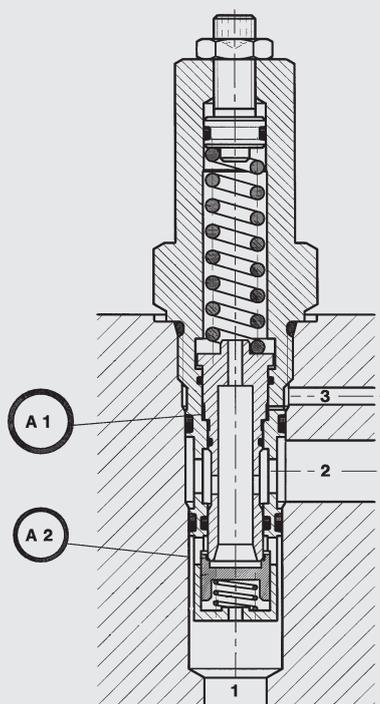


up to 100 l/min
up to 350 bar

FUNCTION



Counterbalance valves are direct-acting poppet valves with integrated check valve which enable smooth action of loads if there are retracting and extending loads. In load-holding applications, it can be used as a hose-break valve.

To raise a load, flow is permitted from pump port 2 to load port 1 via the built-in check valve.

To hold the load, the check valve piston is pressed against its seat by the load pressure at port 1 and seals leakage-free (control port 3 must be unpressurized).

To lower the load, pressure is applied to port 3 which controls the valve. Therefore the load can not speed ahead because the load flow rate is controlled at the metering edge of the control piston according to the load's inlet pressure.

A limitation of the load pressure is also included - here the load pressure at port 1 acts on a ring surface against the force of the adjustment spring. When the spring force is exceeded, the control piston moves away from the check valve piston, and this opens the flow path from port 1 to 2.

Counterbalance Valve Poppet type, direct-acting Cartridge – 350 bar SBVE08021 and SBVE16021

FEATURES

- Acts as a hose-break valve for safety purposes if there is a break in the control line, load supply line or drain line
- Load prevented from speeding ahead in case of retracting loads
- Speed of load controlled in accordance with the inlet flow
- Adjustable throughout pressure range
- Load pressure is restricted to the relevant pre-set pressure
- Load is held in position leakage-free
- Exposed surfaces zinc-nickel plated for increased corrosion protection (1.000 h salt spray test) - optional version 04

SPECIFICATIONS*

Operating pressure:	max. 350 bar (265 bar bei $\phi = 3,3$)	
Setting pressure:	max. 420 bar (320 bar bei $\phi = 3,3$)	
Nominal flow:	max. 100 l/min (SBVE16021) max. 30 l/min (SBVE08021)	
Cracking pressure:	1 bar (from port 2 to 1)	
Leakage:	Leakage-free max. 5 drops/min (0.25 cm ³ /min) at 350 bar	
Control volume:	SBVE08021	0.05 cm ³
	SBVE16021	0.20 cm ³
Pilot ratio:	$\phi = \frac{A1}{A2}$	
Media operating temperature range:	min. -20 °C to max. +120 °C	
Ambient temperature range:	min. -20 °C to max. +120 °C	
Operating fluid:	Hydraulic oil to DIN 51524 Part 1, 2 and 3	
Viscosity range:	min. 2.8 mm ² /s to max. 380 mm ² /s	
Filtration:	Class 21/19/16 according to ISO 4406 or cleaner	
MTTF _d :	150 - 1200 years, according to DIN EN ISO 13849-1	
Installation:	No orientation restrictions	
Material:	Valve body:	free-cutting steel
	Piston:	hardened and ground steel
	Seals:	FKM (standard) NBR (optional, media temperature range -30 °C to +100 °C)
	Back-up rings:	PTFE
Cavity:	08021 and 16021	
Weight:	SBVE08021	0.20 kg
	SBVE16021	0.77 kg

