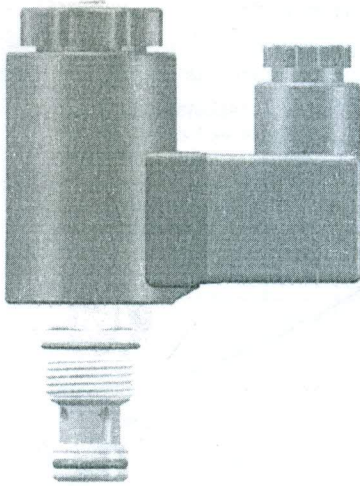


2/2 Solenoid Directional Cartridge Valve 5 mm Poppet Type, Direct Acting Series WS22G ... / WS22O ...



- Pmax 250 bar / Qmax 30 l/min
- High flow rates

- Wet-armature solenoid with p_{max}-rated core tube and slip-on coil
- Coils can be changed without opening the hydraulic envelope
- All exposed steel parts are zinc-plated to ISO 4042
- BUCHER cavity type AL, ALM
- 3/4"-16 UNF or M20 x 1,5 Mounting Thread
- Line mounting bodies (G 3/8") are available

1. Description

Series WS22... directional valves are solenoid actuated, direct acting poppet type screw-in cartridges, nominal size 5 mm. The range is based on the 3/4"-16 UNF mounting thread but models WS22GNZ5 and WS22ONZ5 has an M20 x 1,5 thread. The straight-forward design delivers an outstanding

Price / Performance ratio and good Δp -Q characteristics. All exposed steel parts are zinc-plated to ISO 4042, and the valves are suitable for use in the harshest operating environments. The core tube / slip-on coil design allows coils to be changed without opening the hydraulic envelope, even when the valve is under pressure. Coils can be secured at any angle through 360° and are available with most common electrical connectors. The valves are designed to be fitted with a normal 24 A/F OE spanner in BUCHER cavity AL but can also be installed in some other makes of 3/4"-16 UNF cavity. For customers who manufacture their own manifold blocks, we offer form tool sets for sale or hire. The G 3/8" threaded bodies GALA and GALMA are available for line mounting applications.

2. Symbols



3. Characteristics

| | | |
|---------------------------|------------|---|
| Type | | 2/2 solenoid directional valve |
| Design | | direct acting, poppet type |
| Mounting method | | screw-in cartridge |
| Size | | 3/4"-16 UNF model: 5 mm nominal size, BUCHER cavity AL M20 x 1.5 model: 5 mm nominal size, BUCHER cavity ALM |
| Mass | kg | 0.35 |
| Mounting attitude | | unrestricted |
| Flow direction | | 1 ⇒ 2 / 2 ⇒ 1 see symbols |
| Operating pressure | bar | to 250 in 1 and 2 |
| Flow rate Q max. | l/min | 30 |
| Fluids | | Hydraulic oils HL and HLP to DIN 51 524 other fluids - contact BUCHER |
| Fluid temperature range | °C | -25 ... +80 |
| Ambient temperature range | °C | -25 ... +50 |
| Viscosity range | cSt | 10 ... 500, recommended 15 ... 250 |
| Minimum fluid cleanliness | | 18/14 to ISO 4406 /CETOP RP70H 8 ... 9 to NAS 1638 |
| Standard voltages | VAC VDC | 115, 230 50 ... 60 Hz 12, 24 |
| Nom. voltage tolerance | % | ± 10 |
| Nom. power consumption | W | VAC: 25, VDC: 27 |
| Duty cycle | % ED | 100 % energisation |

Replaces: W-2 150c

Enclosure protection
Electrical connection

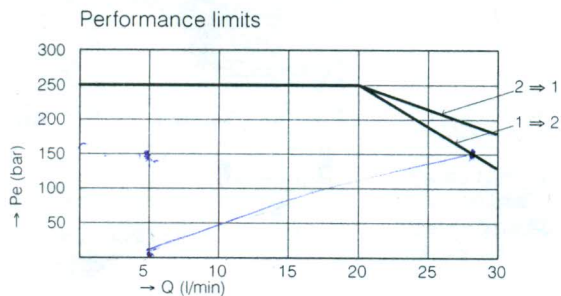
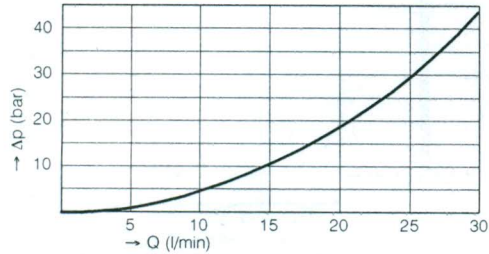
IP 65 to DIN 40050

3-pin square plug to DIN 43 650 / ISO 4400 (standard)
other connectors - see data sheet ...120110..

