Pneumatically operated 3/2-way seat valve ELEMENT for decentralized automation

- For mixing or distributing of mediums
- Decentralized automation with control head
- Flow optimized body in stainless steel
- Long service life and maintenance-free operation
- Control head is connected w/o external tubing

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

Type 8695 ▸
Control head for decentralised automation of ELEMENT process valves

Type 8691 ▸
Control head for decentralised automation of ELEMENT process valves

Type 8690 ▸
Pneumatic control unit for decentralised automation of process valves ELEMENT

Type 8697 ▸
Pneumatic control unit for decentralised automation of process valves ELEMENT

Type 8801 ▸
On/off valve systems ELEMENT with decentralised automation – overview

Type 8840 ▸
Modular process valve cluster – distributor and collector

Type description

The Bürkert 3/2-way seat valve, Type 2106, consists of a pneumatically operated ELEMENT actuator and a 3-way stainless steel valve body. Interchanging of pressure and service ports enables different fluidic circuit functions, such as the mixing or distributing of mediums. The flow-optimized valve body of Type 2106 allows excellent flow rates. The tried and tested self-adjusting gland secures a high level of tightness and thus ensures reliable operation over years. The design of the 3/2-way valve, Type 2106, offers all the advantages of a modern, decentralized automation: The directly connected control head and actuator provide a compact and smooth design, integrated pneumatic lines, protection class IP65/67, NEMA Type 4X, and a high chemical resistance. An optionally integrated fieldbus interface through to an explosion-proof automation units are further advantages of the 3-way shut-off valve. For the user, the compact Type 2106 is thus often an economical alternative to two single valves.

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Visit product website ▸

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1. General technical data

Product properties	
Dimensions	Further information can be found in chapter "5. Dimensions" on page 8.
Material	
Body	Cast stainless steel 316L
Actuator	PPS
Seal	PTFE
Cover	Stainless steel 1.4561 (316Ti)
Spindle packing	PTFE seal with spring compensation
Nominal diameter (port connection)	DN 15...DN 50, NPS ½...NPS 2
Performance data	
Nominal pressure	PN 16 (body)
Pilot pressure	Max. 10 bar(g), actuator size Ø 130 mm, 7 bar(g)
Medium data	
Medium	Steam, water, neutral gases, alcohols, oils, fuels, hydraulic fluids, salt solutions, alkalis, organic solvents, oxygen and fuel gases of families I, II and III in accordance with the Gas Appliances Regulation (EU) 2016/426
Medium temperature	-10 °C...+185 °C
Viscosity	Max. 600 mm^2/s
Control medium	Air, neutral gases
Product connections	
Port connection	
Threaded connection	G (DIN ISO 228 - 1) NPT (ASME B1.20.1) (RC on request)
Pilot air port	Push-in connector (external Ø 6 mm or ¼") or thread G ⅛" (on request)
Approvals and conformities	
Further information can be found in chapter "3. Approvals and conformities" on page 5.	
Material certificate	2.2, 3.1
Environment and installation	
Environmental factors	Protect the device from electromagnetic interference, UV radiation and, when used outdoors, from weather conditions.
Ambient temperature	-10 °C...+60 °C (integrated control unit) -10 °C...+100 °C (push-in air ports)
Installation position	As required, preferably with actuator in upright position

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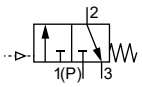
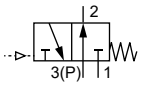
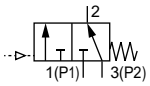
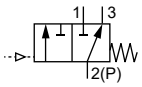
2. Control functions

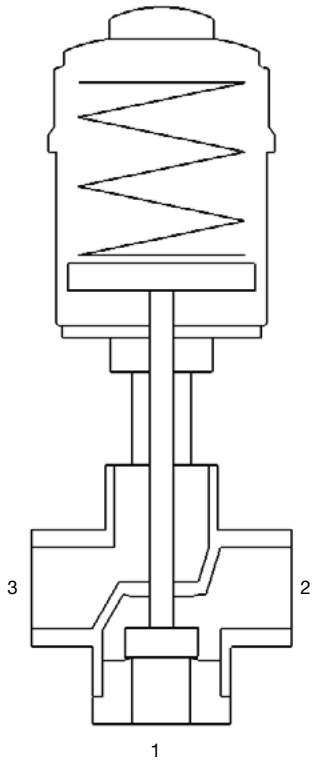
2.1. Control function

Symbol	Description
	**Control function C (CF C)** Pneumatically operated 3/2-way process valve When de-energised, pressure port 1 closed, service port 2 exhausted
	**Control function D (CF D)** Pneumatically operated 3/2-way process valve When de-energised, pressure port 3 connected to service port 2, exhaust port 1 closed
	**Control function E (CF E)** Pneumatically operated 3/2-way mixer valve When de-energised, pressure port 3 connected to service port 2, pressure port 1 closed
	**Control function F (CF F)** Pneumatically operated 3/2-way distributor valve When de-energised, pressure port 2 connected to service port 3, service port 1 closed

