bürkert
FLUID CONTROL SYSTEMS

Electromotive process valve - 2 way globe control valve

- high precise and fast flow control
- several Kvs value per port size due to removable trim kit
- weather, impact and vibration resistant design
- easy cleaning by its design according hygienic demands
- position controller und process controller available

Options

Touch Display

SAFEPOS
energy-pack

Type 3360
for highest control accuracy

Modbus
EtherNet/IP
PROFINET

Fieldbus

FDA

powered by
EDIP

The innovative process controller Bürkert valve Type 3361 is the solution when it comes to demanding control tasks and operating conditions. The electromotive actuator with ball screw positions the control cone with highest precision. A unique feature is its high positioning speed of 6 mm/s, that reacts quasi delay-free to process signals, and can be varied according to customer demands. Pressure variations or shocks in the medium aren´t transferred to the valve position. Each flow optimized valve housing can be equipped with up to 5 different valve seats for a precise adaptation according to customer needs. If necessary, the safety position can be approached by an optional energy storage in case of power failure. Actuator and valve are adapted perfectly to each other with closed design and robust surface. This ensures the hygienic requirements of a fast and residue-free cleaning. Harsh environment are no problem for the Type 3361 because of the protection class IP65 / IP67 and its high impact and vibration resistance. Unrivalled cycle life and sealing integrity is guaranteed by the proven self adjusting spindle packing with exchangeable V-seals. The fieldbus suitable Type 3361 provides many helpful functions for process monitoring, valve diagnostics and predictive maintenance and thus offers the decisive advantage of a modern process automation.
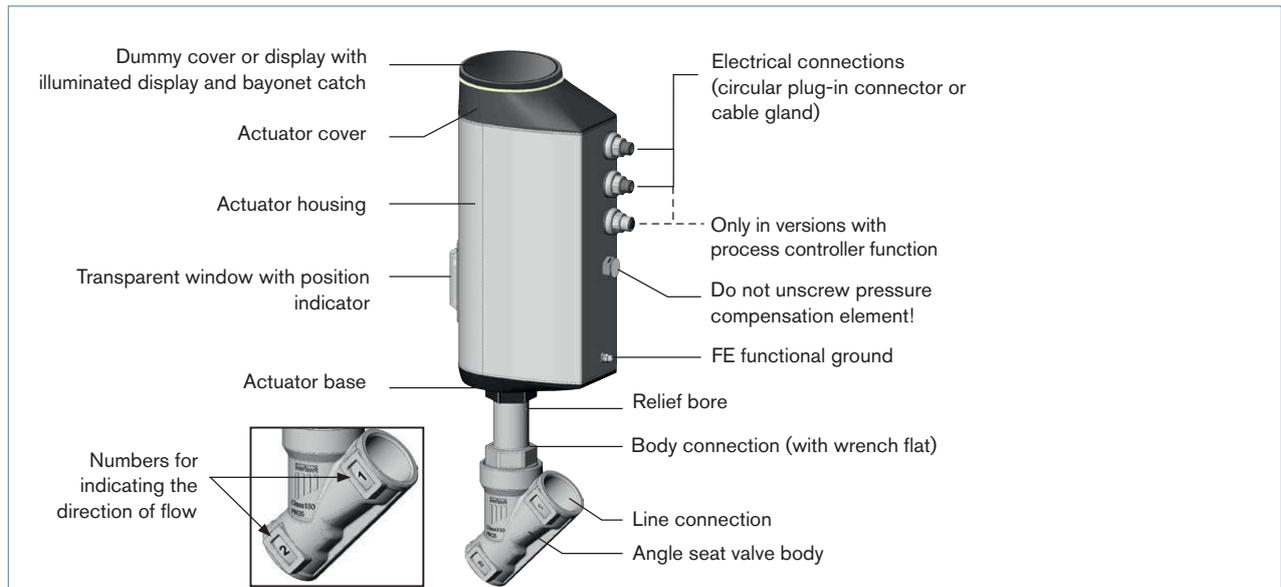
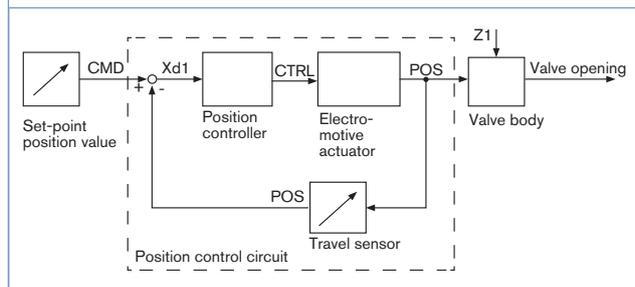| Technical data	
Kvs-Werte	0.4 … 37 m³/h
Port and seat size	DN 10 … DN 50 / D3 … DN 50
Operating pressure	16 bar / 1600 kPa / 232 psi
Port connections	
▪ Flange	▪ DIN EN 1092-1, ANSI B 16.5, JIS 10K
▪ Thread	▪ G, RC, NPT (EN ISO 228-1, ISO 7/1 /DIN EN 10226-2, ASME B 1.20.1)
▪ Weld ends	▪ EN ISO 1127 / ISO 4200, DIN 11850 R2, ASME BPE, BS 4825-1, SMS 3008
▪ Clamp	▪ ISO 2852, DIN 32676, ASME BPE, BS 4825
Medium	Neutral Gas, water, alcohol, oil, fuels, hydraulic mediums, salt solution, alkali solutions, organic solvents, steam
Viscosity	max. 600 mm²/s
Media temperature	-10…+185 °C (seat sealing steel/steel)
	-10…+185 °C (seat sealing PEEK/steel)
	-10…+130 °C (seat sealing PTFE/steel)
Ambient temperature	-25 °C … +65 °C (without touch display)
	-25 °C … +60 °C (with touch display)
	-25 °C … +55 °C (with SAFEPOS energy storage)
	Note: Derating see temperature chart
Seat leakage according to IEC 534-4/EN 1349	Shut-off class III and IV for steel/steel
	Shut-off class VI for PTFE/steel and PEEK/steel
Safety position at power failure	with SAFEPOS energy-pack: opened, closed or free programmable
	without SAFEPOS energy-pack: blocked in last position
Power supply	24 V DC +/- 10% (max. residual ripple 10%)
Closing time (100% stroke)	3.3 … 4.5 s (depending on stroke)
Travel speed	6 mm/s
Deadband (min.)	0.1% (DN20 or bigger)
	0.2% (DN10, DN15)
Duty cycle	100%
Protection class	IP65 / IP67
Controller type	Position controller or process controller
Analogue control	Setpoint: 0-20 mA, 4-20 mA, 0-5 V, 0-10 V actual value optional
Digital control (fieldbus)	EtherNet/IP, Modbus/TCP, Profinet (on request)
Vibration, sinusoidal	5 g according to IEC 60068-2-6 Test Fc
Shock, mechanical	50 g according to IEC 60068-2-27 Test Ea
Approval and Conformity	EGV 1935/2004 (standard)
	FDA (optional)

