

## 2/2 way Bellow Control Valve



Bellow valve  
+ Type 8696

Bellow valve  
+ Type 8693

- For neutral and aggressive media
- Media separation by PTFE bellow
- Hygienic design

The Type 2380 consists of the bellow valve and one of the controllers below:



**Type 8696**  
Positioner  
Basic



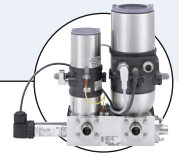
**Type 8694**  
Positioner  
Basic



**Type 8692**  
Positioner



**Type 8693**  
Positioner and  
Process Controller



**as system (e.g.)**  
Customized block  
variant

The bellow control valve is a pneumatically operated process valve with a single-acting diaphragm actuator.

A PTFE bellow ensures the separation between medium and actuator.

The materials used and the design of the media space allow the use under hygienic or aggressive conditions. It has a good cleanability. The combination with a controller (Type 869x) and the control cone integrated into the bellow enable the valve to handle demanding control tasks.

The space-saving actuator with low internal volume not only results in a very compact size but also in remarkably low response times. The valve is characterized by a good control performance due to the low-friction design and has a linear characteristic.

A certain variety of body and block system solutions are deliverable.

**Main fields of application:**

- Food & Beverage industry
- Pharmaceutical & Biopharmaceutical industry
- Cosmetic industry

Technical Data	
<b>K<sub>vs</sub> values</b>	0.4 to 2 m <sup>3</sup> /h
<b>Orifice</b>	DN3 to DN10
<b>Port connections (for media)</b>	<ul style="list-style-type: none"> <li>▪ Thread</li> <li>▪ Weld ends</li> <li>▪ Clamp</li> </ul>
<b>Media</b>	<b>gases and liquids</b> (ultrapure, sterile, dirty, aggressive, abrasive or even highly viscous), <b>steam</b> (for sterilization)
<b>Media temperature</b>	0 to +80 °C (-10 °C to +150 °C at limited operating conditions <sup>1)</sup> )
<b>Media pressure</b>	vacuum to 6 bar <sup>2)</sup>
<b>Ambient temperature</b>	-10 to +55 °C
<b>Seat leakage</b>	< 0.01 % of full open valve capacity (ANSI class IV)
<b>Control media</b>	air acc. to DIN ISO 8573-1 or neutral gases <ul style="list-style-type: none"> <li>▪ 5.5 to 7 bar<sup>2)</sup></li> <li>▪ threaded ports (G 1/8)</li> </ul>
<b>Materials, media contacting</b>	<ul style="list-style-type: none"> <li>▪ stainless steel 316L ASME BPE (1.4435 BN2)</li> <li>▪ advanced PTFE</li> <li>▪ Ra 1.6 µm</li> <li>▪ Ra 0.6 µm (mechanically polished) or</li> <li>▪ Ra 0.4 µm (electropolished)</li> </ul>
<b>Materials, not media contact.</b>	<ul style="list-style-type: none"> <li>▪ 304 (1.4301) or CF-8 (1.4308)</li> <li>▪ PPS, stainless steel</li> <li>▪ EPDM, FKM</li> </ul>

<sup>1)</sup> media pressure max. 4 bar  
up to +134 °C: max. 60 min, ambient temperature max. +40 °C,  
up to +150 °C: max. 30 min, ambient temperature max. +35 °C  
<sup>2)</sup> all pressure values are listed as **overpressure** relating to atmospheric pressure in bar

Technical Data (continued)	
Electrical Data / Settings	defined by the Type 869x used
Electrical connections	multipole connector cable gland (in dependence of the Type 869x used)
Electrical signals / communication	analogue standard signals bus communication (AS-i, DeviceNet, Profibus-DP) (in dependence of the Type 869x used)
Reaction / switching time	typical regulating time < 1 sec.
Protection class	IP65/67 acc. to EN 60529
Installation for self-draining	see Fig. 1 below
Certifications / approvals	CE acc. to EC Declaration of Conformity (2014/30/EU EMC) FDA EC Regulation No 1935/2004 USP class VI – 121 °C ATEX II Kat. 3 G/D (on request)

