DERV 10 Leakfree double check valve, cartridge type, pilot operated

1. General description

- pilot-operated, spring-loaded, cartridge-type poppet valve
- it holds the load in neutral position
- prevents a load from falling if a burst occurs in feed pipe A or B
- prevents creep of hydraulically clamped actuators
- hardened and ground seat and poppet
- shuts off pressurized working circuits in both directions

2. Advantages of Beringer's check valve

- pilot-operated check valve and pipe-rupture-valve function integrated in one unit
- soft opening thanks to optimized pre-opening function
- suitable housing with screw thread or flange connection available on request
- minimal spatial requirement thanks to compact design

3. Application

- for direct installation in cylinders
- for installation in unit constructions
- as a straight-way-valve installation kit

4. Characteristics

(Please contact Beringer if machinery is required for use beyond these tolerances)

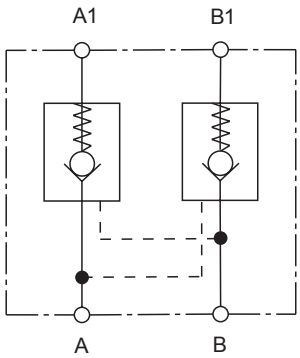
4.1 General:

• Type:	spring-loaded poppet valve with hydraulic piloting
• Mounting method:	screw-type cartridge
• Ports:	A, A1 = ø 10 B, B1 = ø 10
• Mounting position:	any
• Flow direction:	A ➔ A1, B ➔ B1 free flow A1 ➔ A, B1 ➔ B blocked, pressurized flow pilot-operated at opposite end
• Weight:	0.87 kg
• Opening ratio:	$\frac{\text{opening spool area}}{\text{pilot spool area}} = \frac{18}{1}$
• Opening pressure:	$\frac{\text{load pressure}}{18}$ + 3bar
• Closing pressure:	3 bar

4.2 Hydraulic characteristics:

• Size:	10
• Rated flow rate:	100 l/min
• Max. working pressure:	350 bar
• Max. load pressure (A1/B1) closed position:	500 bar
• Hydraulic medium:	mineral oil per DIN 51524 and DIN 51525 (HL/HLP) inquire about other media
• Hydraulic medium temperature range:	-20°C...+80°C inquire about other temperatures
• Viscosity range:	2.8 mm^2/s up to 1500 mm^2/s
• Filtering:	NAS 1638 class 9, β10 ±75.

5. Symbol



6. Safety instructions

- This valve must only be used for the purpose for which it has been designed.
- The hydraulic system must be depressurized and checked before the valve is dissasembled.
- The valve must not be opened without the express permission of the manufacturer.

7. Assembly instructions

- Observe all port designations (see dimension diagram).
- Protect seals and flange surfaces against becoming damaged.
- Observe the tightening torques (see dimension diagram).
- Bleed the hydraulic system before putting it into operation.

8. Functional description, sectional view

8.1 Neutral position (load pressure at A1 or B1, ports A and B depressurized)

The control spool and pilot ball are closed from A1 to A and B1 to B, free of leaks, by the force of the pressure spring and the load pressure that acts on the rear side of the pilot ball and control spool.

