

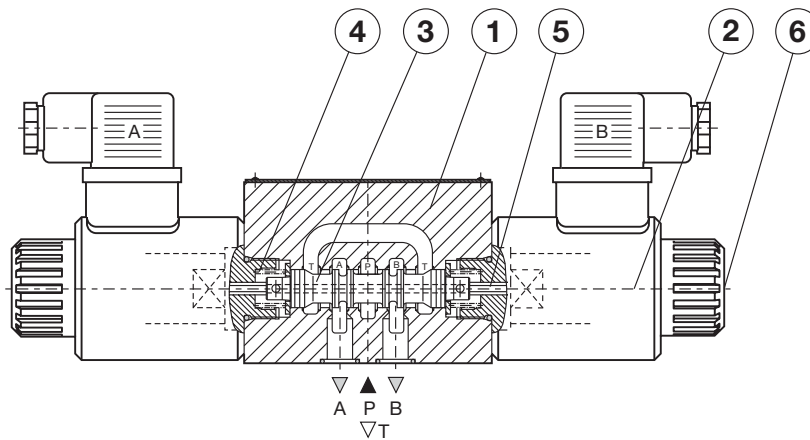
4/2 and 4/3 - WAY DIRECTIONAL VALVES type KV

- NS 6
- to 350 bar
- to 75 l/min
- Direct operation by solenoid
- Connection diagram and connecting dimensions to ISO 4401, DIN 24340
- Plug-in connector for solenoids to ISO 4400
- 5-chamber model with good spool guidance
- Optimized flow paths for low losses of pressure
- Adjustment of the switching time
- Wet pin solenoid with interchangeable coil
- Manual emergency control
- Protection of solenoid IP 65 to DIN EN 60529
- Fulfil EMC (89/336/EEC)



KV-4/3-5K0-6

Description of operation



Directional valves type KV with direct solenoid operation control the direction of the hydraulic medium flow.

These directional valves consist of a housing (1), a control spool (3), and one solenoid (2) with two return springs (4) in 4/2-way directional valves, and two solenoids (2) with two return springs (4) in 4/3-way directional valves. In 4/3-way directional valves the centre position of the control spool is the neutral position. The change-over to the operating position (a) and (b) is done by energising the solenoids (2) "a" and "b" respectively, whereby the solenoid plunger acts on the control spool (3) via the operating pin (5), thus clearing the corresponding flow ways and establishing relevant links between ports A, B, P, and T. For selection of spool types refer to page 3.6.2.

When the solenoid (2) is de-energised, the control spool (3) is returned to its neutral position by the return spring (4). The change-over can be done manually by pressing the emergency hand operator (6).

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Directional valve with two operating position, two solenoids without springs allows the control spool to be held in the operating position (detent). The control spool remains in the operation position also when the solenoids are de-energised.

Technical data

Hydraulic

Size	6	
Flow rate	see p-Q curves, page 3.6.3	
Operating pressure ports P,A,B	bar	350
Operating pressure port T	bar	210
Oil temperature range	°C	-20 to +70
Viscosity range	mm ² /s	15 to 380
Mounting position	optional	
Mass	4/2	kg 1,9
	4/3	kg 2,7
Filtration	NAS 1638	8

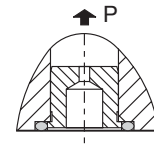
Electrical

Supply voltage	direct or	V	12, 24, 48
	alternating		110, 230
Power		W	29*
Switch-on time**		ms	50 to 80
Switch-off time**		ms	30 to 55
Switching frequency		1/h	15 000
Ambient temperature		°C	to +50
Coil temperature		°C	to +180
Duty cycle			continuous
** -The switching-on and off times apply to 24 V DC solenoids			
* -12V supply voltage - 36 W			

