

2/2 Solenoid Cartridge Valve, Size 10

$Q_{\max} = 140 \text{ l/min}$, $p_{\max} = 350 \text{ bar}$
Bidirectional Seat-Valve Shut-Off, Two-Stage
Series WS22GND..., WS22OND...



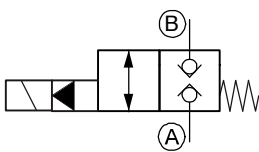
- With bidirectional seat-valve shut-off
- No external pilot drain required
- High flow rates
- With return spring for main spool (on request)
- All exposed parts with zinc-nickel plating
- High pressure wet-armature solenoids
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope
- Various plug-connector systems and voltages are available
- Can be fitted in a line-mounting body
- Can be fitted in sandwich bodies

1 Description

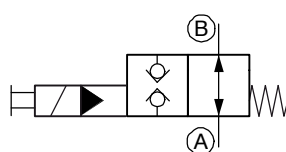
These 2/2 solenoid-operated directional valves are size 10, two stage, high performance screw-in cartridges with an M24x1.5 mounting thread. The main and pilot stages are both designed on the poppet/seat principle, and they are therefore virtually leak-free in both directions of flow (bidirectional seat-valve shut-off). "De-energised closed" and "de-energised open" functions are available. These screw-in cartridges 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 according to DIN EN ISO 19 598 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



WS22GN...-10...



WS22ON...-10...

3 Technical data

General characteristics	Description, value, unit
Designation	2/2 solenoid cartridge valve
Design	bidirectional seat-valve shut-off, two-stage
Mounting method	screw-in cartridge M24 x 1.5
Size	nominal size 10, cavity type DD or cavity type DC (option with adapter ring C)
Weight	0.52 kg
Mounting attitude	unrestricted

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	350 bar
Maximum flow rate	140 l/min
Flow direction	A → B / B → A, see symbols Switching safety achieved by flow and Δp .
Hydraulic fluid	HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER
Ambient temperature range ¹⁾	-25 °C ... +80 °C
Hydraulic fluid temperature range ¹⁾	-25 °C ... +80 °C ²⁾
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 %
Ambient temperature range ¹⁾	-25 °C ... +50 °C
Nominal power consumption	V DC = 27 W V AC = 25 W
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	DIN EN 175301-803, 3-pin 2 P+E (standard) for other connectors, see "Ordering code"



IMPORTANT!:

1) The less favourable values from the hydraulic and electrical characteristics determine the temperature range of the whole valve.



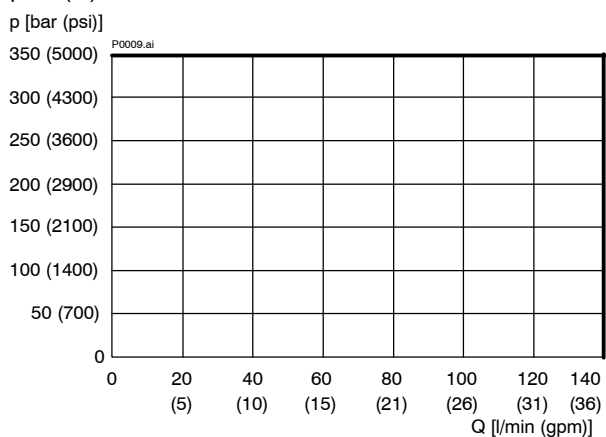
IMPORTANT!:

2) The maximum fluid temperature must not exceed the permissible ambient temperature for the whole valve.

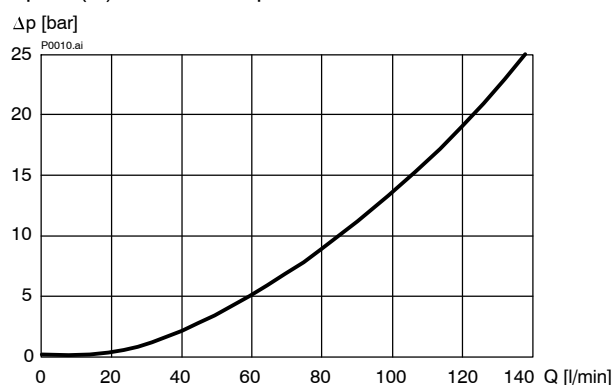
4 Performance graphs

measured with oil viscosity 33 mm²/s (cSt), coil at steady-state temperature and 10 % undervoltage

