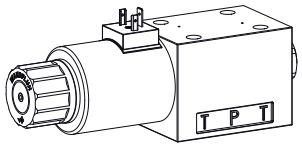
Solenoid operated spool valve
- **4/2-way impulse valve**
- **4/3-way with spring centred mid position**
- **4/2-way with spring reset**
- **Q_{max} = 160 l/min, p_{max} = 350 bar**

NG10
ISO 4401-05



DESCRIPTION
Direct operated solenoid valve with 4 ports in 5 chamber design. Spool deteted or with spring reset. 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.
The body made of high grade hydraulic casting for long service life is painted. The armature tube and the plug crew are zinc coated. The solenoid coil is zinc- / nickel-coated.

FUNCTION
• 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
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.

TYPE CODE

W D M F A10 - [ ] - [ ] / W [ ] - [ ] [ ] # [ ]

Spool valve, direct operated		
Medium-slip-on coil		
Flange construction		
International standard interface ISO, NG10		
Description of symbols acc. to table		
Nominal voltage U_N	12 VDC	G12
	24 VDC	G24
	without solenoid coil	X5
Slip-on coil	Metal housing round	W
Electric connection	Connector socket EN 175301 - 803 / ISO4400	D
	Connector socket AMP Junior-Timer	J (only for $U_N \leq 75$ VDC)
	Connector Deutsch DT04 - 2P	G (only for $U_N \leq 75$ VDC)
Sealing material	NBR	
	FKM (Viton)	D1
Manual override	Integrated	
	Push-button	HF1
	Spindle	HS1
Design-Index (Subject to change)		

GENERAL SPECIFICATIONS

Description	4/2-, 4/3-spool valve
Nominal size	NG10 to ISO 4401-05 / 7790
Construction	Direct operated spool valve
Operation	Solenoid
Mounting	Flange 4 fixing holes for socket head screws M6x70
Connections	Threaded connection plates Multi-flange subplates Longitudinal stacking system

Ambient temperature	-20…+70 °C if > +50 °C, then voltage tolerance 0 / -10%
Mounting position	any, preferably horizontal
Fastening torque	M_D = 9,5 Nm (screw quality 8.8) for fixing screws M_D = 5 Nm for knurled nut

Weight	
4/2-way impulse	m = 5,9 kg
4/3-way	m = 5,9 kg
4/2-way (1 solenoid)	m = 4,4 kg

ELECTRICAL CONTROL

Construction	Solenoid, wet pin push type, pressure tight
Standard-nominal voltage	U_N = 12 VDC U_N = 24 VDC Other nominal voltages and nominal performances on request
Voltage tolerance	±10% of nominal voltage
Protection class to EN 60 529	Connection version D: IP 65 J: IP 66 only for $U_N \leq 75$ VDC G: IP 67 and 69K only for $U_N \leq 75$ VDC
Relative duty factor	100% DF (see data sheet 1.1-430)
Switching cycles	6 000/h
Operating life	10^7 (number of switching cycles, theoretically)
Connection/Power supply	Over device plug connection
Coil versions:	W.E64 / 31 x 72 (data sheet 1.1-190)

Other electrical specifications see data sheet 1.1-190

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, classe 20/18/14 (refer to data sheet ß10…16≥75) see data sheet 1.0-50/2
Viscosity range	12 mm²/s…320 mm²/s
Fluid temperature	-20…+70°C
Working pressure in port P, A, B	p_{max} = 350 bar
Tank pressure in port T	$p_{T\,max}$ = 160 bar
Max. volume flow	Q_{max} = 160 l/min, see characteristics
Leakage volume flow	see characteristics

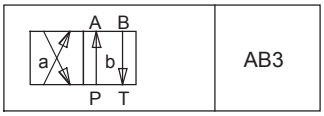
MANUAL OVERRIDE

- Integrated (–) Actuation pin integrated in the armature tube.
- Push-button (HF1) integrated in the knurled nut.
  Actuation by pressing the pin
- Spindle (HS1) integrated in the knurled nut.
  Actuation by turning the spindle (infinitely variable valve actuation)

NOTE!
The actuation of the manual override is possible up to a tank pressure of:
40 bar Integrated (-)
40 bar Push-button (HF1)
160 bar Spindle (HS1)

