

Bypass Compensator Cartridge, Size 10

$Q_{\max} = 140 \text{ l/min}$, $p_{\max} = 350 \text{ bar}$

Direct acting, compensator spring adjustable or fixed, optional spool-locking

Series DWDPB-2D...



- Compensator spring adjustable: from 7...15 bar
- Compensator spring fixed: 3, 5, 8, 10, 12 or 15 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
- With spool-locking option to allow application with variable- or fixed-displacement pumps
- 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 bypass pressure-compensator (hydrostat) cartridges, series DWDPB-2D...-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 (7 ... 15 bar) and six models with a fixed compensator spring (3, 5, 8, 10, 12 or 15 bar). In addition, a model with a lockable spool is available as an option. This enables the valve to be used in load-sensing systems with either variable-displacement pumps (closed center) or fixed-displacement pumps (open center). 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. 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. By fitting external pilot controls (pressure-relief valves or 2/2 unloading valves) in the line to the port Z, additional functions such as pressure relief or vented bypass from A → B can be produced. 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 according to DIN EN ISO 19 598 and are thus suitable for use in the harshest operating environments. For self-assembly, please refer to the section related data sheets.

2 Symbol



DWDPB-2D-10-...0715... DWDPB-2D-10-F...

3 Technical data

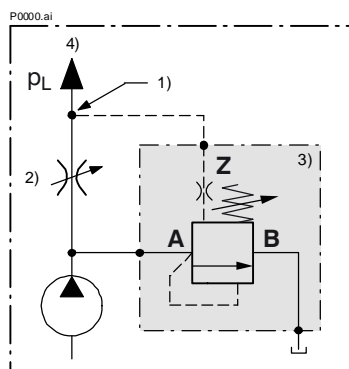
General characteristics	Description, value, unit
Designation	bypass pressure-compensator cartridge
Design	direct acting, compensator spring adjustable or fixed, optional spool-locking, external remote-control port Z with integral damping orifice
Mounting method	screw-in cartridge M24x1.5
Size	nominal 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 A → B	140 l/min
Maximum flow rate attainable at the actuator	See performance graphs
Pressure adjustment range	7...15 bar (1 turn ≈ 1.2 bar)
Flow direction	A → B, 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)

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) Bypass pressure-compensator cartridge
- 4) Actuator port (p_L = load pressure)



IMPORTANT!

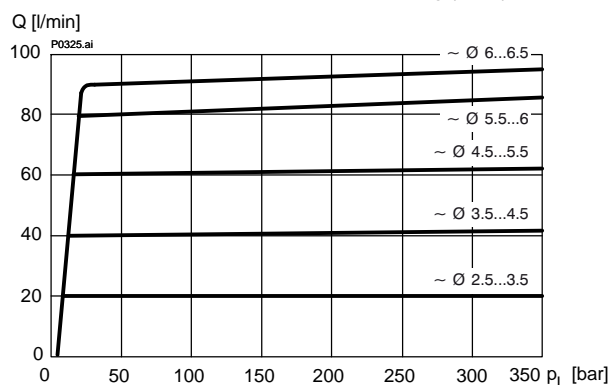
The load sensing and compensator inlet (port A) tapping points must be located **immediately after the throttle (orifice) and before it** respectively. This minimises the pressure drop and gives the best flow rate / load pressure values.



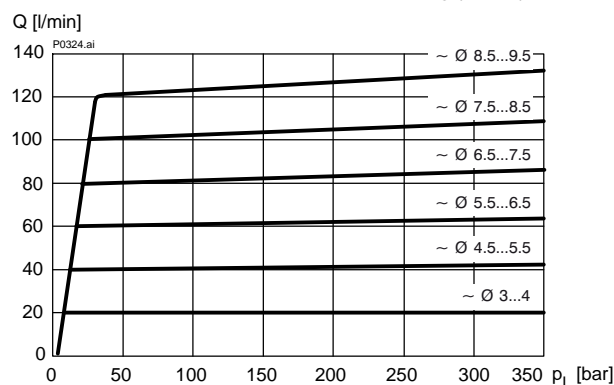
IMPORTANT!

