

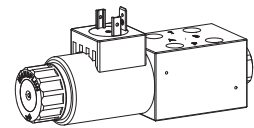
## Proportional spool valve

### Flange construction

- ◆  $Q_{max} = 20 \text{ l/min}$
- ◆ 3 volume flow levels
- ◆  $Q_{Nmax} = 12 \text{ l/min}$
- ◆  $p_{max} = 350 \text{ bar}$

### NG4

ISO 4401-02



## 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).

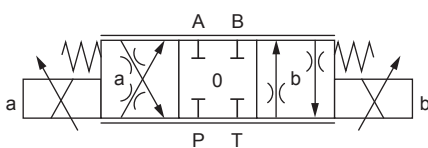
## APPLICATION

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: rotor blades control of wind generators, forestry and earth moving machines, machine tools and paper production machines with simple position control, robotics and fan control. Miniature values are used where both, reduced dimensions and weight are important.

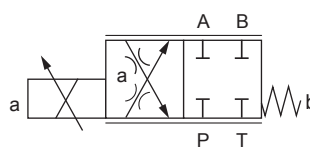
## SYMBOL

### Symmetrical control

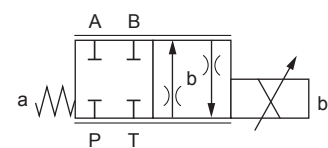
ACB-S



AC1-S

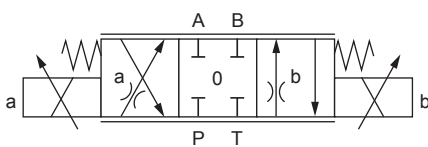


CB2-S

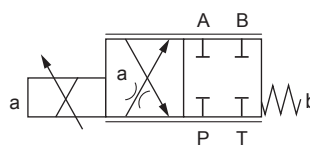


### Meter-in control

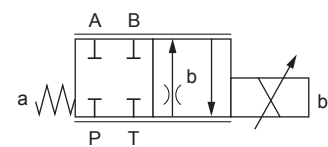
ACB-V



AC1-V

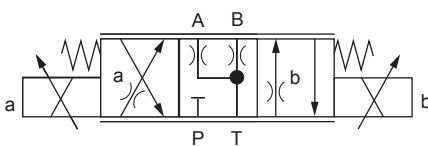


CB2-V

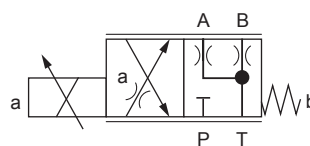


### Meter-in control

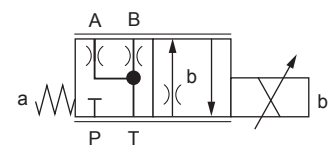
ADB-V



AD1-V

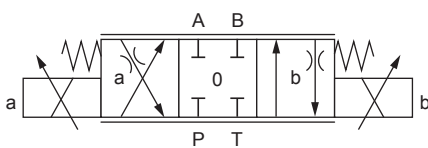


DB2-V

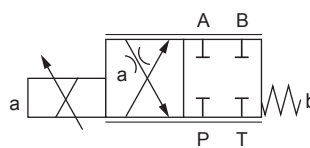


### Meter-out control

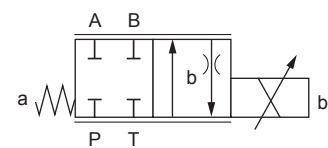
ACB-R



AC1-R



CB2-R



**TYPE CODE**

		W D P F B04 - <input type="checkbox"/> - <input type="checkbox"/> - <input type="checkbox"/> - <input type="checkbox"/> / <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> # <input type="checkbox"/>									
Spool valve, directly operated, proportional											
Flange construction											
International standard interface ISO, NG4											
Designation of symbols acc. to table											
Nominal volume flow rate $Q_N$	4 l/min	<input type="checkbox"/>									
	8 l/min	<input type="checkbox"/>									
	12 l/min	<input type="checkbox"/>									
Nominal voltage $U_N$	12 VDC	<input type="checkbox"/>									
	24 VDC	<input type="checkbox"/>									
	without coil	<input type="checkbox"/>									
Slip-on coil	Metal housing, round with one-sided collar	<input type="checkbox"/>									
	Metal housing, square with one-sided collar	<input type="checkbox"/>									
Connection execution	Connector socket EN 175301-803 / ISO 4400	<input type="checkbox"/>									
	Connector socket AMP Junior-Timer	<input type="checkbox"/>									
	Connector Deutsch DT04-2P	<input type="checkbox"/>									
Sealing material	NBR	<input type="checkbox"/>									
	FKM (Viton)	<input type="checkbox"/>									
Manual override	Integrated	<input type="checkbox"/>									
	Push-button	<input type="checkbox"/>									
	Spindle	<input type="checkbox"/>									
Design index (subject to change)											

1.10-74

**GENERAL SPECIFICATIONS**

Designation	Proportional spool valve
Construction	Direct operated
Mounting	Flange construction
Nominal size	NG4 according to ISO 4401-02
Actuation	Proportional solenoid
Ambient temperature	-25...+70 °C (NBR) -20...+70 °C (FKM) if >50 °C, $I_G$ is only conditionally achievable
Weight	0,90 kg (1 solenoid) 1,25 kg (2 solenoids)

**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 power	12 VDC, 24 VDC
Limiting current at 50 °C	$I_G = 620 \text{ mA}$ ( $U_N = 24 \text{ VDC}$ ) $I_G = 1'200 \text{ mA}$ ( $U_N = 12 \text{ VDC}$ )

