

Inline Compensator Cartridge, Size 16

$Q_{\max} = 250 \text{ l/min}$, $p_{\max} = 420 \text{ bar}$

Direct acting, adjustable compensator spring

Series DWDP A-5B...



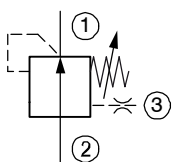
- Compensator spring adjustable from 8...16 bar
- External remote-control port 3 with integral damping orifice
- High flow rates
- Very good dynamics
- Excellent stability over the whole pressure and flow range
- Available with hand-knob or tamper-proof cap
- All external parts zinc plated, passivated (CrVI-free)
- Can be fitted in a line-mounting body

1 Description

These direct-acting inline pressure-compensator (hydrostat) cartridges, series DWDP A-5B...-16..., are size 16, high performance screw-in cartridges with an M42x2 mounting thread. The main stage is designed on the sliding-spool principle, and it can be set between 8...16 bar using the adjustable compensator spring. Inline compensators maintain the control pressure difference between inlet and outlet pressure - for example, across a throttle (an orifice) - at a constant level. This means that the flow rate is independent of the load pressure at the actuator. The adjusting screw or the handwheel enable the user to carry out system optimisation directly on the equipment, without any need to install

or replace components that have different flow ranges (e.g. proportional valves). To safeguard valve settings, the adjusting spindle can be sealed with a tamper-proof cap. These screw-in cartridges are used in hydraulic circuits, predominantly in conjunction with a throttle cartridge, to ensure constant travel speed irrespective of variations in load or primary pressure. All external parts of the cartridge are zinc plated and passivated (CrVI-free) and are thus suitable for use in the harshest operating environments. If you intend to manufacture your own cavities or are designing a line-mounting installation, please refer to the section "Related data sheets".

2 Symbol



3 Technical data

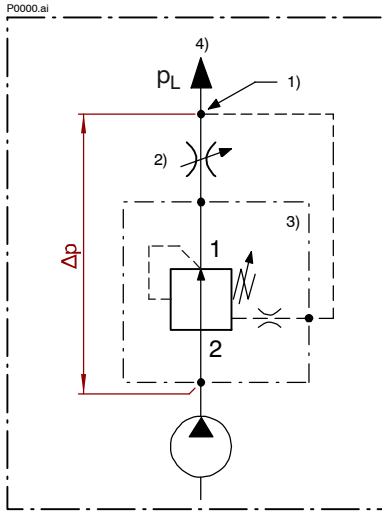
| General characteristics | Description, value, unit |
|---------------------------|--|
| Designation | inline pressure-compensator cartridge |
| Design | direct acting, adjustable compensator spring, external remote-control port 3 with integral damping orifice |
| Mounting method | screw-in cartridge M42x2 |
| Tightening torque | 200 Nm \pm 10 % |
| Size | nominal size 16, cavity type EB |
| Weight | 0.92 kg |
| Mounting attitude | unrestricted |
| Ambient temperature range | -25 °C ... +80 °C |

| Hydraulic characteristics | Description, value, unit |
|---|---|
| Maximum operating pressure | 420 bar |
| Maximum allowable pressure in port 3 | 420 bar |
| Maximum flow rate 2 → 1 | 250 l/min |
| Maximum flow rate attainable at the actuator | 130 l/min with control Δp of 8 bar 225 l/min with control Δp of 16 bar |
| Pressure adjustment range | 8...16 bar (1 turn \cong 1.5 bar) |
| Flow direction | 2 → 1, see symbols |
| Hydraulic fluid | HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER |
| Hydraulic fluid temperature range | -25 °C ... +80 °C |
| Viscosity range | 10...650 mm ² /s (cSt), recommended 15...250 mm ² /s (cSt) |
| Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999 | class 20/18/15 |

4 Performance graphs

measured with oil viscosity 33 mm²/s (cSt) and in a cavity with an annular groove

Test setup (for flow rate v. load pressure characteristic)



