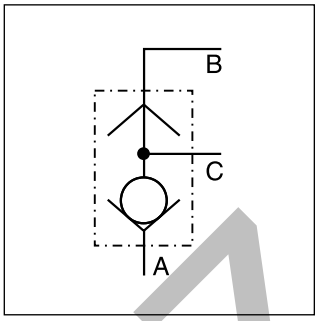
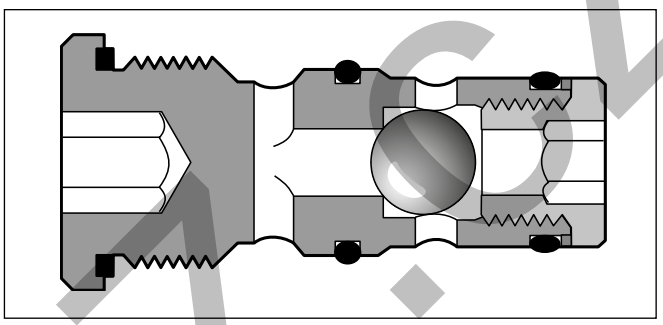
6

More check valves are presented in the following chapters:
Chapter 7: Sandwich Valves
Chapter 8: Slip-In Cartridge Valves
Chapter 9: SAE Flange Valves
Chapter 10: Valves for Pipe Mounting

The shuttle valve series SSR is designed as a threaded cartridge valve. All parts are assembled in one unit and easy to mount.





Features

- Little space required
- Leak-free
- Easy assembly

6

Ordering code

	–	**SSR**	**B**	**080**	**E**	
Seal		Shuttle valve	Design series	Factory norm, direct operated	Threaded cartridge	Valve size

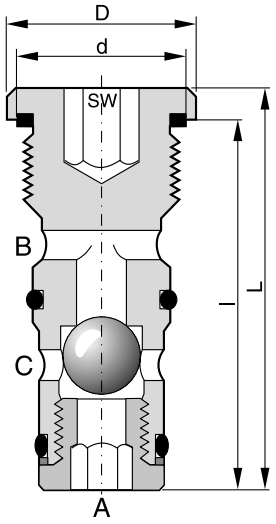
Code	Seal
omit	**NBR**
V	FPM

Code	Size
06	**NG06**
10	**NG10**

Bold letters =
Short-term availability

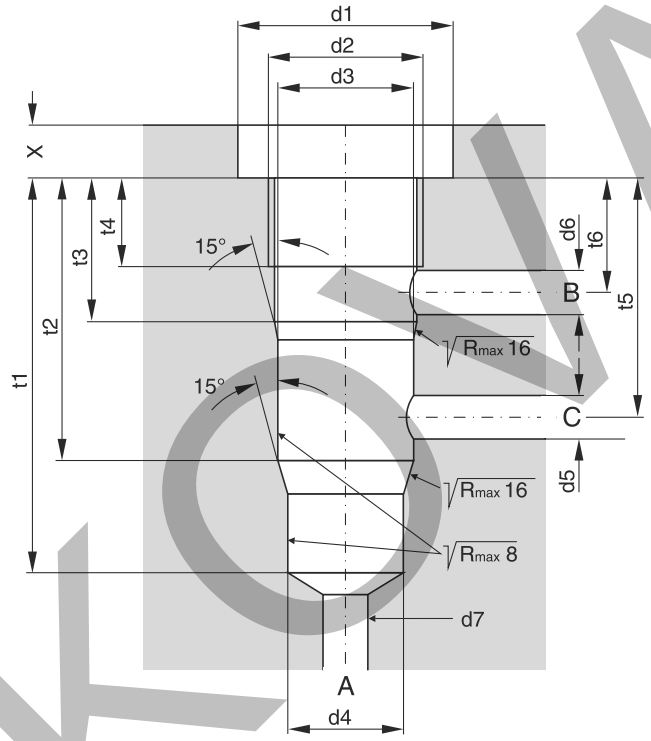
Technical data

General				
Design			Threaded cartridge valve	
Mounting position			Unrestricted	
Ambient temperature		[°C]	-20 ... +60	
Nominal size			NG06	NG10
Weight		[kg]	0.5	0.8
Hydraulic				
Flow direction			See symbols	
Fluid			Hydraulic oil as per DIN 51524	
Fluid temperature		[°C]	-20...+70 (NBR: -25...+70)	
Viscosity,	permitted	[cSt] / [mm²/s]	20 ... 400	
	recommended	[cSt] / [mm²/s]	30 ... 80	
Filtration			ISO 4406; 18/16/13	
Nominal pressure		[bar]	350	
Flow		[l/min]	40	60



Dimensions	NG06	NG10
D	23	29
L	48	70
d	M18x1.5	M24x1.5
l	42.5	64
SW	8	12
Tightening torque [1] [Nm] ± 15 %	40	65

Mounting cavity



Dimensions	NG06	NG10
d1	25	35
d2	M18 x 1.5	M24 x 1.5
$d3^{H7}$	16	22
$d4^{H7}$	14	20
$d5_{max.}$	6	9
$d6_{max.}$	6	9
$d7_{max.}$	13.5	19.5
t1	45	68
t2	32	51
t3	16	20
t4	10	15
t5	27.5	40
t6	12	14.5
X	6	7

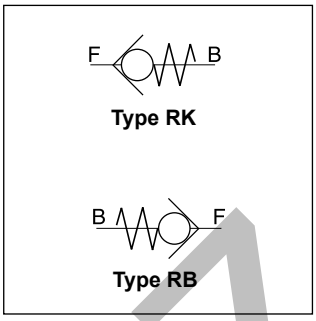
Seal kits

NG	NBR seals	FPM seals
06	SK-SSRB0E06	SK-SSRB0E06V
10	SK-SSRB0E10	SK-SSRB0E10V

[1] Please note the material specification for tightening torque in chapter 12, "accessories"

The check valves series RK and RB are designed to go into simple, threaded cavities. The connection is O-ring sealed on the 118° shoulder in the mounting cavity.

The valve body is supplied as a unit, with a spring loaded, hardened and polished semisphere of stainless bearing steel inside. The seat is also hardened and ground.



Ordering code

R		
Check valve, screwable	Mounting direction	Size

Code	Mounting direction
K	**in the blocked direction**
B	**in open flow direction**

Code	Flow [l/min]	Thread	Seal
0 [1]	**10**	**G1/8A**	**NBR**
1	**20**	**G1/4A**	**NBR**
2	**50**	**G3/8A**	**NBR**
3	**80**	**G1/2A**	**NBR**

Bold letters =
Short-term availability

[1] Only series RK available.

Technical data

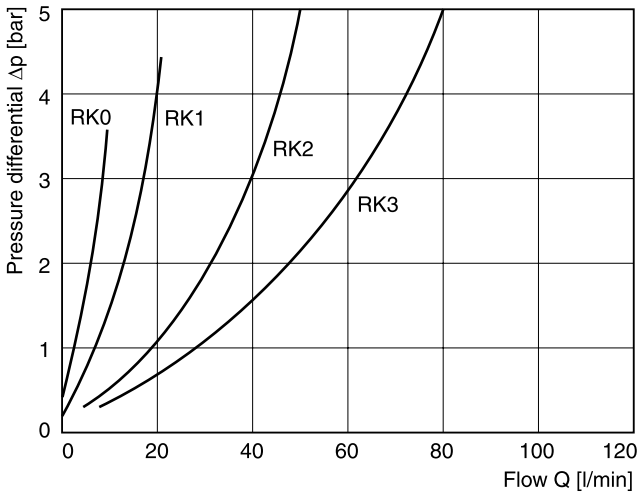
Series design with pipe thread

General								
Code			RK0	RK1	RK2	RK3	RB1	RB2	RB3
Flow		[l/min]	10	20	50	80	20	50	80
Operating pressure		[bar]	700	700	700	500	700	700	500
Opening pressure		[bar]	0.15	0.18	0.2	0.25	0.15	0.07	0.17
Thread (DIN ISO 228/1)			G1/8A	G1/4A	G3/8A	G1/2A	G1/4A	G3/8A	G1/2A
Tightening torque* ±20 %		[Nm]	10	15	20	40	15	20	40
Weight		[g]	5	5	15	15	5	15	20
Mounting position			unrestricted						
Ambient temperature		[°C]	-20 ... +60						
Hydraulic									
Fluid			Hydraulic oil according to DIN 51524						
Fluid temperature		[°C]	-25...+70						
Viscosity,	permitted	[cSt] / [mm²/s]	20 ... 400						
	recommended	[cSt] / [mm²/s]	30 ... 80						
Filtration			ISO 4406; 18/16/13						

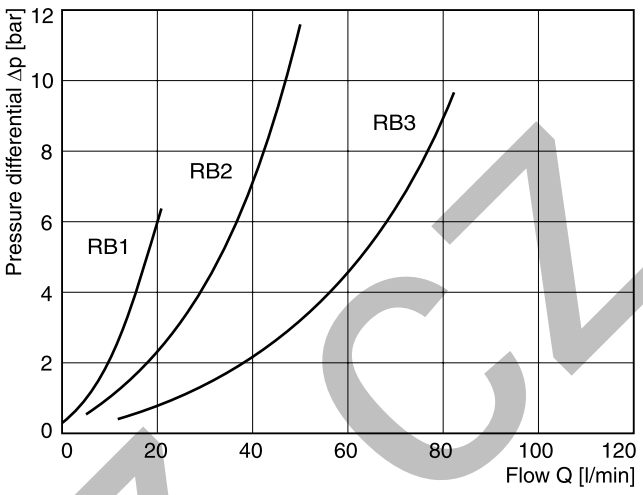
* In case of strong vibration, it is recommended to secure the mounting threads.

Δp/Q performance curves

Type RK



Type RB

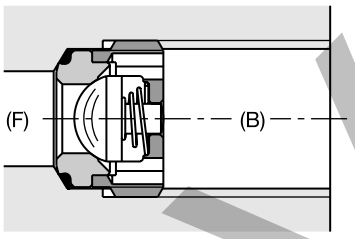


All characteristic curves measured with HLP46 at 50 °C.