8.2 Check-valve operation (flow from A → A1, B → B1)

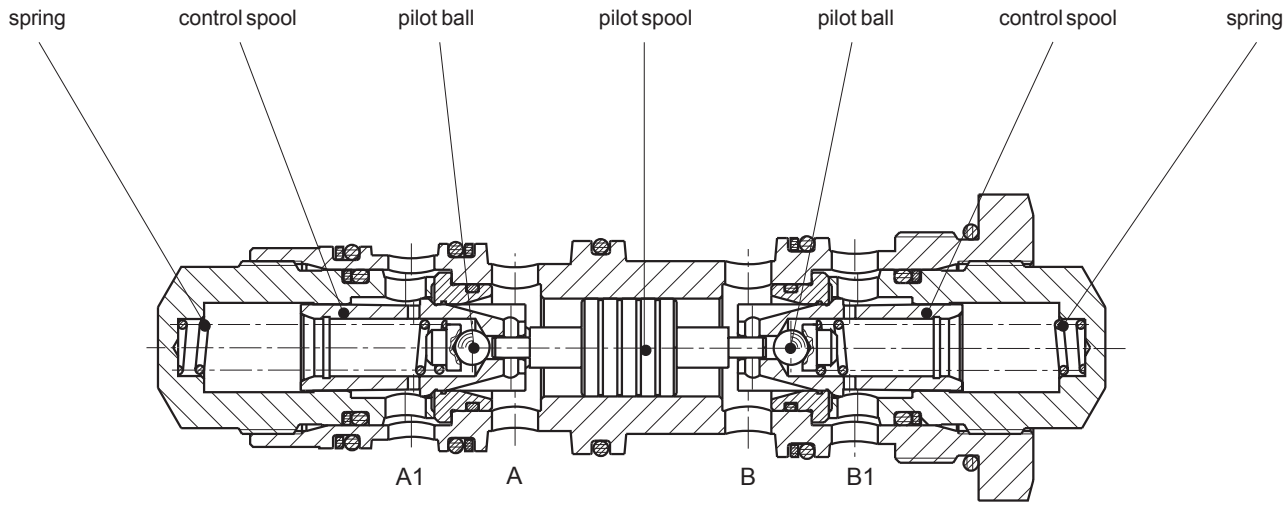
If the pressure is applied to the valve seat of the control spool via port A or B, the control spool, together with the pilot ball, is opened against the compliant pressure spring. Due to the small effective surface of the pilot ball, the control spool moves in the opening direction when this check valve functions, without the pilot ball opening.

8.3 Hydraulic piloting (flow from A1 → A, B1 → B)

8.3.1 Decompression
When control pressure A or B is being built up, the opening spool is forced against the pilot ball. If the opening force is greater than the sum of the pressure-spring force and the load pressure, the pilot ball opens and decompresses the pressure behind the control spool.

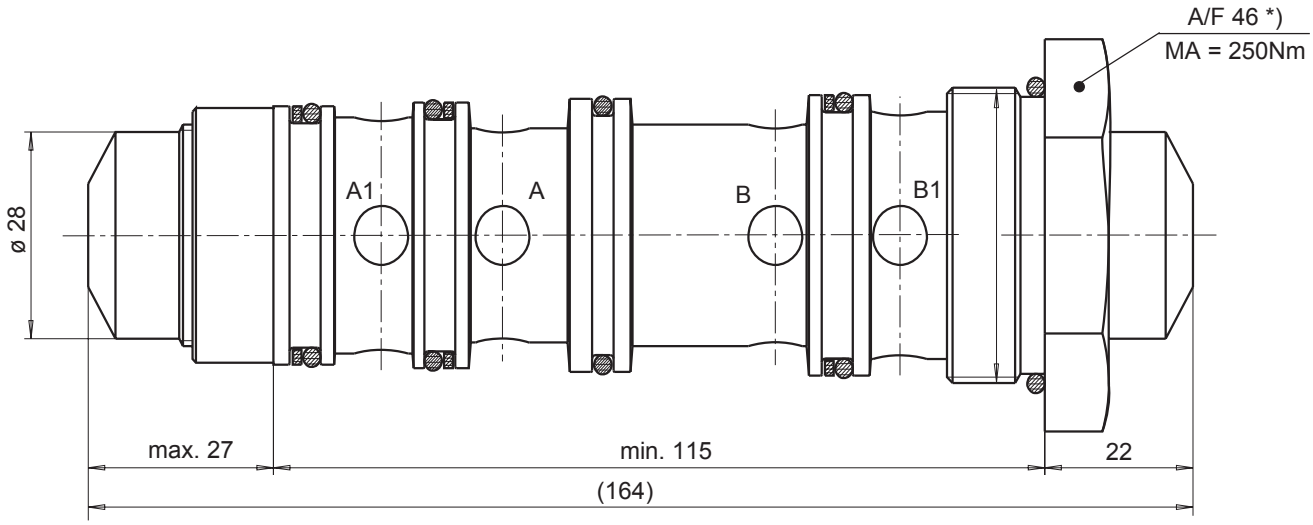
8.3.2 Opening the control spool
Due to the pressure drop (decompression) behind the control spool, the opening spool now only acts against the compliant pressure spring. This means that the control spool is opened by the opening spool without any great increase in control pressure. Flow from A1 to A or from B1 to B is guaranteed.

