Pharmaceutical

Planning Overview

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Content

Competence in the Pharmaceutical Sector

Welcome to our Hygienic Processing Pharmaceutical brochure. Inside you will find an overview of our strategic approach to serving your business needs, an insight into some unique products which provide the chance to enhance overall plant performance, make the very best of your space envelope, reduce and even eliminate dead space to optimize cleaning and ultimately achieve a higher product yield.

Through Bürkert's customer oriented segment approach we have combined our knowledge and brought together an extended portfolio allowing us to offer our customers a more comprehensive and attuned range of customized products and system solutions.

Within Bürkert's international subsidiary offices and global distribution network you are even closer to these services and products. Our combined energies in all business areas – research and development, production capacity, knowledge transfer and especially customer service and support.

We look forward to being your partner of choice for hygienic processing systems and solutions and look forward to serving your needs in the future! Your insistence on our partnership will be highly appreciated and valued and we are confident it will be a successful and rewarding long term relationship.

With You from the Start

Bürkert offers you the opportunity of a competent and knowledgeable partner from the very beginning. Whether you are undertaking a routine maintenance program through or a major project we want to be with you from the very start to share our knowledge and engineer the very best possible systems and product solutions for your facilities.

Our fully trained sales team operates globally and together with our multiple manufacturing facilities and unique Systemhaus operations you are always close to a willing partner.

Our service around the world is unparalleled. We are totally committed to provide support for all of our products and the networks and applications wherever they are used. Satisfying your needs and requirements are our primary concerns and supporting in all areas such as installation, commissioning and certification as well as general engineering and design work.

We base our partnership approach on continuous consultation. Our pharmaceutical experience lies in common applications such as fermentor control, mixing and batching, water production and distribution, clean steam generation, and transmission, separation, filtration and chromatography, lyophilisation equipment, vacuum systems, high speed liquid packaging machinery, coating equipment, solvent handling to name some of the many we work with on a regular basis.

Combined Competence

In hygienic processing, the measuring and controlling of liquids and gases demands superior instrument performance and networkability; the equipment used has to interface seamlessly. The overall mechanical process connectivity is equally as important for maintaining sterile and pure conditions as well as optimisation of plant performance and process security.

Standard connectivity with modular, decentralized monitoring, intelligence and diagnostics are the platform for flow control networks which provide reliable productivity data from your plant level network.

Fluids like ultra-pure water through to those with extreme viscosities, high solid concentrations and low conductivity, and clean or sterile manufacturing application environments present a wide range of challenges that we understand. All our mechanical components are designed according to global standards.

This means proven reliability, superior accuracy and virtually maintenance free service ensuring that we deliver unsurpassed total performance in the form of complete flow control loop systems.

Welcome to the Fascinating World of Fluid Control Systems

Measurement and control: When it comes to working with liquids and gases, we are at your side – as a manufacturer of sophisticated products, as a problem-solver with an eye for the big picture, and as a partner offering you reliable advice. Since we started in 1946, we have developed into one of the world's leading suppliers of Fluid Control Systems. At the same time we have kept our status as a family-owned business with a foundation of strong basic values to highlight the way we think and act.

EXPERIENCE

There are things which are not inherently yours. You have to gather them bit by bit. You receive them from others. And you constantly have to acquire them anew. That is what makes them so valuable. Experience is one of those things. For instance, because of our many years of experience in hygienic processing, we can provide our extensive services to you – from consulting, development, and 3D CAD simulation to testing and after-sales service. Whether individual product solutions or a pioneering new system for the entire control process: Benefit from our experience!

COURAGE

Those who only work toward optimizing things that already exist will eventually reach the limits – technically, financially, or personally. In order to overcome these limits, courage is needed: The courage to be different and trust one's own ideas; the courage to venture into the unknown, searching for new ways to develop products that have never existed before. We have this courage. By pooling and utilizing our competencies across all sectors, you benefit from our cumulative knowledge of hygienic processing systems, whether it is in the pharmaceutical or the biotechnology sector.

CLOSENESS

There are things we simply take for granted. Only when they are gone, do we realize how important these things really were. This applies in particular to closeness. Without closeness, it is very difficult to build relationships and a good understanding of one another. As an established medium-sized company, we know that. And that is why we are always there for you. Working with you, we develop the best possible solutions for your projects in the area of hygienic processing. Our global presence in 35 locations enables us to press ahead with technical innovations for our customers around the world.

Bürkert Product Program

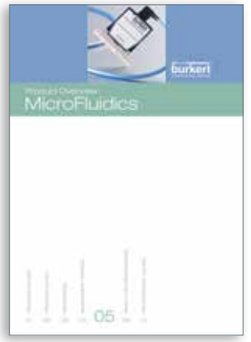
We are one of the few suppliers on the market to cover the complete control loop. Our current product range extends from solenoid valves through process and analytical valves to pneumatic actuators and sensors.

Bürkert offers a remarkable range of servo assisted and direct acting solenoid valves. Read more about them in this brochure.

Bürkert offers unlimited modularity for process control with angle-seat, globe and diaphragm valves in the widest range of configurations.

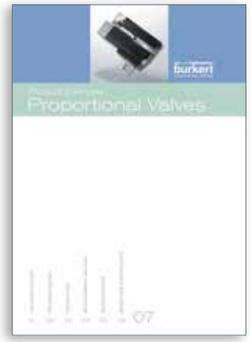
Here you can find our product range of pneumatic valves, valve units and automation systems as well as information on our control cabinet building.

Here you can find our sensors, transmitters and controllers for measuring and controlling flow, temperature, pressure, level, pH/ORP and conductivity.



The brochure contains an overview of Bürkert miniature valves and micro pumps, which allow for precise and safe handling of small volumes of liquids.

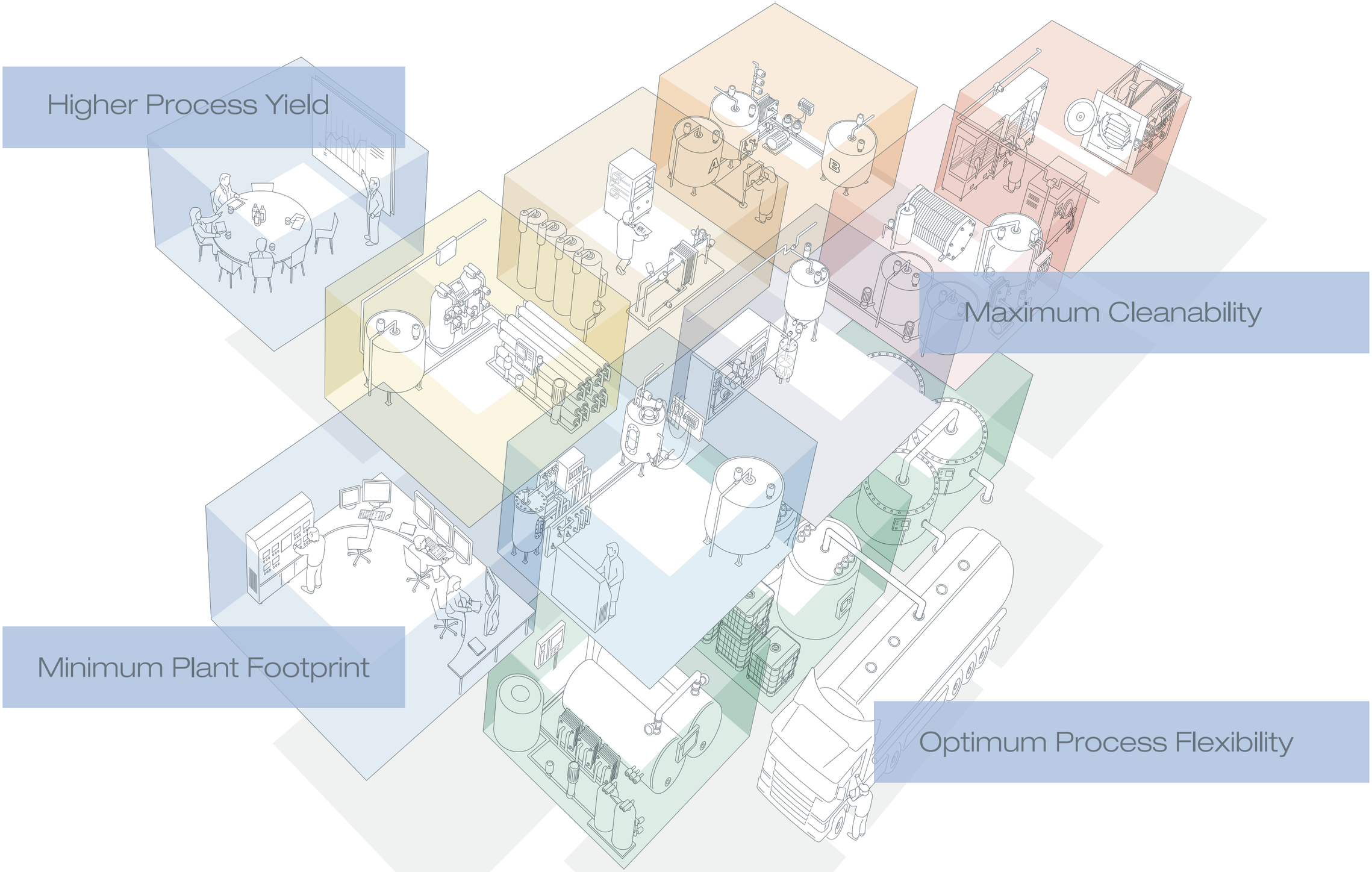
This brochure provides technical background information as well as a detailed product overview for the mass flow controller and meter product range.



This brochure presents our solenoid control valves including their respective features, functions and typical applications.

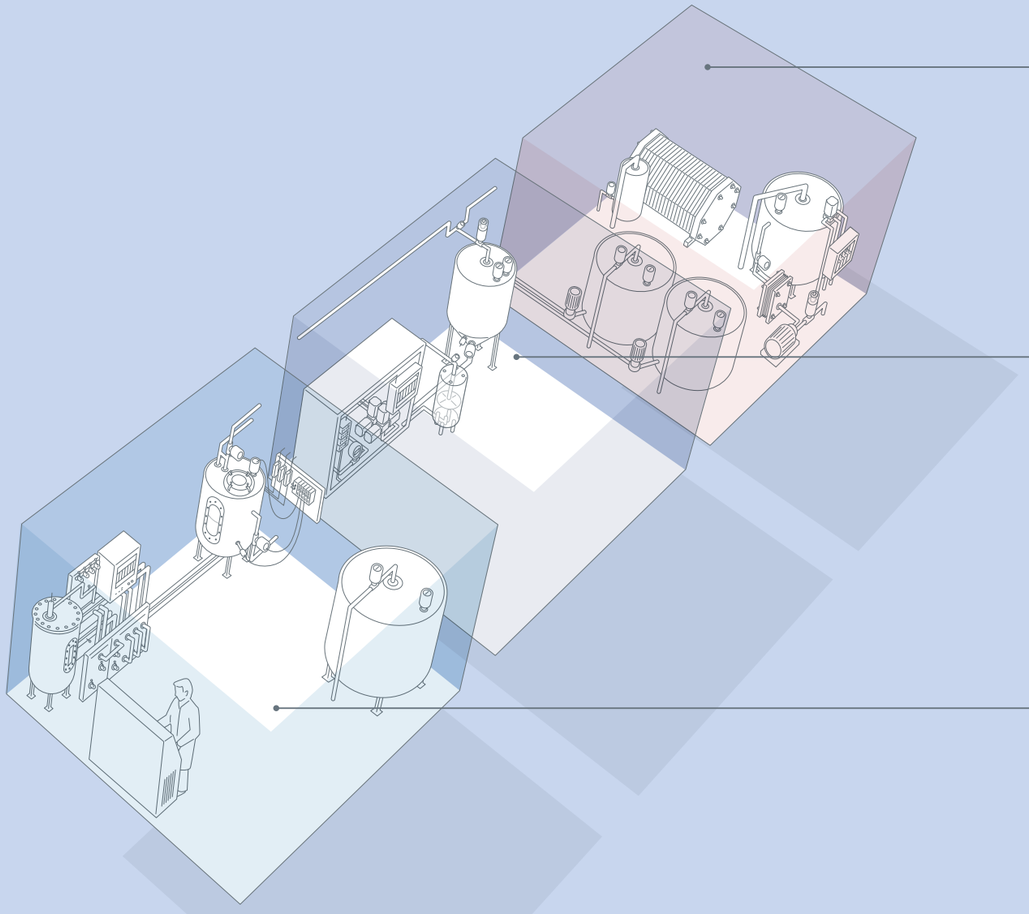
Hygienic Processing

Virtual Plant



In the Process

In the world of hygiene, where compactness, smart communications, plant footprints, cleaning and sterilization, dead legs, cross-contamination, and validation are everyday concerns, We provide process efficiency and higher yields by offering unlimited process modularity. End-users profit from the combined experience of both companies. And in addition to convincing functionality and cleanability, all instruments and components are not only good looking, they are also flexible, and can be used in many different processes – for even easier operation, internal processing, and preventative maintenance. Through the sterile process area the scope of systems and components from the alliance cover all the different application environments – effective and efficient in each application whilst working harmoniously together to provide a reliable total plant solution.



Separation and Filtration

Filtration and separation of identifiable and specific active drug ingredients require our unlimited modularity to save you valuable plant space and offer you peace of mind from dead legs and cross-contamination.

Chromatography

Obtain as much product yield as possible in the right place with the least amount of waste. This is the area where the combined engineering competence and process/application understanding is fully utilised to deliver fast flow shifts, minimum dead space and reduced footprint.

Downstream is the home of the Robolux multiway/multiport diaphragm valve solution, extending the principle that a highest possible return on investment is generated from this area of the plant.

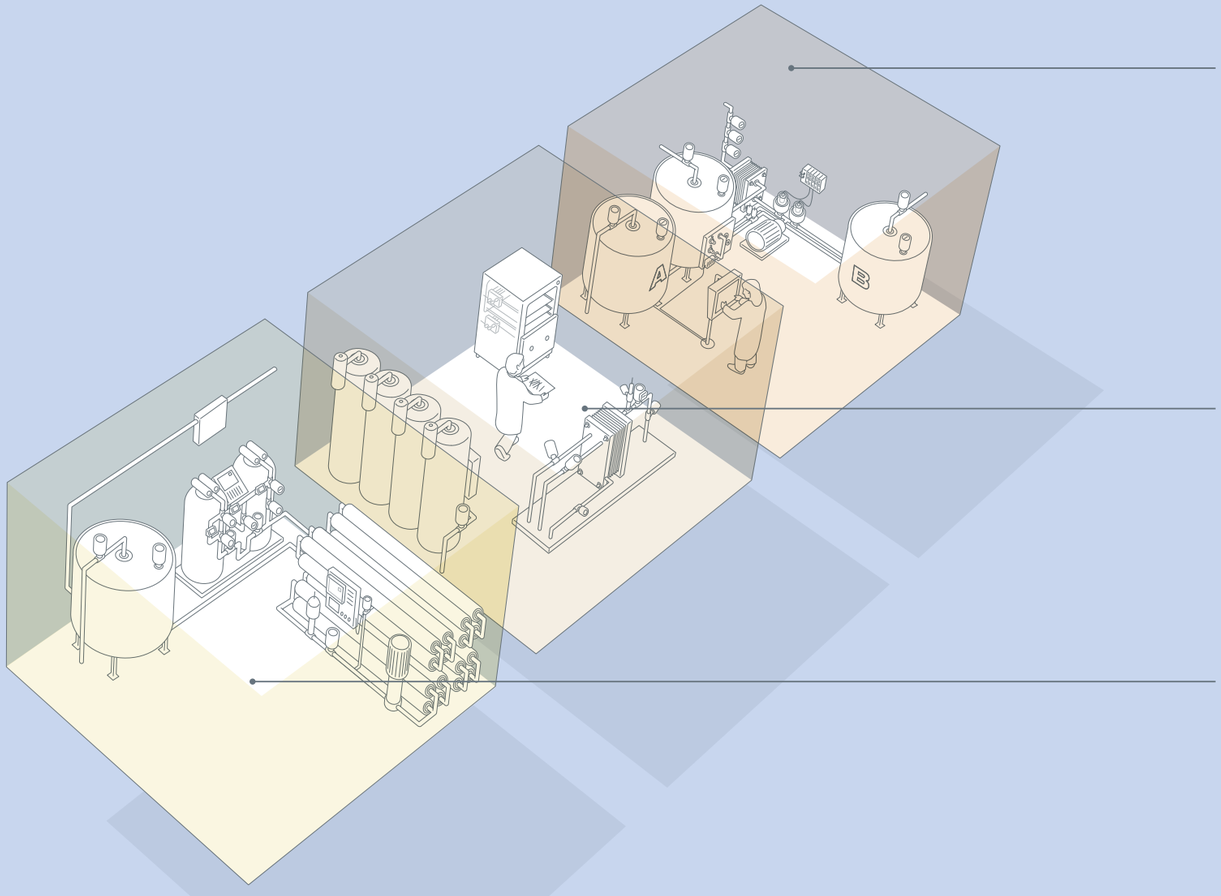
Fermentation

Significant time and money is already invested in preparing the ingredients for the fermentation process. On the reactor our sterile flanges, ingolds and access ports are of the highest quality materials and engineering as well as being precision machined. The result is completely reliable environment control for the culture creation; we combine that with exceptional components for fermenter gas control, pH and pressure monitoring, and field bus solutions, which are used to join up separate reactors within coordinated processing lines.

In the Background

Pharmaceutical manufacturing relies on utilities liquids and gasses being readily available and of the desired quality. This means controlled conditions, accurate pressures and temperatures and variations of other measurements according to specific duty. These applications are critical in upstream integrity as well as overall plant performance.

Each area demands strict control and yet flexibility is often a key desire – you can be certain that both mechanical and instrumentation equipment are system designed to realise these goals offering enhanced plant lifecycle with high integrity and satisfaction.



Clean-in-Place, Sterilize-in-Place

Patients trust your product and safety is related to your brand. Each stage of your CIP/SIP regime can be controlled and safely documented. Our stable and rugged components are designed for the harsh shifts from acid to base. Our components and system solutions bring peace of mind. Reliability in switching from water to clean steam and from chemical to surfactant is standard in a range of valves which are designed for this purpose. All of the CIP parameters are safe in Bürkert hands allowing you to make your product with confidence.

Utility and Clean Steam

Bürkert provides cutting edge solutions for heat transfer applications in your world. Your use of steam as a heat transfer media, a cleaning agent or as a crucial sterile ingredient can be regulated precisely with Bürkert systems and solutions. Through constant innovation our technology is designed to work with your steam in your hygienic environment.

Water Quality and Availability

In the pharma sector water is known as the most important ingredient. Water quality is therefore often essential to the success of the product. It affects the sterility of an injectable saline solution, traceability and certification of water quality is standard procedure. Bürkert is involved in the complete water supply chain from groundwater treatment and incoming water supply, processing to your most stringent requirements, inline verification and final decontamination, treatment and/or neutralization. In the production of de-mineralised water, purified water and water for injection(s) Bürkert‘s technology and expertise are employed with confidence.