Controllers Type 869x that can be used with the bellow valve:

Type	Function	Communication	Display
8696	positioner	analogue	LEDs
8694	positioner	analogue or bus (AS-i)	LEDs
8692	positioner	analogue or bus (Profibus / DVN)	graphic display
8693	positioner and process controller	analogue or bus (Profibus / DVN)	graphic display

For more details see datasheets (DS) and user manuals (MA) of Type 869x on our homepage: [www.burkert.com](http://www.burkert.com)

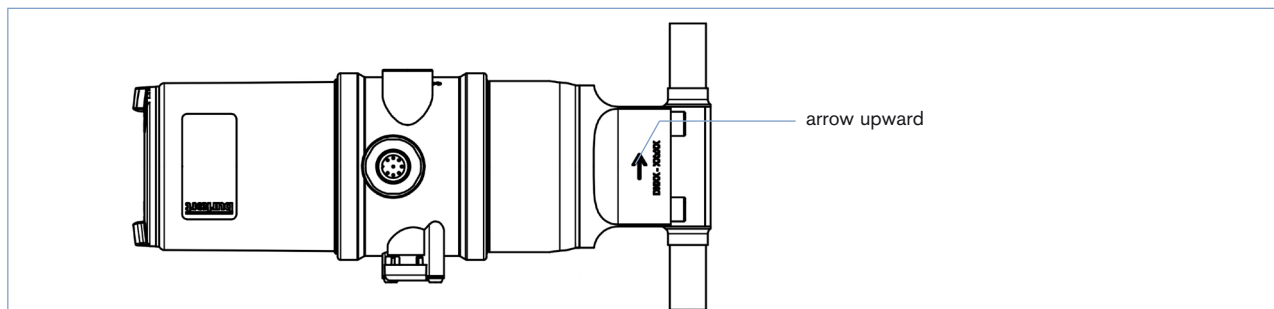


Fig. 1: Installation position for self-draining

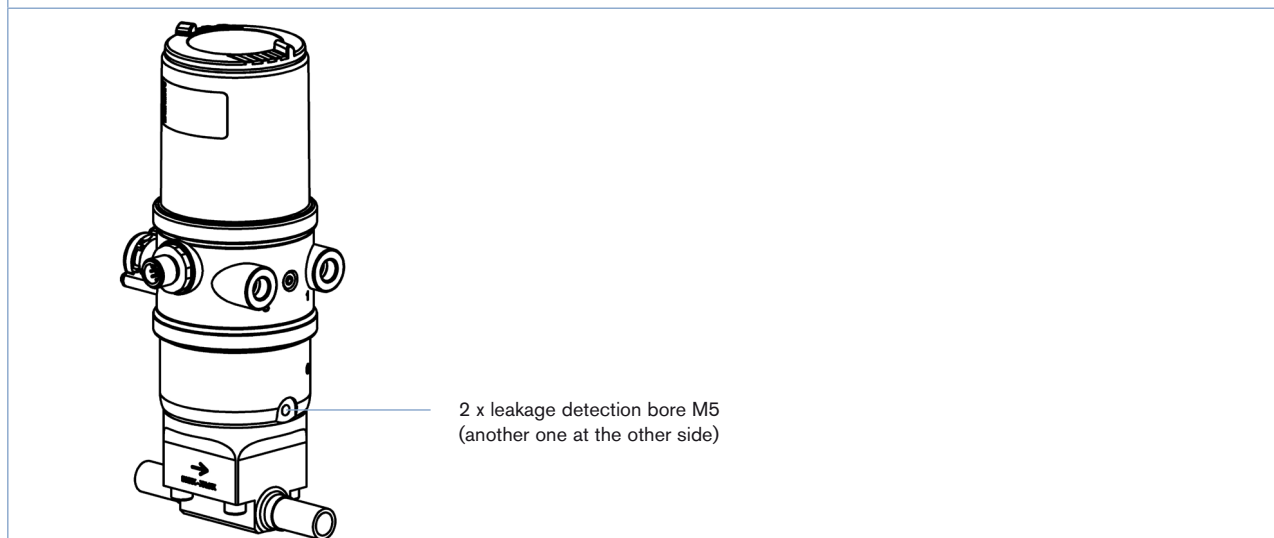
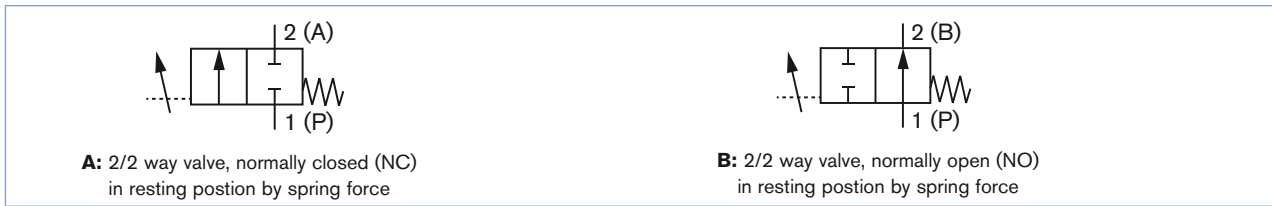


