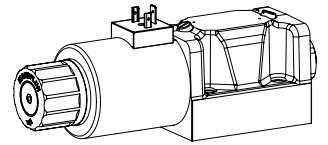


## Solenoid operated spool valve with soft switching

### Flange construction

- ◆ 4/3-way with spring centred mid position
- ◆ 4/2-way with spring reset
- ◆  $Q_{max} = 120 \text{ l/min}$
- ◆  $p_{max} = 350 \text{ bar}$

**NG10**  
ISO 4401-05



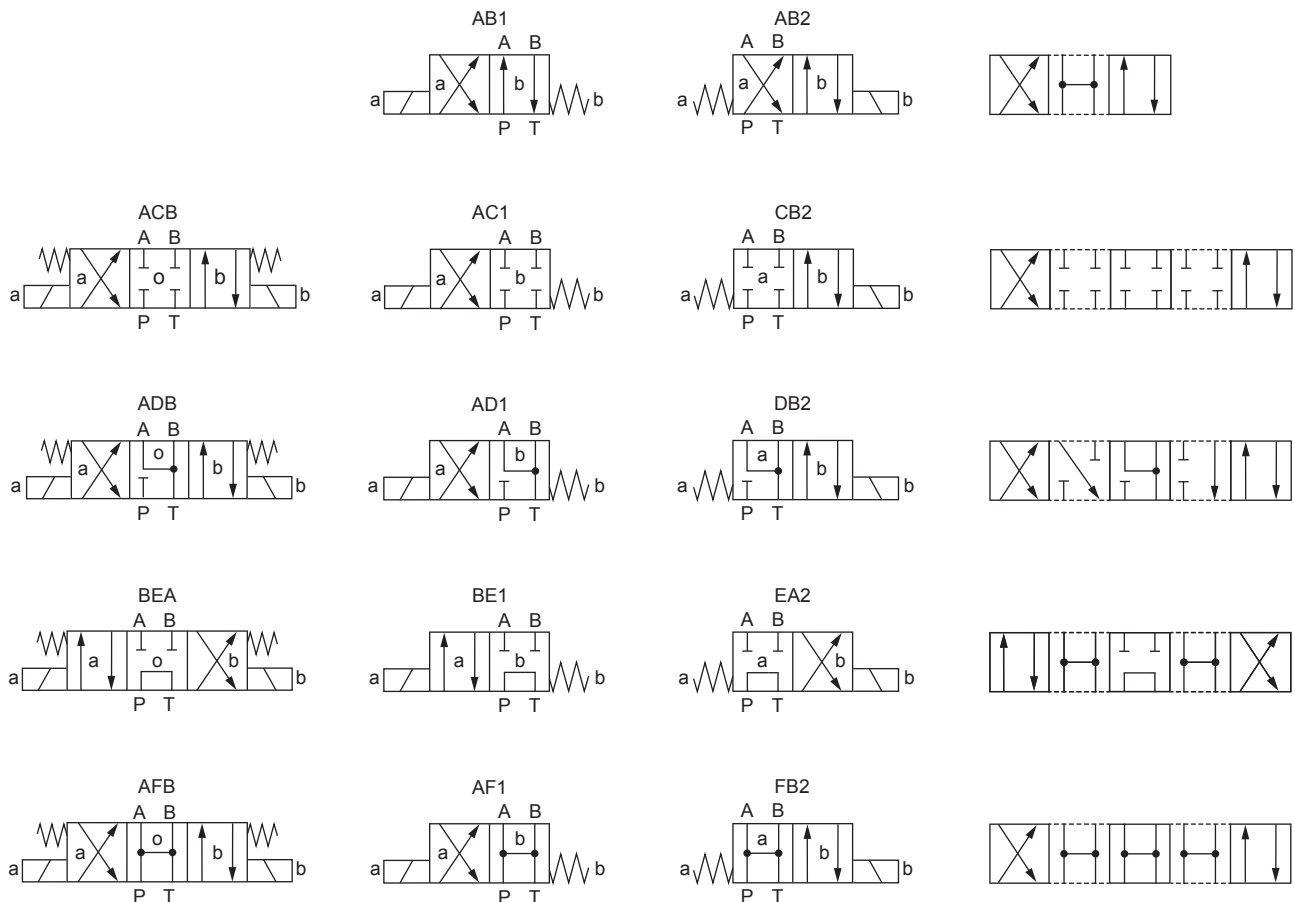
### DESCRIPTION

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). The soft switching of the valve is achieved by means of an optimum combination of the orifice and spool design. Precise spool fit, low leakage, long service life time. Spool made from hardened steel, valve body from high quality hydraulic cast steel. Wide range of standard and special voltages.

