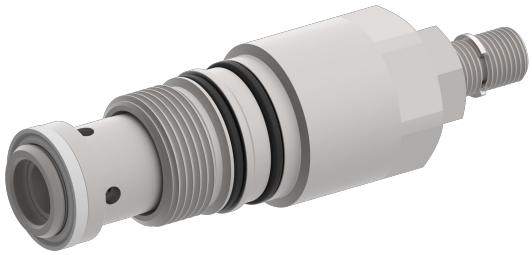
Pressure valve
Inline Compensator

Q_{max} = 21 gpm, p_{max} = 5000 psi
direct acting, spool type, hydraulically operated
Type series: DWDPB-5D-10-...

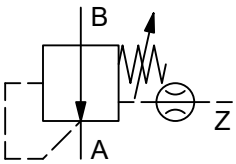


- Screw-in cartridge valve
- For cavity DD
- All external parts with zinc-nickel plating according to DIN EN ISO 19598
- Installation in threaded port body type DD-12
- External remote-control port with integral damping orifice
- High flow rates
- Excellent stability over the whole pressure and flow range
- Available with hand-knob or tamper-proof cap
- Optionally with damped spool, for use with low load pressures (< 20 bar)

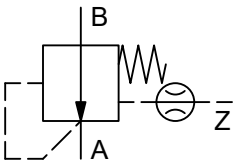
Description

These direct-acting inline pressure-compensator (hydrostat) cartridges, series DWDPB5D10..., are size 10, high performance screw-in valves with an M24×1.5 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 DWDPUB5D10... 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 optimization 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 tamperproof cap. All external parts of the valves are zinc-nickel plated and are thus suitable for use in the harshest operating environments. These valves are used in hydraulic circuits in mobile and industrial applications, predominantly in conjunction with a throttle cartridge. For self-assembly, please refer to the section related data sheets.

Symbol



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



DWDPB-5D-10-F...

Technical data

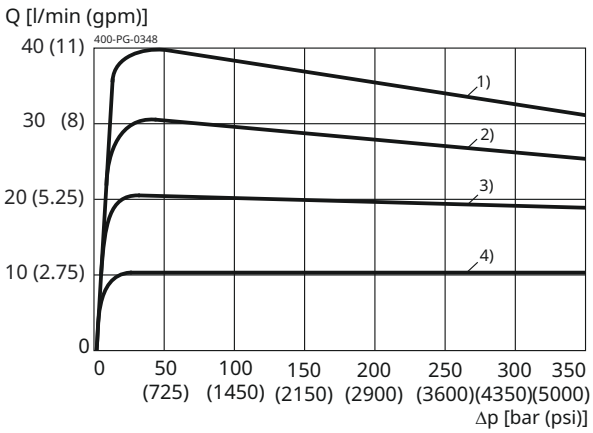
General characteristics	Description, value, unit
Function group	Pressure valve
Function	Inline Compensator
Design	Screw-in cartridge valve
Controls	hydraulically operated
Characteristic	direct acting, spool type
Construction size	NG 10
Thread size	M24×1,5
Mounting attitude	unrestricted
Weight	0.55 lb
Cavity acc. factory standard	For cavity DD
Tightening torque steel	48 ft·lb
Tightening torque aluminium	37 ft·lb
Tightening torque tolerance	± 10 %
Minimum ambient temperature	- 22 °F
Maximum ambient temperature	+ 176 °F
Surface protection	All external parts with zinc-nickel plating according to DIN EN ISO 19598
Sealing material	see ordering code
Seal kit order number	NBR: DS-288-N / FKM: DS-288-V

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	5000 psi
Maximum flow rate	21 gpm
Flow direction	see symbol
Hydraulic fluid	HL and HLP mineral oil according to DIN 51 524; other fluids on request!
Minimum fluid temperature	- 22 °F
Maximum fluid temperature	+ 176 °F
Viscosity range	10 ... 650 mm^2/s (cSt)
Recommended viscosity range	15 ... 250 mm^2/s (cSt)
Minimum fluid cleanliness (cleanlineless class according to ISO 4406:1999)	class 20/18/15
Pressure adjustment range	70...215 bar (1 turn ≈ 26 psi)