Materials Specifications

Metallurgy

The use of stainless steel is widely endorsed in the pharmaceutical segment; but the exact grade and finish of the material will determine the most important contribution to process efficiency and security against contamination or resistance to corrosion. A steel alloy has a minimum content of 10% chromium which defines it as stainless steel; this content is sufficient that chromium oxide forms a passive film across the surface and protects against surface corrosion as well as inhibiting internal material structure corrosion.

Ensuring low ferrite content raw material and optimised manufacturing processes are standard practice and together with appropriate validation certification mean that you are assured of quality every time.

Welding components inline for optimum tightness and process integrity demands high quality materials. Metallurgical knowledge is extensive throughout our alliance and covers a wide range of materials with high corrosion resistance for demanding applications.

Elastomers

Elastomers are materials that can be stretched or compressed repeatedly but upon release of stress return to almost their original size and state. Their resistance to different process media, cleaning media and temperature cycles are critical success factors in a pharmaceutical installation.

The use of EPDM, PTFE, FPM, silicone and many other elastomeric materials is controlled through regulatory bodies such as FDA (Food & Drug Administration) and USP (United States Pharmacopeia). Our qualified and experienced engineers have vigorously tested each of the grades of elastomer in our laboratory facilities to gain satisfactory approval for use.

Whether used for sealing gaskets, o-rings or diaphragms or used in the construction of special process interfaces, all such materials used by the alliance meet the necessary grade and ensure your peace of mind.

Metallurgy	
AISI ASTM	A182, A479, 316L ASME BPE
DIN 17440	1.4435 BN2 2 CrNiMo 18 12
British Standard	970 316 S12
Ferrite rate	< 0.5 %

Elastomers	
EPDM	FDA CFR #21 177.2600 USP Class VI 121 °C
Advanced PTFE	FDA CFR #21 177.1550 USP Class VI 121°C
PTFE Third generation /Gylon	FDA CFR # 211771550 USP Class VI 121°C
Full FDA compliant certification and traceability is provided.	

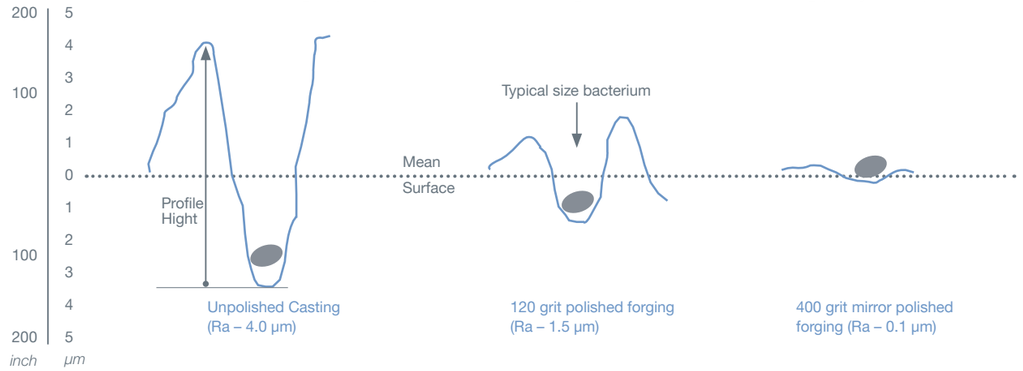
Perfect Surface for Process Efficiency

All Bürkert valve bodies are machined and finished in house using the latest computer controlled CNC machines and measurement equipment. A high surface quality by precision machining followed by grinding or polishing, to ensure the surface is free of shrink-holes, scoring and other roughness phenomena and free of impurities.

Virtually ferrite-free alloys prevent contamination which may occur due to the use of cast pipe sections.

One key to hygiene is the high quality of stainless steel.

A high surface quality is demanded, particularly in the pharmaceutical and biotechnology industries. The high-quality surfaces meet the stringent requirements concerning purity in the processes.



Electropolishing offers a 50 % reduction of roughness by smoothing the surface. The operation also reduces the surface tension and increases corrosion resistance by creating a high-chromium oxide barrier. Electropolishing optimizes cleanability and sterilizability and removes any chance of contamination by lubricants or dirt particles. It also gives the beautiful appearance expected in the industry.

All stainless steel diaphragm valve bodies are passivated after polishing as a cleaning procedure to improve the passive surface and re-establish the chromium at the surface.

Surface finish											
Ra µm	6.3	3.2	2.7	1.6	0.89	0.75	0.625	**0.51**	**0.375**	0.28	0.25
Ra µInch	250	128	108	64	35	30	25	**20**	**15**	11	10
Grit					150		180	**240**	**280**	320	330
ASME BPE						SF3	SF2	**SF1**	**SF4**		

Documentation and Validation

Supporting the validation requirements of our clients and customers every time, we have extended our quality culture to certification and documentation for pharmaceutical specific requirements. Optimized traceability, the elimination of waste from handling procedures and innovative supply chain/transformation processes raise our level of capability. We are ready to react and deliver to new market requirements by supplying a full range of supporting paperwork with each of our fantastic products.

3D-Visualization tools for process efficiency

The unique Robolux valve, which makes use of a double weir-single diaphragm-single actuator design, is the ultimate solution for achieving all of these criteria.

Exceptional solutions can be provided by combining all the available technologies, and we have some of the most experienced design engineers who can bring your ideas to life in a virtual 3D model so that you can visualise the process enhancements as they are developed for you.

Diaphragm Valves for Hygienic Process

Safety first at Bürkert

- All assembled diaphragm valves 100 % leakage tested to ensure tightness
- All component diaphragm valve body weirs are 100 % measured to ensure dimensional compliance
- Machining and assembling under segregated production and assembly to avoid cross contamination of materials
- Assembling in an enclosed area under controlled clean environment conditions
- All diaphragm valves are designed to closed dynamically against max. operating pressure. Actuators for lower line pressure available upon request.
- All stainless steel diaphragm valve bodies are passivated after polishing as a cleaning procedure to improve the passive surface and re-establish the chromium at the surface.

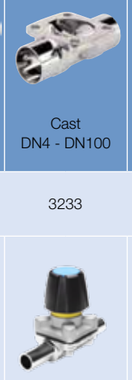
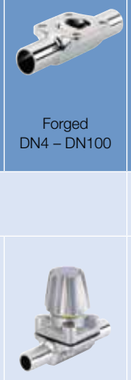
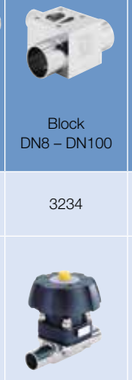
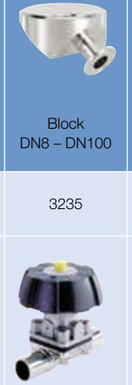
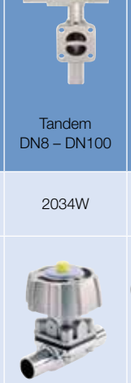
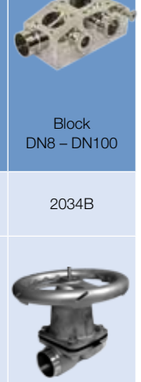
Process Yield Magic

Pharmaceutical and biotechnology customers need to be certain about their process. Often reducing dead legs and optimising system volume are key factors when engineering for maximum process efficiency and highest possible yield.

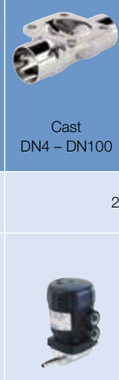
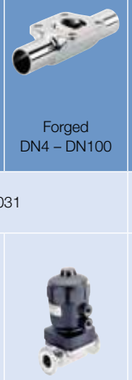
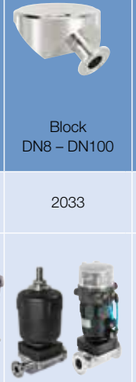
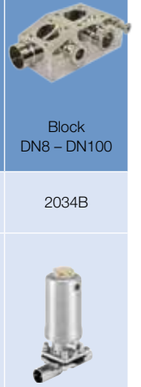
In recent years the development of complex block and multi port diaphragm valve solutions has proven advantageous for achieving smaller footprints through compact design; this has led to solutions that are extremely cleanable and provide sterile conditions when designed accordingly.

The use of manual and pneumatic actuators with different options for stroke limitation, feedback of position or even full PID control can be combined with any conventional solution or can be implemented in such multi port solutions, meaning even higher levels of performance can be ascertained.

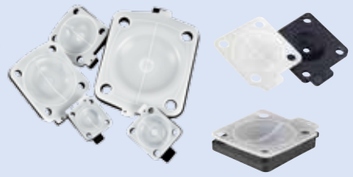
Manual operated 2-way Diaphragm Valve DN4 – DN100

	TVB3G DN15 – DN50	Cast DN4 - DN100	Forged DN4 – DN100	Block DN8 – DN100	Block DN8 – DN100	Tandem DN8 – DN100	Block DN8 – DN100
Valve type number	3233			3234	3235	2034W	2034B
Acuator							
Actuator material	PPS/ PPS	PPS/ VA	VA/ VA	PPS/ PPS	PPS/ VA	VA/ VA	
Port connection	DN4 - DN10			DN15 – DN50			DN65 – DN100
Diaphragm material	 EPDM, FKM PTFE/EPDM, advanced PTFE/EPDM, PTFE/FKM, Gylon®						
Medium temperature range	Depending on diaphragm material. Please see page 24.						
Pressure range	0 – 10 bar						
Connection variants	 Standard weld end Standard clamp	 BBS-05 Sterile Clamp	 BBS-03 Sterile threaded connection	 BBS-06 Sterile flange			

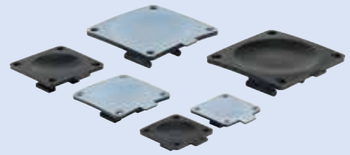
CLASSIC Pneumatically operated 2/2-way Diaphragm Valve DN4 – DN100

	TVB3G DN08 – DN50	Cast DN4 – DN100	Forged DN4 – DN100	Block DN8 – DN100	Block DN8 – DN100	Tandem DN8 – DN100	Block DN8 – DN100
Valve type number	2063	2031		2032	2033	2034W	2034B
Acuator							
Actuator design	INOX	CLASSIC			CLASSIC +8690/8691/8697	CLASSIC +8630/8692/ 8693/8694	CLASSIC
Actuator material	VA VA	PPS PPS		PPS VA	PPS PPS/VA		VA
Port connection	DN4 – DN15	DN4 – DN50			DN15 – DN50		
Diaphragm material	 EPDM, FKM PTFE/EPDM, advanced PTFE/EPDM, PTFE/FKM, Gylon®						
Medium temperature range	Depending on diaphragm material. Please see page 24.						
Pressure range	0 – 10 bar						
Connection variants	 Standard weld end Standard clamp	 BBS-05 Sterile Clamp	 BBS-03 Sterile threaded connection	 BBS-06 Sterile flange			

ELEMENT Pneumatically operated 2/2-way diaphragm valve DN4 – DN50

	 Cast DN4 – DN50	 Forged DN4 – DN100	 Block DN8 – DN100	 Block DN8 – DN100	 Tandem DN8 – DN100	 Block DN8 – DN100
Valve type number	2103	8801 (2103 + 8690)	8801 (2103 + 8691/8695)	8802 (2103 + 8694/8696)	8802 (2103 + 8692)	8802 (2103 + 8693)
Acutator						
Actuator design	ELEMENT					
Actuator material	SS+PPS	SS+PPS PPS	SS+PPS PPS 8691/8695	SS+PPS PPS	SS+PPS PPS LED 8692	SS+PPS PPS LED 8693
Port connection	DN4 – DN50					
Protection class	IP65/IP67					
Diaphragm material	 EPDM, FKM	 PTFE/EPDM, advanced PTFE/EPDM, PTFE/FKM, Gylon®				
Medium temperature range	Depending on diaphragm material. Please see page 24.					
Pressure range	0 – 10 Bar					
Connection variants	 Standard weld end Standard clamp	 BBS-05 Sterile Clamp	 BBS-03 Sterile threaded connection	 BBS-06 Sterile flange		

Robolux Multiway/multiport diaphragm valve pneumatically operated DN10 – DN50

	 Block DN8 – DN50	 Block DN8 – DN50	 Block DN8 – DN50
Valve type number	2036	8806 (2036 with 8685+8686)	2034B
Acutator			
Actuator design	stainless steel		
Actuator material	SS		SS+PPS SS
Port connection	DN10 – DN50		
Protection class	IP65/IP67	IP65/IP67	IP65/IP67
Diaphragm material	 EPDM, advanced PTFE		
Medium temperature range	-10 – 120°C		
Pressure range	0 – 10 Bar		
Connection variants	 Robolux	 BBS-05 Sterile Clamp	 BBS-03 Sterile threaded connection	 BBS-06 Sterile flange

Diaphragm valve body material

Bürkert production of stainless steel diaphragm valve bodies include casting, forging, block material or hydro forming. Inspection certificate 3.1 by EN 10204 is standard for traceability of stainless steel materials. The diaphragm valve body material is available as per required standard.

316L....1.4435 BN2 material composition								
	C	Mn	Si	S	P	Cr	Ni	Mo
1.4404	0,03	2	1	0,030	0,045	16,5-18,5	10-13	2-2,5
316L	0,03	2	0,75	0,030	0,045	16-18	10-15	2-3
1.4435-BN2	0,03	2	1	0,015	0,045	17-18	12,5-15	2,5-3
ASME BPE 316L	0,035	2	1	0,005-0,017	0,045	16-18	10-15	2-3

Bürkert valve material meets the following standards depending on product method:

AISI 316L

DIN 17440 1.4435 X 2 CrNiMo 18 12

USA: ASME BPE ASME BPE 2009 316L

The valve body material from Bürkert is of highest quality stainless steel with low percentage Sulphur, which supports the welding process. Besides, Bürkert can also comply with the following material specification:

904L / 1.4539

Hasteloy C22 / 2.4602

1.4539

254 SMO

other material upon request

Bürkert Diaphragms

As the name implies, the diaphragm is the most important part of the diaphragm valve. It is the sensitive point in this valve type. To help you decide which diaphragm optimally fulfils the requirements of your process, the following table lists our extensive product range in a detailed and transparent manner.

Material	Bürkert Code	Diaphragm size	Temperature			Approvals				Vacuum
			min.	max.	Steam sterilisation	FDA	EC 1935/2004	3A (compl. valve)	USP Class VI	
EPDM	AD	8 to 100	-10 °C	+143 °C	+150 °C for 60 min	yes	yes	yes	yes	yes
FKM	FF	8 to 100	0 °C	+130 °C	-	-	-	-	-	yes
PTFE/ EPDM 2-section	EA	8 to 100	-10 °C	+130 °C	+140 °C for 60 min	yes	yes	-	yes	yes
Advanced PTFE/ EPDM 2-section	EU	8 to 100	-5 °C	+143 °C	+150 °C for 60 min	yes	yes	-	yes	yes
GYLON®/ EPDM laminated	ER	8 to 50	-5 °C	+130 °C	+140 °C for 60 min	yes	yes	yes	yes	yes
Robolux – EPDM	AD	RV50 to 110	+5 °C	+130 °C	+140 °C for 60 min	yes	yes	-	yes	yes
Robolux – Advanced PTFE/ EPDM laminated	EK	RV50 to 110	+5 °C	+90 °C	-	yes	yes	-	yes	yes

The life of the diaphragm depends on the following factors:

- the material of which the diaphragm is made
- the medium that will be in contact with the diaphragm
- the temperature and pressure of the medium
- the choice of the spring forces required for sealing
- the control pressure for double acting actuators and normally open actuators
- the tightening torque applied to the diaphragm during installation

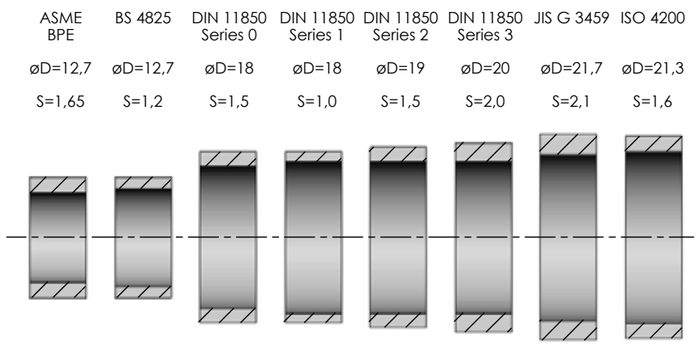
Traceability in a pharmaceutical plant is essential for ensuring that all materials have the required documentation for the quality assurance processes. The marking of material, size, production year and month, as well as the Bürkert logo ensure the traceability required both in the GMP and the ASME BPE guidelines. The required certification is available upon request.

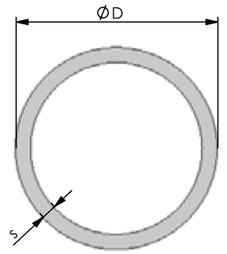
The connection type and pipe standards of diaphragm valves There are three common ways for connection: butt weld ends, clamp and hydroformed tube valve body

Bürkert can produce corresponding welded connection to match with different pipe standards. For an overview we list, in a table below, the different outer diameters and wall thicknesses for several common used pipes.

DN [mm]	DIN EN ISO 1127 / ISO 4200 / DIN 11866 Series B	SMS 3008 / ISO 2037	DIN 11850 Series 0	DIN 11850 Series 1 DIN EN 10357 Series B	DIN 11850 Series 2 DIN EN 10357 Series A DIN 11866 Series A	DIN 11850 Series 3	BS 4825	ASME BPE / DIN 11866 Series C	JIS G 3447	JIS G 3459
4.0	-	-	6x1.0	-	-	-	-	-	-	-
6.0	10.2x1.6	-	8x1.0	-	-	-	-	3.17x0.56	-	-
8.0	13.5x1.6	-	10x1.0	-	-	-	6.35x1.2	6.35x0.89	-	13.8x1.65
10.0	17.2x1.6	-	-	12x1.0	13x1.5	14x2.0	9.53x1.2	9.53x0.89	-	17.3x1.65
15.0	21.3x1.6	-	18x1.5	18x1.0	19x1.5	20x2.0	12.7x1.2	12.7x1.65	-	21.7x2.1
20.0	26.9x1.6	-	22x1.5	22x1.0	23x1.5	24x2.0	19.05x1.2	19.05x1.65	-	-
25.0	33.7x2.0	25.0x1.2	28x1.5	28x1.0	29x1.5	30x2.0	25.4x1.65	25.4x1.65	25.4x1.2	-
32.0	42.4x2.0	33.7x1.2	34x1.5	34x1.0	35x1.5	36x2.0	-	-	-	-
40.0	48.3x2.0	38.0x1.2	40x1.5	40x1.0	41x1.5	42x2.0	38.1x1.65	38.1x1.65	38.1x1.2	-
50.0	60.3x2.0	51.0x1.2	52x1.5	52x1.0	53x1.5	54x2.0	50.8x1.65	50.8x1.65	50.8x1.5	-
65.0	76.1x2.0	63.5x1.6	-	-	70x2.0	-	63.5x1.65	63.5x1.65	63.5x2.0	-
80.0	88.9x2.3	76.1x1.6	-	-	85x2.0	-	76.2x1.65	76.2x1.65	76.3x2.0	-
100.0	114.3x2.3	101.6x2.0	-	-	104x2.0	-	101.6x2.11	101.6x2.11	-	-

Since the standard varies, the outer diameter and wall thickness of the pipe are different as well. For example, you can see the differences for DN15 from the following comparison





The Hydroformed Tube Valve Body for Diaphragm Valves

One of the most common necessities for manufacturing pharmaceuticals, cosmetics, food and beverages are diaphragm valves. What used to be a dull two-way race between forged and cast body variants is now being challenged by an exciting, ground-breaking technology. The hydroformed, light-weight diaphragm tube valve body will change the way you think about plant design and operation – as it helps you create more sustainable processes while meeting the industry's demanding regulations. And during operation, it can increase overall productivity of your plant.