Structure and function

The electromotive linear actuator consists of a brushless direct current motor, gears and a threaded spindle. The valve spindle, which is connected to the threaded spindle, transfers the force to the control cone. The electronic control system is actuated either via standard signals (analog) or via a field bus (digital). Optionally there is the energy pack (SAFEPOS energy-pack) for the device. If the supply voltage fails, the energy pack supplies the actuator with the required energy to move the valves into the required position which can be adjusted via a menu.

The valve position can be manually changed in 2 ways. Either over an electrical manual control or over mechanical manual control, if no supply voltage applied. The device can be set and operated either via 2 capacitive buttons and 4 DIP switches or optionally on a display with touch-screen. There is also the option of setting the device via the büs Service interfache and by using the PC software "Bürkert-Communicator".

The intelligent process valve Type 3360 offers the operator options for process monitoring, valve diagnostics and predictive maintenance. Internal measurements for the operating state are evaluated and, if issued as a warning or error message. This signal, for example, undue environmental and process conditions, functional deviations of components or the state of the energy accumulator. Internal measurements for operating state are evaluated and, possible a warning or error message is issued. This signal indicates, for example, bad environmental and process conditions, functional deviations of components or the state of the energy accumulator. A special feature of the globe control valve is the screwed valve seat which can be replaced to reduce the nominal diameter.


Dummy cover or display with illuminated display and bayonet catch

Actuator cover

Actuator housing

Transparent window with position indicator

Actuator base

Numbers for indicating the direction of flow

Electrical connections (circular plug-in connector or cable gland)

Only in versions with process controller function

Do not unscrew pressure compensation element!

FE functional ground

Relief bore

Body connection (with wrench flat)

Line connection

Angle seat valve body

Structure, electromotive straight seat control valve Type 3361

Integrated position controller

The position of the actuator (stroke) is regulated according to the set-point position value. The set-point position value is specified either by an external standard signal (analog) or via a field bus (digital). The travel sensor records the actual position (POS) of the electric linear actuator. The position controller compares this actual position value with the set-point position value (CMD) which is defined as standard signal. If there is a control difference (Xd1), the electromotive actuator is controlled via the CTRL variable and the actual position value is changed accordingly.
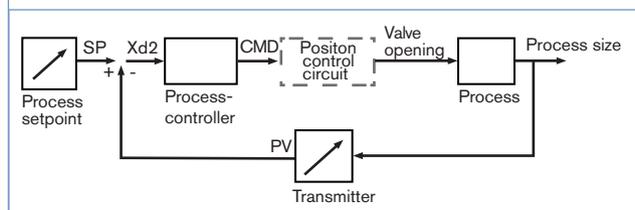

Integrated process controller

By implementing a PID controller can a process control be carried out. From the external signal (z.B. level, pressure, flow , temperature) the process setpoint and the actuals process value is calculated on the control parameters (PID controller) for the target postion of the valve.

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Structure and function, continued

SAFEPOS
energy-pack
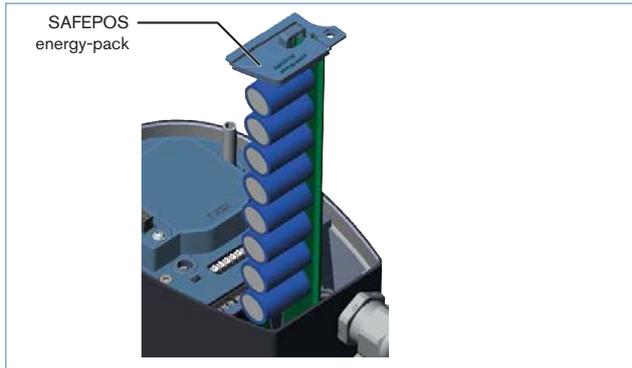
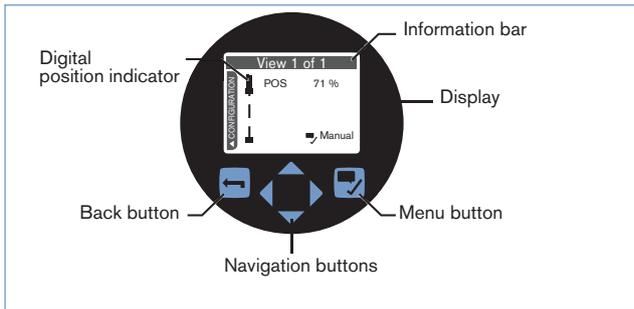**Safety position with energy storage (Option)**

The safety starting positions in case of power interruption is realized with the optional energy storage SAFEPOS energy-pack. The desired position is adjusted from the menu. Here any intermediate position can be defined in addition to the end positions (NO / NC). The energy storage has a lifespan of up to 10 years, depending on the operating conditions. The power of the energy storage is monitored and a warning is displayed to indicate its life is coming to an end. The memory is designed as a plug-in module making it easy to exchange. Without energy storage, the valve remains in the last position. The energy storage is fully charged after maximum 100 seconds (depending on the operating conditions) and ready to use.

