

# Directional valve 2-way/2-position

$Q_{\max} = 140 \text{ l/min}$ ,  $p_{\max} = 350 \text{ bar}$

switching solenoid, bidirectional, pilot operated, poppet type

Type series: WSVN220-10A...



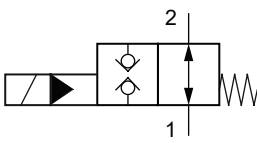
- Screw-in cartridge valve
- For cavity HA/C1220
- All external parts with zinc-nickel plating according to DIN EN ISO 19598
- Fits common cavity according to ISO
- Reliable switching, even after long dwell times
- No external pilot drain required
- Optional with manual override
- De-energized open
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope
- High pressure wet-armature solenoids
- Various plug-connector systems and voltages are available
- Installation in threaded port body type GHA-34

## Description

The 2-way/2-position solenoid-operated directional seat valves, series WSVN220..., are size 10 / SAE 12, two stage, pressure balanced screw-in valves with a 1 1/16-12 UN 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). All external parts of the screw-in valves are zinc-nickel plated and are thus suitable for use in the hars-

hest operating environments. The slip-on coils can be replaced without opening the hydraulic envelope and can be positioned at any angle through 360°. These 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. For self-assembly, please refer to the section related data sheets.

## Symbol



## Technical data

General characteristics	Description, value, unit
Function group	Directional valve
Function	2-way/2-position
Design	Screw-in cartridge valve
Controls	switching solenoid
Characteristic	bidirectional, pilot operated, poppet type
MTTFd value	150 years
Construction size	NG 10 / SAE 12
Thread size	1 1/16-12 UN-2A
Mounting attitude	unrestricted
Weight	0,6 kg
Cavity acc. ISO	fits into ISO 17209: 1 1/16-01-1-13
Cavity acc. factory standard	For cavity HA/C1220
Tightening torque steel	150 Nm
Tightening torque aluminium	150 Nm
Tightening torque tolerance	± 10 %
Minimum ambient temperature	- 30 °C
Maximum ambient temperature	+ 50 °C
Surface protection	All external parts with zinc-nickel plating according to DIN EN ISO 19598
Sealing material	see ordering code
Seal kit order number	NBR: DS-505-N / FKM: DS-505-V

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	350 bar
Maximum flow rate	140 l/min
Flow direction	see symbol
Hydraulic fluid	HL and HLP mineral oil according to DIN 51 524; other fluids on request!
Minimum fluid temperature	- 30 °C
Maximum fluid temperature	+ 80 °C
Viscosity range	10 ... 500 mm <sup>2</sup> /s (cSt)
Recommended viscosity range	15 ... 250 mm <sup>2</sup> /s (cSt)
Minimum fluid cleanliness (cleanliness class according to ISO 4406:1999)	class 20/18/15

Electric characteristics	Description, value, unit
Actuator type	solenoid coil
Solenoid coils type	D36
Supply voltage DC	12/24 V DC
Supply voltage AC	115/230 (50 ... 60 Hz) V AC
Supply voltage tolerance	± 10 %
Nominal power consumption	V DC = 27 W / V AC = 25 W
Switching time	Switching time measured at: $U_N$ ; $\Delta p = 280$ bar; $Q = 112$ l/min; $T_{Ambient} = 20$ °C; $\vartheta = 46$ mm <sup>2</sup> /s 1 to 2: 77 ms (energizing) 38 ms (de-energizing) 2 to 1: 96 ms (energizing) 33 ms (de-energizing)
Relative duty cycle	100 %
Electrical connection coil	several connection types available, see ordering code
Protection class solenoid coil to ISO 20 653 / EN 60 529	several classes of protection available, see ordering code (with appropriate mating connector and proper fitting and sealing)