6

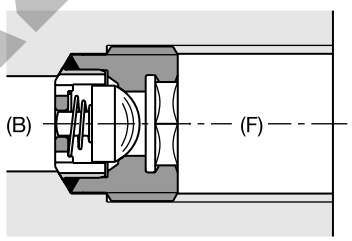
Mounting direction

Type RK



Screwed in, in the blocked direction

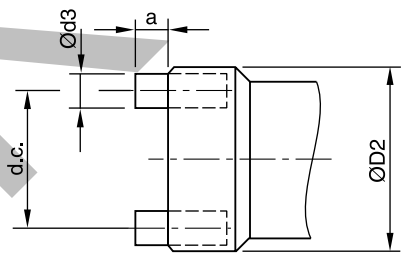
Type RB



Screwed in, in the open flow direction

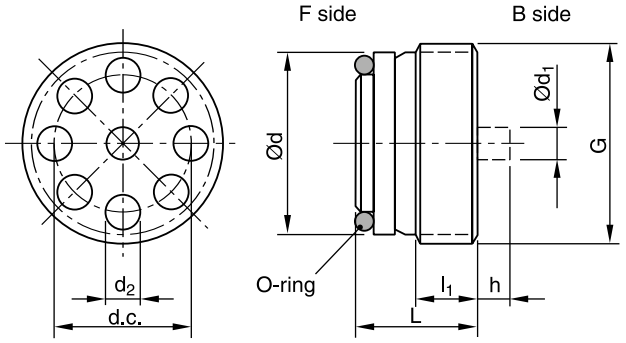
Mounting tool

Type RK



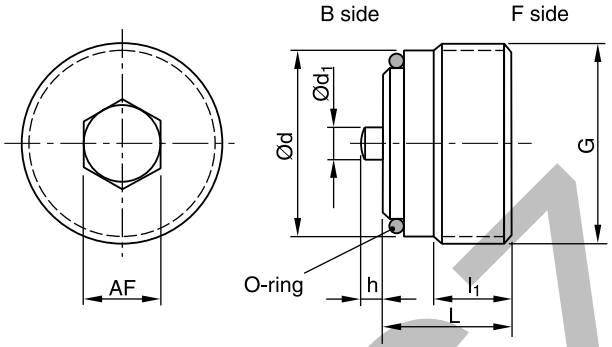
Type	Ordering number	D_2	a	d_3
RK0	5005216	8.6	2	1.5
RK1	5005217	11.5	2.5	2
RK2	5005218	15	2	2.5
RK3	5005219	18.8	4	3.5

Type RK



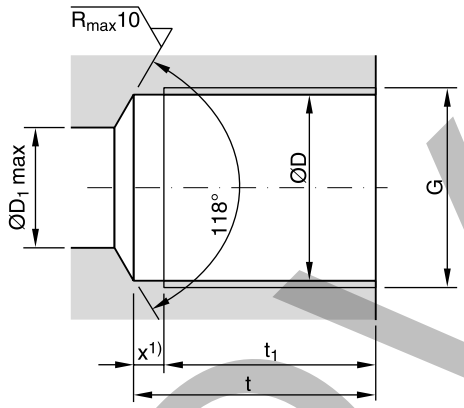
Type	Thread	L	l_1	d	d_1	d_2	h	d.c.	O-ring	Nm
RK0	G1/8A	7.2	3.8	8.6	2	1.5	1.3	6.8	6x1	8
RK1	G1/4A	9	4.5	11.5	2.6	2.2	1.5	$8.8_{-0.1}$	9x1	15
RK2	G3/8A	11.5	6.5	15	3.4	3	2.5	11	11x1.5	20
RK3	G1/2A	13.5	8	18.5	4.3	3.8	3	$14.2_{-0.1}$	14x1.5	40

Type RB



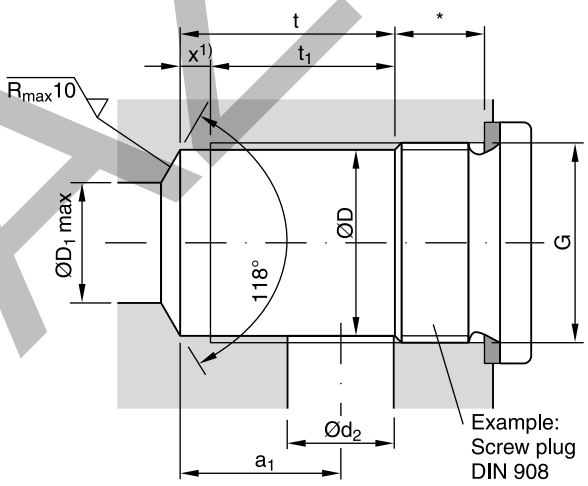
Type	Thread	L	l_1	d	d_1	h	AF	O-ring	Nm
RB1	G1/4A	10.3	5.5	11.6	2.2	1.3	5	9x1	15
RB2	G3/8A	11.5	7.0	15	3	2	6	11x1.5	20
RB3	G1/2A	13.15	8	18.5	3.4	2.5	8	14x1.5	40

Type RK



Type	Thread	D	D_1	t	t_1 2)	x 1)
RK0	G1/8	8.7	5	16	13.7	2.3
RK1 and RB1	G1/4	11.8	8	22	19	3
RK2 and RB2	G3/8	15.25	9	24.5	21.5	3
RK3 and RB3	G1/2	19	12	29	25.5	3.5

Type RB



Type	Thread	D	D_1	t	t_1 2)	x 1)	a_1	d_2
RK0	G1/8	8.7	5	12.3	10	2.3	9.5	5
RK1 and RB1	G1/4	11.8	8	14	11	3	11	6
RK2 and RB2	G3/8	15.25	9	17	14	3	13	8
RK3 and RB3	G1/2	19	12	22	18.5	3.5	16	12

Mounting cavity

- for connecting in combination with tube fitting
- for internal line channels

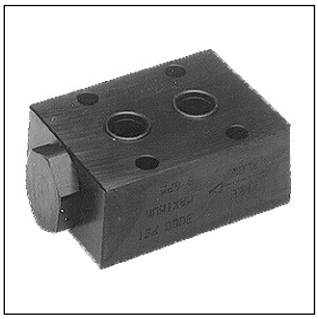
* Required depth depending on type of screw plug, connecting plate etc. used.

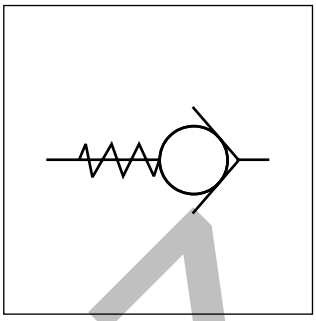
1) Thread runout x must be maintained. It may be smaller, but not larger (requirement for a perfect seal using the O-ring).

2) Fully cut-out thread

Manatrol check valves of the series CS for subplate mounting provide free flow in one direction and block flow in the counter direction.

Specific Manatrol poppets and poppet guides ensure reliable functional integrity even at high flow rates and/ or pulsations.





Ordering code

CS		S		
Manifold design	Nominal size	Steel body	Opening pressure	Seal

Code	Size
400	**400 (1/4)**
600	**600 (3/8)**
800	**800 (1/2)**
1200	**1200 (3/4)**
1600	1600 (1)

Code	Seal
omit	**NBR**
V	FPM

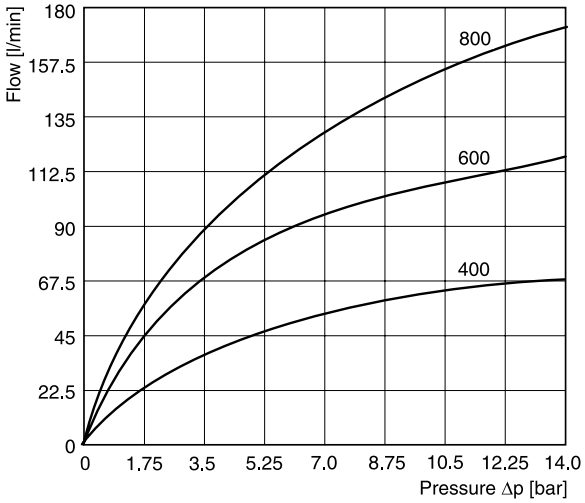
Code	Pressure [bar]
omit	**0.35**
65	4.5

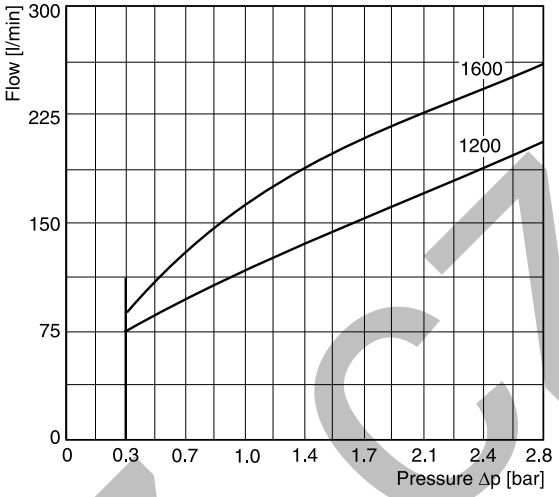
Bold letters =
Short-term availability

Technical data

General						
Size		**400**	**600**	**800**	**1200**	**1600**
$MTTF_D$ value	[years]	150				
Weight	[kg]	0.5	0.7	1.0	2.3	3.5
Ambient temperature	[°C]	-20 ... +60				
Hydraulic						
Operating pressure	[bar]	210	210	210	210	210
Pressure drop Δp	[bar]	10	10	10	1	1
Flow	[l/min]	65	110	155	112	160
Fluid		Hydraulic oil as per DIN 51524				
Fluid temperature	[°C]	-20...+70 (NBR: -25...+70)				
Viscosity, permitted	[cSt] / [mm²/s]	20 ... 400				
recommended	[cSt] / [mm²/s]	30 ... 80				
Filtration		ISO 4406; 18/16/13				

Δp/Q performance curves

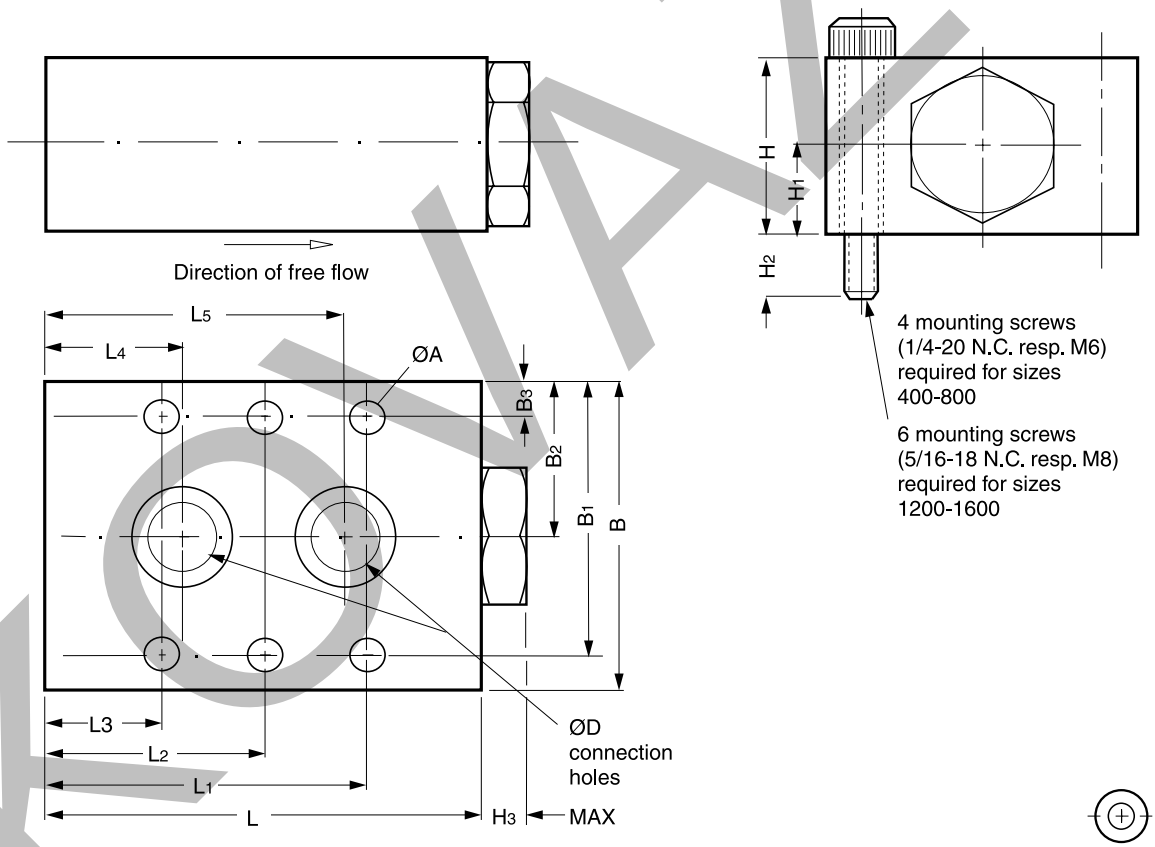




All characteristic curves measured with HLP46 at 50 °C.