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Controls and indicators

Dummy cover disclosed

SIM card

DIP switch *

büS Service interface

OPEN button *

CLOSE button*

Mechanical manual control
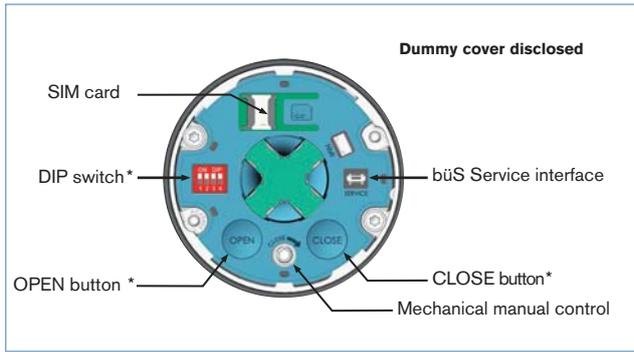
Devices without display module

In the version without control display the basic functions are operated by 4 DIP switches and 2 pushbuttons. These are located under the dummy cover which can be removed manual by turning. Through the büS service access, the device can also be configured in detail with the Bürkert communicator software. For this, the optional USB-büS interface kit is required.

Digital
position indicator

Information bar

View 1 of 1

POS   71 %

CONFIGURATION

Manual

Display

Back button

Menu button

Navigation buttons

Robust display with control buttons (optional)

The robust display module is easy to use, it configurates and displays all the required functions. In addition to the start screen you can also switch to the configuration view and user-specified views as needed. All functions of the device without display module like büS-Service interface are available too.

OPEN button

CLOSE button

Mechanical manual override
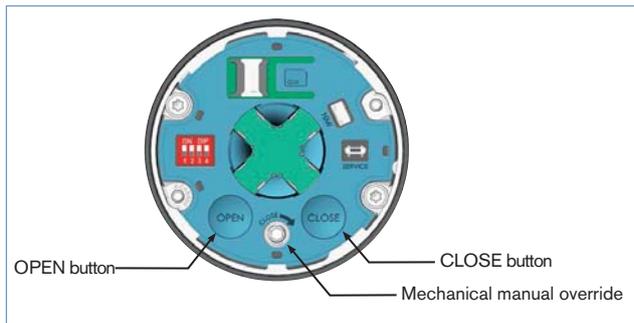
Manual and electrical operation

The manual override for mechanical operation of the valve is located under the dummy cover or the display module.
Electrical manual override for the procedure is carried out directly on the touch screen, or in the version without a display by two buttons below the dummy cover.

LED illuminated ring

360°- LED Illuminated ring

To display the device status, the valve timing and the operating condition a visible 360° LED illuminated ring is mounted around the dummy cover or the display module. The LED ring lights up, flashes or flashes in one or different colors. Depending on customer requirements 4 different LED modes can be selected (Namur mode, valve mode without warnings, valve mode with warnings, LED off)

Mechanical
position indicator

Valve open

Valve closed
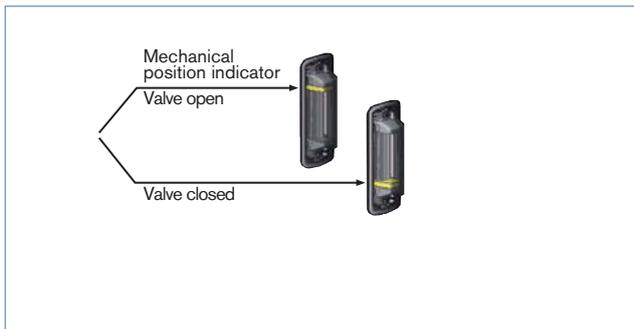
Mechanical position indicator

The mechanical position indicator also indicates when the supply voltage of the current valve position fails

Controls and indicators, continued

SIM card holder
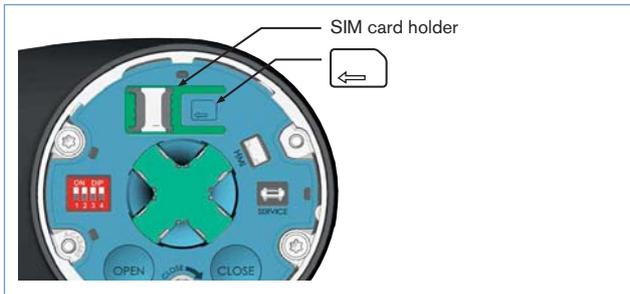
SIM card as data storage (option)

