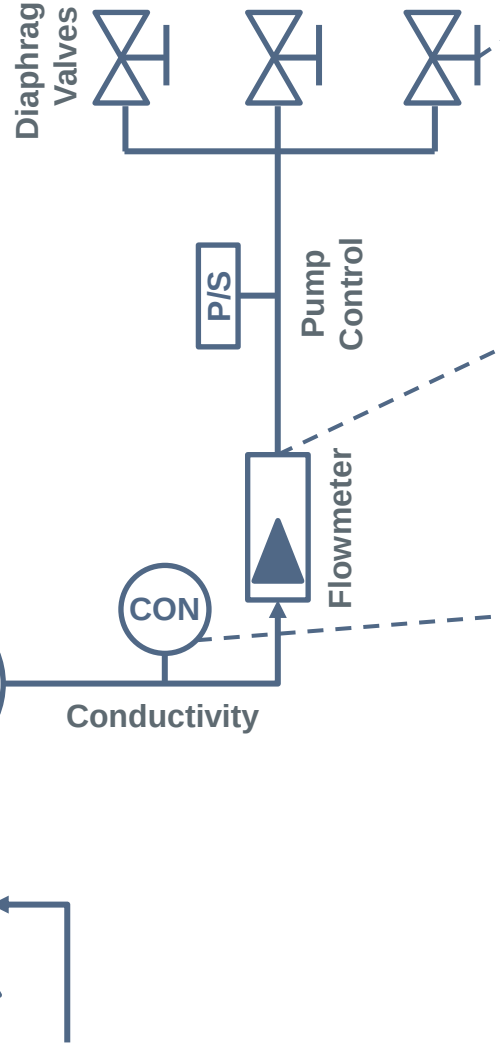
- VCP (Vertical Continuous Plating Equipment
- DSM (Desmear Process of PCB Production
- ELS (Electrodes Copper Plating Process of PCB Production

## Process

- Hot Rinse
- Sweller
- Micro-etch
- Neutraliser
- PCW
- DI Water

## S030 Material by Media

- DI Water: PVC
- Rinse (NaOH, H2SO4, H2O2): PP
- Micro Etch (Mn): PVDF
- Micro Etch Holding Tank (H2O2): SUS