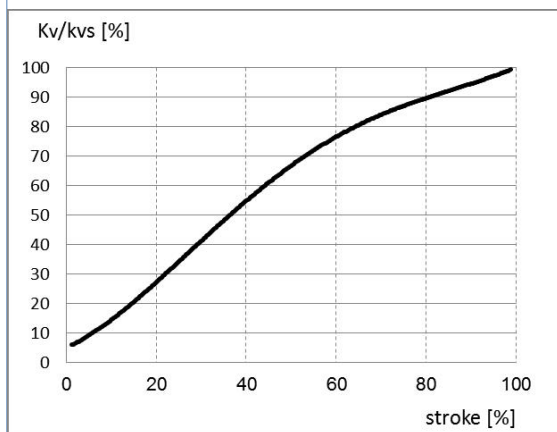
Fig. 2: Leakage detection bores

**Control functions**



**Flow characteristics and  $K_v$  values [m<sup>3</sup>/h]**

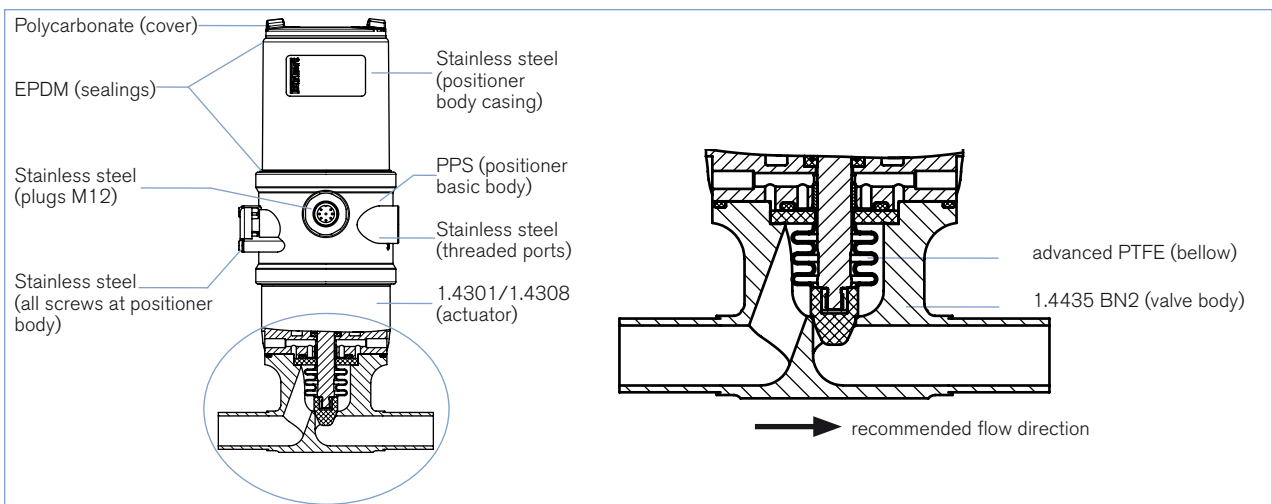
Port size (tube)		Orifice [mm]	Stroke [%]										
[mm]	ASME size		5	10	20	30	40	50	60	70	80	90	100 ( $K_{vs}$ )
6.35 × 0.89	¼"	DN3	0.08	0.11	0.15	0.23	0.29	0.32	0.36	0.37	0.38	0.39	0.41
6.35 × 0.89	¼"	DN4	0.11	0.14	0.23	0.27	0.3	0.34	0.39	0.43	0.45	0.47	0.49
8.0 × 1.0	-	DN6	0.12	0.22	0.41	0.5	0.61	0.69	0.77	0.84	0.9	0.93	0.95
12.7 × 1.65	½"	DN6	0.07	0.16	0.28	0.40	0.51	0.61	0.75	0.88	1.02	1.12	1.19
12.7 × 1.65	½"	DN8	0.25	0.35	0.63	0.91	1.1	1.22	1.36	1.44	1.52	1.57	1.64
12.7 × 1.65	½"	DN10	0.18	0.29	0.54	0.83	1.04	1.25	1.39	1.5	1.6	1.66	1.74
19.0 × 1.5	-	DN10	0.18	0.29	0.52	0.76	0.99	1.31	1.5	1.64	1.74	1.83	1.97