6

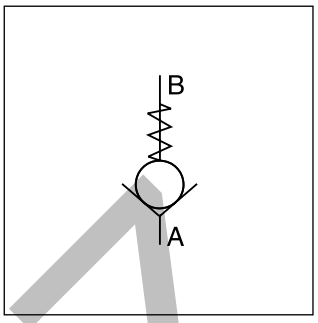
Dimensions

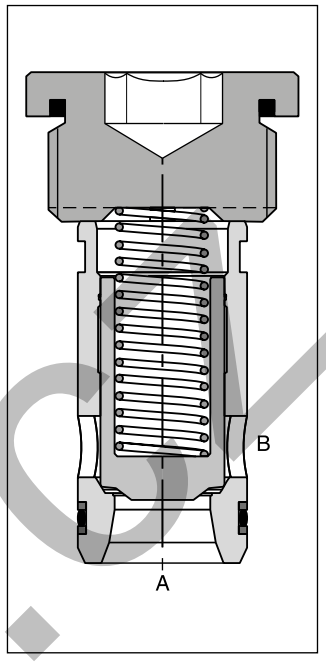


Size	ØD	ØA	L	L1	L2	L3	L4	L5	B3	B2	B1	B	H	H1	H2	H3	Weight [kg]
CS 400S	7.1	6.35	63.5	49.0	–	14.2	19.1	44.5	5.3	22.1	38.9	44.5	22.1	10.9	9.9	7.9	0.5
CS 600S	10.2	6.35	69.9	51.6	–	18.0	22.1	47.5	6.4	25.4	44.5	50.8	25.4	12.7	13.0	8.1	0.7
CS 800S	11.9	6.35	80.7	59.4	–	21.3	25.4	55.6	6.4	28.4	50.8	57.2	31.8	15.7	13.2	8.1	1.0
CS 1200S	17.3	8.5	103.9	89.9	51.8	13.7	25.1	79.2	7.9	34.8	61.7	69.9	44.5	22.1	14.5	10.7	2.3
CS 1600S	22.1	8.5	127.0	111.0	63.5	15.7	34.8	91.9	7.9	38.1	68.1	76.2	50.8	25.4	14.5	10.7	3.5

The check valves series SPZBE are slip-in cartridge valves. The function unit is fixed inside the manifold by a hexagonal plug with slot.

The design is based on CE series with same poppet and sleeve. The different mounting cavity has to be considered.





Features

- Little space required
- Leak-free from port B to A
- 4 different opening pressures

Ordering code

		–	SP	Z	BE	1010	E		
Seal			Check valve	Flow direction A to B	Design series, screwed cover	Factory norm, poppet, direct operated	Slip-in valve	Valve size	Opening pressure

Code	Seal
omit	**NBR**
V	FPM

Code	Size
16	**NG16**
25	**NG25**
32	**NG32**

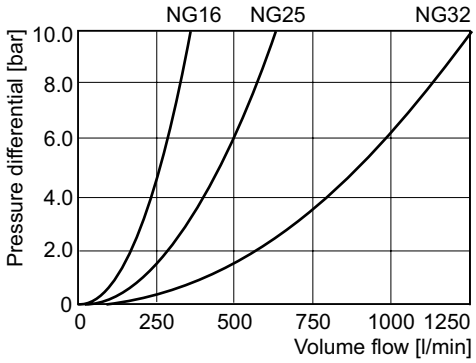
Code	Pressure [bar]
L	0.1
N	**0.5**
S	1.6
U	4.0

Bold letters =
Short-term availability

Technical data

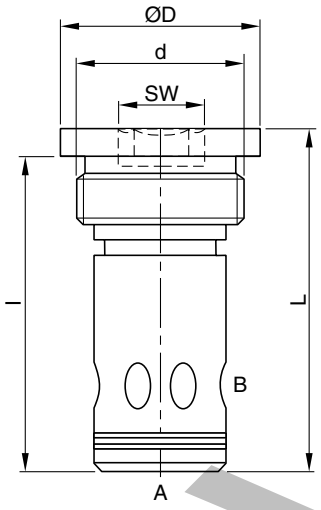
General				
Design		Threaded cartridge valve		
Mounting position		Unrestricted		
Ambient temperature	[°C]	-20 ... +60		
$MTTF_D$ value	[years]	150		
Nominal size		**NG16**	**NG25**	**NG32**
Weight	[kg]	0.25	0.5	1.2
Hydraulic				
Flow direction		Port A to B		
Fluid		Hydraulic oil according to DIN 51524		
Fluid temperature	[°C]	-20...+70 (NBR: -25...+70)		
Viscosity, permitted	[cSt]/[mm²/s]	20 ... 400		
recommended	[cSt]/[mm²/s]	30 ... 80		
Filtration		ISO 4406; 18/16/13		
Nominal pressure	[bar]	350		
Opening pressure	[bar]	0.1; 0.5; 1.6 and 4.0		
Flow at Δp= 5 bar	[l/min]	250	450	900

Δp/Q performance curves

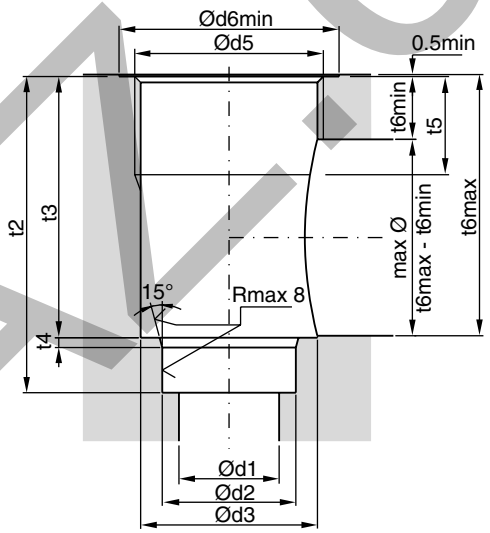


All characteristic curves measured with HLP46 at 50 °C.

Dimensions



Mounting cavity



Dimensions	NG16	NG25	NG32
D	40	55	72
L	72.5	89	109.5
d	M33x2	G1½"	G2"
d4	–	–	–
l	66	80.5	99.5
SW	17	24	32
Tightening torque[1)] [Nm] ± 15 %	225	450	550

Seal kits

NG	NBR seals	FPM seals
16	SK-SPZBE10E16	SK-SPZBE10E16V
25	SK-SPZBE10E25	SK-SPZBE10E25V
32	SK-SPZBE10E32	SK-SPZBE10E32V

Springs

Spring Type	Ordering Number		
	NG16	NG25	NG32
L 0.1 bar	45051368	45051375	45051376
N 0.5 bar	45051369	45051374	45051377
S 1.6 bar	45051370	45051372	45051378
U 4.0 bar	45051371	45051373	45051379

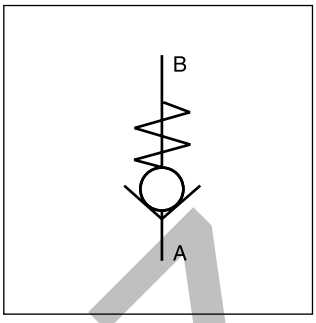
Size	NG16	NG25	NG32
d1	18	25.5	36
$d2^{H7}$	25	34	45
d3	31	45	57
d5	M33x2	G1½"	G2"
$d6_{min}$	41	56	73
$t2^{+0.1}$	66	80.5	99.5
t3	53	66.5	84.5
t4	2	2.5	2.5
t5	21	25	30
$t6_{min}$	16	16	24
$t6_{max}$	52.5	66	84

[1)] Please note the material specification for tightening torque in chapter 12, "accessories".

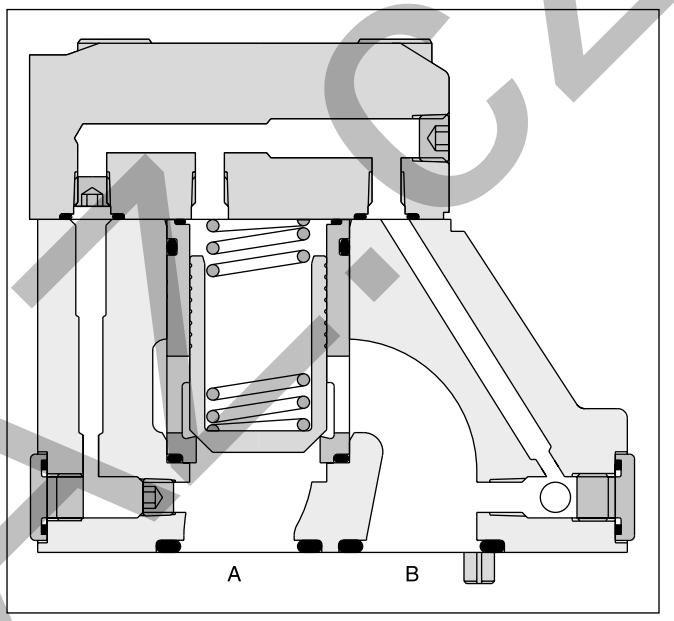
Direct operated check valves C4V allow free flow from A to B. The counter direction is blocked. The C4V series is equipped with a leak-free seat type cartridge.

Function

The pressure arising in port A lifts the poppet from the valve seat and releases the flow to B. In the counter direction, the spring and the pressure on top of the cartridge hold the poppet onto the seat and block the flow.



C4V06



C4V10

Ordering code

C4V	☐	–	5	3	0	☐	B	☐	☐
Check valve direct operated	Nominal size		Max. pressure 350 bar	Subplate mounting		Approx. cracking pressure	Design series	Seal	Options

Code	Nominal size
03	NG10
06	NG25
10	NG32

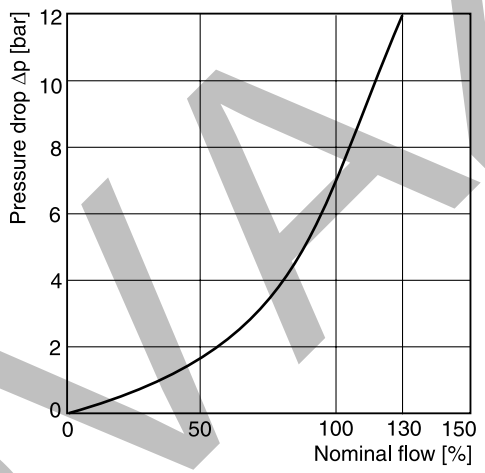
Code	Seal
1	NBR
5	FPM

Code	Approx. cracking pressure [bar]	
	C4V03	C4V06/10
1	2.8	3.5
2	0.5	0.5
3	0.3	0.3
4	2.2	2.2
5	—	9.0
6	1.2	1.2
7	3.0	—