**Type 2030**

*Plastic Diaphragm Valves*

**Type 8203**

*pH Meter*

**Type 8032 & 8030**

*Paddle Wheel Flowmeter*

**Type 8220**

*Conductivity Transmitter*

**Type 8619**

*multiCELL: Multi-channel transmitter / controller*

# ELEC&SEMICON: SALES REFERENCES

Scrubber

Heat Treatment

Vacuum System

CCSS

Gas Cabinet

N2 Purge

Chiller

Plating & Surfacing

Etcher

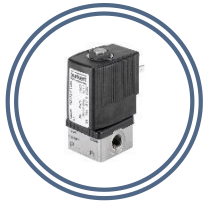
Utility

Water Treatment

Type 8626 Mass Flow Controller

Type 8718 Liquid Flow Controller

Type 8810 Manifold Solenoid Valve



Type 6013 Solenoid Valves

Type 6213 Solenoid Valves

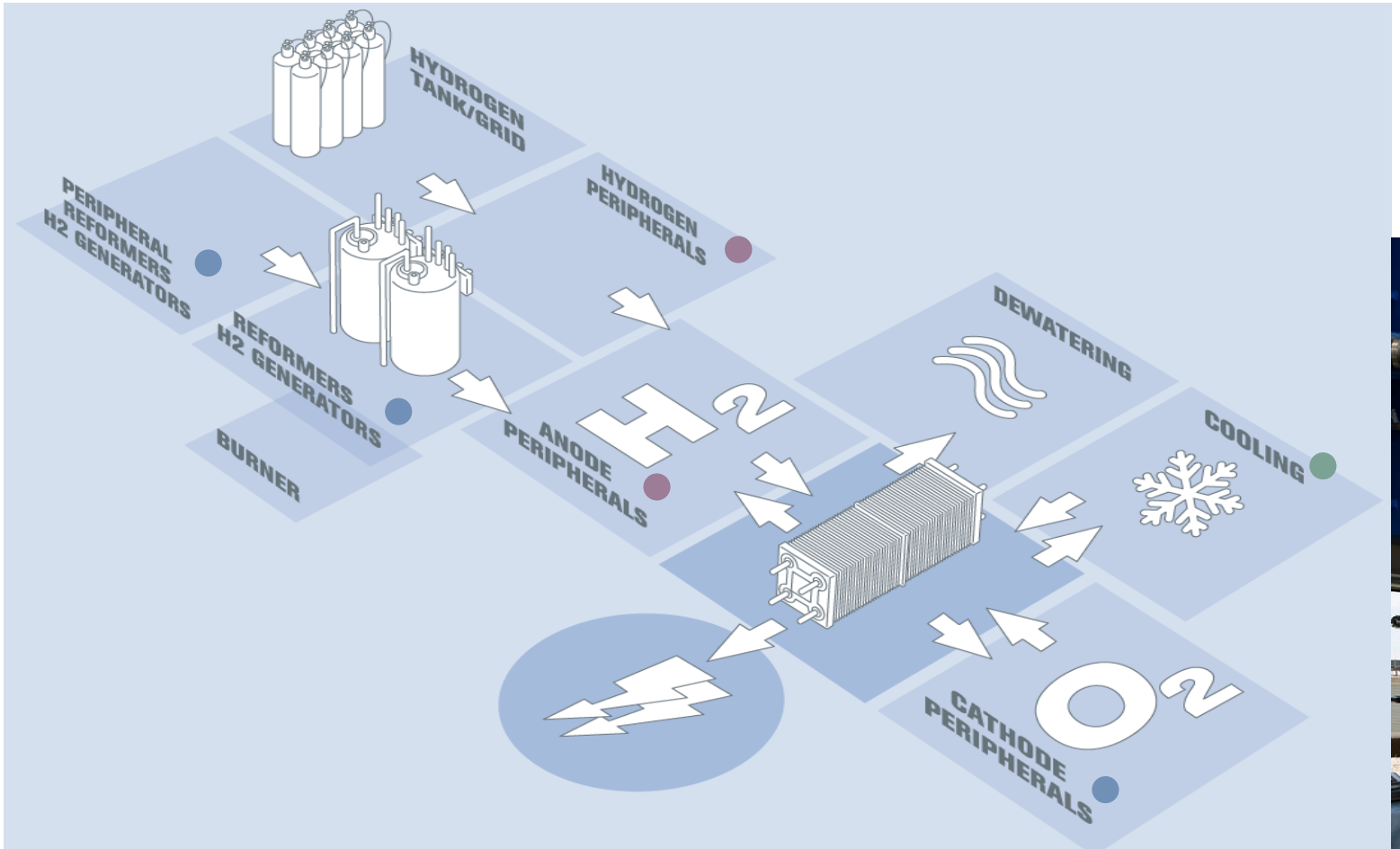
Pressure Transmitter

Type 6407 Solenoid Valves
for High Temperature

# H2: FROM PRODUCTION TO USE

## H2 GENERATORS & DRAINAGE

## HYDROGEN PERIPHERALS & ANODE PREIPHERALS




## COOLING & TEST MACHINE

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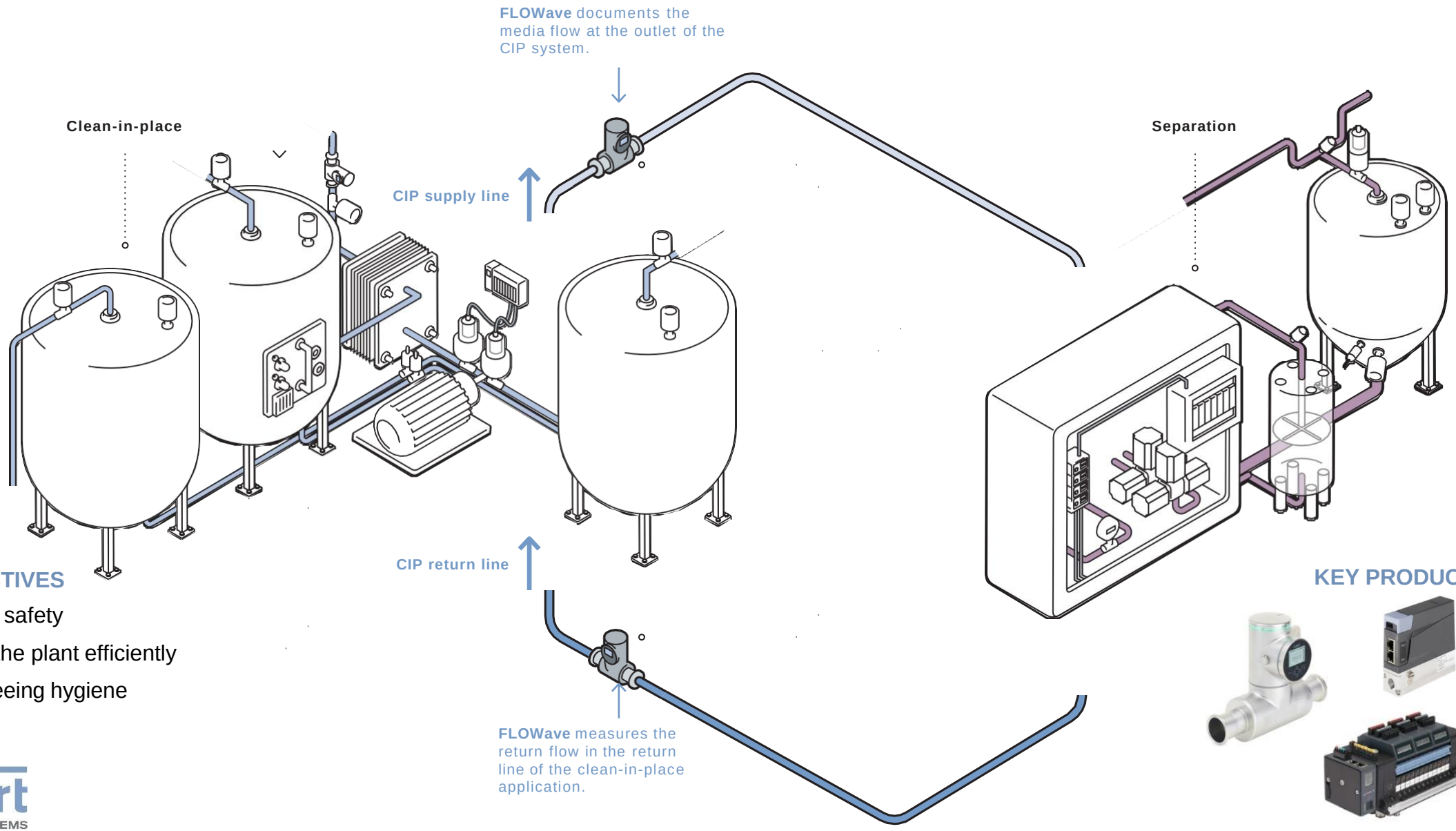
# PHARMACEUTICAL & BIOTECH: CIP