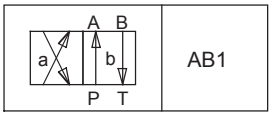
TYPE LIST / DESIGNATION OF SYMBOLS

4/2-way valve impulse



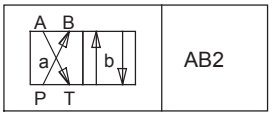
AB3

4/2-way valve with spring reset
operation A-side



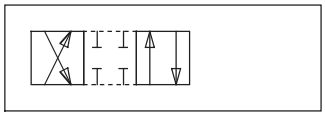
AB1

operation B-side

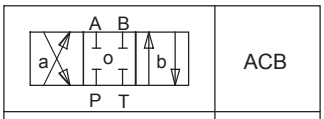


AB2

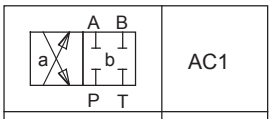
Transitional functions



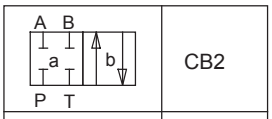
4/3-way valve spring centered



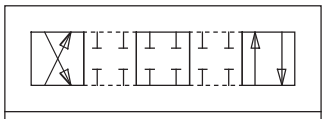
ACB

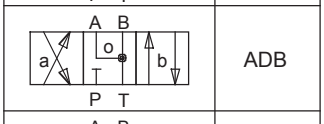


AC1

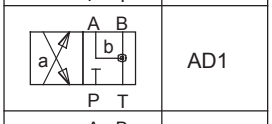


CB2

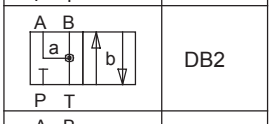




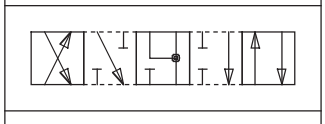
ADB

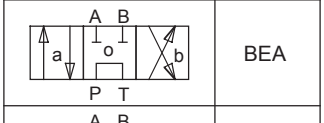


AD1

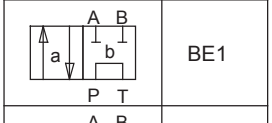


DB2

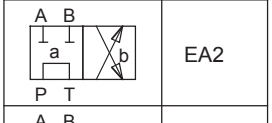




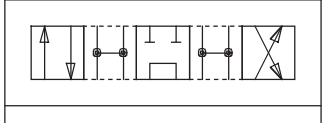
BEA

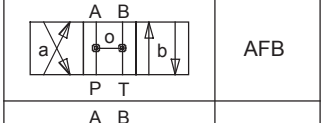


BE1

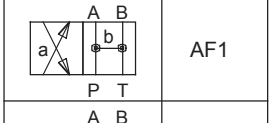


EA2

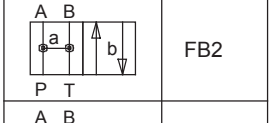




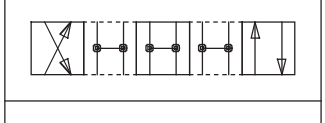
AFB

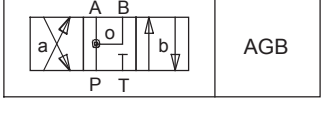


AF1

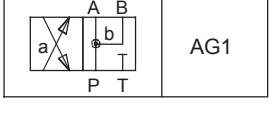


FB2

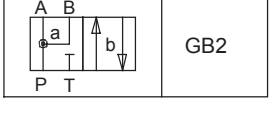




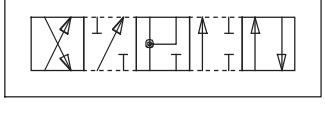
AGB



AG1

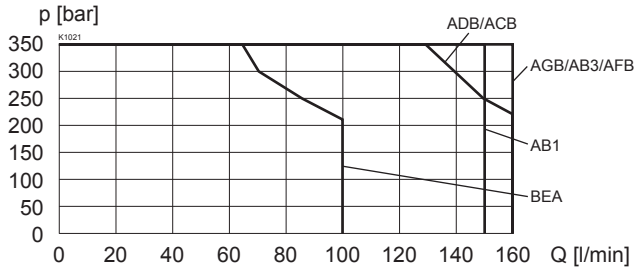


GB2