Performance graphs

Q = f (Δp) Flow rate-pressure drop

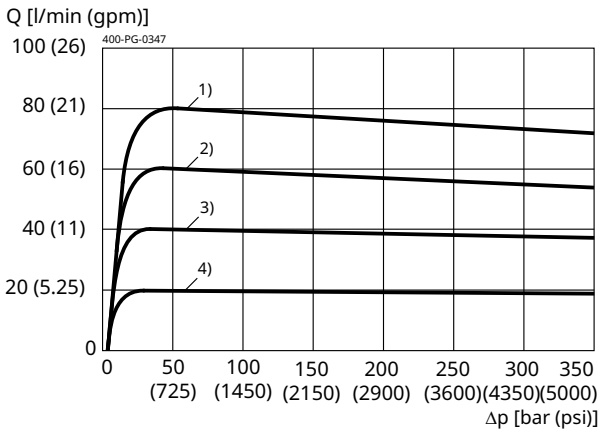
Adjustable model



At the minimum compensator setting [5 bar (70 psi)]
1) ~ Ø5...6 mm (.20... .24 in)
2) ~ Ø 4.5...5.5 mm (.18... .22 in)
3) ~ Ø 3.5...4.5 mm (.14... .18 in)
4) ~ Ø 2.5...3.5 mm (.10... .14 in)

Q = f (Δp) Flow rate-pressure drop

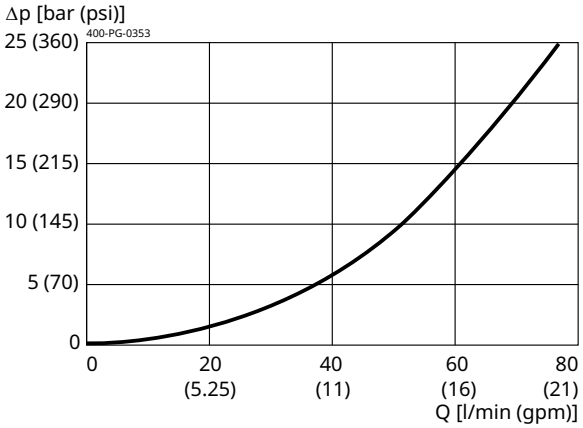
Adjustable model



At the minimum compensator setting [15 bar (215)]
1) ~ Ø 5.5...6.5 mm (.22... .26 in)
2) ~ Ø 4.5...5.5 mm (.18... .22 in)
3) ~ Ø 3.5...4.5 mm (.14... .18 in)
4) ~ Ø 2.5...3.5 mm (.10... .14 in)

Δp = f (Q) Pressure drop-flow rate characteristic

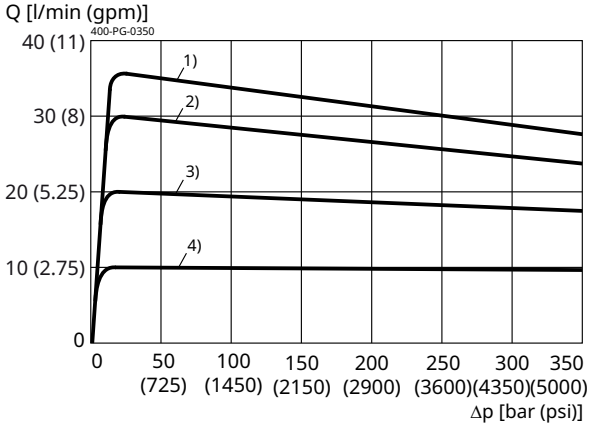
Adjustable model



Port Z pressurized

Q = f (Δp) Flow rate-pressure drop

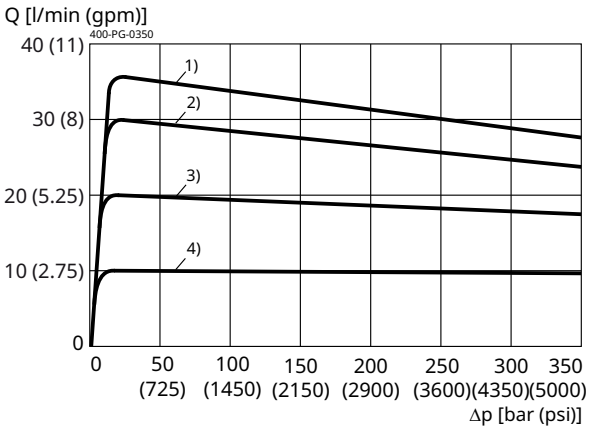
Fixed model



At the fixed compensator setting [4 bar (60 psi)]
1) ~ Ø5...6 mm (.20... .24 in)
2) ~ Ø 4.5...5.5 mm (.18... .22 in)
3) ~ Ø 3.5...4.5 mm (.14... .18 in)
4) ~ Ø 2.5...3.5 mm (.10... .14 in)

