

# Inline Compensator Cartridge, Size 10

$Q_{\max} = 80 \text{ l/min}$ ,  $p_{\max} = 350 \text{ bar}$

Direct acting, compensator spring adjustable or fixed, optional damped design

Series DWDPB-5D..., DWDPUB-5D...



- Adjustable compensator spring: from 5...15 bar
- Fixed compensator spring: 1, 4, 6 or 8 bar
- External remote-control port Z with integral damping orifice
- High flow rates
- Excellent stability over the whole pressure and flow range
- Available with hand-knob or tamper-proof cap
- Optionally with damped spool, for use with low load pressures (< 20 bar)
- All exposed parts with zinc-nickel plating
- Can be fitted in a line-mounting body
- Can be fitted in sandwich bodies

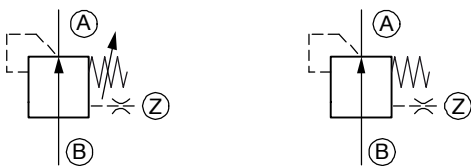
## 1 Description

These direct-acting inline pressure-compensator (hydrostat) cartridges, series DWDPB-5D-10..., are size 10, high performance screw-in cartridges with an M24x1.5 mounting thread. The main stage is designed on the sliding-spool principle. The range includes a model with an adjustable pressure-compensator spring (5 ... 15 bar) and four models with a fixed compensator spring (1, 4, 6 or 8 bar). Pressure-compensator cartridges 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. An optional model DWDPUB-5D-10... with damped spool is available for use in oscillation-susceptible conditions (for example, with load

pressure < 20 bar).

The adjusting screw or the hand-knob 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 screw can be sealed with a tamper-proof cap. These screw-in cartridges are used in hydraulic circuits in mobile and industrial applications, predominantly in conjunction with a throttle cartridge. All external parts of the cartridge are zinc-nickel plated to DIN 50 979 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



DWDPB-5D-10-...S0515... DWDPB-5D-10-F...

### 3 Technical data

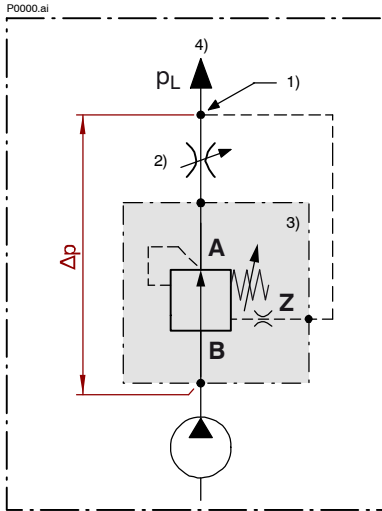
General characteristics	Description, value, unit
Designation	Inline pressure-compensator cartridge
Design	direct acting, compensator spring adjustable or fixed, optional damped design, external remote-control port Z with integral damping orifice
Mounting method	screw-in cartridge M24x1.5
Size	nominal size 10, cavity type DD to Bucher Standard
Weight	0.25 kg
Mounting attitude	unrestricted
Ambient temperature range	-25 °C ... +80 °C

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	350 bar
Maximum flow rate B → A	80 l/min
Maximum flow rate attainable at the actuator	see performance graphs
Pressure adjustment range	5...15 bar (1 turn ≈ 1.9 bar)
Flow direction	B → A, 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 <sup>2</sup> /s (cSt), recommended 15...250 mm <sup>2</sup> /s (cSt)
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999	class 20/18/15

## 4 Performance graphs

measured with oil viscosity 33 mm<sup>2</sup>/s (cSt)

### Test setup (for flow rate v. $\Delta p$ characteristic)



- 1) Load sensing immediately after orifice <sup>2)</sup>
- 2) Throttle function (orifice size, see performance graphs)
- 3) Inline pressure-compensator cartridge
- 4) Actuator port ( $p_L$  = load pressure)

