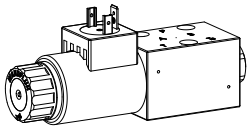
Proportional directional valve
- **not pressure compensated**
- **Q_{max} = 20 l/min**
- **$Q_{N\ max}$ = 12 l/min**
- **p_{max} = 350 bar**

NG4-Mini®



DESCRIPTION
Direct operated proportional spool valve in flange design NG4-Mini Interface to Wandfluh standard with 4 ports. The spool valve is designed to the 5 chamber principle. The volume flow is adjusted by a slip-on coil acc. to VDE 0580. Low pressure drop due to the body design and spool profiling. The spool is made of hardend 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
Proportionally to the solenoid current spool stroke, spool opening and valve volume flow will increase. Proportional directional valves NG4-Mini are not load-compensated. The optimum spool shape and progressive characteristics curve allow fine motion control. To control the valve Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION
Proportional directional spool valves are well suited for demanding applications where high resolution, high volume flow and low hysteresis are requested. They are implemented in industrial hydraulics as well as in mobile hydraulics for the smooth control of hydraulic actuators. Application examples: pitch control of wind generators, forest and earth moving machines, machine tools and paper production machines with simple position controls, robotics and fan control.

TYPE CODE

W D P F A04 - [ ] - [ ] - [ ] - [ ] / [ ] [ ] - [ ] - [ ] # [ ]

Spool valve, direct operated, proportional			
Flange construction			
Mounting interface acc. to Wandfluh standard, NG4-Mini			
Description of symbols acc. to table			
Nominal volume flow Q_N	4 l/min	4	
	8 l/min	8	
	12 l/min	12	
Nominal voltage U_N	12 VDC	G12	
	24 VDC	G24	
	without coil	X5	
Slip-on coil	Metal housing round with one-sided collar	V	
	Metal housing square with one-sided collar	N*	
Electric connection	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)			

* Only available in conjunction with other nominal voltages and connection versions. (See data sheet 1.1-175)

GENERAL SPECIFICATIONS

Nominal size	NG4-Mini to Wandfluh standard	Ambient temperature	-20…+70 °C (slip-on coil «V»)
Designation	Direct operated proportional spool valve		if > +50 °C, then I_G - 10%
Construction	Direct operated spool valve		-20…+70 °C (slip-on coil «N»)
Betätigungsart	Proportional solenoid	Mounting position	any, preferably horizontal
Mounting	Flange, 3 fixing holes for socket head cap screws M5 x 40	Fastening torque	M_D = 5,5 Nm (screw quality 8.8) for fixing screws
Connections	Connection plates		M_D = 5 Nm for knurled nut
	Multi-station flange subplate		
	Longitudinal stacking system		

ELECTRICAL SPECIFICATIONS

Construction	Proportional solenoid, wet pin push type, pressure tight	
Standard-Nominal voltage	U_N = 12 VDC	U_N = 24 VDC
Limiting current	I_G = 1200 mA	I_G = 630 mA
Relative duty factor	100% DF (see data sheet 1.1-430)	
Protection class to EN 60529	Connection version D: IP 65 J: IP 66 G: IP 67 and 69K	
Connection/Power supply	Over device plug connection	

Other electrical specifications see data sheet 1.1-168 (V)
1.1-175 (N)

HYDRAULIC SPECIFICATIONS

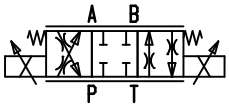
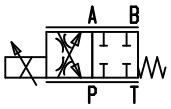
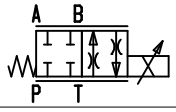
Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406:1999, class 18/16/13 (Required filtration grade ß 6…10 ≥ 75) refer to data sheet 1.0-50/2
Viscosity range	12 mm²/s…320 mm²/s
Fluid temperature	-20…+70 °C
Working pressure in port P, A, B	p_{max} = 350 bar (p_T <20 bar) p_{max} = 315 bar (p_T >20 bar)
Tank pressure in port T	$p_{T\,max}$ = 160 bar
Nominal volume flow	Q_N =4 l/min, 8 l/min, 12 l/min
Max. volume flow	see characteristic
Leakage volume flow	on request
Hysteresis	≤ 5 % ∗ ∗ at optimal dither signal