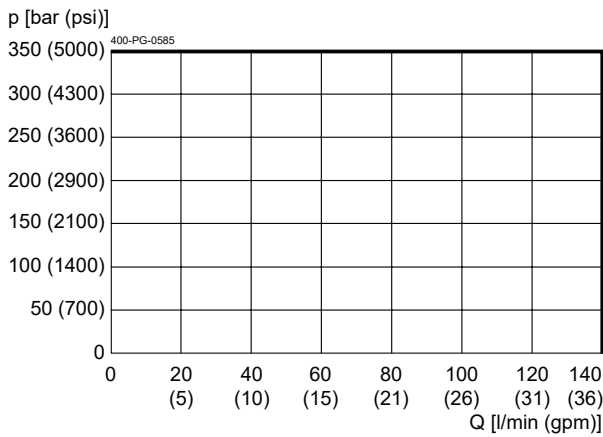
**NOTE!**

The switching time can be strongly dependent on flow rate, pressure, oil viscosity and the dwell time under pressure. In practice, the switching time may therefore deviate from the specified value range.

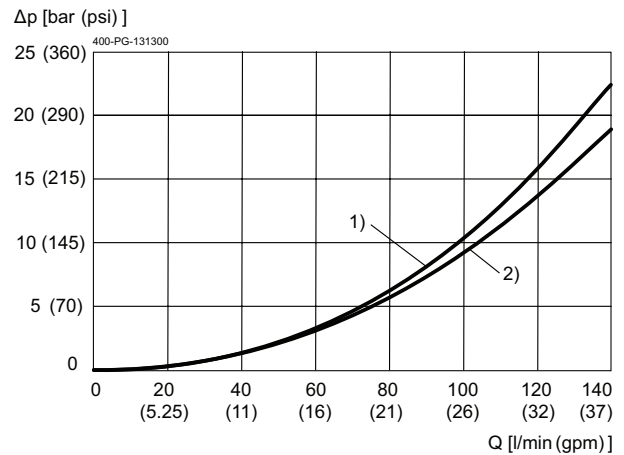
**Performance graphs**

measured with oil viscosity 33.0 mm<sup>2</sup>/s (cSt), coil at steady-state temperature and 10 % undervoltage

