The Proven Mixproof Range

SMP-BC Mixproof Valve

Concept

SMP-BC is a sanitary pneumatic seat valve, designed for safety and leak detection when two different products flow through only one valve. The valve is often used as a part in CIP return lines or other systems not experiencing pressure spikes offering leakage detection for greater safety.

Working principle

SMP-BC is remote-controlled by means of compressed air. The valve is a normally closed (NC) valve.
The valve is fitted with two small pneumatic normally open (NO) valves, a detecting valve and a CIP-valve.
The valve plug (the upper plug in a change-over valve) has two seals, forming a leakage chamber under atmospheric pressure between them. Leaking product flows into the leakage chamber and is discharged through the detecting valve. SMP-BC can be cleaned by CIP by supplying compressed air to the actuator (see fig. 1). During cleaning of the valve, flow pattern against the closing direction of the valve plug makes SMP-BC insensitive to water hammer.

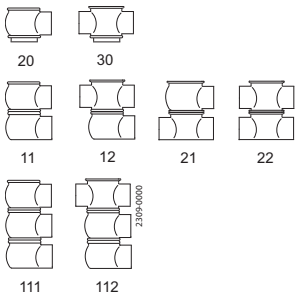
TECHNICAL DATA

Max. product pressure (depending on valve specifications):	145 PSI (10 bar)
Min. product pressure:	Full vacuum.
Temperature range:	14°F to +284°F (EPDM).
Air pressure:	72.5 to 116 PSI (5 to 8 bar)

PHYSICAL DATA

Product wetted steel parts:	1.4401 (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.
Other seals:	NBR

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-BC is available in two versions, as a shut-off valve with one valve body or as a change-over valve with three valve bodies (sizes 5" + 6" only as shut-off valve).
The valve bodies and the external actuator are clamped together. SMP-BC is fitted with one detecting valve and one CIP-valve. The seals and the lip seal can be serviced after removing the actuator.

It is recommended, due to the valve size and weight, to use supporting equipment, handling and installing the valve. Guidelines are given in the instruction manual (IM70771). Alfa Laval is not able to supply the recommended supporting equipment.

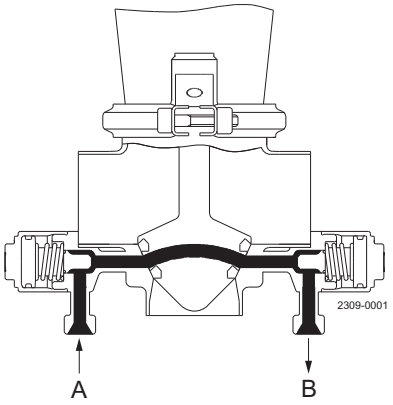
Options

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

Note!
For further details, see also instruction IM 70771.

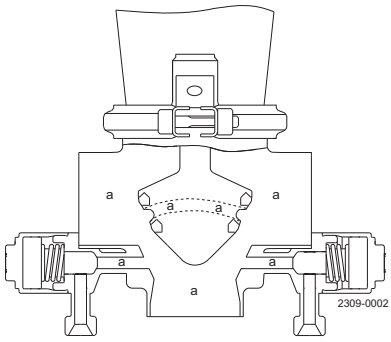
Air Consumption at 80 PSI				
Size	1.5-inch - 2-inch	2.5-inch - 3-inch	5-inch - 6-inch	5-inch - 6-inch
Shut-off valve - Actuator function	67.1 in^3	235.0 in^3	503.4 in^3	738.4 in^3
Shut-off valve - Actuator function			1208.2 in^3	973.3 in^3
Change-over valve - Actuator function	67.1 in^3	235.0 in^3		

Operation/cleaning

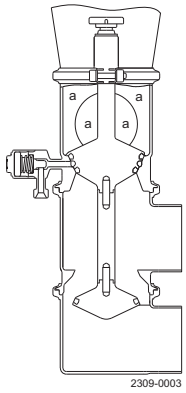


A) CIP in B) CIP out

a. Closed shut-off valve:
Cleaning of the leakage chamber.



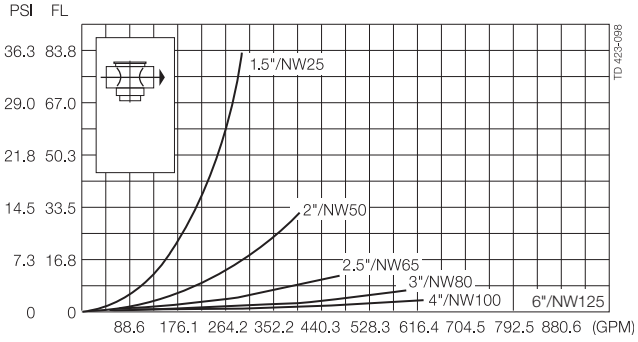
b. Open shut-off valve
a. Cleaning of the valve body and the leakage chamber.

