2/2 Logic Cartridge Valve, Size 10

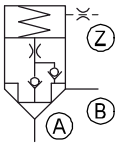
Q_{max} = 150 l/min, p_{max} = 420 bar
Passive Control, Seated Design
Series WL22SDLN…, WL22SDRN…, WL22SDPN…

- Passive control
- Area ratio 2 : 1
- Valve spool with 2 mm or 4 mm nose and notch
- High flow rates with low Δp
- Seat-valve shut-off from A → B and B → A
- Various opening pressures
- With integral orifice for pilot port
- All external parts zinc plated, chromited (CrVI-free)
- Can be fitted in a line-mounting body

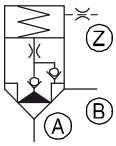
1 Description

Series WL22SDLN..., WL22SDRN..., and WL22SDPN passively controlled 2/2 logic valves are size 10, high performance screw-in cartridges with an M27 x 2 mounting thread. The conical-seat design ensures that the cartridges are leak-tight from A → B and from B → A. When the same pressure exists at ports A, B and Z, the valve spool is held in its closed position by the ≥ 2 bar compression spring. The A → B and B → A connection is opened or closed by relieving or closing the pilot port Z. When the Z port is vented (A → B and B → A connection open), there is a continuous discharge of pilot oil through the spool orifice, the flow rate being dependent on the Δp in A, B and Z. When port Z is closed, the check valves that are incorporated in the valve spool allows the pressure in Z to rise to the higher of the two pressures in A and B. The area ratio AZ : AA = 2 : 1 results in a net force on the valve spool, thus closing the A → B connection. If the same pressure exists at the A and B ports, closing port Z will still cause the valve spool to close, but only due to the ≥ 2 bar spring. The valve's opening and closing switching times can be influenced by using suitable orifices pairings (in the valve spool and in port Z) and spool nose length (2 mm or 4 mm). 2/2 logic cartridge valves can be used in both mobile and industrial applications. All external parts are zinc plated and chromited (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



WL22SDLN…,



WL22SDRN…, WL22SDPN…

3 Technical data

General characteristics	Description, value, unit
Designation	2/2 logic cartridge valve
Design	passively controlled, conical-seat type
Mounting method	screw-in cartridge M27 x 2
Tightening torque	150 Nm ± 10 %
Size	Nominal 10 mm, cavity type DJ
Weight	0.21 kg
Mounting attitude	unrestricted

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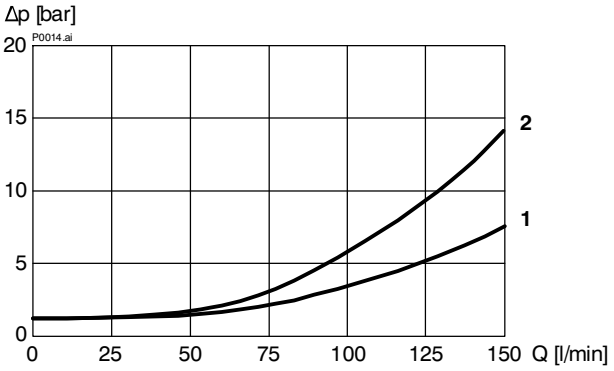
General characteristics	Description, value, unit
Ambient temperature range	-25 °C … +80 °C
Flow direction	A → B / B → A, see symbol

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	420 bar
Maximum flow rate	150 l/min
Pressure drop	< Δp = 5 bar at 100 l/min
Opening pressure - standard - optional	2.0 bar 0.4 / 1.0 / 3.0 / 6.0 / 7.5 / 13 bar
Hydraulic fluid	HL and HLP hydraulic oils to DIN 51 524; for other fluids, please consult 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 level Cleanliness class to ISO 4406: 1999	class 20/18/15