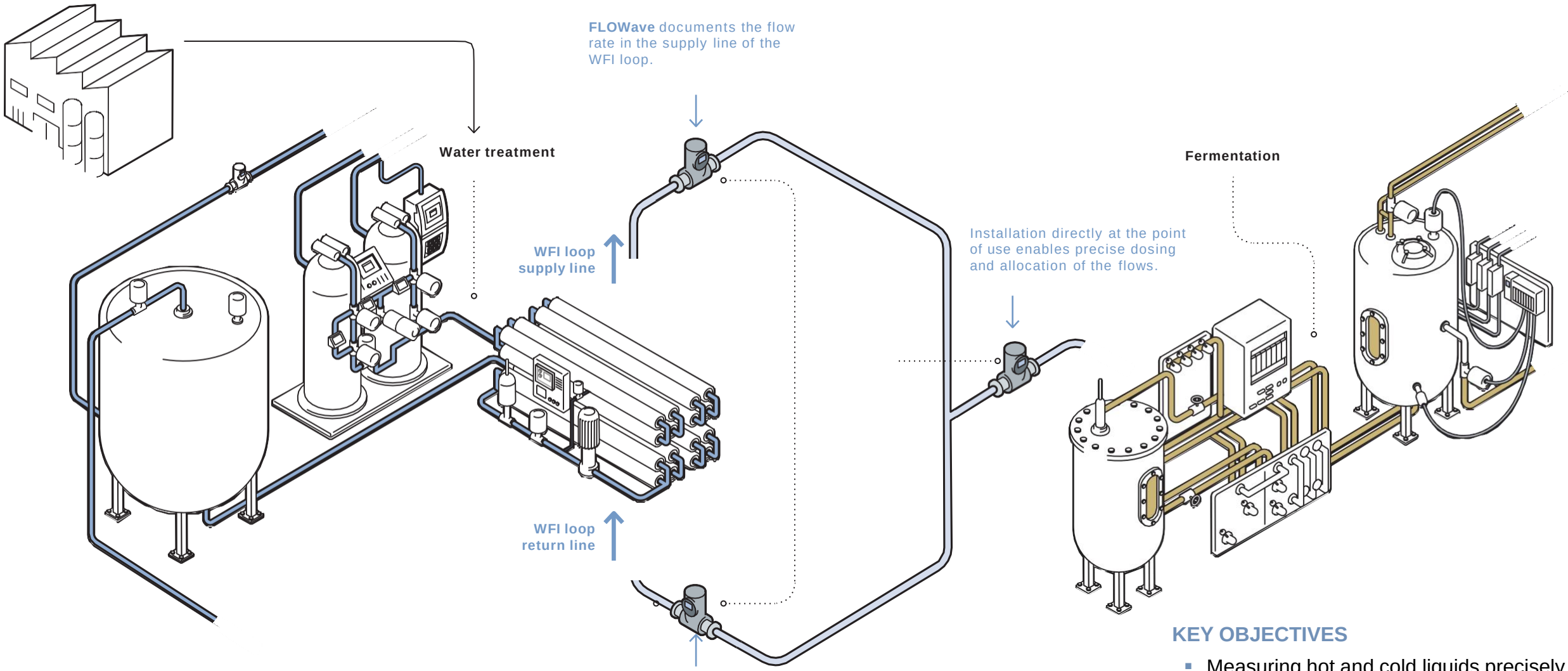



## KEY OBJECTIVES

- Ensuring safety
- Utilizing the plant efficiently
- Guaranteeing hygiene

## KEY PRODUCTS

# PHARMACEUTICAL & BIOTECH: ULTRA PURE WATER




## KEY OBJECTIVES

