

## 2/2 Logic Cartridge Valve, Size 10

$Q_{\max} = 150 \text{ l/min}$ ,  $p_{\max} = 420 \text{ bar}$   
Active Control, Seated Design  
Series WL22SD...



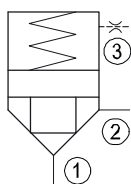
- Active control
- Area ratio 2 : 1
- High flow rates with low  $\Delta p$
- Seat-valve shut-off from A  $\rightarrow$  B and B  $\rightarrow$  A
- No pilot oil consumption at Z
- With or without seal on the seated valve spool
- Various opening pressures
- With integral orifice for pilot port
- All external parts zinc plated, chromited (CrVI-free)
- Can be fitted in a line-mounting body

### 1 Description

Series WL22SD... actively 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  $\rightarrow$  B and from B  $\rightarrow$  A. When the same pressure exists at ports A, B and Z, the valve spool is held in its closed position by the  $\geq 2 \text{ bar}$  compression spring. The A  $\rightarrow$  B and B  $\rightarrow$  A connection is opened or closed by relieving or pressurising the pilot port

Z, bearing in mind the corresponding area- and pressure-ratios. 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



WL22SD ...

### 3 Technical data

General characteristics	Description, value, unit
Designation	2/2 logic cartridge valve
Design	actively controlled, conical-seat type
Mounting method	screw-in cartridge M27 x 2
Tightening torque	150 Nm $\pm$ 10 %
Size	nominal 10 mm, cavity type DJ
Weight	0.21 kg
Mounting attitude	unrestricted
Ambient temperature range	-25 °C ... +80 °C
Flow direction	A $\rightarrow$ B / B $\rightarrow$ A, see symbol

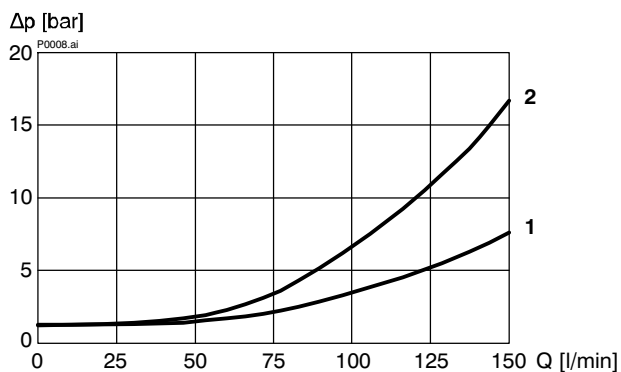
Hydraulic characteristics	Description, value, unit
Maximum operating pressure	420 bar
Maximum flow rate	150 l/min
Pressure drop	$\Delta p < 5$ bar at 100 l/min
Opening pressure: - standard - optional	2.0 bar 0.4 <sup>1)</sup> / 1.0 <sup>1)</sup> / 3.0 / 6.0 / 7.5 / 13 bar
Hydraulic fluid	HL and HLP hydraulic oils to DIN 51 524; for other fluids, please consult Bucher
Hydraulic fluid temperature range	-25 °C ... +80 °C
Viscosity range	10 ... 650 mm <sup>2</sup> /s (cSt), recommended 15...250 mm <sup>2</sup> /s (cSt)
Minimum fluid cleanliness level Cleanliness class to ISO 4406: 1999	class 20/18/15

1) only recommended for use when the seated valve spool is not fitted with a seal.