All characteristics were recorded with a **surplus flow of 10...15 l/min.**

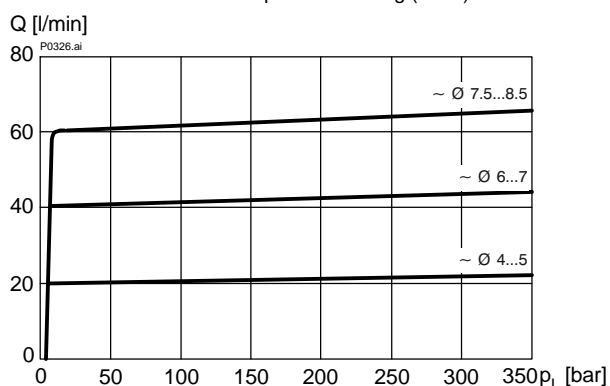
$Q = f(p_L)$ Flow rate v. load pressure characteristic at the minimum compensator setting (7 bar)



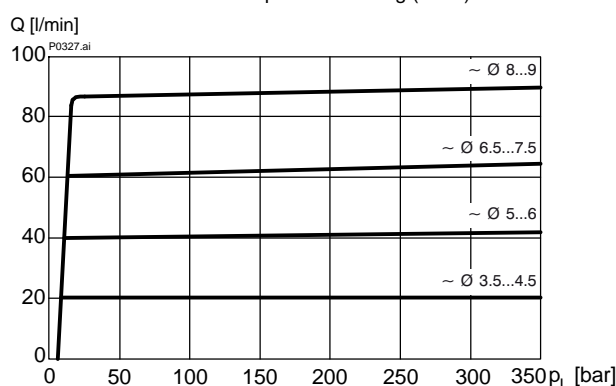
$Q = f(p_L)$ Flow rate v. load pressure characteristic at the maximum compensator setting (15 bar)



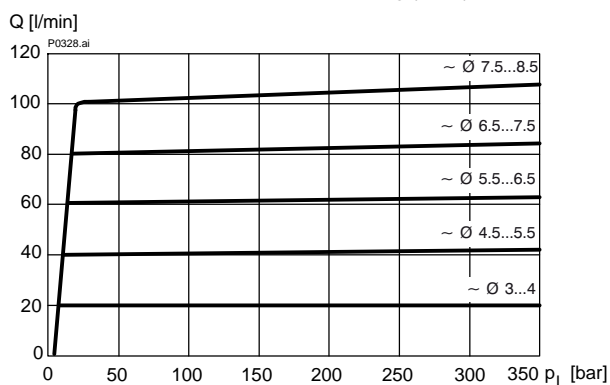
$Q = f(p_L)$ Flow rate v. load pressure characteristic at the fixed compensator setting (3 bar)



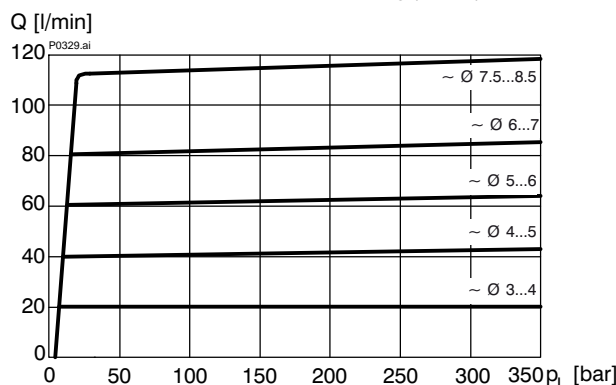
$Q = f(p_L)$ Flow rate v. load pressure characteristic at the fixed compensator setting (5 bar)