* see "Conditions and instructions for valves" in brochure 53.000

MODEL CODE

SBVE 08021 - 01 - C - N - 4.6 - 420 V 200

Designation

Counterbalance valve

Cavity

08021

16021

Type

01 = phosphated

04 = zinc-nickel plated

Body and ports*

C = cartridge only

Versions with housing see chart

Seals

V = FKM (standard)

N = NBR

Pilot ratio ϕ

Cavity 08021

3,3 = 3,3 : 1

4,6 = 4,6 : 1

7,5 = 7,5 : 1

Cavity 16021

4,8 = 4,8 : 1

7,5 = 7,5 : 1

Nominal pressure

420 = 420 bar

320 = 320 bar ($\phi = 3,3$)

Type of adjustment

V = adjustable by tool

Other adjustment options on request

Setting pressure

No details = no pre-setting

200 = 200 bar – pre-setting by factory (optional)

other setting pressures on request

Standard models

Model code	Part No.
SBVE08021-01-C-N-7,5-420V180	3383978
SBVE08021-04-C-V-3,3-320V200	3252066
SBVE16021-01-C-N-4,8-420V090	4101255
SBVE16021-04-C-V-4,8-420V230	3151326

Other models on request

Standard in-line bodies

Code	Part No.	Material	Ports	Pressure
R08021-01X-01	275033	Steel, zinc-plated	G3/8", G1/4"	350 bar
R08021-10X-01	283841	Steel, zinc-plated	G3/8", G1/4"	350 bar
R16021-01X-01	277051	Steel, zinc-plated	G1"	350 bar

Other line bodies on request

Seal kits

Code	Part No.
FS Metrisch 080.../V	3877546
FS Metrisch 160.../V	3877598

Setting pressure p_e :

The adjustment spring must be set to a value at least 1.2 times higher than the load pressure ($p_e > p_1 \times 1.2$)

p_1 = pressure required to move the load

p_e = setting pressure

Control pressure:

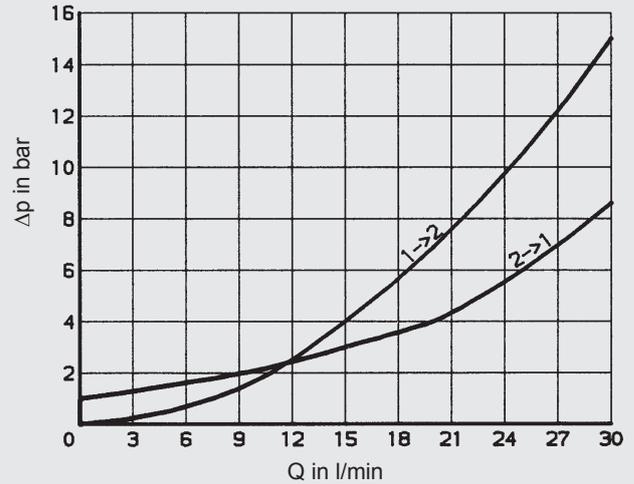
Pressure for opening the valve at port 3 (flow from 1 to 2)

p_2 = pressure at port 2

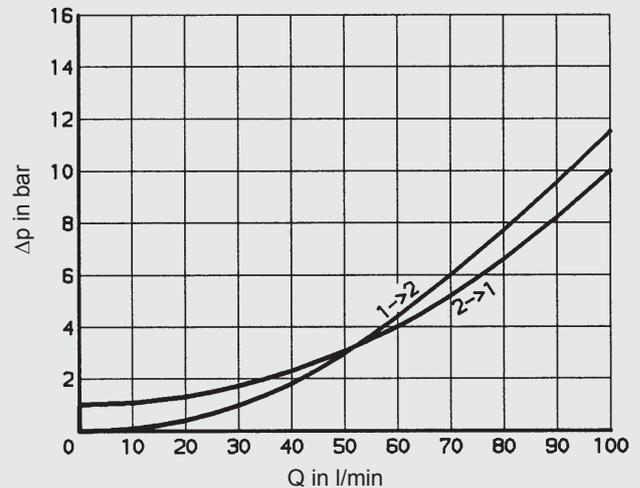
$$p_{ctrl} = \frac{p_e - p_1}{\phi} + p_2$$