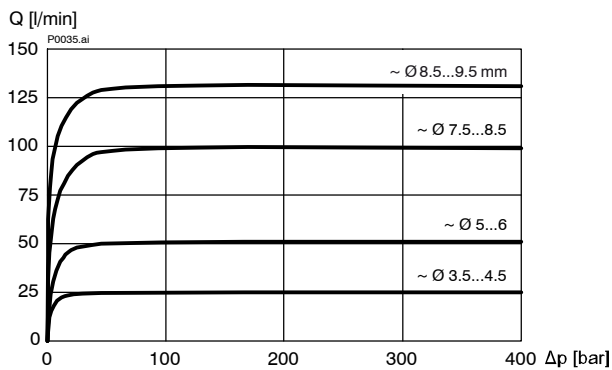
- 1) Load sensing immediately after orifice 2)
- 2) Throttle function (orifice size, see performance graphs)
- 3) Inline pressure-compensator cartridge
- 4) Actuator port ($p_L = \text{load pressure}$)



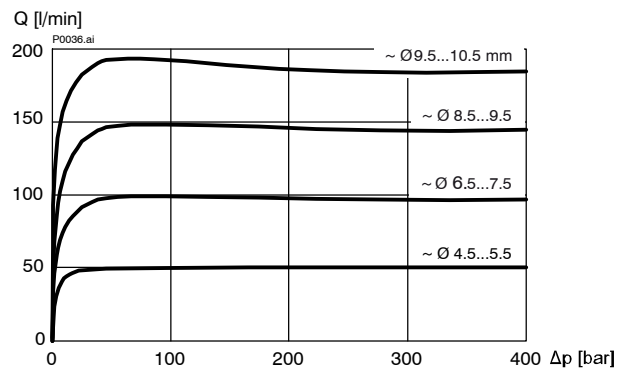
IMPORTANT!

The load-sensing tapping point must be located immediately after the throttle (orifice). Also bear in mind that the pressure drop between the compensator inlet (2) and the throttle outlet (orifice 2) must be as small as possible (short distance between the two components). This gives the best flow rate / load pressure values.

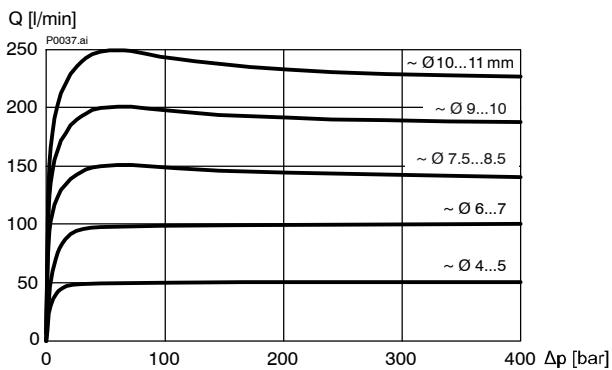
$Q = f(\Delta p)$ Flow rate - Pressure drop characteristic at the minimum compensator setting (8 bar)



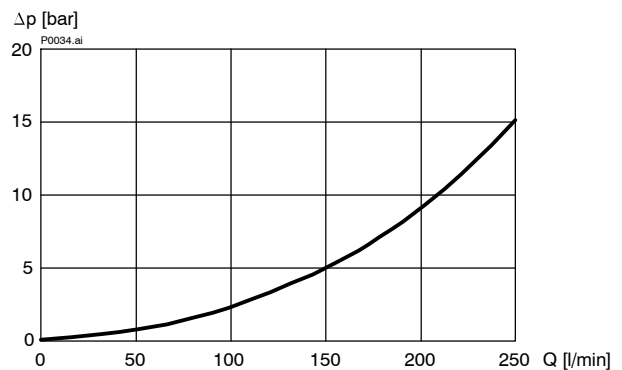
$Q = f(\Delta p)$ Flow rate - Pressure drop characteristic at the mid-range compensator setting (12 bar)



