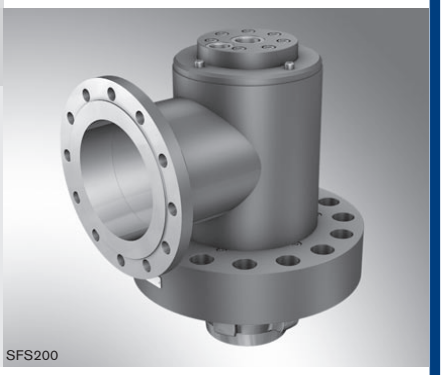
Prefill valve, actively operatable

RE 20473/12.06 1/6
Replaces: 06.06

Type SFS

Sizes 200 to 300
Component series 4X
Maximum operating pressure 350 bar


SFS200

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Features

- Hydraulically, actively switchable prefill valve (check valve) for flanged connection
- Reduced switching noise due to end position cushioning effective on both sides
- Optimised switching time characteristics

Ordering code

SFS		A	0 – 1 – 4X /	*

Prefill valve

Size 200 = **200**
Size 250 = **250**
Size 300 = **300**

Type of connection
Flanged connection = **A**

Without pre-compression feature = **0**

1 = Main piston can be actively controlled

4X = Component series 40 to 49 (40 to 49: unchanged installation and connection dimensions)

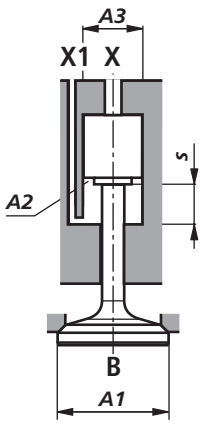
No code = NBR seals

⚠ Caution!
Observe compatibility of seals with hydraulic fluid used!

Seal material

Further details in clear text

Poppet geometry and determination of minimum pilot pressure



A1 = Effective area of main poppet
A2 = Effective area of pilot piston for “closing“
A3 = Effective area of pilot piston for “opening“
s = Piston stroke
V1 = Pilot oil flow for opening the valve
V2 = Pilot oil flow for closing the valve
p_{St} = Pilot pressure in port X
p_B = Operating pressure in port B

$$\text{Unchecking ratio} = \frac{\text{Pilot pressure } p_p}{\text{System pressure } p_B}$$

Size	A_1 in cm²	A_2 in cm²	A_3 in cm²	s in mm	V_1 in cm³	V_2 in cm³	Unchecking ratio in bar
200	216.4	36.4	50.3	42.0	211.0	153.0	4.3
250	373.2	67.4	95.0	52.5	503.7	353.8	3.9
300	572.6	92.86	143.1	63.0	901.8	585.0	4.0

Example (type SFS 200 A0…):
p_B = 30 bar; p_p = 4.3 x 30 bar = 129 bar

Function, section, symbol

Valves of type SFS are hydraulically, actively operatable prefill valves (check valves). They are used for the leak-free isolation of pressurised working circuits, mainly in press cylinders. The possibility of actively influencing the opening and closing process results in a reduction in switching times when compared with a conventional prefill valve.

The valves basically consist of housing (1), poppet (2), connection cover (3), pilot piston (4), mounting flange (5) and guide (6).