2.2. Pin assignment for fluidic circuit functions C, D, E and F

Note:

- Actuator with Control function A
- When de-energised port connection 1 is closed with spring



Fluidic circuit function	Connection		
	1	2	3
C	P	A	R
D	R	A	P
E	P1	A	P2
F	A	P	B

A, B Service ports
P, P1, P2 Pressure ports
R Exhaust port

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3. Approvals and conformities

3.1. General notes

- The approvals and conformities listed below must be stated when making enquiries. This is the only way to ensure that the product complies with all required specifications.
- Not all available variants can be supplied with the below mentioned approvals or conformities.

3.2. Conformity

In accordance with the Declaration of Conformity, the product is compliant with the EU Directives. This includes the following directives:

- Pressure Equipment Directive 2014/68/EU
- Machinery Directive 2006/42/EC

3.3. Standards

The applied standards which are used to demonstrate compliance with the EU Directives are listed in the EU-Type Examination Certificate and/or the EU Declaration of Conformity.

3.4. Explosion protection

Approval	Description
	Optional: Explosion protection (valid for the variable code PX51) As a category 2 device suitable for zone 1/21 and zone 2/22. **ATEX:** EPS 18 ATEX 2 008 X II 2G Ex h IIC T4...T2 Gb II 2D Ex h IIIC T135 °C...T300 °C Db **IECEx:** IECEx EPS 18.0007X Ex h IIC T4...T2 Gb Ex h IIIC T135 °C...T300 °C Db

Temperature class	T2	T3	T4
Maximum surface temperature	+ 300 °C	+ 200 °C	+ 135 °C
Ambient temperature	- 40 °C...+ 130 °C	- 40 °C...+ 130 °C	- 40 °C...+ 100 °C
Maximum medium temperature	+ 285 °C	+ 185 °C	+ 125 °C

Note: The ambient and medium temperature range may be limited by non-ex-relevant specifications. Observe the Operating Instructions.

3.5. Drinking water

Conformity	Description
H_2O	**Suitable for use in drinking water applications** The materials comply with the assessment principles (UBA) for materials in contact with drinking water (TrinkwasserV). **Stainless steel body** PF39: Suitable for products with medium temperature up to 85 °C (hot water)

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3.6. Foods and beverages/Hygiene

Conformity	Description
FDA	**FDA – Code of Federal Regulations (valid for the variable code PL02, PL03)** All wetted materials are compliant with the Code of Federal Regulations published by the FDA (Food and Drug Administration, USA) according to the manufacturer's declaration.
	EC Regulation 1935/2004 of the European Parliament and of the Council (valid for the variable code PL01, PL02) All wetted materials are compliant with EC Regulation 1935/2004/EC according to the manufacturer's declaration.
	China food GB Standards of the People's Republic of China (valid for the variable code PL10) All wetted materials are compliant with the requirement of China food GB Standards according to the manufacturer's declaration.

3.7. Others

DNV GL classification

Approval	Description
	DNV GL classification – Ships, offshore units, and high speed and light craft The products are accepted for installation on all vessels classed by DNV GL.

Oxygen

Conformity	Description
O_2	**Optional: Suitability for oxygen (valid for the variable code NL02)** The products are suitable for use with gaseous oxygen, according to the manufacturer's declaration.