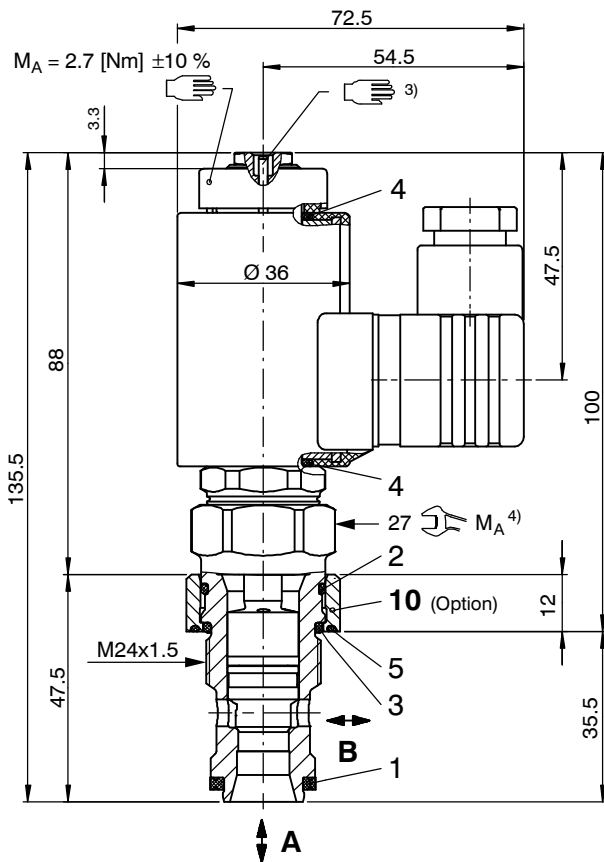
$p = f(Q)$ Performance limits



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



5 Dimensions & sectional view



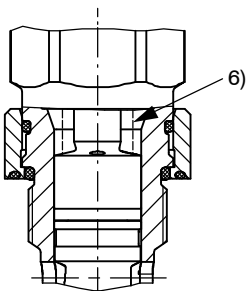
IMPORTANT!:
 3) WS22GN... without manual override
 WS22ON... with manual override

Option with adapter ring C

Item	Qty.	Description
10	1	Adapter ring C $\varnothing 32.00 \times 12.00$

7 Return spring for main spool (on request)

Additional return spring for main spool to assist the closing force. This results in a higher Δp when opening. Available on request, if a certain minimum order quantity is achieved.



6) additional return spring for main spool

6 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.

Tightening torque M_A ⁴⁾ $\pm 10\%$

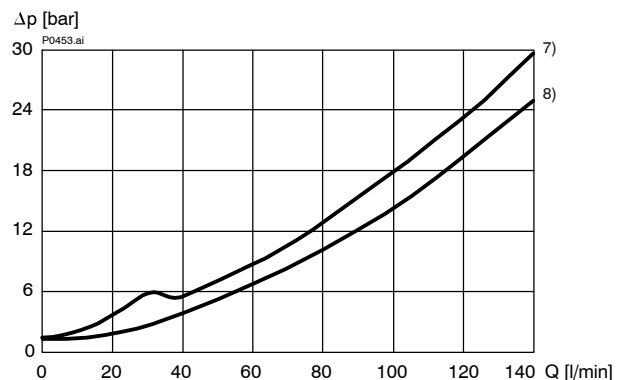
Cavity type	DD	DC
Can be fitted in steel	65 [Nm]	100 [Nm]
Can be fitted in aluminium	50 [Nm]	100 [Nm]

NBR seal kit no. DS-281-N ⁵⁾

Item	Qty.	Description
1	1	O-ring $\varnothing 22.10 / 16.50 \times 2.50$
2	1	O-ring no. 020 $\varnothing 21.95 \times 1.78$ N90
3	1	O-ring $\varnothing 21.00 \times 2.00$ N75
4	2	O-ring $\varnothing 16.00 \times 2.00$ Viton
5	1	Backup ring $\varnothing 27.00 \times 1.50$ N75