**Note!** Other electrical specifications see data sheet 1.1-168 (slip-on coil V) and 1.1-175 (slip-on coil N)

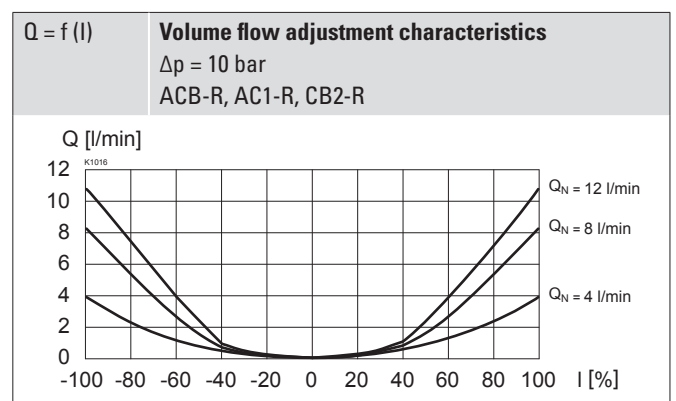
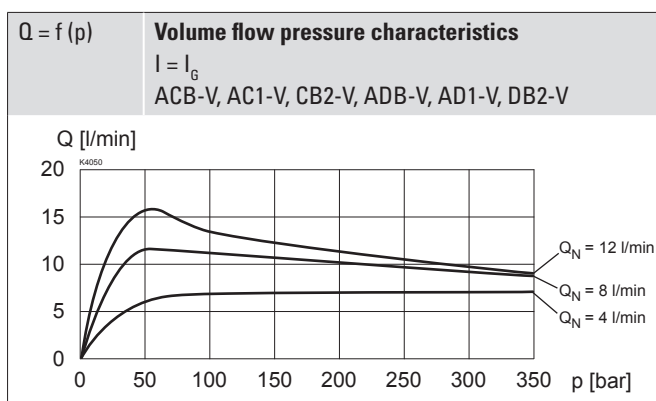
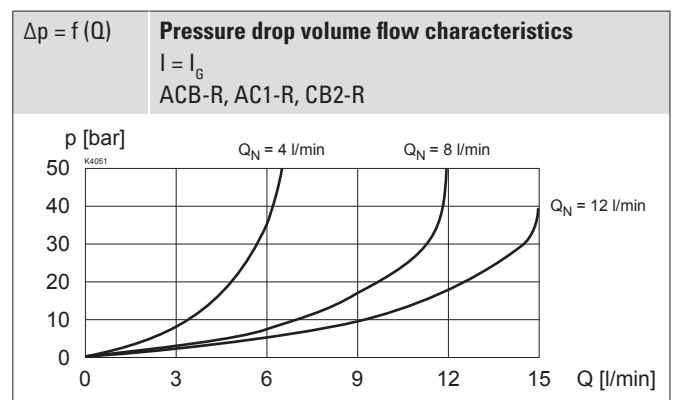