The new tube valve body in combination with Bürkert's diaphragm valve actuators

Current challenges

Currently, traditional forged body diaphragm valves needlessly consume energy in SIP processes with loads of costly-to-raise clean steam. At the same time, they diminish manufacturing time while heating and cooling slowly in CIP/SIP cycles due to their excessive thermal mass. This is also valid for cast bodies, even though they have a lower thermal mass than forged, but are still heavier than the new tube valve body. Besides, cast bodies increase product contamination risk due to possible casting impurities.

The way to more sustainable processes …

Now you are able to regain your valuable manufacturing time due to shortened heat-ups and quicker cool downs, as Bürkert's unique tube valve body has a remarkably lighter thermal mass than forged and cast alternatives – up to 75% for a 2-inch-valve. During laboratory testing, we found steam rate savings of up to 53.8% per valve (with a temperature delta of 100 K). Multiply this energy saving with the number of valves in your plant – and then multiply again with the number of CIP/SIP cycles per year!

Expect the high quality you are used to. The tube valve body is robust and rigid: Its wall thickness conforms to ASME-BPE 2014. It bears up against sudden temperature changes from hot steam and cold water, long-term vibrations and intensive corrosion tests. Hygienic safety is assured by EHEDG certified CIP processes and the fact that any media only touches the diaphragm and the pharma tube section – which is identical to the piping elements you are already using in your process! With this revolutionary body, you get access to the most hygienic connection available: tube-to-tube welding.

… and higher plant productivity

The tube valve body is a ground-breaking technology for diaphragm valves users in the pharmaceutical, cosmetic, food and beverage industry. You will be able to design lighter, more sustainable processes including less steam for CIP/SIP. With these energy savings plus Bürkert's green tube valve body production you will reduce your overall Carbon Footprint. Moreover, when the process comes into operation, tube valve bodies can increase overall productivity of your plant by increasing the manufacturing time available to you.

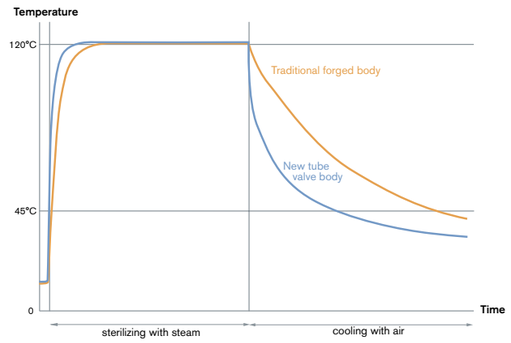
The tube valve body helps to design lighter, more sustainable processes.

Applications

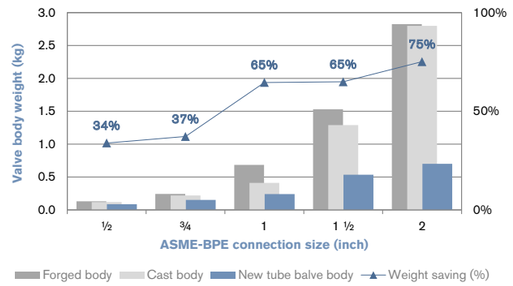
- Clean Utilities – distribution and storage loops for pharmaceutical water like WFI and PW
- Cleaning in Place (CIP)
- Sterilization in Place (SIP)

Industries

- Pharmaceuticals, Biotechnology
- Cosmetics
- Food & Beverage



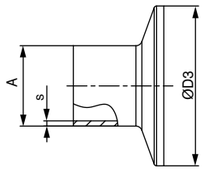
Regain valuable manufacturing time with shortened heat-ups and quicker cool downs in SIP/CIP cycles: SIP temperature curves in comparison.



The tube valve body has a lighter thermal mass (up to 75 %) than traditional forged or cast body alternatives and therefore saves energy.

Clamp connection standard

Beside outer diameter and wall thickness, the other important criteria is the clamp size.
The following overview shows some common Bürkert clamp dimensions.



ASME BPE standard clamp connection, mm

mm	inch	A	s	Ø D3
08	1/4"	6.35	0.89	25.0
10	3/8"	9.53	0.89	25.0
15	1/2"	12.7	1.65	25.0
20	3/4"	19.05	1.65	25.0
25	1.0"	25.4	1.65	50.5
40	1.5"	38.1	1.65	50.5
50	2.0"	50.8	1.65	64.0
65	2.5"	63.5	1.65	77.5
80	3.0"	76.2	1.65	91.0
100	4.0"	101.6	2.11	119.0

DIN32676 Series-A clamp, mm with DIN 11850 pipe, mm

	A	s	Ø D3
08	10.0	1.0	25.0
10	13.0	1.5	34.0
15	19.0	1.5	34.0
20	23.0	1.5	34.0
25	29.0	1.5	50.5
32	35.0	1.5	50.5
40	41.0	1.5	50.5
50	53.0	1.5	64.0
65	70.0	1.5	91.0

DIN 32676 Series-B clamp connection, mm with ISO4200 pipe, mm

	A	s	Ø D3
08	13.5	1.6	25.0
08	13.5	1.6	25.0
10	17.2	1.6	34.0
15	21.3	1.6	25.0
15	21.3	1.6	50.5
20	26.9	1.6	50.5
25	33.7	2.0	50.5
32	42.4	2.0	50.5
40	48.3	2.0	64.0
50	60.3	2.0	77.5
65	76.1	2.0	91.0
88	88.9	2.3	106.0
100	114.3	2.3	130.0

ISO 2852 standard clamp connection, mm

	A	s	Ø D3
25	25.6	1.5	50.5
40	38.6	1.5	50.5
50	51.6	1.5	64.0
65	64.1	1.9	77.5
80	76.7	1.9	91.0
100	102.5	2.45	119.0

BS 4825-3 standard clamp connection, mm with BS4825-1 pipe, mm

	A	s	Ø D3
08	6.35	1.2	25.0
10	9.53	1.2	25.0
15	12.7	1.2	25.0
20	19.05	1.2	25.0
25	25.4	1.65	50.5
40	38.1	1.65	50.5
50	50.8	1.65	64.0
65	63.5	1.65	77.5
80	76.1	1.65	91.0
100	101.6	2.11	119.0

DIN 32676 serie B Clamp 34.00 with ISO 4200 pipe, mm

	A	s	Ø D3
08	13.5	1.6	34.0
10	17.2	1.6	34.0
15	21.3	1.6	34.0

Common accessories for Bürkert diaphragm valves

Bürkert diaphragm valve are suitable for different accessories, orientation and I/O system to meet customers' requirement.

Feedback and accessories	
	Type 1060 electrical feedback *
	Type 8697 feedback top actuator *
	Type 8697 feedback with stroke limit top actuator *
	Type 1071 External Magnetic Inductive Position Feedback *
	Manual valve with locking device (option HA24)
	Manual override *
	NAMUR adapter *
Stroke Limiter	
	Max. stroke limiter *
	Min./ max. stroke limiter with optical position indicator *

Control header	
	8697 Pneumatic Control Unit / Feedback
	8690/8691/8695 Element control heads

Positioner and Pneumatic systems	
	8694/8696/8692 Digital electro-pneumatic positioner
	8693 Digital electro-pneumatic process controller
	8635 Electro Pneumatic Positioner
	300/6012/6014 Solenoid valves
	8647 Valve Island compatible SIEMENS ET200SP
	8652 AirLINE valve island

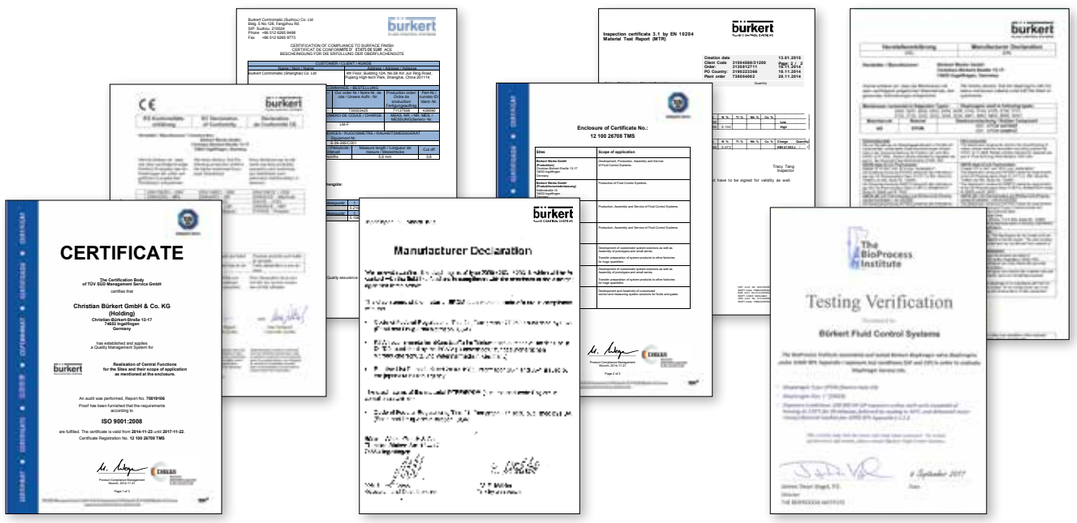
** For further information please see data sheet 2XXX Accesories: http://www.burkert.com/en/Media/plm/DTS/DS/DS2XXX-Accessories-EU-EN.pdf?id=DTS0000000000000001000102756ENX*

Global Certifications

- Level 2.2 Conformance Certification
- Level 3.1 Material Certification
- FDA compliance statement
- USP VI compliance statement
- Instruction, Maintenence and Operation Manual
- CE Statement
- ATEX Certification
- Positive Material Identification (PMI)
- Re-stamping & traceability
- Ferrite Content Confirmation
- Surface Finish Profilometer Report
- EP Certificate
- Welding Certification and Boroscope Media
- CE Declarations
- 3A Certification
- CRN certificate
- ASME BPE 2016 Appendix J - Test verification

Certificates

Bürkert complies with customer's requirements for certification and documentation. It varies from material certification that meets EN 10204 3.1, certificates of conformity and different approvals from different organisations.



Diaphragm valve type and corresponding code

Example	2031	A	2	25	AB	VS	TG04	D	F	*	NO17	+	NK52
	▼	▼	▼	▼	▼	▼	▼	▼	▼	*	▼	▼	▼
	1	2	3	4	5	6	7	8		*	9.1	9.2	9.3
	Type	Control function	Path/positions	Diaphragm size	Diaphragm material	Valve body material	Port connection	Actuator version	Actuator size		variable, i.e. Surface finish	variable	variable, i.e. with certification 3.1

Welding connection overview

DN [mm]	DIN EN ISO 1127 / ISO 4200 / DIN 11866 Series B	SMS 3008 / ISO 2037	DIN 11850 Series 0	DIN 11850 Series 1 DIN EN 10357 Series B	DIN 11850 Series 2 DIN EN 10357 Series A DIN 11866 Series A	DIN 11850 Series 3	BS 4825	ASME BPE / DIN 11866 Series C	JIS G 3447	JIS G 3459	ASME B36.19M SCHEDULE 10S
4.0	-	-	SC40 - 6x1.0	-	-	-	-	-	-	-	-
6.0	SA78 - 10.2x1.6	-	SC41 - 8x1.0	-	-	-	-	SA89 - 3.17x0.56	-	-	-
8.0	SA40 - 13.5x1.6	-	SC42 - 10x1.0	-	-	-	SODB - 6.35x1.2	SA90 - 6.35x0.89	-	SA70 - 13.8x1.65	-
10.0	SA41 - 17.2x1.6	-	-	SF40 - 12x1.0	SD40 - 13x1.5	SE40 - 14x2.0	SODC - 9.53x1.2	SA91 - 9.53x0.89	-	SA71 - 17.3X1.65	-
15.0	SA42 - 21.3x1.6	-	SC43 - 18x1.5	SF41 - 18x1.0	SD42 - 19x1.5	SE42 - 20x2.0	SODD - 12.7x1.2	SA92 - 12.7x1.65	-	SA72 - 21.7x2.11	SA30 - 21.3x2.11
20.0	SA43 - 26.9x1.6	-	SC44 - 22x1.5	SF42 - 22x1.0	SD43 - 23x1.5	SE43 - 24x2.0	SODE - 19.05x1.2	SA93 - 19.05x1.65	-	SA80 - 27.2x2.1	SA31 - 26.7x2.11
25.0	SA44 - 33.7x2.0	SA60 - 25.0x1.2	SC45 - 28x1.5	SF43 - 28x1.0	SD44 - 29x1.5	SE44 - 30x2.0	SODF - 25.4x1.65	SODF - 25.4x1.65	SA73 - 25.4x1.2	SA81 - 34x2.0	SA32 - 33.4x2.77
32.0	SA45 - 42.4x2.0	SA61 - 33.7x1.2	SC46 - 34x1.5	SF44 - 34x1.0	SD45 - 35x1.5	SE45 - 36x2.0	-	-	-	SA82 - 42.7x2.0	SA33 - 42.2x2.77
40.0	SA46 - 48.3x2.0	SA62 - 38.0x1.2	SC47 - 40x1.5	SF45 - 40x1.0	SD46 - 41x1.5	SE46 - 42x2.0	SODH - 38.1x1.65	SODH - 38.1x1.65	SA74 - 38.1x1.2	SA83 - 48.6x2.0	SA35 - 60.3x2.77
50.0	SA47 - 60.3x2.0	SA63 - 51.0x1.2	SC48 - 52x1.5	SF46 - 52x1.0	SD47 - 53x1.5	SE47 - 54x2.0	SODI - 50.8x1.65	SODI - 50.8x1.65	SA75 - 50.8x1.5	SA84 - 60.5x2.0	SA36 - 73.0x3.05
65.0	SA48 - 76.1x2.0	SA64 - 63.5x1.6	-	-	SD48 - 70x2.0	-	SODJ - 63.5x1.65	SODJ - 63.5x1.65	SA77 - 63.5x2.0	-	SA37 - 88.9x3.05
80.0	SA49 - 88.9x2.3	SA65 - 76.1x1.6	-	-	SD49 - 85x2.0	-	SODK - 76.2x1.65	SODK - 76.2x1.65	SA79 - 76.3x2.0	-	SA38 - 114.3x3.05
100.0	SA39 - 114.3x2.3	SA66 - 101.6x2.0	-	-	SD50 - 104x2.0	-	SODL - 101.6x2.11	SODL - 101.6x2.11	-	-	-

Clamp connection overview

DN [mm]	Clamp 34.0 DIN 32676 Series B (ISO-tube(ISO 4200)	DIN 32676 Series A (DIN-tube(DIN 11850 S-2))	DIN 32676 Series B (ISO-tube(ISO 4200))	ASME BPE	BS 4825 (Clamp BS 4825-3, tube(BS 4825-1))	ISO 2852
8.0	TC51 - 13.5x1.6 Clamp: 34.0	TD40 - 10.0x1.0 Clamp: 25.0	TC40 - 13.5x1.6 Clamp: 25.0	TG50 - 6.35x0.89 Clamp: 25.0	TH40 - 6.35x1.2 Clamp: 25.0	-
10.0	TC41 - 17.2x1.6 Clamp: 34.0	TD41 - 13.0x1.5 Clamp: 34.0	TC53 - 17.2x1.6 Clamp: 25.0	TG01 - 9.53x0.89 Clamp: 25.0	TH41 - 9.53x1.2 Clamp: 25.0	-
15.0	TC42 - 21.3x1.6 Clamp: 34.0	TD42 - 19.0x1.5 Clamp: 34.0	TC52 - 21.3x1.6 Clamp: 50.5	TG02 - 12.7x1.65 Clamp: 25.0	TH42 - 12.7x1.2 Clamp: 25.0	-
20.0	-	TD43 - 23.0x1.5 Clamp: 34.0	TC43 - 26.9x1.6 Clamp: 50.5	TG03 - 19.05x1.65 Clamp: 25.0	TH43 - 19.05x1.2 Clamp: 25.0	-
25.0	-	TD44 - 29.0x1.5 Clamp: 50.5	TC44 - 33.7x2.0 Clamp: 50.5	TG04 - 25.4x1.65 Clamp: 50.5	TG04 - 25.4x1.65 Clamp: 50.5	TM44 - 25.6x1.5 Clamp: 50.5
40.0	-	TD46 - 41.0x1.5 Clamp: 50.5	TC46 - 48.3x2.0 Clamp: 64.0	TG05 - 38.1x1.65 Clamp: 50.5	TG05 - 38.1x1.65 Clamp: 50.5	TM46 - 38.6x1.5 Clamp: 50.5
50.0	-	TD47 - 53.0x1.5 Clamp: 64.0	TC47 - 60.3x2.0 Clamp: 77.5	TG06 - 50.8x1.65 Clamp: 64.0	TG06 - 50.8x1.65 Clamp: 64.0	TM47 - 51.6x1.5 Clamp: 64.0
65.0	-	TD48 - 70.0x2.0 Clamp: 91.0	TC48 - 76.1x2.0 Clamp: 91.0	TG07 - 63.5x1.65 Clamp: 77.5	TG07 - 63.5x1.65 Clamp: 77.5	TM48 - 64.1x1.9 Clamp: 77.5
80.0	-	-	TC49 - 88.9x2.3 Clamp: 106.0	TG08 - 76.1x1.65 Clamp: 91.0	TG08 - 76.1x1.65 Clamp: 91.0	TM49 - 76.7x1.9 Clamp: 91.0
100.0	-	-	TC50 - 114.3x2.3 Clamp: 130.0	TG09 - 101.6x2.11 Clamp: 119.0	TG09 - 101.6x2.11 Clamp: 119.0	TM50 - 102.5x2.45 Clamp: 119.0

1. Type of valve

Type	Description
3233	2/2 way diaphragm valve manually operated
3234	T Zero Deadleg diaphragm valve manually operated
3235	Tank Bottom diaphragm valve manually operated
2031	2/2 way diaphragm valve Classic pneumatically operated
2032	T Zero Deadleg diaphragm valve pneumatically operated CLASSIC
2033	Tank Bottom diaphragm valve pneumatically operated CLASSIC
2034B	Multifunction Block Solution, monoblock
2034W	Tandem diaphragm valve, welded configuation
2036	Robolux Multiway Multiport diaphragm valve
2103	2/2 way diaphragm valve Element diaphragm valve
2104	T Zero Deadleg diaphragm valve Element pneumatically operated
2105	Tank bottom diaphragm valve Element pneumatically operated

