The Proven Mixproof Range

SMP-BCA Mixproof Valve with PTFE Diaphragm

Concept

SMP-BCA is an aseptic double seat valve with PTFE diaphragm. It is available as a stop- or divert valve. The valve is suited for aseptic operating conditions such as high sterilisation temperatures. SMP-BCA is specially designed for aseptic applications with the highest hygienic demands.

Working principle

SMP-BCA is operated by means of compressed air. The valve is a normally closed (NC) valve. Sterile stem sealing towards the atmosphere is ensured by a special designed PTFE/rubber diaphragm unit. The PTFE diaphragm does not allow product residues to build up on the product contact surface. The product lines are separated by two sealings and a sterile barrier chamber to avoid mixing of product and to ensure immediate indication in case of a leak from one of the plug seals. Two small pneumatic normally open (NO) valves control flow to and from the sterile barrier chamber. The barrier chamber must be clean and sterile when the main valve is closed.The lower product lines on change over valves are separated by a single seal plug, without sterile barrier chamber.

TECHNICAL DATA

Pressure range:	0-116 psi (0-8 bar).
Temperature range:	14°F to 284°F (EPDM).
Optimum process conditions:	>7.25 psi (0.5 bar), >68°F.
Max. sterilization temperature (steam - short time)	302°F - 55 psi(3.8 bar).
Air pressure:	72.5-116 psi (5-8 bar).

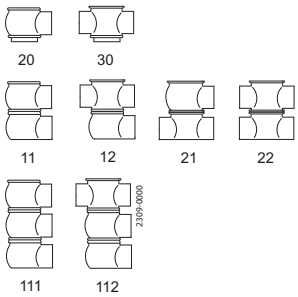
Note!

Vacuum is not recommended in aseptic applications.

PHYSICAL DATA

Product wetted steel parts:	1.4404 (316L).
External surface finish	Semi-bright (blasted)
Internal surface finish	Bright (polished), Ra < 64 µinch
Other steel parts:	1.4301 (304).
Product wetted seals:	EPDM and PTFE.
Other seals:	NBR, EPDM.

Valve body combination



Type 20 and 30 body versions are on request available in following configurations:

- Tee welded on lower port in 0 or 90 deg. version
- Bend welded on lower port in 0, 90, 180 or 270 deg. version

The three body version is on request available in following configurations:

- Type 121, 122, 211, 212, 221 & 222

Standard design

SMP-BCA is based on the SMP-BC valve design. It consists of actuator, bonnet, stem with diaphragm unit and valve bodies. The divert version is a three body design.

The valve is assembled by means of clamp rings and a stem clip system for easy maintenance.

Options

A. Male parts or clamp ends in accordance with required standard.
B. Control and Indication: IndiTop, ThinkTop or ThinkTop Basic.
C. Larger actuator for valve sizes 1½"-2" /DN 40-50.
D. CIP installation kits.
E. Other valve body combinations.
F. Surface roughness, product wetted parts: Ra ≤ 32 µin.
G. Product wetted seals of NBR and PTFE or FPM and PTFE.
H. Service tool for actuator.
I. Tool for plug seals (Necessary for changing the seals).

Note!
For further details, see also ESE01563 and instruction IM 70811.

Air consumption (litres free air)		
Size	1½", 2"/DN40,50 Actuator ø89	2½", 3",4"/DN 65, 80,100 Actuator ø133
Stop valve/Divert valve	0.2 x Air pressure (bar)	0.7 x Air pressure (bar)

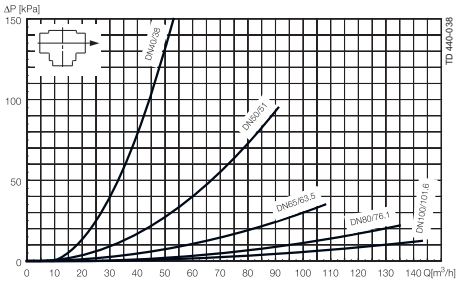
Expected lifetime of diaphragm unit under normal conditions:
(no pressure shocks or cavitation).

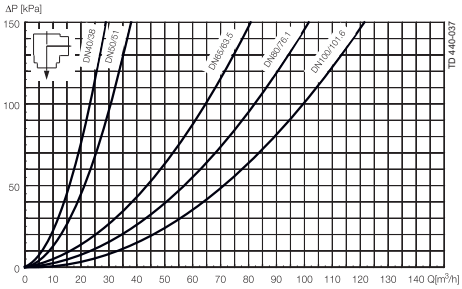
Size/Type	Stop valve activations	Divert valve activations
1½"/DN40	12.000	10.000
2"/DN50	12.000	10.000
2½"/DN65	12.000	5.000
3"/DN80	5.000	5.000
4"/DN100	5.000	5.000

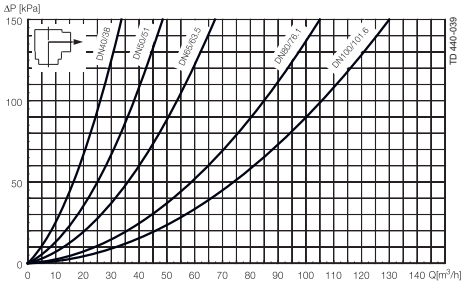
Note! Activating the valve without internal product pressure reduces lifetime of diaphragm unit.