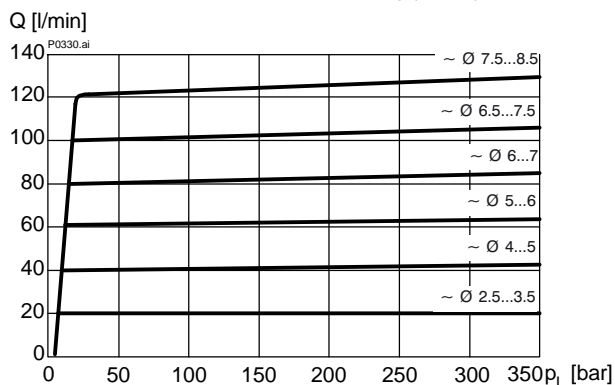
$Q = f(p_L)$ Flow rate v. load pressure characteristic at the fixed compensator setting (8 bar)



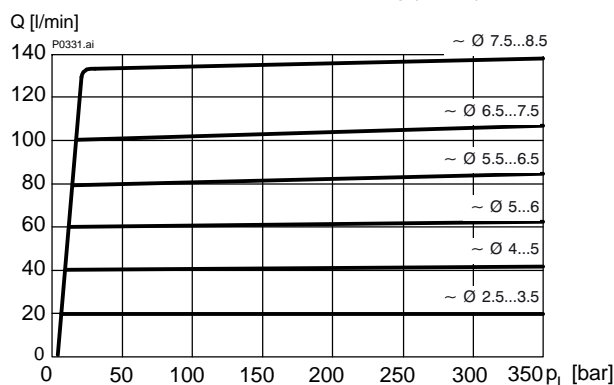
$Q = f(p_L)$ Flow rate v. load pressure characteristic at the fixed compensator setting (10 bar)



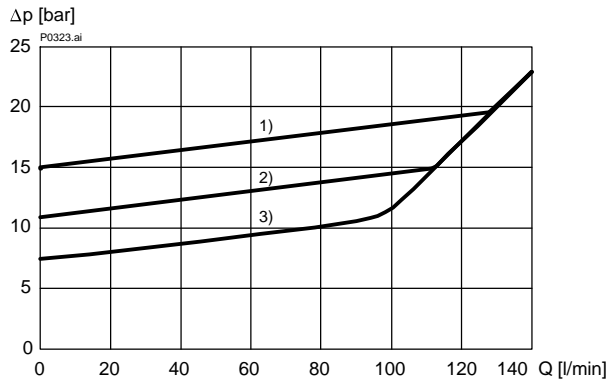
$Q = f(p_L)$ Flow rate v. load pressure characteristic at the fixed compensator setting (12 bar)



$Q = f(p_L)$ Flow rate v. load pressure characteristic at the fixed compensator setting (15 bar)

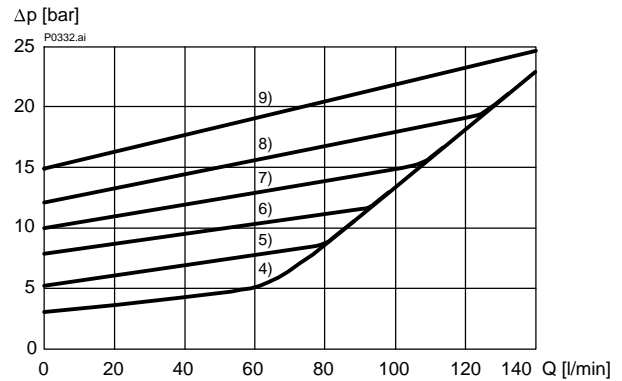


$\Delta p = f(Q)$ Pressure-drop characteristic (control Δp , A→B)
(port Z completely unloaded)



- 1) 15 bar control Δp setting (maximum value)
- 2) 11 bar control Δp setting (mid-range value)
- 3) 7 bar control Δp setting (minimum value)

$\Delta p = f(Q)$ Pressure-drop characteristic (control Δp , A→B)
(port Z completely unloaded)