8.3.3 Closing the control spool
When the control pressure is relieved at the opening spool, the control spool is closed by the force of the spring and the small delta p of the pre-opening fluid flowing through, i.e. the closing pressure remains as good as identical for any load pressure.



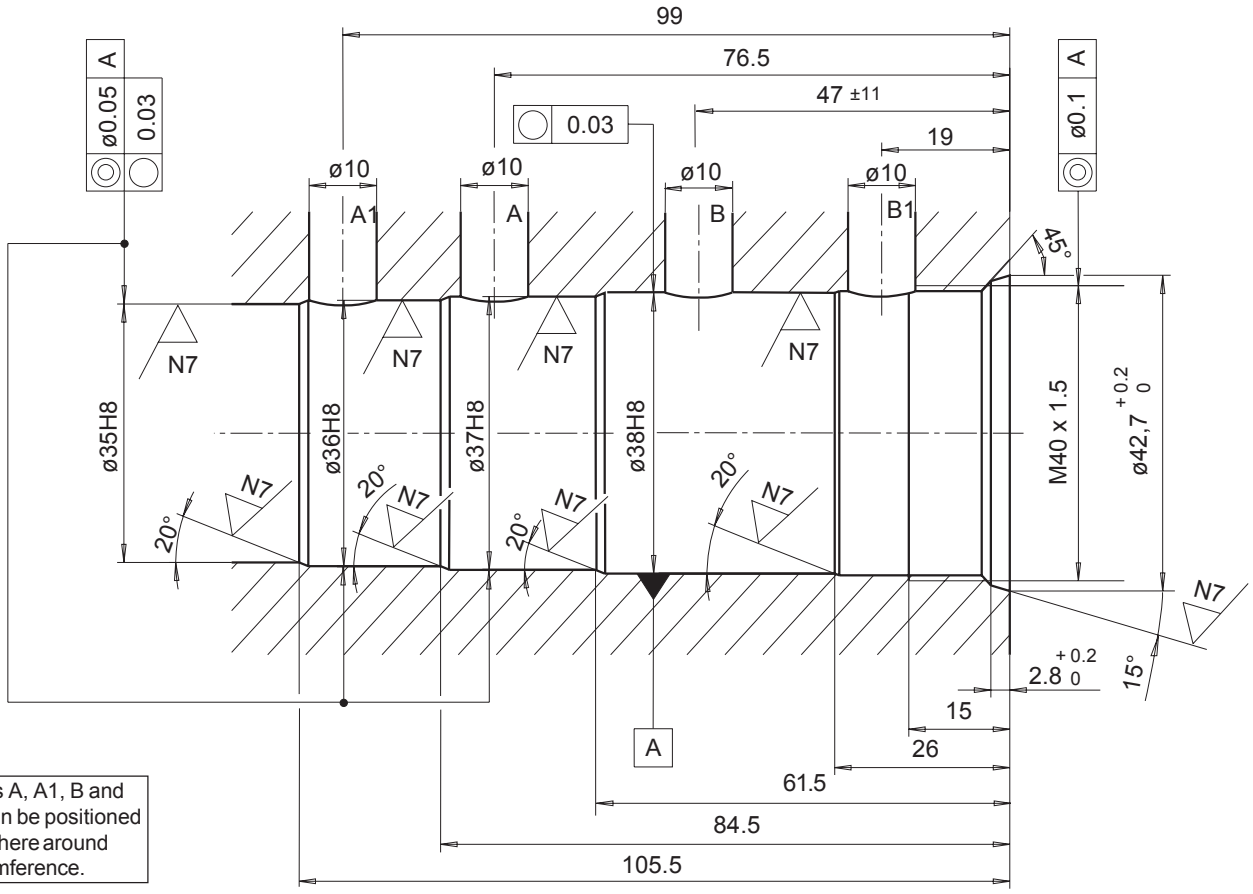
9. Dimension diagram, location hole

9.1 Cartridge



*) For assembling and disassembling the cartridge

9.2 Location hole

