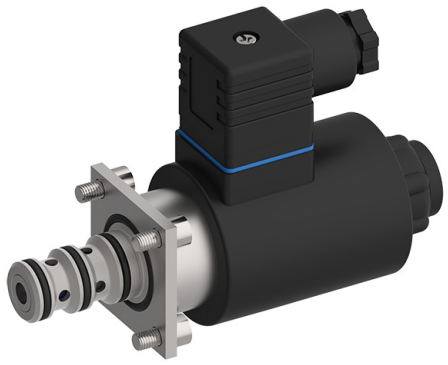
3/2 Solenoid Cartridge Valve, Size 6

Q_{max} = 20 l/min, p_{max} = 315 bar
Bidirectional seat-valve shut-off, direct acting
Series W1D…, W1F…



- Guided valve spool and poppet
- Two spool variants are available
- Available in two mounting versions
- With or without manual override
- Hand lever can be fitted on solenoid
- All exposed parts with zinc-nickel plating
- High pressure wet-armature solenoids
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope
- Can be fitted in a line-mounting body

1 Description

The W1D…/ W1F… series of 3/2 solenoid operated directional seat valves are size 6, direct acting, pressure balanced, push-in cartridges. IIn the normal condition (de-energised), flow in port 1 is shut off without leakage. The core element operates on the tried and tested principle of the guided poppet, and the guide spool has a seal. Two different mounting versions are available, which allows the designer to choose the insertion depth (flange 10.1 mm or 18 mm). The “overlapped spool” model (W1F…) features a closed crossover characteristic i.e. during the valve's switching period, there is no connection between ports 1, 2, and 3 and therefore only a minimal loss of flow / pressure occurs. These cartridge seat valves are also available with or without manual override, and with the option of an additional hand lever. These valves are predominantly used in certain mobile and industrial applications where leak-tight shut-off functions are crucially important. Examples are where loads, tensions, or clamping forces must be held without leakage. 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. The slip-on coils can be replaced without opening the hydraulic envelope and can be positioned at any angle through 360°. 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

3 Technical data

General characteristics	Description, value, unit
Designation	3/2 solenoid cartridge valve
Design	bidirectional seat-valve shut-off, direct acting poppet and valve-spool design (pressure balanced) with underlapped or overlapped spool
Mounting method	push-in cartridge, 4 mounting bolts M5 x 10
Tightening torque	5.2 Nm ± 5 %
Size	size 6, cavity type AC or cavity type AD
Weight	0.86 kg

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hydraulics

General characteristics	Description, value, unit
Mounting attitude	unrestricted
Ambient temperature range	-25 °C … +50 °C

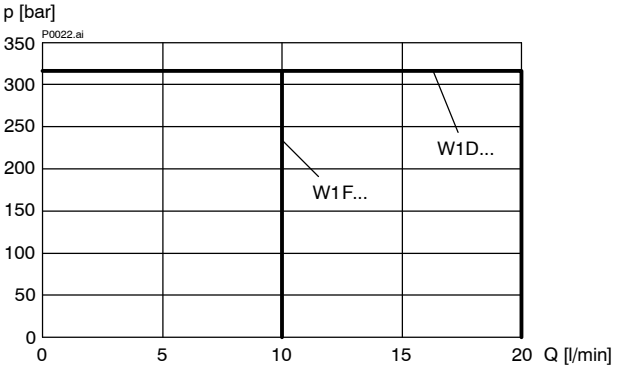
Hydraulic characteristics	Description, value, unit
Maximum operating pressure	…315 bar
Maximum flow rate	20 l/min 10 l/min (series W1F…, with overlapped spool)
Flow direction	see symbols
Hydraulic fluid	HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER
Hydraulic fluid temperature range	-25 °C … +80 °C
Viscosity range	10…500 mm^2/s (cSt), recommended 15...250 mm^2/s (cSt)
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999	class 20/18/15

Electrical characteristics	Description, value, unit
Supply voltage	12 V DC, 24 V DC / 115 V AC, 230 V AC (50 … 60 Hz) others by consultation
Supply voltage tolerance	± 10 %
Nominal power consumption	V DC = 30 … 32 W / V AC = 31 … 32 W
Switching time	Flow direction 1 → 2 30 … 160 ms (energising) 20 … 100 ms (deenergising) Flow direction 3 → 2 30 … 120 ms (energising) 20 … 60 ms (deenergising) Depending on pressure, flow rate and viscosity as well as dwell time under pressure, the switching times may vary from the the stated values.
Relative duty cycle	100 %
Protection class to ISO 20 653 / EN 60 529	IP 65 / IP 67 / IP 69K, see “Ordering code” (with appropriate mating connector and proper fitting and sealing)
Electrical connection	3-pin square plug to ISO 4400 / DIN 43 650 (standard) for other connectors, see “Ordering code”