Pressure drop/capacity diagrams

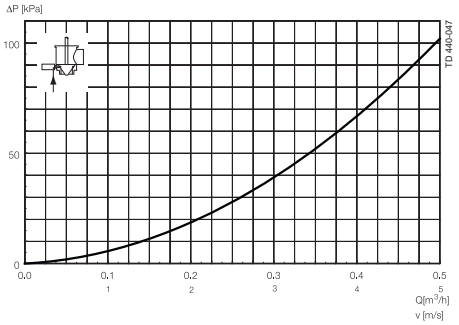
Stop valve:



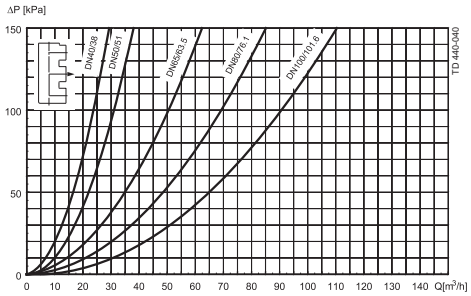


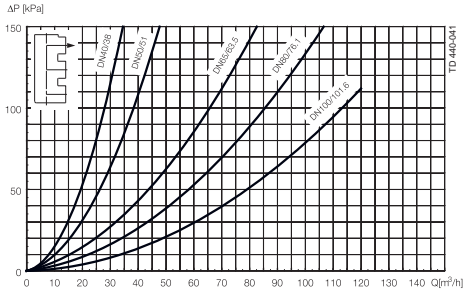


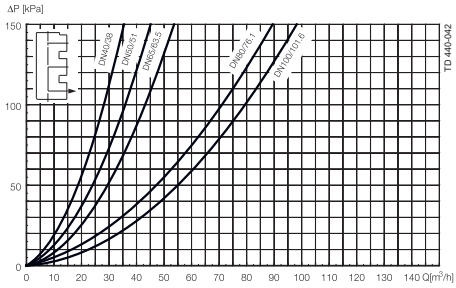
CIP chamber:

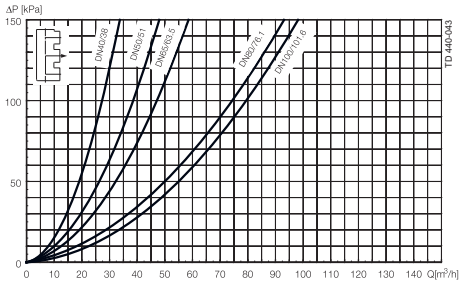


Divert valve:







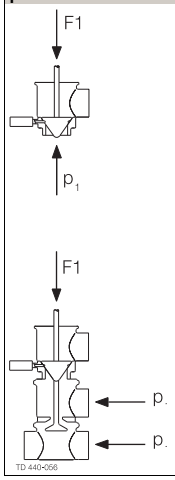


NOTE! For the diagrams the following applies:
Medium: Water (68°F).

Measurement: In accordance with VDI 2173.

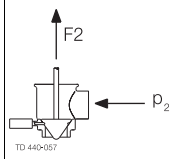
Pressure data for SMP-BCA

1. Upper plug. Max. product pressure P_1 without leakage due to pressure shocks, as a function of support air pressure.

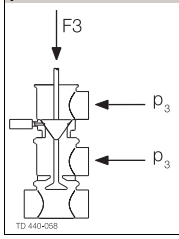
Direction of pressure	Valve size	Actuator size	Spring type	Support air pressure (bar) 0	3	5	6	7
	38mm/	ø89	Normal	6.0	16.0	22.5	26.2	29.5
	DN40	ø89	Strong	9.6	19.5	26.3	30.0	30.0
		ø133	Normal	16.0	30.0	30.0	30.0	30.0
		ø133	Strong	22.0	30.0	30.0	30.0	30.0
	51mm/	ø89	Normal	6.0	16.0	22.5	26.2	29.5
	DN50	ø89	Strong	9.6	19.5	26.3	30.0	30.0
		ø133	Normal	16.0	30.0	30.0	30.0	30.0
		ø133	Strong	22.0	30.0	30.0	30.0	30.0
	63.5mm/	ø133	Normal	9.6	25.5	30.0	30.0	30.0
	DN65	ø133	Strong	16.0	30.0	30.0	30.0	30.0
	76.1mm/	ø133	Normal	6.5	14.5	19.5	22.4	26.8
	DN80	ø133	Strong	9.2	17.5	23.5	26.2	29.5
	101.6mm/	ø133	Normal	4.0	11.0	16.0	18.4	20.6
	DN100	ø133	Strong	6.5	14.4	19.6	22.2	25.0