Fuel gases

Conformity	Description
CE	**Fuel gases (valid for the variable code PO19, PO20)** The products comply with: • Regulation (EU) 2016/426 – Appliances burning gaseous fuels and • DVGW DIN EN 161 (Automatic shut-off valves for gas burners and gas appliances) and • DIN EN 16678, Class A or Class D (Safety and control devices for gas burners and gas burning appliances – Automatic shut-off valves for operating pressure of above 500 kPa up to and including 6 300 kPa)

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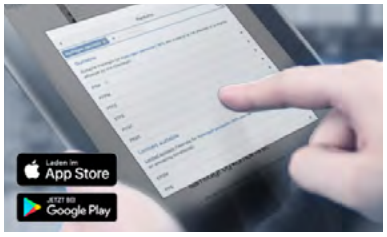
4. Materials

4.1. Bürkert resistApp



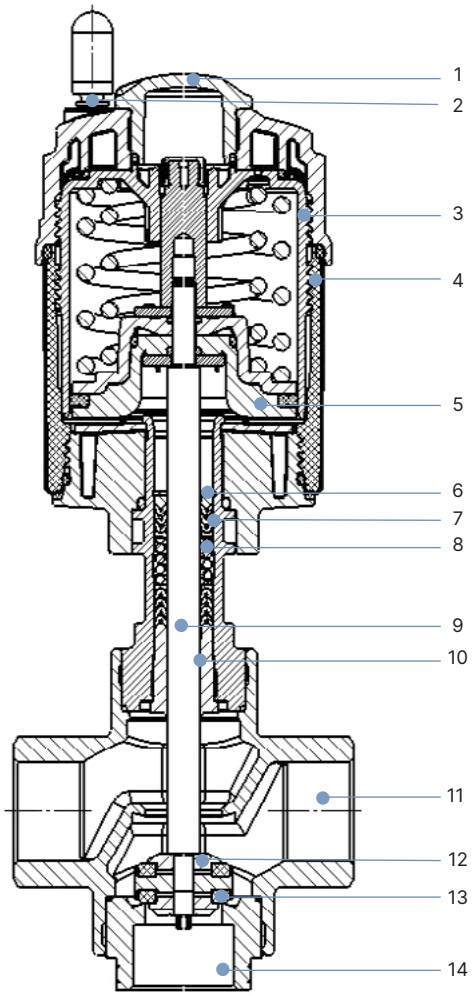
Bürkert resistApp – Chemical resistance chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start chemical resistance check

4.2. Material specifications

Note:
The lubricants for packing gland and actuator are classified according to NSF H1.



No.	Element	Material
1	Transparent cap	Polysulfone PSU
2	Pilot air ports	Push-in connector PP (standard) Thread G ⅛" stainless steel 1.4305 (on request)
3	Actuator cover	PPS
4	Actuator casing	Stainless steel 1.4561 (316Ti)
5	Piston seal	FKM
6	Spring	Stainless steel 1.4310
7	Tube	Stainless steel 1.4401 (316)/1.4404 (316L)
8	Packing gland	PTFE
9	Spindle	Stainless steel 1.4401 (316)/1.4404 (316L)
10	Spindle guide	PEEK
11	Valve body	Stainless steel 1.4404 (316L)
12	Body closer	Stainless steel 1.4404 (316L)
13	Seal	PTFE
14	Seat nipple	Stainless steel 1.4404 (316L)

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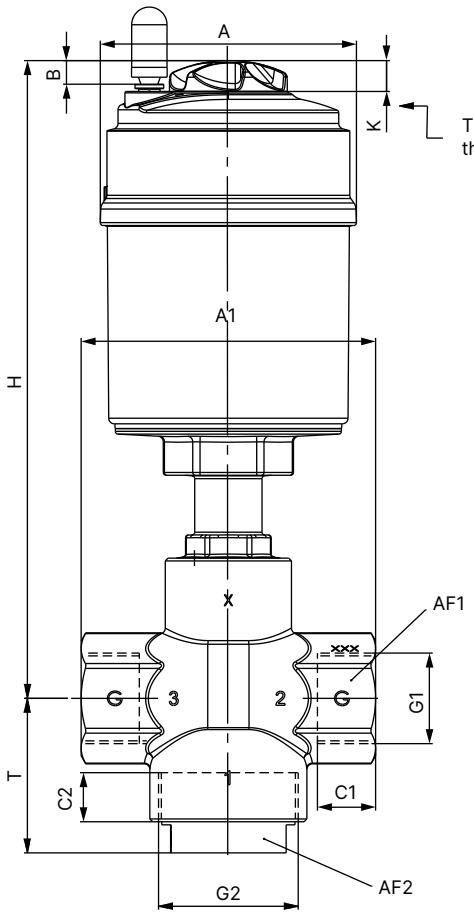
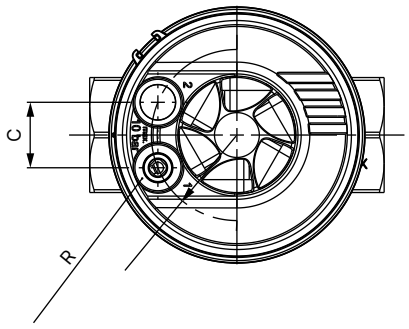
5. Dimensions