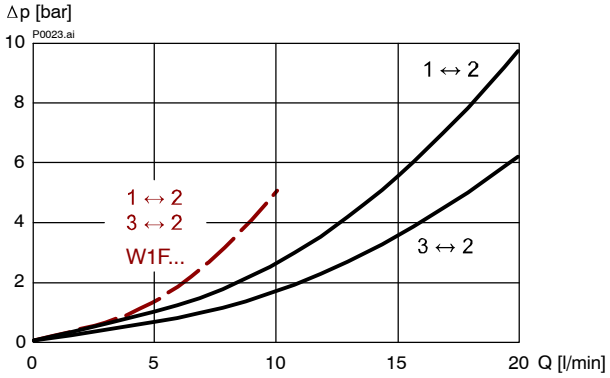
4 Performance graphs

measured with oil viscosity 33 mm^2/s (cSt), coil at steady-state temperature and 10 % undervoltage

p = f (Q) Performance limits

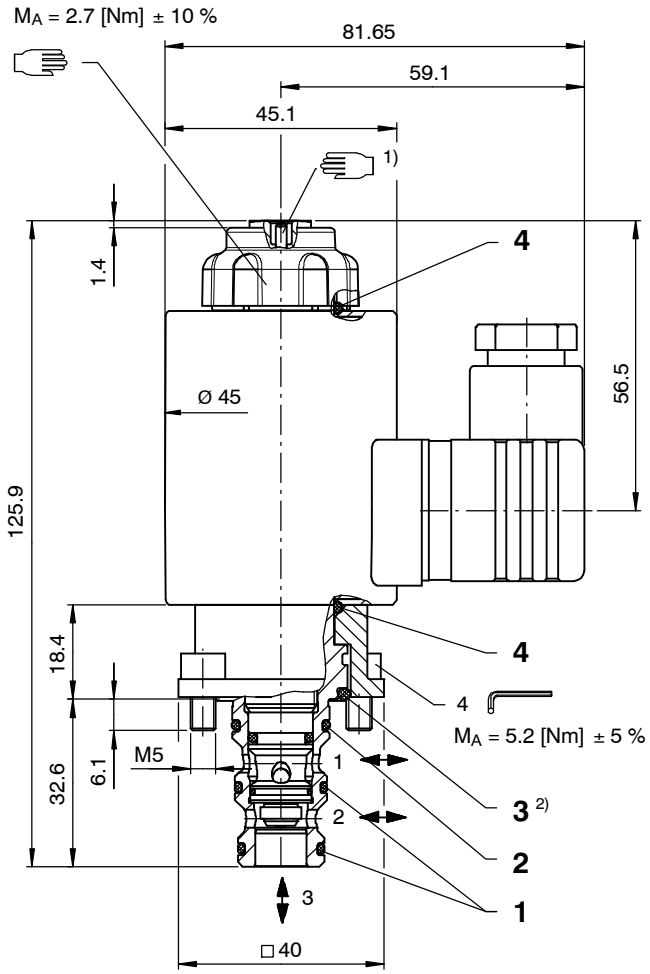


Δp = f (Q) Pressure drop - Flow rate characteristic



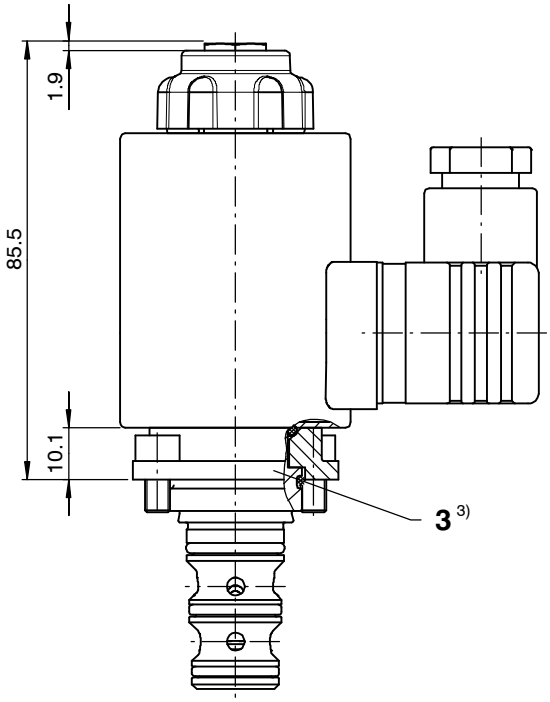
5 Dimensions & sectional view

5.1 Shallow insertion model



5.2 Deep insertion model

(shown here without manual override)



IMPORTANT!