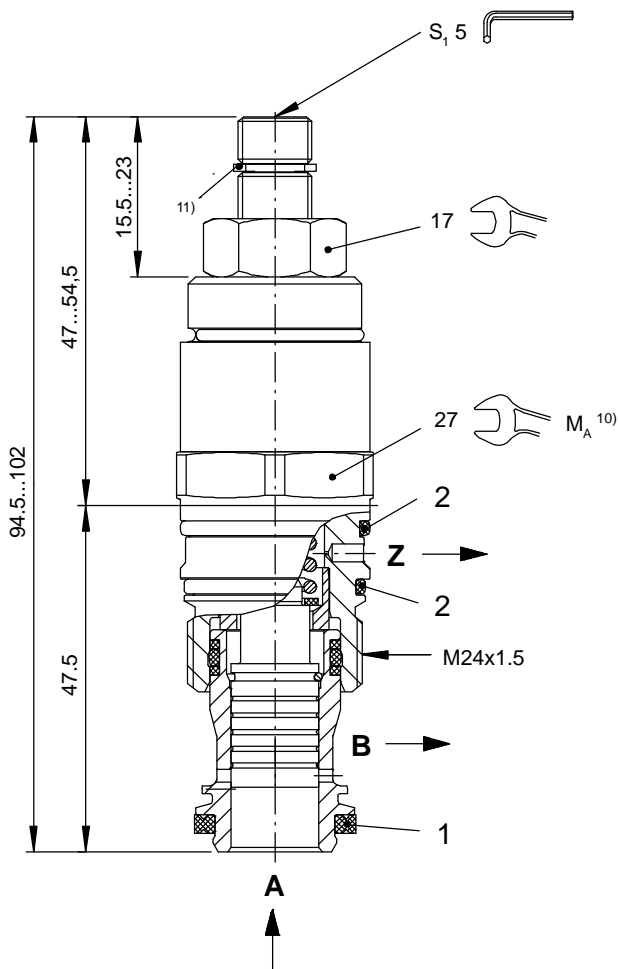


- 4) 3 bar control Δp fixed
- 5) 5 bar control Δp fixed
- 6) 8 bar control Δp fixed
- 7) 10 bar control Δp fixed
- 8) 12 bar control Δp fixed
- 9) 15 bar control Δp fixed

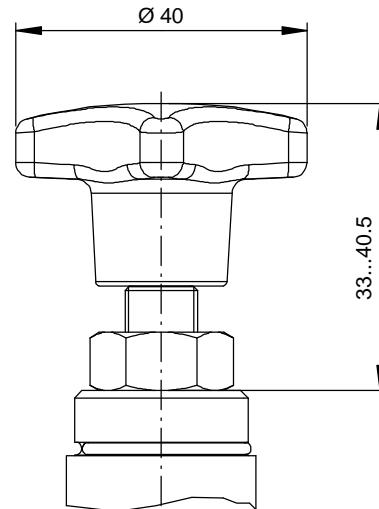
5 Dimensions & sectional view

5.1 Model with adjustable compensator spring

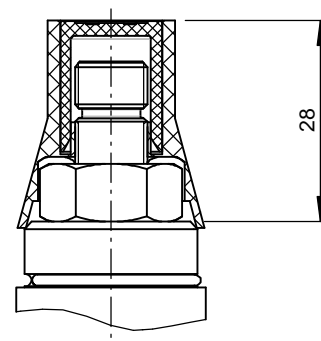
With adjusting screw "S"