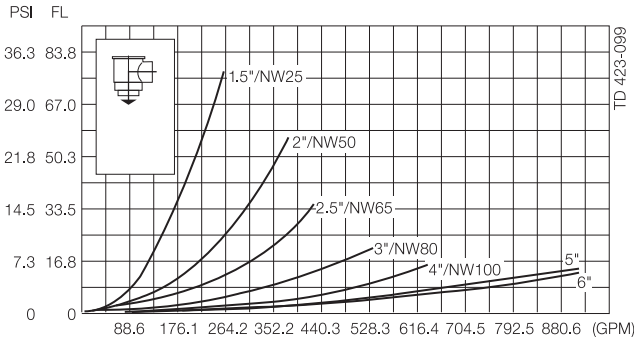


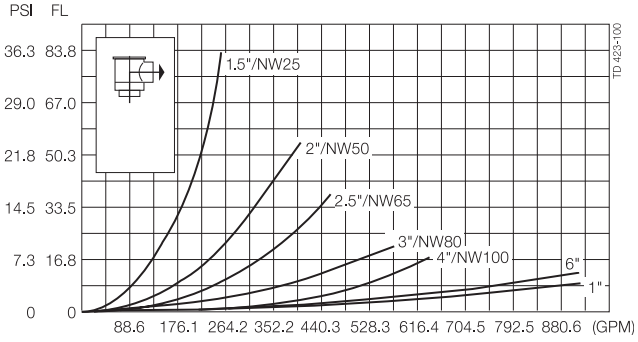
c. Closed change-over valve
a. Cleaning of the upper valve body.

Pressure drop/capacity diagrams

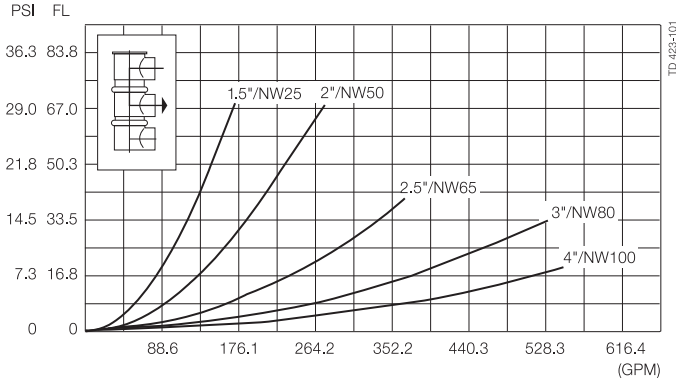
Shut-off valve:

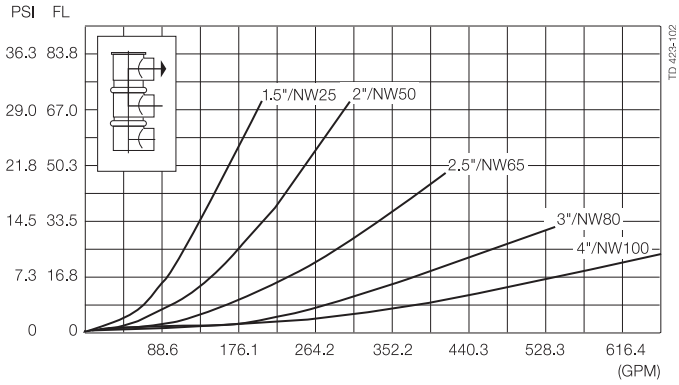


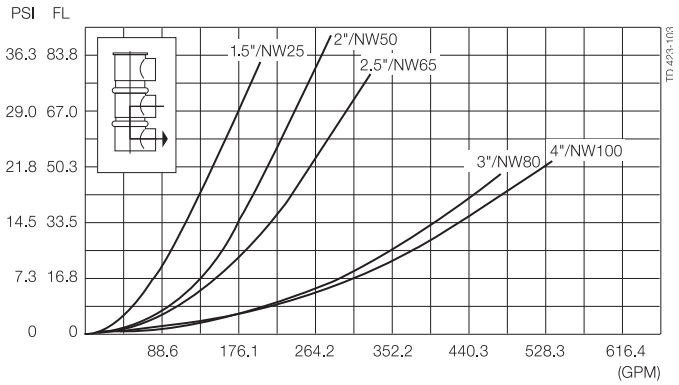




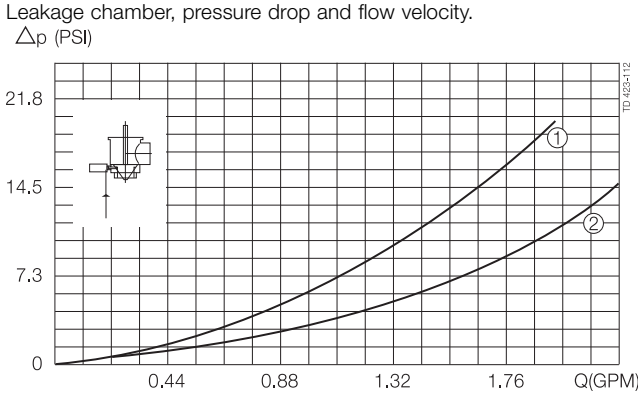
Change-over valve:





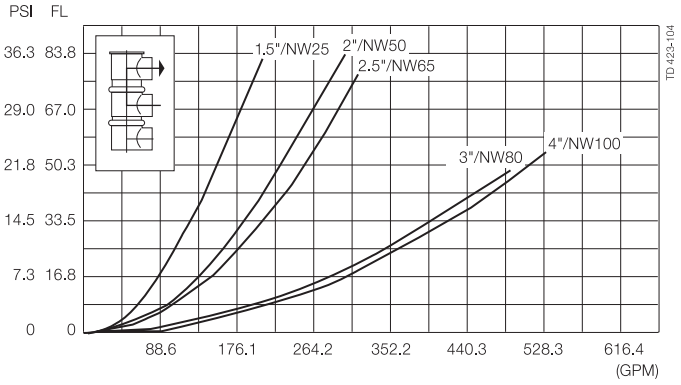


Leakage chamber, pressure drop and flow velocity.



1) CIP/detecting valve ø27

2) CIP/detecting valve ø32

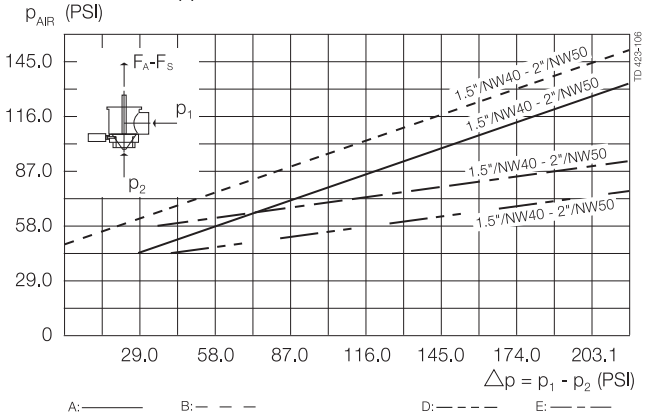


Note! For the diagrams the following applies:
Medium: Water (68°F).

Measurement: In accordance with VDI 2173.

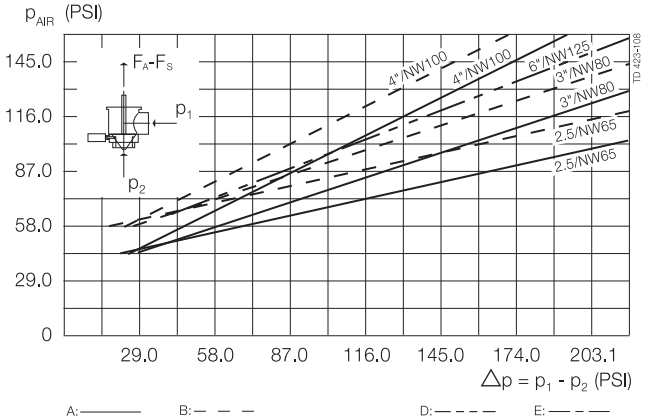
Max-pressure difference/support air pressure diagrams

Upper plug max. product pressure without leakage,
as a function of support air.



