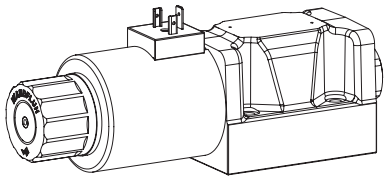
Proportional spool valve

Flange construction

- Q_{max} = 100 l/min
- $Q_{N\,max}$ = 65 l/min
- p_{max} = 350 bar

NG10
ISO 4401-05



DESCRIPTION

Direct operated proportional spool valve with 4 connections in 5-chamber system. Precise spool fit, low leakage, long service life time. The volume flow adjustment takes place by a Wandfluh proportional solenoid. Proportional to the solenoid current, the spool stroke, the spool opening and the valve volume flow increase. For the control, Wandfluh proportional amplifiers are available (see register 1.13).

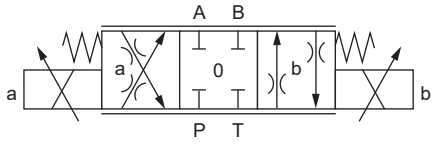
APPLICATION

Proportional spool valves are perfectly suitable for demanding tasks due to the high resolution, large volume flow and low hysteresis. The applications are in the industry as well as in the mobile hydraulics for the smooth control of hydraulic actuators. Some examples: control of the rotor blades of wind generators, forestry and earth moving machines, machine tools and paper production machines, simple position controls, robotics and fan control.

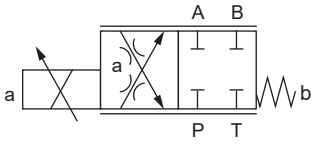
SYMBOL

Symmetrical control

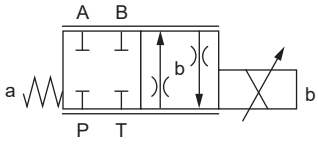
ACB-S



AC1-S

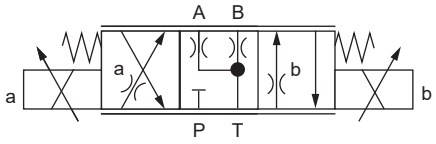


CB2-S

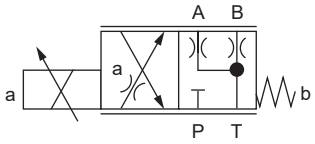


Meter-in control

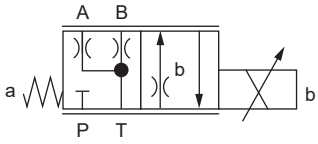
ADB-V



AD1-V



DB2-V



GENERAL SPECIFICATIONS

Designation	Proportional spool valve
Construction	Direct operated
Mounting	Flange construction
Nominal size	NG10 according to ISO 4401-05
Actuation	Proportional solenoid
Ambient temperature	-25…+70 °C if >50 °C, I_G is only conditionally achievable
Weight	3,9 kg (1 solenoid) 5,4 kg (2 solenoids)

HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 350 bar
Tank pressure	$p_{T\,max}$ = 160 bar
Maximum volume flow	Q_{max} = 100 l/min, see characteristics
Nominal volume flow	$Q_{N\,max}$ = 65 l/min
Leakage oil	see characteristics
Hysteresis	≤ 7 % at optimal dither signal
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm²/s…320 mm²/s
Temperature range fluid	-25…+70 °C (NBR) -20…+70 °C (FKM)
Contamination efficiency	Class 18 / 16 / 13
Filtration	Required filtration grade ß 6…10 ≥ 75, see data sheet 1.0-50

TYPE CODE

W D P F A10 - [ ] - [ ] - 65 - [ ] / [ ] [ ] - [ ] [ ] # [ ]

Spool valve		
Directly operated		
Proportional		
Flange construction		
International standard interface ISO, NG10		
Designation of symbols acc. to table		
Nominal volume flow rate Q_N	65 l/min	
Nominal voltage U_N	12 VDC	G12
	24 VDC	G24
	without coil	X5
Slip-on coil	Metal housing, round	W
	Metal housing, square	M
Connection execution	Connector socket EN 175301-803 / ISO 4400	D
	Connector socket AMP Junior-Timer	J
	Connector Deutsch DT04-2P	G
Sealing material	NBR	
	FKM (Viton)	D1
Manual override	Integrated	
	Push-button	HF1
	Spindle	HS1
Design index (subject to change)		

1.10-3400

ELECTRICAL SPECIFICATIONS

Protection class	Connection execution D: IP65 Connection execution J: IP66 Connection execution G: IP67 and IP69K
Relative duty factor	100 % DF
Standard nominal voltage	12 VDC, 24 VDC
Limiting current at 50 °C	I_G = 2255 mA (U_N = 12VDC) I_G = 1105 mA (U_N = 24VDC)

Note! Other electrical specifications see data sheet 1.1-190 (slip-on coil W) and 1.1-193 (slip-on coil M)

