

<b>MANNESMANN REXROTH</b>	<b>Pre-fill Valve, Type SF, Series 1X</b>		<b>RE 20 475/01.96</b>
	Size 40 to 80	up to 315 bar	Replaces: 10.85

**Features:**

- Hydraulic pilot operated check valve
  - for flange connections
  - as a cartridge valve
- Complete valve (pilot cylinder, housing and check valve) suitable for being directly mounted to a hydraulic cylinder
- As a check valve which acts as an anti-cavitation valve
- Cartridge valve (pilot cylinder and check valve) for mounting directly into the base of a cylinder
- Optionally with and without de-compression



K 2184/5  
Type SF .. A0-1-1X/

**Functional description, section, symbols**

The type SF valve is a hydraulic pilot operated check valve. It gives leak free isolation in direction B – A and free flow from A – B.

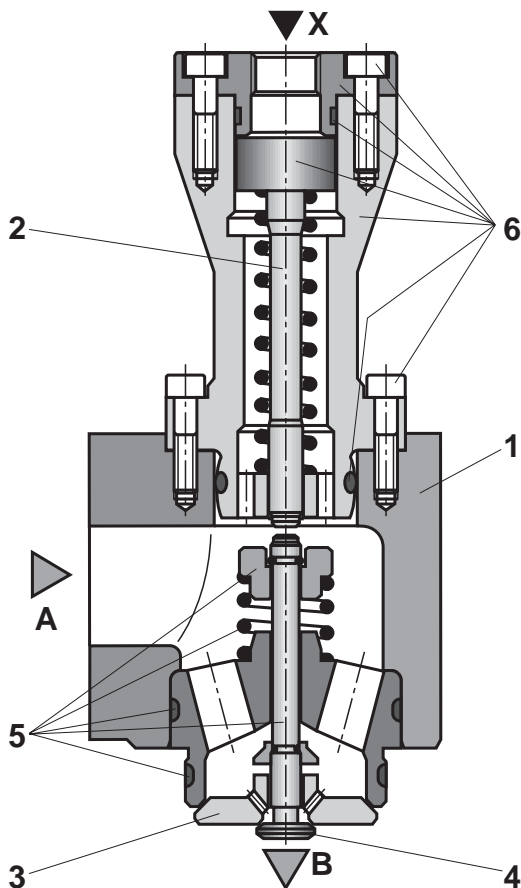
The pre-fill valve basically consists of the housing (1), pilot piston (2), main poppet (3), de-compression poppet (4), check valve (5) and pilot piston (6).

The valve is hydraulically opened via the pilot piston (2), that has pressure applied to it via port X. The main poppet (3) is thereby directly opened (version without de-compression).

With the version with de-compression, the de-compression poppet (4) is firstly opened and then the main poppet (3). Therefore, a fast and shock free unloading of the compressed pressure fluid is guaranteed. Via a throttle check valve, built into the pilot line, it is possible to influence the opening or closing times of the valve.

The valve is of a modular design, therefore, all variations can be built up from one basic valve.

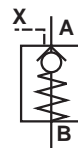
The open position of the valve can be monitored by fitting a limit switch at the pilot piston.



Type SF .. A1-1-1X/  
(with de-compression)

**Symbols:**

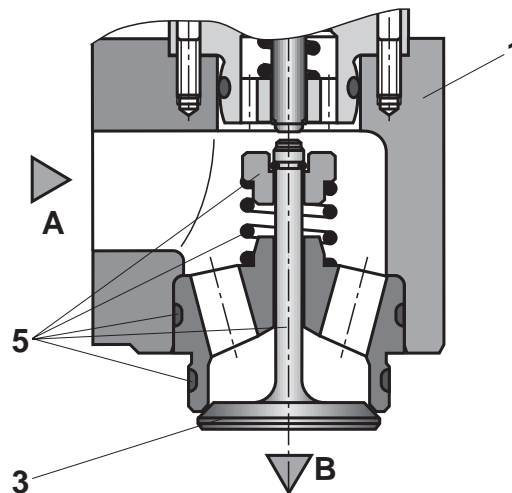
For flange connections,  
as cartridge valve



As check valve



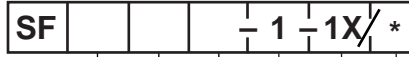
For calculating the required pilot pressures, see page 2.