Q = f (Δp) Flow rate-pressure drop

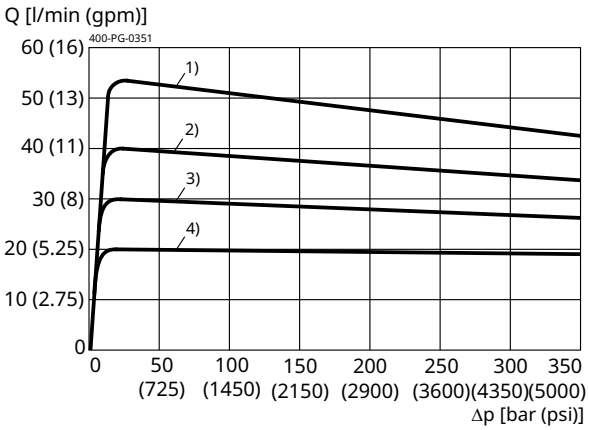
Fixed model



At the fixed compensator setting [4 bar (60 psi)]
1) ~ Ø5...6 mm (.20... .24 in)
2) ~ Ø 4.5...5.5 mm (.18... .22 in)
3) ~ Ø 3.5...4.5 mm (.14... .18 in)
4) ~ Ø 2.5...3.5 mm (.10... .14 in)

Q = f (Δp) Flow rate-pressure drop

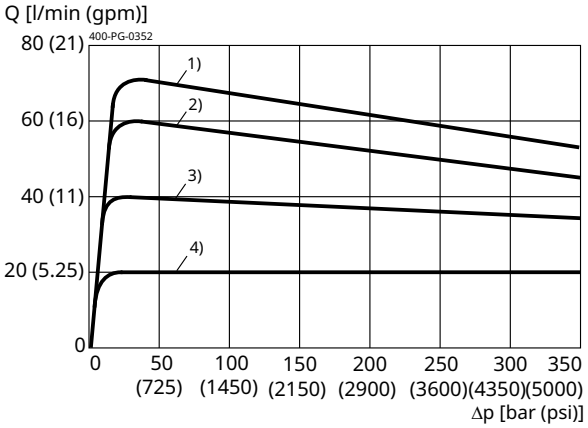
Fixed model



At the fixed compensator setting [6 bar (85 psi)]
1) ~ Ø 6...7 mm (.24... .28 in)
2) ~ Ø 5...6 mm (.20... .24 in)
3) ~ Ø 4...5 mm (.16... .20 in)
4) ~ Ø 3.5...4.5 mm (.14... .18 in)

Q = f (Δp) Flow rate-pressure drop

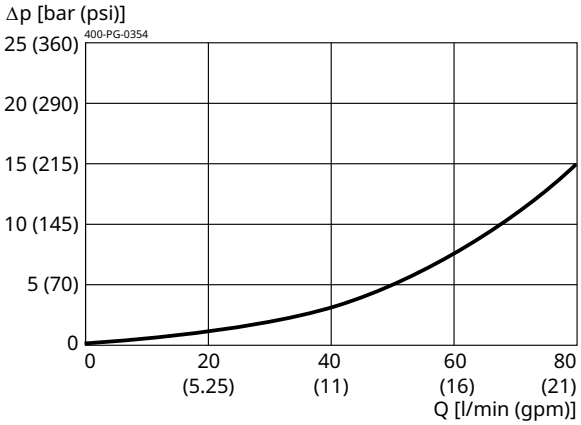
Fixed model



At the fixed compensator setting [8 bar (115 psi)]
1) ~ Ø 6...7 mm (.24... .28 in)
2) ~ Ø 5.5...6.5 mm (.22... .24 in)
3) ~ Ø 4.5...5.5 mm (.18... .22 in)
4) ~ Ø 3...4 mm (.13... .16 in)

