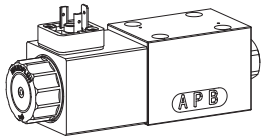
Solenoid operated spool valve

Flange construction

- 4/3-way with spring centred mid position
- 4/2-way with spring reset
- Q_{max} = 80 l/min
- p_{max} = 350 bar

NG6
ISO 4401-03



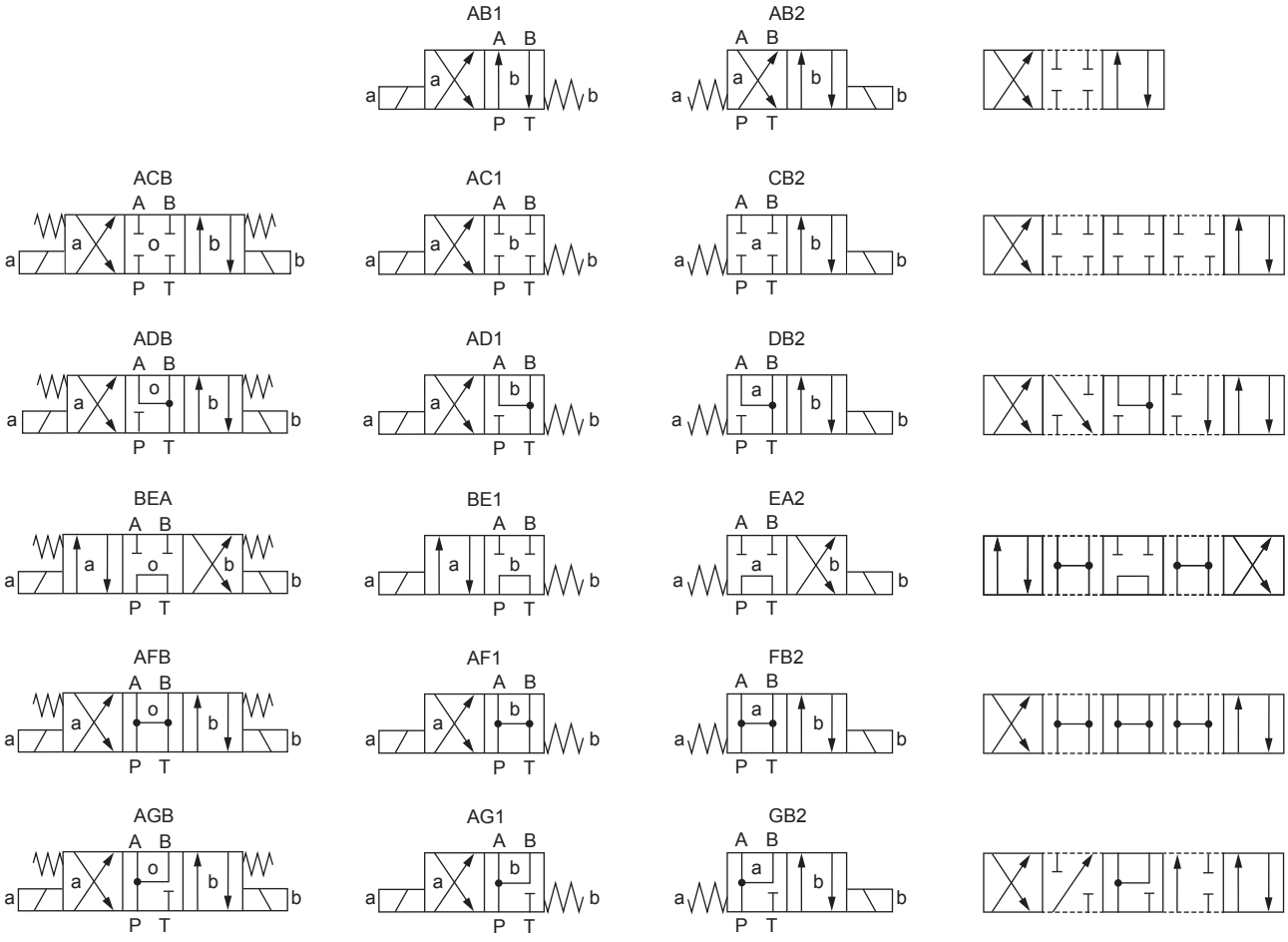
DESCRIPTION

Direct operated solenoid spool valve with 4 connections in 5 chamber design. With the solenoids deenergised, the spool is held in the center position by the spring (4/3), or switched back to the offset position (4/2). Precise spool fit, low leakage, long service life time. Spool made from hardened steel, body from high quality hydraulic cast steel. Wide range of standard and special voltages.

