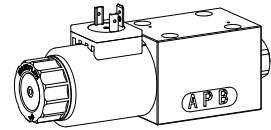


Solenoid operated spool valve

- 4/2-way impulse valve
- 4/3-way with spring centred mid position
- 4/2-way with spring reset
- $Q_{max} = 80 \text{ l/min}$, $p_{max} = 350 \text{ bar}$

NG6
 ISO 4401-03


DESCRIPTION

Direct operated solenoid valve with 4 ports in 5 chamber design. Spool detented 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. Wide range of standard and special voltages. 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 nickel-/chromium-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 off-set. 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.

TYPE CODE

		W	D	M	F	A06	-	-	/	-	#
Spool valve, direct operated											
Medium-slip-on coil											
Flange construction											
International standard interface ISO, NG6											
Description of symbols acc. to table											
Nominal voltage U_N	12 VDC										
	24 VDC										
	115 VAC										
	230 VAC										
	without solenoid coil										
Slip-on coil	Metal housing round										
	Metal housing square										
Electric connection	Connector socket EN 175301 - 803/ISO4400										
	Connector socket AMP Junior-Timer										
	Connector Deutsch DT04 - 2P										
Sealing material	NBR										
	FKM (Viton)										
Manual override	Integrated										
	Push-button										
	Spindle										
Design-Index (Subject to change)											

* Only available in conjunction with other nominal voltages and connection versions. (See data sheet 1.1-181)

GENERAL SPECIFICATIONS

Description	4/2-, 4/3-spool valve	Ambient temperature	-20...+70 °C (slip-on coil «W») if > +50 °C, then voltage tolerance 0 / -10%
Nominal size	NG6 to ISO 4401-03/7790	Mounting position	any, preferably horizontal
Construction	Direct operated spool valve	Fastening torque	$M_D = 5,5 \text{ Nm}$ (screw quality 8.8) for fixing screws $M_D = 7 \text{ Nm}$ for knurled nut
Operation	Solenoid		
Mounting	Flange 4 fixing holes for socket head screws M5x50		
Connections	Threaded connection plates Multi-flange subplates Longitudinal stacking system		

Weight	
4/2-way impulse	m = 2,0 kg
4/3-way	m = 2,0 kg
4/2-way (1 solenoid)	m = 1,5 kg

ELECTRICAL CONTROL

Construction	Solenoid, wet pin push type, pressure tight
Standard-nominal voltage	$U_N = 12 \text{ VDC}$ $U_N = 24 \text{ VDC}$ $U_N = 115 \text{ VAC}^*$ $U_N = 230 \text{ VAC}^*$ $AC = 50 \text{ bis } 60 \text{ Hz}$ *Rectifier integrated in the coil, other nominal voltages and nominal performances on request
Voltage tolerance	$\pm 10\%$ of nominal voltage
Protection class	Connection version
to EN 60 529	D: IP 65 J: IP 66 only for $U_N \leq 75 \text{ VDC}$ G: IP 67 and 69K only for $U_N \leq 75 \text{ VDC}$
Relative duty factor	100% DF (see data sheet 1.1-430)
Switching cycles	15000/h
Operating life	10^7 (number of switching cycles, theoretically)
Connection/Power supply	Over device plug connection
Coil versions:	W.E45/23x50 (data sheet 1.1-182)

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, classe 20/18/14 (refer to data sheet B10...16 \geq 75) refer to data sheet 1.0-50/2
Viscosity range	12 mm ² /s...320 mm ² /s
Fluid temperature	-20...+70°C
Working pressure in port P, A, B	$p_{max} = 350 \text{ bar}$
Tank pressure in port T	$p_{Tmax} = 200 \text{ bar}$
Max. volume flow	$Q_{max} = 80 \text{ l/min}$, see characteristics
Leakage volume flow	see characteristics