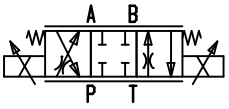
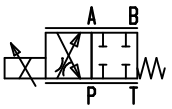
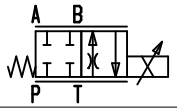
MANUAL OVERRIDE

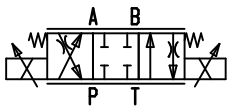
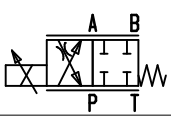
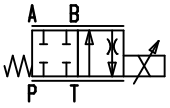
- Integrated (–) Actuation pin integrated in the armature tube.
- Push-button (HF1) integrated in the knurled nut.
  Actuation by pressing the pin
- Spindle (HS1) integrated in the knurled nut.
  Actuation by turning the spindle (infinitely variable valve actuation)

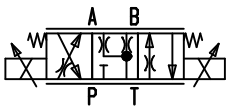
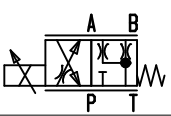
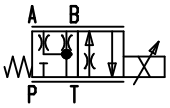
Weight	
4/3-way	m = 1,25 kg
4/2-way (1 solenoid)	m = 0,9 kg

TYPE CHARTS / DESIGNATIONS OF SYMBOLS

	ACB - S S = Symmetrical control mode
	AC1 - S S = Symmetrical control mode
	CB2 - S S = Symmetrical control mode

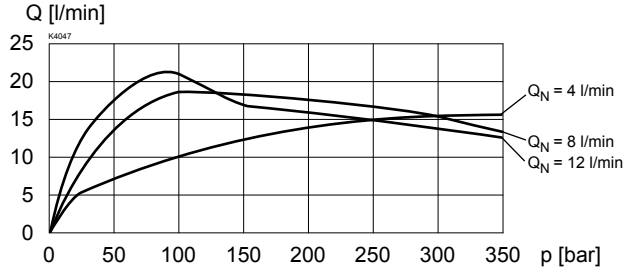
	ACB - V V = Meter-in control mode
	AC1 - V V = Meter-in control mode
	CB2 - V V = Meter-in control mode

	ACB - R R = Meter-out control mode
	AC1 - R R = Meter-out control mode
	CB2 - R R = Meter-out control mode

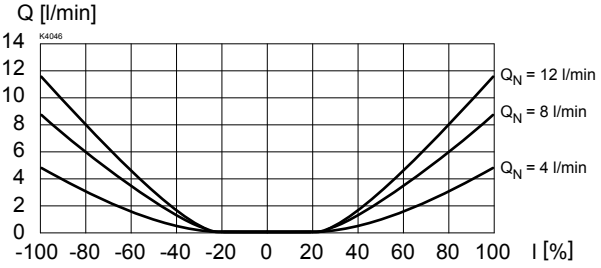
	ADB - V V = Meter-in control mode
	AD1 - V V = Meter-in control mode
	DB2 - V V = Meter-in control mode

CHARACTERISTICS oil viscosity υ = 30 mm²/s

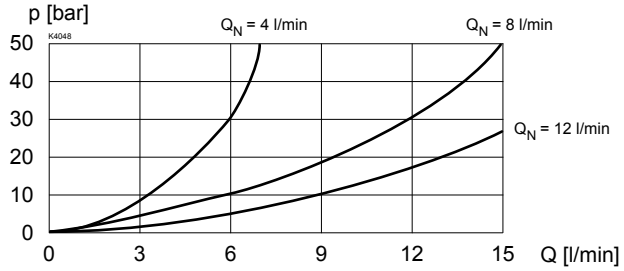
Q = f (p) Volume flow pressure characteristics ($I = I_G$)
[Types: ACB-S, AC1-S, CB2-S]