Type SF .. A0-1-1X/  
(without de-compression)

**Ordering code for a complete valve (pilot piston, housing, check valve)**

Order nos. for pilot piston and cartridge (individual order), see page 4.



Nominal size 40 = 40  
 Nominal size 50 = 50  
 Nominal size 63 = 63  
 Nominal size 80 = 80

**Connection type**  
 for flange connection = A  
 as a cartridge valve = K

**Flanges with fixing bolts** must be ordered separately, see RE 45 503.

Further details in clear text  
 Series 10 to 19  
 (10 to 19: unchanged installation and connection dimensions)  
**Spring return of the main poppet**  
 cracking pressure ≈ 0.2 bar  
 1 = With de-compression  
 0 = Without de-compression

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

**General**

Installation	optional					
Weights		Size 40	Size 50	Size 63	Size 80	
	• Flange connection	kg	8	14	24	41
	• Cartridge valve	kg	3.7	6.8	11.3	19.5

**Hydraulic**

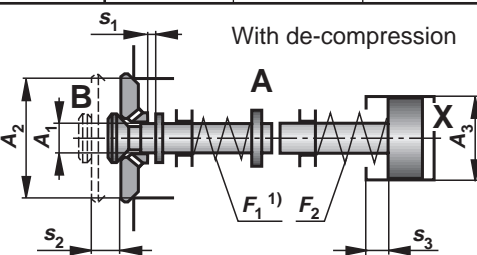
Pressure fluid - temperature range	°C	-30 to +80	
Viscosity range	mm <sup>2</sup> /s	10 to 800	
Pressure fluid		Mineral oil (HL, HLP) to DIN 51 524; Fast bio-degradable pressure fluids to VDMA 24 568 (also see RE 90 221); HETG (rape seed oil); other fluids on request	
Degree of contamination		Maximum permissible degree of contamination of the fluid is to NAS 1638 class 9. We, therefore, recommend a filter with a minimum retention rate of β <sub>10</sub> ≥ 75.	
Operating pressure, max.	• Connection A	bar	up to 16
	• Connection B	bar	up to 315
	• Connection X	bar	up to 315

**Flow q<sub>v</sub> in L/min in relationship to the flow velocity**

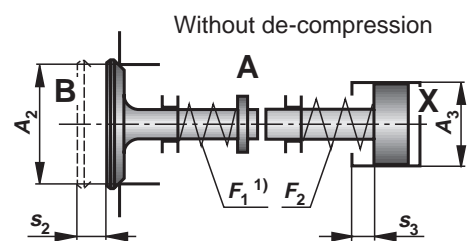
	Flow velocity v in m/s							
	0.5	1	1.5	2	2.5	3	3.5	4
Size40	38	76	114	152	190	228	266	304
Size50	59	118	177	236	295	354	413	472
Size63	93	186	279	372	465	508	651	744
Size80	152	304	456	608	760	912	1064	1216

**Calculation of the pilot pressure required for opening**

	A <sub>1</sub> <sup>2)</sup> in cm <sup>2</sup>	A <sub>2</sub> in cm <sup>2</sup>	A <sub>3</sub> in cm <sup>2</sup>	s <sub>1</sub> <sup>2)</sup> in mm	s <sub>2</sub> in mm	s <sub>3</sub> in mm	F <sub>1</sub> in daN	F <sub>2</sub> in daN	V <sub>St</sub> in cm <sup>3</sup>
Size40	1.77	18.1	9.07	3	10	12	3.6 to 4.4	45 to 60	10.9
Size50	3.14	30.2	15.2	3	12	14	6 to 7.5	76 to 95	21.3
Size63	4.52	45.36	22.9	3	15	17	9 to 11.5	114 bis 165	38,9
Size80	7.06	70.88	35.25	3	20	22	14 to 18	176.5 to 249	77.6



A<sub>1</sub> = Effective area of pilot poppet  
 A<sub>2</sub> = Effective area of main poppet  
 A<sub>3</sub> = Effective area of control spool  
 s<sub>1</sub> = Pilot poppet stroke  
 s<sub>2</sub> = Main poppet stroke  
 s<sub>3</sub> = Pilot piston stroke  
 F<sub>1</sub> = Spring force of valve spring  
 F<sub>2</sub> = Spring force of compression spring of pilot piston  
 V<sub>st</sub> = Control volume for opening of valve