IMPORTANT!
 5) Seal kit with FKM (Viton) seals, no. DS-281-V

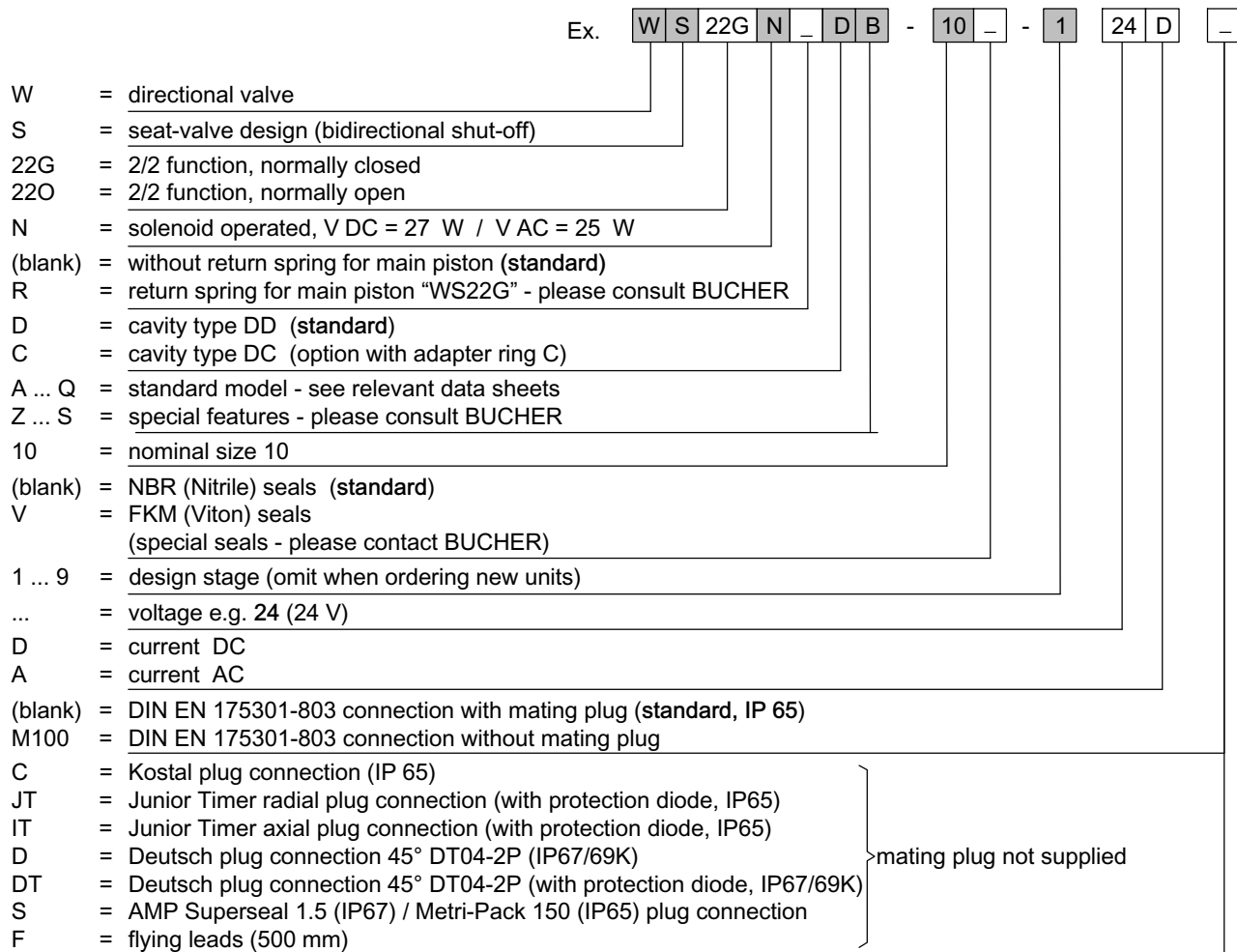
$\Delta p = f(Q)$ Pressure drop - Flow rate characteristic



7) A → B, solenoid energising

8) B → A, solenoid energising

8 Ordering code



9 Related data sheets

Reference	Description
400-P-040011	The form-tool hire programme
400-P-060121	Cavity type DD
400-P-060111	Cavity type DC (option with adapter ring C)
400-P-120110	Coils for screw-in cartridge valves series D36
400-P-740111	Line- and manifold-mounting body, type DD-12 (G 1/2")
400-P-740101	Line- and manifold-mounting body, type DC-12 (G 1/2")
400-D-9010001	Technical Hints and Tips Pilot Operated Solenoid Valves with a Return Spring

info.ch@bucherhydraulics.com

www.bucherhydraulics.com

© 2020 by Bucher Hydraulics AG Frutigen, CH-3714 Frutigen

All rights reserved.

Data is provided for the purpose of product description only, and must not be construed as warranted characteristics in the legal sense. The information does not relieve users from the duty of conducting their own evaluations and tests. Because the products are subject to continual improvement, we reserve the right to amend the product specifications contained in this catalogue.

Classification: 430.300.-.305.320.300