TYPICAL PERFORMANCE

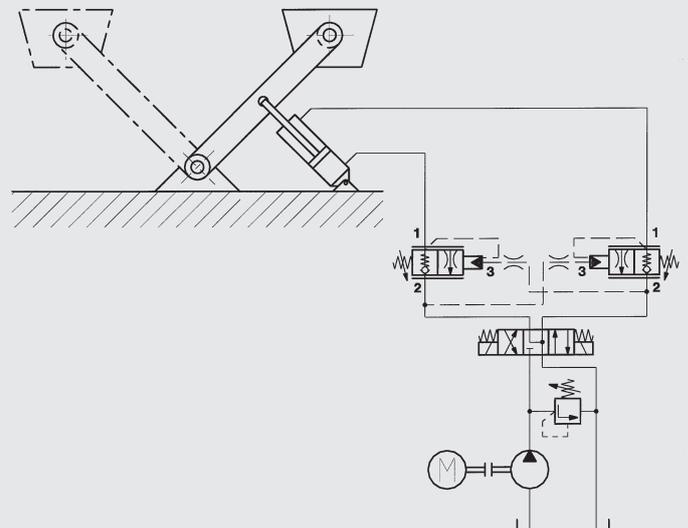
SBVE08021



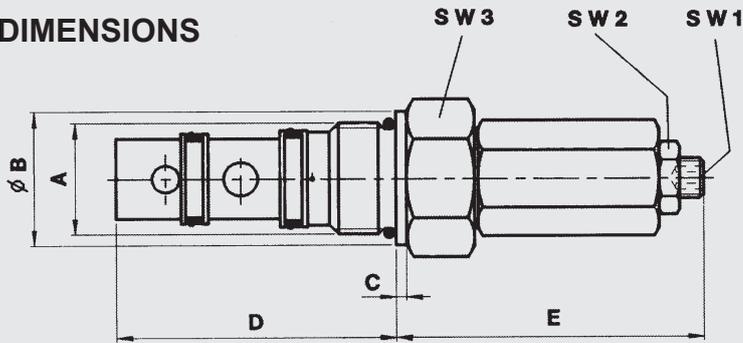
SBVE16021



CIRCUIT DIAGRAM EXAMPLE



DIMENSIONS



*Torque:

Steel manifold

(ultimate tensile strength < 360 N/mm²): see chart

Aluminium manifold

(ultimate tensile strength < 330 N/mm²): see chart

(tool acc. to DIN EN ISO 6789, tool type II class A or B)

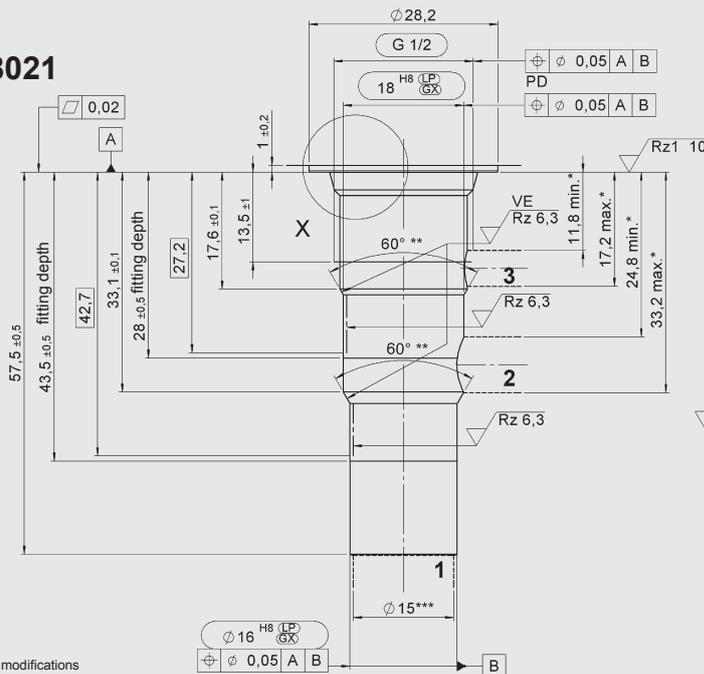
For further informations see brochure No. 53.000