4. Performance characteristics

Oil viscosity 33 cSt solenoid at steady-state temperature, 10% under-voltage

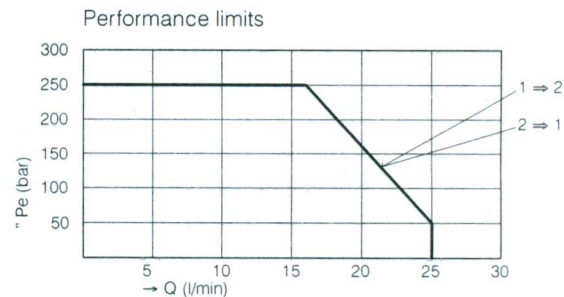
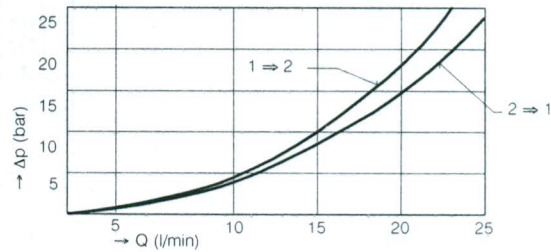
Δp -Q characteristic
flow direction 1 \Rightarrow 2 and 2 \Rightarrow 1
WS22GNA5/ WS22GNZ5



Switching times: Flow direction 1 \Rightarrow 2 and 2 \Rightarrow 1

| | |
|--------------|---------------|
| Solenoid ON | 30 ... 120 ms |
| Solenoid OFF | 20 ... 50 ms |

Δp -Q characteristic
flow direction 1 \Rightarrow 2 and 2 \Rightarrow 1
WS22ONA5/ WS22ONZ5

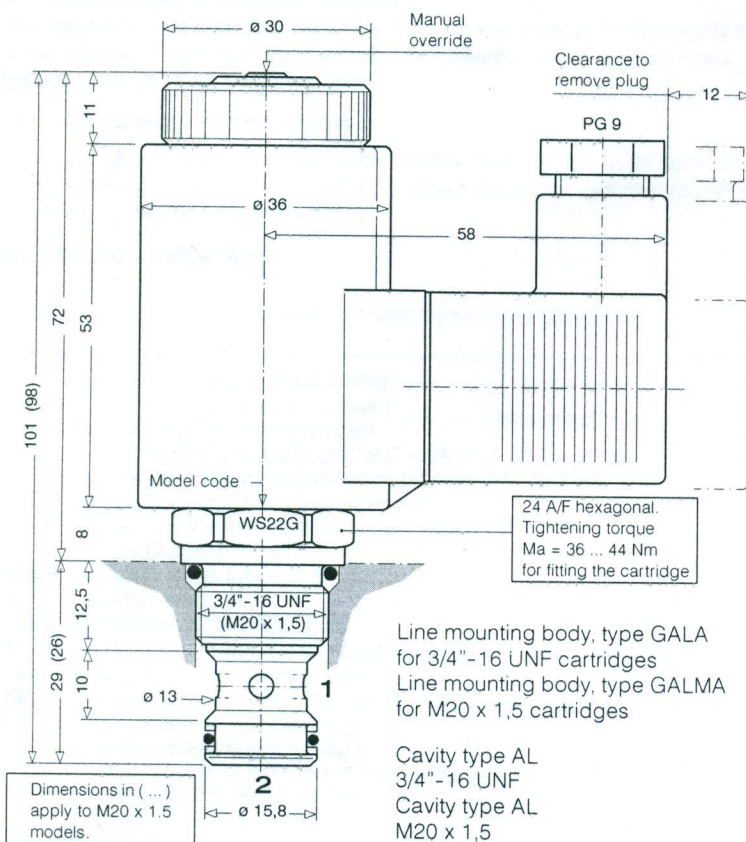


Switching times: Flow direction 1 \Rightarrow 2 and 2 \Rightarrow 1

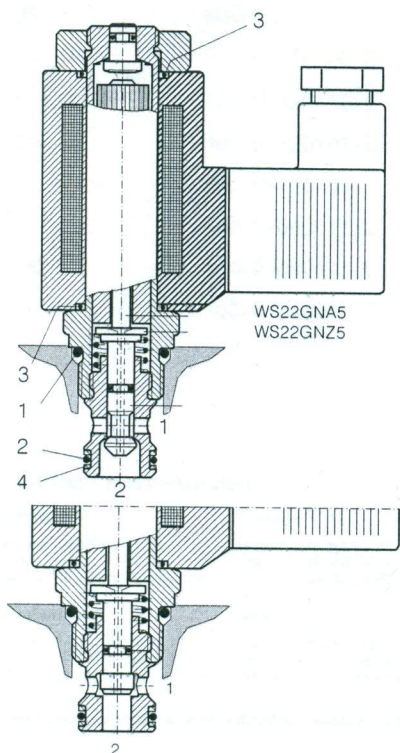
| | |
|--------------|---------------|
| Solenoid ON | 30 ... 200 ms |
| Solenoid OFF | 20 ... 70 ms |

These times are strongly influenced by fluid pressure, flow rate and viscosity, as well as by the dwell time under pressure.