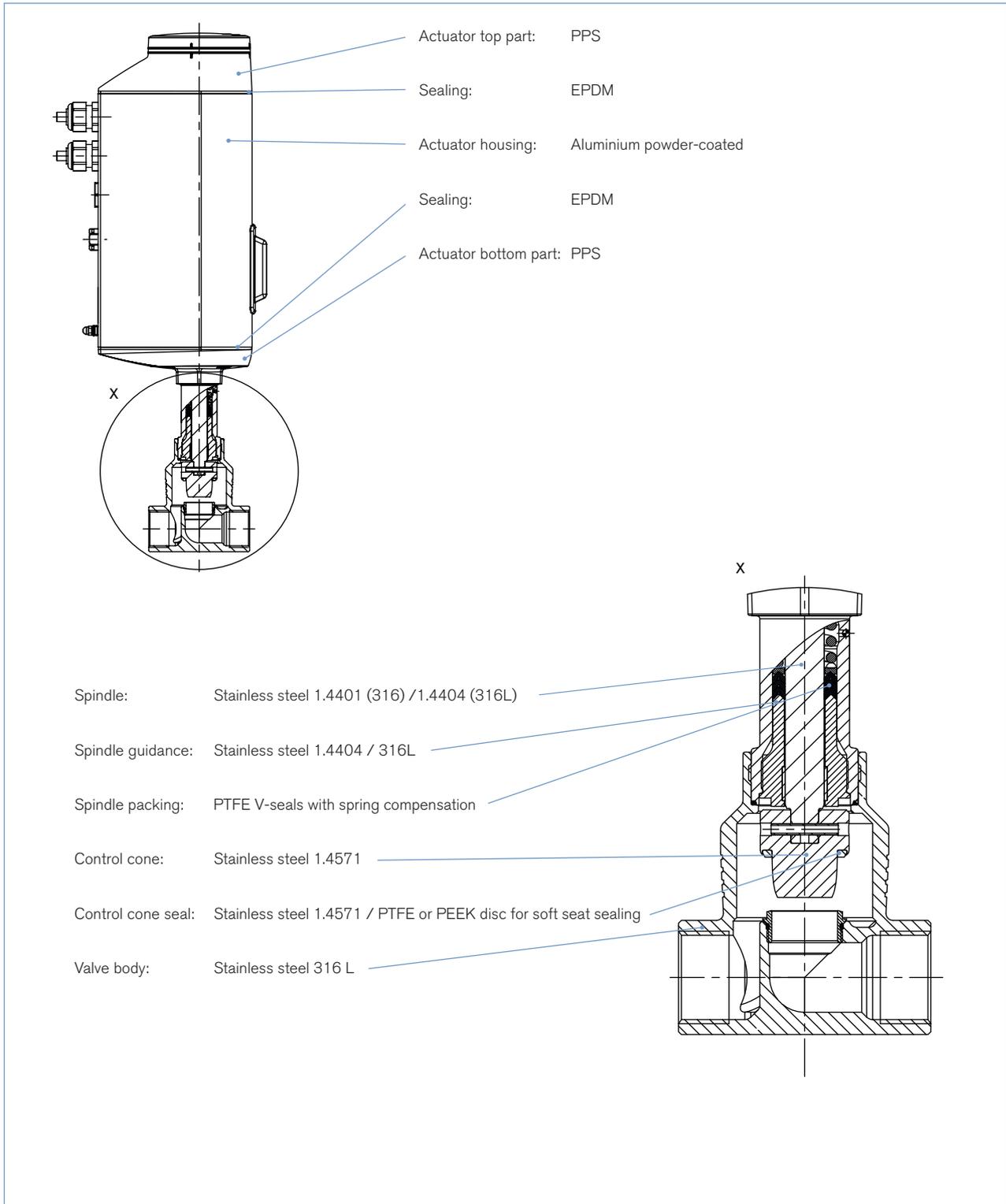With the SIM card optional device-specific values and user settings can be saved and quickly transferred to another device.

büS service interface
Connection for CAN adapter or
USB-büS interface set
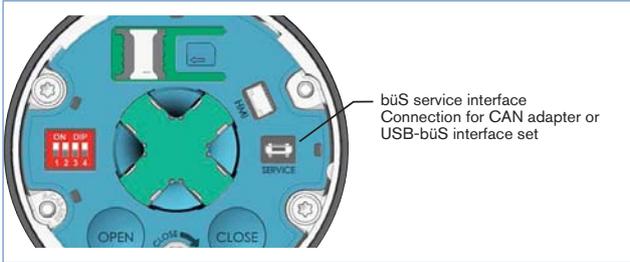
büS service interface

The büS service interface connects the device to the communicator software on a PC, laptop or smartphone. From there, a configuration of the device or failure diagnosis can be performed.

Design and materials view

Actuator top part: PPS

Sealing: EPDM

Actuator housing: Aluminium powder-coated

Sealing: EPDM

Actuator bottom part: PPS

X

X

Spindle: Stainless steel 1.4401 (316) / 1.4404 (316L)

Spindle guidance: Stainless steel 1.4404 / 316L

Spindle packing: PTFE V-seals with spring compensation

Control cone: Stainless steel 1.4571

Control cone seal: Stainless steel 1.4571 / PTFE or PEEK disc for soft seat sealing

Valve body: Stainless steel 316 L

Note: The globe control valve **Type 3361** could be delivered with miscellaneous port connection (thread, weld ends and clamp), there are not be represented in the picture, but are made with same material as the valve body.
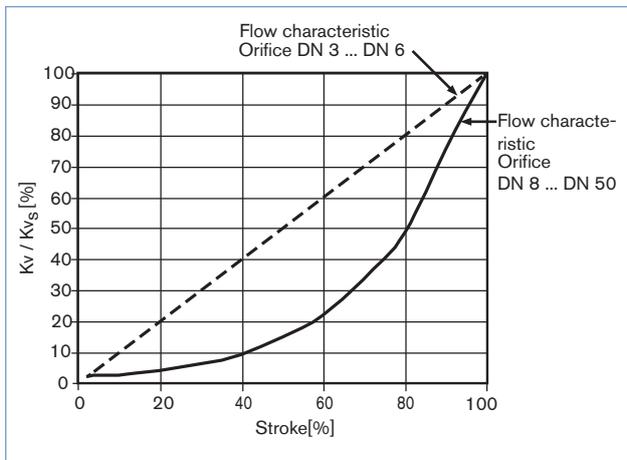
Technical data