"Conditions and instructions for valves"

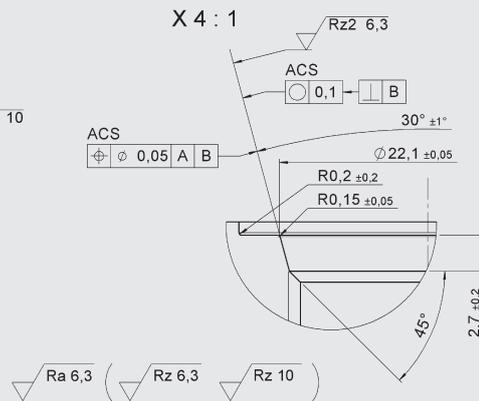
Nominal size	A (ISO 228)	ØB	C	D	E _{max}	SW1	SW2	SW3	Torque*
SBVE08021	G 1/2	24	4	56.5	56	4	13	24	Steel: 35 Nm, Alu: 35 Nm
SBVE16021	G 1	40	3	82	94	6	19	41	Steel: 160 Nm, Alu: 140 Nm

CAVITY SBVE08021

08021



Millimeter
Subject to technical modifications

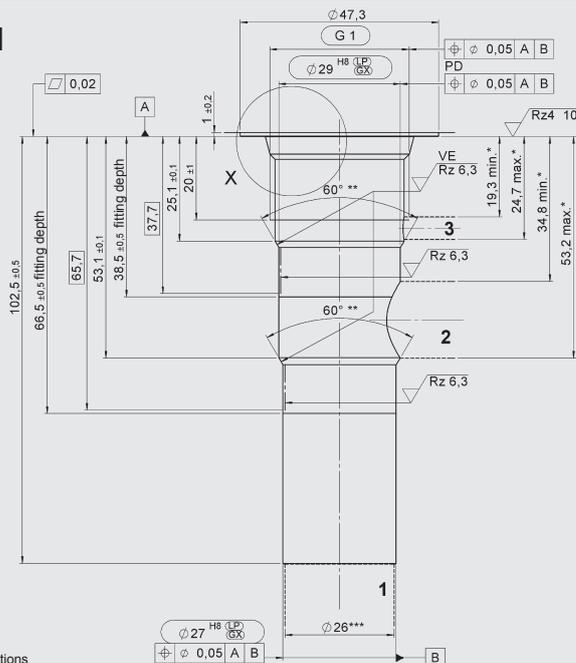


Form tools

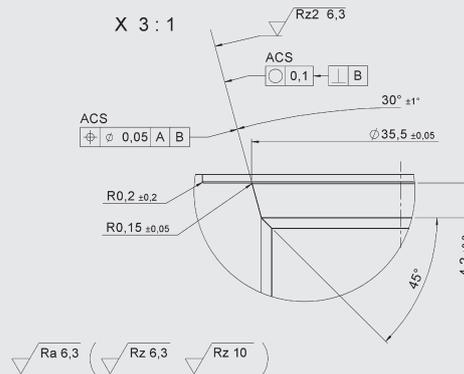
Tool	Part No.
Countersink	170031
Reamer	169962
Tap	1002667
Plug gauge	169939

SBVE16021

16021



Millimeter
Subject to technical modifications



Form tools

Tool	Part No.
Countersink	170035
Reamer	169965
Tap	1002661
Plug gauge	174879

VE = Visual Examination

* Allowed drilling zone (for manifold design)

** Sharp edges should be avoided by rounding to a radius of 0.1 mm to 0.2 mm

*** largest pre-drilling diameter (nominal tool diameter)

NOTE

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

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