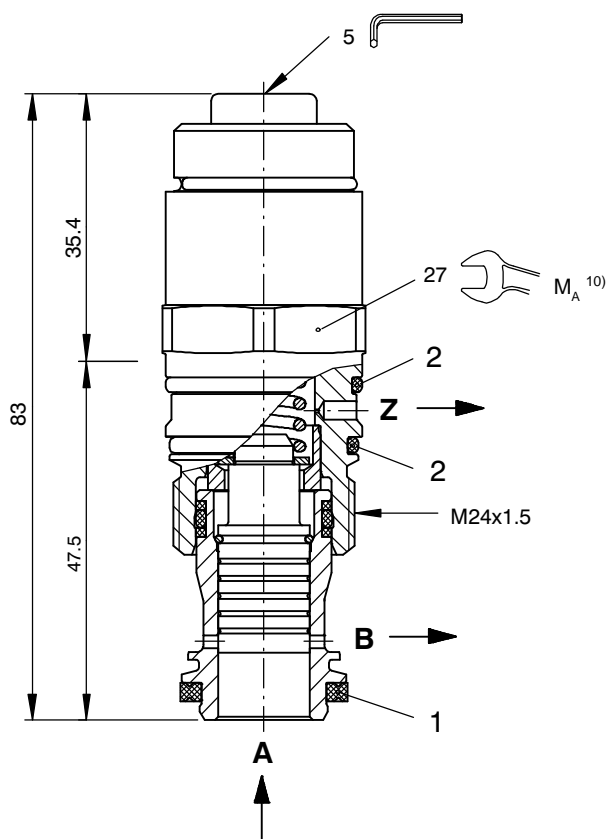
With hand-knob adjuster "H"



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

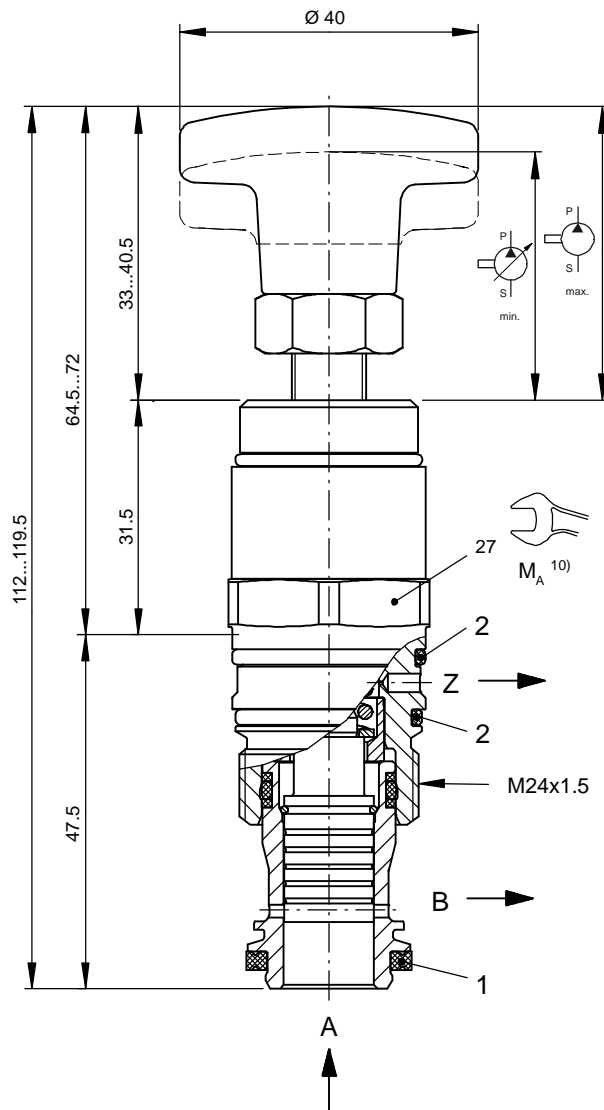


5.2 Model with fixed spring



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

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



5.3 With spool locking (optional)

6 Options

6.1 Spool locking (with hand-knob)

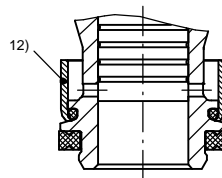
In a load-sensing system, the optional model featuring spool locking can be changed over to allow operation with either a fixed-displacement pump (open center) or a variable-displacement pump (closed center). For use with variable-displacement pumps, the spindle is screwed in fully. This locks the spool and closes the connection from A to B.



