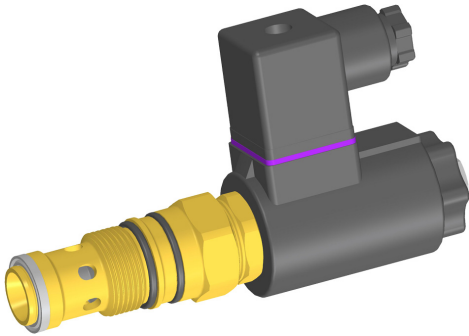


## 2/2 Solenoid Cartridge Valve, Size 10

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



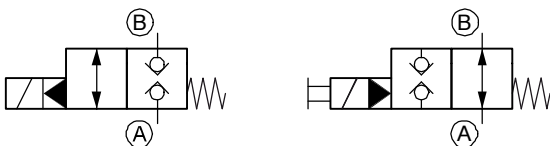
- With bidirectional seat-valve shut-off
- No external pilot drain required
- High flow rates
- All exposed parts with zinc-nickel plating
- High pressure wet-armature solenoids
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope
- Various plug-connector systems 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 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



WS22GND...-10...

WS22OND...-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
Ambient temperature range	-25 °C ... +50 °C

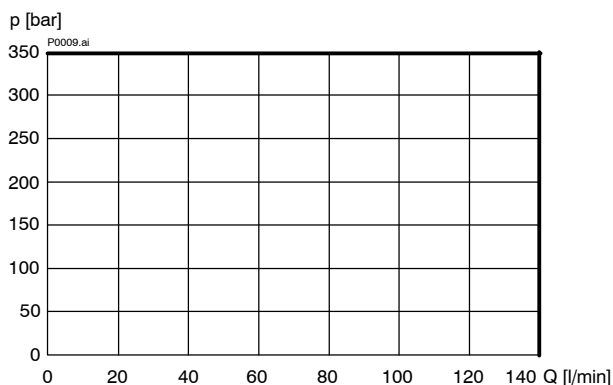
Hydraulic characteristics	Description, value, unit
Maximum operating pressure	350 bar
Maximum flow rate	140 l/min
Flow direction	A → B / B → A, see symbols
Hydraulic fluid	HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER
Hydraulic fluid temperature range	-25 °C ... +80 °C
Viscosity range	10...500 mm <sup>2</sup> /s (cSt), recommended 15...250 mm <sup>2</sup> /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	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	3-pin square plug to ISO 4400 / DIN 43 650 (standard) for other connectors, see "Ordering code"

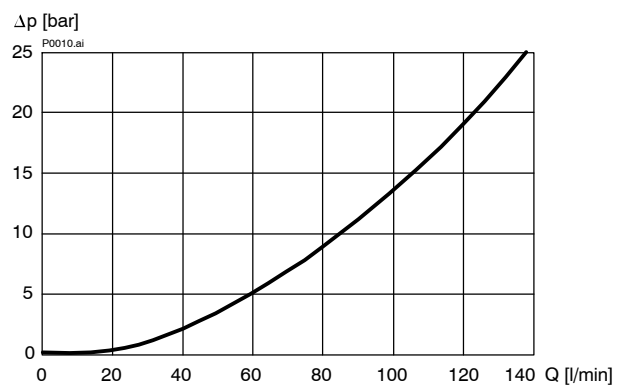
## 4 Performance graphs

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

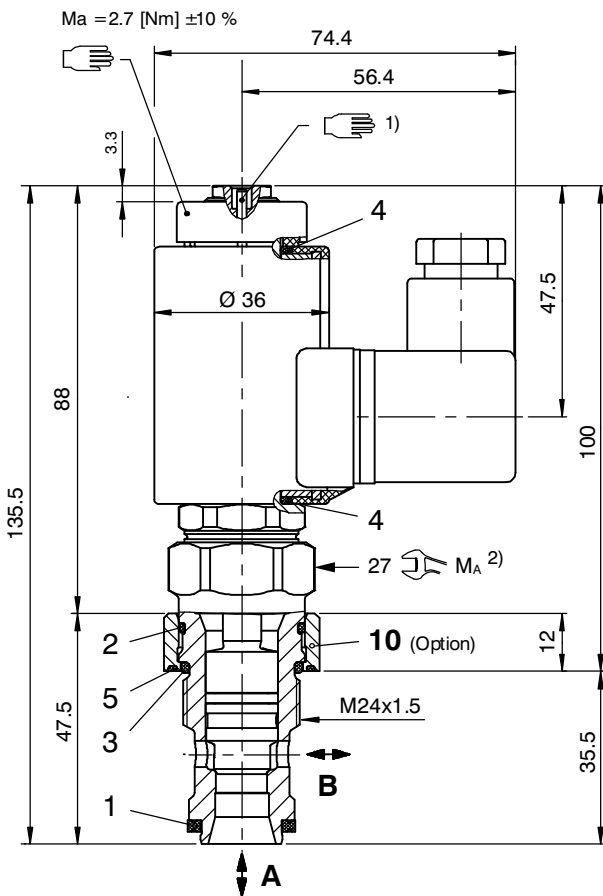
$p = f(Q)$  Performance limits



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



## 5 Dimensions & sectional view



**IMPORTANT!:**

- 1) WS22GN... without manual override  
WS22ON... with manual override

## 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  $M_A^{2)} \pm 10\%$

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<sup>3)</sup>

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!**

- 3) Seal kit with FKM (Viton) seals, no. DS-281-V

Option with adapter ring C

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

### 7 Ordering code

Ex. **W S 22G N D B - 10 - 1 24 D -**

- W = directional valve
- S = seat-valve design (bidirectional shut-off)
- 22G = 2/2 function, normally closed
- 22O = 2/2 function, normally open
- N = solenoid operated, V DC = 27 W / V AC = 25 W
- D = cavity type DD (standard)
- C = cavity type DC (option with adapter ring C)
- A ... Q = standard model - see relevant data sheets
- Z ... R = special features - please consult BUCHER
- 10 = nominal size 10
- (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 mating plug (standard, IP 65)
- M100 = without mating DIN 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 (IP 67) / Metri-Pack 150 (IP 65)
- 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-060121	(i-45.2)	Cavity type DD
400-P-060111	(i-45.1)	Cavity type DC (option with adapter ring C)
400-P-120110	(W-2.141)	Coils for screw-in cartridge valves
400-P-740111	(G-24.21)	Line- and manifold-mounting body, type DD-12 (G 1/2")
400-P-740101	(G-24.20)	Line- and manifold-mounting body, type DC-12 (G 1/2")

info.ch@bucherhydraulics.com

www.bucherhydraulics.com

© 2015 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