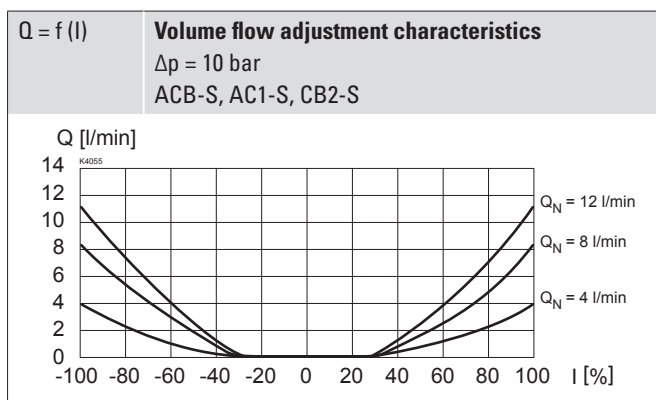
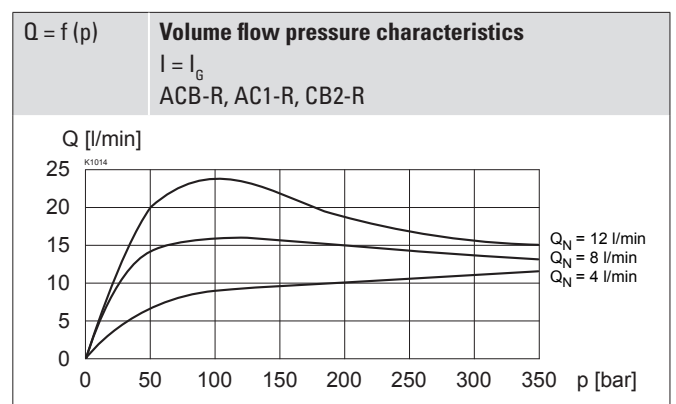
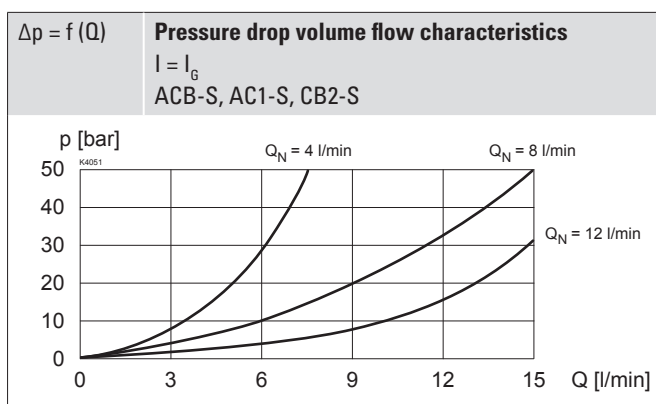
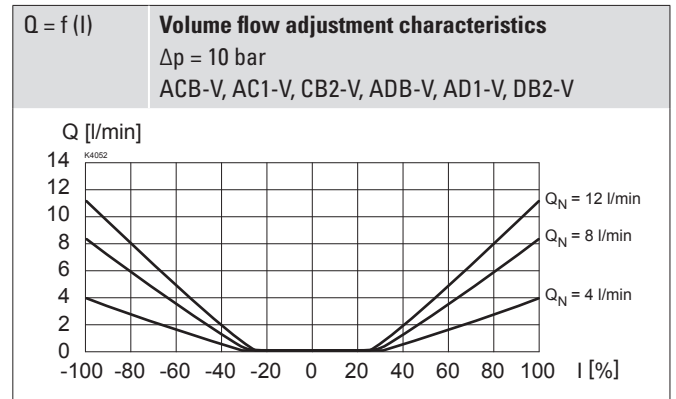
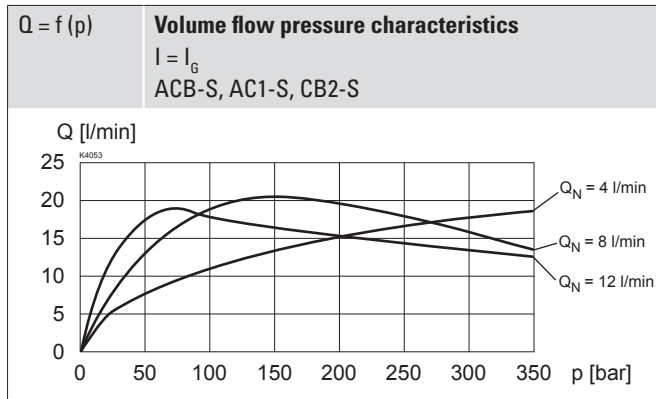