### APPLICATION

Normal solenoid spool valves switch very quickly. This can lead to shocks in the hydraulic system which can cause mechanical wear and have a negative effect on operation. The soft switching valves slow down and dampen the switching movements which benefits the system. Optimum results can be achieved if all 4 connections are connected and the valve is properly vented.

### SYMBOL



**TYPE CODE**

		W W M F A10 - <input type="text"/> - <input type="text"/> / <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/> <input type="text"/> # <input type="text"/>									
Spool valve, soft switching											
Slip-on coil Medium											
Flange construction											
International standard interface ISO, NG10											
Designation of symbols acc. to table											
Nominal voltage $U_N$	12 VDC	<input type="text" value="G12"/>									
	24 VDC	<input type="text" value="G24"/>									
	115 VAC	<input type="text" value="R115"/>									
	230 VAC	<input type="text" value="R230"/>									
	without coil	<input type="text" value="X5"/>									
Slip-on coil	Metal housing round	<input type="text" value="W"/>	(only G12 and G24)								
	Metal housing square	<input type="text" value="M"/>									
Connection execution	Connector socket EN 175301-803 / ISO 4400	<input type="text" value="D"/>									
	Connector socket AMP Junior-Timer	<input type="text" value="J"/>	(only for $U_N \leq 75$ VDC)								
	Connector Deutsch DT04 - 2P	<input type="text" value="G"/>	(only for $U_N \leq 75$ VDC)								
Sealing material	NBR	<input type="text"/>									
	FKM (Viton)	<input type="text" value="D1"/>									
Manual override	Integrated	<input type="text"/>									
	Push-button	<input type="text" value="HF1"/>									
	Spindle	<input type="text" value="HS1"/>									
Orifice diameter	Ø 0,3 mm	<input type="text" value="Q0,3"/>									
	Ø 0,5 mm (Standard)	<input type="text"/>									
	Ø 0,8 mm	<input type="text" value="Q0,8"/>									
	Spindle (adjustable soft switching)	<input type="text" value="S"/>									
Design index (subject to change)											

1.4-42

**GENERAL SPECIFICATIONS**

Designation	4/2-, 4/3-spool valve
Construction	Direct operated
Mounting	Flange construction
Nominal size	NG10 according to ISO 4401-05
Actuation	Switching solenoid
Ambient temperature	-25...+70 °C if > +50 °C, then no undervoltage is admissible
Weight	3,9 kg (1 solenoid) 5,4 kg (2 solenoids)
MTTFd	150 years

**ACTUATION**

Actuation	Switching solenoid, wet pin push type, pressure tight
Execution	W.E64/31x72 (Data sheet 1.1-190) W.S60/31x72 (Data sheet 1.1-193)
Connection	Connector socket EN 175301 – 803 Connector socket AMP Junior-Timer Connector Deutsch DT04 – 2P

**HYDRAULIC SPECIFICATIONS**

Working pressure	$p_{max} = 350$ bar
Tank pressure	$p_{Tmax} = 160$ bar
Maximum volume flow	$Q_{max} = 120$ l/min, see characteristics
Leakage oil	See characteristics
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm <sup>2</sup> /s...320 mm <sup>2</sup> /s
Temperature range fluid	-25...+70 °C (NBR) -20...+70 °C (FKM)
Contamination efficiency	Class 20 / 18 / 14
Filtration	Required filtration grade $\beta_{10...16} \geq 75$ , see data sheet 1.0-50

## 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	Since switching is damped and slow, switching frequency is of secondary importance.
Service life time	10 <sup>7</sup> (number of switching cycles, theoretically)
Voltage tolerance	± 10 % with regard to nominal voltage
Standard nominal voltage	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 1.1-190 (slip-on coil W) and 1.1-193 (slip-on coil M)



## COMMISSIONING

**Attention!** When commissioning, the valve must be vented under pressure (max. two rotations of screw E).



## 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

## ACCESSORIES

Mating connector grey (A)	Article no. 219.2001
Mating connector black (B)	Article no. 219.2002
Fixing 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
Filtration	Data sheet 1.0-50
Relative duty factor	Data sheet 1.1-430

