

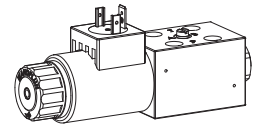
## Solenoid operated spool valve with soft switching

### Flange construction

- ◆ 4/3-way with spring centred mid position
- ◆ 4/2-way with spring reset
- ◆  $Q_{max} = 20 \text{ l/min}$
- ◆  $p_{max} = 350 \text{ bar}$

### NG4

ISO 4401-02



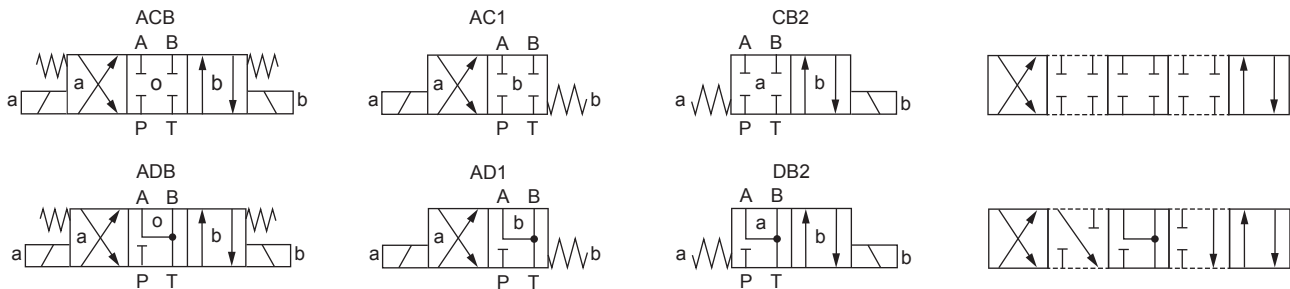
## DESCRIPTION

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, 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. Miniature valves are used where both, reduced dimensions and weight are important.

## SYMBOL



## 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

## SEALING MATERIAL

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

## SURFACE TREATMENT

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

## COMMISSIONING

**Attention!** When commissioning, the valve must be vented under pressure (max. 2 revolutions of screw E).



**TYPE CODE**

		W W M F B04 -		<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, NG 4														
Designation of symbols acc. to table														
Nominal voltage $U_N$	12 VDC	<input type="text" value="G12"/>	115 VAC	<input type="text" value="R115"/>										
	24 VDC	<input type="text" value="G24"/>	230 VAC without coil	<input type="text" value="R230"/> <input type="text" value="X5"/>										
Slip-on coil	Metal housing, round with one-sided collar	<input type="text" value="V"/>												
	Metal housing, square with one-sided collar	<input type="text" value="N"/>												
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 (Standard)	<input type="text"/>												
Design index (subject to change)														

1.4-23

**GENERAL SPECIFICATIONS**

Designation	4/2-, 4/3-spool valve
Construction	Direct operated
Mounting	Flange construction
Nominal size	NG4 according to ISO 4401-02
Actuation	Switching solenoid
Ambient temperature	-25...+70 °C (NBR) -20...+70 °C (FKM) if > +50 °C, then no undervoltage is admissible
Weight	0,90 kg (1 solenoid) 1,25 kg (2 solenoids)
MTTFd	150 years

**HYDRAULIC SPECIFICATIONS**

Working pressure	$p_{max} = 350$ bar
Tank pressure	$p_{Tmax} = 100$ bar
Maximum volume flow	$Q_{max} = 20$ l/min, see characteristics
Leakage volume flow	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	-20...+70°C
fluid	
Contamination efficiency	Class 18 / 16 / 13
Filtration	Required filtration grade $\beta_{10...16} \geq 75$ , see data sheet 1.0-50

**ACTUATION**

Actuation	Switching solenoid, wet pin push type, pressure tight
Execution	V.E37 / 19 x 50 (Data sheet 1.1-168) 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