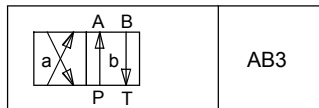
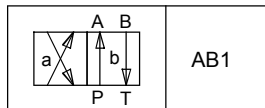
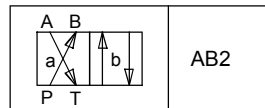
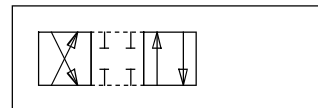
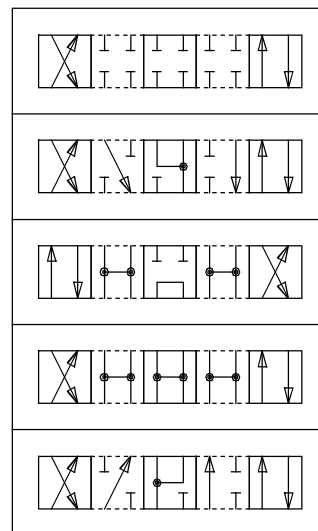
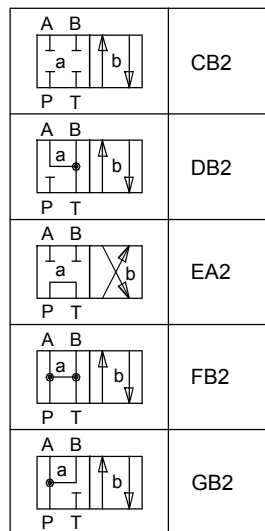
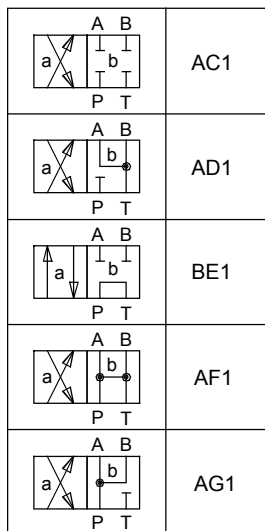
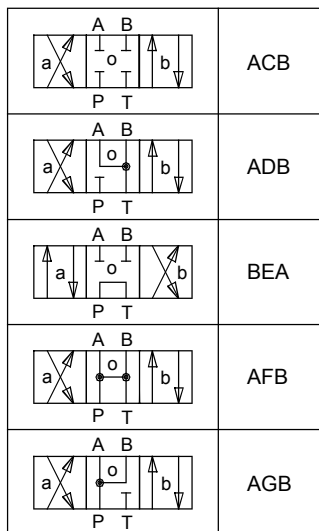
Other electrical specifications see data sheet 1.1-182 (W)
1.1-181 (M)

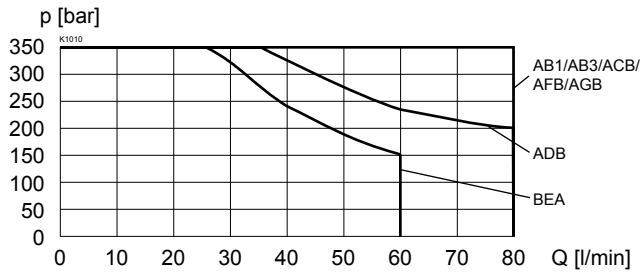
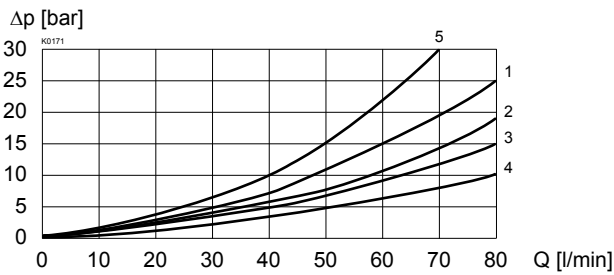
MANUAL OVERRIDE

- 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)

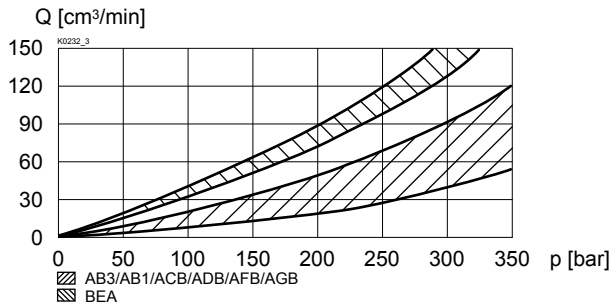

NOTE!

