CHECK-Q-METER BZV

- NG 6
- Up to 350 bar *[5 076 PSI]*
- Up to 60 l/min *[15.8 GPM]*

- Hermetically sealing at closed flow path.
- Minimum pressure losses when the medium flows from port A towards port B.
- When the medium flows from port B towards port A the speed of load lowering is controlled with respect to the medium flow rate supplied to the opposite side of the hydraulic motor or cylinder. With operating cylinders the characteristic ratio of surface areas must be taken into account.
- For building into pipe-lines.
- Threaded connections to ISO 9974 (Metrisch), ISO 1179 (BSPP/Gas), ISO 11926 (UNF).

BZV-6-D, BZV-6-E

Operation

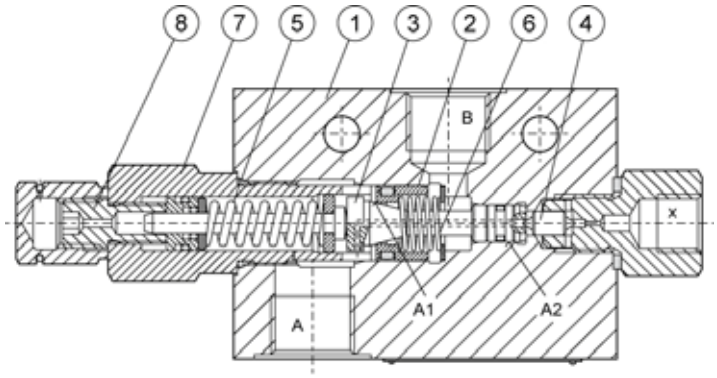
The check-Q-meter is used for maintaining constant speed during the lowering of loads by means of hydraulic cylinders or hydromotors in the systems where load changes with time. It prevents uncontrolled falling of load if defects occur in the pipeline between the directional control valve and the check-Q-meter or if there is no pilot pressure. When it is installed in combination with a directional control valve with negative change-over in intermediate positions, it has the function of a holding valve. If the load on hydraulic cylinders or hydromotors does not change the sign, a single check-Q-meter must be used. The check-Q-meter consists of a housing (1), main poppet (2), auxiliary spool (3), pilot poppet (4), spring (5), insert housing (7) and setting screw (8).

Lifting the load:
The hydraulic fluid flows from port A towards port B with minimum pressure losses, the main poppet (2) being lifted. In the case of a pressure drop and an interruption in the hydraulic fluid supply to port A, the main poppet (2) closes, holding the load in position. With the directional control valve in position (a) the hydraulic fluid flows to the annulus side of the hydraulic cylinder, which provokes a certain pilot pressure on the auxiliary spool (3). The check-Q-meter opens and thereby a free hydraulic fluid flow from port B towards port A occurs, when the main poppet (2) leans against the insert housing (7), where as the auxiliary spool (3) still performs a part of the controlled move which depends on the quantity of the hydraulic fluid supplied in a unit of time to the annulus side of the operating cylinder. In the opening direction, also the load pressure works on the circle of the predefined surface. The pilot pressure required for the opening of the check-Q-meter is:

$$\text{Required pilot pressure} = \frac{\text{safety valve setting - load pressure}}{4{,}25}$$

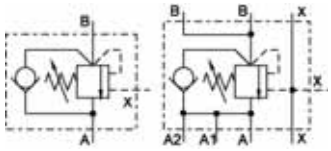
In case that the hydraulic cylinder piston starts to move faster than permitted by the hydraulic fluid supply, the pilot pressure on the port X drops and the auxiliary spool (3) under the effect of spring (5) moves in the valve closing and shutting-off direction, respectively.
Because of the reduction in flow cross-section the resistances increase, which causes an increase in the pilot pressure and thereby a larger opening of the check-Q-meter. In this manner, the check-Q-meter is continuously balanced during lowering. The spring (5) setting force must be set at least 1.3 -times higher than the maximum force due to the operating pressure (pressure due to load):

$$\text{Max. operating pressure} = \frac{350 \text{ Bar } [5076 \text{ PSI}]}{1{,}3} = 270 \text{ Bar } [3916 \text{ PSI}]$$

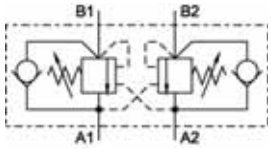


Hydraulic symbols

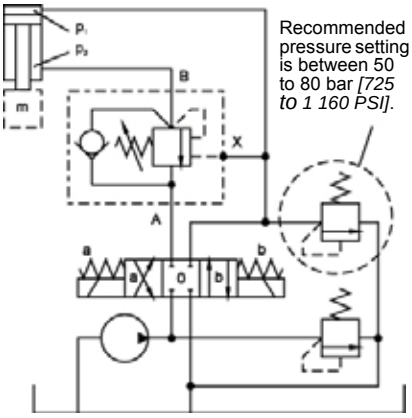
BZV-6-E



BZV-6-D



Mounting example



Recommended pressure setting is between 50 to 80 bar *[725 to 1 160 PSI]*.