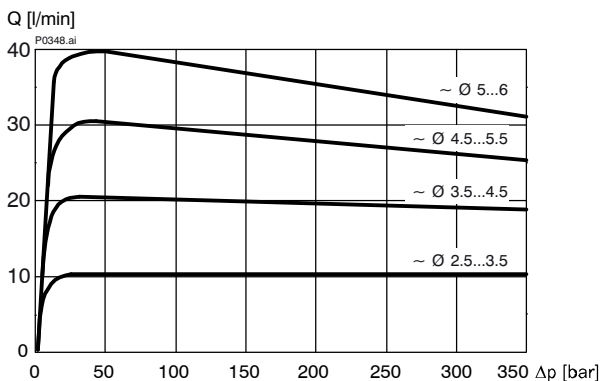


#### IMPORTANT!

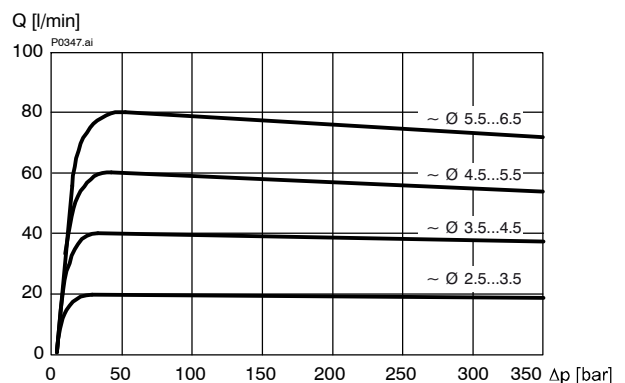
The load-sensing tapping point must be located immediately after the throttle (orifice). Also bear in mind that the pressure drop between the compensator inlet (B) and the throttle outlet (orifice <sup>2)</sup>) must be as small as possible (short distance between the two components). This gives the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

### 4.1 Adjustable model

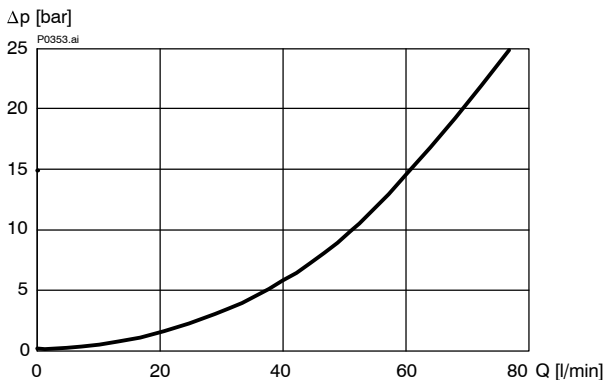
$Q = f(\Delta p)$  Flow rate - Pressure drop characteristic at the minimum compensator setting (5 bar)



$Q = f(\Delta p)$  Flow rate - Pressure drop characteristic at the maximum compensator setting (15 bar)



$\Delta p = f(Q)$  Pressure drop - Flow rate characteristic (B → A) (Port Z pressurised)

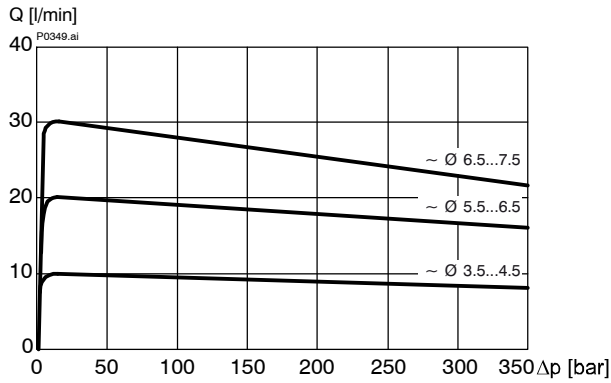


#### IMPORTANT!

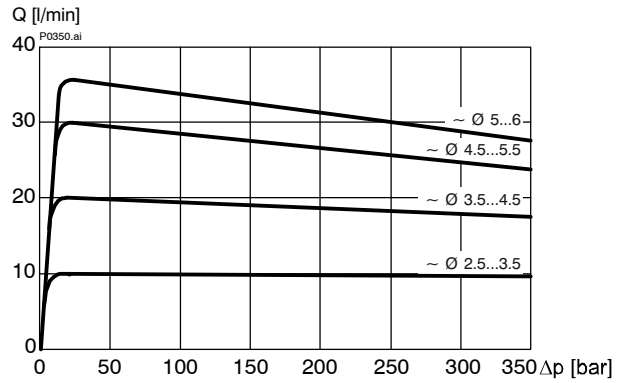
Special version (M527) with lower  $\Delta p$ -values can be supplied – please contact Bucher.