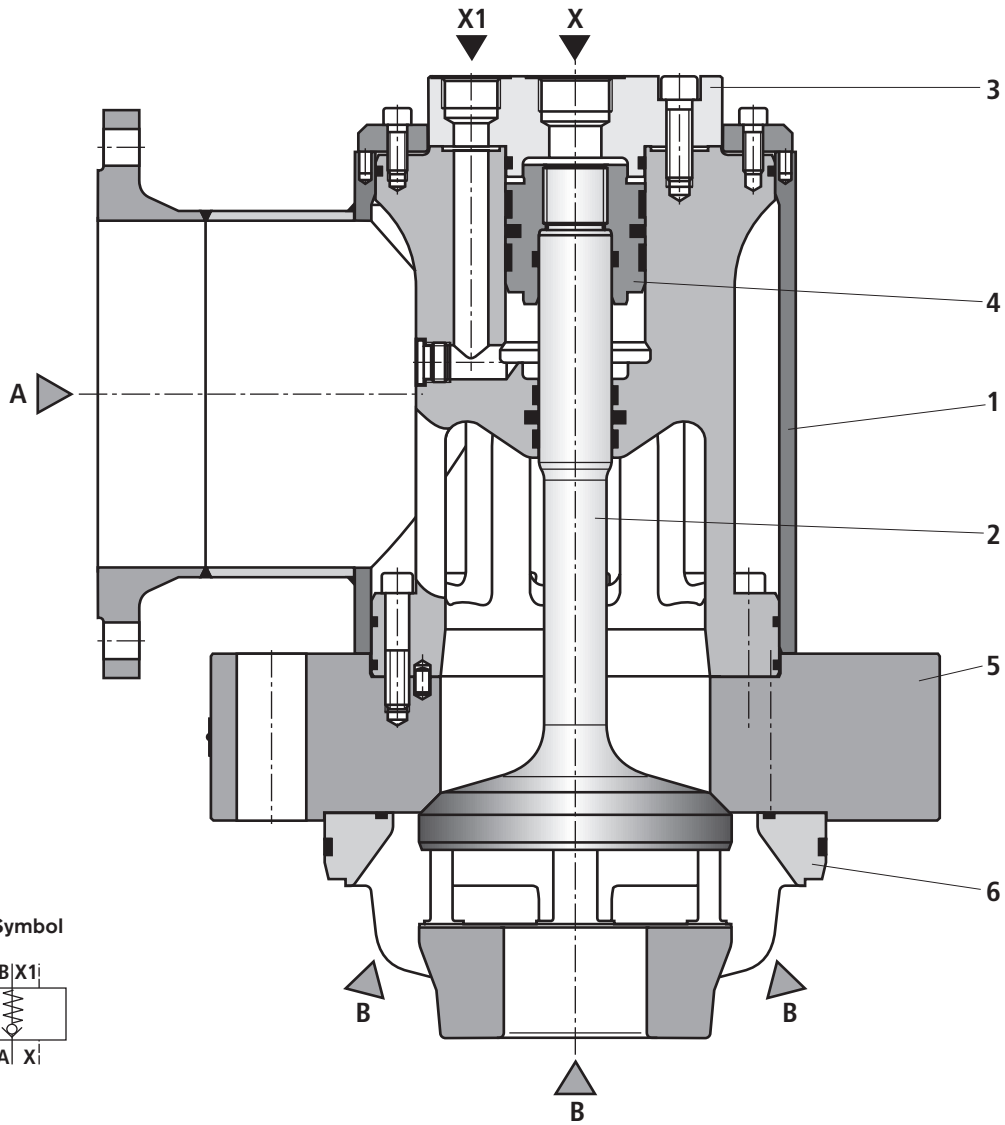
The valves allow free flow from A to B while pilot port X1 is depressurised. In the opposite direction, poppet (2) is held on its seat by the pressure acting in port B. Due to pressure present in pilot port X, poppet (2) is pushed off its seat. This allows a free flow through the valve also in the opposite direction. Closing of the piston can be initiated via pilot port X1.

The opening and closing time can be influenced by means of the pilot oil flow (throttling).

For technical data for the calculation of the required pilot pressure, see page 2.

Pilot port X: “opening“

Pilot port X1: “closing“



Symbol

Technical data (for applications outside these parameters, please consult us!)