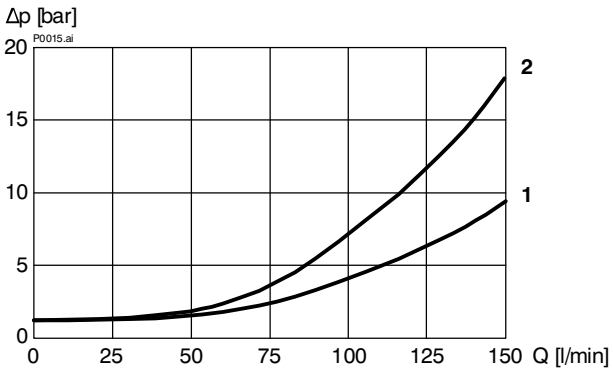
4 Performance graphs

measured with oil viscosity 33 mm^2/s (cSt)

Δp = f (Q) Pressure drop - Flow rate characteristic
- WL22SDLN… (no spool nose)
- WL22SDRN… (with spool nose, 2 mm notch)



Δp = f (Q) Pressure drop - Flow rate characteristic
- WL22SDPN... (with spool nose, 4 mm notch)

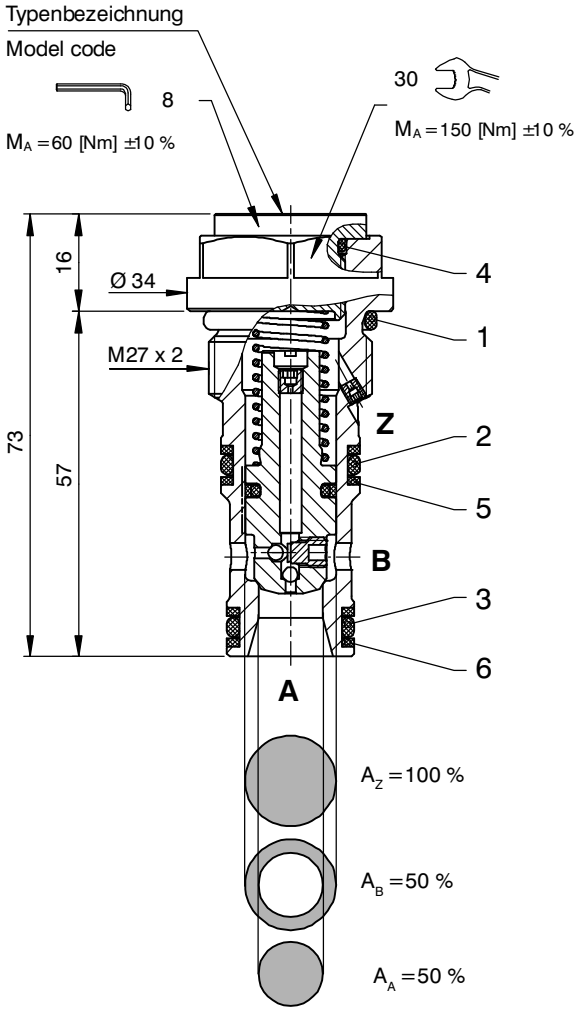


1 = Cavity type DJ **with annular groove**
2 = Cavity type DJ **without annular groove**