**ACTUATION**

Actuation	Proportional solenoid, wet pin push type, pressure tight
Execution	N.S35 / 19 x 50 (Data sheet 1.1-175)
Connection	Connector socket EN 175301 – 803 Connector socket AMP Junior-Timer Connector Deutsch DT04 - 2P

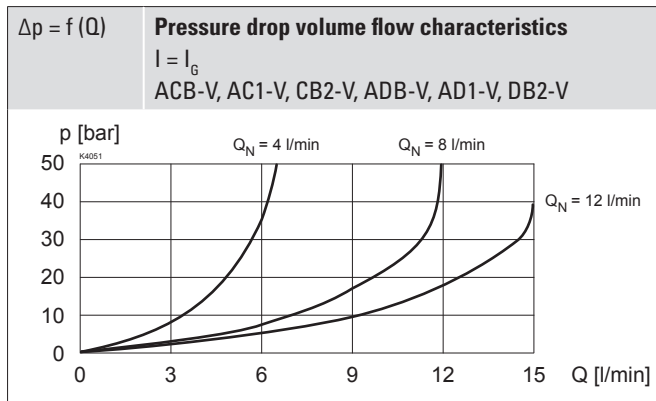
**HYDRAULIC SPECIFICATIONS**

Working pressure	$p_{\max} = 350 \text{ bar}$
Tank pressure	$p_{T\max} = 160 \text{ bar}$
Maximum volume flow	$Q_{\max} = 20 \text{ l/min}$ , see characteristics
Nominal volume flow	$Q_N = 4 \text{ l/min}$ , 8 l/min, 12 l/min
Leakage volume flow	On demand
Hysteresis	$\leq 5 \%$ at optimal dither signal
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm <sup>2</sup> /s...320 mm <sup>2</sup> /s
Temperature range fluid	-20...+70 °C
Contamination efficiency	Class 18 / 16 / 13
Filtration	Required filtration grade $\beta_{6...10} \geq 75$ , see data sheet 1.0-50