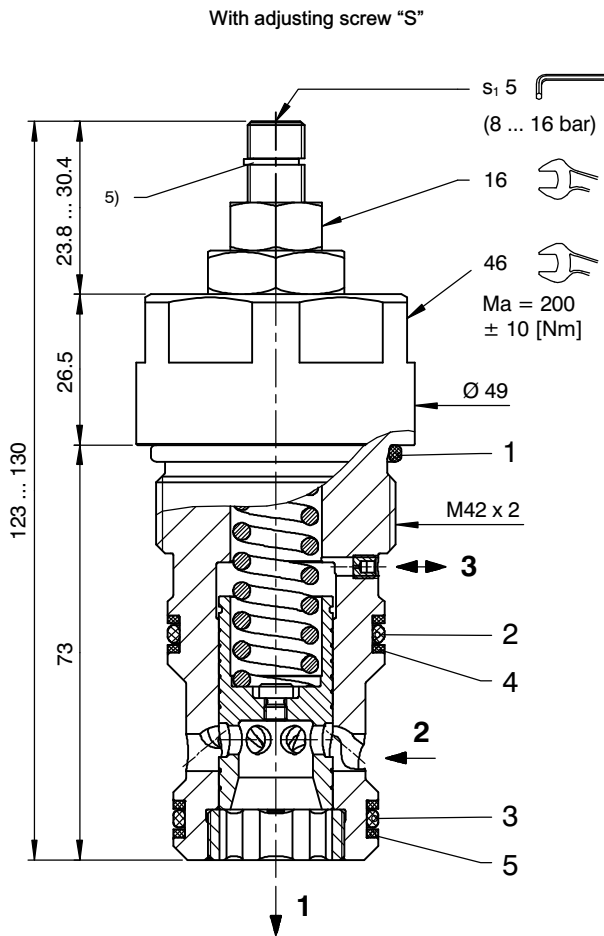
$Q = f(\Delta p)$ Flow rate - Pressure drop characteristic at the maximum compensator setting (16 bar)



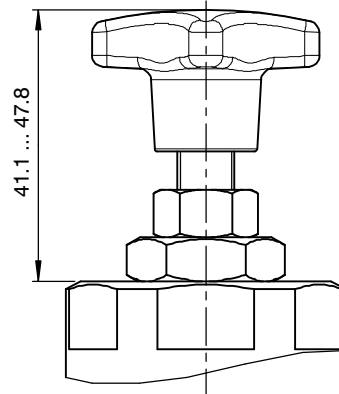
$\Delta p = f(Q)$ Pressure-drop characteristic (control Δp , 2→1) (port 3 completely unloaded)



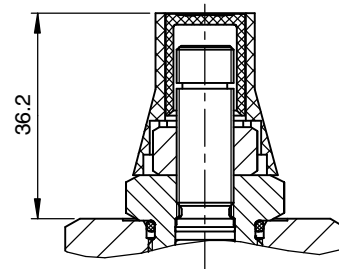
5 Dimensions & sectional view



With hand-knob adjuster "H"



Adjusting screw with tamper-proof cap
(order separately in plain language)



6 Installation information



IMPORTANT!

When fitting the cartridges, use the specified tightening torque. Set the required control Δp (8...16 bar) with the adjusting screw (s_1 5). After you have set the valve, lock the adjusting screw with the lock nut.



ATTENTION!

Only qualified personnel with mechanical skills may carry out any maintenance work. Generally, the only work that should ever be undertaken is to check, and possibly replace, the seals. When changing seals, oil or grease the new seals thoroughly before fitting them.



IMPORTANT!

Valve settings can be sealed by fitting the tamper-proof cap. To fit the cap, the snap ring ⁵⁾ has to be removed. Subsequent adjustment is only possible by destroying the tamper-proof cap.

Seal kit NBR no. DS-359-N ⁶⁾

| Item | Qty. | Description |
|------|------|--|
| 1 | 1 | O-ring no. 129 Ø 39,34 x 2,62 N90 |
| 2 | 1 | O-ring no. 125 Ø 32,99 x 2,62 N90 |
| 3 | 1 | O-ring no. 124 Ø 31,42 x 2,62 N90 |
| 4 | 2 | Backup ring Ø 32,00 x 2,00 x 1,40 FI0751 |
| 5 | 2 | Backup ring Ø 30,00 x 2,00 x 1,40 FI0751 |



IMPORTANT!

⁶⁾ Seal kit with FKM (Viton) seals, no. DS-359-V

7 Application examples

The following diagram shows a typical manifold block for a load-sensing circuit with a pressure/flow-controlled pump. The block uses our direct acting, inline pressure-compensator cartridges.