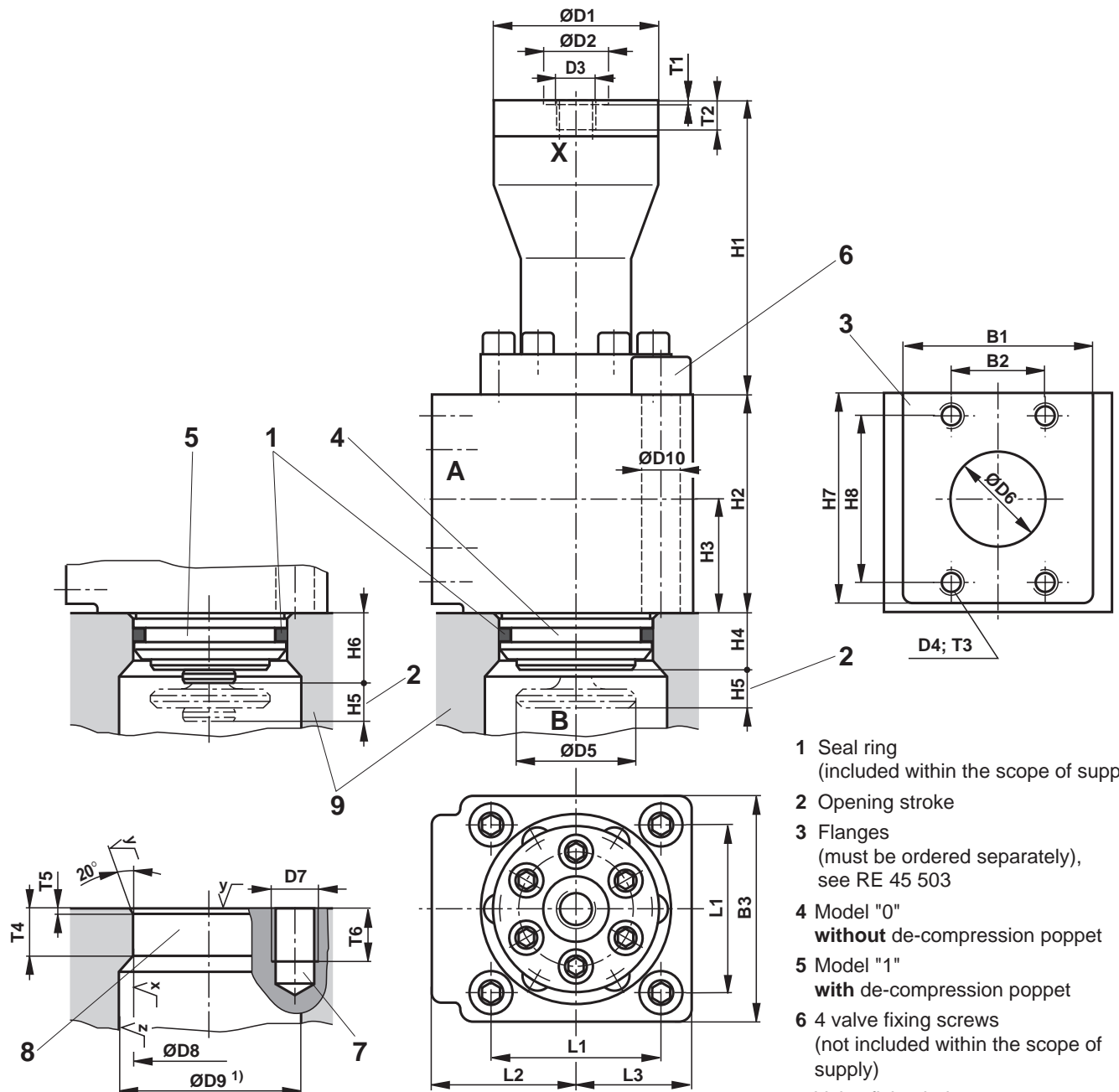


1) Cracking pressure 0.2 bar

2) Omitted with type "without de-compressing poppet"