5. Dimensions



6. Schematic section



Seal kit no. DS-246, comprising *):
Seal kit no. DS-245, comprising **):

| Item | Qty. | Qty. | Description | Dimension |
|------|------|------|----------------|----------------------------|
| 1 | 1*) | 1**) | O-ring no. 017 | Ø 17,17 x 1,78 N90 |
| 2 | 1*) | - | O-ring no. 014 | Ø 12,42 x 1,78 N90 |
| 2 | - | 1**) | O-ring no. 013 | Ø 10,82 x 1,78 N90 |
| 3 | 2*) | 2**) | O-ring | Ø 16,00 x 2,00 Viton |
| 4 | 2*) | - | Backup ring | Ø 10,7 X 1,45 X 1,0 FI0751 |
| 4 | - | 2**) | Backup ring | Ø 9,9 X 1,45 X 1,4 FI0751 |

WS22GNZ5 / WS22ONZ5 (M20 x 1,5 model)

WS22GNA5 / WS22ONA5 (3/4"-16 UNF model)

7. Installation and servicing

All installation and servicing must be carried out with care, and by qualified personnel only. When changing seals,

the new seals must be thoroughly oiled or greased before they are fitted. Use

the correct tightening torque when fitting the cartridge.

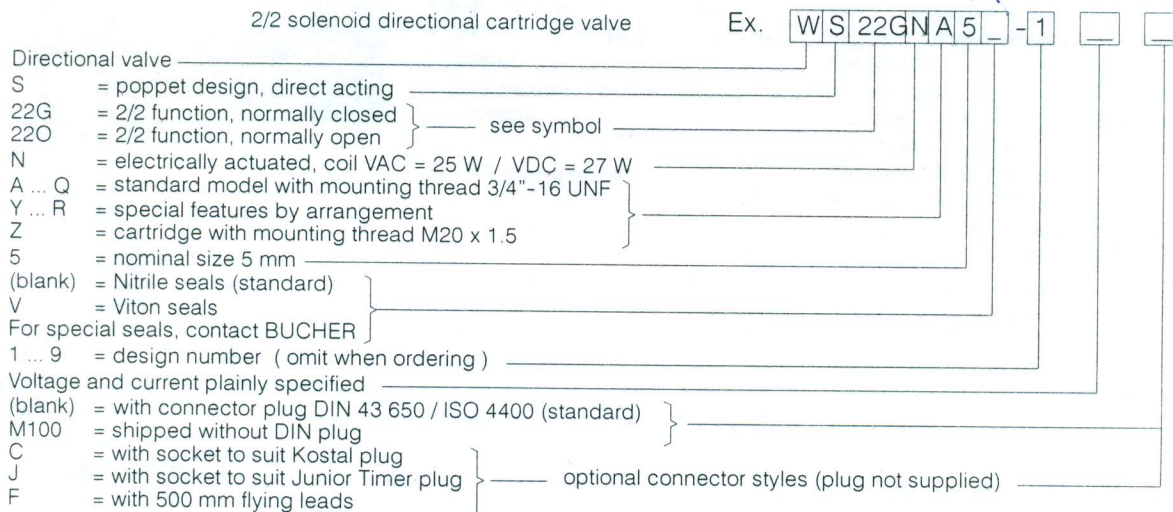
8. Reliability information

In accumulator systems, the user must ensure that the maximum flow rate of 30 l/min (25 l/min) is not exceeded in

either flow direction. In applications where the valve is subjected to long

dwell periods under pressure, please contact BUCHER.

9. Model code key



10. Related data sheets

| Old no. | New no. | |
|---------|----------------|---|
| W-2.140 | 400-P-120100-E | Solenoid directional cartridge valves, 5 mm (overview) |
| W-2.141 | 400-P-120110-E | Optional coils for solenoid operated directional valves |
| G-4.10 | 400-P-720101-E | Line mounting body, type GALA (G 3/8") |
| G-4.11 | 400-P-720105-E | Line mounting body, type GALMA (G 3/8") |
| i-32 | 400-P-040011-E | The Form Tools hire programme |
| i-33.10 | 400-P-040171-E | BUCHER cavity type AL |
| i-33.13 | 400-P-040201-E | BUCHER cavity type ALM |

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We reserve the right of modification without notice.

400-P-121100-E-0c/01.00