General					
Size			200	250	300
Weight		kg	190	380	655
Installation orientation			Optional		
Port A (flange to EN 1092-1/11…/ PN16)		DN	200	250	300
Port X1			G1	G1 1/4	G1 1/4
Port X			G1 1/4	G1 1/2	G1 1/2

Hydraulic			
Maximum operating pressure	– Port A	bar	16
	– Port B	bar	350
	– Ports X and X1	bar	150
Hydraulic fluid			Mineral oil (HL, HLP) to DIN 51524; fast bio-degradable hydraulic fluids according to VDMA 24568 (see also RE 90221); HETG (rape seed oil); other hydraulic fluids on enquiry
Hydraulic fluid temperature range		°C	–30 to +80
Viscosity range		mm^2/s	10 to 800
Max. permissible degree of contamination of the hydraulic fluid - cleanliness class to ISO 4406 (c)			Class 20/18/15 [1]

[1] The cleanliness classes specified for components must be adhered to in hydraulic systems. Effective filtration prevents malfunction and, at the same time, increases the service life of components.

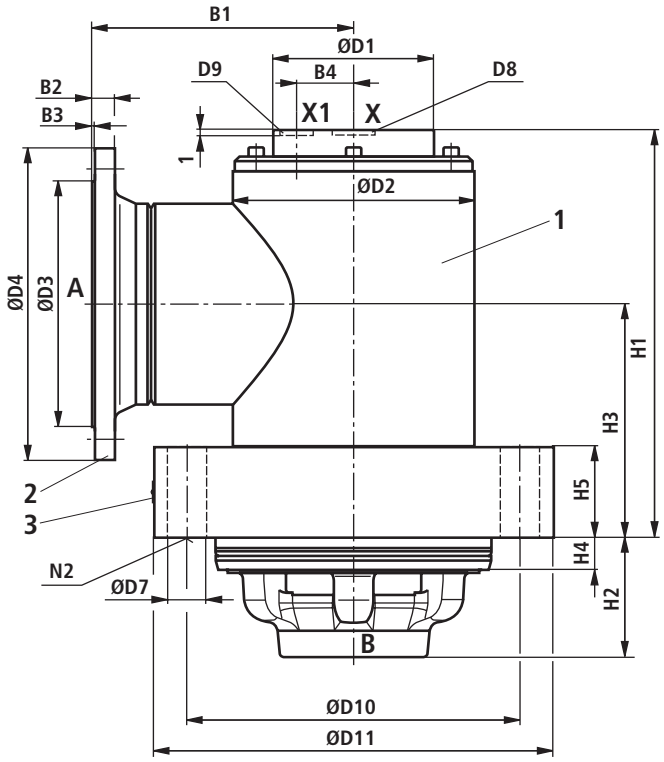
For the selection of filters, see data sheets RE 50070, RE 50076, RE 50081, RE 50086, RE 50087 and RE 50088.

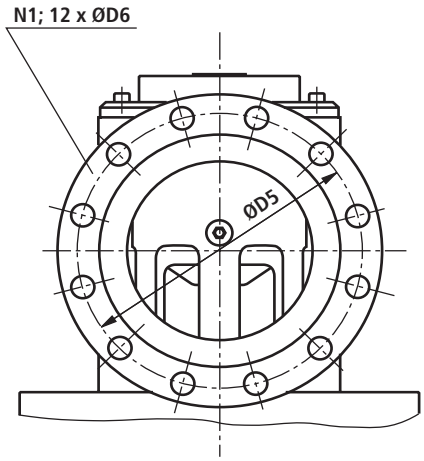
Maximum switching times

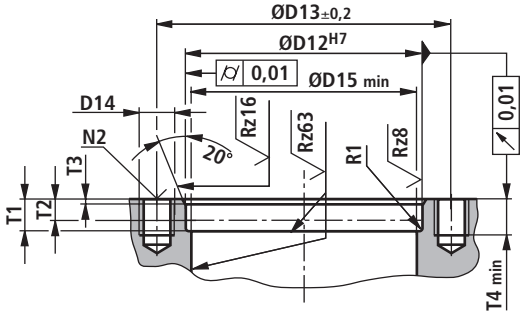
Size	**Maximum switching time** in ms (at X, X1 = 150 bar)	
	Closing	Opening
200	60	70
250	70	80
300	110	90

The switching time depends on the line resistance, pilot valve and pilot oil flow.

