

RE 20 485/02.03

Replaces: 12.00

**Pre-fill valve
Type SFA**

Nominal sizes 32 to 80

Series 1X

Maximum operating pressure 350 bar



H/A/D 6714

Type SFA 40 FT0-1X/M/01

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Features

- Hydraulic pilot operated check valve
 - For threaded connections (NS 32)
 - For flange connections (from NS 40)
- For mounting directly onto the work cylinder
- With or without decompression, optional
- Integrated high pressure connection

Ordering details

Nominal size	SFA				-1X / M / 01	*
Nominal size 32	= 32					
Nominal size 40	= 40					
Nominal size 50	= 50					
Nominal size 63	= 63					
Nominal size 80	= 80					
Connection type (port A)						
For threaded connections (only NS 32)	= G					
For flange connections (from NS 40)	= F					
Without tank drilling	= No code					
With tank drilling	= T					
With decompression	= 1					
Without decompression	= 0					

Further details in clear text

Connection version

01 = Threaded holes, with pipe threads to DIN ISO 228, DIN 3852 part 2

M = NBR seals (other seals on request)

⚠ Attention!

The compatibility of the seals and pressure fluid has to be taken into account!

1X = Series 10 to 19 (series 10 to 19: unchanged installation and connection dimensions)

Preferred types (readily available)

Type	Material number	Type	Material number
SFA 32 G0-1X/M/01	R900955984	SFA 80 F1-1X/M/01	R900737034
SFA 40 F0-1X/M/01	R900964465		
SFA 40 F1-1-1X/M/01	R900964466		
SFA 50 F1-1-1X/M/01	R900972963		
SFA 63 F0-1X/M/01	R900975897		

Further preferred types and standard components are shown in the EPS (standard price list).

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Function, section, symbols

The valve type SFA is a hydraulic pilot operated check valve. It is used for leak-free isolation of pressurised working circuits (e.g. press cylinders). Due to its good flow characteristics and the relatively low closing force of the main poppet compression spring (5), the valve is ideally suited for anti-cavitation functions and the pre-filling, for example of the main cylinders on a press during fast closing movements. The integrated pressure connection „P” makes it possible to build up the high pressure in the press cylinder!

The valve basically consists of the housing (1), control spool (2), main poppet (3), pilot poppet (4) and compression springs (5) and (6).

Version without decompression

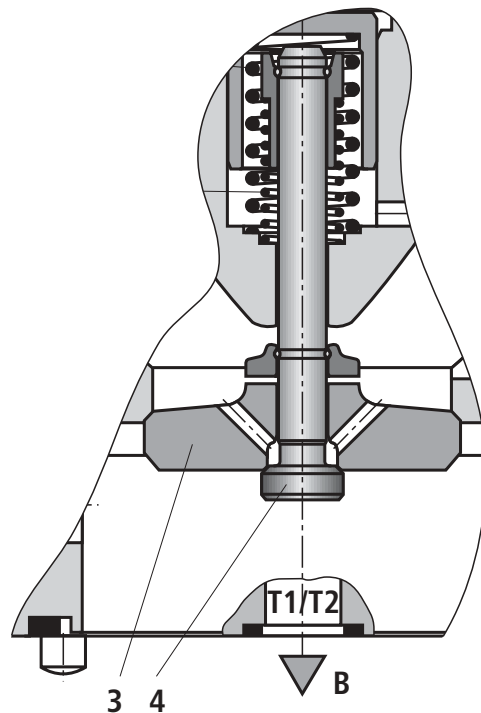
In the valve free-flow occurs from A to B. In the opposite direction the main poppet (3) is held on its seat by the compression spring (5) and the pressure acting on port B. When control port X is pressurised, the control spool (2) is forced down against the spring (6) and moves the main poppet (3) from its seat. Hence the valve now also has free-flow in the opposite direction.