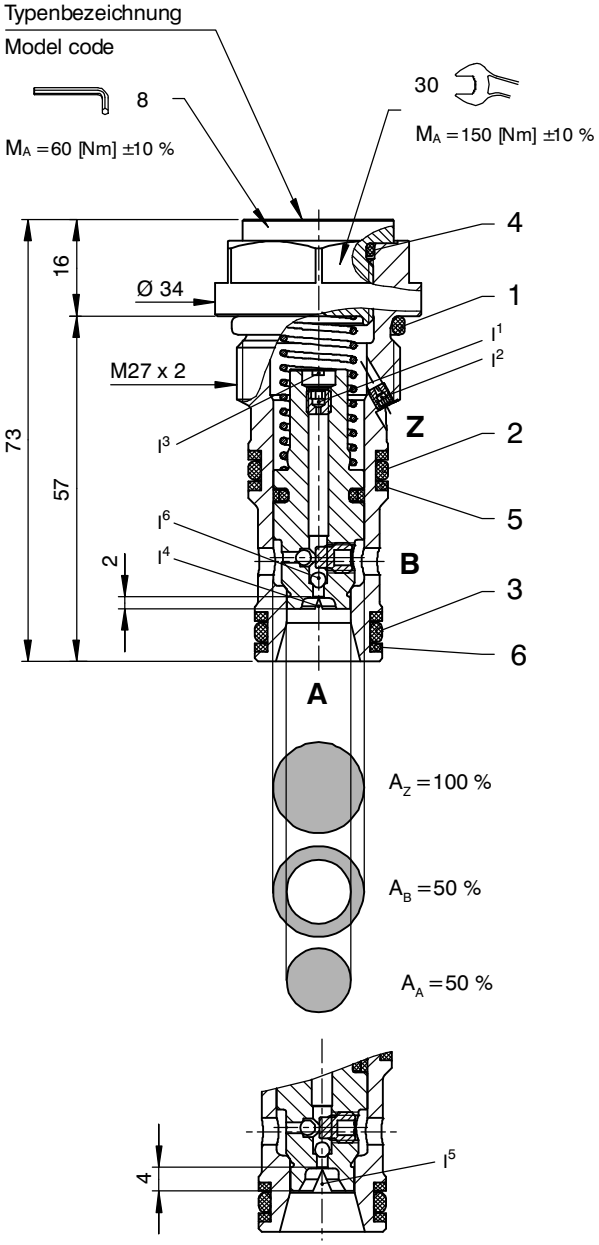
Attention:
The Δp characteristic is valid when the load pressure in the A → B / B → A connection is higher than the opening pressure. If the load pressure is lower than the opening pressure, the load pressure must first rise to overcome the opening pressure before flow can occur.

5 Dimensions, sectional view

Model with **no nose on the valve spool** (WL22SDLN…)

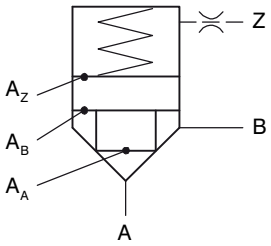


Model **with nose and notch on the valve spool**
- 2 mm nose (WL22SDRN…)
- 4 mm nose (WL22SDPN…)



I^1 = orifice in valve spool
I^2 = orifice in pilot port Z
I^3 = valve spool end with slot
I^4 = spool nose with 2 mm notch
I^5 = spool nose with 4 mm notch
I^6 = integral check valves

6 Area- and pressure-ratios



Area A_Z : Area A_A = 2 : 1
Area A_Z : Area A_B = 2 : 1
Area A_A : Area A_B = 1 : 1

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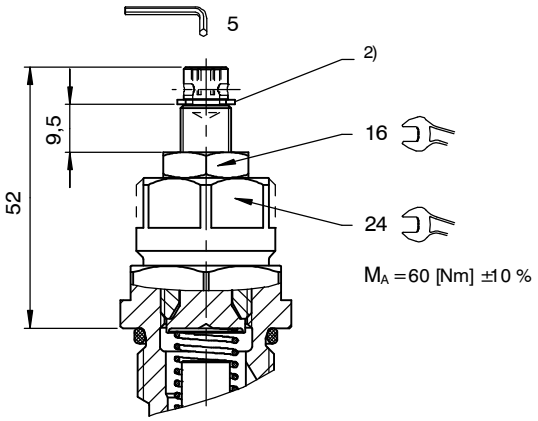
7 Adjuster types (optional)

Type **"E" adjuster** (WL22S...E2D...)

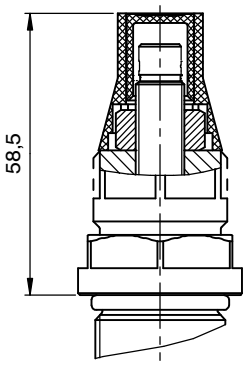
Important
Can be used to limit the opening stroke, for example, or to block the valve spool in the closed position.