IMPORTANT!

Carry out the changeover only when the valve is unpressurised.


6.2 Model with steel ring





IMPORTANT!


For installation in aluminium bodies (manifold blocks), we recommend the model with the steel ring ¹²⁾.

7 Installation information

 **IMPORTANT!**
When fitting the cartridges, use the specified tightening torque. Set the required control Δp (7...15 bar) with the adjusting screw (s₁ 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.

 For installation in aluminium bodies (manifold blocks), we recommend the model with the steel ring ¹²⁾. (see options in Section 6.2)

 **IMPORTANT!**
Valve settings can be sealed by fitting the tamper-proof cap. To fit the cap, the snap ring ¹¹⁾ has to be removed. Subsequent adjustment is only possible by destroying the tamper-proof cap.

Seal kit NBR no. DS-288-N ⁹⁾

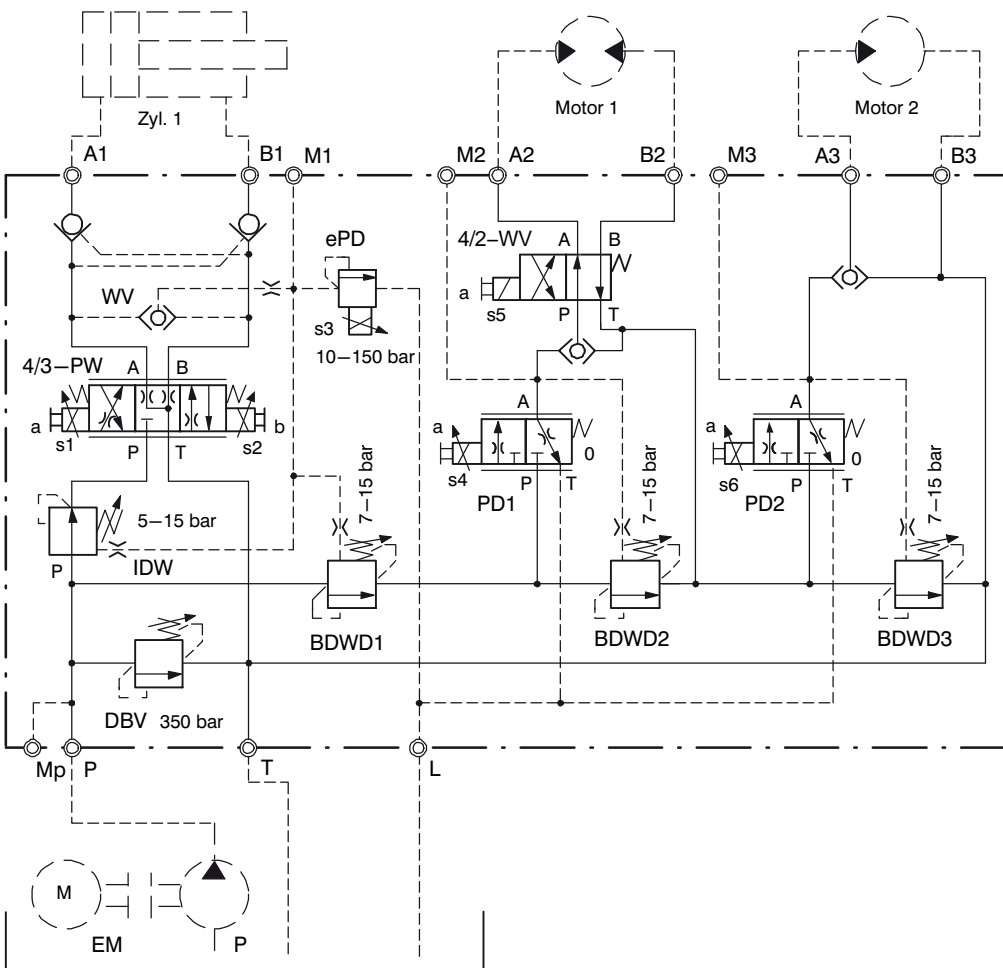
Item	Qty.	Description
1	1	O-ring \varnothing 22.10 / 16.50 x 2.50
2	2	O-ring no. 020 \varnothing 21.95 x 1.78 N90