## 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)

## SURFACE TREATMENT

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

## SEALING MATERIAL

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

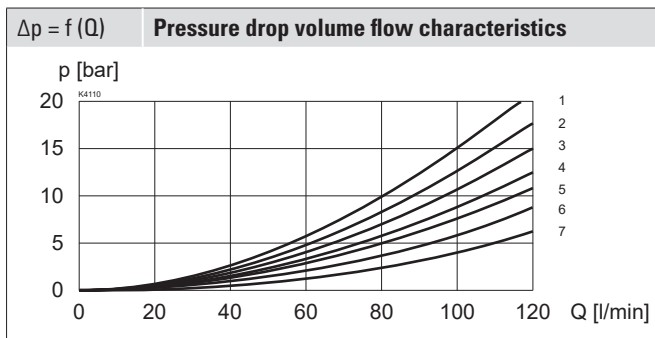
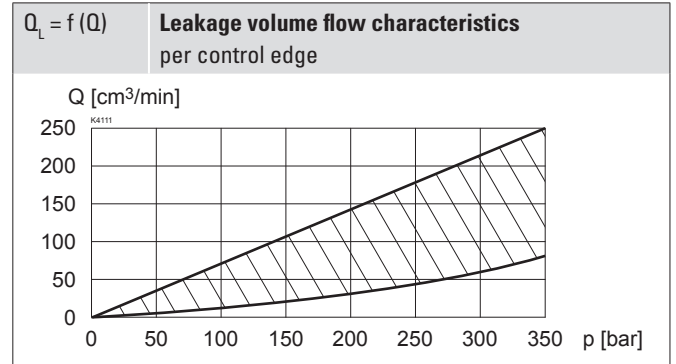
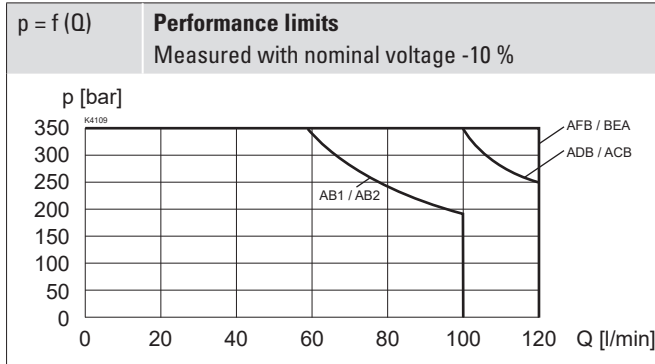
## INSTALLATION NOTES

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

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

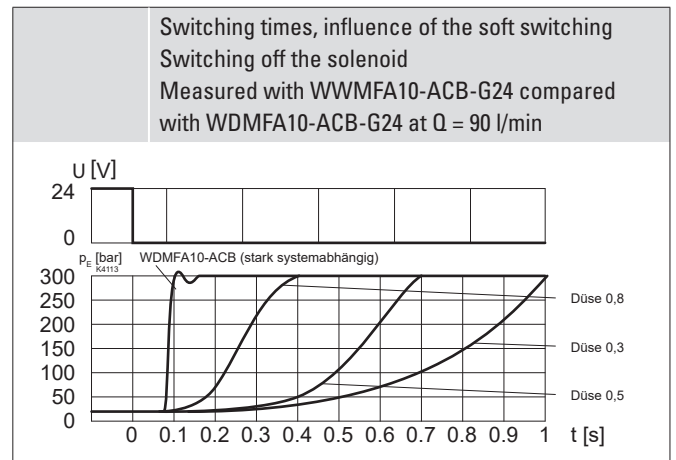
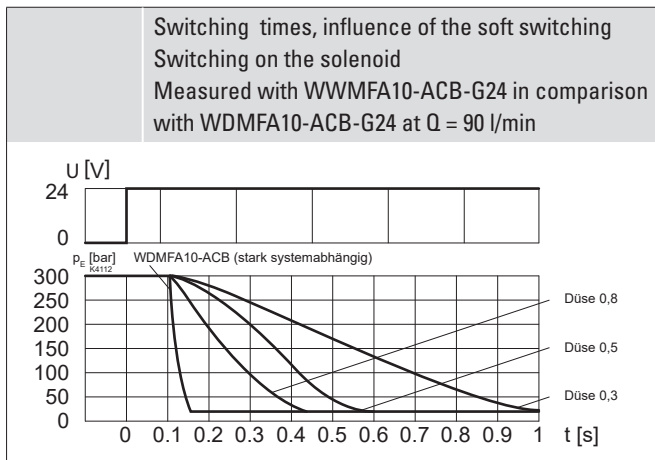