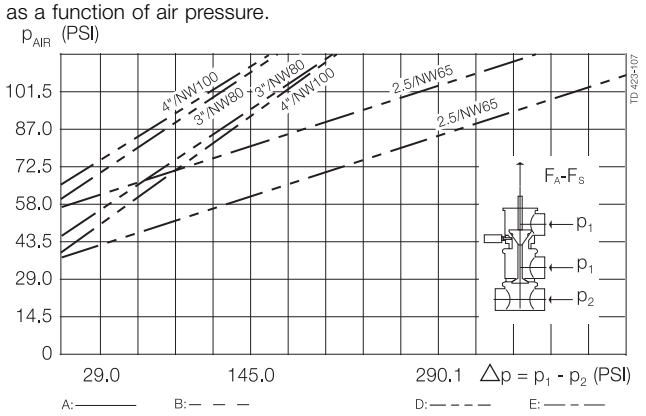
ø89	Actuator:	A	ø133	Actuator:	D
ø89	Actuator with extra strong spring:	B	ø133	Actuator with extra strong spring:	E
ø199	Actuator	C			

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



ø89	Actuator:	A	ø133	Actuator:	D
ø89	Actuator with extra strong spring:	B	ø133	Actuator with extra strong spring:	E

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

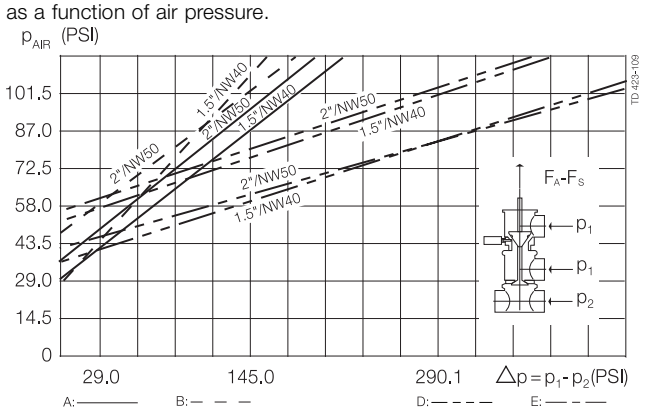


ø89	Actuator:	A	ø133	Actuator:	D
ø89	Actuator with extra strong spring:	B	ø133	Actuator with extra strong spring:	E

Lower plug (change over). Max. Product pressure without leakage,
as a function of air pressure.

ø89	Actuator:	A	ø133	Actuator:	D
ø89	Actuator with extra strong spring:	B	ø133	Actuator with extra strong spring:	E

Lower plug (change over). Max. Product pressure without leakage,
as a function of air pressure.

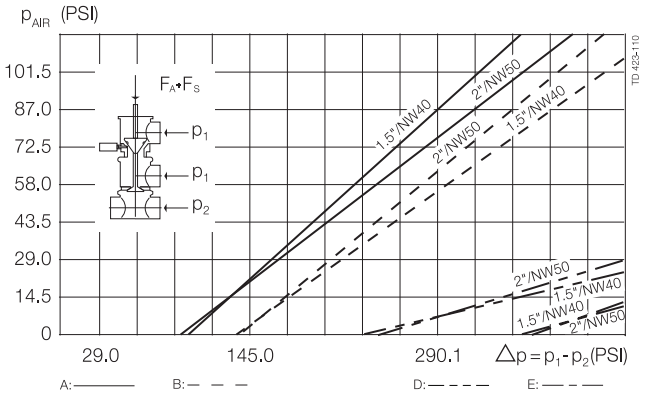


ø89	Actuator:	A	ø133	Actuator:	D
ø89	Actuator with extra strong spring:	B	ø133	Actuator with extra strong spring:	E

Note! If actuator is supported by air on spring side: max. allowable pressure is 45 PSI (3 bar)

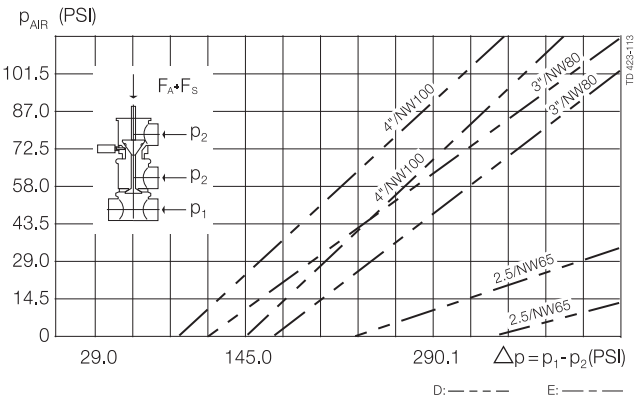
Max-pressure difference/support air pressure diagrams

Lower plug (change over) max. product pressure against which the valve can open by support air and spring.