- Measuring hot and cold liquids precisely
- Making installation as easy as possible
- Continuous checks

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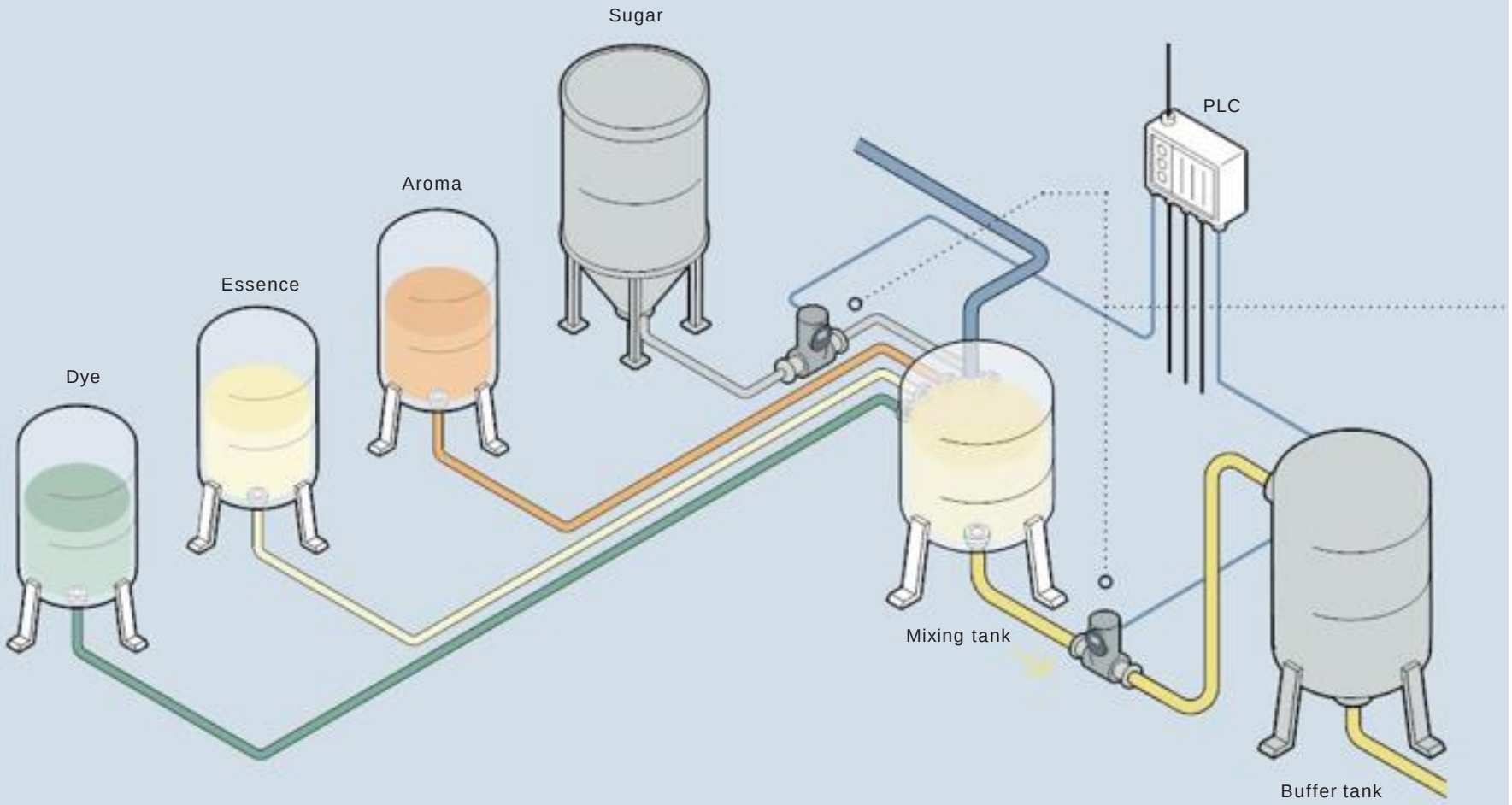
# FOOD & BEVERAGE