Ordering code

KV - / - **5KO** - **6** - - - - - *

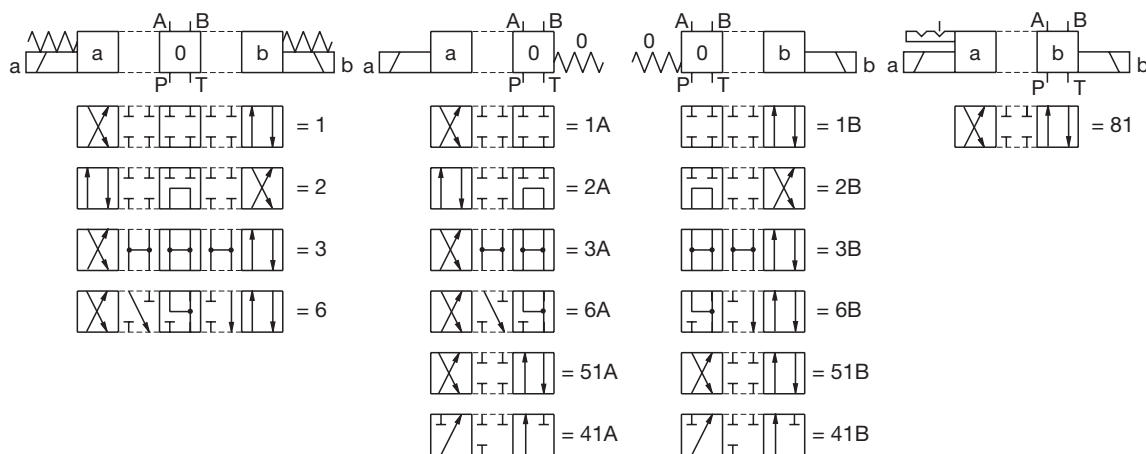
Working ports	
Number of control spool positions	
Spool type	
Supply voltage	
Plug-in connector	
Throttle	
Seal type	
Constant action restrictor	
Special requirements to be briefly specified	



If flow rates greater than permissible occur during change-over, a cartridge throttle must be fitted into P-line of the directional valve.

Working ports 3 working ports = 3 4 working ports = 4	Plug-in connector without signal lamp = no design with signal lamp = L
Number of control spool positions two positions = 2 three positions = 3	Throttle without throttle in "P" line = no design. throttle 0,8 mm dia = D08 throttle 1,0 mm dia = D10 throttle 1,2 mm dia = D12
Supply voltage direct voltage 24 V = no design. 12 V = 12 DC 48 V = 48 DC 110 V = 110 DC 230 V = 230 DC alternating voltage 12 V = 12 AC 24 V = 24 AC 48 V = 48 AC 110 V = 110 AC 230 V = 230 AC - Alternating voltage solenoids are fitted with a bridge rectifier. - With solenoids of over 48 V an earthing clamp (⊥) to ISO 4400 must be connected. * To fulfil EMC (89/336/EEC) a capacitor must be built in (see 10.2.2)	Seal type NBR seals for mineral oil HL, HLP, to DIN 51524 = no design. FPM seals for HETG, HEES, HEPG to VDMA 24568 = E and ISO 15380
	Constant action restrictor Without restrictor = no design. Restrictor 0,3 dia. = UD

Spool types

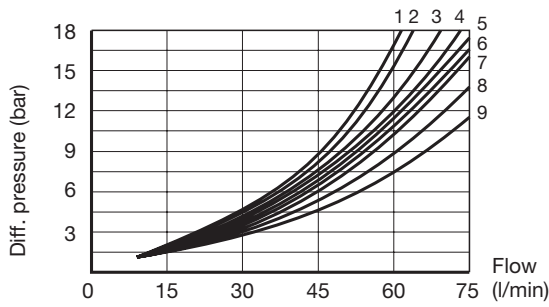


- Port T in the valves with spool type 41A and 41B to be used as leakage line.

Important note:

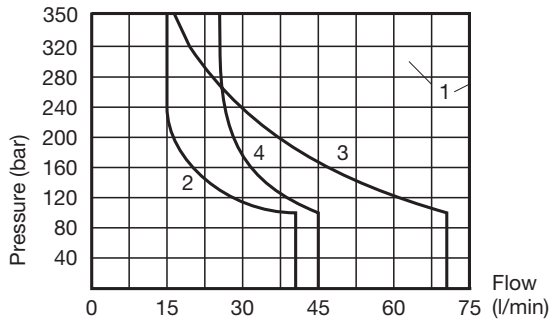
Valves with adjustment of the switching time - a constant or short - time static oil pressure of at least ≥ 4 bar must prevail at connection T of the directional control valve to maintain the pressure in the spring chambers.