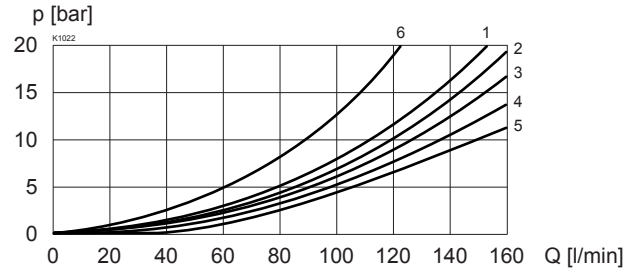


CHARACTERSISTICS Oil viscosity υ = 30 mm²/s

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

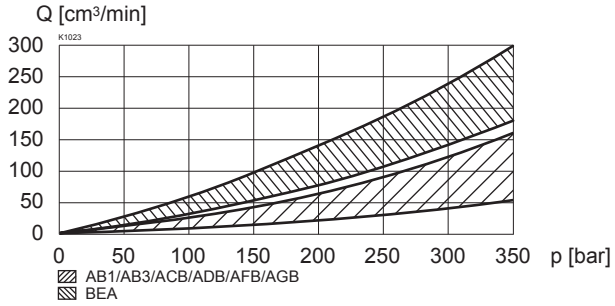


Δp = f (Q) Pressure drop volume flow characteristics



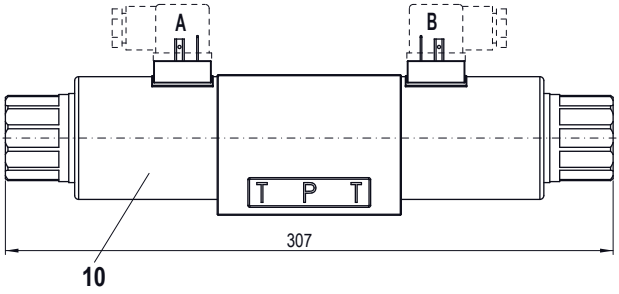
Pressure drop / Curve no. / Symbol	Volume flow direction P - A	P - B	P - T	A - T	B - T
AB1	2	2	–	4	4
AB3	2	2	–	4	4
ACB	2	2	–	2	2
ADB	1	1	–	5	5
BEA	3	3	6	4	4
AFB	4	4	5	5	5
AGB	4	4	–	2	2

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

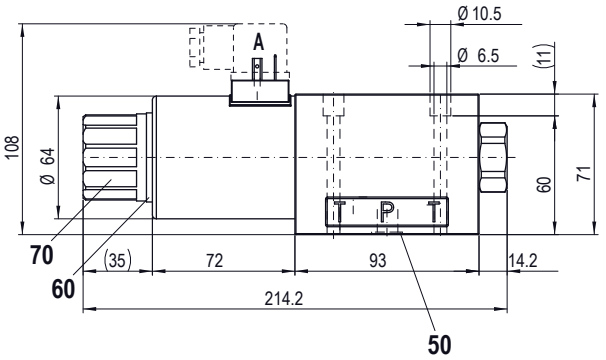


DIMENSIONS

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



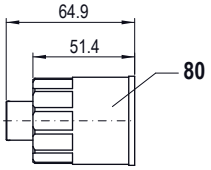
4/2-way valve (spring reset)

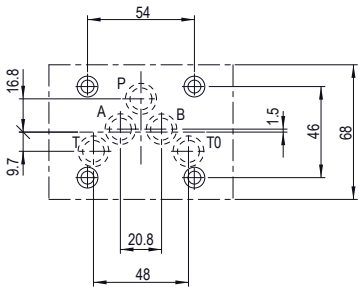


PARTS LIST

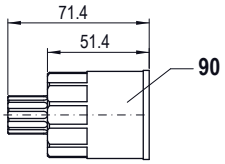
Position	Article	Description
10	206.3...	W.E64/31x72
50	160.2120 160 8124	O-ring ID 12,42x1,78 (NBR) O-ring ID 12,42x1,78 (FKM)
60	160.2282	O-ring ID 28,24x2,62 (NBR)
70	154.2706	Knurled nut
80	253.7006	Push-button
90	253.7005	Spindle

HF1





HS1



ACCESSORIES

Threaded connecting plates, Multi-flange subplates and Longitudinal stacking system — see Reg. 2.9
Mating connector (A) EN175301-803 — article no. 219.2001
Mating connector (B) EN 175301-803 — article no. 219.2002

Technical explanation see data sheet 1.0-100