

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 WS22GNH..., WS22ONH...



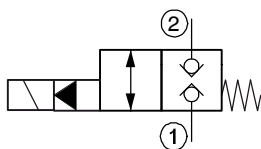
- With bidirectional seat-valve shut-off
- No external pilot drain required
- Compact construction for cavity type DH to ISO 7789-27-01-0-07
- High flow rates
- With return spring for main spool (on request)
- All exposed parts with zinc-nickel plating
- High pressure wet-armature solenoids
- The slip-on 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

1 Description

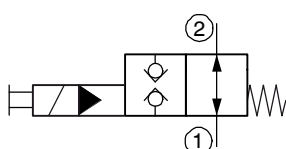
These 2/2 solenoid-operated directional valves are size 10, two stage, high performance screw-in cartridges with an M27 x 2 mounting thread. The main and pilot stages are both designed on the poppet/seat principle, and they are therefore virtually leak-free in both directions of flow (bidirectional seat-valve shut-off). 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



WS22GNH...-10...



WS22ONH...-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 M27 x 2
Tightening torque	80 Nm ± 10 %
Size	nominal size 10, cavity type DH
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	1 → 2 / 2 → 1, 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.



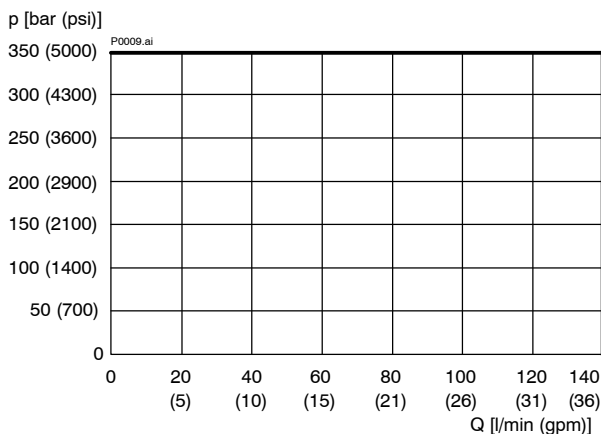
IMPORTANT!:

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

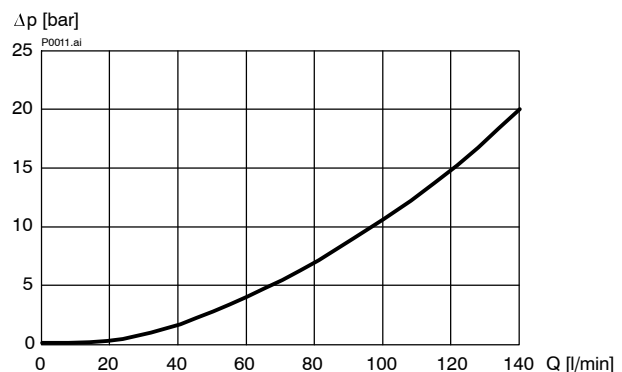
4 Performance graphs

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

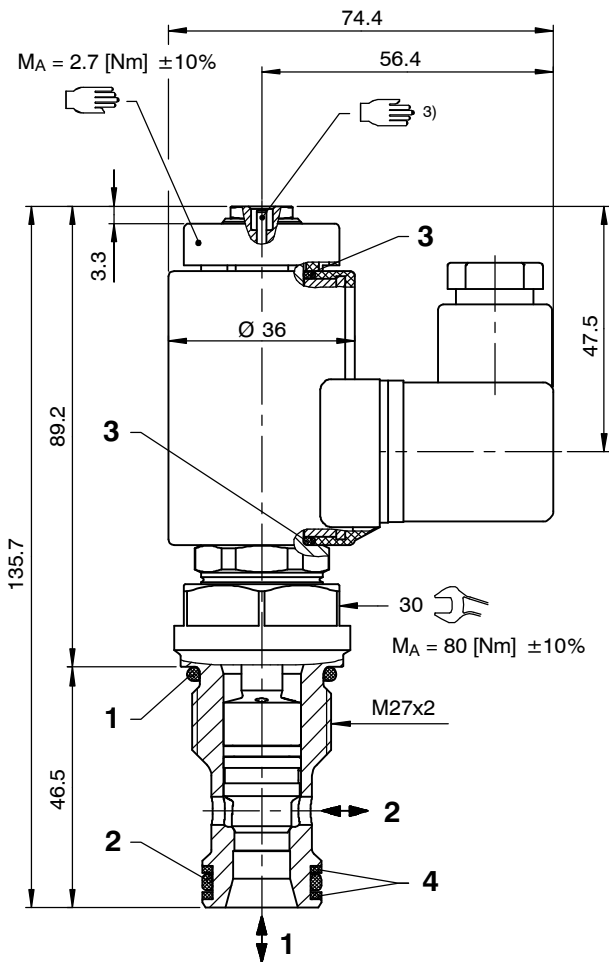
$p = f(Q)$ Performance limits



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



5 Dimensions & sectional view



IMPORTANT!:

- 3) WS22GNH... without manual override
WS22ONH... 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.

Seal kit NBR no. DS-367-N ⁴⁾

Item	Qty.	Description
1	1	O-ring no. 119 \varnothing 23.47 x 2.62 N90
2	1	O-ring no. 116 \varnothing 18.72 x 2.62 N90
3	2	O-ring \varnothing 16.00 x 2.00 FKM
4	1	Backup ring \varnothing 17.10 x 2.00 x 1.40 FI0751

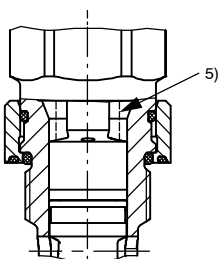


IMPORTANT!

- 4) Seal kit with FKM (Viton) seals, no. DS-367-V

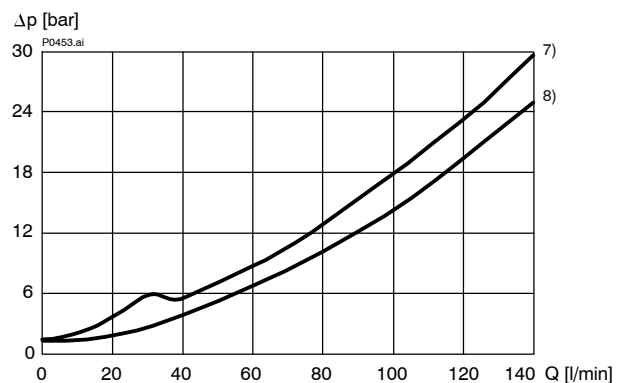
7 Return spring for main spool for “WS22G” (version R)

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.



- 5) additional return spring for main spool

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



- 7) 1 → 2, solenoid energising

- 8) 2 → 1, solenoid energising

8 Ordering code

Ex.

W	S	22G	N	_	H	A	-	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
- (blank) = without return spring for main piston (**standard**)
- R = return spring for main piston "WS22G" - please consult BUCHER
- H = cavity type DH
- A ... Q = standard model - see relevant data sheets
- Z ... S = 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) = DIN EN 175301-803 connection with mating plug (**standard**, IP 65)
- M100 = DIN EN 175301-803 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 45° DT04-2P (IP67/69K)
- DT = Deutsch plug connection 45° DT04-2P (with protection diode, IP67/69K)
- S = AMP Superseal 1.5 (IP67) / Metri-Pack 150 (IP65) plug connection
- F = flying leads (500 mm)

} mating plug not supplied

9 Related data sheets

Reference	Description
400-P-040011	The form-tool hire programme
400-P-060171	Cavity type DH to ISO 7789-27-01-0-07
400-P-120110	Coils for screw-in cartridge valves series D36
400-P-740161	Line mounting body, type GCDHA (G 3/4")
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