Δp - Q Performance curves (measured at $t = 50\text{ }^\circ\text{C}$ and $v = 28\text{ mm}^2/\text{s}$)



Spool type	Flow path				
	P-A	P-B	A-T	B-T	P-T
1	8	8	6	6	-
2	5	5	4	4	1
3	8	8	7	7	-
6	5	5	9	9	-
81	5	5	1	1	-
51A, 51B	5	5	1	1	-
41A, 41B	7	7	-	-	-

p - Q Operating limits (measured at $t = 50\text{ }^\circ\text{C}$ and $v = 28\text{ mm}^2/\text{s}$)

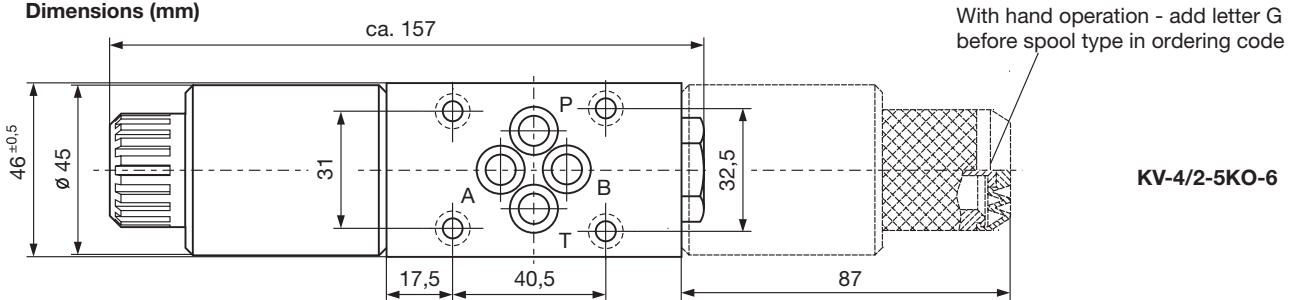


Spool type	Curve
1	1
2	4
3	3
6	3
81	1
51A, 51B	1
41A, 41B	2

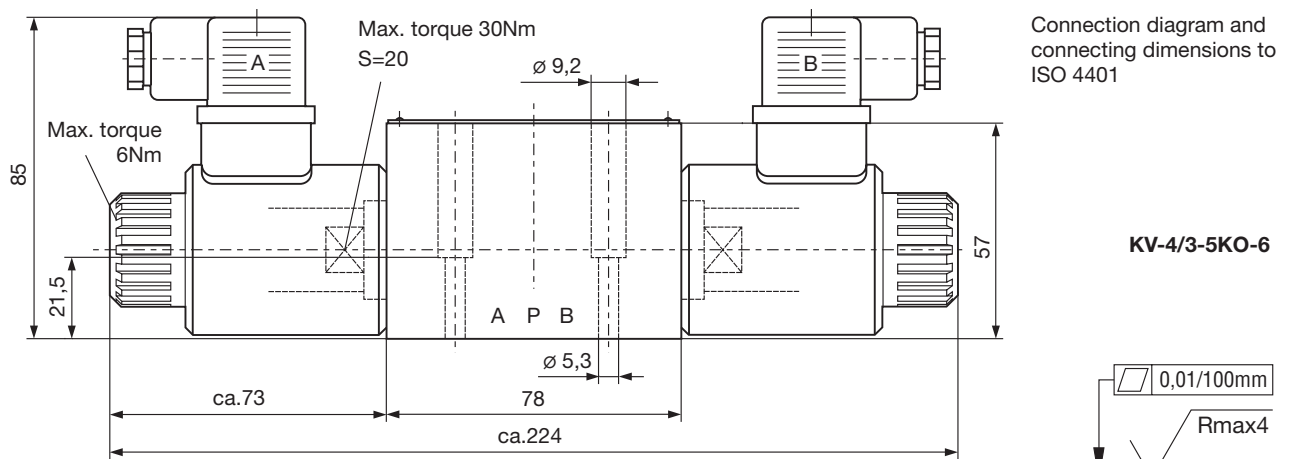
The operating limits of the valve are determined at a voltage 10% below the nominal rating. The curves refer to application with symmetrical flow through the valve (P-A and B-T). In the case of asymmetric flow (e.g. one part not used) reduced values may result.