Version with decompression

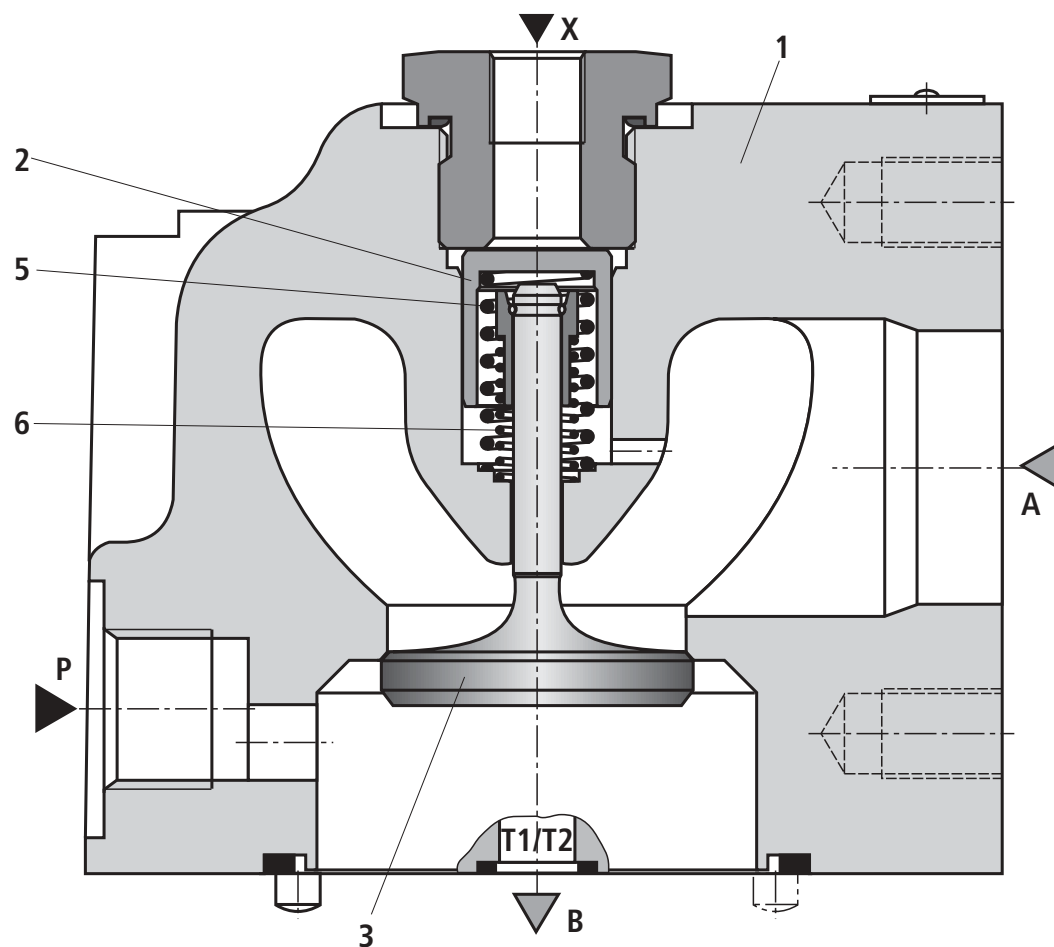
The way in which this version operates is very similar to the way in which the version without decompression.

When control port X is pressurised the control spool (2) at first only opens the pilot poppet (4). Thereby shock-free decompression of the trapped fluid is guaranteed.

A slip-in-type nozzle must be provided in the P-channel of the directional valve. The orifice size is related to the nominal size of the pre-fill valve (see below).



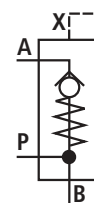
Type SFA..FT1-1X/M/01
(with decompression)



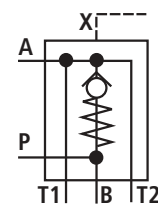
Type SFA..GT0-1X/M/01 (without decompression)

Symbols

Type SFA...



Type SFA...T...



⌀ Threaded orifice

	Orifice Ø
NS 32	0.8 mm
NS 40	0.8 mm
NS 50	0.8 mm
NS 63	0.8 mm
NS 80	1.0 mm

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

Nominal size	NS	32	40	50	63	80
Weight	kg	6	7	10.5	16	23
Installation		Optional				
Ambient temperature range	°C	- 30 to + 80 (NBR seals)				
Maximum operating pressure	Ports B, P	bar	350			
	Port X	bar	150			
	Port A	bar	16			
Opening pressure ¹⁾	bar	≈ 0.12				
Maximum flow	L/min	See application cases on page 7				
Pressure fluid		Mineral oil (HL, HLP) to DIN 51 524 ²⁾ ; Fast bio de-gradable pressure fluids to VDMA 24 568 (also see RE 90 221); HETG (rape seed oil) ²⁾ ; Other pressure fluids on request				
Pressure fluid temperature range	°C	- 30 to + 80				
Viscosity range	mm ² /s	10 to 800				
Cleanliness class to ISO code		Maximum permissible degree of contamination of the pressure fluid is to ISO 4406 (C) class 20/18/15 ³⁾				