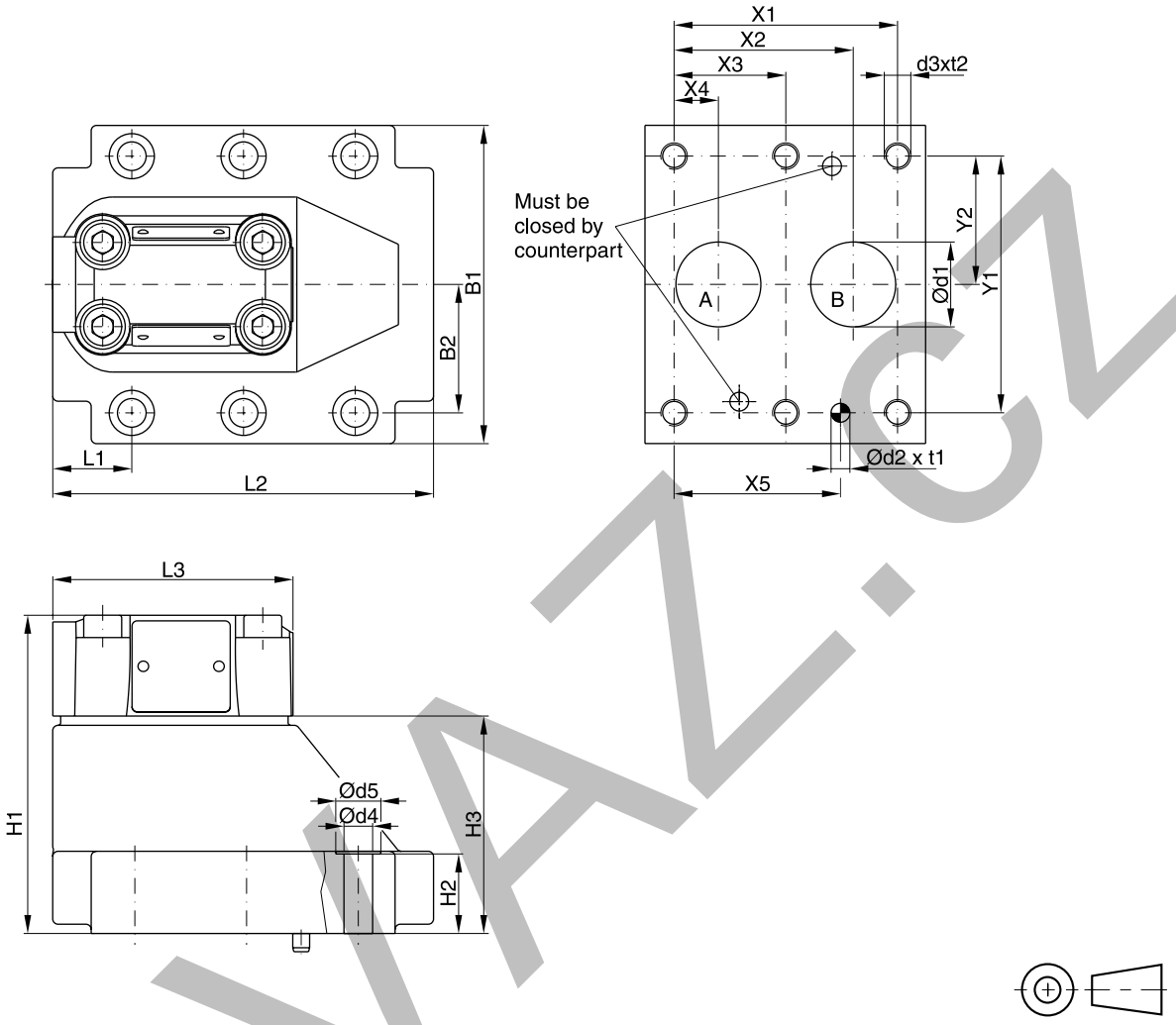
Technical data

General					
Nominal size			**NG10**	**NG25**	**NG32**
Subplate mounting			ISO 5781		
Mounting position			Unrestricted		
Ambient temperature		[°C]	-20...+60		
$MTTF_D$ value		[years]	150		
Weight		[kg]	2.8	4.6	6.1
Hydraulic					
Max. operating pressure		[bar]	350		
Nominal flow		[l/min]	150	270	450
Fluid			Hydraulic oil according to DIN 51524		
Fluid temperature		[°C]	-20...+70 (NBR: -25...+70)		
Viscosity,	permitted	[cSt] / [mm²/s]	20...400		
	recommended	[cSt] / [mm²/s]	30...80		
Filtration			ISO 4406; 18/16/13		

Δp/Q performance curve



Characteristic curve measured with HLP46 at 50 °C.



NG	ISO-code	x1	x2	x3	x4	x5	y1	y2	B1	B2	H1	H2	H3	L1	L2
10	5781-06-07-0-00	42.9	35.8	–	7.2	31.8	66.7	33.4	87.3	33.4	83	21	45	29	94.8
25	5781-08-10-0-00	60.3	49.2	–	11.1	44.5	79.4	39.7	105	39.7	107.5	29	69.5	34.7	126.8
32	5781-10-13-0-00	84.2	67.5	42.1	16.7	62.7	96.8	48.4	120	48.4	120	30	82	30.6	144.3

Tolerance for all dimensions ±0.2

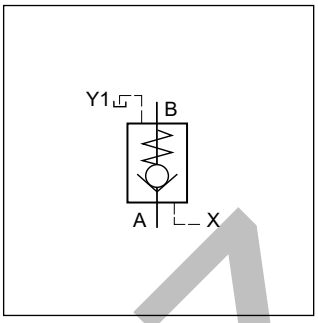
NG	ISO-code	d1max	d2	t1	d3	t2	d4	d5
10	5781-06-07-0-00	15	7.1	8	M10	16	10.8	17
25	5781-08-10-0-00	23.4	7.1	8	M10	18	10.8	17
32	5781-10-13-0-00	32	7.1	8	M10	20	10.8	17

NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	5781-06-07-0-00	BK505	4x M10x35 ISO 4762-12.9	63 Nm ±15 %	S26-58507-0	S26-58507-5	R_{max}6.3 ▱ 0.01/100
25	5781-08-10-0-00	BK485	4x M10x45 ISO 4762-12.9	63 Nm ±15 %	S26-58475-0	S26-58475-5	
32	5781-10-13-0-00	BK506	6x M10x45 ISO 4762-12.9	63 Nm ±15 %	S26-58508-0	S26-58508-5	

Hydraulically pilot operated check valves C4V allow free flow from A to B. The counter-flow direction is blocked.

When pressure is applied to control port X, the ring chamber flow from B to A is released.

Up to four different pilot control ratios are available (see ordering code).

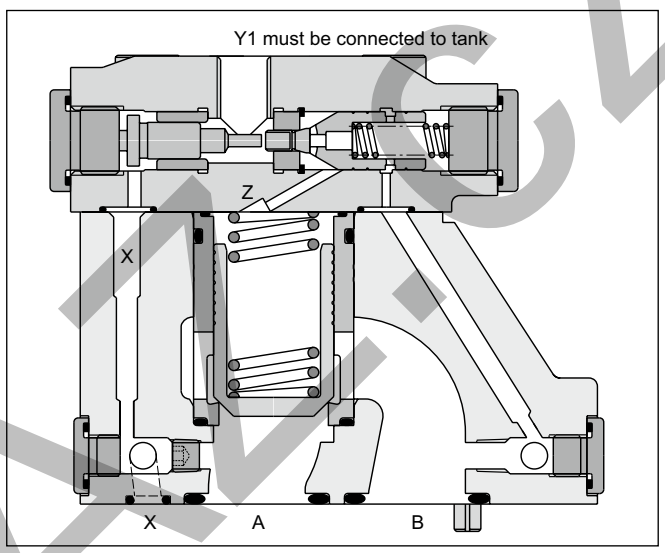


Function

When no pressure is applied to the X-port, the flow from B to A is blocked, because the pressure in B is also in effect on top of the poppet.

Pressurizing the X port relieves the area on top of the poppet to the drain port and allows flow from B to A.

The seat design of the SVL valve series provides leak-free separation of port A and B in the closed position.



Ordering code

C4V	☐	–	5	9	☐	☐	B	☐
Check valve pilot operated	Nominal size		Max. pressure 350 bar	Y1-port G¼"	Opening ratio	Approx. cracking pressure	Design series	Seal

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Opening ratio	Code	Opening ratio
1	1 : 1	K [1]	1 : 1
3	3 : 1	L [1]	3 : 1
8	8 : 1	M [1]	8 : 1
9	10 : 1	N [1]	10 : 1

Code	Seal
1	NBR
5	FPM

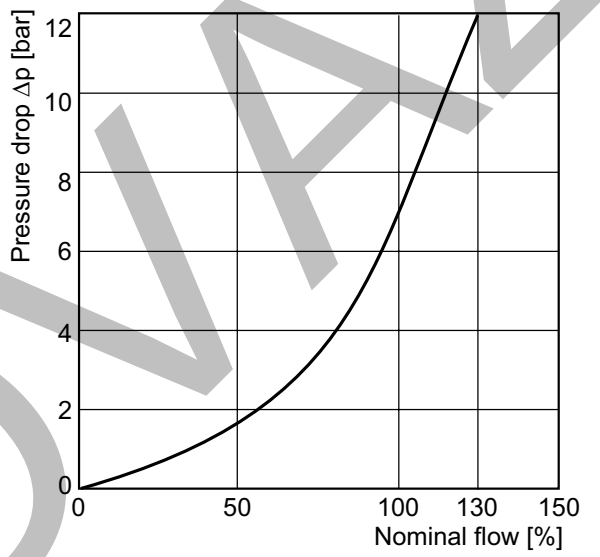
Code	Approx. cracking pressure [bar]			
	Flow A to B		Flow B to A	
	C4V03	C4V06/10	C4V03	C4V06/10
2	1.0	1.0	1.5	1.7
4	4.0	3.5	5.5	6.0
6	2.0	2.2	3.0	3.8

[1] Position control incl. amplifier for C4V06/10 only.

Technical data

General					
Nominal size			**NG10**	**NG25**	**NG32**
Subplate mounting			ISO 5781		
Mounting position			Unrestricted		
Ambient temperature		[°C]	-20...+60		
$MTTF_D$ value		[years]	150		
Weight		[kg]	2.8	4.6	6.1
Hydraulic					
Max. operating pressure		[bar]	350		
Nominal flow		[l/min]	150	270	450
Fluid			Hydraulic oil according to DIN 51524		
Fluid temperature		[°C]	-20...+70 (NBR: -25...+70)		
Viscosity,	permitted	[cSt] / [mm²/s]	20...400		
	recommended	[cSt] / [mm²/s]	30...80		
Filtration			ISO 4406; 18/16/13		

Δp/Q flow curve



Characteristic curve measured with HLP46 at 50 °C.

Position control as per IEC 61076-2-101 (M12x1)

Protection class		IP65 in accordance with EN 60529
Ambient temperature	[°C]	-20...+60
Supply voltage Us / ripple	[V]	10...30 / ±10 %
Current consumption without load	[mA]	≤ 10
Max. output current per channel, ohmic	[mA]	200
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2 A	[V]	≤ 2
EMC		EN61000-6-4 / EN61000-6-2
Min. distance to next AC solenoid	[m]	> 0.1
Interface		M12x1 acc. to IEC 61076-2-101
Wiring min.	[mm²]	3 x 0.14 brad shield recommended
Wiring length max.	[m]	50 recommended

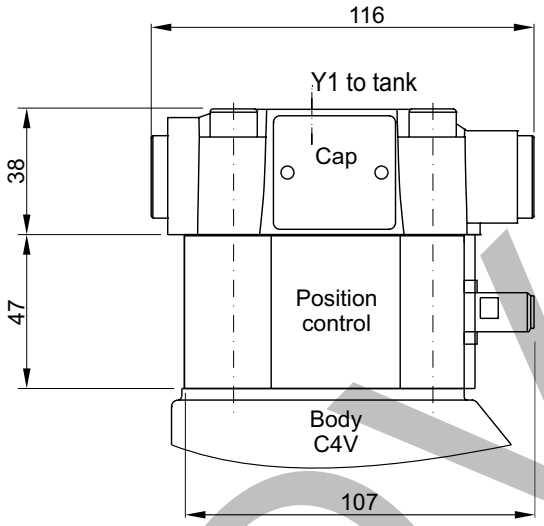
Position control

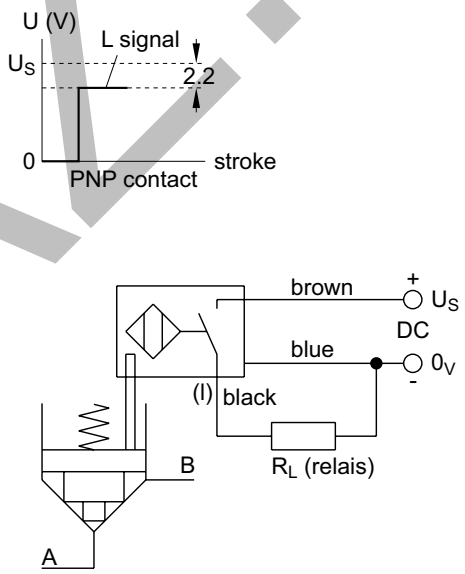
Position control by proximity switch with amplifier. The closed position is monitored.