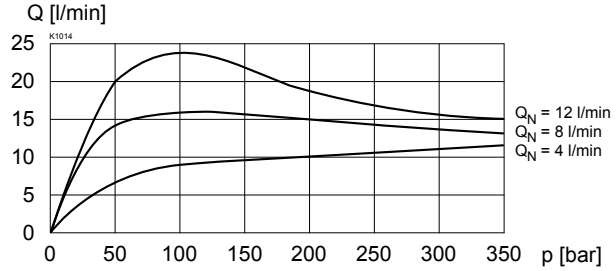
Q = f (I) Volume flow adjustment characteristics (Δp = 10 bar)
[Types: ACB-V, AC1-V, CB2-V, ADB-V, AD1-V, DB2-V]



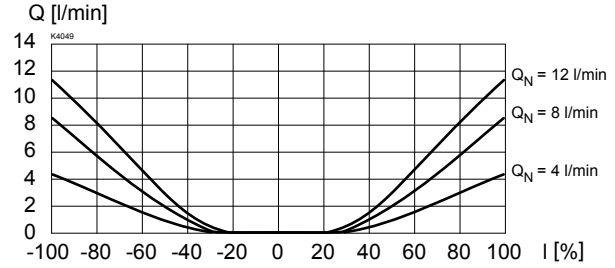
Δp = f (Q) Pressure loss/flow characteristics ($I = I_G$)
[Types: ACB-S, AC1-S, CB2-S]



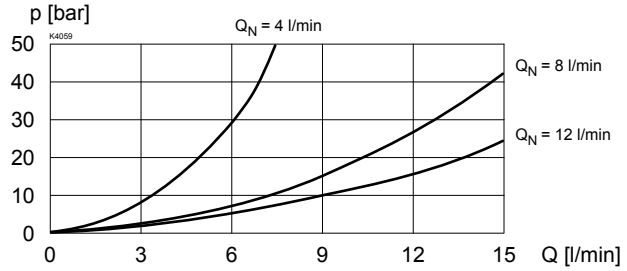
Q = f (p) Volume flow pressure characteristics ($I = I_G$)
[Types: ACB-R, AC1-R, CB2-R]



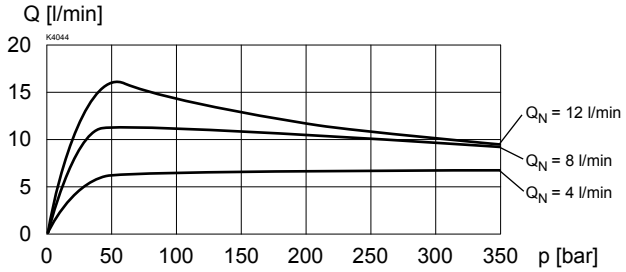
Q = f (I) Volume flow adjustment characteristics (Δp = 10 bar)
[Types: ACB-S, AC1-S, CB2-S]



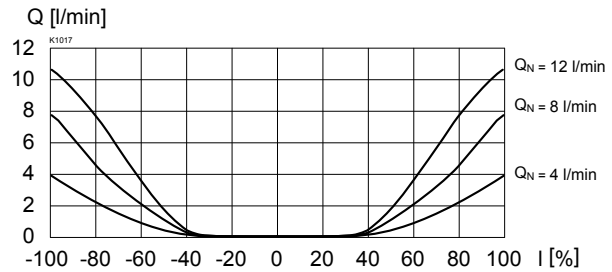
Δp = f (Q) Pressure loss/flow characteristics ($I = I_G$)
[Types: ACB-R, AC1-R, CB2-R]