Temperature chart

The maximum allowable ambient temperature and media temperature influence each other. The maximum allowable temperature curves of different device variants can be seen in the temperature chart.
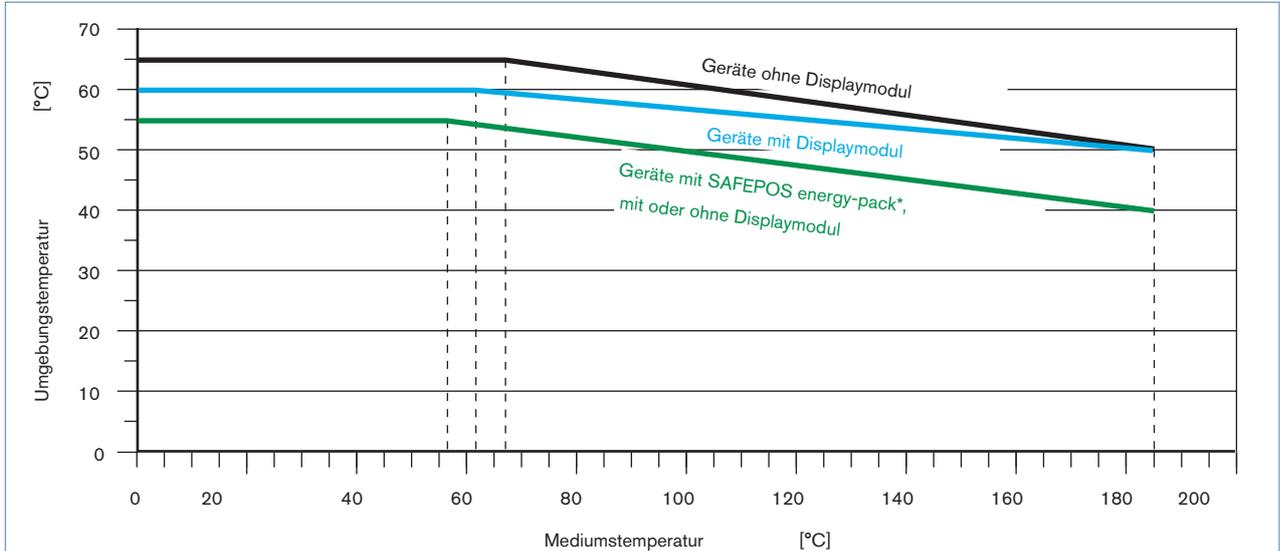
Flow characteristic

The straight seat control valve shows different characteristics depending on the orifice.

- Equal percentage of parabolic cone for valve seats with orifice DN 8… DN 50

- Linear cone for valve seats of the orifice DN 4 and DN 6, flow characteristic according to DIN / IEC 534-2-4

- Theoretical setting ratio (KvS: Kv0)

    Orifice DN 8…DN 50: 50: 1
    Orifice DN 6: 25: 1
    Orifice DN 4: 10: 1

- KvR value[9] at 5% of the stroke for DN > 10 mm
    KvR value at 10% of the stroke for DN ≤ 10 mm

Selection chart for seat sealing

Seat sealing type steel / steel is recommended for shut-off class III and IV.

Seat sealing with PTFE is used for shut-off class VI, if fluid temperature is <130 °C. If the maximum fluid temperature exceeds 130°C temporarily or permanently, then PEEK is used for seat sealing.

[9] KvR value= the smallest KV value at which the angularity tolerance according to DIN / IEC 534-2-4 can still be maintained.

Technical data, continued

Flow below seat

Port connection (tube)		Seat size		Operating pressure seal/conical seat			Leakage class seal / conical seat		Kv value with stroke [m³/h]						Kvs value
				stainless steel/stainless steel [bar]	PTFE/stainless steel [bar]	PEEK/stainless steel [bar]	stainless steel/stainless steel	PTFE o. PEEK/stainless steel							
[mm]	[inch]	[mm]	[inch]						5%	10%	30%	50%	70%	90%	[m³/h]
10	3/8	3	0.12	16	-	-	IV	-	0.001	0.003	0.015	0.037	0.065	0.090	0.1
		4[1]	0.16						0.00	0.02	0.10	0.19	0.27	0..33	0.35
		4	0.16						0.04	0.05	0.16	0.27	0.36	0.44	0.5
		6[2]	0.24						0.05	0.12	0.48	0.76	0.98	1.13	1.2
		6[3]	0.24						0.01	0.007	0.045	0.16	0.41	1.08	1.25
		8	0.31						0.06	0.07	0.12	0.26	0.61	1.50	2.0
		10	0.39						0.09	0.11	0.19	0.48	1.00	2.30	2.7
15	1/2	3	0.12	16	-	-	IV	-	0.001	0.003	0.015	0.037	0.065	0.090	0.1
		4[1]	0.16						0.005	0.015	0.100	0.190	0.265	0.325	0.35
		4	0.16						0.04	0.05	0.16	0.27	0.36	0.44	0.5
		6[2]	0.24						0.05	0.12	0.48	0.76	0.98	1.13	1.1
		6[3]	0.24						0.005	0.007	0.045	0.160	0.410	1.080	1.25
		8	0.31						0.07	0.08	0.13	0.27	0.63	1.60	2.1
		10	0.39						0.09	0.11	0.19	0.49	1.10	2.50	3.1
		15	0.59						0.14	0.17	0.35	0.80	1.80	3.70	4.3
20	3/4	10	0.39	16	-	-	IV	-	0.11	0.12	0.20	0.52	1.20	2.60	3.2
		15	0.29						0.14	0.17	0.35	0.80	1.80	4.00	5.2
		20	0.79	16	16	10	IV	VI	0.20	0.25	0.45	1.10	2.40	5.20	7.1
25	1	15	0.29	16	-	-	IV	-	0.14	0.17	0.35	0.80	1.80	4.10	5.3
		20	0.79	16	16	10	IV	VI	0.2	0.25	0.47	1.10	2.50	5.40	7.2
		25	0.98						0.35	0.38	1.00	2.20	5.10	9.40	12.0
32	1 1/4	20	0.79	16	16	10	IV	VI	0.22	0.25	0.50	1.10	2.50	5.80	8.0
		25	0.98						0.40	0.47	1.10	2.50	5.40	10.3	13.0
		32	1.3						0.48	0.60	1.30	3.10	6.80	14.0	17.8
40	1 1/2	25	0.98	16	16	10	IV	VI	0.40	0.50	1.10	2.60	5.60	10.7	13.6
		32	1.3						0.48	0.60	1.30	3.20	6.90	15.0	20.2
		40	1.6	10	10	6	III	VI	0.60	0.70	1.70	4.00	9.20	18.2	23.8
50	2	32	1.3	16	16	10	IV	VI	0.48	0.60	1.30	3.20	6.90	16.0	21.0
		40	1.6	10	10	6	III	VI	0.60	0.70	1.70	4.00	9.20	18.9	24.6
		50	2.0	6	6	-	III	VI / -	0.90	1.10	2.90	6.80	15.5	29.3	37.0