2. Control function

Code	Function
0	Manual
A	Normally Closed
B	Normally Open
I	Double Acting

3. Path/positions

Code	Way/Position
2	2 Way / 2 position
6	2 Way / 3 position

4. Diaphragm size

DN	Seat Size
04	8 mm (5/16)
06	8 mm (5/16)
08	8 mm (5/16)
10	15 mm (1/2)
15	15mm (1/2)
20	20mm (3/4)
25	25mm (1)
32	32mm (1 1/4)
40	40mm (1 1/2)
50	50mm (2)
65	65mm (2 1/2)
80	80mm (3)
100	100mm (4)

5. Diaphragm material

Type	Material
AD	EPDM
EA	PTFE/EPDM
EU	advanced PTFE/EPDM in two pieces
FF	FKM
ER	Gylon bonded on EPDM

6. Valve body material

Code	Material
VS	Forged 1.4435BN2/ASME BPE
VI	Block 1.4435 acc. to BN2/ASME
VG	Investment cast 316L/1.4435
VH	Block 1.4435/AISI 316L
VP	Stainless steel tube 1.4435-BN2 /UNS
VU	Block Uranus 1.4539
HA	Block Hastelloy C22 2.4602

7. Port connection and dimension

Code	Description
TG50	Clamp acc. ASME BPE short version ¼“
TG01	Clamp acc. ASME BPE short version 3/8“
TG02	Clamp acc. ASME BPE short version ½“
TG03	Clamp acc. ASME BPE short version ¾“
TG04	Clamp acc. ASME BPE short version 1“
TG05	Clamp acc. ASME BPE short version 1 ½“
TG06	Clamp acc. ASME BPE short version 2“
TG07	Clamp acc. ASME BPE short version 2 ½“
TG08	Clamp acc. ASME BPE short version 3“
TG09	Clamp acc. ASME BPE short version 4“
SA90	Weld connection ASME BPE ¼“
SA91	Weld connection ASME BPE 3/8“
SA92	Weld connection ASME BPE ½“
SA93	Weld connection ASME BPE ¾“
SODF	Weld connection ASME BPE 1“
SODH	Weld connection ASME BPE 1 ½“
SODI	Weld connection ASME BPE 2“
SODJ	Weld connection ASME BPE 2 ½“
SODK	Weld connection ASME BPE 3“
SODL	Weld connection ASME BPE 4“
TM44	Clamp 50,5 - 25.6x1.5mm acc. ISO 2852
TM46	Clamp 50,5 - 38.6x1.5mm acc. ISO 2852
⋮	⋮
TM50	Clamp 119,0 - 102.5x2.45mm acc. ISO 2852
SA40	Weld ends-OD 13.5mm acc. ISO 4200, DIN EN ISO 1127, DIN 11866 series B
SA41	Weld ends-OD 17.2mm acc. ISO 4200, DIN EN ISO 1127, DIN 11866 series B
⋮	⋮
SA49	Weld ends-OD 88.9mm acc. ISO 4200, DIN EN ISO 1127, DIN 11866 series B
SA39	Weld ends-OD 114.3mm acc. ISO 4200, DIN EN ISO 1127, DIN 11866 series B
SA60	Weld end - 25.0x1.2mm acc. SMS 3008 / ISO 2037
⋮	⋮
SA66	Weld end – 101.6x2.0mm acc. SMS 3008 / ISO 2037
SD40	Weld end 13.0x1.5 acc. DIN11850 series 2, DIN 11866 series A, DIN EN10357 series A
⋮	⋮
SD50	Weld end 104.0x2.0 acc. DIN11850 series 2, DIN 11866 series A, DIN EN10357 series A
TD40	Clamp 25.0 – 10.0x1.0 acc. DIN32676 series A (DIN pipe)
⋮	⋮
TD48	Clamp 91.0 – 70.0x2.0 acc. DIN32676 series A (DIN pipe)
TC43	Clamp 50.5 – 26.9x1.6 acc. DIN32676 series B (ISO pipe)
⋮	⋮
TC50	Clamp 130.0 – 114.3x2.3 acc. DIN32676 series B (ISO pipe)

8.1. Actuator version

Code	Version
C	PA-Actuator On/Off
D	PPS-Actuator On/Off
F	PA-Control Actuator
I	PPS Control Actuator
G / E	Element
D050	PPS handwheel and bonnet
D051	PPS handwheel and stainless steel bonnet
D052	Stainless steel handwheel and bonnet
D058	PPS Handwheel and SS bonnet and hole for bolt
D059	Stainless steel handwheel and bonnet with hole for bolt
D102	Handwheel and jaw pad SS and hole for bolt

8.2. Actuator size

Code	Actuator diameter
C	ø 40mm CLASSIC
D	ø 50mm CLASSIC
E	ø 63mm CLASSIC
F	ø 80mm CLASSIC
G	ø 100mm CLASSIC
H	ø 125mm CLASSIC
K	ø 175mm CLASSIC
L	ø 225mm CLASSIC
M	ø 70mm (For ELEMENT)
N	ø 90mm (For ELEMENT)
P	ø 130mm (For ELEMENT)

9. Variable code

9.1. Surface finish internal

Code	Surface quality
NO14	mechanically polished Ra <= 0,5 µm / Ra <= 20 µinch (ASME BPE SF1)
NO23	mechanically polished Ra (0.6 µm / Ra= 23 µinch (ASME BPE SF2)
NO06	mechanical polished Ra <= 0,78 µm / Ra <= 30 µinch (ASME BPE SF3)
NO17	electro polished Ra <= 0,38µm/Ra <= 15 µinch (ASME BPE SF4)

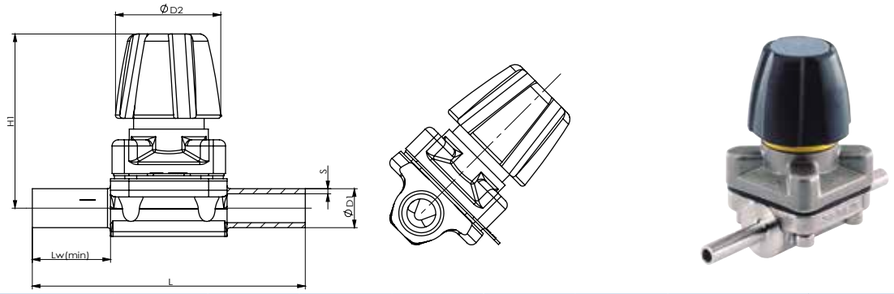
9.2. Some selected variable codes

Code	Certificates
NK52	with material certification EN 10204 3.1
NK55	with material certification EN 10204 3.1 and FDA certificate of conformity
…	

2/2-way diaphragm valve technical data ASME BPE weld ends

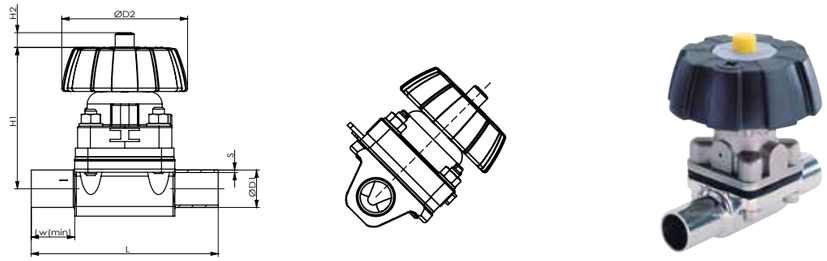
The following pages are examples showing ASME BPE variants. For more information about other standards please consult the data sheets.

Basic diaphragm valve manualy operated with weld ends ¼”- ½”



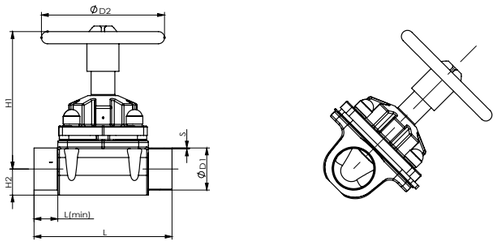
	L	Lw (min.)	ø D1	s	H1	ø D2		
							A	B
1/4"	78.0	20.0	6.35	0.89	56.0	35.0	54°	36°
3/8"	89.0	25.5	9.53	0.89	56.0	35.0	61°	29°
1/2"	89.0	25.5	12.70	1.65	56.0	35.0	65°	25°

Basic diaphragm valve manually operated with weld ends ½” – 2 ½”



	L	Lw (min.)	ø D1	s	H1	H2	ø D2
1/2"	108.0	29.8	12.70	1.65	85.0	7.0	80
3/4"	117.0	28.3	19.05	1.65	93.0	11.0	80
1.0"	127.0	29.5	25.40	1.65	94.0	12.0	80
1 1/2"	159.0	34.5	38.10	1.65	116.0	19.0	114
2.0"	190.0	41.0	50.80	1.65	133.0	25.0	114
2 1/2"	192.0	42.0	63.50	1.65	133.0	25.0	114

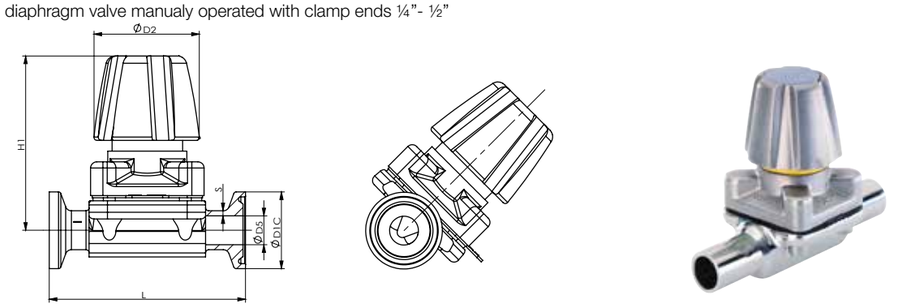
Basic diaphragm valve manually operated with weld ends 2 1/2” – 4”



	L	Lw (min.)	ø D1	s	H1	H2	ø D2
2 1/2"	250.0	43.0	63.50	1.65	212.0	43.0	272
3.0"	250.0	43.0	76.20	1.65	212.0	43.0	272
4.0"	295.0	35.0	101.60	2.11	225.0	49.0	272

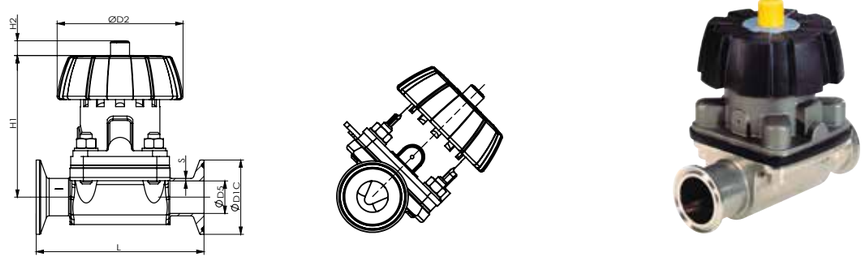
2 way diaphragm valve technical data ASME BPE Clamp connection

Basic diaphragm valve manualy operated with clamp ends ¼”- ½”



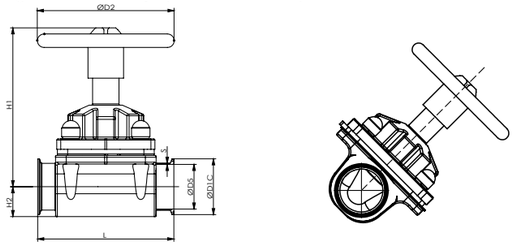
	L	ø D1C	ø D5	s	H1	ø D2
1/4"	78.0	25.0	4.57	0.89	56.0	35.0
3/8"	89.0	25.0	7.75	0.89	56.0	35.0
1/2"	89.0	25.0	9.40	1.65	56.0	35.0

Basic diaphragm valve manually operated with clamp ends ½” – 2 ½”



	L	ø D1C	ø D5	s	H1	H2	ø D2
1/2"	89.0	25.0	9.40	1.65	85.0	7.0	80.0
3/4"	102.0	25.0	15.75	1.65	93.0	11.0	80.0
1.0"	114.0	50.5	22.20	1.65	94.0	12.0	80.0
1 1/2"	140.0	50.5	34.90	1.65	116.0	19.0	114.0
2.0"	159.0	64.0	47.60	1.65	133.0	25.0	114.0
2 1/2"	190.0	77.5	60.20	1.65	133.0	25.0	114.0

Basic diaphragm valve manually operated with clamp ends 2 1/2” – 4”

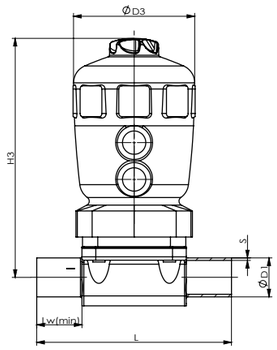


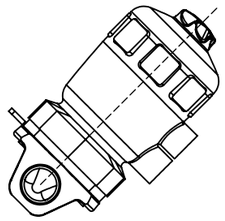
	L	ø D1C	ø D5	s	H1	H2	ø D2
2 1/2"	190.0	77.5	60.20	1.65	212.0	43.0	272.0
3.0"	222.0	91.0	72.90	1.65	212.0	43.0	272.0
4.0"	352.2	119.0	97.40	2.11	225.0	49.0	272.0

For details please see the data sheets.

2/2-way diaphragm valve technical data ASME BPE weld ends

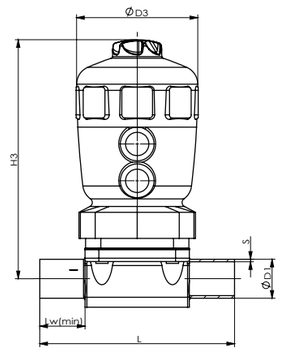
Basic diaphragm valve pneumatically operated with weld ends ¼”- ½”

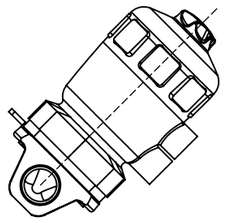




	L	Lw (min.)	ø D1	s	H3	ø D3
1/4" (C-40)	78.0	20.0	6.35	0.89	85.0	53.0
3/8" (C-40)	89.0	25.5	9.53	0.89	85.0	53.0
1/2" (D-50)	108.0	29.8	12.70	1.65	121.0	64.0

Basic diaphragm valve pneumatically operated with weld ends ½” – 4”

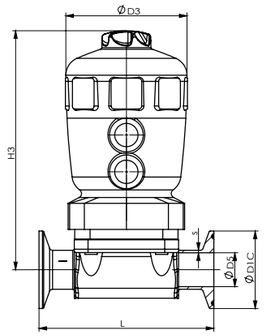


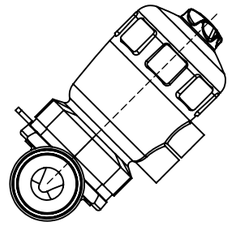


	L	Lw (min.)	ø D1	s	H3	ø D3
1/2" (E-63)	108.0	29.8	12.70	1.65	138.0	80.0
3/4" (E-63)	117.0	29.3	19.05	1.65	148.0	80.0
1.0" (F-80)	127.0	29.5	25.40	1.65	177.0	101.0
1 1/2" (G-100)	159.0	34.5	38.10	1.65	233.0	127.0
2.0" (H-125)	190.0	41.0	50.80	1.65	278.0	153.0
2 1/2" (H-125)	192.0	42.0	63.50	1.65	278.0	153.0
3.0" (K-175)	250.0	43.0	76.20	1.65	394.0	211.0
4.0" (L-225)	295.0	35.0	101.60	2.11	409.0	261.0

2-way diaphragm valve technical data ASME BPE Clamp connection

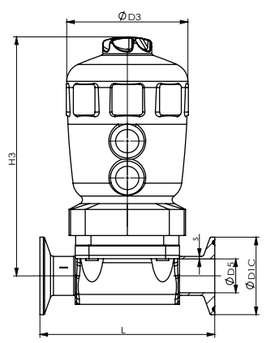
Basic diaphragm valve pneumatically operated with clamp ends ¼”- ½”

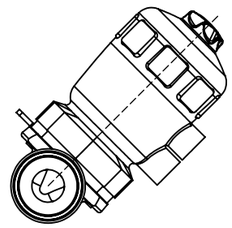




	L	ø D1C	ø D5	s	H3	ø D3
1/4" (C-40)	64.5	25	4.57	0.89	85.0	53.0
3/8" (C-40)	89.0	25	7.75	0.89	85.0	53.0
1/2" (D-50)	89.0	25	9.40	1.65	121.0	64.0

Basic diaphragm valve pneumatically operated with clamp ends ½” – 4”



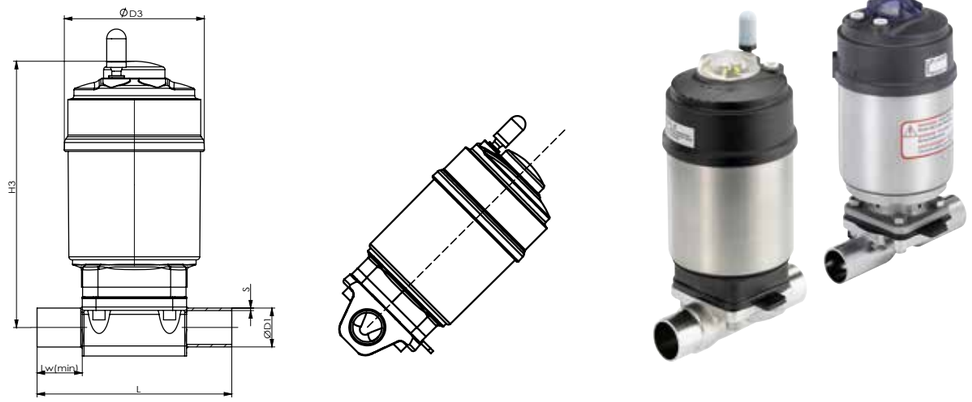


	L	ø D1C	ø D5	s	H3	ø D3
1/2" (E-63)	89.0	25.0	9.40	1.65	138.0	80.0
3/4" (E-63)	102.0	25.0	15.75	1.65	148.0	80.0
1.0" (F-80)	114.0	50.0	22.20	1.65	177.0	101.0
1 1/2" (G-100)	140.0	50.5	34.90	1.65	233.0	127.0
2.0" (H-125)	159.0	64.0	47.60	1.65	278.0	153.0
2 1/2" (H-125)	190.0	77.0	60.20	1.65	278.0	153.0
3.0" (K-175)	222.0	91.0	72.90	1.65	394.0	211.0
4.0" (L-225)	352.2	119.0	97.40	2.11	409.0	261.0

For details please see the data sheets.