Because of the multiplication of pressure in hydraulic cylinder by the difference of surface areas:

$p_2 = p_m + p_1 \times \varphi \qquad \varphi = A1/A2 > 1$

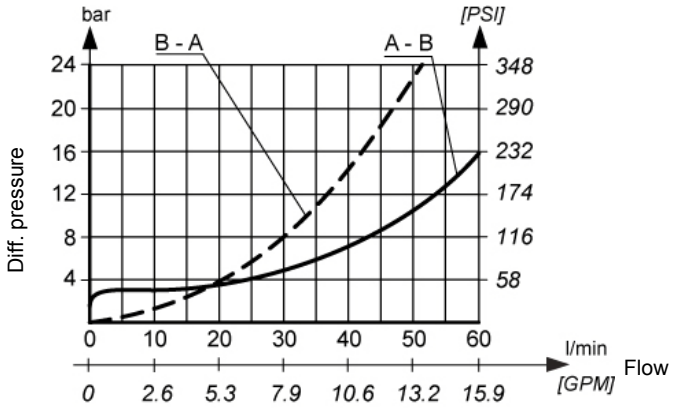
It is recommended to protect the circuit by means of a pressure relief valve, the cracking pressure of which is set with respect to the selected spring (5) in the BZV.

Features

Size			BZV-6-E	BZV-6-D
Flow rate		l/min *[GPM]*	60 *[15.8]*	
Operating pressure	spring 200 Bar *[2.900 PSI]*	Bar *[PSI]*	150 *[2 175]*	
	spring 350 Bar *[5076 PSI]*		270 *[3 916]*	
Pilot pressure	spring 200 Bar *[2.900 PSI]*	Bar *[PSI]*	4 to 50 *[58 to 725]*	
	spring 350 Bar *[5076 PSI]*		6 to 85 *[87 to 1.232]*	
Cracking pressure		Bar *[PSI]*	2,2 *[31.9]*	
Pilot ratio	R = A2/A1-A2		4,25	
Oil temperature range		°C *[°F]*	-20 to +70 *[-4 to +158]*	
Viscosity range		mm^2/s *[SUS]*	15 to 380 *[69,5 to 1.760]*	
Filtration		NAS 1638	8	
Mass		kg *[lbs]*	1,5 *[3.30]*	2,4 *[5.29]*

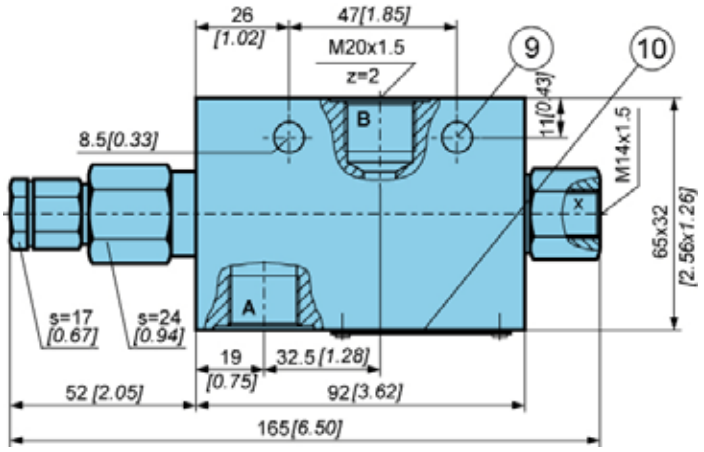
ΔP-Q Performance curves

Measured at 50C *[122F]*
and viscosity of 32 mm^2/s *[148 SUS]*.