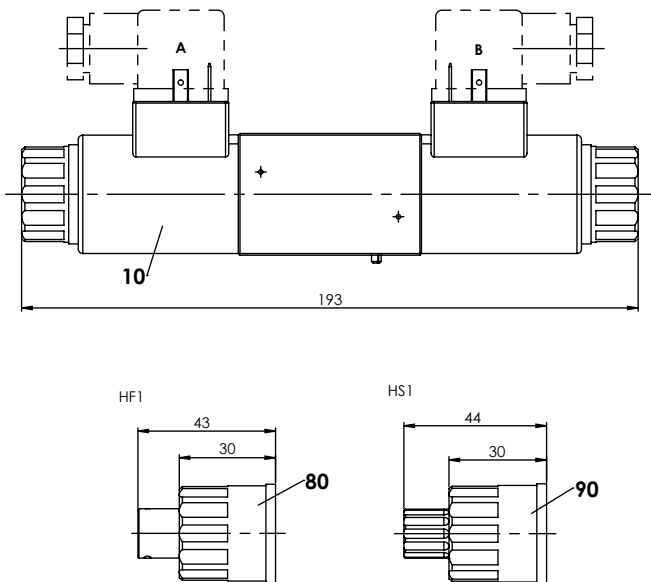
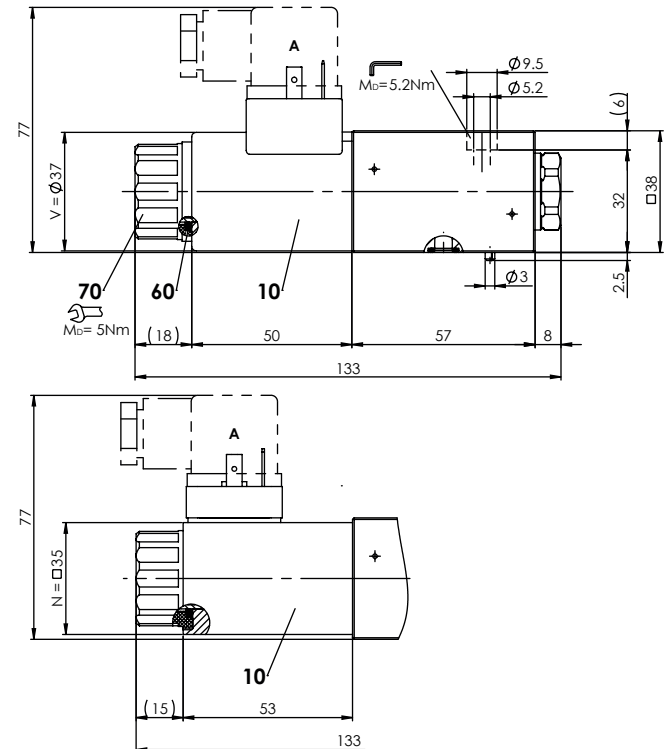
**PERFORMANCE SPECIFICATIONS**

 Oil viscosity  $\nu = 30 \text{ mm}^2/\text{s}$ 


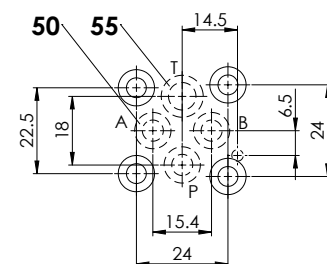
**PERFORMANCE SPECIFICATIONS**

 Oil viscosity  $\nu = 30 \text{ mm}^2/\text{s}$ 

**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**

**PARTS LIST**

Position	Article	Description
10	206.22..	Solenoid coil V.E37 / 19 x 50
50	160.2060	O-ring ID 6,07 x 1,78 (NBR)
	160.6061	O-ring ID 6,07 x 1,78 (FKM)
55	160.2076	O-Ring ID 7,65 x 1,78 (NBR)
	160.6076	O-Ring ID 7,65 x 1,78 (FKM)
60	160.2187	O-ring ID 18,72 x 2,62 (NBR)
70	154.2700	Knurled nut
80	253.7001	Push-button
90	253.7000	Spindle

**HYDRAULISCHER ANSCHLUSS**


## INSTALLATION NOTES

Mounting type	Flange mounting 4 fixing holes for socket head screws M5 x 40
Mounting position	Any, preferably horizontal
Tightening torque	$M_D = 5,2 \text{ Nm}$ (screw quality 8.8, zinc coated) Fixing screws $M_D = 5 \text{ Nm}$ knurled nut

**Note!**


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

## STANDARDS

Mounting interface	ISO 4401-02
Solenoids	DIN VDE 0580
Connection execution D	EN 175301 – 803
Protection class	EN 60 529
Contamination efficiency	ISO 4406

## SURFACE TREATMENT

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

## 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:  
 160 bar Integrated (–)  
 160 bar Push-button (HF1)  
 160 bar Spindle (HS1)

## ACCESSORIES

Mating connector grey (A)	Article no. 219.2001
Mating connector black (B)	Article no. 219.2002
Threaded subplates	Data sheet 2.9-12
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
Proportional amplifier	Register 1.13

## SEALING MATERIAL

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