Unit dimensions: flange connections

(Dimensions in mm)



- 1 Seal ring  
(included within the scope of supply)
- 2 Opening stroke
- 3 Flanges  
(must be ordered separately),  
see RE 45 503
- 4 Model "0"  
**without** de-compression poppet
- 5 Model "1"  
**with** de-compression poppet
- 6 4 valve fixing screws  
(not included within the scope of supply)
- 7 Valve fixing holes
- 8 Mounting interface in the  
hydraulic cylinder
- 9 Hydraulic cylinder

$$x/\sqrt{8} = \sqrt{R_{\max}}$$

$$y/\sqrt{16} = \sqrt{R_z}$$

$$z/\sqrt{63} = \sqrt{R_z}$$

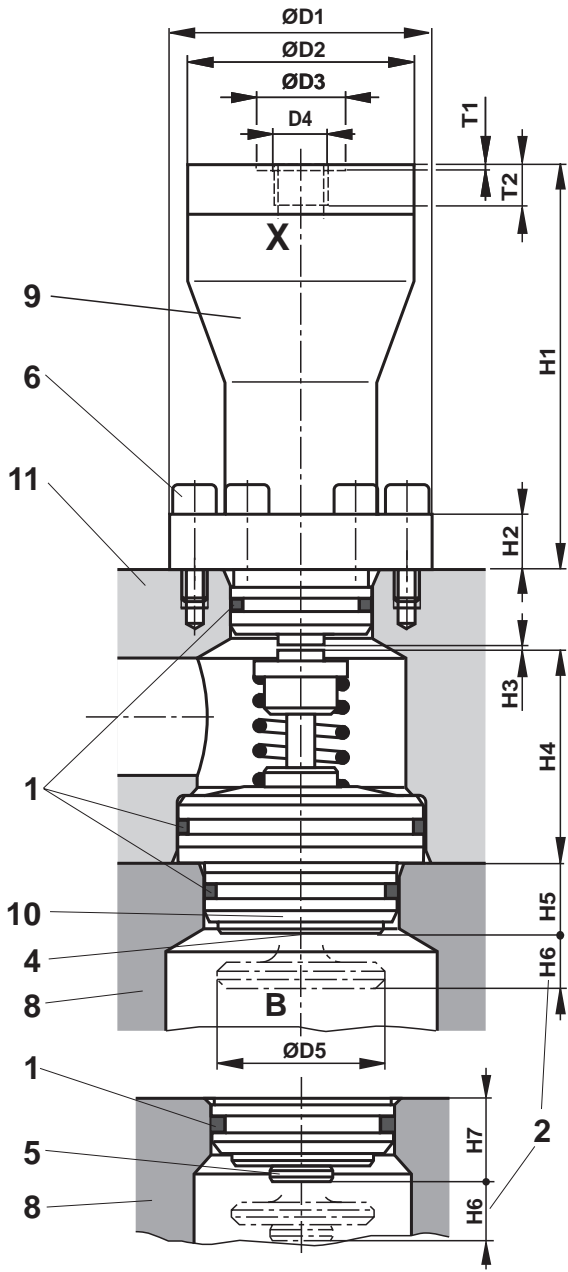
1) Minimum dimension

	Valve fixing screws Pos. 6	$M_A$ in Nm	B1	B2	B3	D1	D2	D3	D4	D5	D6	D7
Size40	M16 x 130 DIN 912-10.9	310	70	43	100	72	34	G1/2	M12	52	40	M16
Size50	M20 x 140 DIN 912-10.9	620	100	51	120	87	24	G1/2	M12	67	50	M20
Size63	M24 x 180 DIN 912-10.9	1060	115	62	145	105	34	G1/2	M16	82	63	M24
Size80	M30 x 200 DIN 912-10.9	2100	115	62	180	132	42	G3/4	M16	102	76	M30

	D8 <sup>H7</sup>	D9	D10	H1	H2	H3	H4	H5	H6	H7	H8	L1	L2	L3	T1	T2	T3	T4	T5	T6
Size40	62	66	18	127	103	53	26	10	30	100	78	75	65	50	1	15	18	20	4	27
Size50	80	84	22	157	113	58	32.5	12	37.5	110	89	90	75	60	1	15	18	25	5	27
Size63	95	104	26	185	139	71.5	34	15	40	135	106.5	105	90	72.5	1	15	25	25	5	42
Size80	115	130	33	237	160	77.5	36	20	43	150	106.5	130	102	90	1	17	25	30	5	55