1) Can be chosen **with** or **without** manual override. (see ordering code)

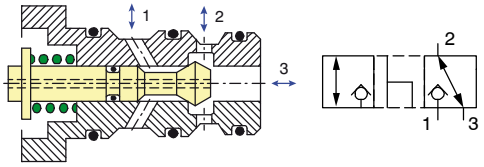
Seal kit no. DS-095-N

Item	Qty. 2)	Qty. 3)	Description			
1	2	2	O-ring	no. 015	∅ 14,00 x 1,78	N90
2	1	1	O-ring	no. 016	∅ 15,60 x 1,78	N90
3	1	- - -	O-ring	no. 116	∅ 18,72 x 2,62	N70
	- - -	1	O-ring	no. 021	∅ 23,52 x 1,78	N90
4	2	2	O-ring		∅ 20,00 x 2,00	V83

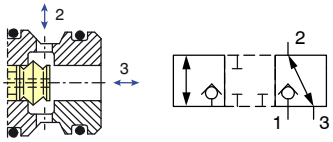
2) W1DB… / W1FB… / W1DD… / W1FD… (Shallow insertion model)
3) W1DC… / W1FC… / W1DE… / W1FE… (Deep insertion model)

6 Functional principle / Spool variants

Underlapped spool (standard, W1D…)



Overlapped spool (W1F…)



The “overlapped spool” model features a closed crossover characteristic i.e. during the valve's switching period, there is no connection between ports 1, 2, and 3 and therefore only a minimal loss of flow/pressure occurs. **This is a very important benefit in small-volume circuits, and in accumulator- and clamping systems.**

7 Installation information

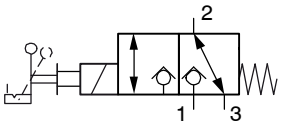
ATTENTION!
Only qualified personnel with mechanical skills may carry out any maintenance work. Generally, the only work that should ever be undertaken is to check, and possibly replace, the seals. When changing seals, oil or grease the new seals thoroughly before fitting them.

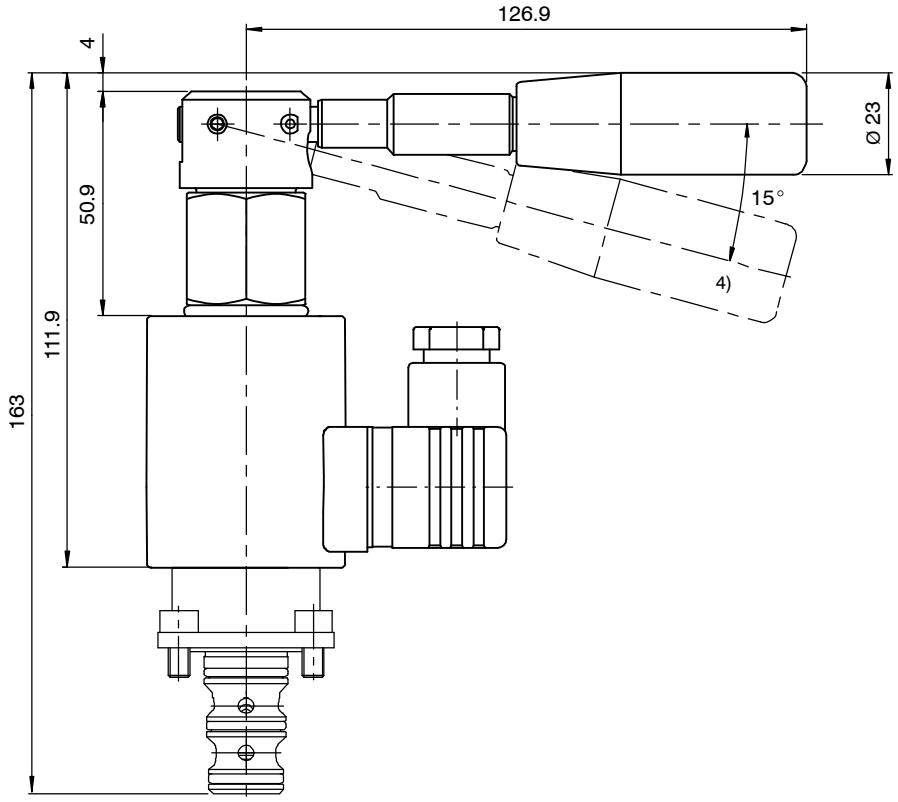
IMPORTANT!
When fitting the cartridges, use the specified tightening torque for the mounting screws. No adjustments are necessary, since the cartridges are set in the factory.