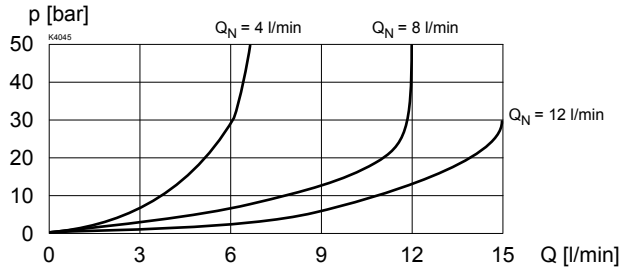
Q = f (p) Volume flow pressure characteristics ($I = I_G$)
[Types: ACB-V, AC1-V, CB2-V, ADB-V, AD1-V, DB2-V]



Q = f (I) Volume flow adjustment characteristics (Δp = 10 bar)
[Types: ACB-R, AC1-R, CB2-R]



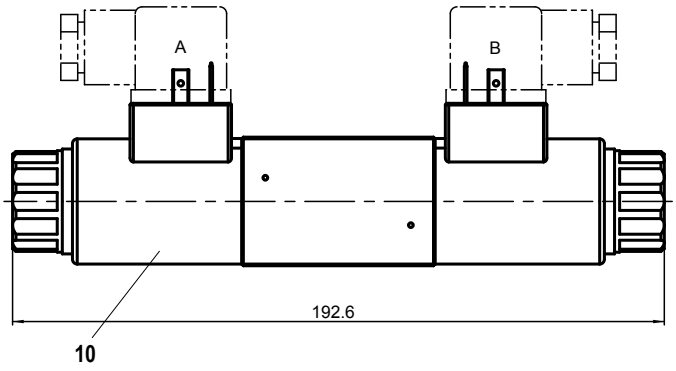
Δp = f (Q) Pressure loss/flow characteristics ($I = I_G$)
[Types: ACB-V, AC1-V, CB2-V, ADB-V, AD1-V, DB2-V]



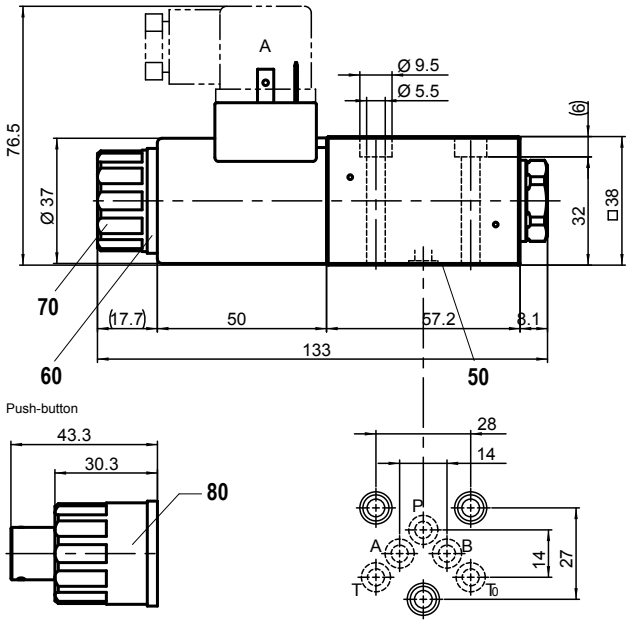
NOTE!
All values measured over 2 metering edges, A and B ports linked.

DIMENSIONS

4/3-way valve



4/2-way valve



PARTS LIST

Position	Article	Description
10	206.2...	V.E37/19x50
50	160.2052 160.6052	O-ring ID 5,28x1,78 (NBR) O-ring ID 5,28x1,78 (FKM)
60	160.2187	O-ring ID 18,72x2,62 (NBR)
70	154.2700	Knurled nut
80	253.7001	Push-button HF1
90	253.7000	Spindle HS1

ACCESSORIES

Threaded connecting plates, Multi-flange subplates and Longitudinal stacking system	see Reg. 2.9
Proportional amplifier	see Reg. 1.13
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