## ELECTRICAL SPECIFICATIONS

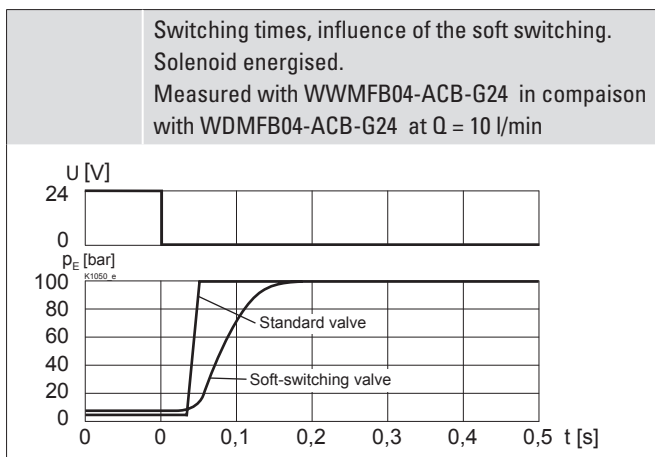
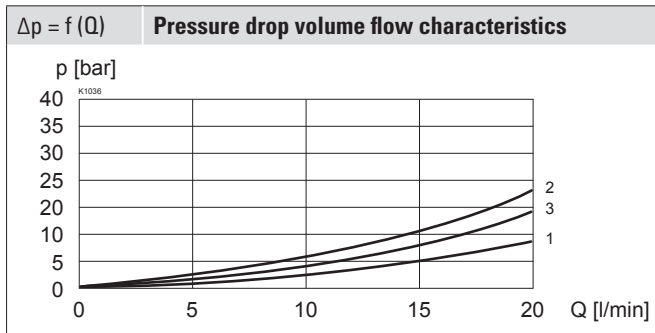
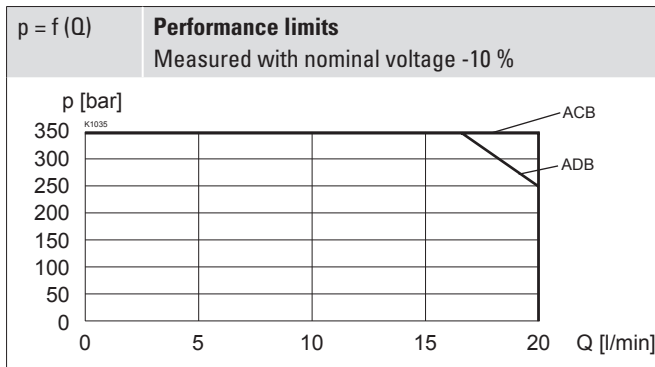
Protection class	Connection execution D: IP65 Connection execution J: IP66 Connection execution G: IP67 and IP69K
Relative duty factor	100 % DF
Switching frequency	Since switching is damped and slow, switching frequency is of secondary importance.
Service life time	10 <sup>7</sup> (number of switching cycles, theoretically)
Voltage tolerance	± 10 % with regard to nominal voltage
Standard nominal power	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 1.1-168 (slip-on coil V) and 1.1-175 (slip-on coil N)



## PERFORMANCE SPECIFICATIONS

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

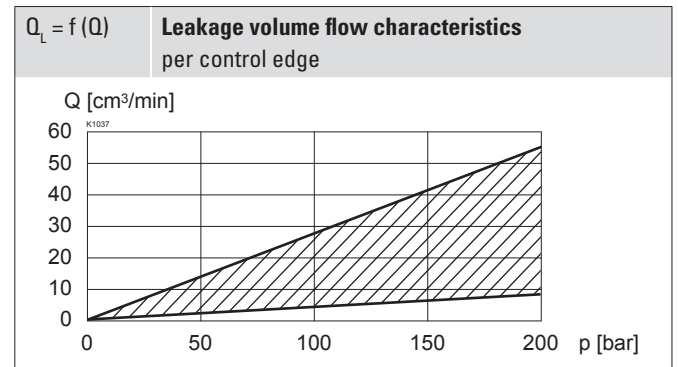


## MANUAL OVERRIDE

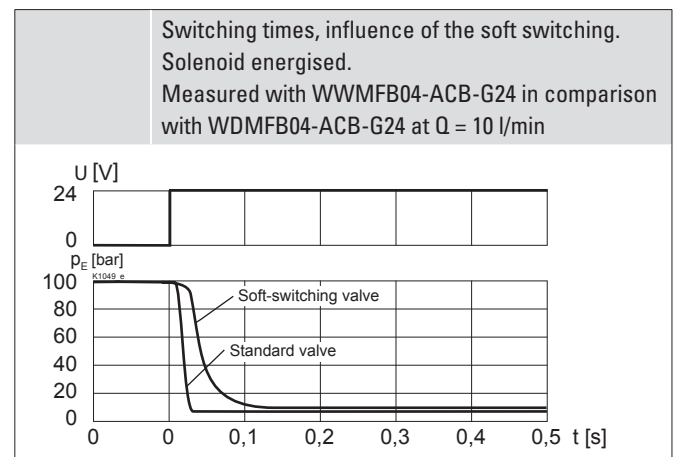
- ◆ Integrated (-) Actuation pin integrated in the armature tube. Actuation by pressing the pin
- ◆ Push-button (HF1) Integrated in the knurled nut. Actuation by pressing the push-button
- ◆ Spindle (HS1) Integrated in the knurled nut. Actuation by turning the spindle (continuously variable valve actuation)