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

TYPE LIST / DESIGNATION OF SYMBOLS
4/2-way valve impulse

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

operation B-side

Transitional functions

4/3-way valve spring centered


CHARACTERISTICS Oil viscosity $\nu = 30 \text{ mm}^2/\text{s}$
 $p = f(Q)$ Performance limits
 with standard voltage -10%

 $\Delta p = f(Q)$ Pressure drop volume flow characteristics


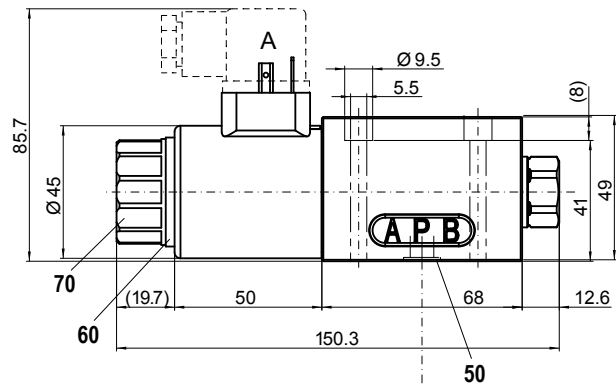
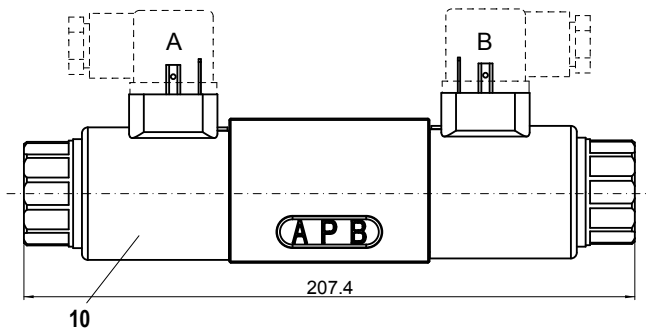
Symbol	Pressure drop Curve no.	Volume flow direction				
		P - A	P - B	P - T	A - T	B - T
AB1/AB2/AB3	2	2	2	-	1	1
ACB/AC1/CB2	2	2	2	-	1	1
ADB/AD1/DB2	2	2	2	-	3	3
BEA/BE1/EA2	2	2	2	5	2	2
AFB/AF1/FB2	4	4	4	-	3	3
AGB/AG1/GB2	4	4	4	-	1	1

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


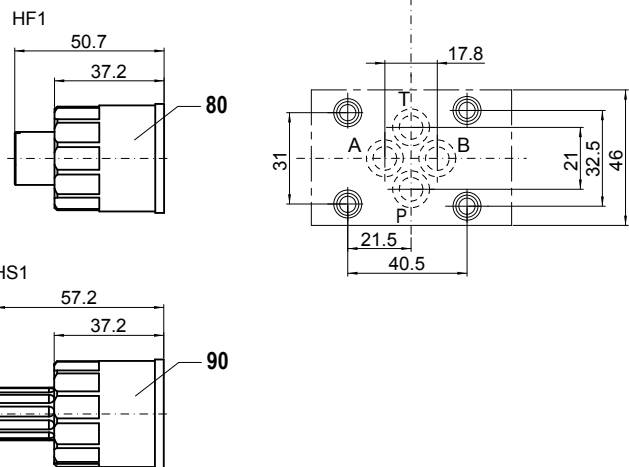
DIMENSIONS

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

4/2-way valve (spring reset)


PARTS LIST

Position	Article	Description
10	206.1...	W.E45/23x50
50	160.2093	O-ring ID 9,25x1,78 (NBR)
	160.6092	O-ring ID 9,25x1,78 (FKM)
60	160.2222	O-ring ID 22,22x2,62 (NBR)
70	154.2701	Knurled nut
80	253.7004	Push-button
90	253.7002	Spindle


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