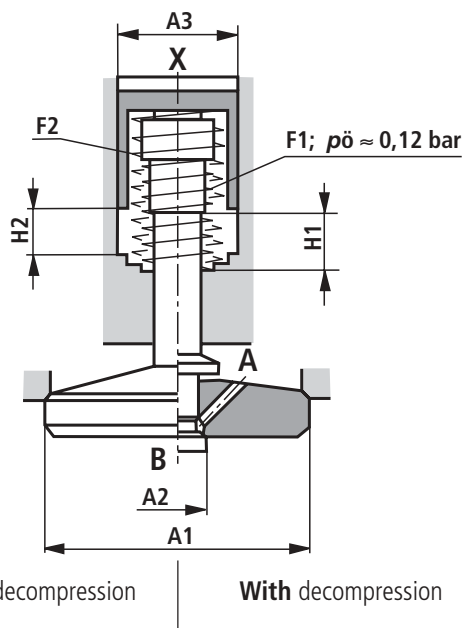
¹⁾ Pressure differential required at the main poppet to overcome the spring force

²⁾ Suitable for NBR **and** FKM seals

³⁾ The cleanliness class stated for the components must be adhered too in hydraulic systems. Effective filtration prevents faults from occurring and at the same time increases the component service life.

For the selection of filters see catalogue sheets RE 50 070, RE 50 076 and RE 50 081.

Calculation of the required control pressure for opening the valve



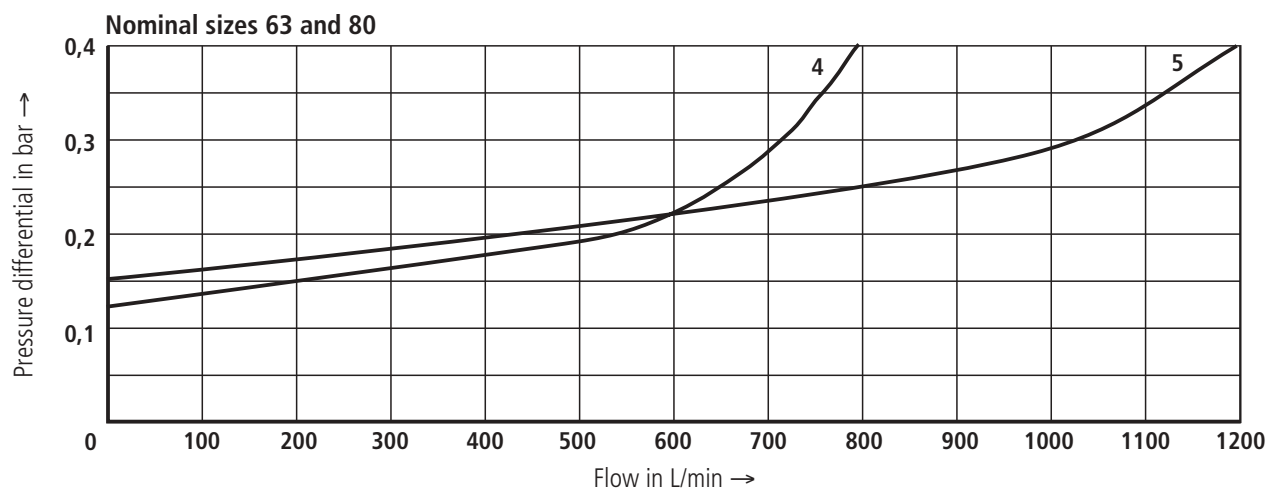
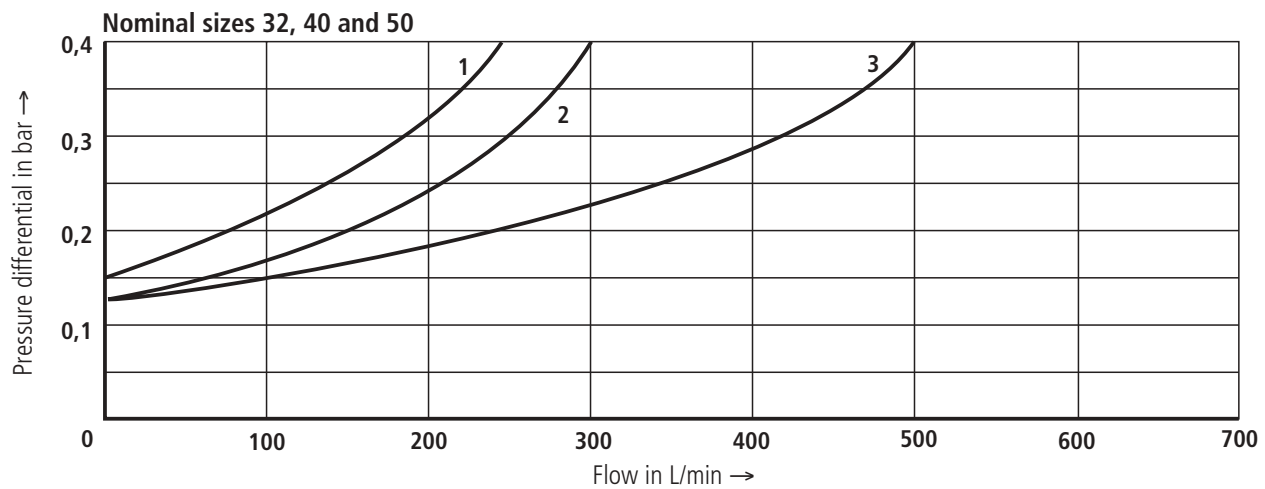
- A1** = Effective area of the main poppet
- A2** = Effective area of the pilot poppet
- A3** = effective area of the control spool
- H1** = Main poppet stroke
- H2** = Pilot poppet stroke
- F1** = Spring force of the valve spring
- F2** = Spring force of the pilot piston compression spring
- V_{st}** = Control volume for opening the valve

