2/2 Cartridge Seat Valve, Size 5

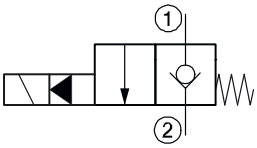
Q_{max} = 40 l/min, p_{max} = 350 bar
with solenoid operation, seat-valve shut-off, two stage
Series WR22L…/ WR22K…

- With seat-valve shut-off from 1 → 2
- Compact design for two different cavity types: AL – 3/4-16 UNF, ALM – M20x1,5
- Minimal headloss
- Reliable switching, even after long dwell times
- Nominal power consumption 17 W – optionally 27 / 25 W
- 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
- Various plug-connector systems and voltages are available
- Can be fitted in a line-mounting body

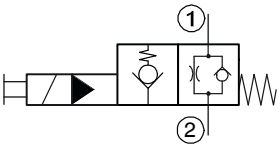
1 Description

These 2/2 solenoid-operated directional seat valves, series WR22L.../ WR22K…, two stage, pressure balanced screw-in cartridges with an 3/4-16 UNF or M20x1.5 mounting thread. They are designed on the poppet/seat principle, and the 1 → 2 flow path is therefore virtually leak-free. These 2/2 directional seat valves are constructively designed for minimal lead loss, thus the flow direction is possible only in one direction (1 → 2). "De-energised closed" and "de-energised open" functions are available. The switching times can be influenced by using solenoid coils with differing power ratings. The straightforward design delivers a good price/performance ratio and outstanding headloss/ flow ratings. These 2/2 solenoid operated seat valves are used in 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



WR22L…



WR22K…

ATTENTION!
Flow direction only 1 → 2 acceptable!

3 Technical data

General characteristics	Description, value, unit
Designation	2/2 cartridge seat valve
Design	with solenoid operation, seat-valve shut-off, two stage
Mounting method	screw-in cartridge 3/4-16 UNF or M20x1.5
Tightening torque	50 Nm ± 10 %

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hydraulics

General characteristics	Description, value, unit
Size	NG 5, cavity type AL 3/4-16 UNF cavity type ALM M20x1.5
Weight	0.40 kg
Mounting attitude	unrestricted
Ambient temperature range	-25 °C … +50 °C

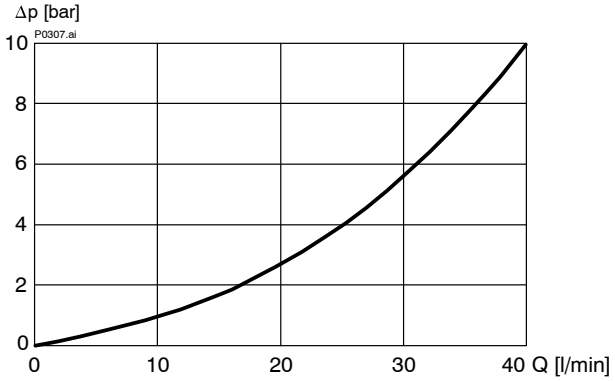
Hydraulic characteristics	Description, value, unit
Maximum operating pressure (ports 1 and 2)	350 bar
Maximum flow rate	40 l/min
Flow direction	1 → 2 **Attention:** 2 → 1 not acceptable! Switching safety achieved by flow and Δp.
Hydraulic fluid	HL and HLP mineral oil to DIN 51 524; for other fluids, 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)
Supply voltage tolerance		± 10 %
Nominal power consumption	- version **“E”** - version **“N”**	V DC = 17 W / V AC = 17 W V DC = 27 W / V AC = 25 W
Switching time	- version W22LE…5	25 … 110 ms (energising) 65 … 180 ms (de-energising)
	- version W22KE…5	35 … 125 ms (energising) 15 … 55 ms (de-energising)
	- version W22LN…5	30 … 125 ms (energising) 30 … 110 ms (de-energising)
	- version W22KN…5	30 … 125 ms (energising) 30 … 50 ms (de-energising)
		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

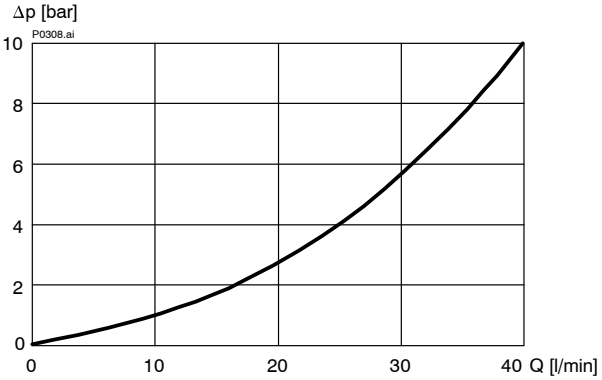
measured with oil viscosity 33 mm^2/s (cSt), coil at steady-state temperature and 10 % undervoltage

Δp = f (Q) Pressure drop - Flow rate characteristic [WR22L…]