## 4.2 Fixed model

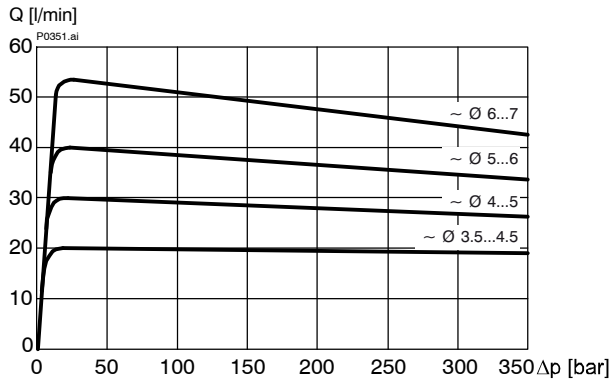
Q = f (Δp) Flow rate - Pressure drop characteristic  
at the fixed compensator setting (1 bar)



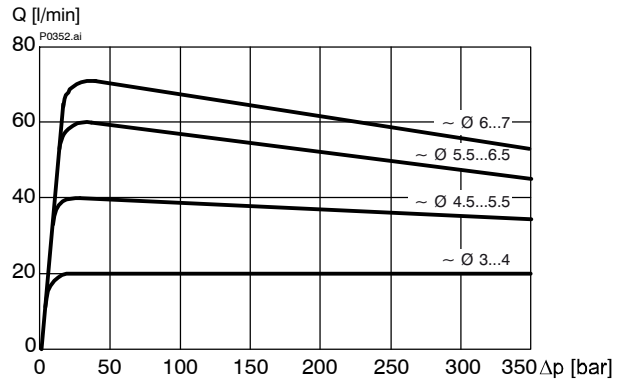
Q = f (Δp) Flow rate - Pressure drop characteristic  
at the fixed compensator setting (4 bar)



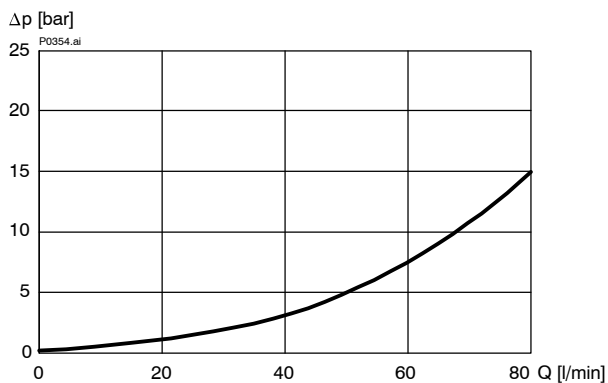
Q = f (Δp) Flow rate - Pressure drop characteristic  
at the fixed compensator setting (6 bar)



Q = f (Δp) Flow rate - Pressure drop characteristic  
at the fixed compensator setting (8 bar)



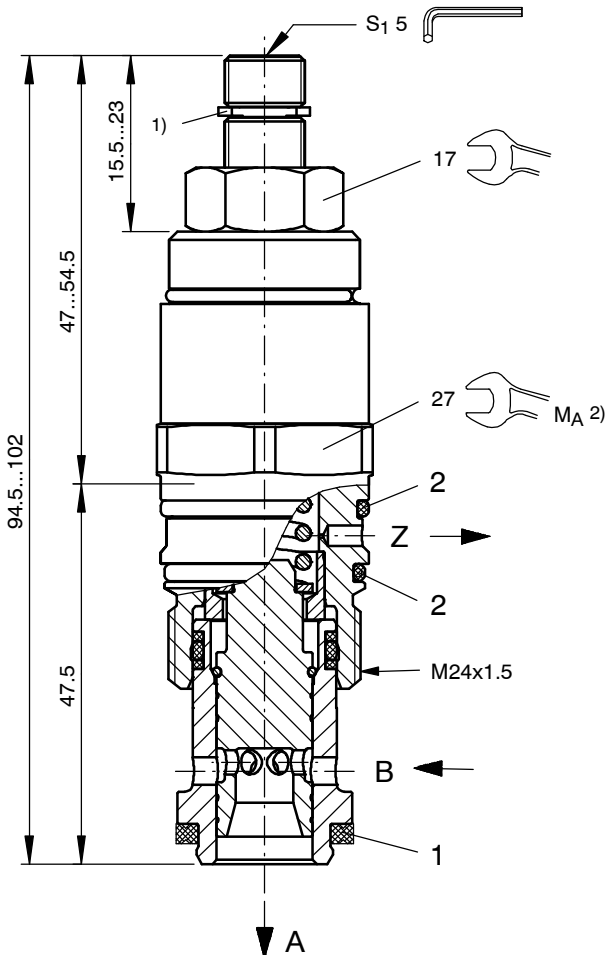
Δp = f (Q) Pressure drop - Flow rate characteristic (B → A)  
(Port Z pressurised)



