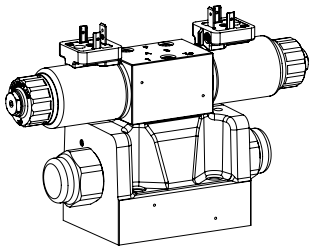
Proportional spool valve

Flange construction

- pilot operated
- Q_{max} = 200 l/min
- $Q_{N\,max}$ = 90 l/min
- p_{max} = 350 bar

NG10
ISO 4401-05



DESCRIPTION

Pilot operated proportional spool valve with 4 connections in 5-chamber system. Precise spool fit, low leakage, long service life time. Very compact construction with corresponding low weight. The pilot valve is a proportional solenoid operated pressure reducing valve. The function of the pilot and main valve as well as the interaction of both valves can be found in the hydraulic diagram. Proportional to the solenoid current, the spool stroke, the spool opening and the valve volume flow increase. The proportional spool valve is not pressure compensated. For the control, Wandfluh proportional amplifiers are available (see register 1.13).

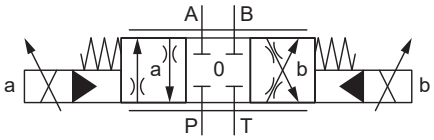
APPLICATION

Proportional spool valves are perfectly suitable for demanding tasks due to the high resolution, large volume flow and low hysteresis. Pilot operated valves are used where large volume flows have to be controlled. Due to the large flow range and the high stiffness of the actuation as a result of the pilot control, these valves are suitable for applications where fast acceleration and deceleration processes, high speeds and sensitive motion sequences are required. The applications are in the industrial as well as in the mobile hydraulics for the smooth control of hydraulic actuations.

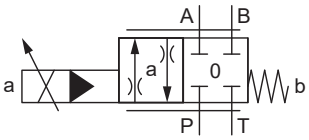
SYMBOL

Symmetrical control

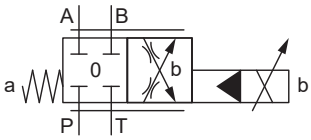
BCA-S



BC1-S

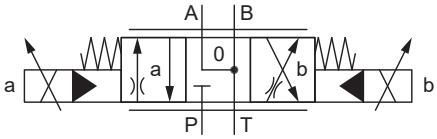


CA2-S

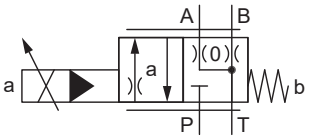


Meter-in control

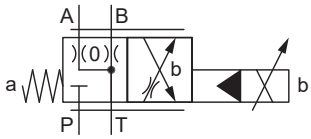
BDA-V



BD1-V

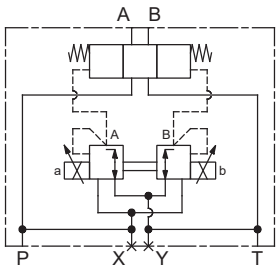


DA2-V

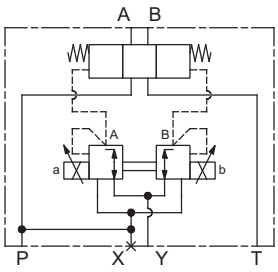


Types of pilot operation

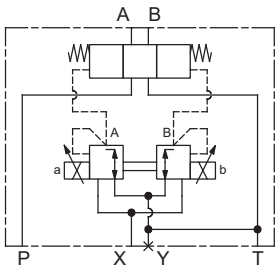
ti



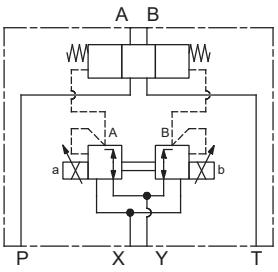
xi



xe



ae



TYPE CODE

WVP F A10 - [ ] - 90 - [ ] - [ ] / [ ] [ ] [ ] # [ ]

Spool valve, pilot operated, proportional		
Flange construction		
International standard interface ISO NG10		
Designation of symbols acc. to table		
Nominal volume flow		
Type of pilot operation: Control oil supply (x) and drain (y)	(x) and (y) internally	ti
	(x) and (y) externally	ae
	(x) internally (y) externally	xi
	(x) externally (y) internally	xe
Nominal voltage U_N	12 VDC	G12
	24 VDC	G24
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
Design index (subject to change)		