## KEY PRODUCTS

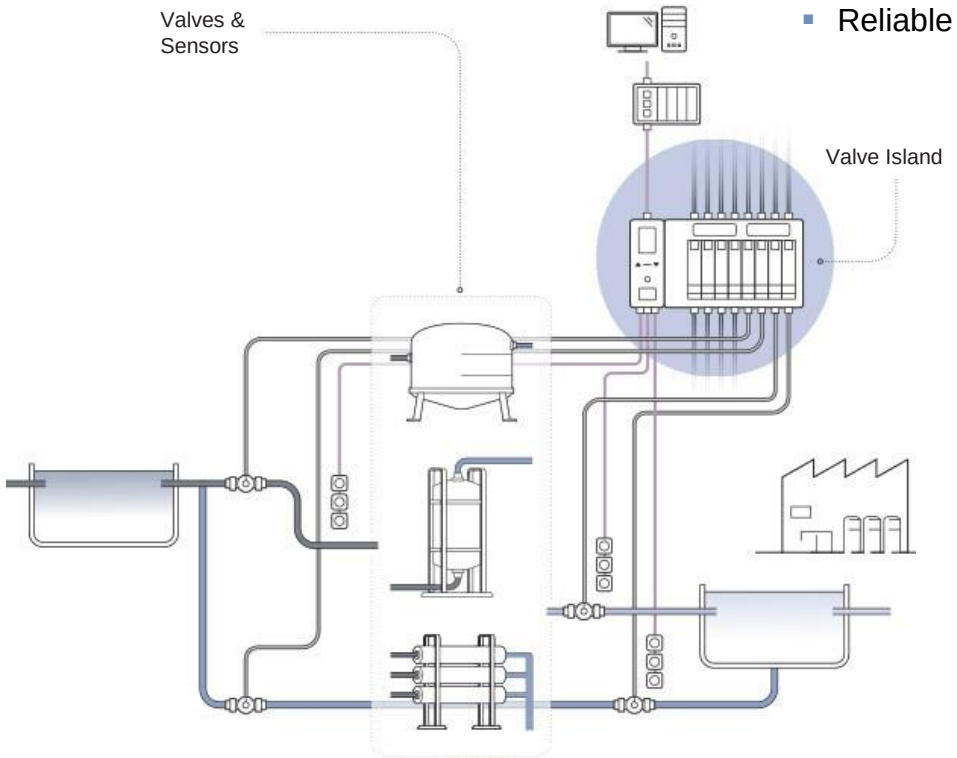

# WATER TREATMENT

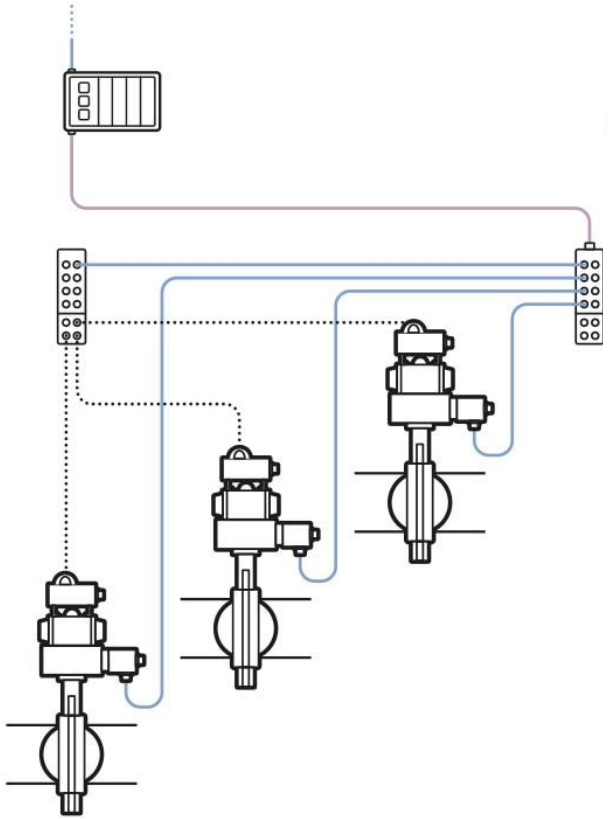
## KEY OBJECTIVES

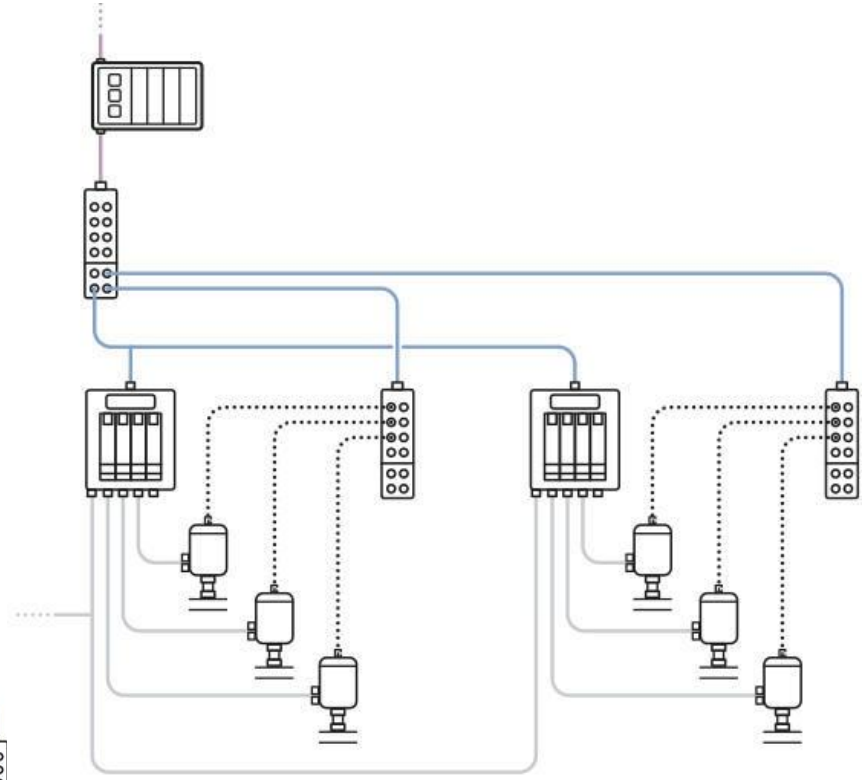
- Reliable water quality
- Economical use of the water resources

## ADVANTAGES OF DISTRIBUTED AUTOMATION

- Flexible communication
- Simple installation
- Rapid implementation
- Reliable processes