$p = f(Q)$  Performance limit



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

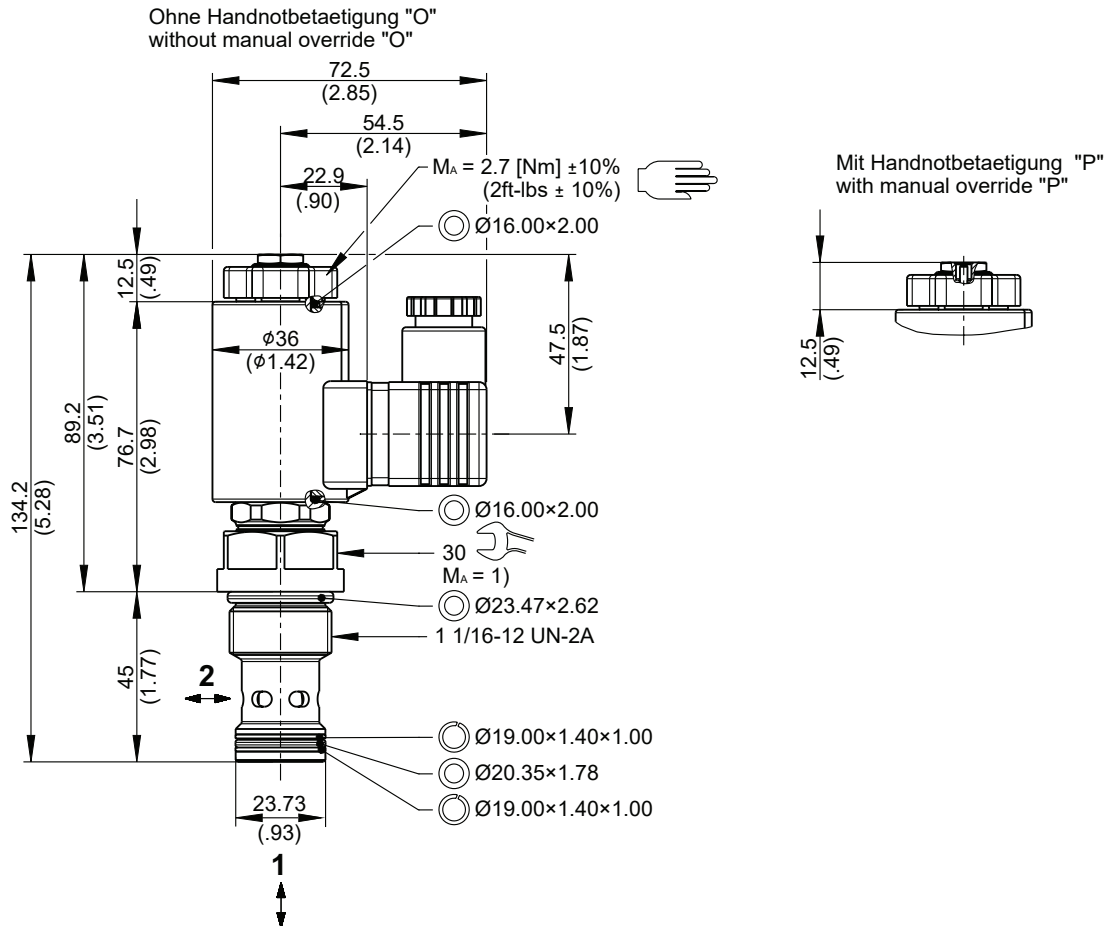


1) = 2→1  
2) = 1→2

## Dimensions and sectional view

**Beispiel für die Masseinheit:  
Example for the dimensional units:**

0.79 = 0.79 mm millimeter  
(.031) = 0.031" inch



## Installation information



### IMPORTANT!

1) When fitting the screw-in cartridge valve, use the specified tightening torque. The value can be found in the chapter "Technical data".



### 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.



### NOTE!

The seals are not available individually. The seal kit order number can be found in the chapter "Technical data".

## Ordering code

Ex. W S V N 22O - 10 A - O - N A 1 24 D \_

W	=	directional valve
S	=	bidirectional seat-valve shut-off, seated design
V	=	pilot operated
N	=	electrically operated, V DC = 27 W / V AC = 25 W
22O	=	2-way/2-position function, normally open
10	=	nominal size 10 / SAE 12
A	=	cavity type HA/C1220
O	=	without manual override ( <b>standard</b> )
P	=	with manual override
N	=	NBR (nitril-butadien-rubber / BUNA) seals ( <b>standard</b> )
V	=	FKM (fluorocarbon rubber / VITON) seals (special seals on request)
A ... Q	=	standard model according to valid data sheet
Z ... R	=	special model (on request)
1 ... 9	=	technical design no. (omit by ordering)
...	=	voltage e.g. 24 (24 V)
D	=	current DC
A	=	current AC
(blank)	=	DIN EN 175301-803 connection      3-pole 2 P+E ( <b>standard</b> )      (IP 65)      with mating plug
T	=	DIN EN 175301-803 connection      3-pole 2 P+E, with protection diode      (IP 65)      with mating plug
M100	=	DIN EN 175301-803 connection      3-pole 2 P+E      (IP 65)
J	=	Junior Timer plug connection      2-pole radial      (IP 65)
JT	=	Junior Timer plug connection      2-pole radial, with protection diode      (IP 65)
I	=	Junior Timer plug connection      2-pole axial      (IP 65)
IT	=	Junior Timer plug connection      2-pole axial, with protection diode      (IP 65)
D	=	Deutsch plug connection DT04-2P      2-pole 45°      (IP 67/69K)
DT	=	Deutsch plug connection DT04-2P      2-pole 45°, with protection diode      (IP 67/69K)

} mating plug not supplied

other plug-variants, please consult BUCHER.



### IMPORTANT!

Not every combination of voltage values, current type and plug connections available.

## Related data sheets

Reference	Description
400-P-040011	Form tools
400-P-065101	Cavity HA/C1220
400-P-740501	Threaded port body GHA-34...
400-P-120110	Solenoid coil D36
400-P-010101	MTTFD Values for Hydraulic Valves

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