1.10-3500

GENERAL SPECIFICATIONS

Designation	Proportional spool valve
Construction	Pilot operated
Mounting	Flange construction
Nominal size	NG10 according to ISO 4401-05
Actuation	Electrical
Ambient temperature	-25…+70 °C if >50 °C, I_G is only conditionally achievable
Weight	3,5 kg (1 solenoid) 3,9 kg (2 solenoids)
MTTFd	150 years

ACTUATION

Pressure reducing valve
MDPFA04-P / AB-25 for BCA-S / BDA-V
MDPFA04-P / B-25 for BC1-S / BD1-V
MDPFA04-P / A-25 for CA2-S / DA2-V
Connector socket EN 175301 – 803

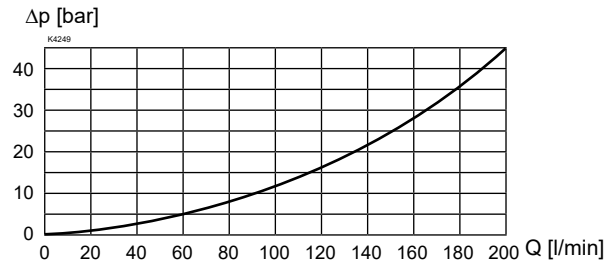
HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 350 bar
Tank pressure	$p_{T\,max}$ = 160 bar (type of pilot operation ae and xi) $p_{T\,max}$ = 100 bar (type of pilot operation ti and xe)
Pilot pressure	p_v = 25...350 bar Connection X: p_v = 25...200 bar
Pressure pilot oil drain	Minimum 25 bar lower than p_v
Maximum volume flow	Q_{max} = 200 l/min, see characteristics
Leakage oil	See characteristics
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm²/s…320 mm²/s
Temperature range fluid	-20…+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

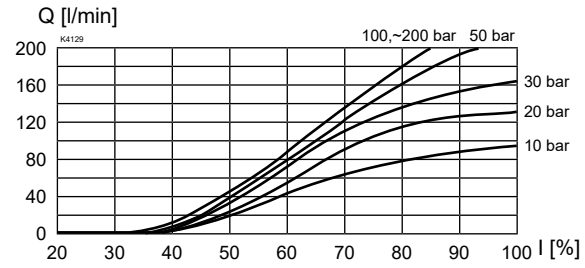
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

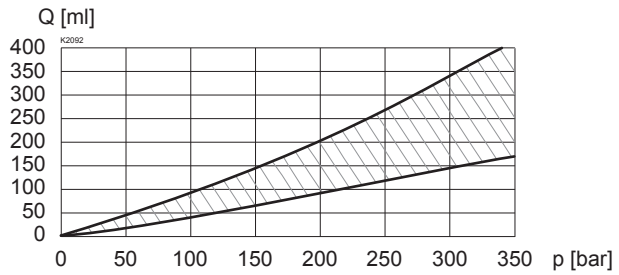
Δp = f (Q)	**Pressure drop / flow characteristic over 2 control edges** [Types: BCA-S, BC1-S, CA2-S, BDA-V, BD1-V, DA2-V]



Q = f (I)	**Volume flow signal characteristics over 2 control edges** [Types: BCA-S, BC1-S, CA2-S, BDA-V, BD1-V, DA2-V]



Q_L = f (p)	**Leakage volume flow characteristics main stage** per control edge



Q_L = f (p)	**Leakage volume flow pilot control stage**

@ 350 bar, p_{red} 0 bar: 100 ml/min
@ 350 bar, p_{red} 25 bar: 320 ml/min

Note!

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

ACCESSORIES

Fixing screws	Data sheet 1.0-60
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