Note: For valves with adjustment of the switching time reduced values of the operating limits may result.

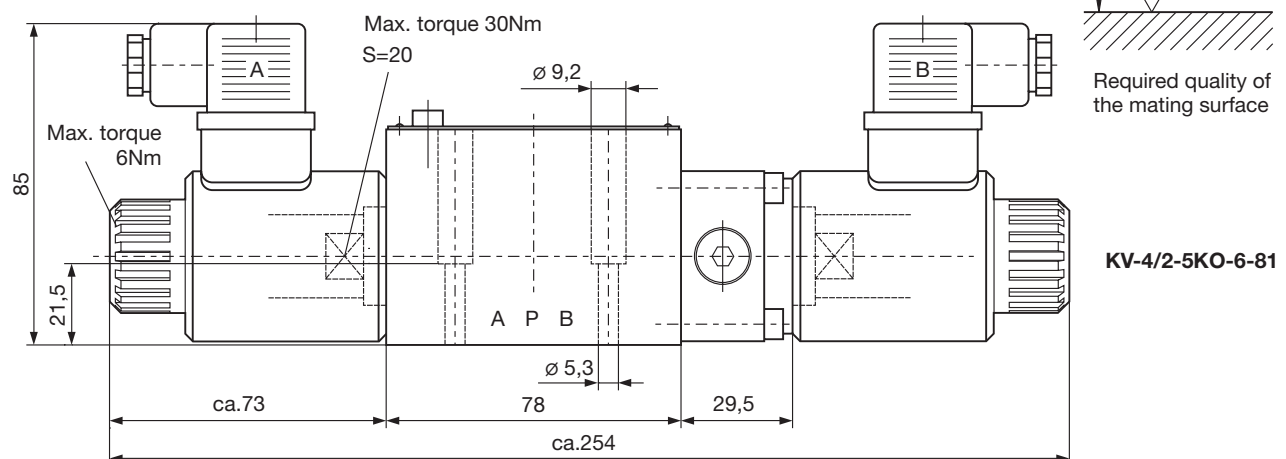
Dimensions (mm)



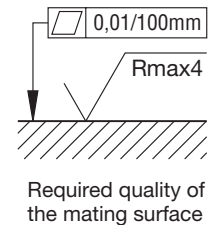
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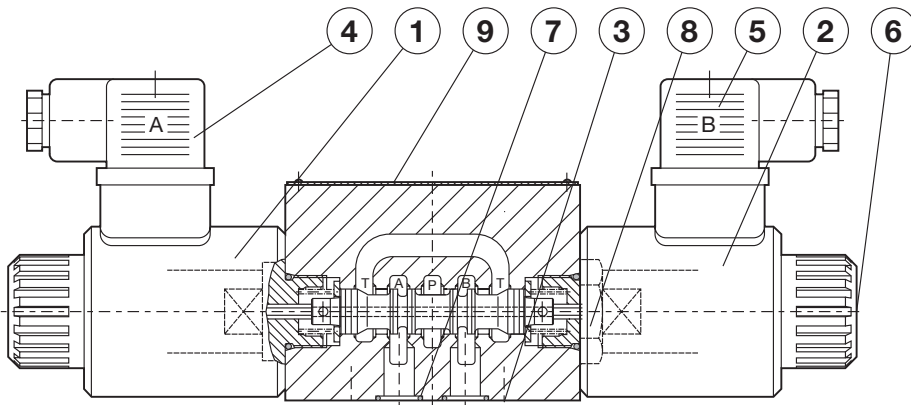
KV-4/3-5KO-6



