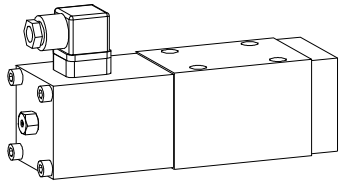
Solenoid operated spool valve
- **4/2-way impulse valve**
- **4/3-way with spring centred mid position**
- **4/2-way with spring reset**
- **Q_{max} = 100 l/min, p_{max} = 350 bar**

NG10
ISO 4401-05



DESCRIPTION
Spool valve in flange design NG10, interface to ISO 4401-03 with 4 ports. Solenoid to standard VDE 0580. Direct operated solenoid valve in 5 chamber design. Spool deteted or with spring reset. Wet pin type solenoid. Precise spool fit, low leakage, long life time. Threaded ports through additional base plate. Spool made from hardened steel, body from high quality cast steel. Wide range of standard and special voltages in 2 solenoid versions. The body made of high grade hydraulic casting for long service life is painted. The cover and the solenoid are zinc coated.

FUNCTION
The solenoid shifts the spool into the corresponding position.
• 4/2-way detented spool valve:
2 solenoids and 2 detented positions. With the solenoids deenergised the spool remains in the last switched position.
• 4/2-way spool valve:
1 solenoid and 2 spool positions, spring offset. With the solenoid deenergised the spool returns to the offset position.
• 4/3-way spool valve:
2 solenoids and 3 spool positions, spring centered. With the solenoids deenergised the spool returns to the center position.

APPLICATION
Solenoid operated spool valves are mainly used for controlling direction of movement and stopping of hydraulic cylinders and motors. Direction of movement depends on the position of spool and its flow symbol. Please pay attention to the performance limits and leakage of the valves. Solenoid operated spool valves are suitable for machine tools and handling systems.

CONTENT

GENERAL SPECIFICATIONS 1
HYDRAULIC SPECIFICATIONS 1
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TYPE LIST/
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TYPE CODE

A □ 4 □ - □ # □

International standard interface ISO

Medium-solenoid M
Super-solenoid S

Number of control ports

Description of symbol refer to table 1.2-71/2

Standard-Nominal voltage U_N:

12 VDC	G12
24 VDC	G24
110 VAC	R110
115 VAC	R115
230 VAC	R230

Design-Index (Subject to change)

GENERAL SPECIFICATIONS

Description	4/2-, 4/3-way spool valve
Nominal size	NG10 to ISO 4401-05
Construction	Direct operated spool valve
Operating method	Solenoid
Mounting	Flange 4 fixing holes for socket head cap screws M6x65
Connections	Threaded connection plates Multi-flange subplates Longitudinal stacking system
Ambient temperature	-20…+50° C
Mounting position	any, preferably horizontal
Fastening torque	M_D= 9,5 Nm (screw quality 8.8)
Weight: 4/2-way impuls	m = 6,0 kg
4/3-way	m = 6,0 kg
4/2-way (1 solenoid)	m = 4,5 kg

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, classe 20/18/14 (Required filtration grade ß 10…16≥75) refer to data sheet 1.0-50/2
Viscosity range	12 mm²/s…320 mm²/s
Fluid temperature	-20…+70°C
Operating pressure in port P, A, B	p_{max} = 350 bar
Tank pressure in port T	Medium: p_{max} = 160 bar Super: p_{max} = 200 bar
Max. volume flow	Q_{max} =100 l/min
Leakage volume flow	see characteristics

ELECTRICAL SPECIFICATIONS

Construction	Solenoid, wet pin push type, pressure tight
Standard-Nominal voltage	U_N = 12 VDC U_N = 24 VDC U_N = 110 VAC∗ U_N = 115 VAC∗ U_N = 230 VAC∗ AC = 50 to 60 Hz ∗ Rectifier integrated in the plug, other nominal voltages and nominal perfor-mances on request
Voltage tolerance	±10% of nominal voltage
Protection class	IP 65 to EN 60529
Relative duty factor	100% DF (see data sheet 1.1-430)
Switching cycles	15'000/h
Operating life	10^7 (number of switching cycles, theoretically)
Connection/Power supply	Over device plug connection to ISO 4400/ DIN 43650, (2P+E), other connections on request

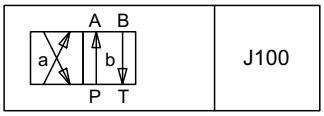
SOLENOID DESCRIPTION

With respect to the selection of the solenoid, the following statements are important:

- The solenoid is the most expensive component of the solenoid spool valve.
- For this reason, it is not economical to use the same solenoid for all applications.
- Depending on the application, sales area, and customer, the requirements for solenoid spool valves and solenoids differ very con-siderably.
- In order to be able to offer the customer an optimum, we can supply our solenoid spool valves NG10 in 2 different versions
  Solenoid:
  - Medium SIN60V (data sheet 1.1-145)
  - Super SIS60V (data sheet 1.1-150)