In this application all three actuators have to travel together, and it is therefore necessary to provide an inline compensator for each station.

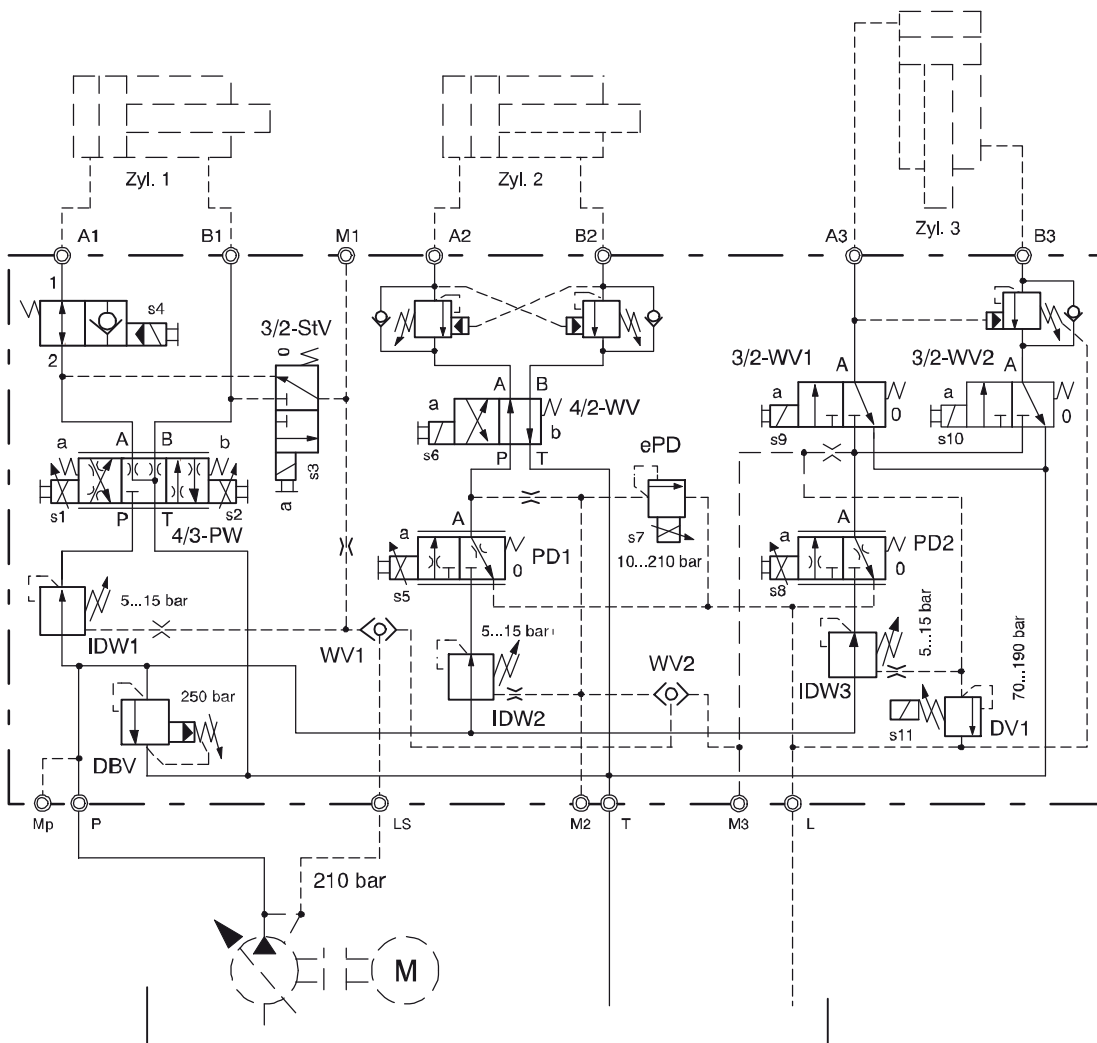
The direction and speed of cylinder 1 is determined by the 4/3 proportional directional valve (4/3-PW), which has meter-in and meter-out throttling.