## 4 Performance graphs

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

$\Delta p = f(Q)$  Pressure drop - Flow rate characteristic



1 = cavity type DJ with annular groove

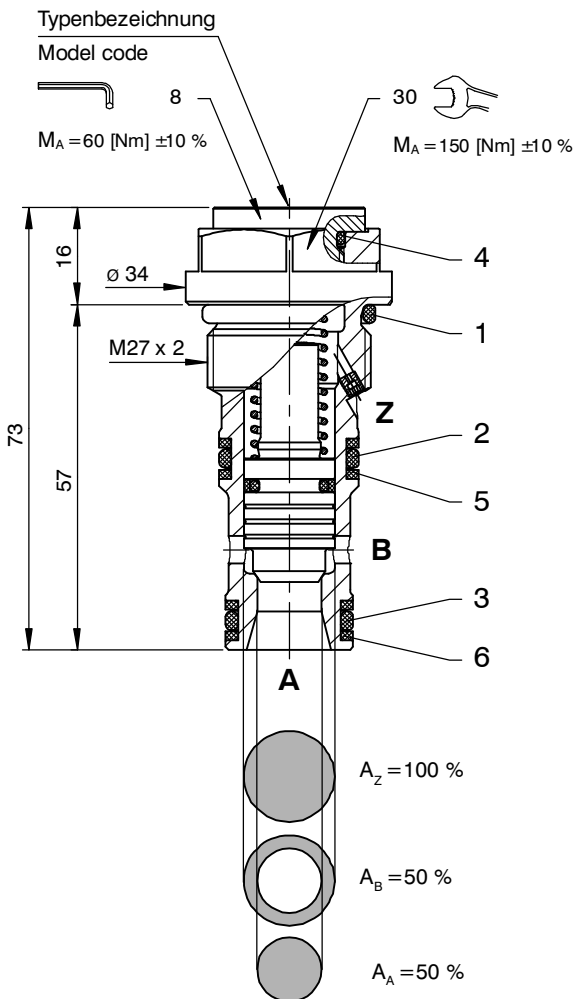
2 = cavity type DJ without annular groove



### Attention:

The  $\Delta p$  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



## 6 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 <sup>1)</sup>

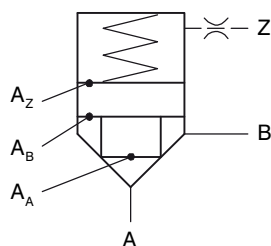
Item	Qty.	Description
1	1	O-ring No. 119 $\varnothing 23.47 \times 2.62$ N90
2	1	O-ring No. 116 $\varnothing 18.72 \times 2.62$ N90
3	1	O-ring No. 114 $\varnothing 15.54 \times 2.62$ N90
4	1	O-ring No. 016 $\varnothing 15.60 \times 1.78$ N90
5	2	Backup ring $\varnothing 17.1 \times 2.0 \times 1.4$ FI0751
6	2	Backup ring $\varnothing 15.3 \times 2.0 \times 1.4$ FI0751



### IMPORTANT!

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

## 7 Area- and pressure-ratios




Area  $A_Z$  : Area  $A_A$  = 2 : 1

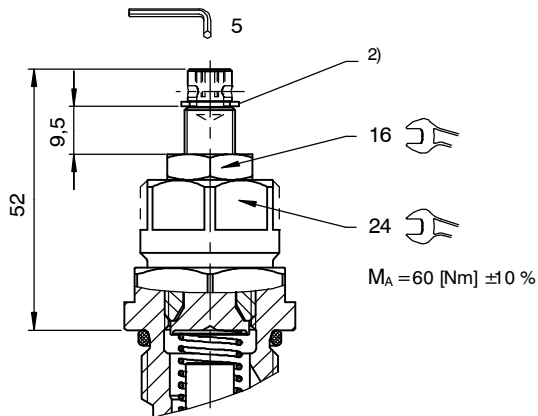
Area  $A_Z$  : Area  $A_B$  = 2 : 1

Area  $A_A$  : Area  $A_B$  = 1 : 1

## 8 Adjuster types (optional)


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

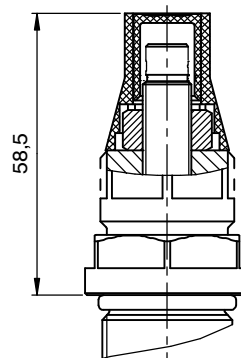
 **Important**  
Can be used to limit the opening stroke, for example, or to block the valve spool in the closed position.



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

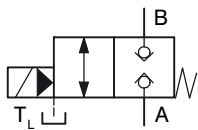
"E" adjuster with "P" tamper-proof cap (WL22S.P2D...)