Dimensions

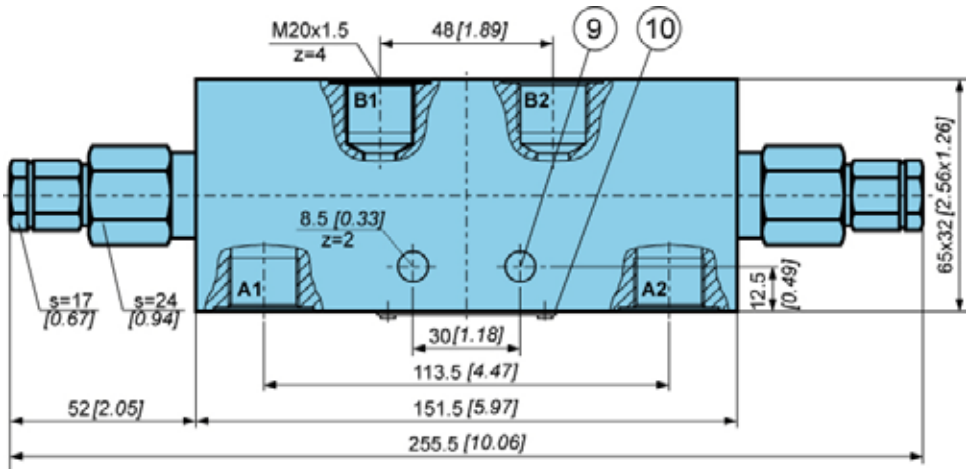
BZV-6-E-...-C



9. Fixing screw
10. Nameplate

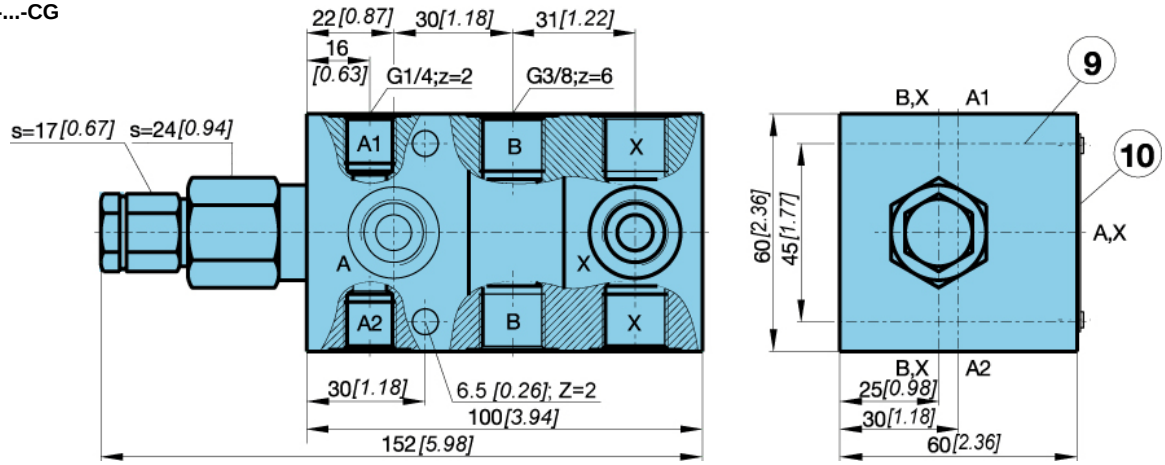
Dimensions

BZV-6-D-...-C



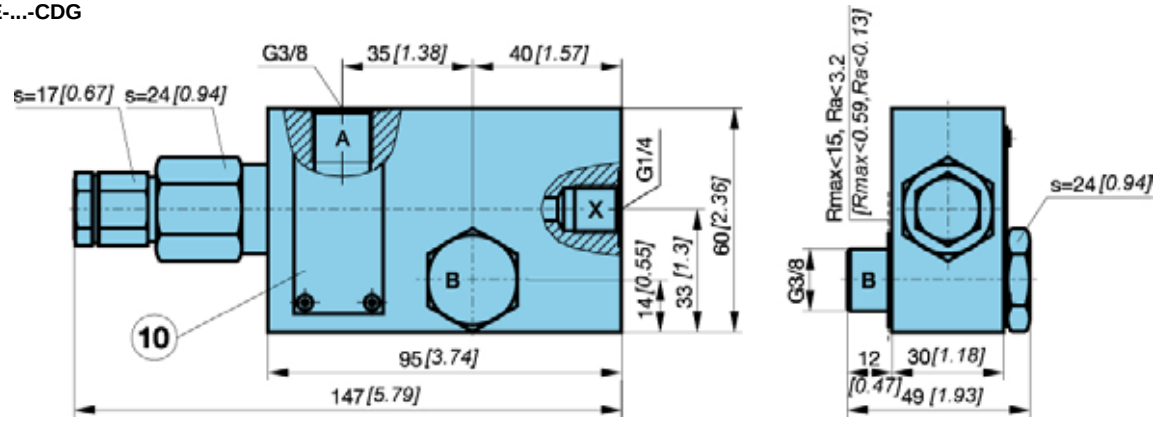
9. Fixing screw
10. Nameplate

BZV-6-E-...-CG



9. Fixing screw
10. Nameplate

BZV-6-E-...-CDG



10. Nameplate

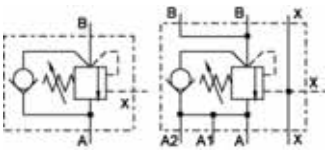
Model code

B Z V - 6 - ☐ - ☐ - ☐ - ☐ - ✱

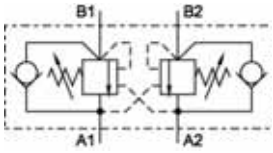
Size

Size 6	**6**

Symbol



E



D

Control range

60 to 200 bar *[870 to 2 900 PSI]*	**200**
100 to 350 bar *[1.450 to 5.076 PSI]*	**350**

Mounting method

Building into pipeline (M20x1,5/M14x1,5)	**C**
Building into pipeline (G3/8)	**CG**
Building direct on hydraulic cylinder	**CDG**
Building into pipeline (SAE8)	**CUNF**

Seal type

NBR seals for mineral oil HL,HLP to DIN 51524	**No designationNo designation**
FPM seals for HETG, HEES, HEPG to VDMA 24568 and ISO 15380	**E**

Special requirements to be briefly specified