NS	A1 in cm ²	A2 ³⁾ in cm ²	A3 in cm ²	H1 in mm	H2 in mm	F1 in daN	F2 in daN	V _{st} in cm ³
32	8.04	0.5	2.01	8.5	6.5	0.9 to 2.2	5.8 to 10.9	1.30
40	13.52	0.7853	3.14	10	7	1.4 to 2.9	9.3 to 16.2	2.20
50	21.24	1.13	4.71	12.5	9	2.3 to 4.9	14.9 to 26.1	4.20
63	32.67	1.77	7.07	14.5	11	3.5 to 6.3	20.6 to 34.8	7.80
80	49.02	2.54	10.18	17	13	5.7 to 12.7	31.0 to 57.9	13.20

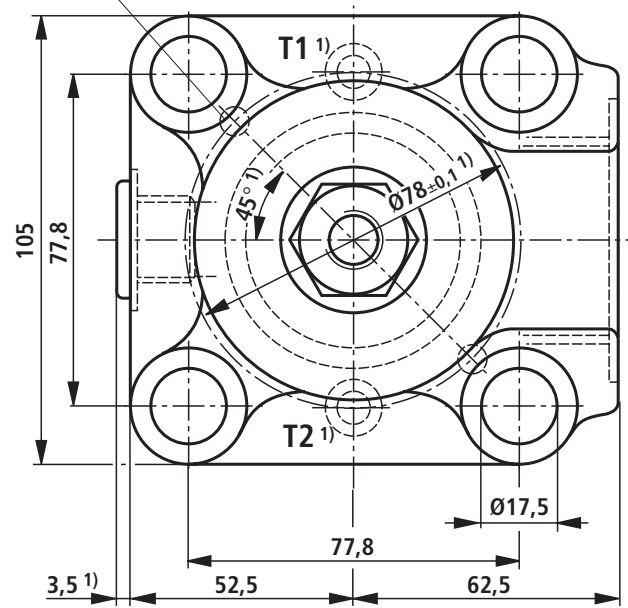
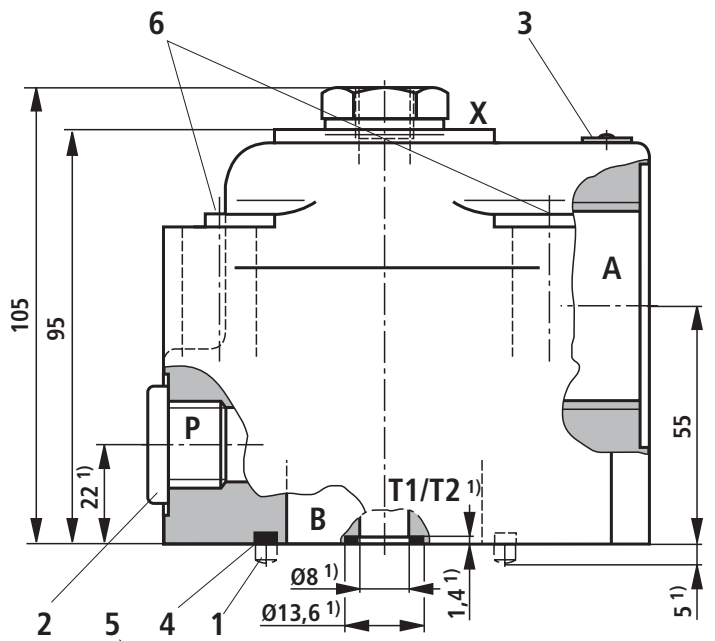
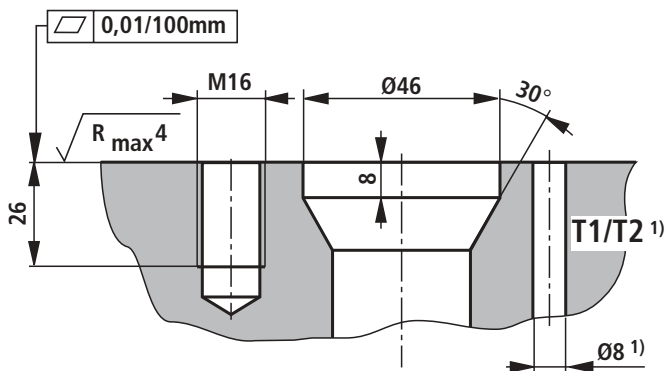
³⁾ Omitted in the version "without decompression" (ordering detail SFA...0...)

Characteristic curves (measured with HLP46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)

Pressure differential Δp between ports A and B in relation to the flow q_v with the flow in the suction direction of A to B.