APPLICATION

Spool valves are mainly used for controlling direction of movement and stopping of hydraulic cylinders and motors. The direction of movement is determined by the position of the spool and its symbol. Switching performance limits and leakage of the valves must be taken into account when designing the system. Solenoid operated spool valves are suitable for machine tools and handling systems of any kind.

SYMBOL



TYPE CODE

W D M F A06 - [ ] - [ ] / L8 / M [ ] - [ ] [ ] # [ ]

Spool valve, direct operated					
Slip-on coil, Medium					
Flange construction					
International standard interface ISO, NG6					
Designation of symbols acc. to table					
Nominal voltage U_N	12 VDC	G12	115 VAC	R115	
	24 VDC	G24	230 VAC	R230	
Nominal power P_N	8 Watt				
Slip-on coil	Metal housing, square				
Connection execution	Connector socketl EN 175301-803 / ISO 4400	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)					

1.2-60

GENERAL SPECIFICATIONS

Designation	4/2-, 4/3-spool valve
Construction	Direct operated
Mounting	Flange construction
Nominal size	NG6 according to ISO 4401-03
Actuation	Switching solenoid
Ambient temperature	-25…+70 °C (NBR) -20…+70 °C (FKM) if > +50 °C, then no undervoltage is admissible
Weight	1.70 kg (1 solenoid) 2.50 kg (2 solenoids)
MTTFd	150 years

ACTUATION

Actuation	Switching solenoid, wet pin push type, pressure tight
Execution	M.S45 / 23 x 50 (Data sheet 1.1-181)
Connection	Connector socket EN 175301 – 803 Connector socket AMP Junior-Timer Connector Deutsch DT04 - 2P

INSTALLATION NOTES

Mounting type	Flange mounting 4 fixing holes for socket head screws M5 x 50
Mounting position	Any, preferably horizontal
Tightening torque	M_D = 5,2 Nm (screw quality 8.8, zinc coated) Fixing screws M_D = 7 Nm knurled nut

Note! The length of the fixing screw depends on the base material of the connection element.

ACCESSORIES

Mating connector grey (A)	Article no. 219.2001
Mating connector black (B)	Article no. 219.2002
Mounting screws	Data sheet 1.0-60
Threaded subplates	Data sheet 2.9-30
Multi-station subplates	Data sheet 2.9-60
Horizontal mounting blocks	Data sheet 2.9-100
Technical explanations	Data sheet 1.0-100
Hydraulic fluids	Data sheet 1.0-50
Filtration	Data sheet 1.0-50
Relative duty factor	Data sheet 1.1-430

ELECTRICAL SPECIFICATIONS

Protection class	Connection execution D: IP65 Connection execution J: IP66 Connection execution G: IP67 and IP69K
Relative duty factor	100 % DF
Switching frequency	15'000 / h
Service life time	10^7 (number of switching cycles, theoretically)
Voltage tolerance	± 10 % with regard to nominal voltage
Standard nominal power	12 VDC, 24VDC, 115 VAC, 230 VAC AC = 50 to 60 Hz, rectifier integrated in the connector socket

Note! Other electrical specifications see data sheet 1.1-181

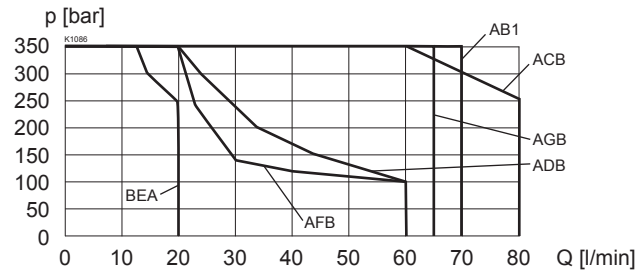
HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 350 bar
Tank pressure	p_{Tmax} = 200 bar
Maximum volume flow	Q_{max} = 80 l/min, see characteristics
Leakage volume flow	See characteristics
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm²/s…320 mm²/s
Temperature range fluid	-20…+70 °C
Contamination efficiency	Class 20 / 18 / 14
Filtration	Required filtration grade ß 10…16 ≥ 75, see data sheet 1.0-50