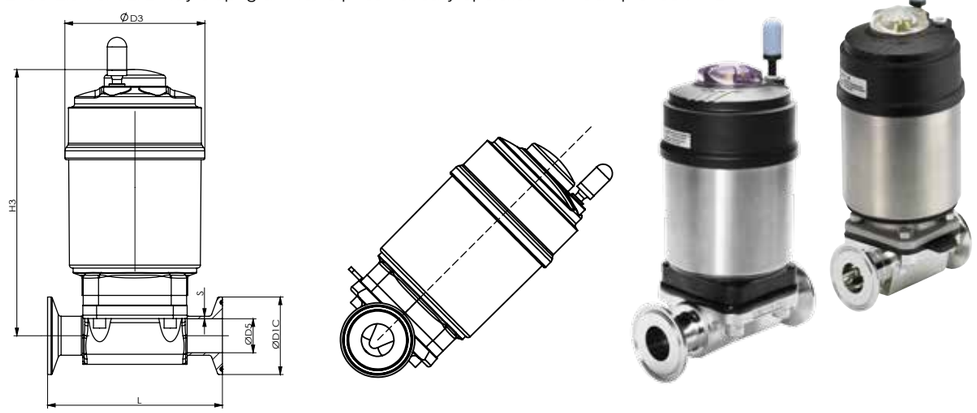
2/2-way diaphragm valve technical data ASME BPE weld ends

2103 Element 2/2 way diaphgram valve pneumatically operated with weld ends ¼”- 2”



	L	Lw (min.)	ø D1	s	H3	øD3
1/4" (D-50)	78.0	20.0	6.35	0.89	129	64.5
3/8" (D-50)	89.0	25.5	9.53	0.89	144	64.5
1/2" (M-70)	108.0	29.8	12.70	1.65	161	91.0
3/4" (M-70)	117.0	28.3	19.05	1.65	171	91.0
1" (N-90)	127.0	29.5	25.40	1.65	207	120.0
1 1/2" (P-130)	159.0	34.5	38.10	1.65	288	159.0
2" (P-130)	190.0	41.0	50.80	1.65	311	159.0

2103 Element 2/2 way diaphgram valve pneumatically operated with clamp ends ¼”-2”



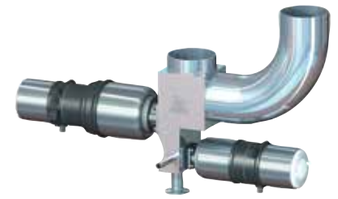
	L	ø D1C	ø D5	s	H3	øD3
1/4" (D-50)	78.0	25	4.57	0.89	129	64.5
3/8" (D-50)	89.0	25	7.75	0.89	144	64.5
1/2" (M-70)	89.0	25	9.40	1.65	161	91.0
3/4" (M-70)	102.0	25	15.75	1.65	171	91.0
1" (N-90)	114.0	50.5	22.20	1.65	207	120.0
1 1/2" (P-130)	140.0	50.5	34.90	1.65	288	159.0
2" (P-130)	159.0	64.0	47.60	1.65	311	159.0

For details please see the data sheets.

Zero Deadleg T diaphragm valve

The Bürkert Zero Deadleg T Valve system is designed for control of ultra-pure, sterile, aggressive or abrasive fluids. Enabling optimised sampling, draining at point of use or diverting and distribution of purified water, water for injection, or critical process fluids. The valve body is machined from one block of stainless steel (monoblock – no weld seams) and therefore only one material certificate EN 10204 3.1 needs to be documented. Many additional customer specific designs are achieved by our specialists.

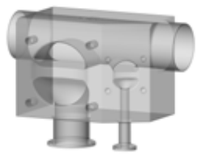
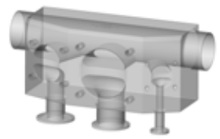




The port diameter of the main tube Zero Deadleg T valve ranges from DN8 to DN150 and the diaphragm size ranges from DN8 to DN 100. Different manual or pneumatic actuators are available.



There are mutiple special combinations available. Please contact Bürkert for more details.

Small diaphragm sizes for sampling and testing ensures a very compact designs with minimum foot print and economical manufacturing costs.

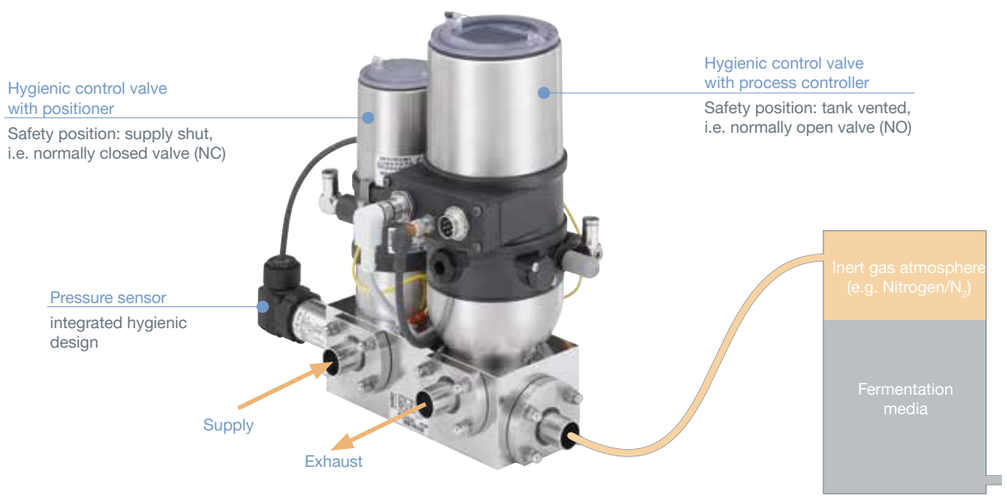



Bellow Control Valve Type 2380 – In charge of safety control

Fluidic applications carried out in tanks – like fermentation or storage – often require the precious media to be protected from reacting with air, oxygen and other ingress. A pressurised inert gas layer above the media serves to maintain a stable chemical balance. This process is known as tank blanketing and commonly utilised in pharmaceutical and biotechnology industries. Building upon the new hygienic control valve Type 2380, a truly robust system is in charge of increasing safety levels in tank blanketing and many more demanding applications.

Although a seemingly simple process on the surface, the strict requirements with respect to cleanability and cross-contamination prevention – mandated by the highly regulated pharma and biotechnology industries – introduce a new level of complexity to this application. Standard off-the-shelf components typically used for tank blanketing inherently cause issues with cleanability, are highly susceptible to contamination and can result in risk issues and erratic failure rates due to naturally acidic carbon dioxide or other aggressive foam upon exhausting. They are simply not fit-for-purpose. Downtimes, maintenance costs and compromise of product quality are all risks introduced by utilising the common standard solenoid components. Liberating pharma and biotech manufacturers from these heavy drawbacks, the Bürkert hygienic control valve system is in full charge of rapidly increasing safety for tank blanketing and virtually any pressure, flow and filling control applications in clean environments.

Downtimes and maintenance costs due to corroding exhausts will be eliminated by the system's robust design. Uptimes and precious productivity will in turn be vastly increased in all of these applications. Considering non-solenoid alternatives, one will find rather heavy and bulky devices. In contrast, the incorporated valves Type 2380 weigh as little as ¼ to ½ of an alternative and save 83% of space in comparison. This means more flexibility in design with a clear focus on process productivity. Naturally, the durable tank blanketing system is fail-safe, tested CIP/SIP capable and fully hygienic design (GMP, FDA) compliant – for all-time high safety levels. At Bürkert we thrive on understanding our customers in order to deliver tailored solutions, which perfectly meet your needs and exceed your expectations. Integration of valves, sensors and logic is our speciality setting Bürkert apart from competitors. Sit down with us, tell us your ideas – and we will make them flow.



The hygienic control valve system on the left clearly demonstrated its all-time high safety values in tank blanketing. The system itself builds upon two hygienic control valves of Type 2380. These compact, light-weight and CIP/SIP-capable valves are suitable for virtually any pressure, low-flow and filling control application in hygienic environments, where they also introduce new levels of precious productivity and quality.

ELEMENT design

Designed exclusively around hygienic requirements, the ELEMENT design has become an industry standard. Rounded stainless steel surfaces, internal air routing, wash-down resistance and a hermetically sealed process boundary (high IP 65/67 protection) keep it all safe.

ELEMENT positioner/controller

Benefitting from ELEMENT design, these control heads are not only durable in chemical wash-down environments but also equipped with preventative maintenance measures to monitor cumulative travel and valve stroke count. They can operate autonomously with an integrated process controller or be easily added into a modern PLC fieldbus network.

Diaphragm actuator

High controllability allows fully reproducible, automated processes. The compact diaphragm actuator in use yields lowest hysteresis, a unique benefit especially for smaller valve sizes in terms of stable reliability levels.

PTFE bellow

Superior reliability plus process safety: Wetted parts and process connections match hygienic needs. Protecting precious media from the environment, the PTFE bellow eliminates contamination risks. Being robust against corroding supplies/exhausts like the naturally acidic CO_2, it is suitable for virtually any media, SIP-capable – and comes with all necessary approvals (FDA, USP class VI).

Stainless steel body

Made from 316L steel in various sizes with port connections according to ASME-BPE, ISO and DIN. Self-drainability in vertical position and smooth curvatures allow hygienically safe operation and cleaning.

Applications & industries

Modularity and system integration capabilities are key advantages making the hygienic control valve essentially valuable in applications like:

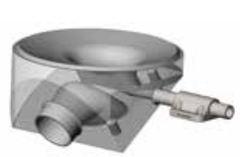
- Pressure control for fermentation and tank storage
- Flow control for precious products and CIP liquids
- Filling control with no product loss and no contamination

Tank bottom diaphragm valve

The tank bottom valve is normally welded on the bottom of the tank at the lowest installation position to achieve the best results for draining, sampling or cleaning of the tank. Depending on the situation of the downstream pipeline, Bürkert tank bottom valves can be designed to meet multiple requirements like “Y” outlet ends for distribution of the media. It can be designed as a tank top valve for the cover of the tank. The tank bottom valve body is machined from monoblock material. Additional CIP / SIP interfaces or a sample port can be realized by machining or welding. A modified design of the tank valve could also be used as a sampling valve welded to the tank wall machined with the specified tank wall radius for a the perfect match. The most compact design of the valve and actuator ensures best operational flexibility. The diaphragm is easy to reach and exchange.

Additional features can be added to the basic design of the tank bottom valve



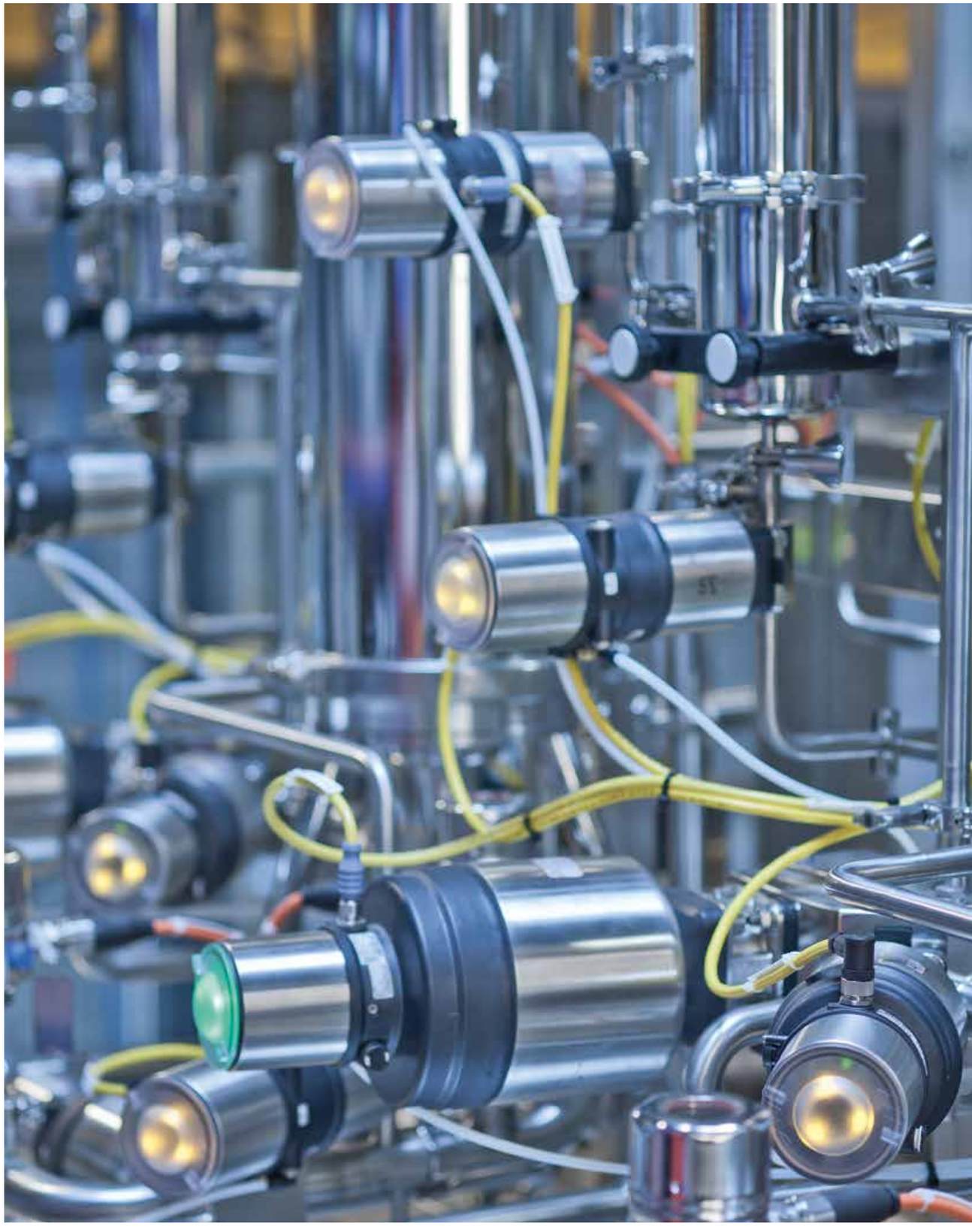


For example: samples taken directly from the valve with an additional valve body welded on or machined into the tank bottom valve body. Sampling diaphragm valve installed to the wall of the tank fermentation system.



Very compact Robolux mutilway-multiport



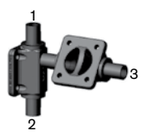
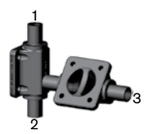


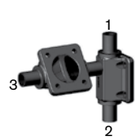
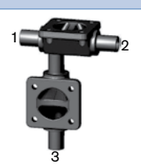
Tandem diaphragm valve solution (GMP design (2034W))

The pharmaceutical and biotechnology industry has the highest quality standards and needs to process different media, avoid any risk of cross contamination and safely produce in accordance with the validated processes. The importance of processing, cleaning and sterilization costs is increasing frequently. Bürkert products meet these requirements and provide the most reasonable and economical solutions on the highest technical level.

Bürkert offers a range of GMP/SAP valve systems or multifunction block solutions

GMP (Good Manufacturing Practice) valve option typically consists of 2 2/2-way diaphragm valve welded together. The GMP design reduces the dead legs on point of use outlets. Based on different technical requirement, Bürkert offers 8 types of standard GMP valve options plus 2 types containing a third port.

GMP1	GMP2	GMP3	GMP4
			

GMP5	GMP6	GMP7	GMP8
			

GMPA	GMPB
	

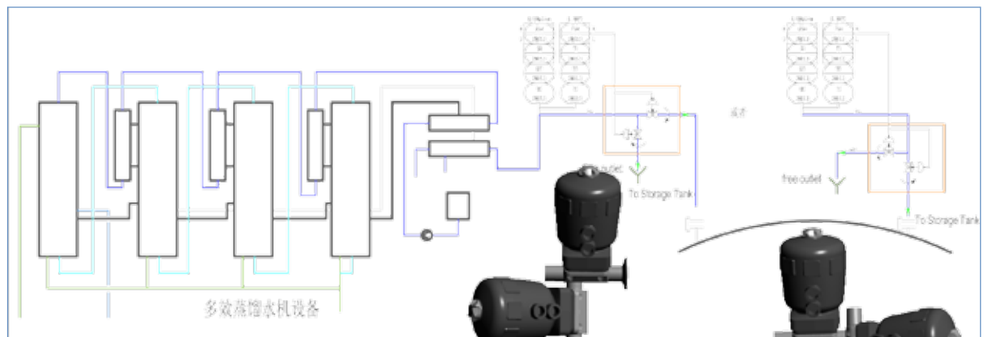
Tandem diaphragm valve system (SAP design)

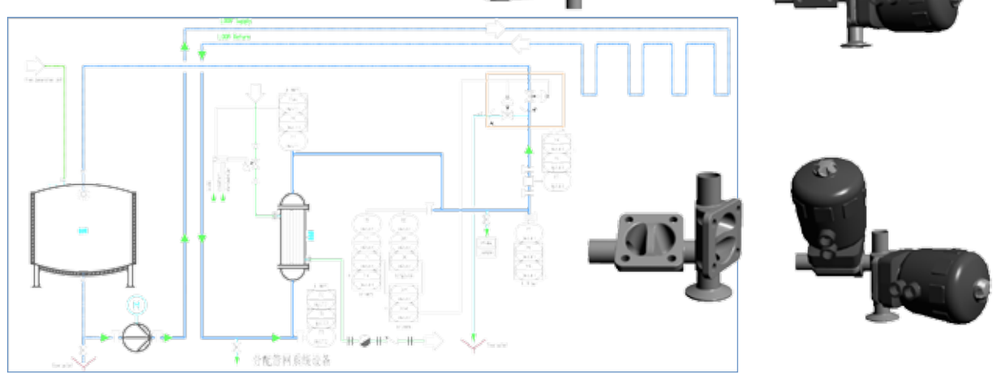
SAP (Sterile Access Port) valve options typically consists of 2 2/2-way diaphragm valve welded together. The SAP is positioned at the lowest point of the main valve body which is oriented at the optimum drain angle in a horizontal piping system. Typically this access port is used for sampling, condensate drain or divert connection. Based on different technical requirements, Bürkert offers 8 types of standard SAP valve options plus 4 types containing a third port. The main valve and the outlet valve can be both manually or pneumatically actuated. Different accessories can be supplied.