[1] low flow
[2] linear
[3] equal percentage

Electrical control

S. 9

Electrical data	
Protection class	3 acc. to DIN EN 61140
Electrical connections	Cable gland, 2 x M20 or 2 circular plug-in connector M12, 5-pin and 8-pin, 1 circular plug-in connector M12, 5-pin (only by process controller)
Operating voltage	24 V DC ± 10% max. residual ripple 10%
Operating current [A]*	max. 3 A including actuator at max. load and charging current of the optional SAFEPOS energy-pack (charging current approx. 1 A)
Lifelong energy storage SAFEPOS energy-pack	up to 10 years (depending on operating conditions)
Electronic without actuator [W]*	min. 2 W, max. 5 W
Control	
Input analogue:	galvanically isolated from the supply voltage and analog output 0/4…20 mA (input resistance 60 Ω) 0…5/10 V (input resistance 22 kΩ)
Analogue actual value input **4…20 mA**	Input resistance: 60 Ω Resolution: 12 bits
Frequency	Measurement range: 0…6500 Hz Input resistance: > 30 kΩ Resolution: 1‰ of measurement value Input signal: > 300 mVss Waveform: Sine wave, rectangle wave, triangle wave Measurement range: −20 to +220 ℃
Pt 100	Resolution: < 0.1 ℃ Measurement current: 1 mA
Output analogue:	Max. current 10 mA (for voltage output 0…5/10 V) Bürde (Last) 0…560 Ω (for current output 0/4…20 mA)
Output digital:	current limit 100 mA
Input digital:	0…5 V = log "0", 10…30 V = log "1" inverted input reversed accordingly
Communication interface:	Connection to PC via USB büS interface set
Communication Software:	Bürkert communicator
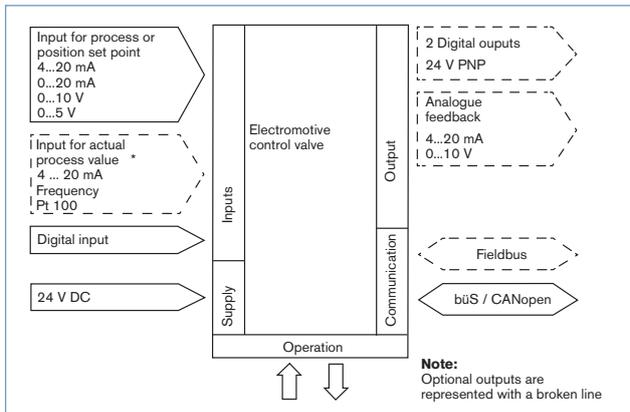
Electrical control and interface

The position of the actuator is regulated according to the set-point position value. The set-point position value is specified either by an external standard signal (analog) or via a field bus (digital).

Analogue Control

For analogue control 2 variants are available for the inputs and outputs and the connection interface

Input and output:
* 1 analogue input, 1 binary input
* 1 analogue input, 1 binary input, 1 analogue output, 2 binary output (option)
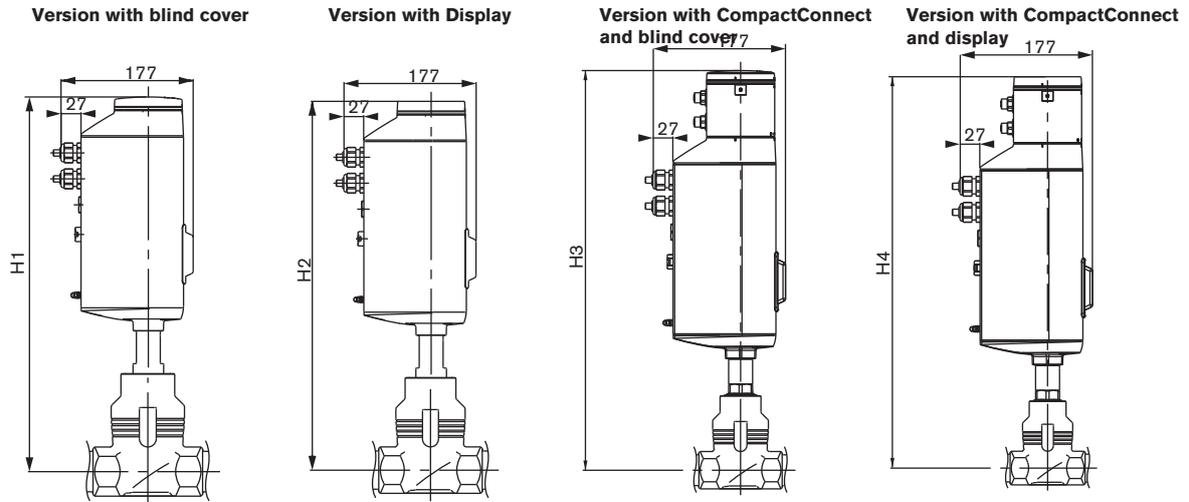 1 input for process actual value (for process controller version)

Interface:
* cable gland with connection terminal
* M12 circular connectors M12 (option)

Fieldbus: EtherNet/IP, PROFINET, Modbus TCP (option)

The Fieldbus Gateway for EtherNet / IP, PROFINET and Modbus TCP is integrated into a special module. It has 2 fieldbus connections with 4-pin M12 circular connectors. Under the gateway housing cover are the interfaces for the fieldbus connection and status LEDs. If there is a need to be include it in a network then the configuration of the Ethernet can be performed via the web server.