KV-4/2-5KO-6-81

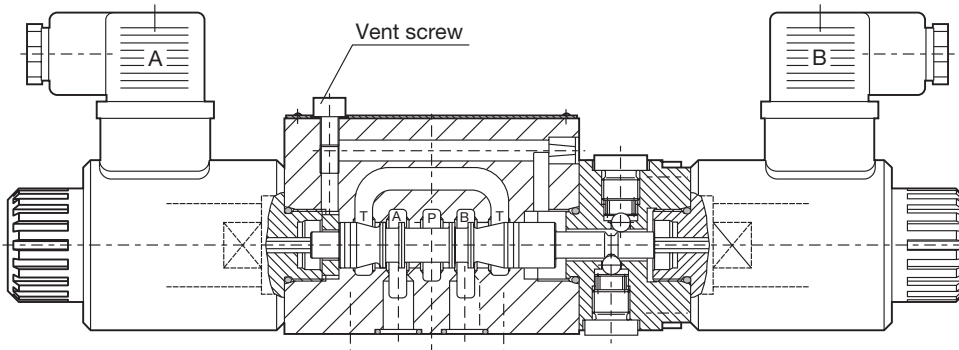


Function drawing

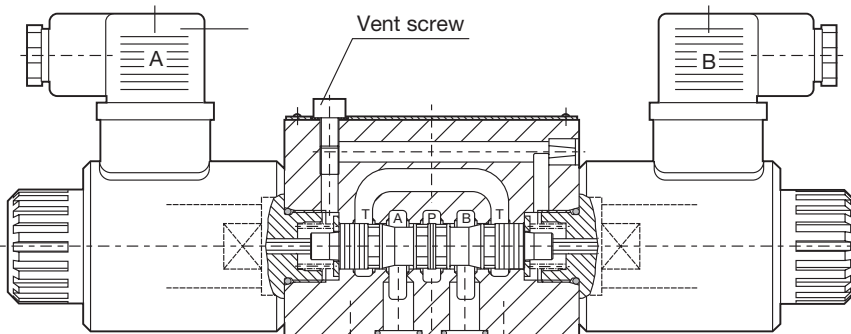


KV-4/3-5KO-6
(KV-4/2-5KO-6)

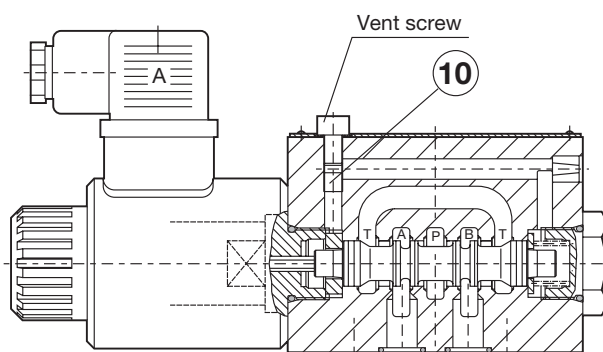
- 1 Solenoid "a" - MR-045
- 2 Solenoid "b" - MR-045
- 3 Fixing screws 4 pcs M5 x 30 to DIN EN ISO 4762 -10.9 must be ordered separately Required tightening torque Md = 9 Nm
- 4 Plug-in connector "a" - grey
- 5 Plug-in connector "b" - black
- 6 Emergency hand operator
- 7 O-ring 9,25 x 1,78
- 8 Valve cap
- 9 Nameplate
- 10 Constant action restrictor



KV-4/2-5KO-6-81



KV-4/3-5KO-6-2



KV-4/2-5KO-6-UD

Installation

The directional control valve must be installed horizontally (Nameplate on top). If this is not the case, the valve must be removed for venting. Unscrew the vent screw. Move the spool alternately to the switching positions a and b until no more bubbles appear at the screw hole. The oil must be visible at the screw hole. Missing oil should be refilled with an oilcan, drop by drop. Screw in the vent screw.

A constant or short time static oil pressure of at least > 4 bar must prevail at connection T of the directional control valve to maintain the oil pressure in the spring chambers. If this is not the case, the preloaded oil volume of the restricted valve would leak into the T channel through the leakage section of the control spool shoulders.

The dampening constancy also depends on the constancy of the oil viscosity.

For this reason the dampening effect should always be adjusted with the system at operational temperature.