SAP1	SAP2	SAP3	SAP4
			

SAP5	SAP6	SAP7	SAP8
			

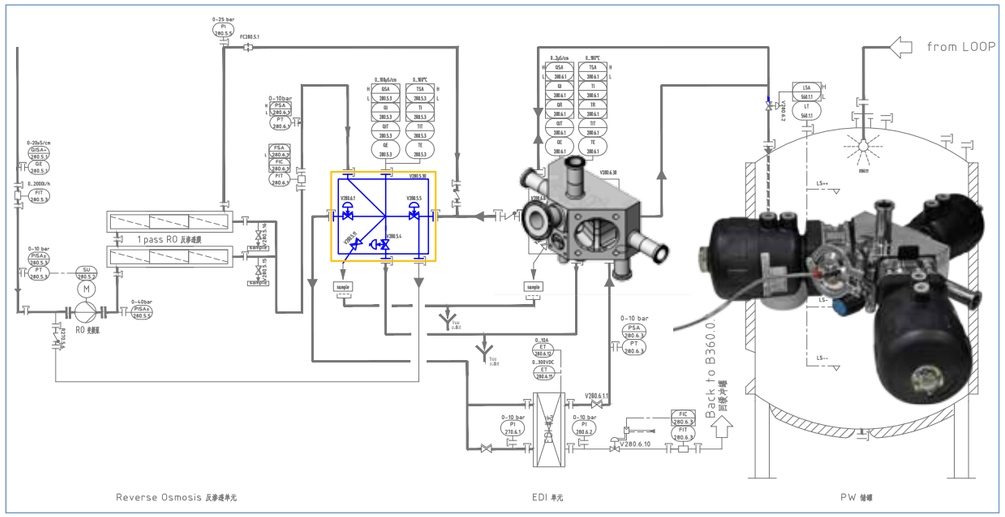
SAPA	SAPB	SAPC	SAPD
			

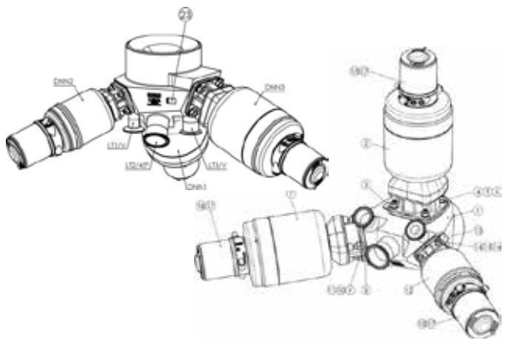


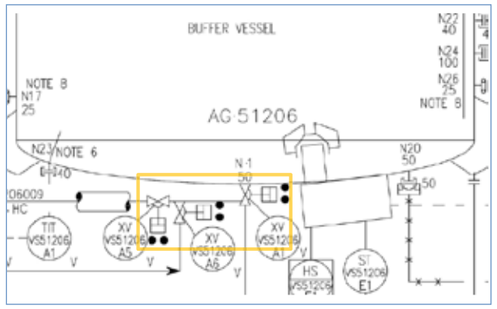


Multifunction Block Solution 2034B *

According to customers' specific requirements and after a detailed evaluation of the P&ID flow path and the orientation and position of the valves, our competent team designs a 3D CAD multifunction block body. This enables a close communication with the customer in detail about the suggested solution. This procedure supports the communication quality and reduces the overall design and delivery time. The Bürkert design team has extended experience and detailed knowledge to achieve a mimimum internal volume between the seats, an optimum drainage of the multifunction block, as well as enhanced cleanability to support overall process efficiency.







** For further information and details please contact our local sales team.*

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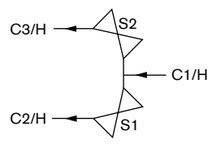	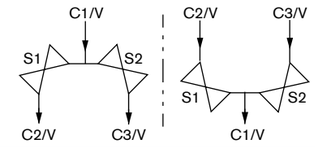	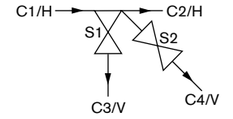
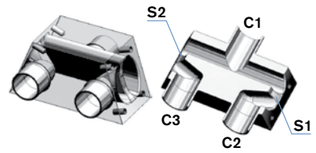	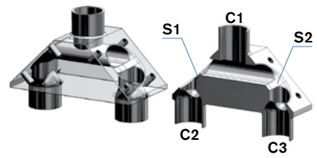	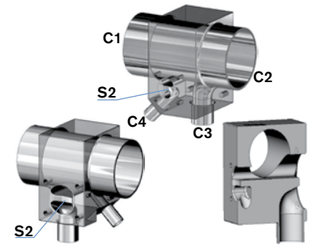

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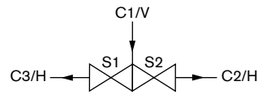	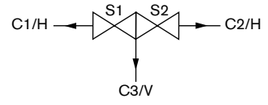	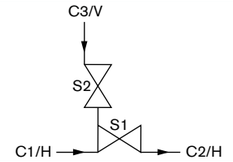
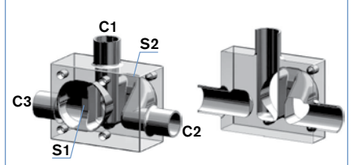	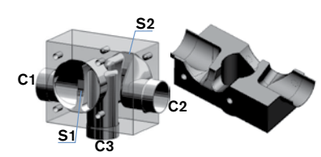	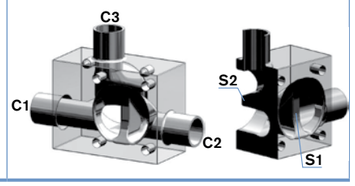

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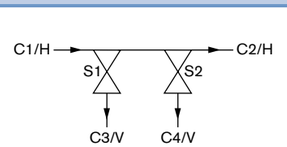	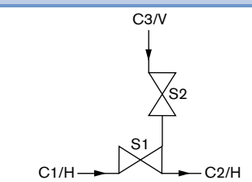	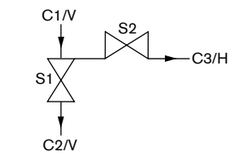
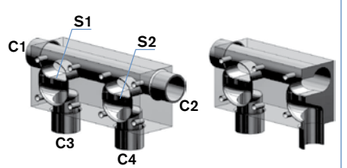	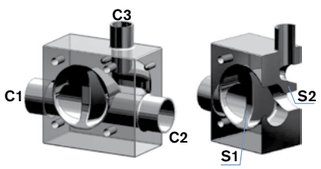	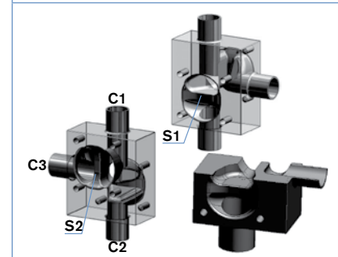

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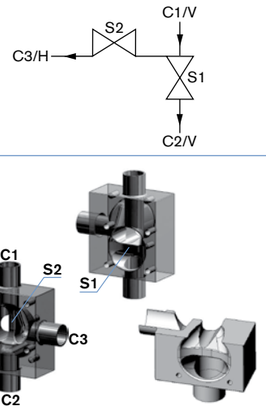	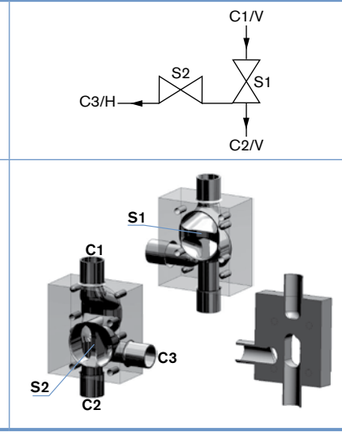	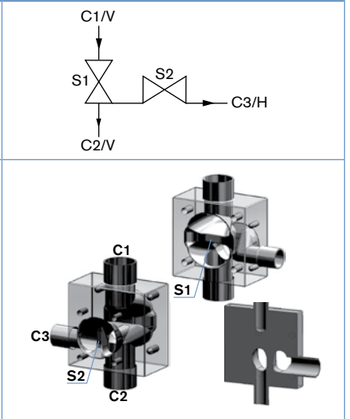

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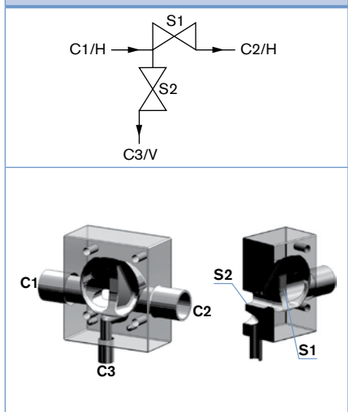	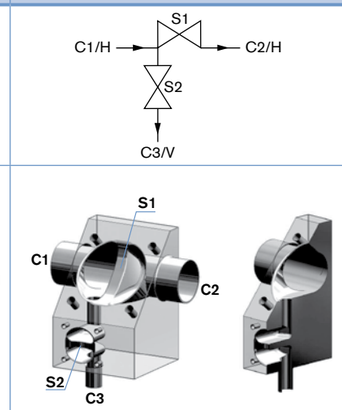	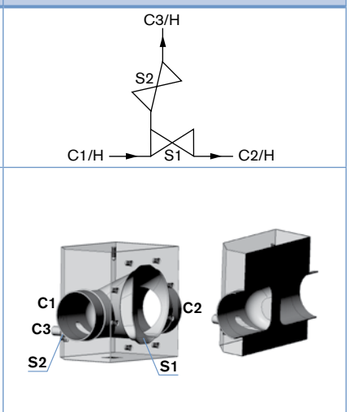

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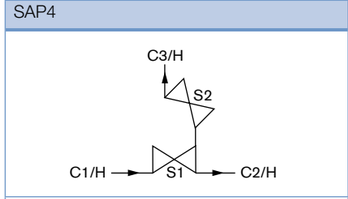	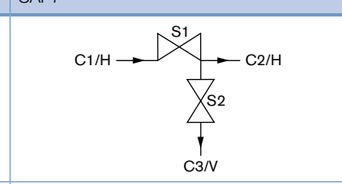	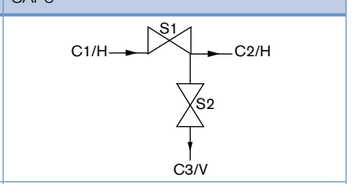

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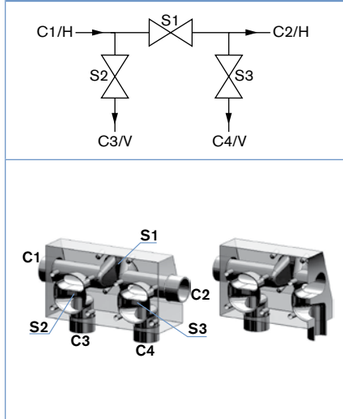	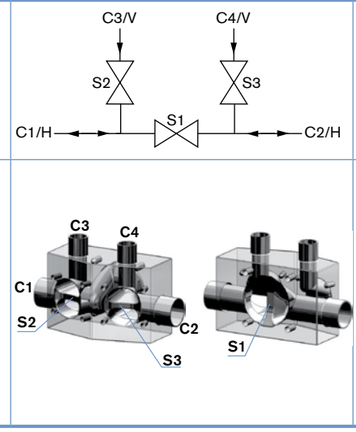	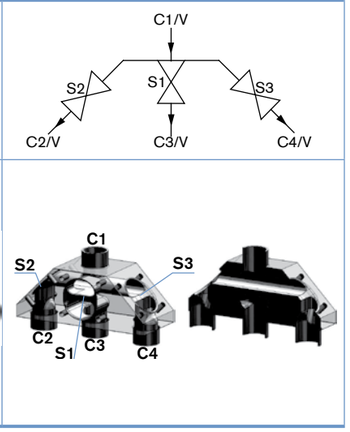

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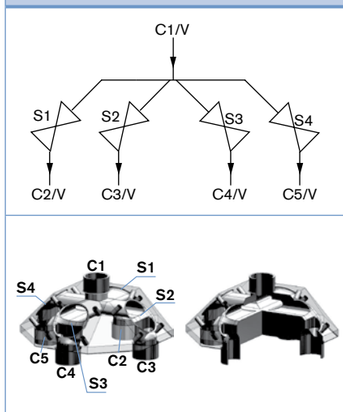	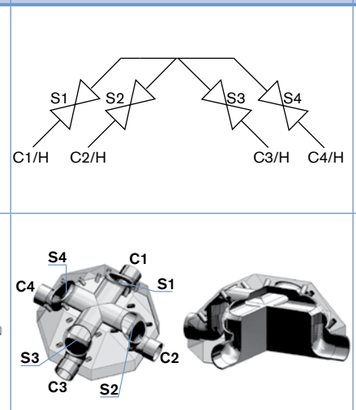	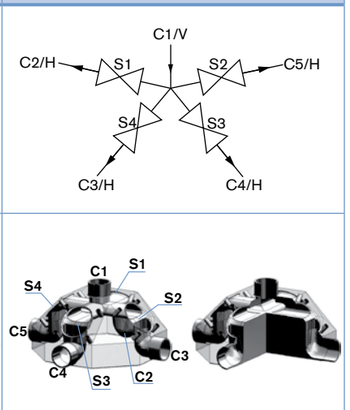

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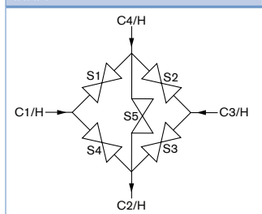
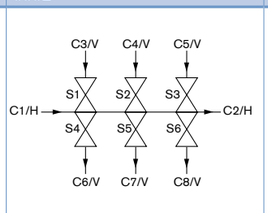
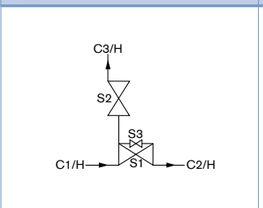
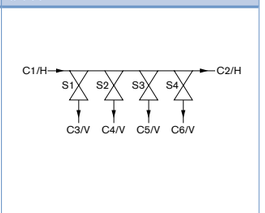
			

2034-B Multifunction Block Solution diaphragm valve specification sheet

Customized configuration – request for quotation

Please fill out and send to your nearest Bürkert facility* with your inquiry or order

Company	Contact person
Customer no.	Department
Address	Tel./Fax
Postcode/town	E-Mail

Bloc solution

Sales data

Project name: _____

Quantities: _____ ☐ single enquiry

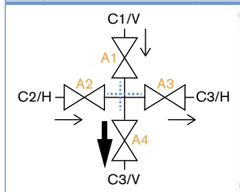
☐ enquiry for series

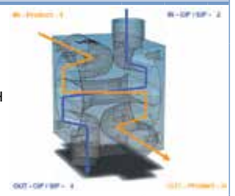
Flow schematic

Warning: connection and valve description should be in accordance with the table that filled below!

Please sketch the schematic

Legende





Diaphragm valve - one seat	
Area with **minimum** volume	
Drain direction	
Flow direction	
Connection C1, C2, ... - System / Bloc	C1 ... Cn
A1, A2, ... actuator (Bloc valves)	A1 ... An
Optional indication of inlet and outlet (horizontal or vertical available)	(V / H)

Technical data -Fluidic

Medium nature _____ Medium pressure _____

Medium temperature _____ Medium viscosity _____

Kv value or flow rate _____ ☐ Bürkert standard in blue

Material for the bloc ☐ 1.4535 / 316L ☐ 1.4435 acc. to BN2 / ASME BPE Specific material: _____

Surface finish **(internal)** ☐ 0.8 ☐ 0.6 ☐ 0.4 ☐ 0.25 Specific surface finish (Ra in µm): _____

☐ Electropolish

Surface finish **(external)** ☐ 1.6 Specific surface finish (Ra in µm): _____

Diaphragm material ☐ EPDM ☐ PTFE ☐ FKM ☐ Silicone (only Robolux)

Connection definition

Nominal size C-Nr.	DN	Weld end DIN 11850 S.2 / DIN 11866 S.A	Weld end ISO 4200 / EN ISO 1127 / DIN 11866 S.B	Weld end ASME BPE / DIN 11866 S.C	Clamp DIN 32676 S. A	Clamp DIN 32676 S. B	Clamp ASME BPE	Divers
C1		☐	☐	☐	☐	☐	☐	
C2		☐	☐	☐	☐	☐	☐	
C3		☐	☐	☐	☐	☐	☐	
C4		☐	☐	☐	☐	☐	☐	
C5		☐	☐	☐	☐	☐	☐	
C6		☐	☐	☐	☐	☐	☐	
C7		☐	☐	☐	☐	☐	☐	
C8		☐	☐	☐	☐	☐	☐	

Actuator and actuation see specification on next page.

Customized configuration – request for quotation, *continued*

Automation system (product overview)

ELEMENT actuator system
compact stainless steel design
designed for modular actuation
fresh air system

ELEMENT control head Type 8691
integrated pilot valve
position teach in
large LED indication

ASI and device net communication possible
ELEMENT control head Type 8695 for actuator 50mm
integrated pilot valve
position teach in
Large LED indication

ASI and device net communication possible
ELEMENT feeedback head Type 8690 / 8697
mechanical electrical feedback
inductive feedback

Eexi version

Robolux actuator system
double actuator with 2 valve function
optimum designed for modular actuator concept
high life time with double piston actuator

Robolux double feedback head Type 8685
contactless position detection
LED indicator
ASI communication
Namur / Ex (without LED)

Robolux double control head Type 8686
2 pilot valve for multi port valve
contactless position detection
LED indicator
ASI communication
Namur / Ex (without LED)

Description fluidic system Type 2034

Detail information on www.burkert.com

Technical data - Actuation

Pilot pressure _____ ☐ Bürkert standard in blue

Ambient temperature _____

Cycle per year _____

Implementation (clean room, outside...) _____

Hazardous location (EX / ATEX / NAMUR) _____

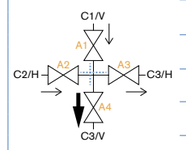
Actuator material ☐ St. steel/Plastic ☐ Plastic

Power supply ☐ 8 V Namur ☐ 24 V/DC ☐ 230 V/50-60 Hz

IP protection ☐ IP65 ☐ IP67

Automation ☐ ASI ☐ DeviceNet

Remarks: _____



Other actuator material _____

Other protection / application conditions _____

Other power supply _____

Other automation (PLC / Fieldbus) _____

Definition actuation, feedback, pilote valves control head

Nominal size A-Nr.	DN	Actuator Pneumatic	Actuator Manual	Control feedback Position ON	Control feedback Position OFF	Control head + Pilot valve	Control function normally closed	Control function normally open
A1		☐	☐	☐	☐	☐	☐	☐
A2		☐	☐	☐	☐	☐	☐	☐
A3		☐	☐	☐	☐	☐	☐	☐
A4		☐	☐	☐	☐	☐	☐	☐
A5		☐	☐	☐	☐	☐	☐	☐
A6		☐	☐	☐	☐	☐	☐	☐
A7		☐	☐	☐	☐	☐	☐	☐
A8		☐	☐	☐	☐	☐	☐	☐

Fluidic specification, connections, norms see previous page.

ELEMENT actuator design

In the pharmaceutical and biotechnology industry, most equipment, process valves and instrumentation are installed in a clean room and customers demand hygienic design and easy to clean surfaces. The Element series is designed specifically for process systems and such conditions. The Element product platform combines excellent chemical and technical properties with the unique characteristics of a beautiful and durable stainless steel housing. This product line is easy to clean and designed in accordance with the EHEDG (European Hygienic Engineering and Design Group) guidelines. The huge advantage of the ELEMENT line is the combination of actuator and automation unit.

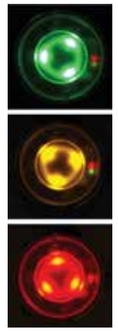
The Element product line fits to the following valve principles:

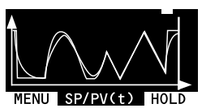
Pneumatic valves: On/Off valve or control valve, incl. diaphragm valve, angle seat valve, and globe valve. Control head or positioner with different type's field-bus.

Modularity: Various combinations modes to meet a variety of application to satisfy customers' needs

Decentralized Automation:

Decentralized automation uses intelligent control heads integrated into pneumatic process and control valves for all production processes and utility circuits such as cleaning agents, steam or temperature control. A minimum of wiring and tubing ensures a maximum hygiene and great energy efficiency through low compressed-air consumption.





Unique patented Robolux Multiway Multiport Diaphragm Valve 2036

Bürkert´s Robolux Multiway Multiport Diaphragm Valve is a most advanced and patented product. It is based on the Robolux design, where two seats are placed under one diaphragm. The new design of the series 2036 is the next level of evolution and it offers in certain applications even more advantages than the traditional Multifunction block. Especially in respect to the volume of remaining internal liquid and installation footprint. It will be designed to meet the requirements of your specific application and system.