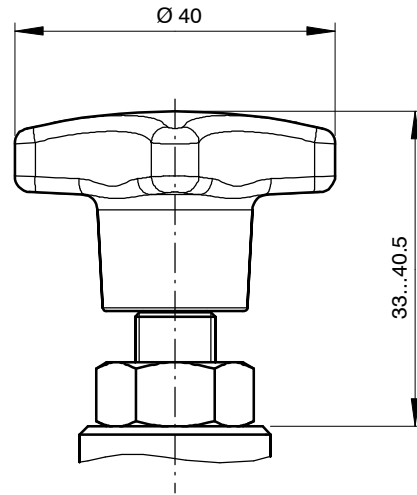
## 5 Dimensions & sectional view

### 5.1 Model with adjustable compensator spring

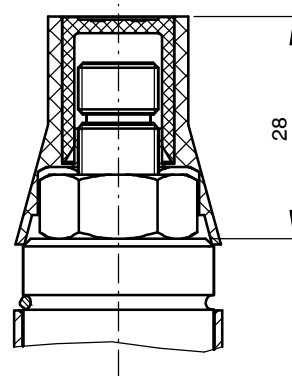
With adjusting screw "S"



With hand-knob adjuster "H"



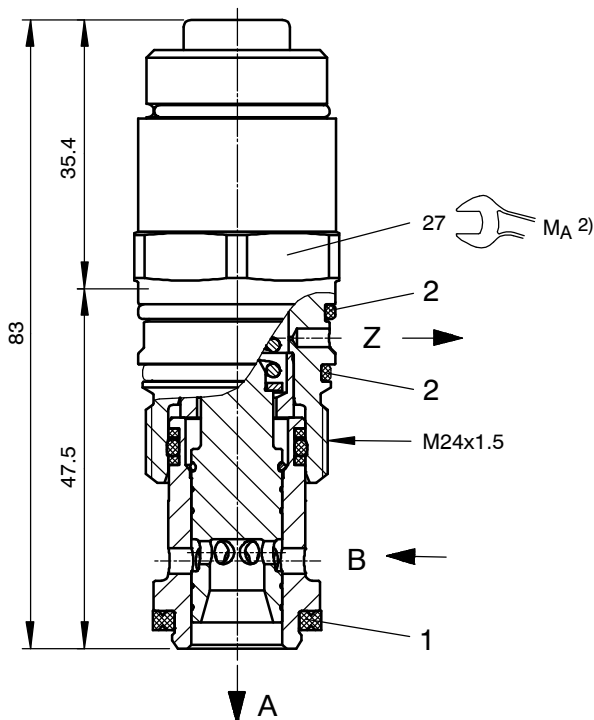
Adjusting screw with tamper-proof cap  
(order separately in plain language)



Tightening torque  $M_A^{2)}$   $\pm 10\%$

Cavity type	DD
When fitted in steel	65 [Nm]
When fitted in aluminium	50 [Nm]

## 5.2 Model with fixed spring



Tightening torque  $M_A^{2)} \pm 10\%$

Cavity type	DD
When fitted in steel	65 [Nm]
When fitted in aluminium	50 [Nm]

## 6 Installation information



### IMPORTANT!

When fitting the cartridges, use the specified tightening torque. Set the required control  $\Delta p$  (5...15 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 <sup>1)</sup> has to be removed. Subsequent adjustment is only possible by destroying the tamper-proof cap.