**Attention!** The actuation of the manual override is possible up to a tank pressure of:

- 40 bar Integrated (-)
- 40 bar Push-button (HF1)
- 100 bar Spindle (HS1)

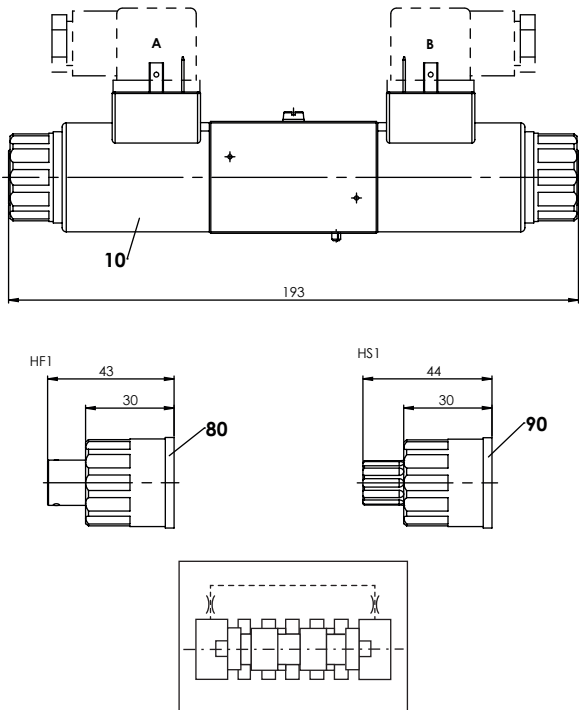


Symbol	Volume flow direction				
	P - A	P - B	P - T	A - T	B - T
ACB	3	3	-	3	3
ADB	2	2	-	1	1

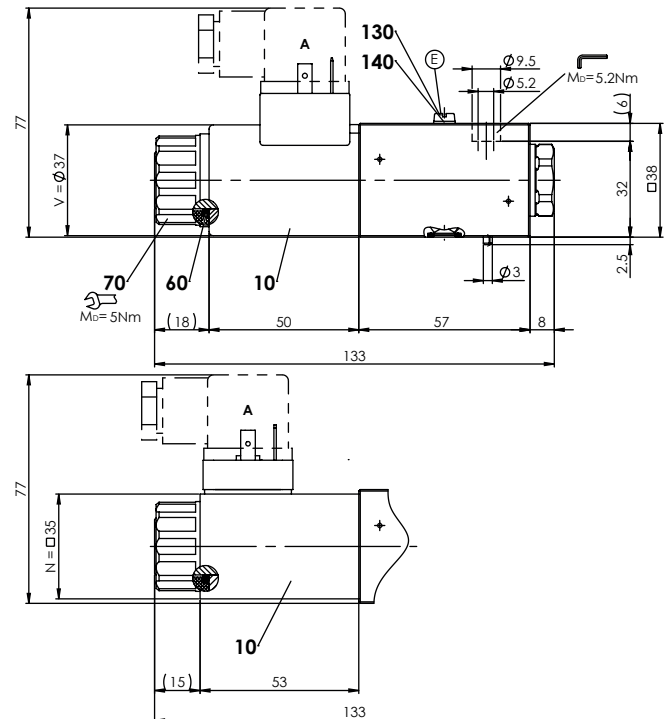


## DIMENSIONS

4/3-way valve (spring centred)



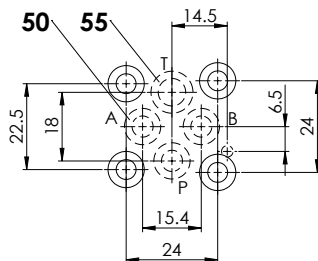
4/2-way valve (spring reset)



E = Air bleed screw

Orifices in valve body influence the switching times

## HYDRAULIC CONNECTION



## PARTS LIST

Position	Article	Description
10	206.2...	V.E37 / 19 x 50
	260.5...	N.S35 / 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
130	246.1007	Socket head screw zinc-coated blue M4 x 6 DIN84 A
140	049.2040	Bonded seal ID 4,1 x 7,2 x 1

## 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

## 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.

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