**Unit dimensions: cartridge valve, installation hole**

(Dimensions in mm)

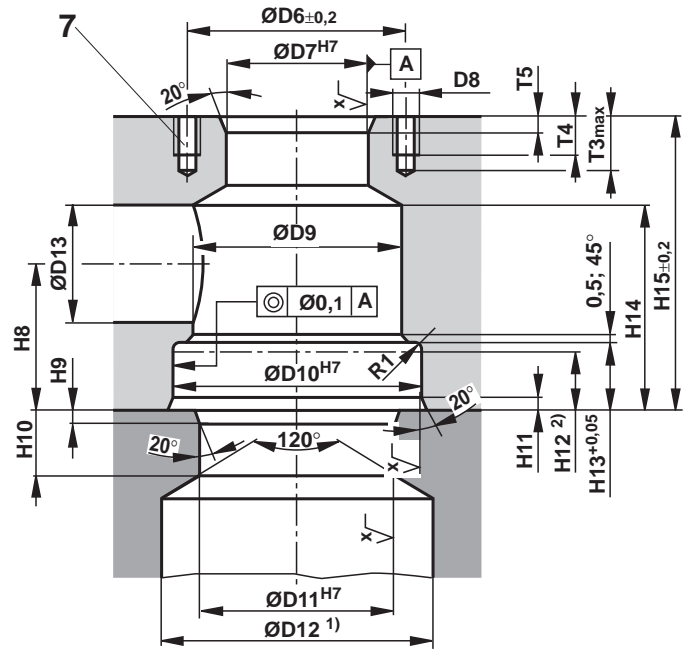


- 1 Seal ring (included within the scope of supply)
- 2 Opening stroke
- 4 Model "0" **without** de-compression poppet
- 5 Model "1" **with** de-compression poppet
- 6 6 valve fixing screws (not included within the scope of supply)
- 7 6 valve fixing holes
- 8 Hydraulic cylinder
- 9 Pilot cylinder <sup>4)</sup>
- 10 Check valve <sup>3)</sup>
- 11 Cylinder cover

1) Minimum dimension

2) Depth of fit

$$x/\sqrt{=} = \sqrt{R_{\max}^8}$$



	Ordering number		
	Check valve <sup>3)</sup>		Pilot cylinder <sup>4)</sup>
	with de-compression	without de-compression	
<b>Size40</b>	303762	303698	305077
<b>Size50</b>	320425	303699	305078
<b>Size63</b>	320426	303772	305136
<b>Size80</b>	320427	303837	305137

	Weight in kg		Valve fixing screws, Pos. 6	$M_A$ in Nm	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13
	<sup>3)</sup>	<sup>4)</sup>															
<b>Size40</b>	1.1	2.6	M8 x 30 DIN 912-8.8	25	80	72	34	G1/2	52	65	45	M8	63	75	62	66	40
<b>Size50</b>	2.0	4.8	M10 x 40 DIN 912-8.8	51	95	87	34	G1/2	67	77	55	M10	80	95	80	84	50
<b>Size63</b>	3.0	8.3	M12 x 50 DIN 912-8.8	87	110	105	34	G1/2	82	90	65	M12	95	110	95	104	63
<b>Size80</b>	4.5	15	M16 x 60 DIN 912-8.8	215	135	132	42	G3/4	102	110	80	M16	115	130	115	130	80

	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	R1	T1	T2	T3	T4	T5
<b>Size40</b>	133	18	2	70	26	10	30	50	4	20	5	20	25	70	97	4	1	1	15	17	12	4
<b>Size50</b>	158	25	2	81	32.5	12	37.5	56	5	25	5	20	25	81	112	5	1	1	15	21	15	5
<b>Size63</b>	189	32	2	96	34	15	40	67	5	25	5	25	30	98	135	5	1	1	15	24	18	5
<b>Size80</b>	237	35	2	112	36	20	43	75	5	30	5	25	30	115	160	5	1	1	17	32	25	5

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