Note:
Dimensions in mm, unless otherwise stated



To determine the basic dimensions for the versions with mounting options



Push-in connector for plastic tubing 6/4 mm or G⅛ connection

Actuator size (Ø)	K
50 (D)	9.7
70 (M)	11
90 (N)	
130 (P)	

DN	Actuator size Ø	Ø A	B	C	R	H	All threaded bodies					G			NPT			RC		
							A1	T	G 2	AF1	AF2	G 1	C1/ C2	LTA	G 1	C1/ C2	LTA	G 1	C1/ C2	LTA
15	50 (D)	64.5	6.0	19.8	19.8	202.4	85	58.3	M40 × 1.5	32	30	½	14	GM84	½	13.7	NM84	½	13.2	RC84
	70 (M)	91	8.5	23.3	30.5	202.4	85	58.3	M40 × 1.5	32	30	½	14	GM84	½	13.7	NM84	½	13.2	RC84
20	50 (D)	64.5	6.0	19.8	19.8	202.4	85	58.3	M40 × 1.5	32	30	¾	16	GM85	¾	14.0	NM85	¾	14.5	RC85
	70 (M)	91	8.5	23.3	30.5	202.4	85	58.3	M40 × 1.5	32	30	¾	16	GM85	¾	14.0	NM85	¾	14.5	RC85
25	50 (D)	64.5	6.0	19.8	19.8	227.4	105	54.9	M50 × 2	41	41	1	18	GM86	1	16.8	NM86	1	16.8	RC86
	70 (M)	90	8.5	23.3	30.5	227.4	105	54.9	M50 × 2	41	41	1	18	GM86	1	16.8	NM86	1	16.8	RC86
32	70 (M)	91	8.5	23.3	30.5	234.7	130	67.8	M70 × 2	55	55	1¼	20	GM87	1¼	17.3	NM87	1¼	19.1	RC87
	90 (N)	120				294.4	130	78.1	M70 × 2	55	55	1¼	20	GM87	1¼	17.3	NM87	1¼	19.1	RC87
	130 (P)	159				346.7	130	68.0	M70 × 2	55	55	1¼	20	GM87	1¼	17.3	NM87	1¼	19.1	RC87
40	70 (M)	91	8.5	23.3	30.5	234.7	130	68.0	M70 × 2	55	55	1½	22	GM88	1½	17.3	NM88	1½	19.1	RC88
	90 (N)	120				294.4	130	68.3	M70 × 2	55	55	1½	22	GM88	1½	17.3	NM88	1½	19.1	RC88
	130 (P)	159				346.7	130	68.0	M70 × 2	55	55	1½	22	GM88	1½	17.3	NM88	1½	19.1	RC88
50	70 (M)	91	8.5	23.3	30.5	245.5	150	72.0	M84 × 2	70	70	2	24	GM89	2	17.6	NM89	2	23.4	RC89
	90 (N)	120				310.7	150	72.0	M84 × 2	70	70	2	24	GM89	2	17.6	NM89	2	23.4	RC89
	130 (P)	159				353.7	150	72.0	M84 × 2	70	70	2	24	GM89	2	17.6	NM89	2	23.4	RC89

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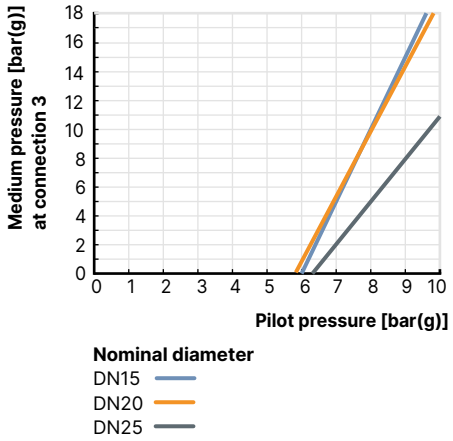
6. Performance specifications