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

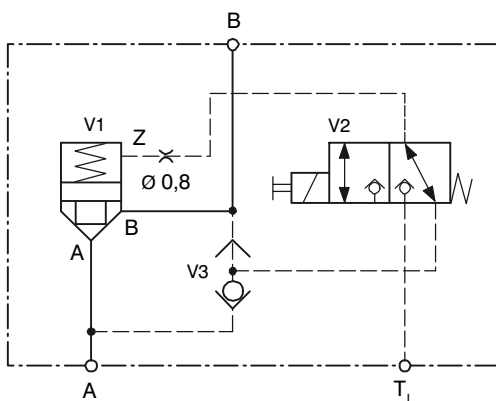


## 9 Application examples (active control)

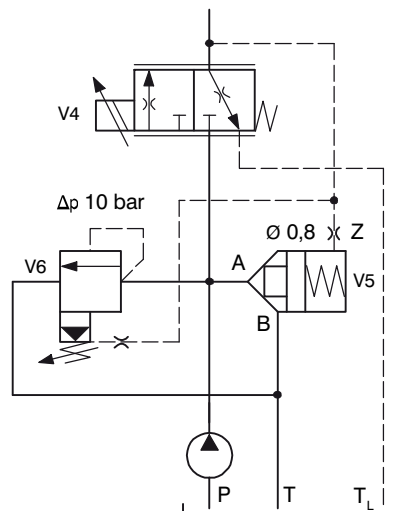
Simplified symbol



Application with seat valve



Logic valve application for lowest possible vented pressure with a proportional throttle and bypass compensator



**Advantage**

When the logic cartridge valve is open (flow A → B / B → A), there is no continuous flow of pilot oil to Z.

V1 = logic cartridge valve

V2 = 3/2 seat valve

V3 = shuttle valve

V4 = proportional throttle cartridge

V5 = logic cartridge valve

V6 = bypass pressure compensator cartridge

## 10 Ordering code

Ex. 

WL22	SD	_	2	D1	3	B	-	10	_	-	_
------	----	---	---	----	---	---	---	----	---	---	---

- WL22 = 2/2 logic cartridge valve
  - SD = seat valve with spool seal (standard)
  - S (\*) = seat valve without spool seal
  - (blank) = non-adjustable (standard)
  - E = adjustable
  - P = adjustable; adjuster is sealed
  - 2 = area ratio (main spool : seat = 2 : 1)
  - D1 = fixed orifice in port Z Ø 0.8 (standard)
  - D2 = orifice Ø 0.6
  - D3 = orifice Ø 1.5
  - D4 = orifice Ø 1.4
  - D5 = orifice Ø 1.3
  - D6 = orifice Ø 1.2
  - D7 = orifice Ø 1.1
  - D8 = orifice Ø 1.0
  - D9 = orifice Ø 0.9
  - D0 = orifice Ø 0.7
  - (blank) = no orifice
- } optional orifice in port Z (type G / M3)
- 1 (\*) = opening pressure 0.4 bar
  - 2 (\*) = opening pressure 1.0 bar
  - 3 = opening pressure 2.0 bar (standard)
  - 4 = opening pressure 3.0 bar
  - 5 = opening pressure 6.0 bar
  - 6 = opening pressure 7.5 bar
  - 7 = opening pressure 13 bar
  - B ... Q = standard model - see relevant data sheets
  - Z ... R = special features - please consult Bucher
  - 10 = nominal size 10 mm
  - (blank) = Nitrile seals (standard)
  - V = Viton seals  
(special seals - please consult Bucher)
  - 1 ... 9 = design number (omit when ordering new units)

(\*) In applications with an opening pressure of less than 2 bar, valve type WL22S2 ... must be used.  
I.e. the seal on the spool is omitted, and the valve is not leak-tight from A → B.

## 11 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")

info.ch@bucherhydraulics.com

www.bucherhydraulics.com

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Classification: 430.300.-.305.320.335