Valve open: proximity switch activated.

This proximity switch is pressure proof and has no wearing parts.

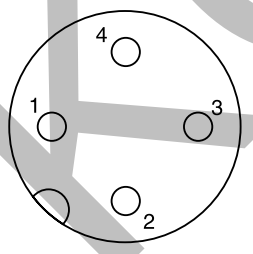
Note: Position control for C4V06 and C4V10 only.



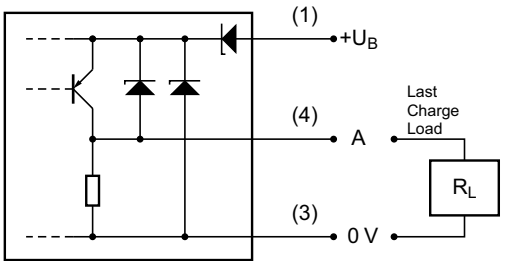


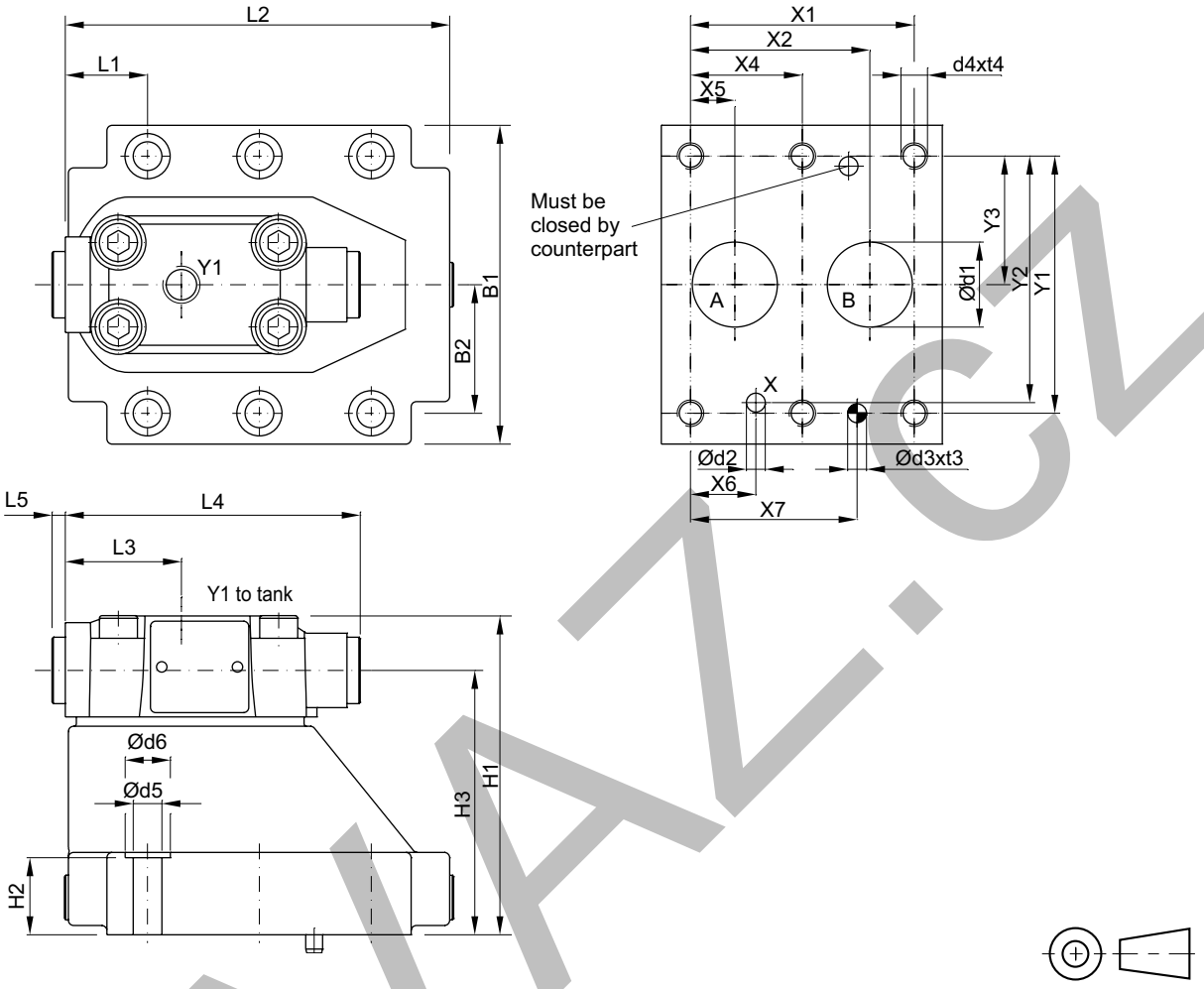
Please order plug M12 x 1 separately. Straight plug recommended – no defined position possible for angled plug.

M12 pin assignment



1 Us 10...30 V
2 not connected
3 0 V
4 Out A: normally open





NG	ISO-code	x1	x2	x3	x4	x5	x6	x7	y1	y2	y3	y4	y5	y6
10	5781-06-07-0-00	42.9	35.8	–	–	7.2	21.5	31.8	66.7	58.8	33.4	–	–	–
25	5781-08-10-0-00	60.3	49.2	–	–	11.1	20.6	44.5	79.4	73	39.7	–	–	–
32	5781-10-13-0-00	84.2	67.5	–	42.1	16.7	24.6	62.7	96.8	92.8	48.4	–	–	–

Tolerance for all dimensions ±0.2

NG	ISO-code	B1	B2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
10	5781-06-07-0-00	87.3	33.4	83	21	62.5	–	–	–	29.4	95.2	43.7	111	5	–
25	5781-08-0-0-00	105	39.7	107.5	29	87	–	–	–	35.1	127.2	43.7	111	5	–
32	5781-10-13-0-00	120	48.4	120	30	99.5	–	–	–	31	144.7	43.7	111	5	–

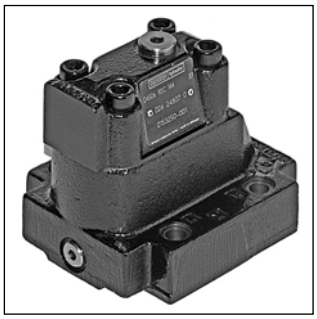
NG	ISO-code	d1max	d2max	d3	t3	d4	t4	d5	d6
10	5781-06-07-0-00	15	7	7.1	8	M10	16	10.8	17
25	5781-08-10-0-00	23.4	7.1	7.1	8	M10	18	10.8	17
32	5781-10-13-0-00	32	7.1	7.1	8	M10	20	10.8	17

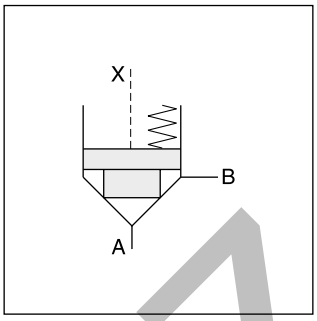
NG	ISO-code	Bolt kit			Kit		Surface finish
					NBR	FPM	
10	5781-06-07-0-00	BK505	4x M10x35 ISO 4762-12.9	63 Nm ±15 %	S26-58507-0	S26-58507-5	R_{max}6.3 0.01/100
25	5781-08-10-0-00	BK485	4x M10x45 ISO 4762-12.9	63 Nm ±15 %	S26-58475-0	S26-58475-5	
32	5781-10-13-0-00	BK506	6x M10x45 ISO 4762-12.9	63 Nm ±15 %	S26-58508-0	S26-58508-5	

Seat valves series D4S are designed for directional control functions. A large variety of poppets, springs and covers – including shuttle valves, stroke limiters, solenoid valves (VV01) and position control – allow to design individual hydraulic solutions for nominal flow up to 600 l/min.

A complete program of 2/2-way seat valves is offered under Parker brand:

subplate mounted valves	series D4S	chapter 6
SAE flange valves	series D5S	chapter 9
slip-in cartridges	series CAR	on request

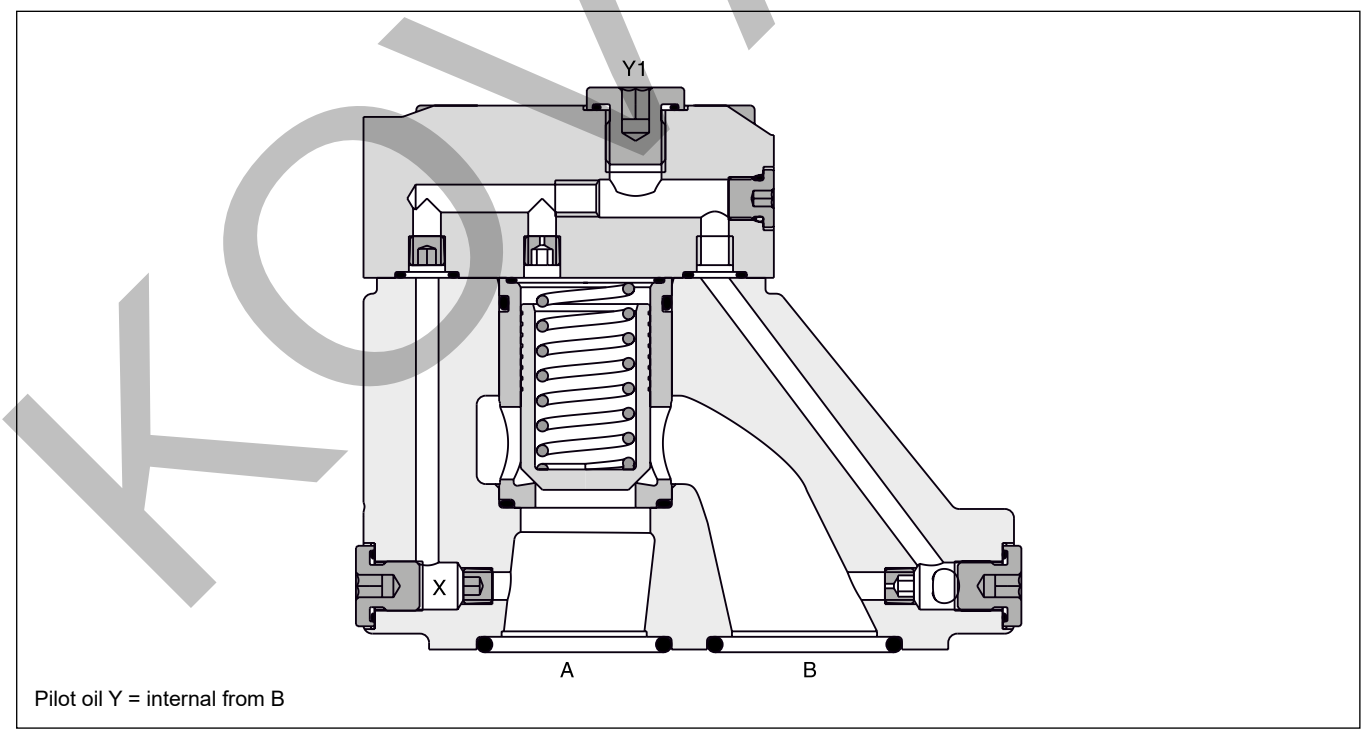




Features

- Subplate mounting according to ISO 5781
- Leak-free seat valve design
- Numerous pilot options
- 6 poppet types
- D4S03 - NG10
  D4S06 - NG25
  D4S10 - NG32