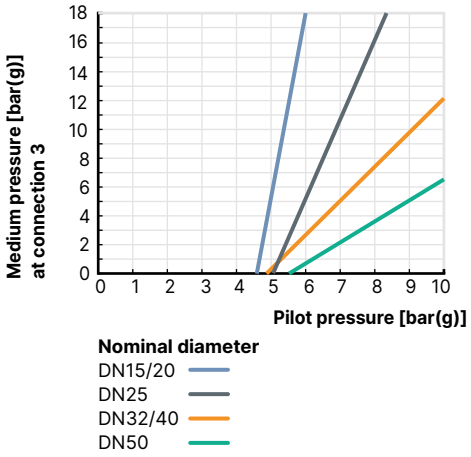
6.1. Pilot pressure diagram

Note:
Legend for actuator size D, M, N, P, see "5. Dimensions" on page 8

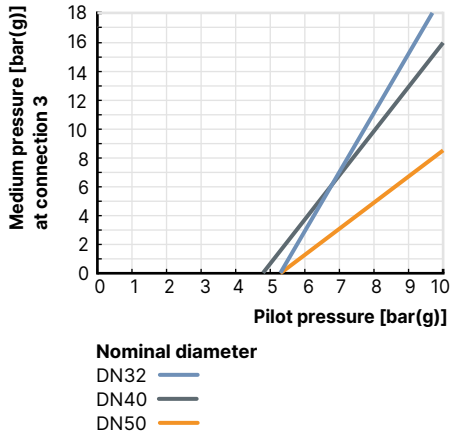
Actuator size Ø 50 mm
Maximum control pressure 10 bar(g)



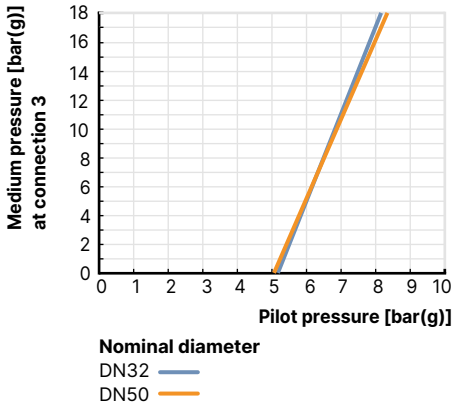
Actuator size Ø 70 mm
Maximum control pressure 10 bar(g)



Actuator size Ø 90 mm
Maximum control pressure 10 bar(g)



Actuator size Ø 130 mm
Maximum control pressure 7 bar(g)



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7. Product accessories

Electrical position indicator

Control head

Type 8691 ▸ Actuator size Ø 70 mm

The control heads Type 8691 and Type 8695 are optimised for integrated mounting on process valves of the 21XX series. The valve position is detected without contact via an analogue sensor element. The sensor element automatically detects and stores the valve end positions during commissioning using the teach function. The integrated pilot valve controls single-acting or double-acting actuators. The valve switching status is indicated by coloured high-performance LEDs.

Features

- Status indication via coloured high-performance LEDs
- Wear-free inductive position sensor
- Pilot valve with manual override
- Teach function for automatic recognition of valve end positions
- Hygienic stainless steel design
- Easy-to-clean, chemically resistant housing according to IP65/67, 4X rating
- AS-Interface, IO-Link, Bürkert system bus (büS)

Customer benefits

- Simple and safe commissioning using the teach function
- Easy process monitoring and fault detection through visible coloured high-performance LEDs
- High degree of system availability due to increased actuator service life by means of spring chamber ventilation
- Minimal space requirement in plant piping for more flexibility in plant design

Type 8695 ▸ Actuator size Ø 50 mm

Pneumatic control unit/position feedback

Type 8690 ▸ Actuator size Ø 70 mm

The pneumatic control units Type 8690 and 8697 are optimised for integrated mounting on process valves of the 21XX series. Mechanical or inductive limit switches detect the valve position. The integrated pilot valve controls single-acting or double-acting (Type 8690) actuators.

Features

- Optical position indicator
- Mechanical or inductive proximity switches for end position detection
- Pilot valve with manual override
- Compact design
- Easy-to-clean, chemically resistant housing according to IP65/67, 4X rating
- Optionally intrinsically safe design according to ATEX/IECEx

Customer benefits

- Simple and safe commissioning using the teach function (Type 8697)
- Signal reliability due to the automatic adjustment of the limit switches
- Minimal space requirement in plant piping for more flexibility in plant design

Type 8697 ▸ Actuator size Ø 50 mm

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8. Networking and combination with other Bürkert products

The **seat valve Type 2106** can be combined with the **position feedback Type 8690/8697** and the **control head Type 8691/8695** to **valve system On/Off ELEMENT Type 8801-GE**.