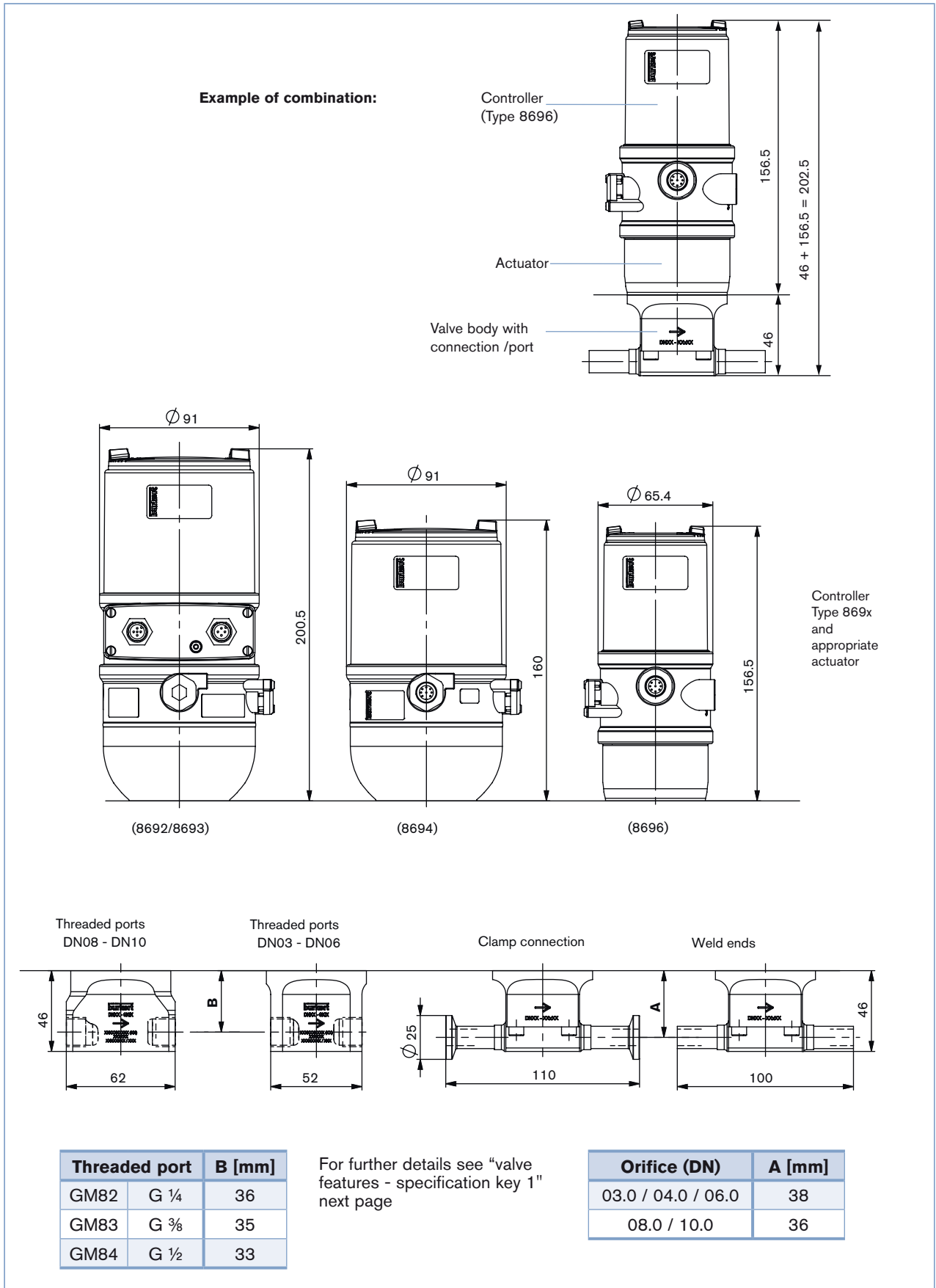
**Remarks on the flow characteristic**

Theoretical control ratio ( $K_{vs}/K_v$ ):  
 40 : 1 for the orifices DN8 to DN10  
 20 : 1 for the orifices DN6  
 10 : 1 for the orifices DN3 to DN4

**Materials**



Dimensions [mm] (for several combinations of control type and actuator + valve body)



**Bellow control valve Type 2380 - possible combinations**

The bellow control valve Type 2380 is a combination of a bellow valve and a controller Type 869x.

The range of control unit consists of:

- a digital electropneumatic Positioner Basic Type 8696
- a digital electropneumatic Positioner Basic Type 8694
- a digital electropneumatic Positioner Type 8692
- a digital electropneumatic Positioner/Process Controller Type 8693.

For the configuration of the bellow control valve Type 2380 please fill in the tables "Specification key 1 and 2" on pages 8 and 9 [go to page](#) as well as the "Request for quotation" on page 10. [go to page](#)



Bellow control valve Type 2380 - further information about TopControl Type 869x

Positioner TopControl Basic Type 8696



More info.

The compact positioner Type 8696 is designed for integrated mounting on pneumatic actuators from the process control valve series Type 23xx/2103 and specifically for the requirements of hygienic process environments. The operation and parameterisation are done via push buttons and DIP switches. Device configuration and parameterisation can be carried out easily by the Bürkert-COMMUNICATOR software tool via a PC interface.

**Features:**

- Hygienic stainless steel design according to EHEDG guidelines
- Contact and wearless analogue position sensor
- Universal positioning system for single and double-acting actuators

**Customer Benefits:**

- Simple design
- Simple and safe start-up by teach function
- High plant availability through increased drive life by spring chamber ventilation
- Little space requirement in the plant piping

Positioner TopControl Basic Type 8694



More info.



The compact positioner Type 8694 is designed for integrated mounting on pneumatic actuators from the process control valve series Type 23xx/2103 and specifically for the requirements of hygienic process environments. The operation and parameterisation are done via push buttons and DIP switches. Device configuration and parameterisation can be carried out easily by the Bürkert-COMMUNICATOR software tool via a PC interface.