The inline compensator (IDW1) ensures that there a constant pressure drop across the proportional directional valve. Since the cylinder is also braked by this proportional directional valve (4/3-PW), the load signal is fed back through a 3/2 solenoid valve (StV) that connects with the respective cylinder supply line in each situation.

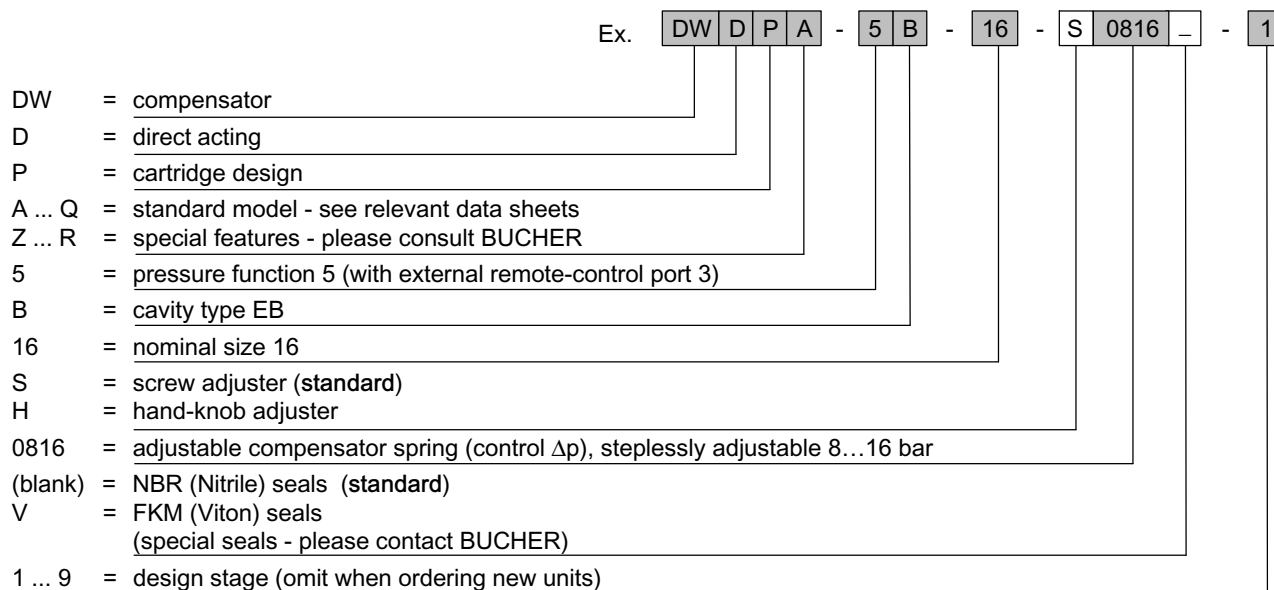
The speed of cylinder 2 (Zyl. 2) is independent of the load, and it is determined by the ventable proportional throttle (PD1) and the inline compensator (IDW2).

By placing a proportional pressure-relief valve (ePD) in the remote-control line for the compensator, we create a proportional 2-way pressure-reducing function. The direction of travel is determined by a 4/2 solenoid valve (4/2-WV) and the deceleration is controlled by the two counterbalance valves.

In the case of cylinder 3 (Zyl. 3), the ventable proportional throttle (PD2) and inline compensator (IDW3) ensure that its travel speed is also load-compensated. The electrically operated pressure-relief valve (DV1) enables two different adjustable pressure levels to be set and activated. The two 3/2 directional valves (3/2-WV1 / 3/2-WV2) control the direction of travel (and fast-advance, slow speed). The counterbalance valve, which is unaffected by back pressure, prevents the cylinder from overrunning.



8 Ordering code



IMPORTANT!

When required, the tamper-proof cap (the adjustment seal) must be ordered separately in plain language.

9 Related data sheets

| Reference | (Old no.) | Description |
|--------------|-----------|---------------------------------------|
| 400-P-040011 | (i-32) | The form-tool hire programme |
| 400-P-080111 | (i-55.2) | Cavity type EB to ISO 7789-42-06-0-07 |
| 400-P-750115 | (G-29.22) | Line-mounting body, type GEBAA (G 1") |

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