2) Snap ring (remove for "P" model)

"E" adjuster with **"P" tamper-proof cap** (WL22S...P2D…)

Important:
Valve settings can be sealed by fitting the tamper-proof cap. To fit the cap, the **snap ring** 2) has to be removed. Subsequent adjustment is only possible by destroying the tamper-proof cap.



8 Installation information

Important:
No adjustments are necessary, since the cartridges are set in the factory.

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

NBR seal kit no. DS-296-N 1)

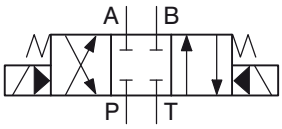
Item	Pcs.	Description
1	1	O-ring No. 119 ∅ 23.47 x 2.62 N90
2	1	O-ring No. 116 ∅ 18.72 x 2.62 N90
3	1	O-ring No. 114 ∅ 15.54 x 2.62 N90
4	1	O-ring No. 016 ∅ 15.60 x 1.78 N90
5	2	Backup ring ∅ 17.1 x 2.0 x 1.4 FI0751
6	2	Backup ring ∅ 15.3 x 2.0 x 1.4 FI0751

IMPORTANT!

1) Seal kit with FKM (Viton) seals, no. DS-296-V

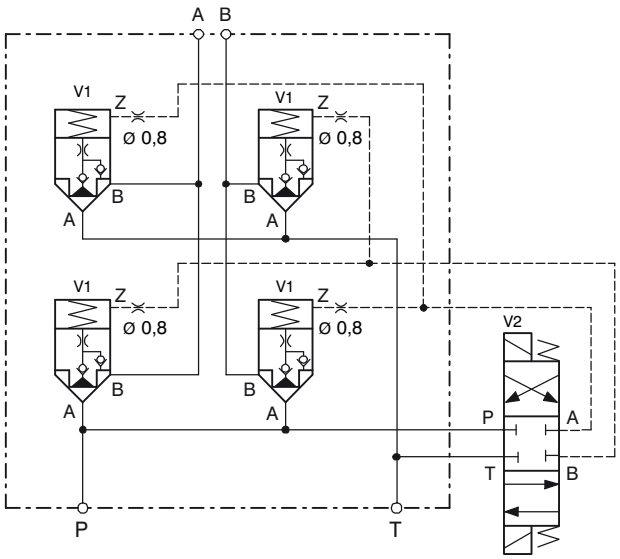
9 Application examples

Simplified symbol

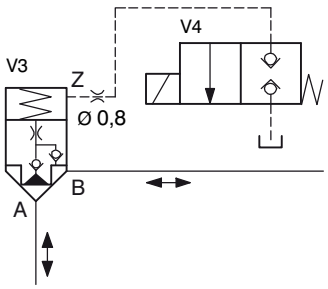


Simplified symbols

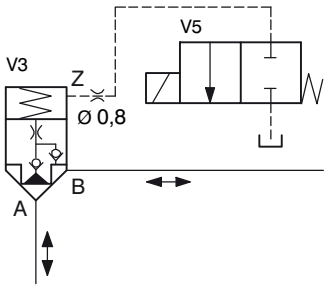
Application with 4/3 spool valve



Application with 2/2 seat valve



Application with 2/2 spool valve



Passively controlled
In the open condition (flow A → B / B → A), there is a continuous flow of pilot oil.