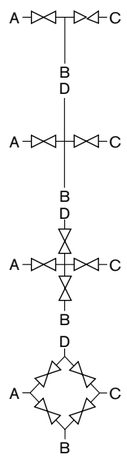
Standard valve body

– 3C2S

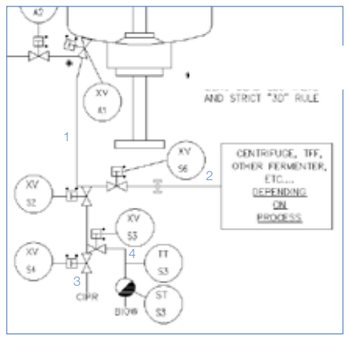
– 4C2S

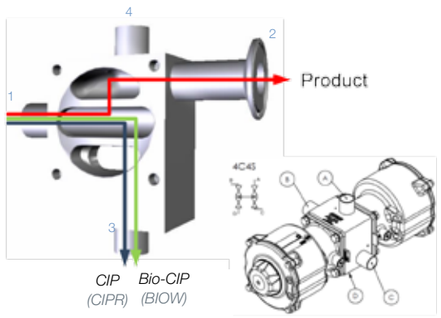
– 4C4S
Cross Flow

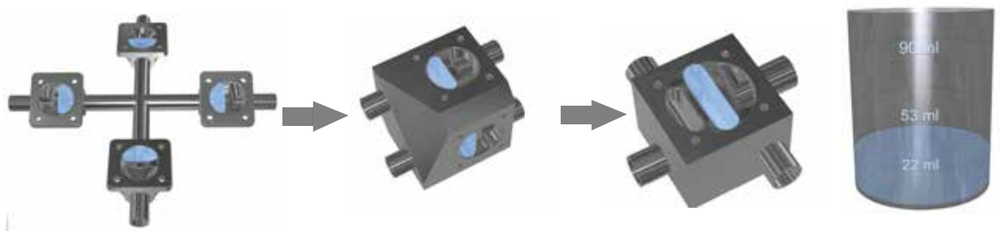
– 4C4S
Double Flow Path



Example of customized valve functions







Some additional products for pharmaceutical industry

Besides standard valves, Bürkert also offers accessories such as:

BBS-05
Sterile clamp

BBS-06
Sterile flange

BBS-03F
Sight glass with weld end

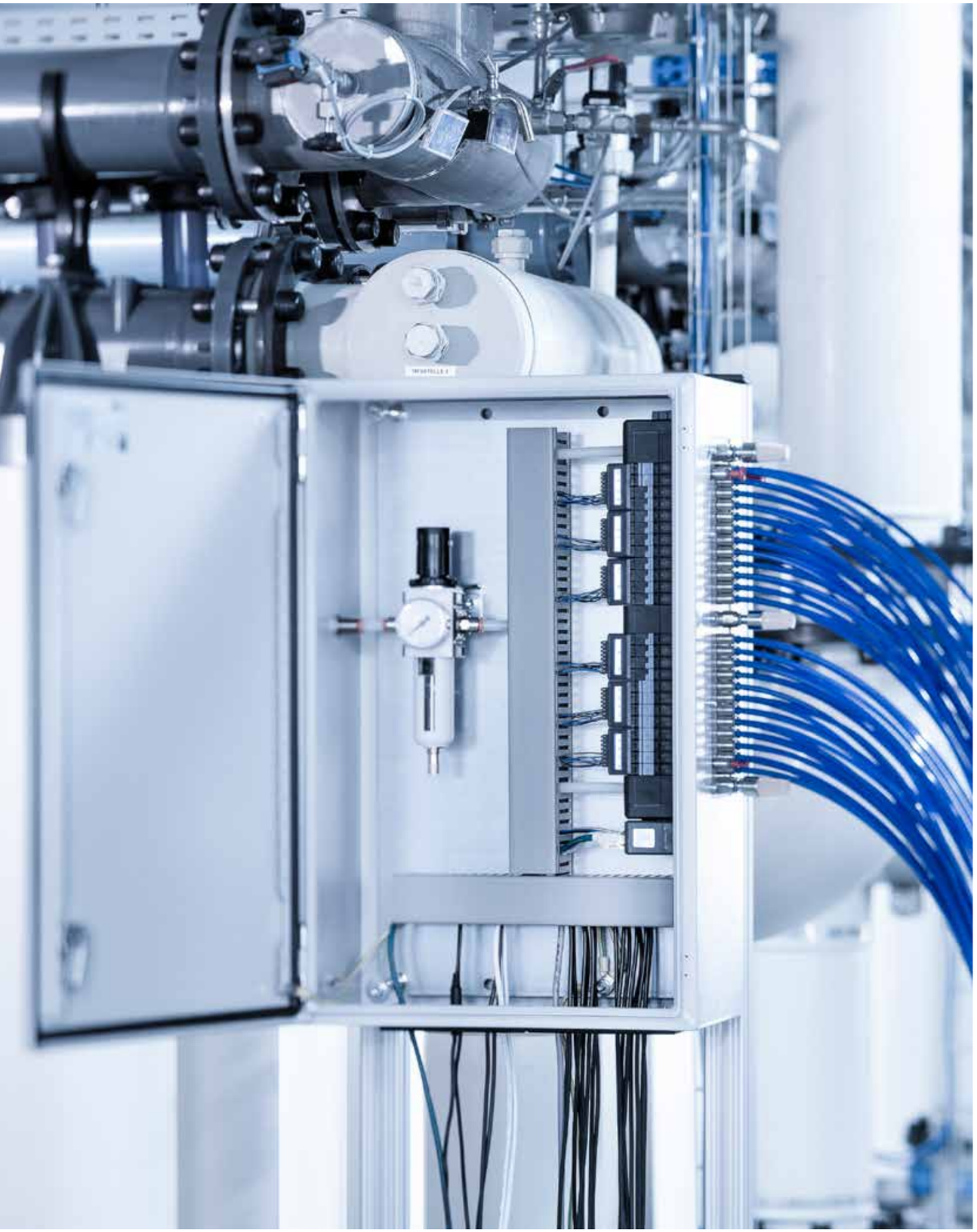
BBS-03F
Sight glass with clamp

BBS-10
Standard aseptic check valve
with weld end

BBS-07
Tank flange clamp

BBS-04 Silicone hose
BBS-04S Hose connections

BBS-10
Eccentric sterile check valve with weld end



Networking
Pneumatic Process Interface

The heart of Bürkert's pharmaceutical expertise. With clients around the world at pharmaceutical plants, builders of fermentors, filtration skids and WFI production equipment we have exceeded market expectations for modularity, performance and ease of use.

Our innovation continues into the hazardous location which is often present in pharmaceutical and cosmetic production plants with systems built for Zone 1 and 2 or Class 1 Div 1 FM as required.

AirLINE consists of a gateway or mini-PLC, modular I/O slices and rugged pneumatic valves on one address.

The gateways connect with all of the normal bus systems and TCP/IP networks for ultimate flexibility in your design. Mini-PLCs can be incorporated easily into the island and in many instances can be programmed for your application by Bürkert engineers. The I/O slices allow 4-20 mA inputs, high frequency counters, thermocouple inputs, relays, RTDs and AS-I bus controllers.

EtherNet/IP™ · Use IO-Link Universal · Smart · Easy · Modbus TCP

AS-i INTERFACE · PROFINET® · PROFIBUS PROCESS FIELD BUS · INTERBUS

Pneumatic Process Interface Centres

Bürkert offers the widest range of equipment to actuate, monitor, network, position and decentralize process control into the field. Each component is the product of cross functional mechanical and electrical engineering innovation and exacting laboratory testing. Each building blocks is ready to be included in your complete automation strategy.

Types 6519 / 6014p / 6012p Pilot Valves

It's your choice. From the simplest banjo valve to a fieldbus enabled off road multichannel miracle. We fit within your flexible plant or latest blockbuster machine seamlessly.

AirLINE Quick – Type 8644 with Rockwell Point I/O

Groundbreaking modular system in protection class IP 20 with multiple communication possibilities including ControlNet, DeviceNet, Ethernet and Profibus DP. Fully compatible with Rockwell Point I/O. In addition to the existing solution the AirLINE Quick version helps you to reduces the number of components in the control cabinet.

AirLINE – Type 8644 with Wago 750

Remote process actuation control system AirLINE, fully compatible with WAGO I/O System 750. It integrates high performance solenoid pilot valves, remote electronic I/O and fieldbus communication into a process actuation and control system that is both compact and extremely flexible.

AirLINE – Type 8644 with Phoenix Inline

Remote process actuation control system AirLINE, fully compatible with Phoenix Inline System. It integrates high performance solenoid pilot valves, remote electronic I/O and fieldbus communication into a process actuation and control system that is both compact and extremely flexible.

AirLINE Quick – Typ 8647 mit Siemens ET 200SP

The pneumatic valve island, Type 8647 AirLINE SP, is a modular, electropneumatic automation system consisting of connection modules and valve modules. It is perfectly designed for safe and complete integration into the decentralized peripheral system "SIMATIC ET 200SP" from Siemens. Type 8647 is used to integrate pneumatic pilot valves directly into the SIMATIC ET 200SP.

AirLINE - Type 8652 optimized for process automation

The pneumatic valve island type 8652 AirLINE is especially developed for applications in process automation. New diagnosis functions can be visualiced at the LC-Display. Both cleartext as well as symbols show information which makes easy to relate the shown diagnosis. This saves time during installation and commissioning.

AirLINE – Type 8653

The Type 8653 AirLINE Field valve island has been especially developed for the demands of process automation. New diagnostics functions can thus be visualised at the LC display, both in clear text and as symbols. This facilitates assignment of the shown messages and helps to save time during start-up and maintenance. Furthermore, a diagnostics message can be sent to the control. A fast overview of the plant status can therefore be given.

AirLINE Ex – Type 8650

AirLINE Ex is a modular electrical and pneumatic automation system for use in hazardous areas (Zone 1/21). Electrical connection via PROFIBUS® DP-is, electrical I/O functions via Siemens SIMATIC ET 200 iSP-modules. Compact design. Protection rating IP30.

Gas Control
Mass Flow Measure and Control

Working hand-in-hand with a host of international clients we have developed some of the most advanced gas blending equipment in the world.

We control protective or reactive mixtures by combining various in-house technologies including thermal mass or differential pressure flow and precision solenoid control valves to form perfect loops. Each of these loops or subsystems offers documented ratio control with millisecond reaction times and, importantly, fewer sealing points. The system operator benefits from high levels of repeatability and flexibility without the cost of expensive, less stable pre-mixed gases.

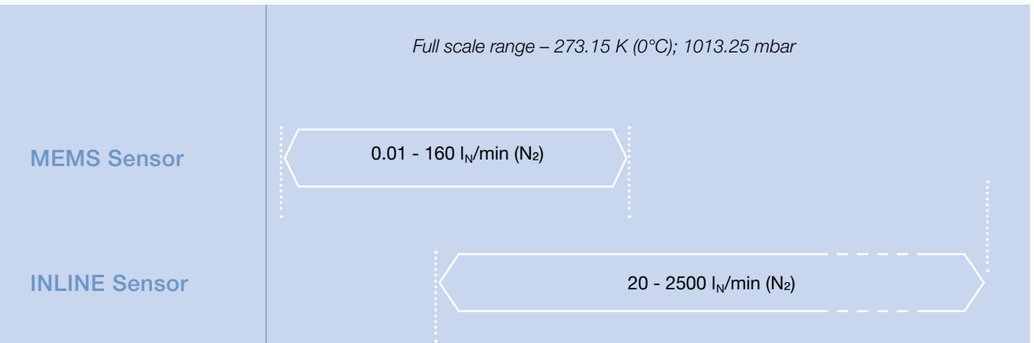
Process gases are indispensable in pharmaceutical manufacturing, from fermentation right through to the packaging processes. Inert gases are used for example to protect packaged drugs against the effect of atmospheric oxygen. The combination of inert gases and reactive gases such as N_2, CO_2, O_2 are used in the fermentation process to give the microorganisms a precise atmo-sphere to achieve a high yield. Whatever the application, it is all down to precise regulation, constant control and accurate metering of the gas media, ensuring a consistent and reproducible result, whilst maintaining process security and limiting costs.

Bürkert's Mass Flow Meters (MFM) and Mass Flow Controllers (MFC) rank among the most sought after components in the business. With a well established position in various processes all over the world, they set the standard in the measurement and control of mass flow rates.

Mass Flow Measure and Control

The Mass Flow Controllers are compact devices that control the mass flow of gases. They control a preset flow rate reference value – regardless of disturbance variables or temporary occurring flow resistances. The mechatronic devices consists of the following components: flow sensor (MEMS and Inline sensor), digital electronics and a solenoid control valve as an actuator.

With its easy installation, the compact structure of the Mass Flow Controller ensures the convenient operation of a complete (closed) control loop. Additional work and costs e.g. wiring and harmonising individual components, incorporating pipe lengths, are ruled out.



Type 8745 MFC/MFM sandard signal or Ethernet

The MFC / MFM type 8745 is suitable for the mass flow control of high flow rates. Type 8746 can be configured as MFM or MFC. Optional, four different gases can be calibrated. The thermal inline sensor is located directly in the main gas stream and therefore reaches very fast response times. A directacting proportional valve as regulating unit guarantees high sensitivity. The integrated PI controller ensures outstanding control characteristics of the MFC / MFM.

Type 8741 (MFC / MFM) büS/CANopen/Ethernet/Standard signal

Type 8741 can be configured as MFM or MFC. Optional, up to four different gases can be calibrated. The thermal MEMS sensor is located directly in the gas stream and therefore reaches very fast response times. A direct-acting proportional valve as regulating unit guarantees high sensitivity. The integrated PI controller ensures outstanding control characteristics of the MFC / MFM. Type 8741 is especially designed for use in cabinets.

Type 8742 (MFC / MFM) büS/CANopen

Type 8742 can be configured as MFM or MFC. Optional, two different gases can be calibrated. The thermal MEMS sensor is located directly in the gas stream and therefore reaches very fast response times. A direct-acting proportional valve as regulating unit guarantees high sensitivity. The integrated PI controller ensures outstanding control characteristics of the MFC / MFM. Type 8742 is especially designed for use in harsh environments due to high protection class and explosion-proof.

Sensors, Controllers and Transmitters

Process Vision

For more than a decade, Bürkert has been providing well-rounded system solutions from one source with its own range of sensors. In view of the wide variety of specific components linked to specific manufacturers, the availability of a standard concept completing the control loop of actuators and controllers with suitable sensors proves to be the most consistent and logical step. The market proximate, practically oriented alignment of our sensor concept has always offered clear advantages characterized by extremely easy operation and efficient standardization of layout, electrical interfaces and process connections. And the Bürkert brand stands for yet another benefit: optimum economy and efficiency and design geared to the future.

Wherever it is necessary to display process values, perform control functions and monitor alarms, the concept is clear: simple menu prompting and easy integration and commissioning of actuators in an individual, tailor-made system.

Whether they are required to control flow rates, monitor for leaks or control pH values in cooling water conditioning systems or monitoring temperature, conductivity and filling level: our sensors act precisely, systematically and economically. The rugged design and long service life even in extreme continuous operation are “design features” which apply to all products manufactured by Bürkert. The trend in sensor systems pursues two directions. High-end technology with field bus interfaces and multi-channel designs is one of them. On the other hand, there is an increasing demand for “simple” monitoring with switching output and optional ASI bus interfacing. Bürkert leads the way on both levels. Integrating intelligent technology using field buses from the start and providing those who only wish to control or measure a simple system with individually adapted products and services.

Our strength is shown in the functional details of a comprehensive range of sensor systems and its modularity. We offer individually configurable, systematic solutions for any application problem. The dialogue between our researchers and developers and on-site specialists has brought about ground-breaking components. For example, in flow measuring technology, the SAW (Surface acoustic Wave) measuring method plays an outstanding role owing to its broad range of application, and measurement with Finger type MID opening up, interesting potentials. Bürkert already provides suitable, fully-developed products for both areas, and new, innovative solutions will be added, making your life simpler.

Flow Sensors

According to the various requests and requirements from the pharmaceutical market, Bürkert provides flow sensors and transmitters with measuring principles suitable for both utilities and process duties. With measuring principles from magnetic inductive and paddlewheel and a range of materials and connections to suit different applications your needs are well covered.

Type 8098 – FLOWave, a flowmeter based on SAW technology

The flowmeter Type 8098 is a product of the FLOWave range. It uses the SAW (Surface Acoustic Waves) technology and is at first designed for the use in applications which require products to be in accordance to all hygienic design guidelines.

This is achieved by using:

- the accepted stainless steel materials
- a tube free of any inner parts
- the ideal outer design (e.g. without any fixing components like screws)

The main use focus is on hygienic applications and for the measurement or monitoring of water similar liquids. As an example low conductivity or non conductive water is a preferred area of usage as FLOWave flow measurement is independent of conductivity.
FLOWave offers a range of features, including advantages of flexibility, cleanability (e.g. CIP and SIP), compact size, light weight, easy installation and handling, and is compliant with numerous standards. In addition to the unique sensor technology it is uses a modular electronic platform based on digital communication and an easy to use operators interface.

Type 8056 – Magflowmeter

The 8056 hygienic magnetic flowmeter has high accuracy, a wide range of outputs and integrated data logger and batch controller. Manufactured from 316L stainless steel with a PTFE lining, it is available from DN3 to DN100 with clamp and other sanitary connections. It is designed for applications with conductivities as low as 5 µS/cm. Type 8056 can control high-precision dosing operations and continuous flow measurement, with a measuring range up to 280 m^3/h.

Type 8045 – INSERTION Magmeter

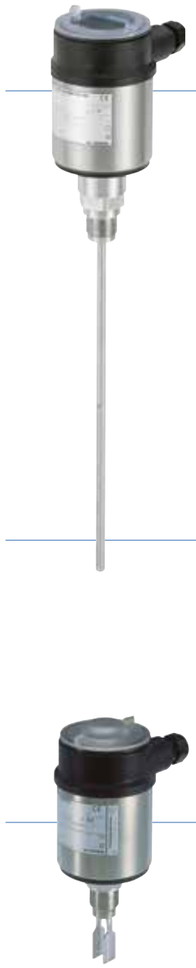
INSERTION magmeter for continuous flow measurement. Designed for pipes with diameters ranging from DN 06 to DN 400 and > 20 µS/cm. FDA approved. The version with a stainless steel sensor has been designed for applications with high pressures (PN16) and high temperatures (up to 110°C). The version with Alloy C22 electrodes allows appliations with highly corrosive fluids.

Type 8030 – Paddlewheel Flow Sensor

The 8030 paddlewheel flowmeter is ideal for non conductive fluids like RO systems and DI water production skids. All wetted parts are produced from FDA approved materials. The Bürkert designed fitting system ensures simple installation of the sensors into all pipes from DN 06 to 65.

Level Sensors

The Bürkert series of level sensors now includes radar, guided microwave, ultrasonic transmitters and tuning fork switches to meet the demanding tasks of the pharmaceutical industry. They fulfill the stringent requirements regarding design, appearance and ease of cleaning in the hygienic sector. Whether aggressive or neutral media: high-tech solutions from Bürkert quickly and efficiently solve your problems.