Unit dimensions (nominal dimensions in mm)







1 Housing can be mounted steplessly rotated through 360°

2 Flange to EN 1092-1/11…/PN16

3 Nameplate

T2 Depth of fit

N2 Number of **valve fixing screws** arranged at equally spaced intervalls on the bolt circle (separate order)

The following valve fixing screws are recommended:

Hexagon socket head cap screws ISO 21269 - 10.9

Friction coefficent μ_{total} = 0.12 to 0.17

Size	Dimensions in mm	Tightening torque M_T in Nm
200	M36 x 3 x 150	3100
250	M42 x 3 x 180	5100
300	M42 x 3 x 220	5100

Size	B1	B2	B3	B4	ØD1	ØD2	ØD3	ØD4	ØD5	ØD6	ØD7	D8	D9	ØD10
200	275	24	3	60	168	273	268	340	295	22	40	G1 1/4	G1	350
250	330	26	3	80	225	356	320	405	355	26	46	G1 1/2	G1 1/4	445
300	380	28	4	94	250	419	378	460	410	26	46	G1 1/2	G1 1/4	525

Size	ØD11	ØD12	ØD13	ØD14	D15	H1	H2	H3	H4	H5	N1	N2	T1	T2	T3	T4	R1
200	420	290	350	M36 x 3	270	445	180	255	35	100	12	15	37	26	5	50	3
250	530	380	445	M42 x 3	355	571	240	320	55	120	12	18	57	42	8	60	5
300	610	450	525	M42 x 3	425	684	305	390	55	160	12	24	57	42	8	75	5

Maximum flow q_V in l/min (A to B) for various applications

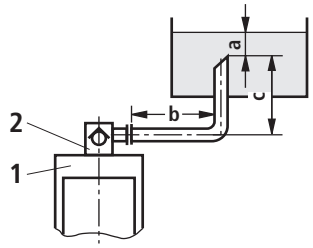
Size	200	250	300
Application 1	5600	10000	14000
Application 2	4340	6775	9750
Application 3	3770	5890	8480
Application 4	1510	2360	3400

⚠ Caution!

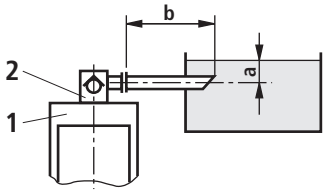
Too small a prefill valve or an insufficiently dimensioned pipe results in gas escaping from the hydraulic fluid with the associated consequences and frequently to long-term damage to cylinder seals.

Applications

Application 1

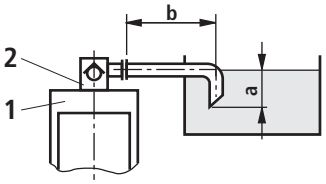


Application 2

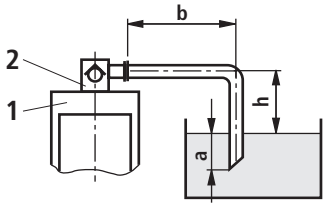


Size of the prefill tank
min. 1.5 x cylinder volume

Application 3

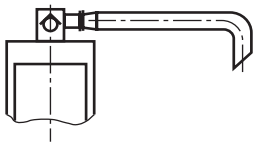


Application 4



1 Cylinder
2 Prefill valve
a Min. 300 mm with extended cylinder
b Up to 1000 mm with specified maximum flows
c ≤ 500 mm
h 300 mm ≤ h < 500 mm

Note on applications 1 to 4



For applications close to the limiting parameters, please consult us. It is, however, often sufficient to select the pipe one size larger.