TYPE LIST / DESIGNATION OF SYMBOLS

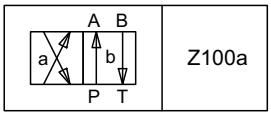
4/2-way valve impulse



J100

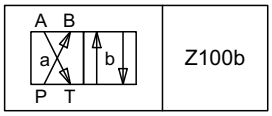
4/2-way valve with spring reset

operation A-side



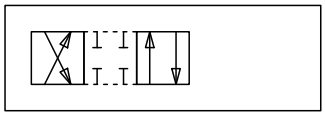
Z100a

operation B-side

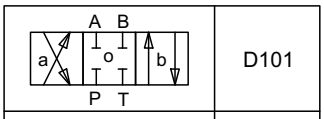
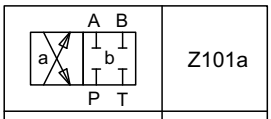
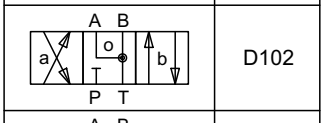
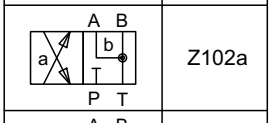
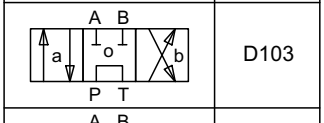
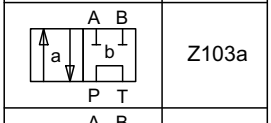
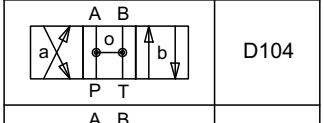
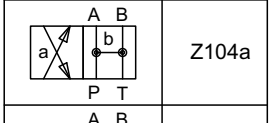
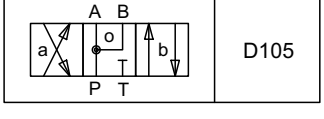
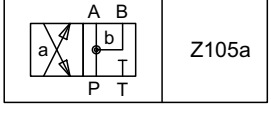


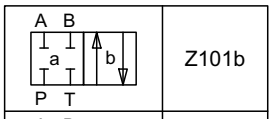
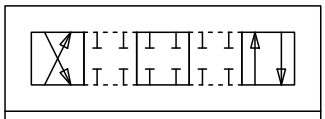
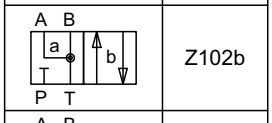
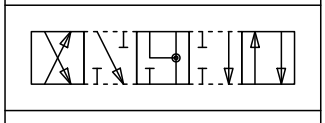
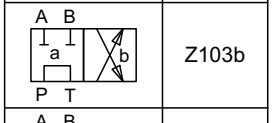
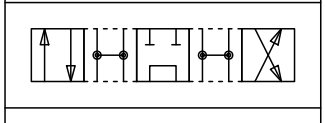
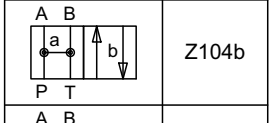
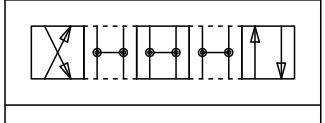
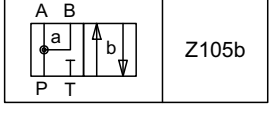
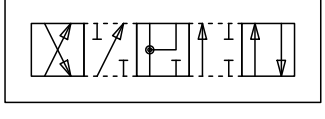
Z100b

Transitional functions



4/3-way valve spring centered

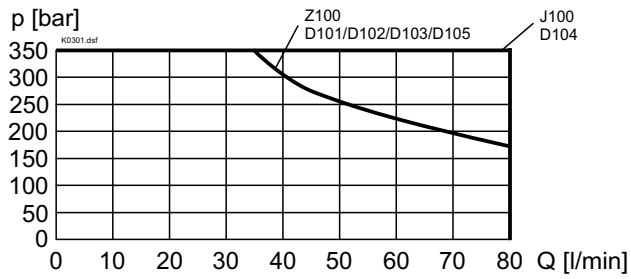
	D101		Z101a
	D102		Z102a
	D103		Z103a
	D104		Z104a
	D105		Z105a

	Z101b		
	Z102b		
	Z103b		
	Z104b		
	Z105b		

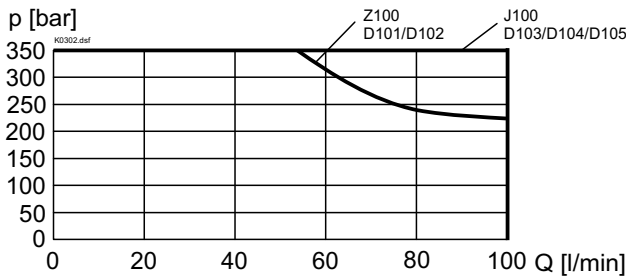
CHARACTERISTICS Oil viscosity υ = 30 mm²/s