Δp = f (Q) Pressure drop-flow rate characteristic

Fixed model

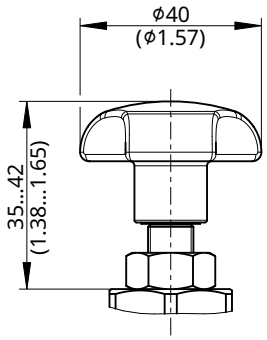


Port Z pressurized

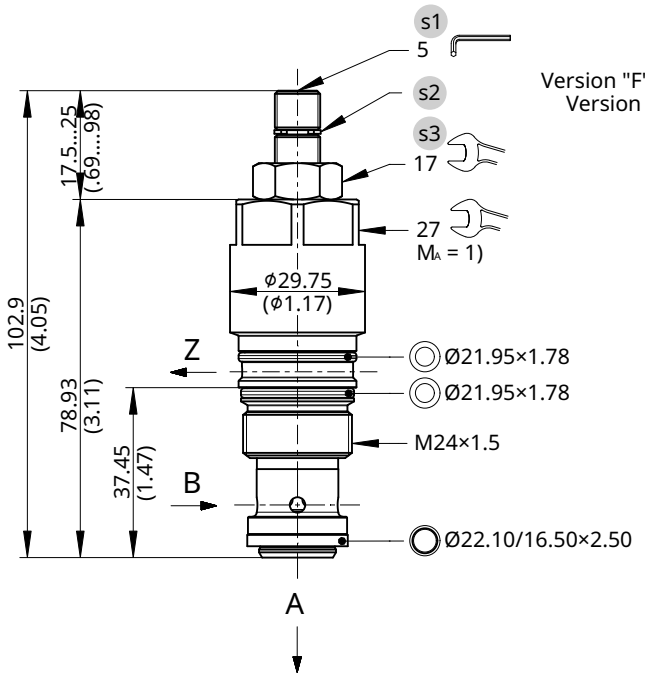
Dimensions and sectional view

Beispiel für die Masseinheit: Exampel for the dimensional units:		
0.79	= 0.79 mm	millimeter
(.031)	= 0.031"	inch

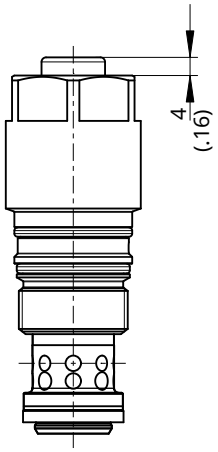
Version "H": Einstellschraube mit Handrad
Version "H": adjustment screw with handknob



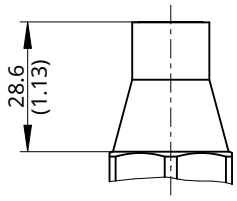
Version "S": Einstellschraube mit Innensechskant (Standard)
Version "S": adjustment screw with internal hexagon (standard)



Version "F": Keine Einstellschraube
Version "F": without handknob



Einstellschraube mit Sicherungskappe
adjustment screw with tamper-proof cap



Installation information

NOTE!
1) When fitting the screw-in cartridge valve, use the specified tightening torque. The value can be found in the chapter "Technical data".

NOTE!
Set the required pressure with the adjusting screw s1 . After you have set the valve, lock the adjusting screw s1 with the lock nut.

NOTE!
Valve settings can be sealed by fitting the tamper-proof cap. To fit the cap, the snap ring s2 has to be removed. Subsequent adjustment is only possible by destroying the tamper-proof cap.

NOTE!
The seals are not available individually. The seal kit order number can be found in the chapter "Technical data".

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.

Cirquit to Application example

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-compen sator cartridges.