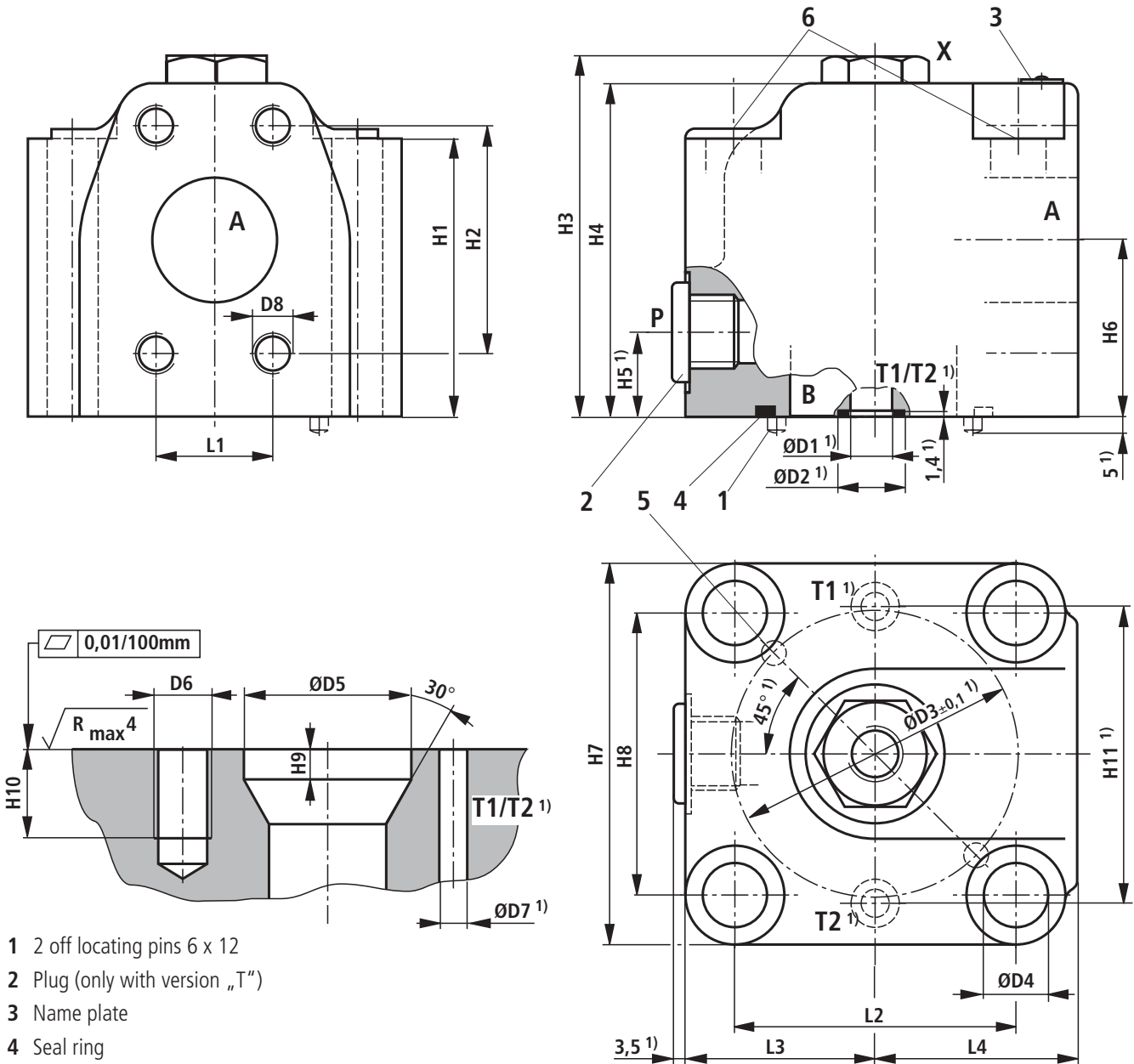
- 1 NS 32
- 2 NS 40
- 3 NS 50
- 4 NS 63
- 5 NS 80



- 1 2 off locating pins 6 x 12
- 2 Plug (only with version „T“)
- 3 Name plate
- 4 Seal ring
- 5 A drilling Ø 6.5 x 6 deep is to be provided on the connection interface for centring the valve!
- 6 **4 off valve fixing screws**
To DIN 912 – 10,9
(not included within the scope of supply);
Tightening torque M_A see table on page 7

¹⁾ Only with version „T“

Unit dimensions: flange connections (NS 40 to NS 80) (dimensions in mm)



- 1 2 off locating pins 6 x 12
- 2 Plug (only with version „T“)
- 3 Name plate
- 4 Seal ring
- 5 A drilling $\text{Ø} 6.5 \times 6$ deep is to be provided on the connection interface for centring the valve!
- 6 4 off valve fixing screws
To DIN 912 – 10.9 (not included within the scope of supply);
Tightening torque M_A see table on page 7

¹⁾ Only with version „T“

NS	L1 ± 0.2	L2	L3	L4	ØD1	ØD2	ØD3 ± 0.1	ØD4	ØD5	D6	ØD7	D8
40	35.7	88.4 ± 0.2	58	62	10	15.7	90	17.5	58	M16	10	M12
50	42.9	102.5 ± 0.2	70	72	13	19	104	22	71	M20	13	M12
63	50.9	113.15 ± 0.2	80	82	13	19	120	26	90	M24	13	M12
80	61.9	134 ^{+0.3}	92	95	13	19	140	30	107	M27	13	M16

NS	H1	H2 ± 0.2	H3	H4	H5	H6	H7	H8	H9	H10	H11 ± 0.1
40	85	69.9	109	102	22	54	116	88.4 ± 0.2	10	26	92
50	101	77.8	132	124	22	66	141	102.5 ± 0.2	12	32	108
63	125	88.9	152	144	30	83	160	113.15 ± 0.2	14	38	130
80	140	106.4	170	158	30	90	185	134 ^{+0.3}	16	43	150