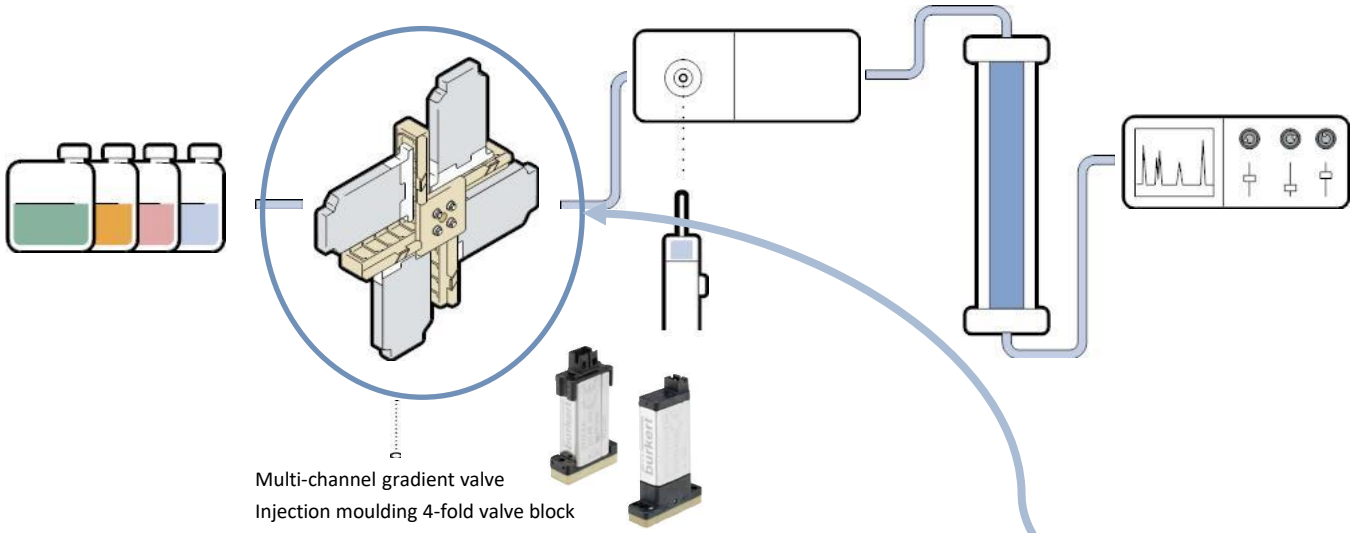





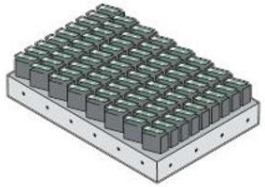
## KEY PRODUCTS

# LAB & ANALYTICS: CHROMATOGRAPHY

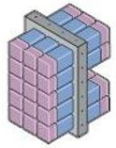
- Maximum precision
- Cost saving on components
- Reduced maintenance costs
- Shorter development times
- Shortened production times
- Resource-efficient and reliable



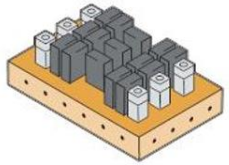
Multi-channel gradient valve
Injection moulding 4-fold valve block