8 Hand lever fitted on solenoid (optional)

As an option, the W1D… / W1F… series of 3/2 solenoid operated directional seat valves are available with an additional hand lever. Two models can be supplied; the “**HHB**” hand lever with detent feature, and the “**HHNB**” hand lever without detent feature.

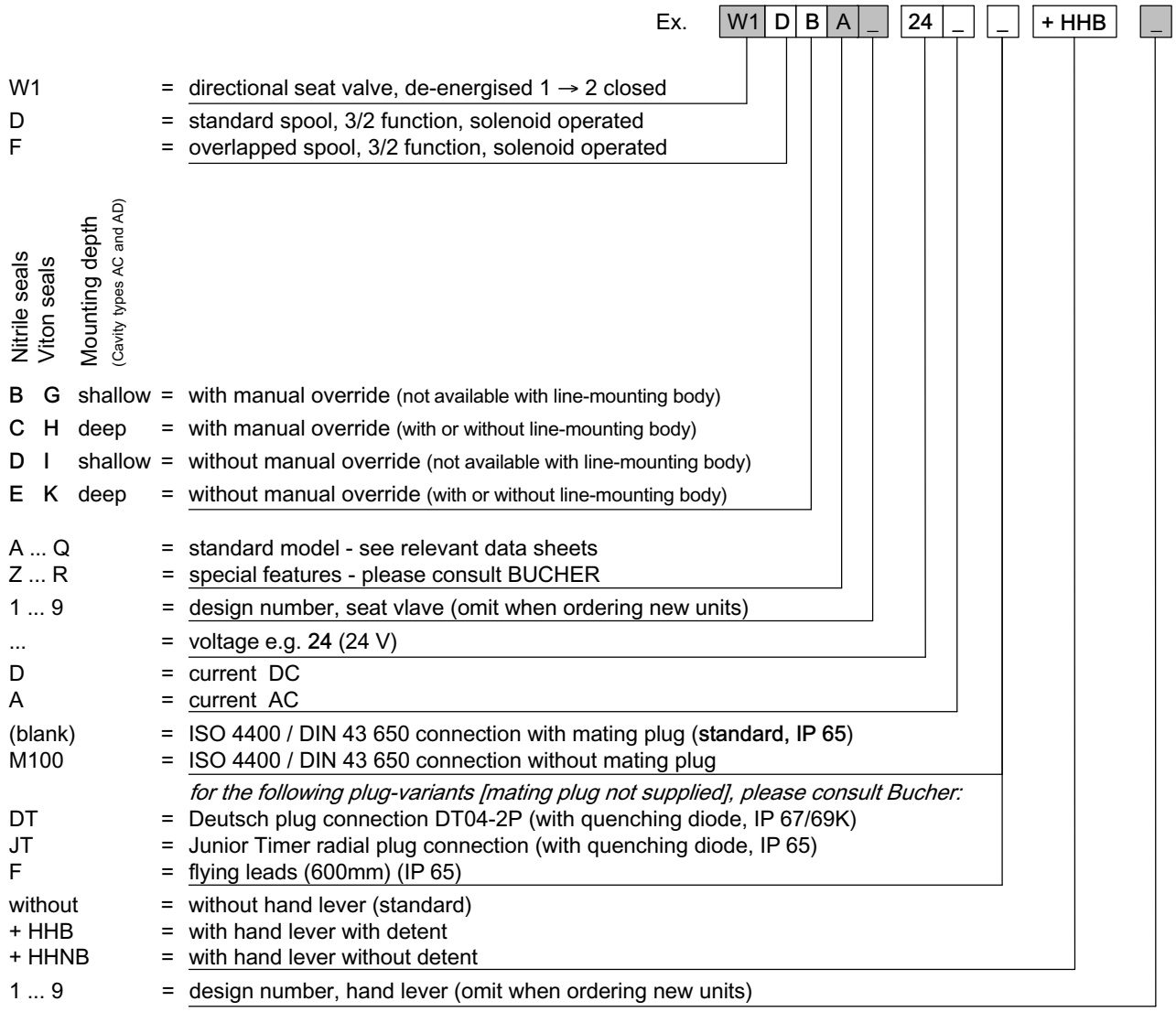
IMPORTANT!
Hand levers can only be fitted to valves that have a manual override.





4) Operated position

9 Ordering code



10 Related data sheets

Reference	(Old no.)	Description
400-P-040011	(i-32)	The form-tool hire programme
400-P-040111	(i-33.2)	Cavity type AC and AD
400-P-120120		Solenoid coil, series D45/207
400-P-730121	(G-2.20)	Line-mounting body, type GADA (G 3/8")

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

Classification: 430.300.-.305.310.300 (W-2.12)