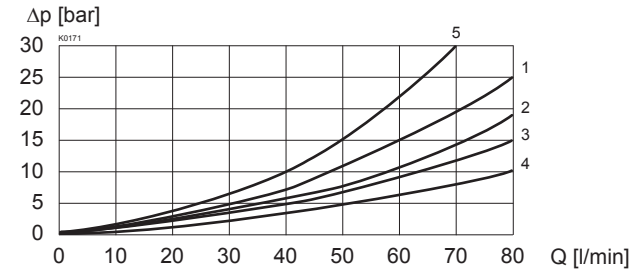
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

p = f (Q) **Performance limits**
Measured with nominal voltage -10 %

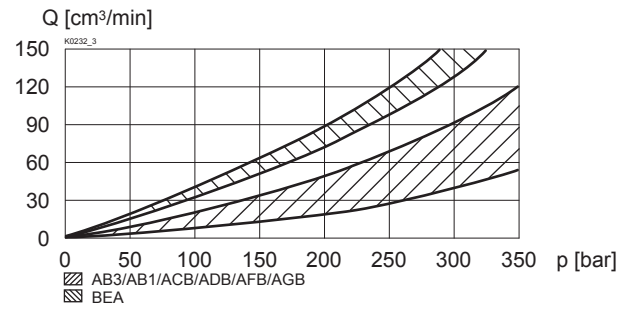


Δp = f (Q) **Pressure drop volume flow characteristics**
Economy / Medium



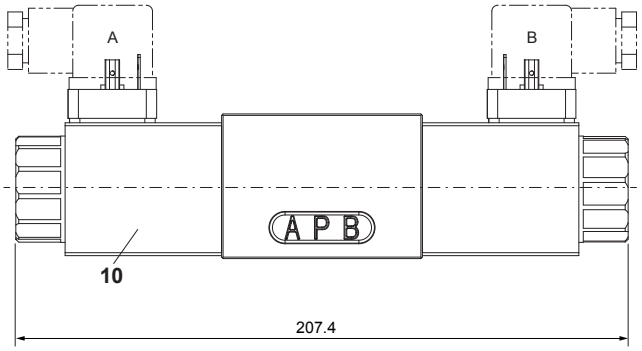
	Volume flow direction				
Symbol	P - A	P - B	P - T	A - T	B - T
AB1 / AB2	2	2	-	1	1
ACB / AC1 / CB2	2	2	-	1	1
ADB / AD1 / DB2	2	2	-	3	3
BEA / BE1 / EA2	2	2	5	2	2
AFB / AF1 / FB2	4	4	-	3	3
AGB / AG1 / GB2	4	4	-	1	1

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

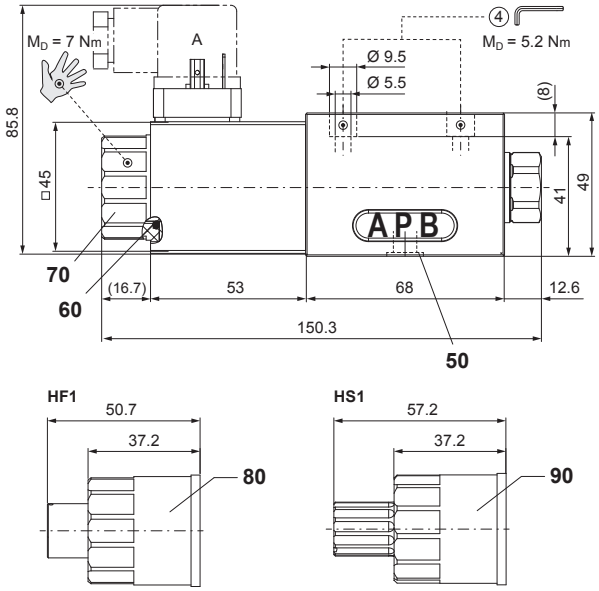


DIMENSIONS

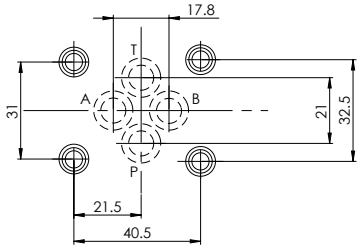
4/3-way valve (spring centred)



4/2-way valve (spring reset)



HYDRAULIC CONNECTION



PARTS LIST

Position	Article	Description
10	206.7...	M.S45 / 23 x 50
50	160.2093	O-ring ID 9.25 x 1.78 (NBR)
	160.6092	O-ring ID 9.25 x 1.78 (FKM)
60	160.2222	O-ring ID 22.22 x 2.62 (NBR)
70	154.2701	Knurled nut
80	253.7004	Push-button
90	253.7002	Spindle

MANUAL OVERRIDE

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

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

SURFACE TREATMENT

- The valve body is painted with a two component paint
- The screw plug is zinc coated
- The slip-on coil and the armature tube are zinc-nickel coated

STANDARDS

Mounting interface	ISO 4401-03
Solenoids	DIN VDE 0580
Connection execution D	EN 175301 – 803
Protection class	EN 60 529
Contamination efficiency	ISO 4406

SEALING MATERIAL

NBR or FKM (Viton) as standard, choice in the type code

Wandfluh AG Postfach CH-3714 Frutigen
Tel. 033 672 72 72 Fax 033 672 72 12 sales@wandfluh.com