S. 9/16

Dimensions [mm] - valve Type 3361 and valve system

Version with blind cover

177

27

H1

Version with Display

177

27

H2

Version with CompactConnect and blind cover

177

27

H3

Version with CompactConnect and display

177

27

H4

Side view

95

Port size	Height [mm]			
[mm]	H1	H2	H3	H4
10	417	417	489	489
15	417	417	489	489
20	423	423	496	496
25	446	446	518	518
32	474	474	546	546
40	479	479	551	551
50	485	485	557	557
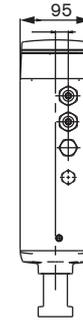
Dimensions [mm] - valve body of Type 3361

Flange connection
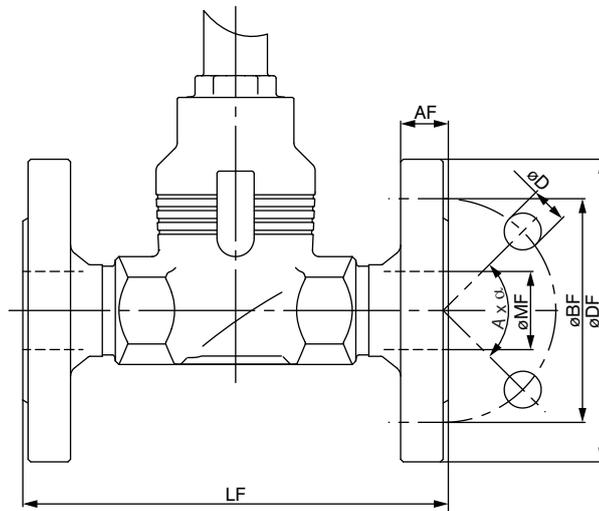
DIN EN 1092, JIS 10K

Port size (tube)	DIN EN 1092 FTF series 1 acc. to DIN EN 558-1						JIS 10K FTF series 10 acc. to DIN EN 558-2					
[mm]	ø DF	LF	ø BF	AF	ø D	ø MF	ø DF	LF	ø BF	AF	ø D	ø MF
10	90	130	60	16	14	13.6	–	–	–	–	–	–
15	95	130	65	16	14	18.1	95	108	70	12	15	18.1
20	105	150	75	18	14	23.7	100	117	75	14	15	23.7
25	115	160	85	18	14	29.7	125	127	90	14	19	29.7
32	140	180	100	18	18	38.4	135	140	100	16	19	38.4
40	150	200	110	18	18	44.3	140	165	105	16	19	44.3
50	165	230	125	20	18	56.3	155	203	120	16	19	56.3

ANSI B 16.5

Port size (tube)	ANSI B 16.5 Class 150 FTF series 37 acc. to DIN EN 558-2					
[inch]	ø DF	LF	ø BF	AF	ø D	ø MF
1/2	89	184	60.5	11.2	15.7	15.7
3/4	99	184	69.9	12.7	15.7	20.8
1	108	184	79.2	14.2	15.7	26.7
1 1/2	127	222	98.6	17.5	15.7	40.9
2	152	254	120.7	19.1	19.1	52.6

Dimensions [mm] - valve body of Type 3361

Threaded connection
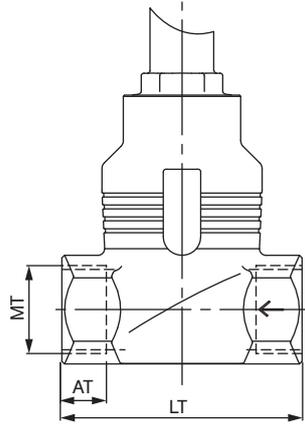
G, RC, NPT (EN ISO 228-1, ISO 7/1 /DIN EN 10226-2, ASME B 1.20.1)

Port size (tube)	MT G / NPT / RC	LT	AT		
[mm]	[inch]		G	NPT	Rc
10	3/8	65	12	10.3	10.1
15	1/2	65	14	13.7	13.2
20	3/4	75	16	14	14.5
25	1	90	18	16.8	16.8
32	1 1/4	110	20	17.3	19.1
40	1 1/2	120	22	17.3	19.1
50	2	150	24	17.6	23.4

Dimensions [mm] - valve body of Type 3361

Weld end connection
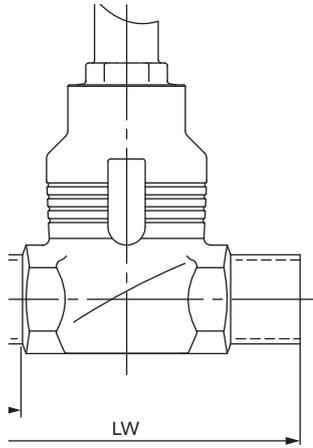
LW

**EN ISO 1127 series 1/ISO 4200/DIN 11866 series B, DIN 11850 series 2/DIN 11866 series A/DIN EN 10357 series A**

Port size (tube) [mm]	AW	LW	EN ISO 1127 series 1/ ISO 4200/DIN 11866 series B		DIN 11850 series 2/DIN 11866 series A/DIN EN 10357 series A	
			ø MW	TW	ø MW	TW
10	20	90	17.2	1.6	13	1.5
15	20	90	21.3	1.6	19	1.5
20	20	100	26.9	1.6	23	1.5
25	26	130	33.7	2.0	29	1.5
32	26	140	42.4	2.0	35	1.5
40	26	150	48.3	2.0	41	1.5
50	26	175	60.3	2.0	53	1.5