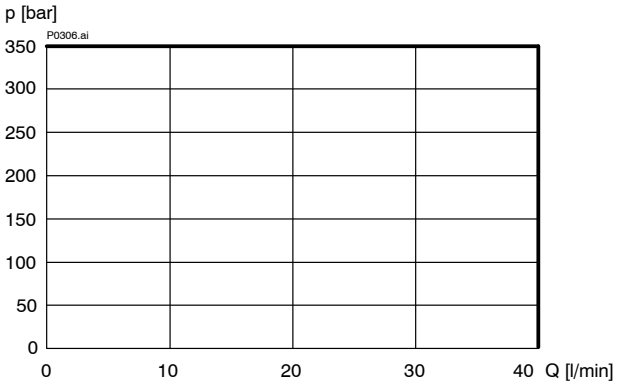
1 → 2, solenoid energising

Δp = f (Q) Pressure drop - Flow rate characteristic [WR22K…]



1 → 2, solenoid de-energising

p = f (Q) Performance limits



5 Installation information

IMPORTANT!
When fitting the cartridges, use the specified tightening torque. 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 undertaken is to check, and possibly replace, the seals. When changing seals, oil or grease the new seals thoroughly before fitting them.

3/4-16 UNF "A" – NBR seal kit no. DS-246-N [1)]

Item	Qty.	Description		
1	1	O-ring no. 017	∅ 17.17 x 1.78	N90
2	1	O-ring no. 014	∅ 12.42 x 1.78	N90
3	2	O-ring	∅ 16.00 x 2.00	Viton
4	2	Backup ring	∅ 10.70 x 1.45 x 1.00	FI0751

IMPORTANT!
1) Seal kit with FKM (Viton) seals, no. DS-246-V

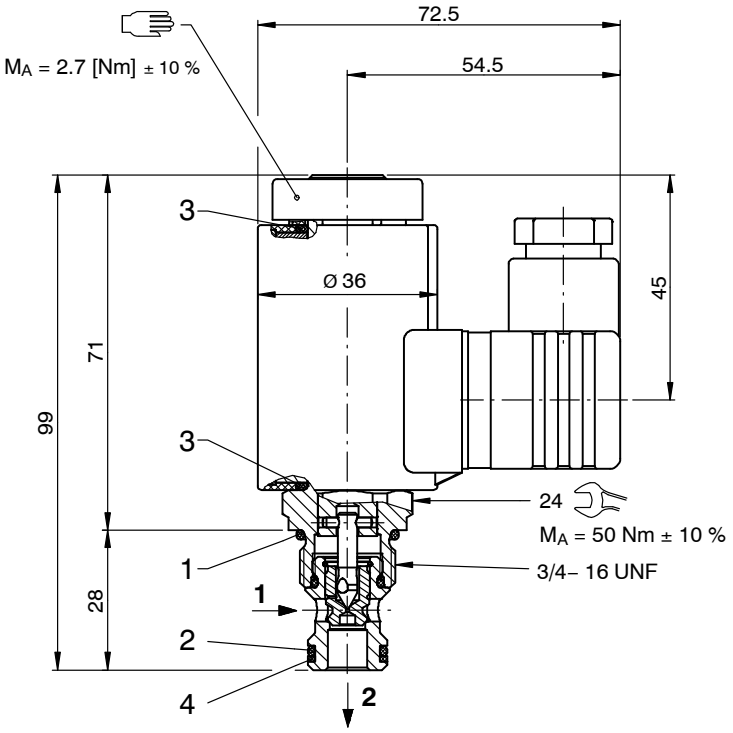
M20x1,5 "Z" – NBR seal kit no. DS-245-N [2)]

Item	Qty.	Description		
1	1	O-ring no. 017	∅ 17.17 x 1.78	N90
2	1	O-ring no. 013	∅ 10.82 x 1.78	N90
3	2	O-ring	∅ 16.00 x 2.00	Viton
4	2	Backup ring	∅ 9.90 x 1.45 x 1.40	FI0751

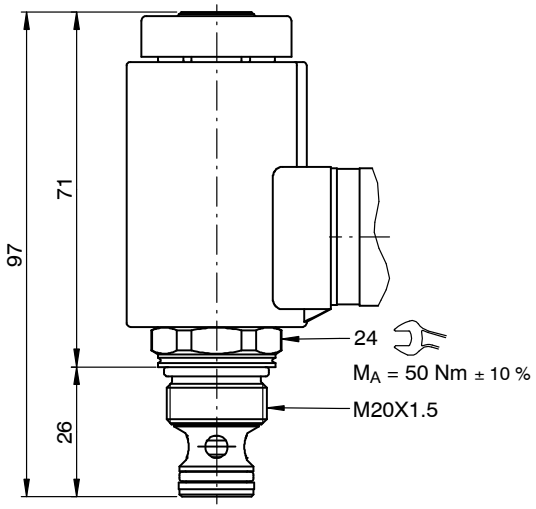
IMPORTANT!
2) Seal kit with FKM (Viton) seals, no. DS-245-V