D4S10-9DC



Pilot oil Y = internal from B

D4S	☐	–	9	☐	☐	☐	☐	☐	☐	☐	B	☐
Seat valve	Nominal size		Subplate mounting ISO 5781, Y1 port G¼"	Pilot connection	Cap version	Sleeve	Spool type	Spring	Switching type	Solenoid voltage	Design series	Seals

Code	Nominal size
03	NG10
06	NG25
10	NG32

Code	Seals
1	NBR
5	FPM

Code	Pilot oil line in body	A-X	B-Y
1	internal from A	⊖	○
2	external from X	●	○
A [1]	internal from A	⊖	●
B	external from X	●	●
C	internal from A + B	⊖	⊖
D	internal from B	●	⊖
G	external from Y	●	●

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12 V=
G0Q	24 V=
GAR [4]	98 V=
GAG [4]	205 V=
W30	110 V / 50 Hz 120 V / 60 Hz
W31	230 V / 50 Hz 240 V / 60 Hz

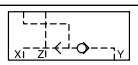
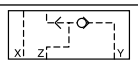
Code	Ports	X	Y	Z	X-Y	Y1	VV01
	Standard						
1	Pilot oil = pilot drain	○	●	⊖	○	●	—
C	Pilot oil = pilot drain	●	○	⊖	○	●	—
	With solenoid valve (VV01)						
2	Ext. PD from cap	○	○	⊖	●	○	●
5	Ext. to subplate	○	○	⊖	●	●	○
6	Internal pilot drain	○	○	⊖	●	●	○
	With stroke limiter (not for D4S03)						
3	Pilot oil = pilot drain	⊖	●	—	—	—	—
4	Pilot oil = pilot drain	●	⊖	—	—	—	—

○ open bore ● closed bore ⊖ orifice Ø 1.2

Code	Sleeve
1	AA = 95 %, AB = 5 %
3	AA = 60 %, AB = 40 %

Code	Size	Poppet type	Sleeve
1	03, 06,10	With closed bottom and 15° chamfer (pZ max. = pA +20 bar)	1
2	03	With 0.8 dia. orifice at the bottom and 15° chamfer	1
	06, 10	With 1.2 dia. orifice at the bottom and 15° chamfer	1
4	03, 06,10	With closed bottom and 45° chamfer	1, 3
A [2]	06, 10	Safety spool (for position control only)	3
B [2]	06, 10	Throttle spool, 10° chamfer	3
C [2]	06, 10	Throttle spool, 3° chamfer	3

Code	Spring (approx. cracking pressure [bar])					
	Sleeve Code 1		Sleeve Code 3			
	A → B		A → B		B → A	
	D4S03	D4S06/10	D4S03	D4S06/10	D4S03	D4S06/10
1	2.8	3.5	6.5	6.5	9.5	11.0
2	0.5	0.5	1.0	1.0	1.5	1.7
3	0.3	0.3	0.6	0.6	0.9	1.0
4	2.2	2.2	4.0	3.5	5.5	6.0
5	—	9.0	—	16.0	—	28.0
6	1.2	1.2	2.0	2.2	3.0	3.8
7	3.0	—	8.0	—	12.0	—

Code	Switching type	
omit	Standard w/o vent function	
09	VV01 with manual override	de-energized: power comp. open
10	VV01 without manual override	
11	VV01 with manual override	de-energized: power comp. closed
12	VV01 without manual override	
CA	Shuttle valve	
DA	Shuttle valve	
CB	VV01 code 09 and shuttle valve code CA	
CD	VV01 code 11 and shuttle valve code CA	
DB	VV01 code 09 and shuttle valve code DA	
DD	VV01 code 11 and shuttle valve code DA	
EH	VV01 code 10 and shuttle valve code CA and position control [3] with amplifier	
EK	VV01 code 12 and shuttle valve code CA and position control [3] with amplifier	
EN	VV01 code 10 and shuttle valve code DA and position control [3] with amplifier	
EQ	VV01 code 12 and shuttle valve code DA and position control [3] with amplifier	
EC	VV01 code 10 and position control [3] with amplifier	
EE	VV01 code 12 and position control [3] with amplifier	
EA	Position control [3] with amplifier	
EF	Position control [3] with amplifier and shuttle valve code CA	
EL	Position control [3] with amplifier and shuttle valve code DA	

[1] With VV01 only.

[2] Springs 2, 3 and 6 only.

[3] Position control for D4S06/10 only. Spring 2 or 4. Spool A and sleeve 3. Valve open: proximity switch damped.

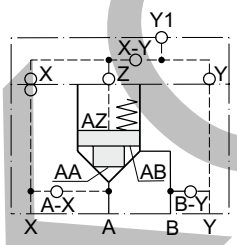
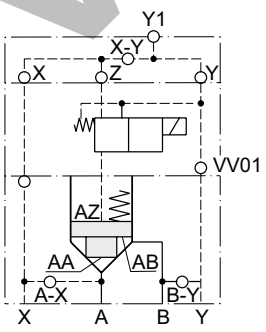
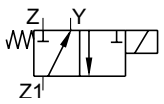
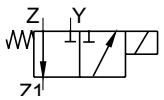
[4] To be used in combination with rectifier plugs at 120 VAC/230 VAC power supply.

Examples see end of chapter

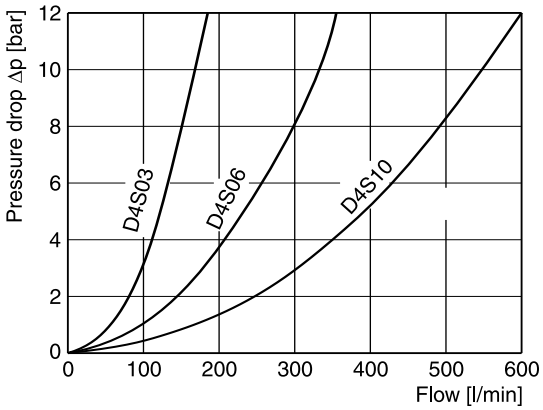
General							
Size			**NG10**		**NG25**		**NG32**
Mounting interface			Subplate mounting according to ISO 5781				
Mounting position			unrestricted				
Ambient temperature		[°C]	-20...+60				
$MTTF_D$ value		[years]	150				
Weight		[kg]	2.7		4.5		6.0
Hydraulic							
Operating pressure		[bar]	Ports A, B up to 350; Port Y 140 (with VV01)				
Nominal flow		[l/min]	180		360		600
Fluid			Hydraulic oil according to DIN 51524				
Fluid temperature		[°C]	-20...+70 (NBR: -25...+70)				
Viscosity,	permitted	[cSt] / [mm^2/s]	20...400				
	recommended	[cSt] / [mm^2/s]	30...80				
Filtration			ISO 4406; 18/16/13				
Electrical (solenoid)							
Duty ratio			100 % ED; CAUTION: coil temperature up to 150 °C possible				
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)				
Code			G0R	G0Q	GAR	GAG	W30	W31
Supply voltage		[V]	12 V =	24 V =	98 V =	205 V =	110 at 50 Hz 120 at 60 Hz	230 at 50 Hz 240 at 60 Hz
Tolerance supply voltage		[%]	±10	±10	±10	±10	±5	±5
Current consumption	hold	[A]	2.72	1.29	0.33	0.13	0.6 / 0.55	0.3 / 0.27
	in rush	[A]	2.72	1.29	0.33	0.13	2.5 / 2.4	1.25 / 1.2
Power consumption	hold	[W]	32.7	31	31.9	28.2	70 / 70 VA	70 / 70 VA
	in rush	[W]	32.7	31	31.9	28.2	280 / 290 VA	280 / 290 VA
Solenoid connection			Connector as per EN175301-803, solenoid identification as per ISO 9461					
Wiring min.		[mm^2]	3 x 1.5 recommended					
Wiring length max.		[m]	50 recommended					

6

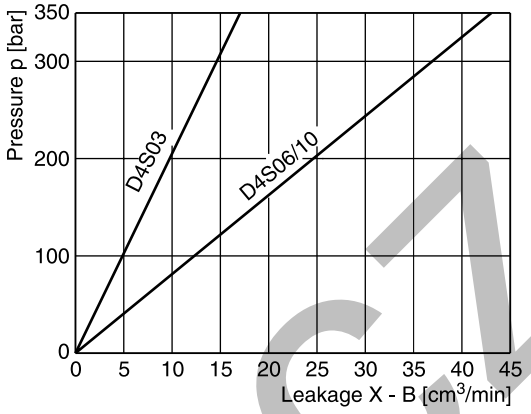
D4S pilot configuration

D4S direct operated	**D4S with vent valve VV01**	**VV01**
		de-energized open  de-energized closed 

Δp/Q performance curves



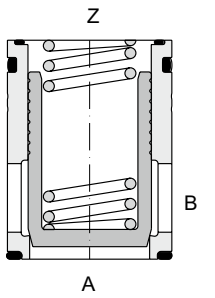
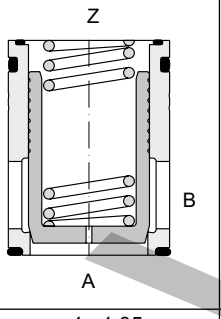
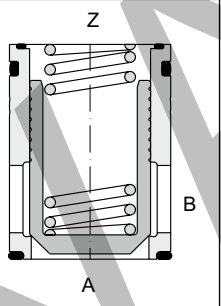
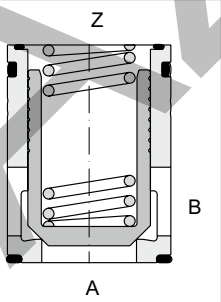
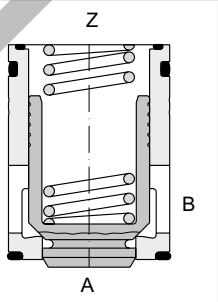
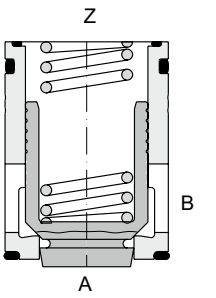
Leakage