BS4825 Part 1, ASME BPE/DIN 11866 series C

Port size (tube) [inch]	AW	LW	BS 4825 Part 1		ASME BPE/ DIN 11866 series C	
			ø MW	TW	ø MW	TW
1/2	20	90	12.7	1.2	12.7	1.65
3/4	20	90	19.05	1.2	19.05	1.65
1	20	100	25.4	1.6	25.4	1.65
1 1/2	26	140	38.1	1.6	38.1	1.65
2	26	150	50.8	1.6	50.8	1.65

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Dimensions [mm] - valve body of Type 3361

Clamp connection
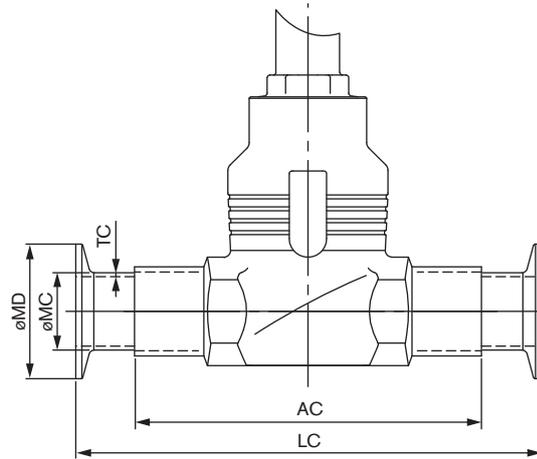
DIN 32676 series A, ASME BPE/DIN 32676 series C oder BS4825-3

Port size (tube)	AC	LC	Clamp: DIN 32676 series A, tube: DIN 11850 series 2/ DIN 11866 series A/ DIN EN 10357 series A			Clamp: ASME BPE/ DIN 32676 series C, tube: ASME BPE/ DIN 11866 series C			Clamp: BS4825-3, tube: BS4825-1		
[mm]			ø MC	ø MD	TC	ø MC	ø MD	TC	ø MC	ø MD	TC
15	90	126	19	34.0	1.5	12.7	25.0	1.65	12.7	25.0	1.2
20	100	136	23	34.0	1.5	19.05	25.0	1.65	19.05	25.0	1.2
25	10	173	29	50.5	1.5	25.4	50.5	1.65	25.4	50.5	1.65
32	140	179	35	50.5	1.5	-	-	-	-	-	-
40	150	193	41	50.5	1.5	38.1	50.5	1.65	38.1	50.5	1.65
50	175	218	53	64.0	1.5	50.8	64.0	1.65	50.8	64.0	1.65

DIN 32676 series B

Port size (tube)	AC	LC	Clamp: DIN 32676 series B, tube: EN ISO 1127 series 1/ ISO 4200/DIN 11866 series B		
[mm]			ø MC	ø MD	TC
15	90	146	21.3	50.5	1.6
20	100	136	26.9	50.5	1.6
25	130	164	33.7	50.5	2.0
32	140	178	-	-	-
40	150	193	48.3	64.0	2.0
50	175	218	60.3	77.5	2.0

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Valve system – request for quotation

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

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

■ = mandatory fields to fill out   Quantity: [   ]   Required delivery date: [   ]

Operating data

Pipe line	DN [ ]		PN [ ]	
Pipe Material				
■ Process medium				
■ Type of medium	☐ Liquid	☐ Steam	☐ Gas	

	min.	standard	max.	Unit
■ Flow rate (Q, Q_N, W) [1]	[ ]	[ ]	[ ]	[ ]
■ Temperature at valve inlet T1	[ ]	[ ]	[ ]	[ ]
■ Absolute pressure at valve inlet P1	[ ]	[ ]	[ ]	[ ]
■ Absolute pressure at valve outlet P2	[ ]	[ ]	[ ]	[ ]
Steam Pressure Pv	[ ]	[ ]	[ ]	[ ]
Kinematic viscosity (ν)	[ ] mm^2/s or cSt			
Dynamic viscosity (η)	[ ] mPa.s or cP			
Standard density	[ ] Kg/m^3			
Max. sound level accepted	[ ] dB (A)			

[1] standard unit:
Liquid Q = m³/h;
Steam W = kg/h;
Gas Q_N = Nm³/h

Valves features

Cone seal material	☐ PTFE/Stainless steel	☐ Stainless steel/Stainless steel	☐ PEEK / Stainless steel
Nominal pressure	PN [ ]		
Seat size (orifice)	DN [ ]		
Type of connection	☐ Flanged ☐ Threaded	☐ Welded ☐ Clamp	
Control function	☐ with energy storage (delivey status NO)	☐ without energy storage (blocked in last position)	
	☐ with energy storage (delivey status NC)		

Valve system – request for quotation, continued

Control unit features

User display

☐ with touch display

☐ without touch display

Controller version

☐ Position controller
☐ Process controller

Communication

☐ Analogue   ☐ Digital (fieldbus)

☐ 1 analogue IN / 1 binary IN   ☐ Ethernet / IP

☐ 1 analogue IN / 1 binary IN   ☐ Profinet
    1 analogue OUT / 2 binary OUT   ☐ Modbus TCP

Electrical connection

☐ Cable gland (without Bus)   ☐ Multipol connection

SIM card

☐ with

☐ without

Please specify item no. (if known)**:**

[   ]

Comments

_____
_____
_____

To find your nearest Bürkert office, click on the orange box →   **www.burkert.com**