**Features:**

- Hygienic stainless steel design according to EHEDG guidelines
- Contact and wearless analogue position sensor
- Universal positioning system for single and double-acting actuators
- AS-Interface Field bus communication

**Customer Benefits:**

- Simple design
- Simple and safe start-up by teach function
- High plant availability through increased drive life by spring chamber ventilation
- Little space requirement in the plant piping

Positioner TopControl Type 8692



More info.



The intelligent electro-pneumatic positioner Type 8692 is designed for integrated mounting on pneumatic actuators from the process control valve series Type 23xx/2103 and specifically for the requirements of hygienic process environments. The initialisation of the positioners can be automatically performed using Tune-Functions. The easy handling and the selection of additional software functions and parameterisation are done either on a big graphic display and keypad. Device configuration and parameterisation can be carried out easily by the Bürkert-COMMUNICATOR software tool via a PC interface.

**Features:**

- Hygienic stainless steel design according to EHEDG guidelines
- Contact and wearless analogue position sensor
- Universal positioning system for single and double-acting actuators
- Highly dynamic positioning system without internal control air consumption
- Integrated diagnostic functions for valve monitoring
- Ensuring failure of the electrical or pneumatic power supply
- Profibus DPV1 or DeviceNet Field bus communication (optional)

**Customer Benefits:**

- Intuitive and easy operation via the large graphic display with backlight and keypad
- Automatic initialisation of positioners and process controllers using TUNE function
- High plant availability through increased drive life by spring chamber ventilation
- Guaranteed reliability and services can be scheduled through valve monitoring and diagnosis

Positioner & Process Controller TopControl Type 8693



More info.



The intelligent process controller Type 8693 is designed for integrated mounting on pneumatic actuators from the process control valve series Type 23xx/2103 and specifically for the requirements of hygienic process environments. The initialisation of the process controller and positioners can be automatically performed using Tune-Functions. The easy handling and the selection of additional software functions and parameterisation are done either on a big graphic display and keypad. Device configuration and parameterisation can be carried out easily by the Bürkert-COMMUNICATOR software tool via a PC interface.

**Features:**

- Hygienic stainless steel design according to EHEDG guidelines
- Contact and wearless analogue position sensor
- Universal positioning system for single and double-acting actuators
- Highly dynamic positioning system without internal control air consumption
- Integrated diagnostic functions for valve monitoring
- Ensuring failure of the electrical or pneumatic power supply
- Profibus DPV1 or DeviceNet Field bus communication (optional)

**Customer Benefits:**

- Intuitive and easy operation via the large graphic display with backlight and keypad
- Automatic initialisation of positioners and process controllers using TUNE function
- High plant availability through increased drive life by spring chamber ventilation
- Guaranteed reliability and services can be scheduled through valve monitoring and diagnosis
- Outstanding price/performance ratio