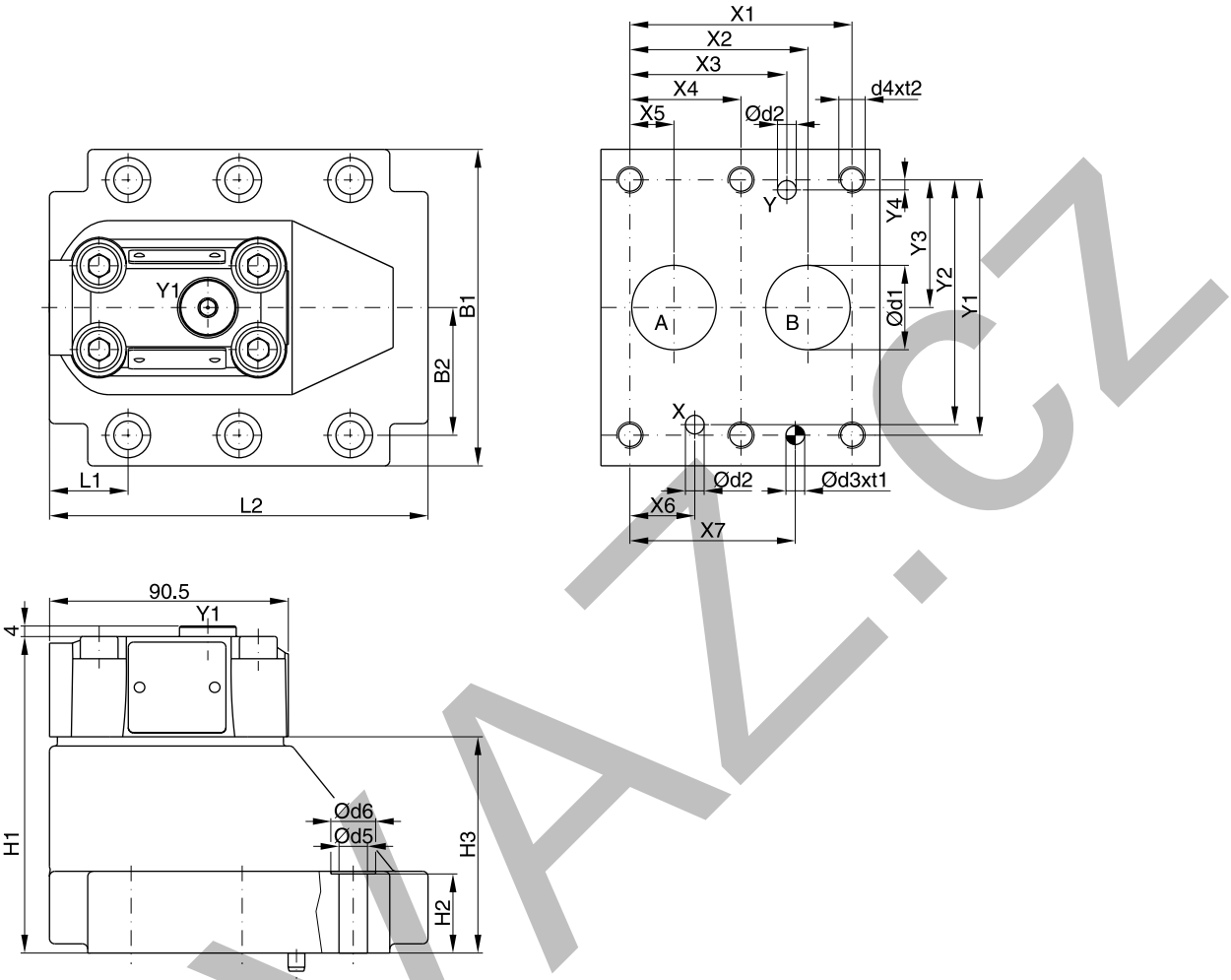


All characteristic curves measured with HLP46 at 50 °C.

6

Selection of Cartridges

Sleeve 1, poppet 1	Sleeve 1, poppet 2	Sleeve 1, poppet 4	Sleeve 3, poppet 4	Sleeve 3, poppet A	Sleeve 3, poppet B/C
					
1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer orifice	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer safety spool	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer throttle spool

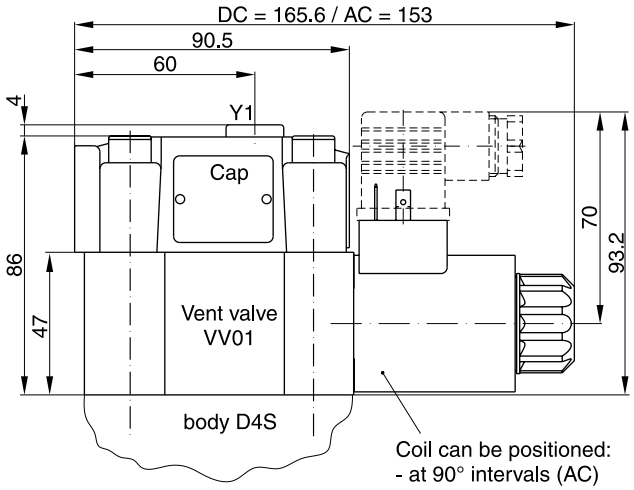


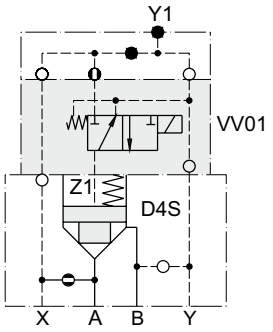
NG	ISO-code	X1	X2	X3	X4	X5	X6	X7	Y1	Y2	Y3	Y4
10	5781-06-07-0-00	42.9	35.8	21.5	–	7.2	21.5	31.8	66.7	58.8	33.4	7.9
25	5781-08-10-0-00	60.3	49.2	39.7	–	11.1	20.6	44.5	79.4	73	39.7	6.4
32	5781-10-13-0-00	84.2	67.5	59.5	42.1	16.7	24.6	62.7	96.8	92.8	48.4	3.8

NG	ISO-code	B1	B2	H1	H2	H3	L1	L2	D1	D2	D3	t1	D4	t2	D5	D6
10	5781-06-07-0-00	87.3	33.35	83	21	45	29	94.8	15	7	7.1	8	M10	16	10.8	17
25	5781-08-10-0-00	105	39.7	107.5	29	69.5	34.7	126.8	23.4	7.1	7.1	8	M10	18	10.8	17
32	5781-10-13-0-00	120	48.4	120	30	82	30.6	144.3	32	7.1	7.1	8	M10	20	10.8	17

NG	Kit	ISO 4762-12.9		Kit		Surface finish
				NBR	FPM	
10	BK505	4x M10x35	63 Nm ±15 %	S26-58507-0	S26-58507-5	R_{max}6.3 ▱ 0.01/100
25	BK485	4x M10x45	63 Nm ±15 %	S26-58475-0	S26-58475-5	
32	BK506	6x M10x45	63 Nm ±15 %	S26-58508-0	S26-58508-5	

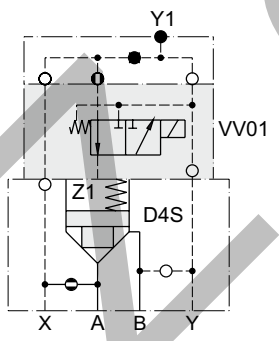
Dimensions D4S with VV01





with manual override / without manual override

D4S..-.....09/10
Solenoid energized:
D4S blocked
Solenoid de-energized:
Flow from A-B or B-A

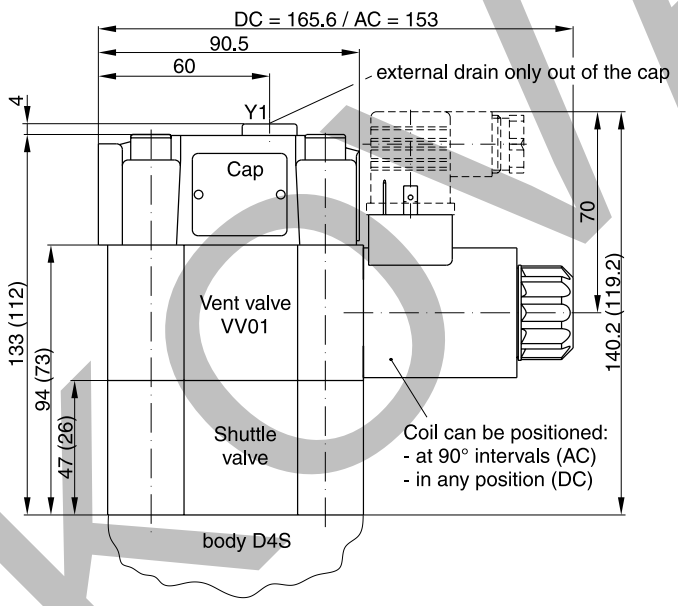


with manual override / without manual override

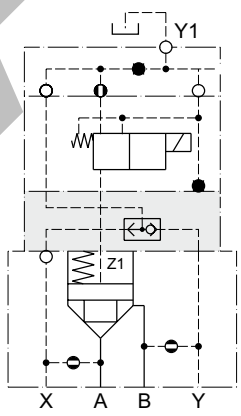
D4S..-.....11/12
Solenoid energized:
Flow from A-B or B-A
Solenoid de-energized:
D4S blocked

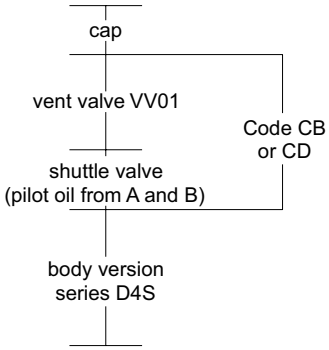
6

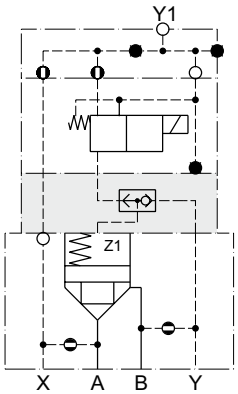
Dimensions D4S with shuttle valve

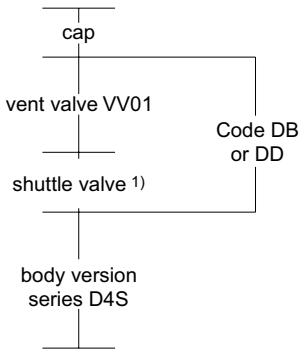


() Dimensions in brackets are for version VV01with shuttle valve code DB or DD.









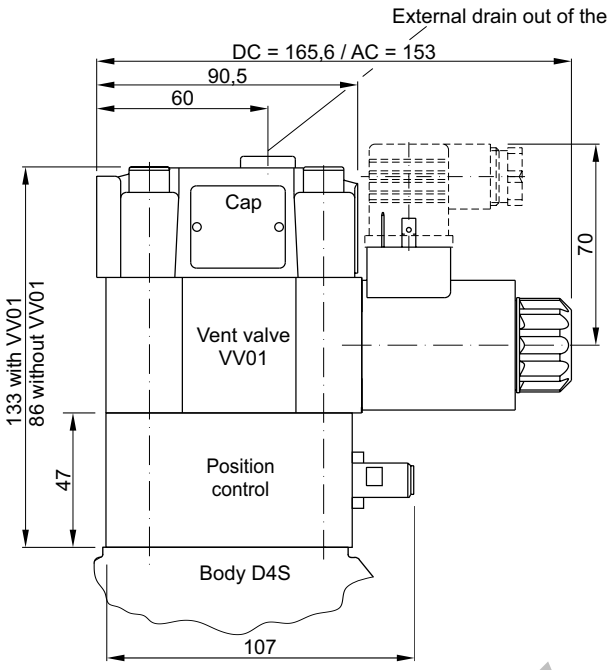
1) Pilot oil from A and B, from B to A check valve function.

Position control by proximity switch (incl. amplifier)

Valve open: proximity switch activated.This proximity switch is pressure proof and has no wearing parts.