 **IMPORTANT!**
⁹⁾ Seal kit with FKM (Viton) seals, no. DS-288-V

8 Application examples

The following diagram shows a typical manifold block that uses our direct acting, bypass pressure-compensator cartridges. Because the port can be pressurised by the returning oil, priority and series circuits can be constructed. If the direct acting bypass compensator (BDWD1) does not receive a load signal from the shuttle valve (WV), it forwards the oil flow to the next actuator with a pressure drop that, at its maximum, is equal to the control Δp (7...15 bar) that has been set or the fixed compensator spring rating that was chosen. If the 4/3 proportional directional valve (4/3-PW) is now operated, the inline compensator (IDW) ensures load-independent travel at a speed that is determined by the 4/3 proportional directional valve. A maximum pressure can be set with the proportional pressure-relief pilot valve (ePD). The direct acting bypass compensator (BDWD1) ensures that the 4/3 proportional directional valve (4/3-PW) is

supplied with the oil flow rate that it requires, regardless of the other actuators. The surplus flow is made available to the other actuators. If the ventable proportional throttles (PD1 and PD2) are not operated, the flow is routed to tank through the bypass compensators (BDWD2 and BDWD3). If the proportional throttles (PD1 and/or PD2) are activated, the hydraulic motors (Motor 1 and/or Motor 2) rotate at speeds that are independent of their loads. The speed is determined by the respective proportional throttle. The direction of rotation of Motor 1 can be reversed by operating the 4/2 directional valve (4/2-WV). The hydraulic motors (Motor 1 and Motor 2) work in a series mode in which either or both can be switched on, and their speeds can be set individually at any required level and will be independent of load.



9 Ordering code

Ex.	DW	D	P	B	-	-	2	D	-	10	-	S	0715	-	-	1
DW	=	compensator														
D	=	direct acting														
P	=	cartridge design														
A ... Q	=	standard model - see relevant data sheets														
Z ... R	=	special features - please consult BUCHER														
(blank)	=	without steel ring (for use in steel body)														
S	=	with steel ring (for use in aluminium body)														
2	=	pressure function 2 (with external remote-control port Z)														
D	=	cavity type DD														
10	=	nominal size 10														
S (*)	=	screw adjuster (standard) – adjustable compensator spring														
H	=	hand-knob adjuster – adjustable compensator spring														
F	=	fixed compensator spring														
HA (**)	=	spool locking via hand-knob; service with variable- or fixed-displacement pumps														
0715	=	adjustable compensator spring (control Δp), steplessly adjustable 7...15 bar														
03	=	fixed compensator spring (control Δp), 3 bar														
05	=	fixed compensator spring (control Δp), 5 bar														
08	=	fixed compensator spring (control Δp), 8 bar														
10	=	fixed compensator spring (control Δp), 10 bar														
12	=	fixed compensator spring (control Δp), 12 bar														
15	=	fixed compensator spring (control Δp), 15 bar														
(blank)	=	NBR (Nitrile) seals (standard)														
V	=	FKM (Viton) seals (special seals - please contact BUCHER)														
1 ... 9	=	design stage (omit when ordering new units)														



IMPORTANT!

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

(**) Only with fixed compensator spring (control Δp), 10 bar or 12 bar.

10 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-335101	(D-30.12)	Sandwich pressure-relief valve, size 6, type SDWDPB-2D...
400-P-336101	(D-31.12)	Sandwich pressure-relief valve, size 10, type SDWDPB-2D...

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