INSTALLATION NOTES

Mounting type	Flange mounting 4 fixing holes for socket head screws M6 x 40
Mounting position	Any, preferably horizontal
Tightening torque	Fixing screw M_D = 10,5 Nm ± 10 % (screw quality 8.8, zinc coated) max. tank pressure 80 bar M_D = 13,5 Nm ± 10 % (screw quality 10.9, zinc coated) Knurled nut M_D = 5 Nm

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

STANDARDS

Mounting interface	ISO 4401-05
Solenoids	DIN VDE 0580
Connection execution D	EN 175301 – 803
Protection class	EN 60 529
Contamination efficiency	ISO 4406

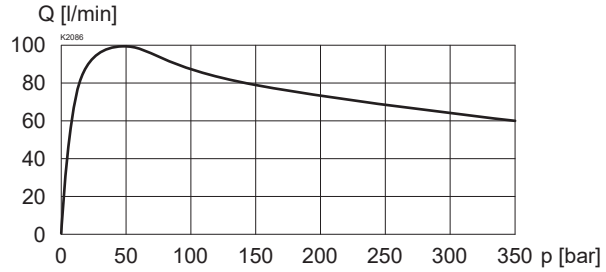
ACTUATION

Actuation	Switching solenoid, wet pin push type, pressure tight
Execution	W.E64 / 31 x 72 (Data sheet 1.1-190) M.A60 / 31 x 72 (Data sheet 1.1-193)
Connection	Connector socket EN 175301 – 803 Connector socket AMP Junior-Timer Connector Deutsch DT04 – 2P

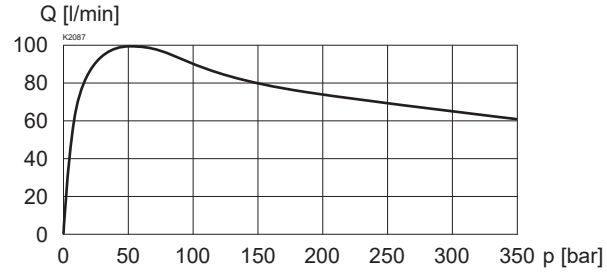
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

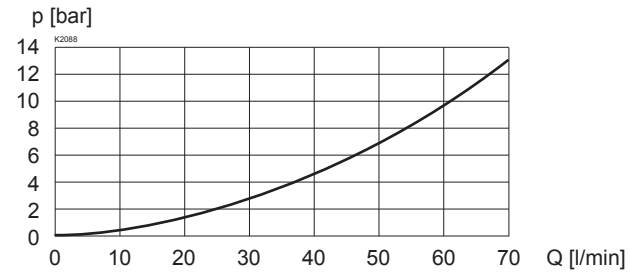
Q = f (p) — **Volume flow pressure characteristics**
$I = I_G$
ACB-S, AC1-S, CB2-S



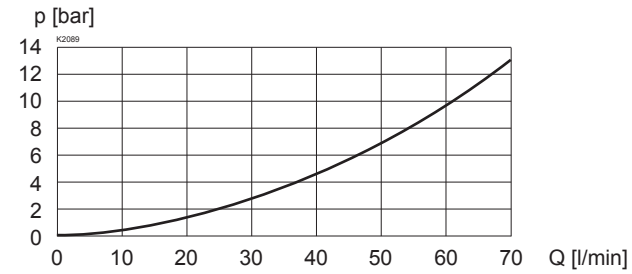
Q = f (p) — **Volume flow pressure characteristics**
$I = I_G$
ADB-V, AD1-V, DB2-V



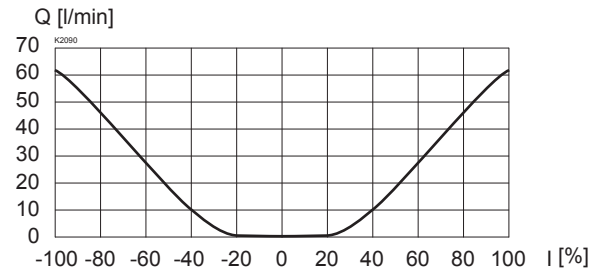
Δp = f (Q) — **Pressure drop volume flow characteristics**
$I = I_G$
ACB-S, AC1-S, CB2-S



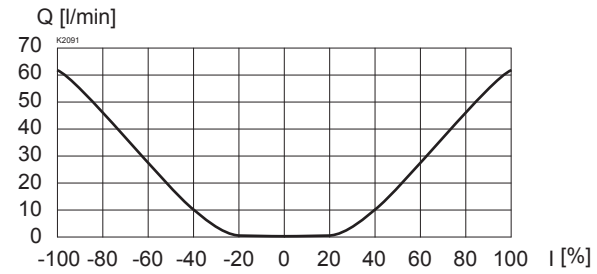
Δp = f (Q) — **Pressure drop volume flow characteristics**
$I = I_G$
ADB-V, AD1-V, DB2-V