p = f (Q) Performance limits with standard voltage -10%

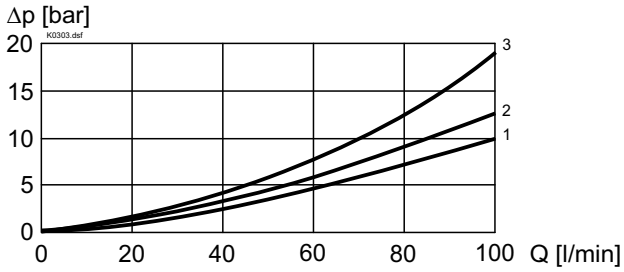
Medium



Super

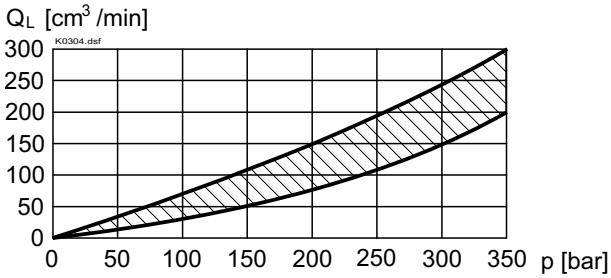


Δp = f (Q) Pressure drop volume flow characteristics



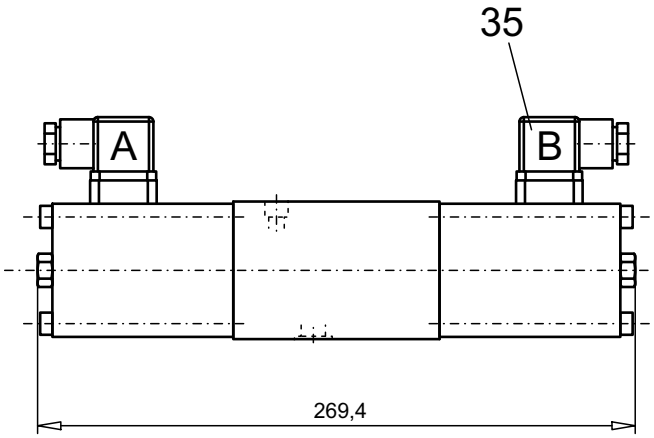
Symbol \ Pressure drop Curve no.	Volume flow direction P - A	P - B	P - T	A - T	B - T
Z100/J100	2	2	-	2	2
D101/Z101	2	2	-	2	2
D102/Z102	2	2	-	1	1
D103/Z103	2	2	3	2	2
D104/Z104	1	1	-	1	1
D105/Z105	1	1	-	2	2

Q_L = f (p) Leakage volume flow characteristics per control edge

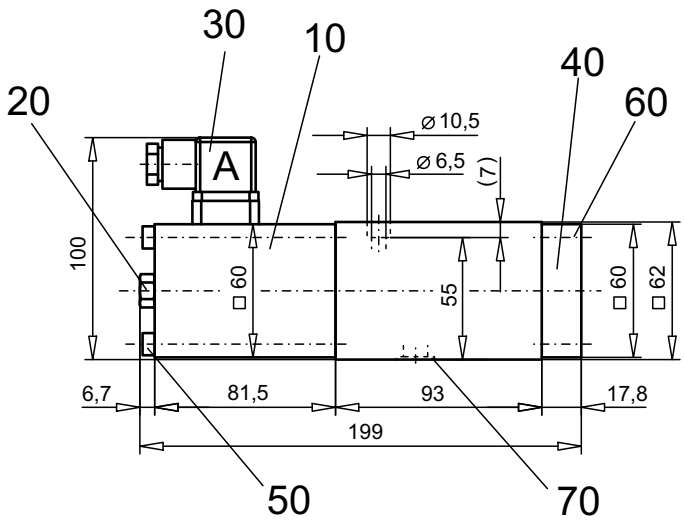


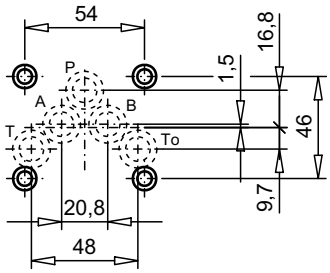
DIMENSIONS

4/3-way valve (spring centred)
4/2-way valve (impulse)



4/2-way valve (spring reset)





PARTS LIST

Position	Article	Description
10	260.8… 260.9…	Medium-solenoid SIN60V Super-solenoid SIS60V
20	253.8002	Plug with integrated manual override HB8,5
30	219.2001	Electric plug A (grey)
35	219.2002	Electric plug B (black)
40	059.2201 059.2203	Cover Medium Cover Super
50	246.3190	Socket head cap screw M6x90 DIN 912
60	246.3121	Socket head cap screw M6x20 DIN 912
70	160.2140	O-ring ID 14,00x1,78

ACCESSORIES

Threaded connecting plates, Multi-flange subplates and Longitudinal stacking system see Reg. 2.9

Technical explanation see data sheet 1.0-100E