Note:

- For the configuration of further valve systems use the **Product Enquiry Form** (see "9.3. Bürkert Product Enquiry Form" on page 12).
- You order two components and receive a completely assembled and tested valve.

Example with welded connection

Seat valve			
Type 2106			
Control head		**Position feedback**	
Type 8691 ▸	**Type 8695** ▸	**Type 8690** ▸	**Type 8697** ▸
Control head for decentralised automation of ELEMENT process valves		Pneumatic control for decentralised automation of ELEMENT process valves	
On/Off ELEMENT valve system			
Type 8801-GE-H ▸ 2106 + 8691	**Type 8801-GE-M** ▸ 2106 + 8695	**Type 8801-GE-K** ▸ 2106 + 8690	**Type 8801-GE-U** ▸ 2106 + 8697

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9. Ordering information

9.1. Bürkert eShop

Bürkert eShop – Easy ordering and quick delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

9.2. Bürkert product filter

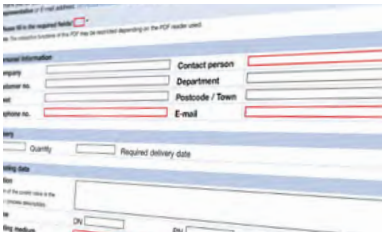
Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements?
Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter

9.3. Bürkert Product Enquiry Form

Note:
Please see our Product Enquiry Form for a full explanation of our specification key.



Bürkert Product Enquiry Form – Your enquiry quickly and compactly

Would you like to make a specific product enquiry based on your technical requirements? Use our Product Enquiry Form for this purpose. There you will find all the relevant information for your Bürkert contact. This will enable us to provide you with the best possible advice.

Fill out the form now

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9.4. Ordering chart

Note:

- Valves in closed position, pressure port 1 closed
- Other variants are available on request.

Control function	Nominal diameter (port connection)	Port connection	Actuator size Ø	K_V value water		Pilot pressure min.	Operating pressure max. 180 °C		Weight	Article no.
				1 → 2	2 → 3		1 → 2	2 → 3 2 → 1		
	DN	NPS	[mm]	[m³/h]	[m³/h]	[bar(g)]	[bar(g)]	[bar(g)]	[kg]	
DIN ISO 228 - 1										
A (CF A) see control functions [1.) 2.)]	15	G ½	50 (D)	7	4.5	5.5	16	16	1.5	282698
			70 (M)	7	4.5	4.5	16	16	2.2	282701
	20	G ¾	50 (D)	9	6.2	5.5	16	16	1.4	282702
			70 (M)	9	6.2	4.5	16	16	2.1	282704
	25	G 1	50 (D)	17	11	5.5	9	11	1.9	282705
			70 (M)	17	11	4.5	16	16	2.6	282706
	32	G 1¼	70 (M)	32	21	4.5	8	11	3.9	282707
			90 (N)	32	21	5.1	11	16	5.4	282708
	40	G 1½	70 (M)	35	24	4.5	7	11	3.7	282711
			90 (N)	35	24	5.1	12	16	5.2	282712
	50	G 2	90 (N)	51	35	5.1	9	8	7.3	282715
			130 (P)	51	35	4.9	16	16	10.4	282716
ANSI B 1.20.1										
A (CF A) see control functions [1.) 2.)]	15	NPT ½	50 (D)	7	4.5	5.5	16	16	1.5	292478
			70 (M)	7	4.5	4.5	16	16	2.2	292531
	20	NPT ¾	50 (D)	9	6.2	5.5	16	16	1.4	292532
			70 (M)	9	6.2	4.5	16	16	2.1	292533
	25	NPT 1	50 (D)	17	11	5.5	9	11	1.9	292534
			70 (M)	17	11	4.5	16	16	2.6	292535
	32	NPT 1¼	70 (M)	32	21	4.5	8	11	3.9	292536
			90 (N)	32	21	5.1	11	16	5.4	292537
	40	NPT 1½	70 (M)	35	24	4.5	7	11	3.7	292538
			90 (N)	35	24	5.1	12	16	5.2	292539
	50	NPT 2	90 (N)	51	35	5.1	9	8	7.3	292540
			130 (P)	51	35	4.9	16	16	10.4	292541

1.) Further information can be found in chapter "2. Control functions" on page 4.

2.) See "2.2. Pin assignment for fluidic circuit functions C, D, E and F" on page 4

Further variants on request

Process connection
RC thread

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