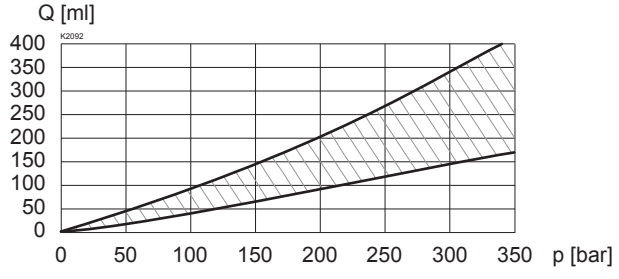
Q = f (I) — **Volume flow adjustment characteristics**
Δp = 10 bar
ACB-S, AC1-S, CB2-S



Q = f (I) — **Volume flow adjustment characteristics**
Δp = 10 bar
ADB-V, AD1-V, DB2-V



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

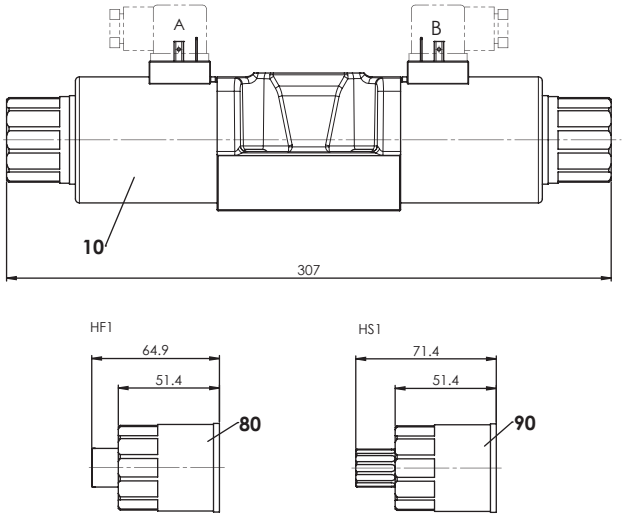


Note!

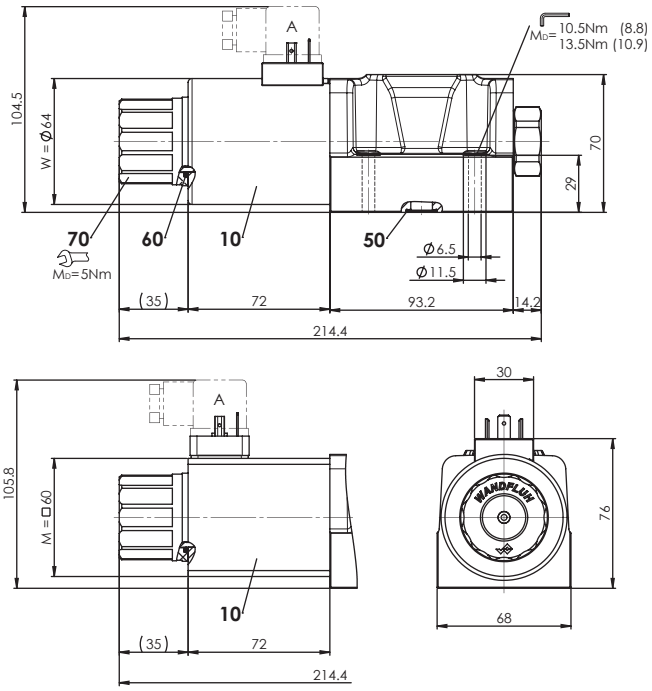
All values were measured over two control edges. The connections A and B were short-circuited.

DIMENSIONS

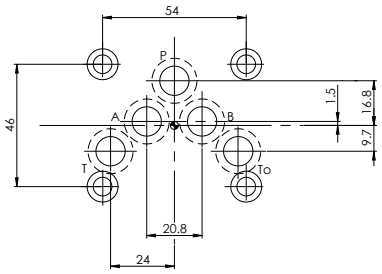
4/3-way spool valve (spring centred)



4/2-way spool valve



HYDRAULIC CONNECTION



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:
20 bar Integrated (–)
20 bar Push-button (HF1)
80 bar Spindle (HS1)

PARTS LIST

Position	Article	Description
10	206.3… 260.9…	W.E64 / 31 x 72 M.A60 / 31 x 72
50	160.2120 160.8124	O-ring ID 12,42 x 1,78 (NBR) O-ring ID 12,42 x 1,78 (FKM)
60	160.2282	O-ring ID 28.24 x 2.62 (NBR)
70	154.2706	Knurled nut
80	253.7006	HF1-M24
90	253.7005	HS1-M24

ACCESSORIES

Proportional amplifier	Register 1.13
Mating connector grey (A)	Article no. 219.2001
Mating connector black (B)	Article no. 219.2002
Threaded subplates	Data sheet 2.9-40
Multi-station subplates	Data sheet 2.9-70
Horizontal mounting blocks	Data sheet 2.9-110
Technical explanations	Data sheet 1.0-100
Filtration	Data sheet 1.0-50
Relative duty factor	Data sheet 1.1-430

SURFACE TREATMENT

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

SEALING MATERIAL

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