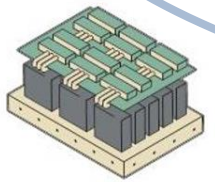
Type 0330



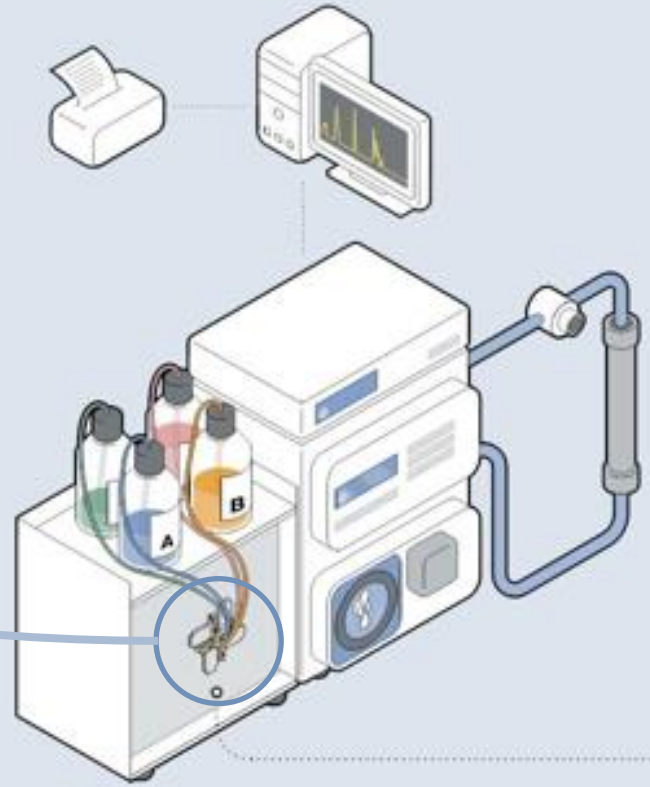
Type 6126



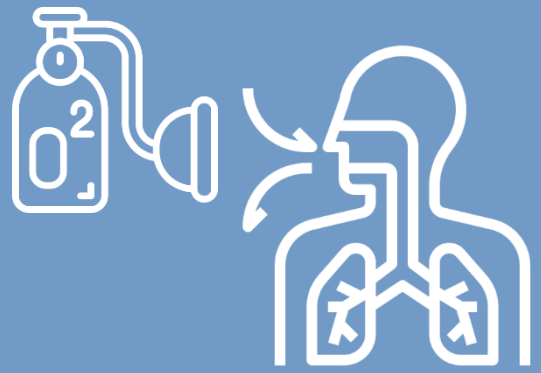
Type 0127



Type 6106

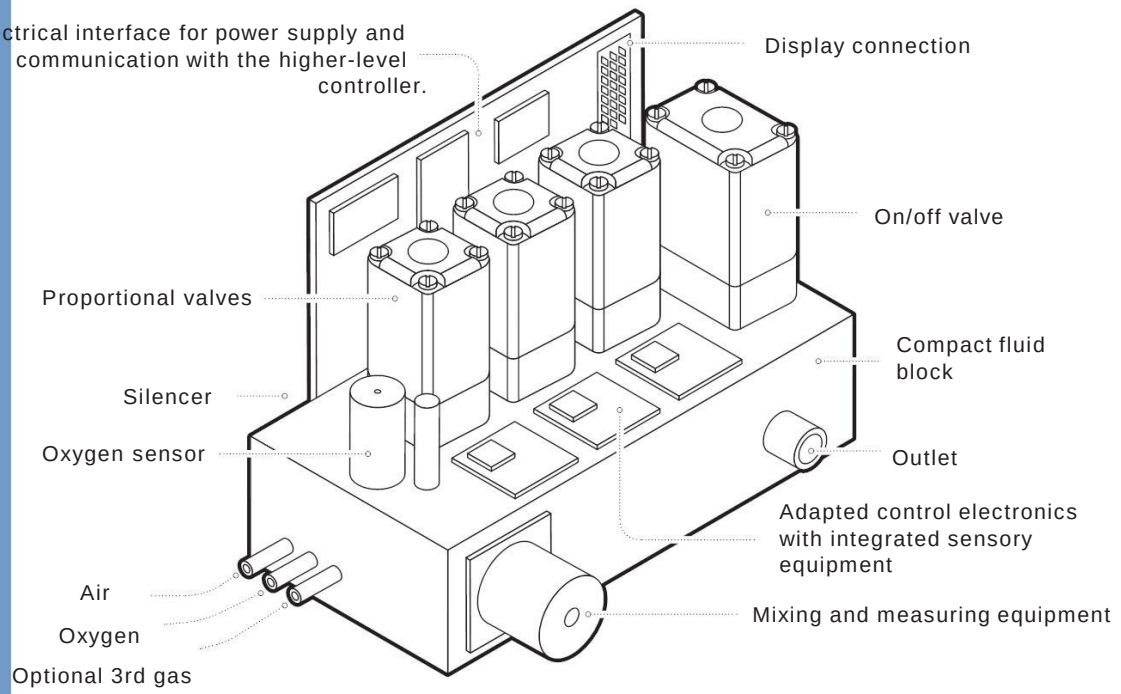


# MEDICAL DEVICE: BREATHING ASSISTANCE




## WHY BURKERT GAS MIXER SYSTEMS?

- Modular system
- Opening up new markets
- Silent solution
- Reliable dosing & data transfer
- Time-saving operation
- Cost-effective and flexible
- Compact
- Efficient operation and maintenance




The system controls the mixture of medical gases such as air and oxygen. You can set the mixing ratio digitally to between 21% and 100%.

The option of controlled oscillation or pulsation of the gas mixture allows you to adjust the concentration in real time.

## KEY PRODUCTS

We make ideas flow.

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