**PERFORMANCE SPECIFICATIONS**

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


Volume flow direction

Symbol	P - A	P - B	P - T	A - T	B - T
AB1 / AB2	4	4	-	2	1
ACB	5	5	-	4	3
ADB	5	5	-	4	3
BEA	5	5	3	5	4
AFB	6	6	7	7	7

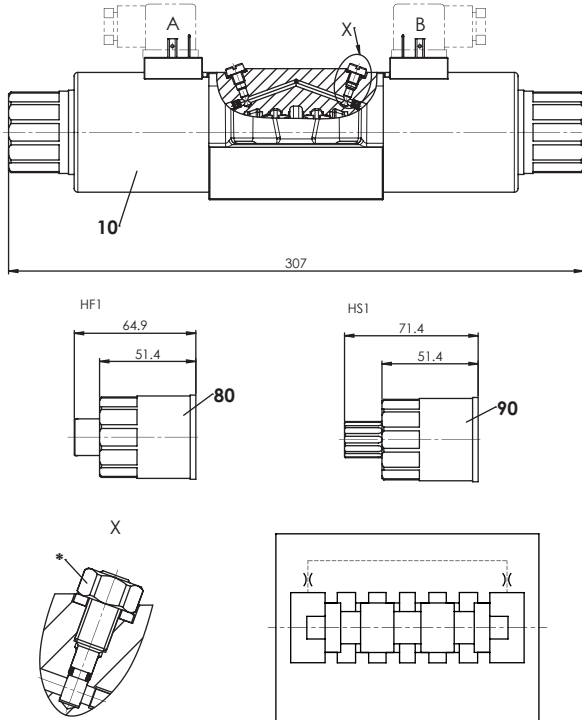


**Note!** With the option spindle «S», the switching time can be adjusted individually.



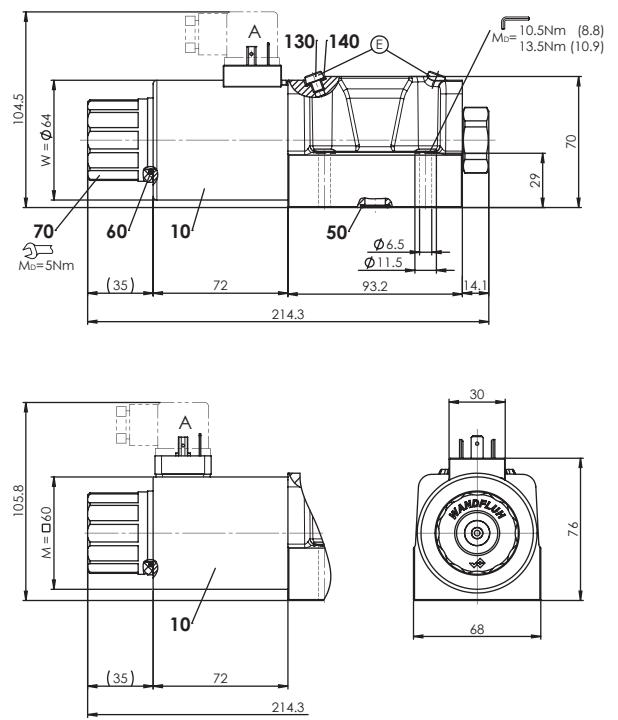
**DIMENSIONS**

4/3-way valve (spring centred)



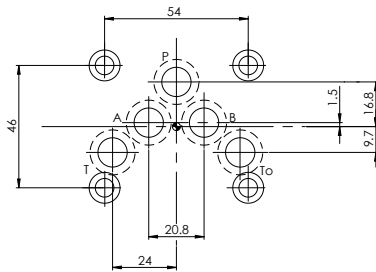
\*optionally spindle

4/2-way valve (spring reset)



E = Air bleed screw

Orifices in valve body influence the switching times

**HYDRAULIC CONNECTION**

**PARTS LIST**

Position	Article	Description
10	206.3...	W.E64 / 31 x 72
	260.9...	M..60 / 31 x 72
50	160.2120	O-ring ID 12,42 x 1,78 (NBR)
	160.8124	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
130	246.3006	Socket head screw M6 x 20 DIN 912
140	049.2062	Bonded seal ID 4,1 x 7,2 x 1