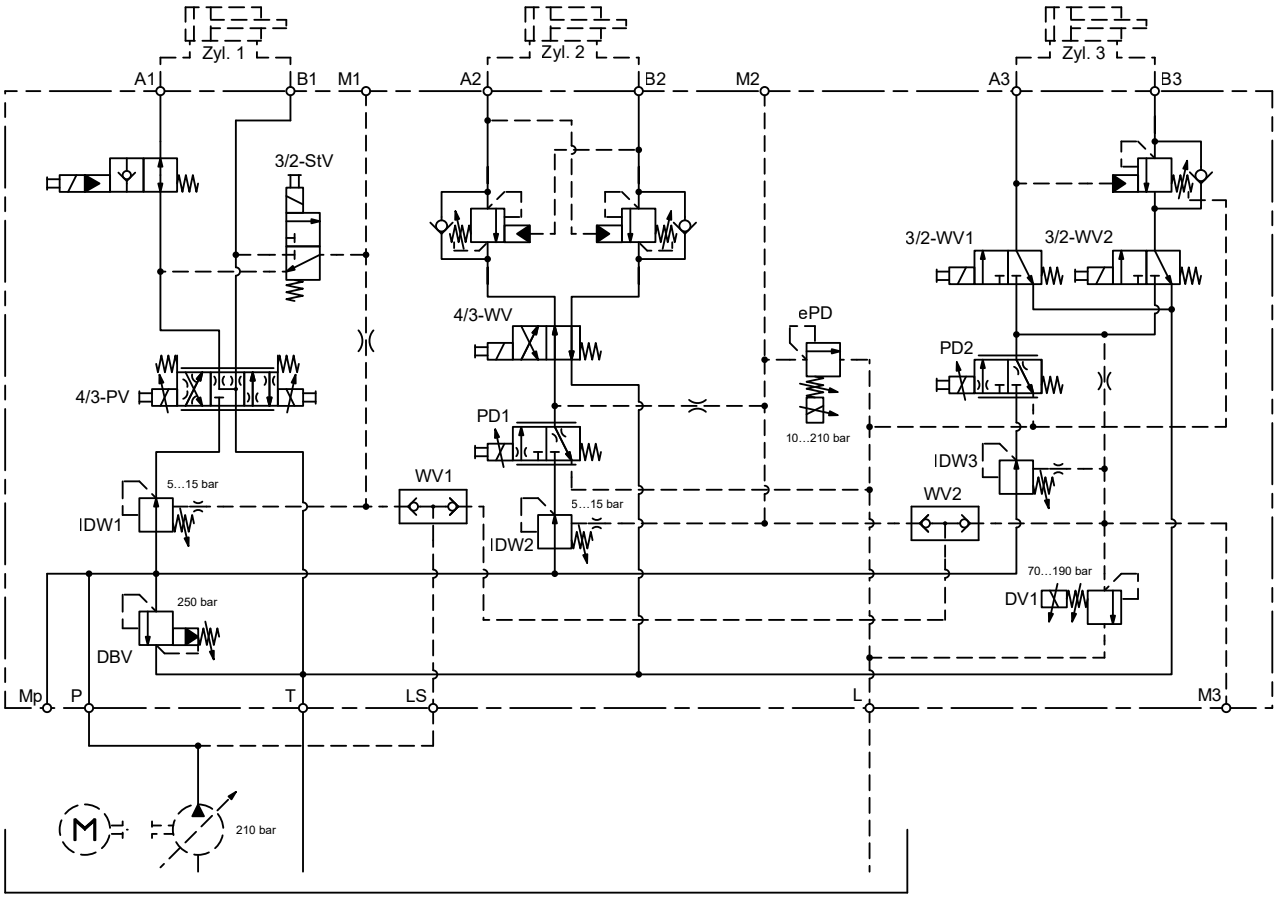
In this application all three actuators have to travel together, and it is therefore necessary to provide an inline compensa tor for each station.

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

The inline compensator (IDW1) ensures that there a con stant pressure drop across the proportional direc-tional 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 re spective cylinder supply line in each situation. The speed of cylinder 2 (Zyl. 2) is inde-pendent of the load, and it is determined by the vent-able proportional throttle (PD1) and the inline compensator (IDW2).

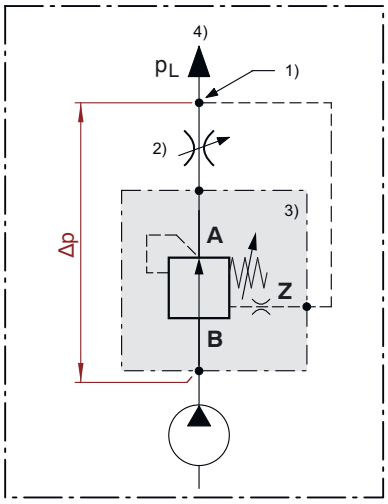
By placing a proportional pressure-relief valve (ePD) in the remote-control line for the compensator, we create a pro portional 2-way pressure-reducing func-tion. The direction of travel is determined by a 4/2 solenoid valve (4/2-WV) and the deceleration is controlled by the two counterbalance valves.