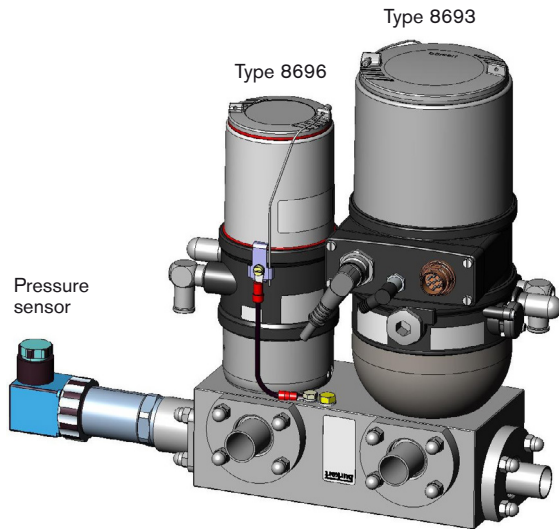
Example of a system solution

**Pressure control unit**

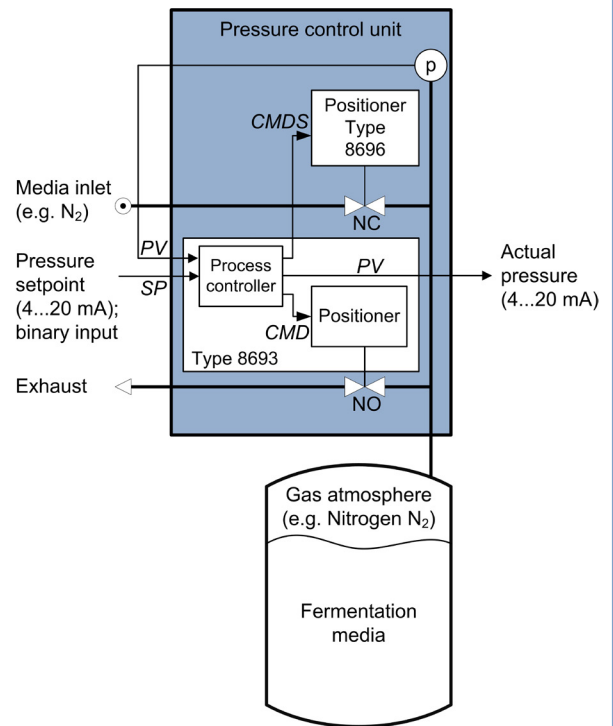
(control of gas pressure cushion in liquid tanks)

block solution with:

- actuator NC (Type 8696)
- actuator NO (Type 8693)
- pressure sensor



**Function diagram**



Valve features, specification key 1

Example

2380 N A 10.0 EE VI SA41 E I 0 0

Specification key 1

(Please make a choice)

TYPE OF CONTROL (+ actuator)	
N	Type 8696
L	Type 8694
I	Type 8692
J	Type 8693

CONTROL FUNCTION	
A	NC - normally closed
B	NO - normally open

ORIFICE [mm]	
03.0	
04.0	
06.0	
08.0	
10.0	
0000	without bellow for devices without valve body

SEALING MATERIAL	
00	without bellow for devices without valve body
EE	PTFE

VALVE BODY MATERIAL	
00	for devices without valve body
VI	1.4435 acc. to BN <sub>2</sub> (others on request)

APPROVAL	
0	without
1	with (select the relevant "Variable code" at "specification key 2" at next page)

COMMUNICATION		
0	no bus communication	
D	DeviceNet	only for Type 8692 or 8693
Y	Profibus DP-V1	
C	AS-i (62 slaves, analogue profile)	only for Type 8694

additional INPUTS/OUTPUTS	
0	no additional in-/output (only for bus communication)
H	1 binary input
I	1 binary input + 1 analogue output
F	1 binary input + 1 analogue output + 2 binary outputs (only for Types 8692 and 8693)
K	16-bit feedback via bus (only AS-i)

POWER SUPPLY	
E	24 V DC
3	via bus (only AS-i)

Orifice	THREADED PORTS		PORT CONNECTION WELD END		
	DIN ISO 228-1	DIN 11850 S. 0	DIN 11866 S. A / DIN 11850 S. 2	DIN 11866 S. B / ISO 4200	DIN 11866 S. C / ASME BPE
DN3	GM82 (G ¼)	SC40 6.0 × 1.0			SA90 ¼" (6.35 × 0.89)
DN4	GM82 (G ¼)	SC40 6.0 × 1.0			SA90 ¼" (6.35 × 0.89)
DN6	GM83 (G ⅜)	SC41 8.0 × 1.0		SA78 10.2 × 1.6	SA91 ⅜" (9.53 × 0.89)
DN8	GM83 (G ⅜)	SC42 10.0 × 1.0	SD40 13.0 × 1.5	SA40 13.5 × 1.6	SA92 ½" (12.7 × 1.65)
	GM84 (G ½)		SD42 19.0 × 1.5	SA41 17.2 × 1.6	SA93 ¾" (19.05 × 1.65)
DN10	GM83 (G ⅜)		SD40 13.0 × 1.5	SA40 13.5 × 1.6	SA92 ½" (12.7 × 1.65)
	GM84 (G ½)		SD42 19.0 × 1.5	SA41 17.2 × 1.6	SA93 ¾" (19.05 × 1.65)