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

SURFACE TREATMENT

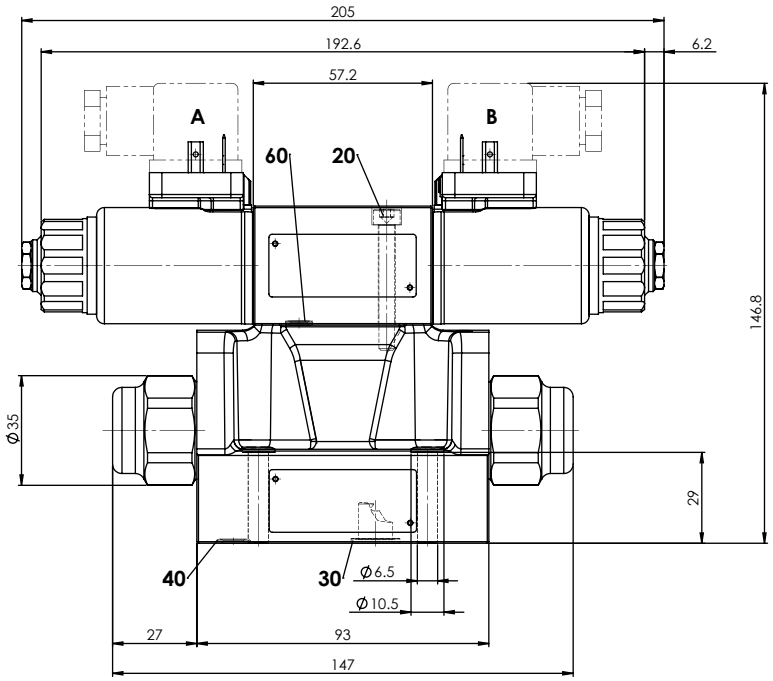
- The main valve body, the screw plugs, the slip-on coil and the armature tube are zinc-nickel coated
- The pilot valve body is coated with a two component paint

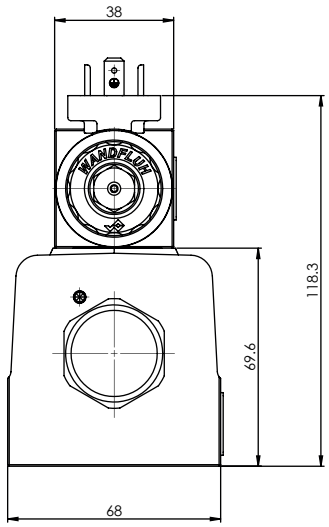
SEALING MATERIAL

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

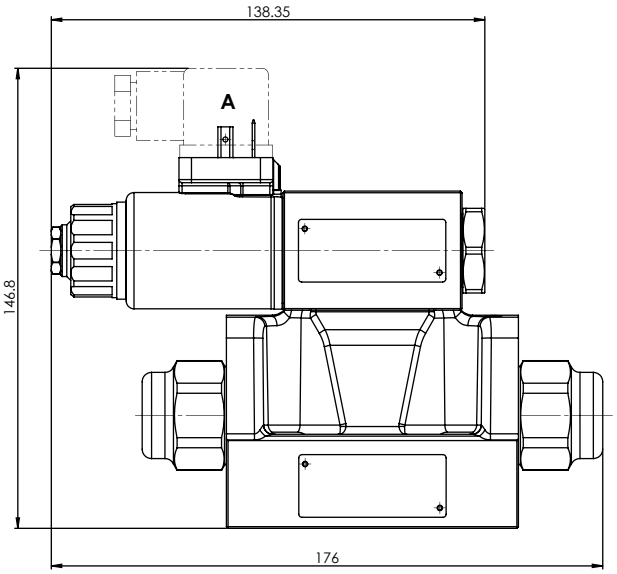
DIMENSIONS

4/3-way spool valve (spring centring)

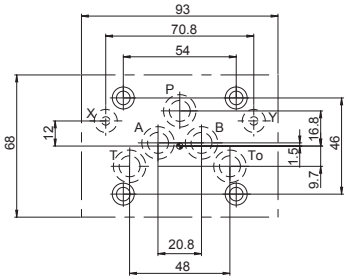




4/2-way spool valve (spring reset)



HYDRAULIC CONNECTION



INSTALLATION NOTES

Mounting type	Flange mounting 4 fixing holes for socket head screws M6 x 40
Mounting position	Any, preferably horizontal
Tightening torque	M_D = 13.5 Nm ± 10 %, quality min. 10.9 M_D = 10.5 Nm ± 10 %, quality 8.8: ◆ maximum tank pressure without external connections: 80 bar ◆ maximum tank pressure and maximum pressure external connections: 35 bar

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

PARTS LIST

Position	Article	Description
20	246.2146	Socket head screw M5 x 45 DIN 912
	251.2923	Seal kit WV.FA10

Seal kit consisting of:

30	O-ring	ID 12,42 x 1,78
40	O-ring	ID 7,65 x 1,78
60	O-Ring	ID 5,28 x 1,78