F1 = Spring + support Air

2. Upper plug. Max. product pressure P_2 against which the valve can open, as a function of air pressure.

Direction of pressure	Valve size	Actuator size	Spring type	Support air pressure (bar) 3	4	5	6	7
	38mm/	ø89	Normal	8.0	8.0	8.0	8.0	8.0
	DN40	ø89	Strong	-	8.0	8.0	8.0	8.0
		ø133	Normal	8.0	8.0	8.0	8.0	8.0
		ø133	Strong	-	8.0	8.0	8.0	8.0
	51mm/	ø89	Normal	8.0	8.0	8.0	8.0	8.0
	DN50	ø89	Strong	-	8.0	8.0	8.0	8.0
		ø133	Normal	8.0	8.0	8.0	8.0	8.0
		ø133	Srong	-	8.0	8.0	8.0	8.0
	63.5mm/	ø133	Normal	4.0	8.0	8.0	8.0	8.0
	DN65	ø133	Strong	-	1.4	8.0	8.0	8.0
	76.1mm/	ø133	Normal	2.8	7.0	8.0	8.0	8.0
	DN80	ø133	Strong	-	2.0	5.4	8.0	8.0
	101.6mm/	ø133	Normal	2.2	4.6	7.2	8.0	8.0
	DN100	ø133	Strong	-	1.6	4.2	6.6	8.0

3. Upper valve. Max. product pressure P_3 in upper valve body at which the valve can close.

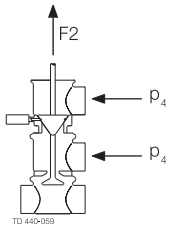
Direction of pressure	Valve size	Actuator size, spring type ø89, Normal	ø89, Strong	ø133, Normal	ø133, Strong
	38mm/DN40	2.7	4.5	8.0	8.0
	51mm/DN50	2.4	4.0	6.0	8.0
	63.5mm/DN65	-	-	7.0	8.0
	76.1mm/DN80	-	-	7.0	8.0
	101.6mm/DN100	-	-	5.0	8.0

F2 = Air - spring

F3 = Spring

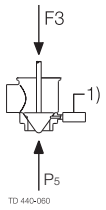
Pressure data for SMP-BCA

4. Lower valve, change-over. Max. product pressure P_4 without leakage, as a function of air pressure.

Direction of pressure	Valve size	Actuator size	Spring size	Air pressure (bar) 3	4	5	6	7
	38mm/	ø89	Normal	*	8.0	8.0	8.0	8.0
	DN40	ø89	Strong	*	*	8.0	8.0	8.0
		ø133	Normal	8.6	8.0	8.0	8.0	8.0
		ø133	Strong	*	*	8.0	8.0	8.0
	51mm/	ø89	Normal	*	8.0	8.0	8.0	8.0
	DN50	ø89	Strong	*	8.0	8.0	8.0	8.0
		ø133	Normal	8.6	8.0	8.0	8.0	8.0
		ø133	Strong	*	*	8.0	8.0	8.0
	63.5mm/	ø133	Normal	3.4	8.0	8.0	8.0	8.0
	DN65	ø133	Strong	*	*	8.0	8.0	8.0
	76.1mm/	ø133	Normal	*	7.6	8.0	8.0	8.0
	DN80	ø133	Strong	*	*	5.6	8.0	8.0
	101.6mm/	ø133	Normal	*	4.6	9.2	8.0	8.0
	DN100	ø133	Strong	*	*	3.8	7.2	8.0

* = Valve cannot close

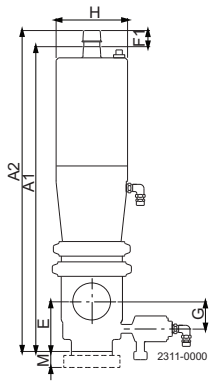
5. Upper valve. Max. CIP pressure P_{CIP} without leakage to product area as a function of product pressure below plug.