6 Dimensions & sectional view

6.1 “Normally closed“ design WR22L…

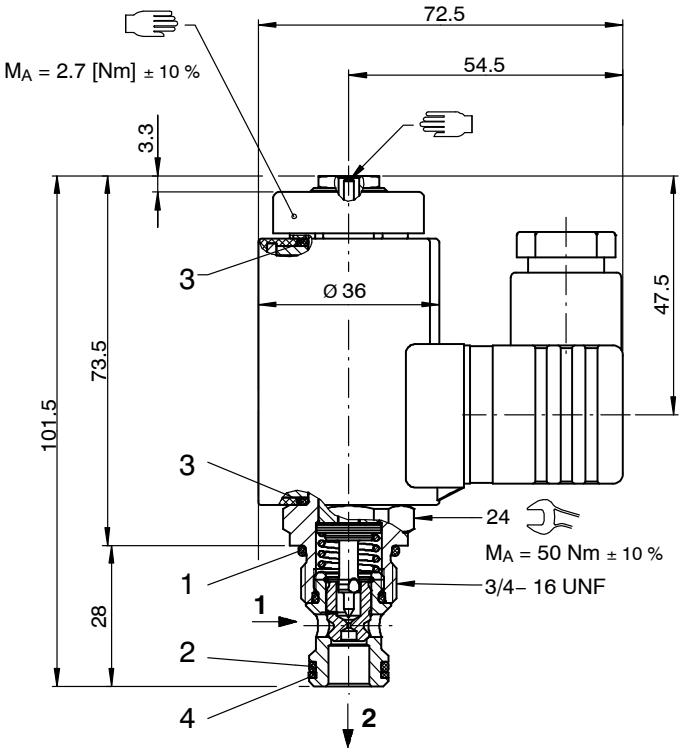


with thread 3/4-16 UNF – Cavity type AL

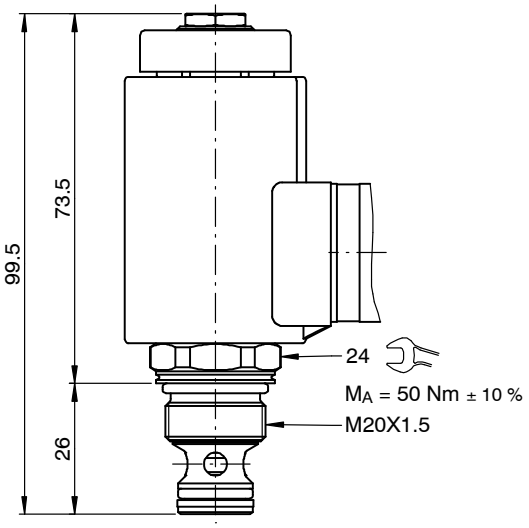


with thread M20x1,5 – Cavity type ALM

6.2 “Normally open“ design WR22K…



with thread 3/4-16 UNF – Cavity type AL



with thread M20x1,5 – Cavity type ALM

7 Ordering code

Ex. W R 22L E A 5 _ - 4 24 D _

W	=	directional valve
R	=	check valve function, seated design, two stage
22L	=	2/2 function, de-energised closed
22K		2/2 function, de-energised normally open
E	=	electrically operated, V DC = 17 W / V AC = 17 W (**standard**)
N	=	electrically operated, V DC = 27 W / V AC = 25 W
A	=	standard model - with thread 3/4 - UNF
Z	=	special features - with thread M20x1,5
5	=	nominal size 5
(blank)	=	NBR (Nitrile) seals (**standard**)
V	=	FKM (Viton) seals
		(special seals - please contact BUCHER)
1 ... 9	=	design stage (omit when ordering new units)
...	=	voltage e.g. **24** (24 V)
D	=	current DC
A	=	current AC
(blank)	=	ISO 4400 / DIN 43 650 connection with mating plug (**standard, IP 65**)
M100	=	ISO 4400 / DIN 43 650 connection without mating plug
C	=	Kostal plug connection (IP 65)
JT	=	Junior Timer radial plug connection (with protection diode, IP65)
IT	=	Junior Timer axial plug connection (with protection diode, IP65)
D	=	Deutsch plug connection DT04-2P (IP 67/69K)
DT	=	Deutsch plug connection DT04-2P (with protection diode, IP 67/69K)
S	=	AMP Superseal 1.5 (IP67) / Metri-Pack 150 (IP65) plug connection
F	=	flying leads (500 mm)

} mating plug not supplied

8 Related data sheets

Reference	(Old no.)	Description
400-P-040011	(i-32)	The form-tool hire programme
400-P-040171	(i-33.10)	Cavity type AL
400-P-040201	(i-33.13)	Cavity type ALM
400-P-120100	(W-2.140)	Overview directional solenoid cartridge valve Size 1…5
400-P-120110	(W-2.141)	Coils for screw-in cartridge valves
400-P-720101	(G-4.10)	Line-mounting body, type GALA (G 3/8")
400-P-720105	(G-4.11)	Line-mounting body, type GALMA (G 3/8")

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Classification: 430.300.-.305.310.300