V1 = logic cartridge valve
V2 = 4/3 spool valve (pilot stage)

V3 = logic cartridge valve
V4 = 2/2 seat valve (pilot stage)
V5 = 2/2 spool valve (pilot stage)

10 Related data sheets

Reference no.	(Old no.)	Description
400-P-040011	(i-32)	The form-tool hire programme
400-P-060181	(i-45.11)	Cavity type DJ
400-P-740131	(G-24.31)	Line-mounting body, type GADJA (G 3/4”)

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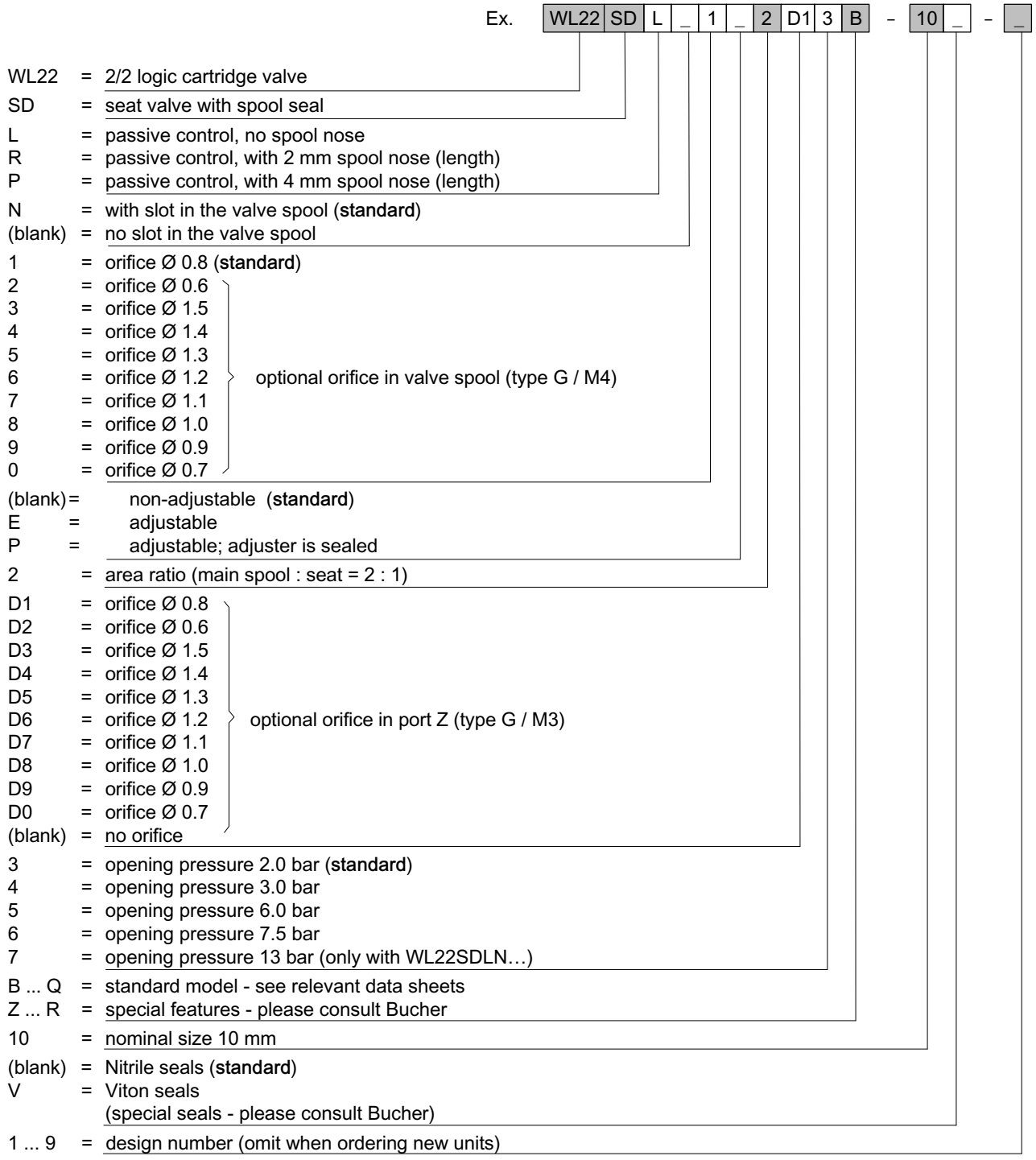
11 Ordering code



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Classification: 430.300.-.305.320.335