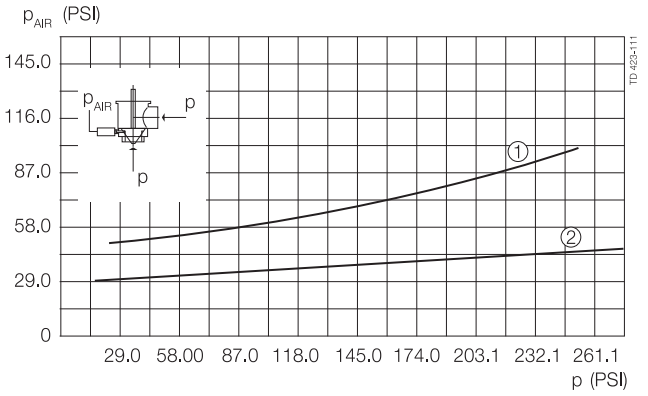
ø89	Actuator:	A	ø133	Actuator:	D
ø89	Actuator with extra strong spring:	B	ø133	Actuator with extra strong spring:	E

Lower plug (change over) max. product pressure against which the valve can open by support air and spring.



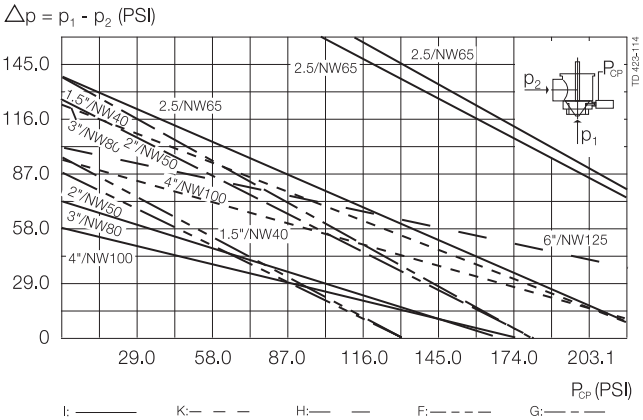
ø133	Actuator:	D			
ø133	Actuator with extra strong spring:	E			

CIP/detecting valves. Max. Product pressure without leakage, as a function of air pressure.



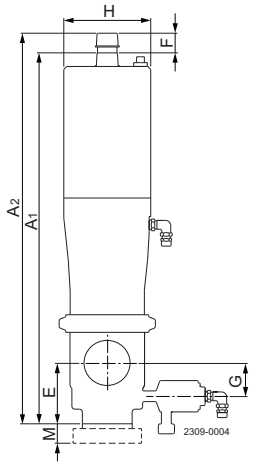
1	CIP/detecting valve ø27	2	CIP/detecting valve ø32

Max. CIP pressure in leakage chamber without leakage to product area, as a function of product pressure.

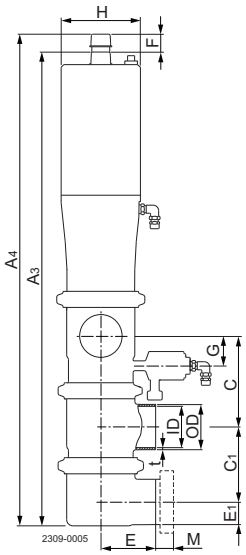


ø89	Actuator:	I	ø133	Actuator:	F
ø89	Actuator with extra strong spring:	K	ø133	Actuator with extra strong spring:	G
ø199	Actuator:	H			

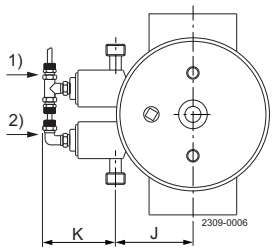
Dimensions



a. Shut-off valve.



b. Divert valve.



1) CIP valve

2) Detecting valve

c. Top view

Dimensions (inch)

Size	1½"	2"	2½"	3"	4"
A1	13.58	13.98	17.05	17.91	20.75
A2	14.57	14.96	18.03	19.17	22.01
A3	19.13	19.91	24.26	25.63	29.60
A4	20.11	20.90	25.52	26.89	30.86
C	3.54	4.02	4.88	5.08	6.18
C1	3.15	3.31	4.25	4.53	5.91
OD	1.50	2.00	2.50	3.00	4.00
ID	1.37	1.87	2.37	2.84	3.84
t	0.06	0.06	0.06	0.08	0.08
E	1.95	2.42	3.24	3.44	5.26
E1	0.81	1.06	1.31	1.54	2.04
F	0.98	0.98	1.26	1.26	1.26
G	1.06	1.31	1.56	1.80	2.30
H	3.50	3.50	5.24	5.24	5.24
J	1.84	1.84	2.24	2.62	3.32
K	2.48	2.48	2.48	2.48	2.48
Tri-Clamp®	0.83	0.83	0.83	0.83	0.83
Weight (lb.) Shut-off valve	13.23	13.89	28.22	29.32	36.60
Weight (lb.) Divert valve	16.98	17.86	33.07	37.48	50.71

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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