In the case of cylinder 3 (Zyl. 3), the ventable propor-tional 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 direc tion of travel (and fast-advance, slow speed). The counter balance valve, which is unaffected by back pressure, pre vents the cylinder from overrunning.



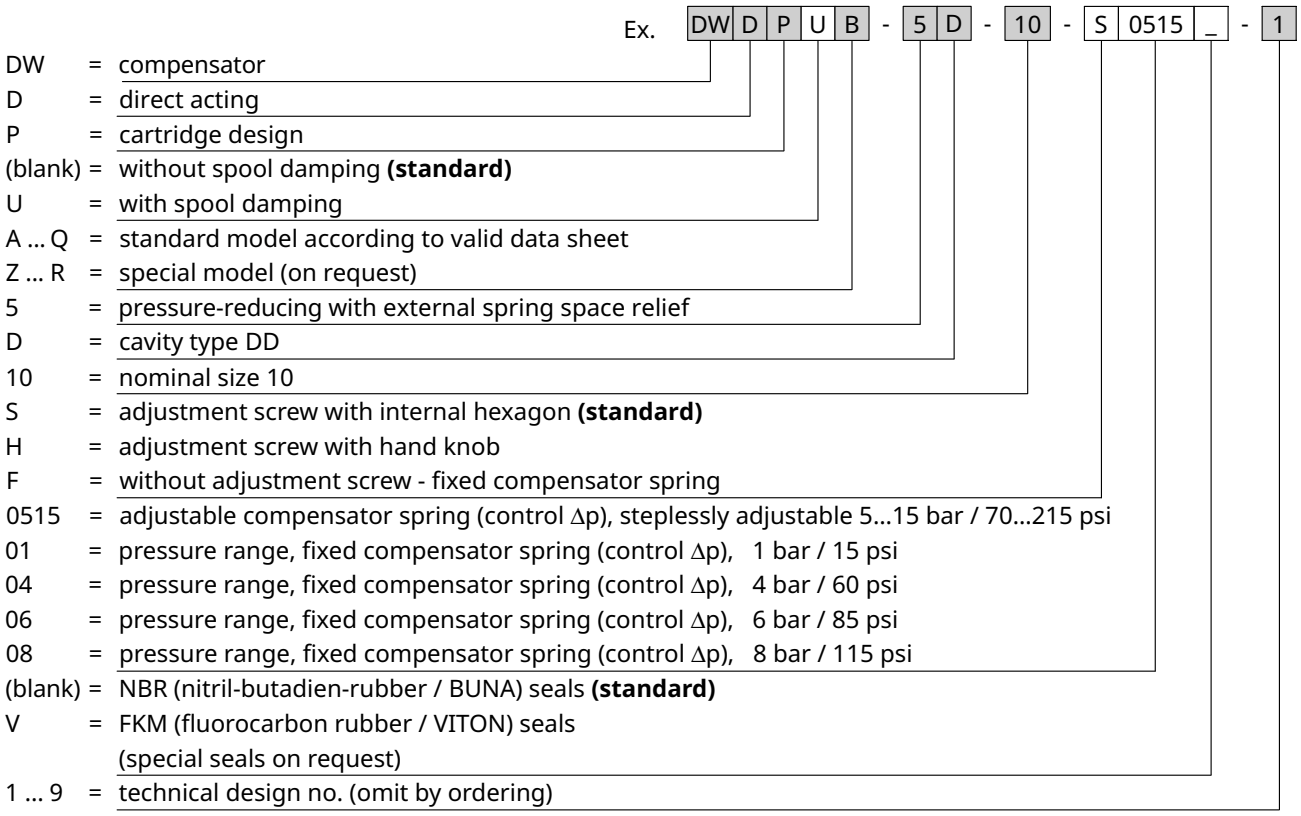
Option: spool locking (with hand-knob)

Test setup (for flow rate v. load pressure characteristic) 1) Load sensing immediately after orifice2) 2) Throttle function (orifice size, see performance graphs) 3) Bypass 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 2) must be as small as possible (short distance between the two components). This gives the best flow rate / load pressure values.

Ordering code



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

Related data sheets

Reference	Description
400-P-040011	Form tools
400-P-060121	Cavity DD
400-P-740112	Threaded port body DDY-12

info.ch@bucherhydraulics.com **www.bucherhydraulics.com**