Seal kit NBR no. DS-288-N <sup>3)</sup>

Item	Qty.	Description
1	1	O-ring $\varnothing 22.10 / 16.50 \times 2.50$
2	2	O-ring no. 020 $\varnothing 21.95 \times 1.78$ N90



### IMPORTANT!

<sup>3)</sup> Seal kit with FKM (Viton) seals, no. DS-288-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.

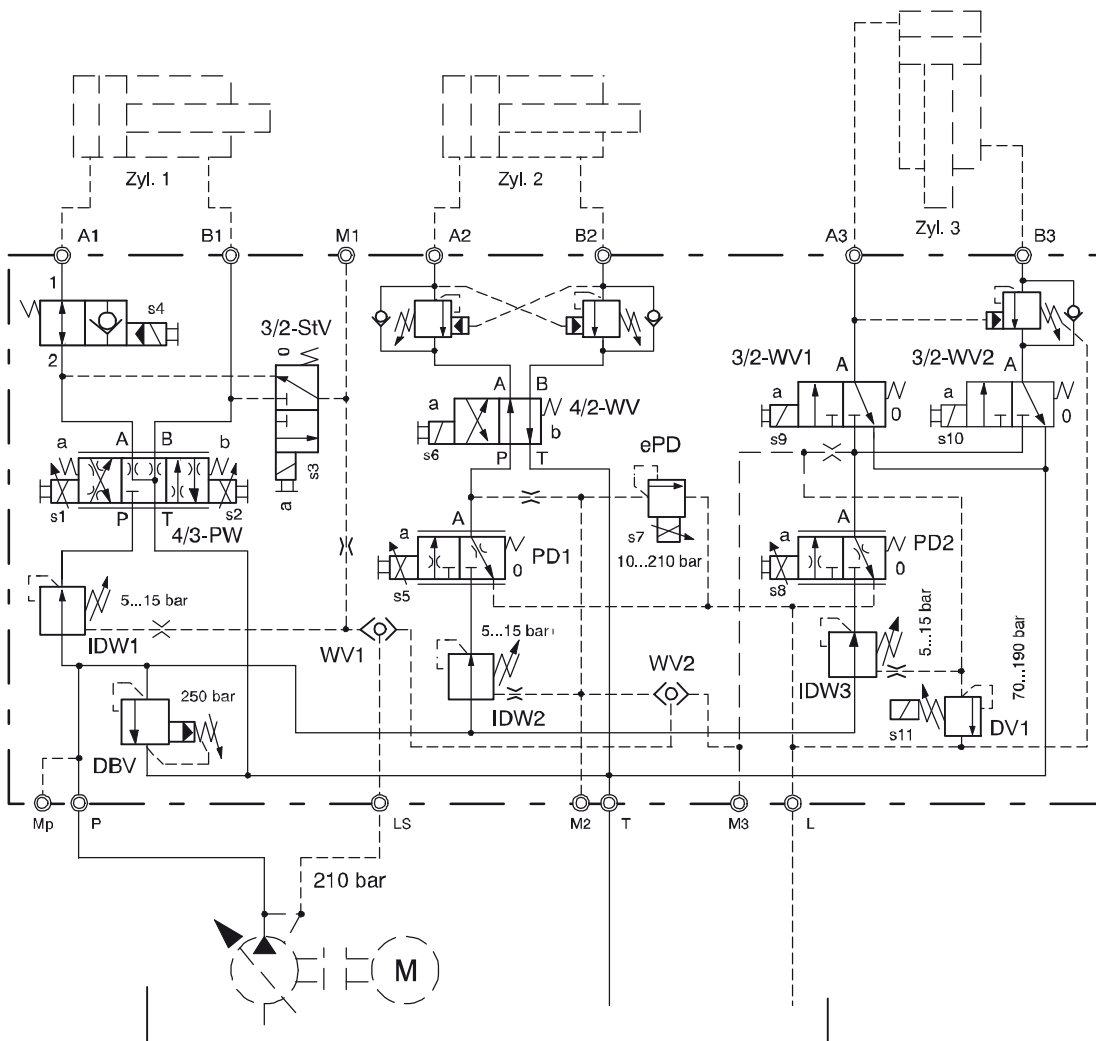
The direction and speed of cylinder 1 is determined by the 4/3 proportional directional valve (4/3-PW), which has meter-in and meter-out throttling.