Type 8188 – Guided Microwave Level Measurement Device

The Type 8188 is a level measurement device with cable, rod or coax probe, designed for continuous level measurement. The unit is suitable for liquids, for industrial use in all areas of process technology. With a measuring range up to 75 m, the 8188 is best suited for tall vessels. Even process conditions such as strong steam generation, density fluctuations or changes of the dielectric constant do not influence the accuracy of the measurement. Build-up or condensation on the probe or vessel wall do not influence the measuring result. A liquid interface measurement is also possible with the Type 8188, typically an oil/water interface.

Type 8177 – Ultrasonic Level Transmitters

Non-contact, highly precise, ultrasonic level transmitters are easily set up for level control of utility fluids such as CIP bulk chemicals where a simple menu allows output of level or volume in minutes. In combination with our intelligent sanitary process valves, continuous level control loops can be established in processing equipment such as flakers.

Type 8111 – Vibrating Level Switch for Food and Beverage

The 8111 is a vibrating level switch for liquids, using a tuning fork for level detection. It is designed for industrial use in areas of process technology and can be used in liquids. Typical applications are overfill or dry run protection. Depending on the version it is also used for monitoring or control of levels in hazardous environments, even for combustible liquids, gases, fogs or vapours. Due to the simple and rugged measuring system, the 8111 is virtually unaffected by the chemical and physical features of the liquid. It works even under unfavourable conditions such as turbulence, air bubbles, foam generation, buildup or varying products.

Type 8138 – Sanitary Radar Level Transmitter

Non-contact radar level transmitter for continuous level measurement up to 20 m. It is particularly suitable for use in small vessels that contain beverage liquids under sanitary process conditions.

Type 8137 – High Pressure Radar Level Transmitter

General purpose high pressure radar level transmitter, level measurement up to 30 m. Available in two versions: with thread and horn antenna particularly suitable for use in small tanks or with flange and horn antenna particularly suitable for use in storage tanks and process vessels for measurement of products under extremely difficult process conditions.

Type 8136 – Radar Level Transmitter

Non-contact radar level transmitter for continuous level measurement up to 20 m. The unit is available in two versions: with encapsulated horn antenna particularly suitable for level measurement of aggressive liquids in small vessels or with plastic horn antenna particularly suitable for flow measurement in open flumes or gauge measurement in water.

Temperature Sensors

Temperature sensing and control is often critical in both process and cleaning cycles within all hygienic processing environments. With its compact size and smart functionality, the Bürkert 8400 series offers you precisely what you need. However, if it is simple blind sensing with thermo well pockets and standard Pt100 sensors, please don't hesitate to talk to our team who will be pleased to discuss your exact needs and requirements. Each instrument offered is available for connection to the wide range of controllers that we offer.

Type 8400 – PT100 Temperature Transmitter

This intelligent sensor/switch with an extra large display is specifically designed to switch a valve and to establish a monitoring system or an On/Off control loop. Compact and wall versions are available. The wall-mounted version must be inserted into a wall mounted holder, and it needs to be associated with a remote temperature sensor.

Pressure Sensors

Accurate and reliable, our range of pressure sensors provides exceptional performance. In standard form they come with threaded connections, but each of them feature zero and span adjustment, which means they can be combined effortlessly with diaphragm seals to adapt to virtually any pressure, temperature or media in an impressive range of connections. Whether hygienic connections for process or rugged connections for utilities, you will benefit from using these sensors throughout your plant.

Type 8311 – Pressure Transmitter, 0-50 bar

This intelligent mini transmitter/switch with an extra-large display is specially designed to switch alarms and to establish a monitoring system or an On/Off control loop. The switching points can be programmed with the three-key keypad under the display. In addition, the process value can be transmitted to the PLC (4-20 mA). Measuring range up to 50 bar. Equipped with EHEDG flush diaphragm for demanding hygienic applications.

Type 8316 – Pressure Transmitter, OEM

The compact Type 8316 pressure transmitter meets the highest requirements with regard to mechanical loading, EMC characteristics and operational reliability and is particularly suitable for demanding industrial applications. For aggressive fluids against stainless steel the process connection in PVDF is available.

Type 8323 – Pressure Transmitter/Monitor, 0-25 bar

High accuracy, compact design, robust construction and flexibility make this instrument universal and suitable for different measurement functions. The sensor is available with flush diaphragm or according to EHEDG standards. For technical reasons, a piezoresistive sensor element is used for measuring ranges up to 16 bar and a thin film sensor element for the measuring range of 25 bar. Wetted parts are made of stainless steel and completely welded. Internal seal elements, which could restrict the choice of measuring materials, are excluded.

Analytical Sensors

In combination with our process valves, Bürkert's analytical sensors and controllers for pH and conductivity measurement are the ideal solution for pharmaceutical CIP and SIP applications. Inductive transmitters are employed in the CIP makeup loop whereas the return CIP must be able to measure the very low conductivity of the final rinse water which is commonly WFI quality.

pH (Process)

Type 8201 – pH Transmitter

The pH measuring system is suitable for measuring absolute pH values in liquids between pH 0 and pH 12 at medium temperatures of up to 140°C and process pressures of a maximum 6 bar. Due to its hygienic design and the robust glass-free layout, this model is particularly suitable for use in hygienic processes, for example the production of foods and active ingredients. The pH electrode's extremely smooth enamel surface prevents the medium from sticking and is very easy to clean. For this, the electrode stays in the process even during a CIP purification.

pH/ORP (Utility)

Type 8202 – pH/ORP Meter, ELEMENT Design

The ELEMENT meter Type 8202 is a compact, but modular device, specially designed for measuring the pH or ORP value of fluids with two transistors and dual analog output for temperature and pH/ORP. The meter consists of a replaceable standard 120 mm pH or ORP probe, screwed in a sensor holder with integrated Pt1000 temperature sensor. This assembly is plugged-in and screwed with a nut to an IP67 enclosure containing the electronic module with cover and a removable display.

Conductivity (Process)

Type 8221 – Four-Pole Conductivity Sensor

Due to their hygienic design and the robust layout, these conductivity sensors are suitable for use under demanding conditions in pharmaceutical, biotechnology and the general chemical industry. The sensors are based on the 4-electrode principle which excludes polarization phenomena normally observed with 2-electrode sensors.

Conductivity (Utility)

Type 8222 – Resistive Conductivity Transmitter, ELEMENT Design

DUAL-compact field transmitter for conductivity and temperature. Direct inline or bypass pipe mounted via a standard True Union fitting. The 8222 utilizes 3 different electrodes which are determined by liquid conductivity covering a broad range from ultra pure water (.05 µS/cm) to industrial sewage water (10 mS/cm). Integrated switches are optional for diagnostics, high/low alarm purposes or for simple on/off controller functions. The programmer unit with backlit display can be left in the unit for local display or removed, leaving the transmitter blind.

Type 8228 – Inductive Conductivity Meter, ELEMENT Design

For demanding applications like CIP, the wide measurement range of this inductive conductivity meter is a powerful feature. Different temperature compensation modes are available and can be easily realized thanks to the integrated temperature sensor.

For measuring under harsh conditions, variants are available with no metallic parts in contact to the process liquid, so conductivity up to 2 S/cm and temperature up to 130°C can by measured easily.

Thanks to the ELEMENT design, optional display, up to two analogue and two switching outputs are available.

Controllers and Transmitters

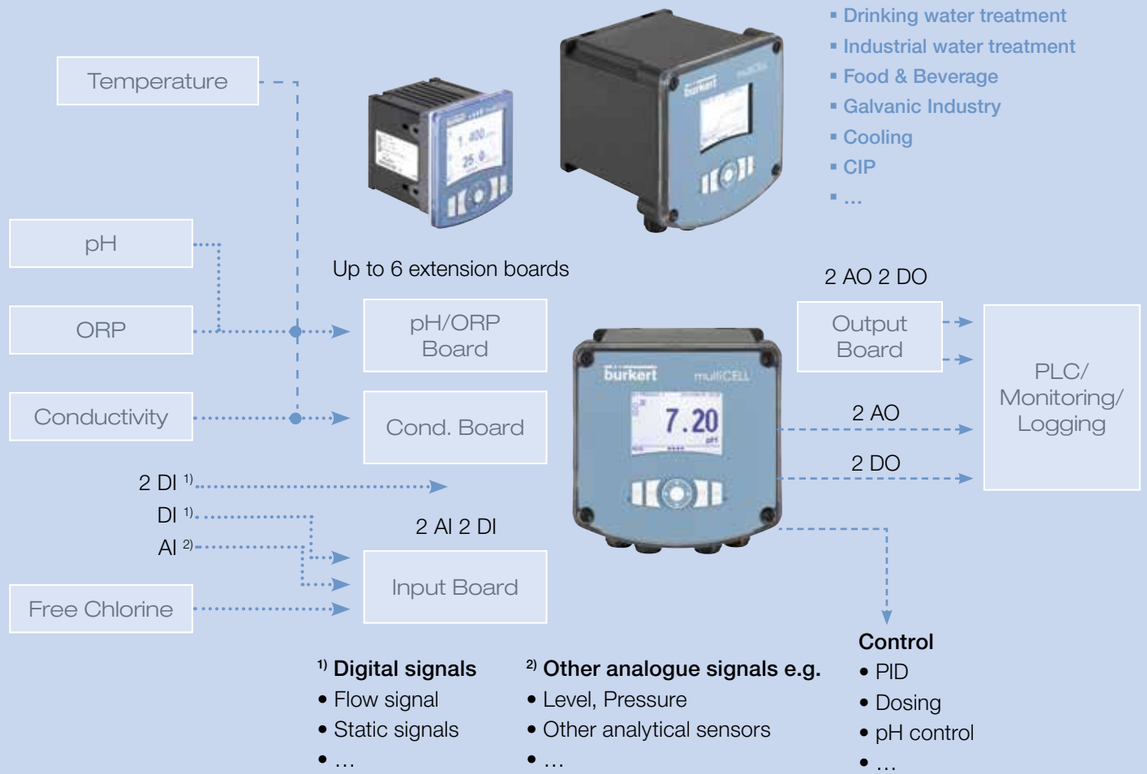
Functionality is the word that best describes this range of transmitters and controllers. Modularity is a close second with plenty of options available as standard to allow you to select the ultimate controller for your process. From standard DIN panel mounting, wall mounting and skid mount-ing you can be sure you can fit your choice into your chosen application for optimum handling. With a wide range of materials of construction and many features built in for convenience and perform-ance, you will find each one a natural choice to enhance your process or use as a stand alone system controller to integrate into your existing systems.

Type 8611 – eCONTROL

Thanks to its compact design, the universal 8611 controller is espec-ially designed for compact control system applications. It is compatible with a wide range of proportional control valves and connects with an electropneumatic servo-system for pneumati-cally actuated process control valves. The PI process controller is equipped with many additional functions. The actual process value can be supplied as one of three inputs; a standard current (4-20 mA), frequency or Pt100 signal connected directly to the universal controller. The process switching points can be set via a 4-20 mA signal or with the keypad.

Type 8619 – MultiCELL

The 8619 multichannel multifunction trans-mitter/controller, available in two housing variants for panel or wall mounting, is a microproces-sor transmitter/controller for connection of sensors which deliver raw sig-nals for pH, ORP, conductivity and flow via pulses or sen-sors (like pressure, level, chlorine…) which delivers analogue signals (0…20 mA, 4…20 mA, 0…2 V, 0…5 V, 0…10 V). Thanks to full support of the Modbus TCP, PROFINET (Conformance Class B) or EtherNet/IP, the 8619 can be integrated into most Industrial Ethernet environments. Therefore all important process values like measure-ment data, process diagnostics or device status can be easily inte-grated into the automation system.



- Drinking water treatment
- Industrial water treatment
- Food & Beverage
- Galvanic Industry
- Cooling
- CIP
- …

multiCELL as full flexible multichannel measurement transmitter / controller

System Competence

Perfect Solutions

Bürkert has a unique perspective in the process control and instrumentation industry as we are the only single brand which combines a complete range of valves, instruments, pneumatic actuation, networking and controllers from a single source.

With our dedicated world-class engineers and our superlative manufacturing facilities we can deliver systems which meet your exact requirements.

Your reliable Bürkert sales consultant and our system engineers work in concert to ask the right questions and provide the right hardware. Transparent operations, up to date situation, review procedure, engineering change notices, portals through SAP and secure intranet are normal in our projects.

For a world class system experience, insist on Bürkert people to be part of your next project.

Connect

As a globally flexible, lean, focused and innovative company we are the partner of choice for fluid control systems in more than 35 countries. Whether you are in Stuttgart, Singapore, Chicago or Sydney, everywhere in the world we are close to you and therefore know first-hand about your specific tasks and problems.

Following our principle of “one face to the customer”, you have a competent, reliable consultant by your side at all times, who listens to your needs and presents a solution in your daily application language … crossing conventional boundaries and creating synergies between industries in pursuit of your ideal solution.

Systemhaus crews in Charlotte (USA), Suzhou (China), Dresden, Ingelfingen and Dortmund are continuously in innovation mode. They creatively engineer cost effective solutions to meet difficult process challenges for our customers.

Conceive & Innovate

Your project team starts working for you: from your reliable sales consultant, qualified industry specialists to dedicated system engineers – Bürkert puts the necessary experts together.

For the entire duration of the project they work together, combining their experience and clarifying all the requirements in close cooperation with you to come up with a feasible draft of your solution within the shortest timeframe.

CAD-created animations or simulations, combined with extended manufacturing, materials, tool design, construction and assembly knowledge enable us to pro-vide a rough but firm production concept for your system at an early stage.

Plan & Specify

In Phase 3 the project is planned in detail. A specification sheet and refined solution concept are developed. This defines exactly what you expect from the system and what it must provide to ensure that all components meet your requirements.

At the end of this phase you are presented with a detailed product definition, a production specification and precise commercial conditions and agreements.

Structured project management based on open communication, effective coordination and thorough documentation ensures fast and reliable results.

Do & Check

Good communication, coordination and documentation at all project phases make sure that we are on the right track, developing the right solution, to allow us to quickly move on to prototyping.

Thanks to the latest technology, we are able to build a prototype made of metal or plastic or a functional model, to test flow for example, within 24 hours.

We provide you with samples; we perform tests and, of course, obtain all the necessary local and global approvals to make sure the system can go to production.

From here we work in concert with one of our production facilities in Ingelfingen, Gerabronn, Criesbach, Öhringen or Triembach according to their individual core manufacturing competencies.

Complete

Our work does not end with the perfect delivery of components and systems. We offer a comprehensive program to our global clients interlinking services ranging from maintenance and service contracts operator training and integrated logistics.

Our customer service is available around the clock, offering support through internet, telephone or our qualified, experi-enced people at your site.

We aim to provide only the utmost in customer experience. Something you will tell your friends about.

Systems

Bürkert will provide you with total system solutions which are completely compliant. Our Quality Management Systems, Quality Assurance, Risk Assessment and Validation and Training all meet latest practices and combine with our manufacturing and engineering design teams to give you an optimum experience.

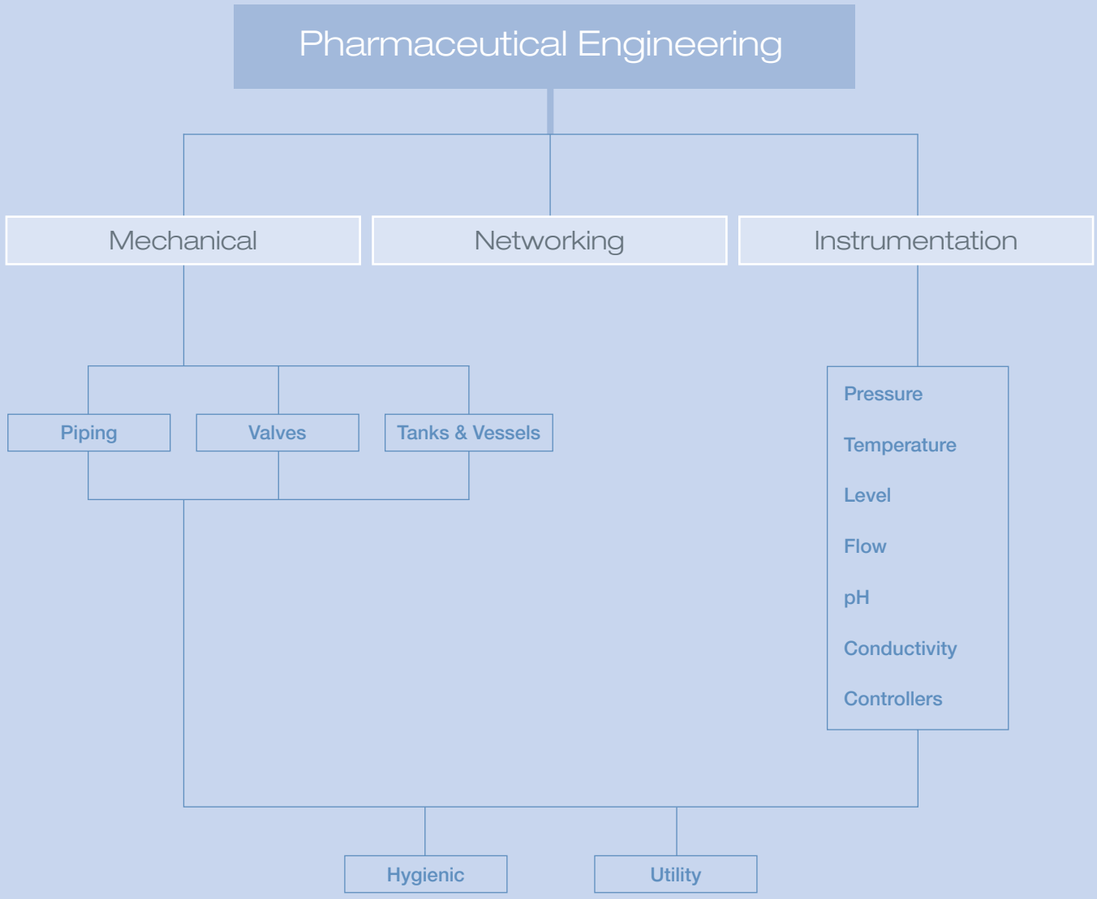
Our practical experience of qualitative and productive tools and techniques is put to use every day and is transferred into your ideal system solution.

When the consulting approach begins we are searching for the knowledge you possess that will allow us to apply these techniques and put our engineering skills and experience into practice. As we continue to consult, our closeness develops and a mutual trust and understanding brings us closer to realising exceptional system solutions which are tailor made to your process demands. Finally we have realised together a system solution which delivers results time and time again and proves to have a rewarding payback. And so we find the courage to continue as partners in the future and push the boundaries of engineering to enhance process performance and product yield for a successful future.

With more than 6 manufacturing locations, multiple Systemhaus facilities globally, more than 2500 employees and an own scope of supply which is unrivalled, we are almost certainly a partner that you will want to insist upon supporting your business development plans.

We make ideas flow.

Your Project – Where can we help?



Project Requirements

Type of Networking:

Application:

Material Specification:

Documentation:

Bürkert – Close to You

For up-to-date addresses
please visit us at
www.burkert.com.

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