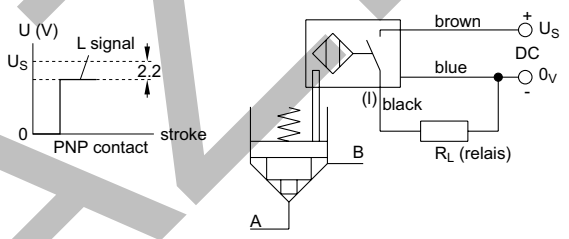
Note

Position control for D4S06 and D4S10 only.

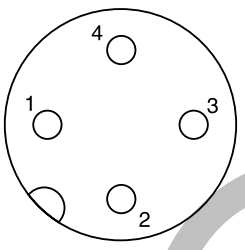


Position control as per IEC 61076-2-101 (M12x1)

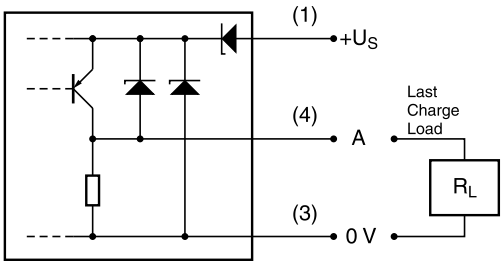
Protection class		IP65 in accordance with EN 60529
Ambient temperature	[°C]	-20...+60
Supply voltage Us / ripple	[V]	10...30 / ±10 %
Current consumption without load	[mA]	≤ 10
Max. output current per channel, ohmic	[mA]	200
Min. output load per channel, ohmic	[kOhm]	100
Max. output drop at 0.2 A	[V]	≤ 2
EMC		EN61000-6-4 / EN61000-6-2
Min. distance to next AC solenoid	[m]	> 0.1
Interface		M12x1 acc. to IEC 61076-2-101
Wiring min.	[mm²]	3 x 0.14 brad shield recommended
Wiring length max.	[m]	50 recommended



M12 pin assignment

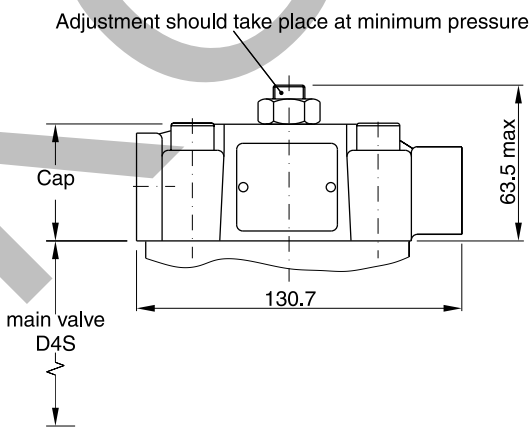


1 Us 10...30 V
2 not connected
3 0 V
4 Out A: normally open

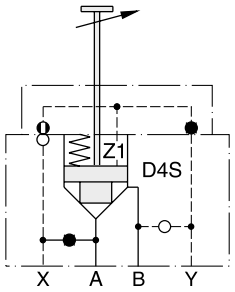


Please order plug M12 x 1 separately. Straight plug recommended – no defined position possible for angled plug.

Dimensions D4S stroke limiter



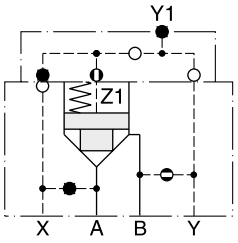
Example: D4S$^{06}_{10}$-.233B.



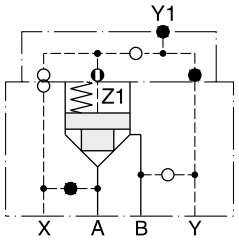
Note:

Stroke limiter not for use with D4S03, vent valve VV01, shuttle valve and positon control.

D4S direct operated

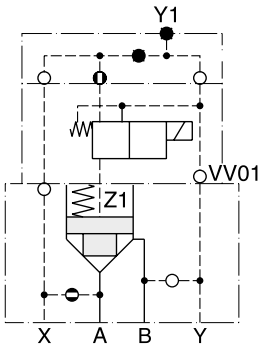


D4S..-.DC
Pilot oil Y = internal from B

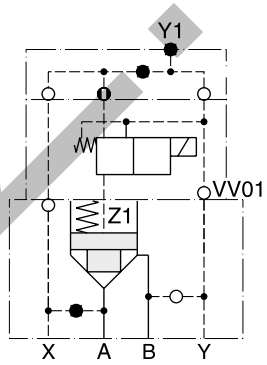


D4S..-.21
Pilot oil X = external

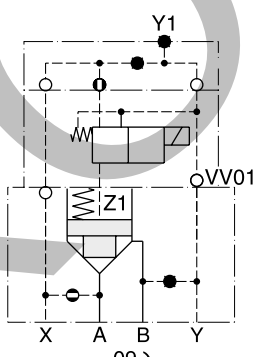
D4S with VV01



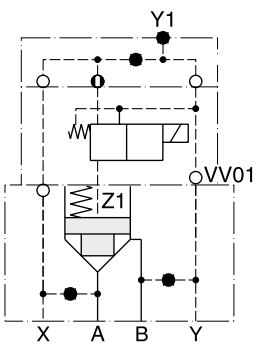
D4S..-.16... 09 10 11 12 } with VV01
Pilot oil X = internal from A
Drain Y = internal to B



D4S..-.26... 09 10 11 12 } with VV01
Pilot oil X = external
Drain Y = internal to B



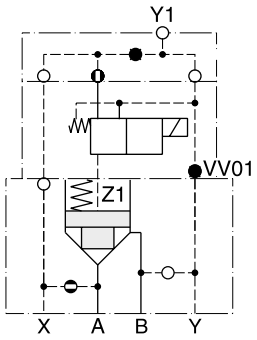
D4S..-.A5... 09 10 11 12 } with VV01
Pilot oil X = internal from A
Drain Y = external to subplate



D4S..-.B5... 09 10 11 12 } with VV01
Pilot oil X = external
Drain Y = external to subplate

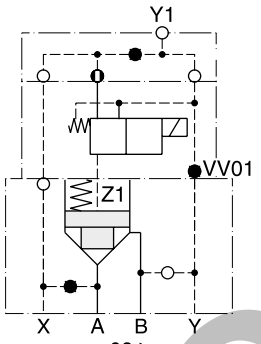
6

D4S with VV01



D4S..-.12... 09 / 10 / 11 / 12 } with VV01

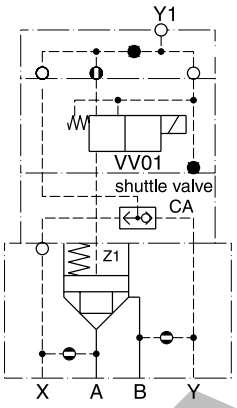
Pilot oil X = internal from A
Drain Y1 = external out of the cap



D4S..-.22... 09 / 10 / 11 / 12 } with VV01

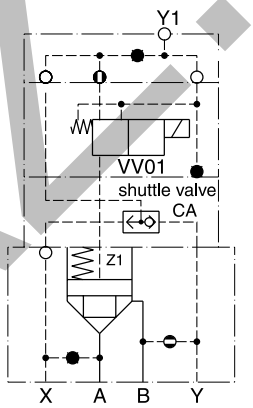
Pilot oil X = external
Drain Y1 = external out of the cap

D4S with shuttle valve



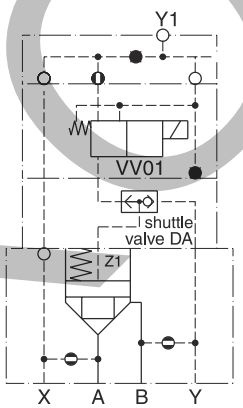
D4S..-.C2... CB / CD } with shuttle valve CA and VV01

Pilot oil = internal from A and B
Drain Y1 = external out of the cap



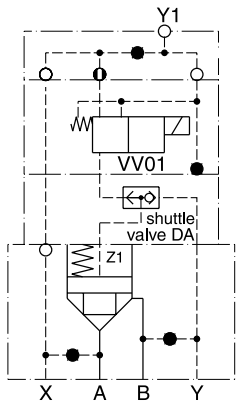
D4S..-.D2... CB / CD } with shuttle valve CA and VV01

Pilot oil = internal from B and external from X
Drain Y1 = external out of the cap



D4S..-.C2-...- DB / DD } with shuttle valve DA and VV01

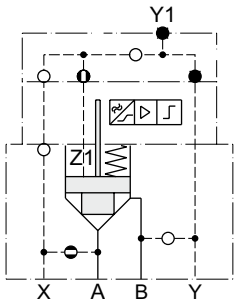
Pilot oil = internal from A and B
(B-A = check valve function)
Drain Y1 = external out of the cap



D4S..-.B2... DB / DD } with shuttle valve DA and VV01

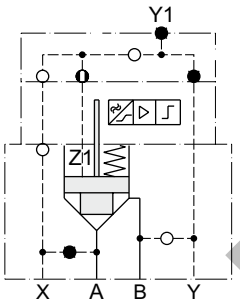
Pilot oil = external from X and Y
Drain Y1 = external out of the cap

D4S with position control



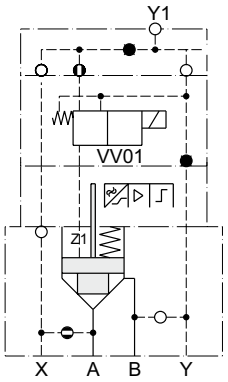
D4S..-.113A.EA
(with position control)

Pilot oil X = internal from A



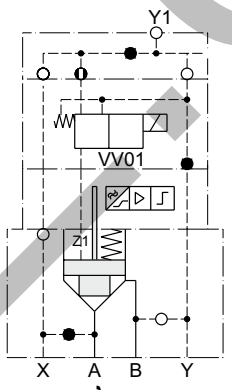
D4S..-.21-3A.-EA
(with position control)

Pilot oil X = external



D4S..-.12-3A.-EC / EE } with position control and VV01

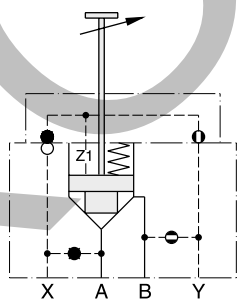
Pilot oil X = internal from A
Drain Y1 = external out of the cap



D4S..-.22-3A.-EC / EE } with position control and VV01

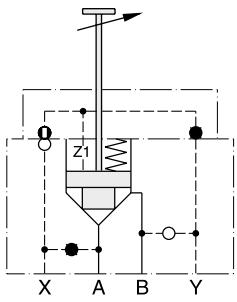
Pilot oil X = external
Drain Y1 = external out of the cap

D4S with stroke limiter



D4S..-.D434. with stroke limiter
Pilot oil Y = internal from B

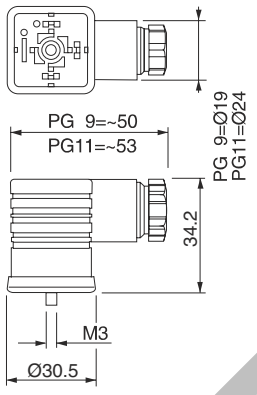
Note: for D4S06 and D4S10 only



D4S..-.233B. with stroke limiter
Pilot oil X = external

Note: for D4S06 and D4S10 only

Description	Threaded cable joint	Body colour coding	Order no.
Plug EN 175301-803, design type AF, protection class IP 65 Voltages up to 250 V	PG 9	black, B	**5001710**
		grey, A	**5001711**
	PG11	black, B	**5001716**
		grey, A	**5001717**



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For other plugs see chapter 2, "Accessories"