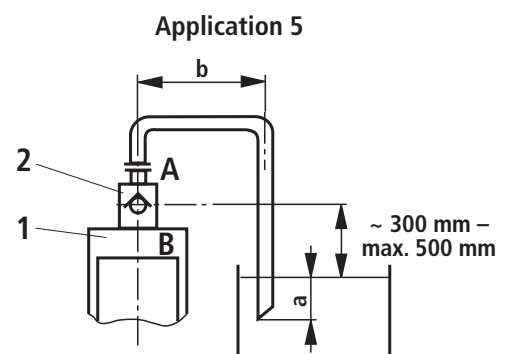
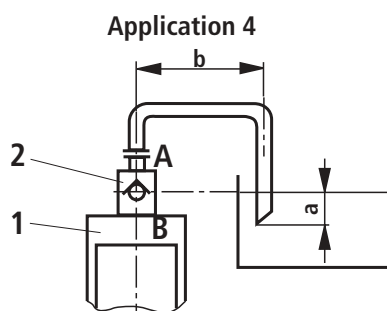
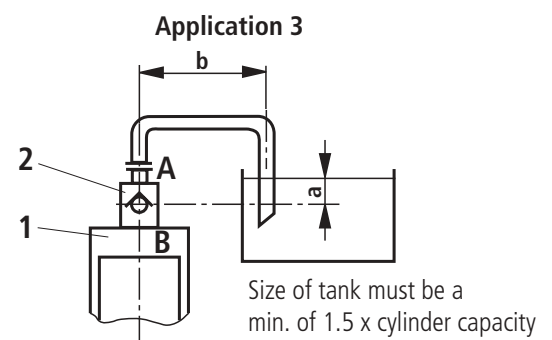
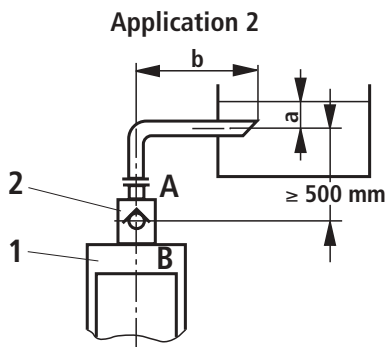
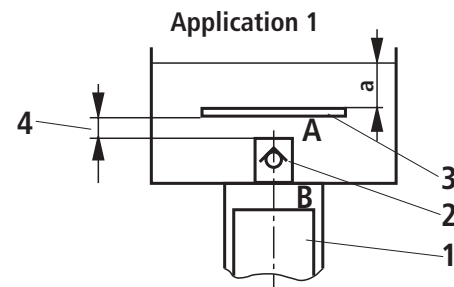
Valve fixing screws, connections

NS	Valve fixing screws DIN 912 – 10.9	M_A in Nm	Connections		
			A	P	X
32	M16 x 100	338	G 1 1/2	G 1/2	G 1/4
40	M16 x 110	338	–	G 1/2	G 1/4
50	M20 x 130	661	–	G 1/2	G 1/4
63	M24 x 160	1136	–	G 1/2	G 1/4
80	M27 x 180	1674	–	G 3/4	G 1/2

Maximum flow q_v in L/min (A to B) for the various applications

NS	32	40	50	63	80
Application 1	200	300	500	800	1200
Application 2	170	250	400	650	1000
Application 3	140	220	360	560	900
Application 4	100	150	240	380	620
Application 5	70	110	170	280	450

⚠ If the pre-fill valve or pipe line is too small, gases may be released from the oil resulting in consequential damage which in turn often leads, in the long term, to damage to the cylinder seals.

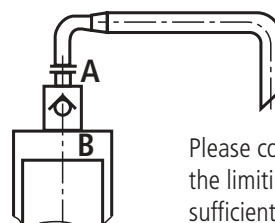


- 1 Cylinder
- 2 Pre-fill valve
- 3 This metal sheet is **not** included within the scope of supply. Its use avoids the formation of a depressed suction vortex in small tanks and at low oil levels (a).
- 4 Take the supply cross-section into account!

Dimensions a and b

- a = Min. 300 mm when the cylinder is extended
 b = Up to 1000 mm at the maximum given flow

Note regarding applications 2 to 5



Please consult us when operating close to the limiting parameters. However, it is often sufficient to choose a pipe one size larger.

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