Direction of pressure	Valve size	Actuator size	Spring size	Product pressure P_5 below plug (bar) 0	2	4	6	7
	38mm/	ø89	Normal	9.0	6.3	3.5	0.8	-
	DN40	ø89	Strong	10.0	9.9	7.2	4.6	2.0
		ø133	Normal	10.0	10.0	10.0	10.0	10.0
		ø133	Strong	10.0	10.0	10.0	10.0	10.0
	51mm/	ø89	Normal	9.0	6.3	3.5	0.8	-
	DN50	ø89	Strong	10.0	9.6	6.7	3.8	1.0
		ø133	Normal	10.0	10.0	10.0	10.0	10.0
		ø133	Strong	10.0	10.0	10.0	10.0	10.0
	63.5mm/	ø133	Normal	10.0	10.0	9.3	5.8	2.5
	DN65	ø133	Strong	10.0	10.0	10.0	10.0	10.0
	76.1mm/	ø133	Normal	10.0	10.0	8.5	4.7	1.0
	DN80	ø133	Strong	10.0	6.8	2.3	-	-
	101.6mm/	ø133	Normal	10.0	6.0	-	-	-
	DN100	ø133	Strong	10.0	10.0	6.5	1.4	-

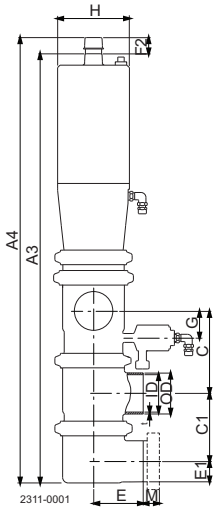
F2 = Air - spring

F3 = Spring

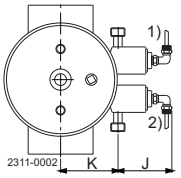
NOTE! Max. recommended CIP pressure = 100 kPa (1 bar).



a. Stop valve



b. Divert valve



c. Top view

1) CIP valve - 2) Detecting valve

Dimensions (mm)

Size		1½”	2”	2½”	3”	4”	40 DN	50 DN	65 DN	80 DN	100 DN
A_1		14.61	15.00	18.07	18.94	21.77	14.53	14.92	17.95	18.98	21.73
A_2		15.16	15.55	18.62	19.72	22.56	15.08	15.47	18.50	19.76	22.52
A_3		20.12	20.94	25.28	26.65	30.63	20.12	20.94	25.28	27.28	30.63
A_4		20.67	21.50	26.06	27.44	31.41	20.67	21.50	26.06	28.07	31.42
C		3.54	4.02	4.88	5.08	6.18	3.54	4.02	4.88	5.28	6.18
C_1		3.15	3.31	4.25	4.53	5.91	3.15	3.31	4.25	4.74	5.91
OD		1.5	2.00	2.5	3.00	4.00	1.61	2.09	2.76	3.35	4.09
ID		1.37	1.87	2.37	2.84	3.84	1.50	1.97	2.60	3.19	3.94
t		0.06	0.06	0.06	0.08	0.08	0.06	0.06	0.08	0.08	0.08
E		1.95	2.42	3.24	3.44	5.26	1.95	2.42	3.24	3.44	5.26
E_1		0.81	1.06	1.31	1.54	2.04	0.87	1.1	1.42	1.71	2.09
F_1		0.55	0.55	0.55	0.79	0.79	0.55	0.55	0.55	0.79	0.79
F_2		0.55	0.55	0.79	0.79	0.79	0.55	0.55	0.79	0.79	0.79
G		1.06	1.31	1.56	1.80	2.30	1.12	1.36	1.67	1.97	2.34
H		3.50	3.50	3.50	5.24	5.24	3.5	3.5	3.5	5.24	5.24
J		1.84	1.84	2.24	2.62	3.32	1.84	1.84	2.24	2.62	3.32
K		2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48
M/ISO	clamp	0.83	0.83	0.83	0.83	0.83					
M/ISO	male	0.83	0.83	0.83	0.83	0.83					
M/DIN	male					0.87	0.91	0.98	0.98	1.18	
M/SMS	male		0.79	0.79	0.94	0.94	1.38				
M/BS	male	0.87	0.87	0.87	0.87	1.06					
Weight (lb):	Stop valve	14.33	14.99	29.32	32.85	40.12	14.33	15.00	29.32	34.39	40.12
	Divert valve	18.08	18.96	34.17	41.01	54.23	18.08	18.96	34.17	43.21	54.23

Air Connections Compressed air:
R 1/8" (BSP), internal thread.

CIP connection:
R 3/8" (BSP), external thread.

Leakage connection:
R 3/8" (BSP), external thread.

Caution, opening/closing time:
Opening/closing time will be affected by the following:

- The air supply (air pressure).
- The length and dimensions of the air hoses.
- Number of valves connected to the same air hose.
- Use of single solenoid valve for serial connected air actuator functions.
- Product pressure.

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