0000 - code for devices without valve body;  
other connections (e.g. clamp connection) / port sizes on request



Valve features, specification key 2

Example

PL02    MP NO17

Specification key 2

(Please make a choice)

PL02

VARIABLE CODE (select as many as required)	
PL02	suitable for food (conform to FDA and EC regulation 1935/2004)
MK04	customer specific software settings
PX03	with approval / certification for ATEX II 3 GD
	others on request

ELECTRICAL CONNECTION	
KD	with cable gland (not for Type 8696 and not for bus communication)
MP	with multipole connection (not for Type 8694 with AS-i)
SK	flat cable clip with 1 m cable (only for AS-i)

SURFACE FINISH	
NO13	without further surface finish (Ra = 1.6 µm)
NO17	inner surface electropolished (Ra = 0.4 µm - for weld-end)
NO23	inner surface mechanically polished (Ra = 0.6 µm - for weld-end)

Spare part sets / order number

Orifice	Article no. of spare part set
DN3	796530
DN4	796531
DN6	796532
DN8	796533
DN10	796534

Each set contains:  
1 x O-ring 20 x 2,5  
1 x O-ring 52 x 2  
1 x bellow DNx

You can fill out the fields directly in the PDF file before printing out the form.

**Bellow control valve - request for quotation**

Please fill out this form and send to your local Bürkert Sales Centre with your inquiry or order

Company		Contact person	
Customer no.		Dept.	
Address		Tel./Fax	
Town / Postcode		E-Mail	

= Mandatory fields

Quantity

Desired date of delivery (YYYY-MM-DD)

**Process / operating data**

<input type="checkbox"/>	Type of process medium	<input type="checkbox"/> Liquid	<input type="checkbox"/> Gas	<input type="checkbox"/> Steam (only for sterilisation)
<input type="checkbox"/>	Process medium			
		min.	standard	max.
<input type="checkbox"/>	Flow rate (Q, Q <sub>N</sub> , W) <sup>1)</sup>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Temperature at valve inlet	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Pressure <sup>2)</sup> at valve inlet P1	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Pressure <sup>2)</sup> at valve outlet P2	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Steam pressure P <sub>v</sub>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Kinematic viscosity (ν)	<input type="text"/>	mm <sup>2</sup> /s or cSt	
	Dynamic viscosity (η)	<input type="text"/>	mPa·s or cP	
	Standard density	<input type="text"/>	kg/m <sup>3</sup>	

1) Standard unit: Liquid Q = m<sup>3</sup>/h | Gas Q<sub>N</sub> = Nm<sup>3</sup>/h | Steam W = kg/h  
2) Note: state all pressure values as **overpressure** relating to atmospheric pressure in bar

**Valve features**

**Specification key 1**

*(automatically transferred from page 8)*

**Specification key 2**

*(automatically transferred from page 9)*

**Certifications, required**

<input checked="" type="checkbox"/>	CE acc. to EC Declaration of Conformity (2014/30/EU EMC)	<input checked="" type="checkbox"/>	USP class VI – 121 °C
<input checked="" type="checkbox"/>	FDA		ATEX II Kat. 3 G/D
<input checked="" type="checkbox"/>	Regulation (EC) No 1935/2004		

**Remarks / comments:**

**i Further versions on request** Reset Form

To find your nearest Bürkert facility, click on the orange box → [www.burkert.com](http://www.burkert.com)

DTS 1000274158 EN Version: E Status: RL (released | freigegeben | validé) printed: 01.02.2018