The inline compensator (IDW1) ensures that there is 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.

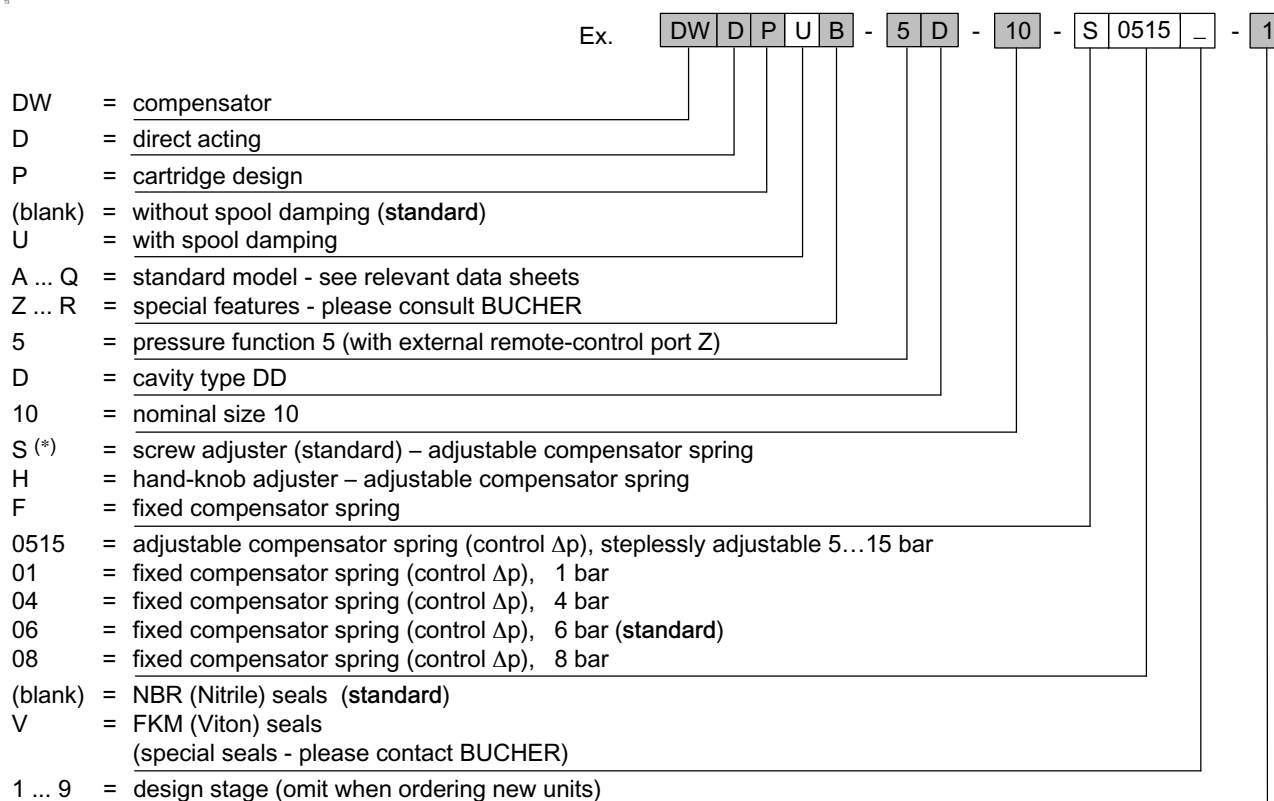
The speed of cylinder 2 (Zyl. 2) is independent of the load, and it is determined by the ventable proportional throttle (PD1) and the inline compensator (IDW2).

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-060121	(i-45.2)	Cavity type DD
400-P-740111	(G-24.21)	Line- and manifold-mounting body, type DDY-12 (G 1/2")
400-P-335501	(D-30.55)	Sandwich pressure-relief valve, size 6, type SDWDPB-2D...
400-P-336501	(D-31.55)	Sandwich pressure-relief valve, size 10, type SDWDPB-2D...

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