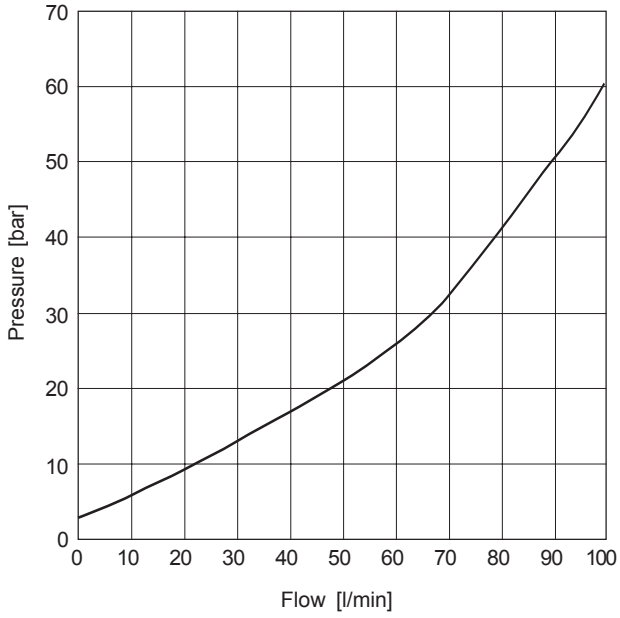


Bores A, A1, B and B1 can be positioned anywhere around circumference.

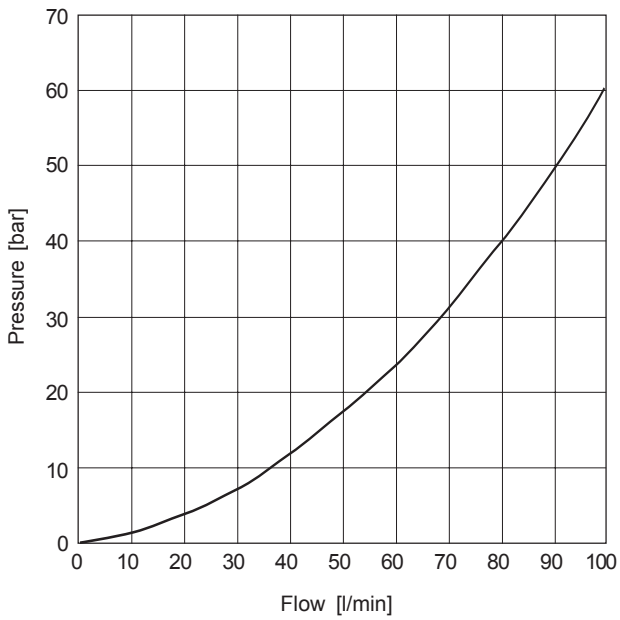
10. Characteristic curves

Measured at 33 mm^2/s

lift (check-valve operation)
A → A1
B → B1



lower (hydr. piloting)
A1 → A
B1 → B



11. Type code

DERV 10 / ☐

Leakfree double check valve

DERV	**DERV**

Size

10	**10**

Seal material

NBR standard	**N**
Viton	**V**
Low-temperature seal	**T**