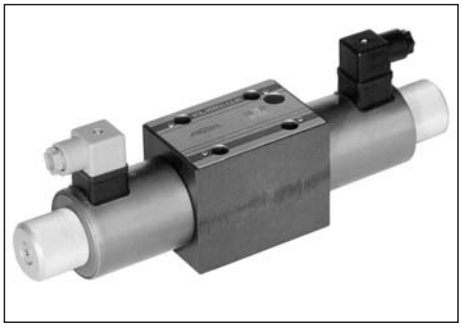
4/2 and 4/3 - WAY DIRECTIONAL VALVES type KV

- NS 10
- to 350 bar
- to 120 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



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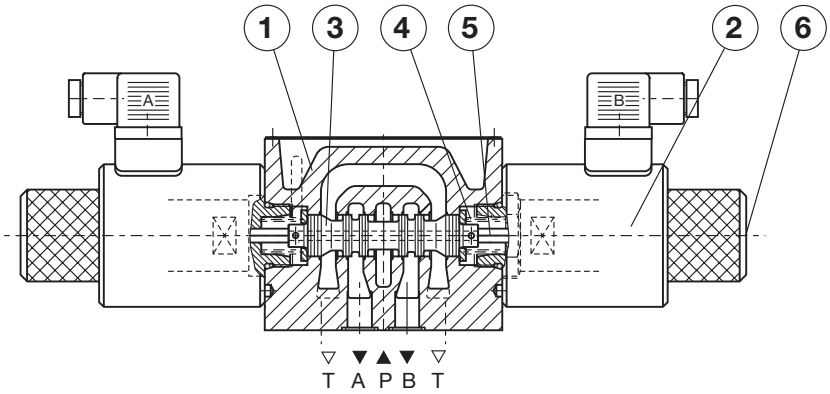
Description of operation



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 3.8.2.

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		10	
Flow rate		see p-Q curves, page 3.8.3	
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	6,5
	4/3	kg	7,3
Filtration		NAS 1638	8

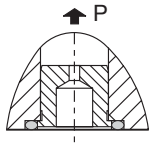
Electrical

Supply voltage direct or alternating	V	12, 24, 48 110, 230
Power	W	45
Switch-on time	ms	70 to 95
Switch-off time	ms	40 to 80
Switching frequency	1/h	15 000
Ambient temperature	°C	to +50
Coil temperature	°C	to +180
Duty cycle	continious	
The switching-on and off times apply to 24 V DC solenoids		

Ordering code

KV - / -5KO-10 - - ✻

- 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**

Number of control spool positions

two positions **= 2**
three positions **= 3**

Supply voltage

direct voltage		alternating voltage	
24 V	**= no desig.**	12 V	**= 12 AC**
12 V	**= 12 DC**	24 V	**= 24 AC**
48 V	**= 48 DC**	48 V	**= 48 AC**
110 V	**= 110 DC**	110 V	**= 110 AC**
230 V	**= 230 DC**	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)

Plug-in connector

without signal lamp **= no design**
with signal lamp **= L**

Throttle

without throttle in "P" line **= no desig.**
throttle 0,8 mm dia **= D08**
throttle 1,0 mm dia **= D10**
throttle 1,2 mm dia **= D12**

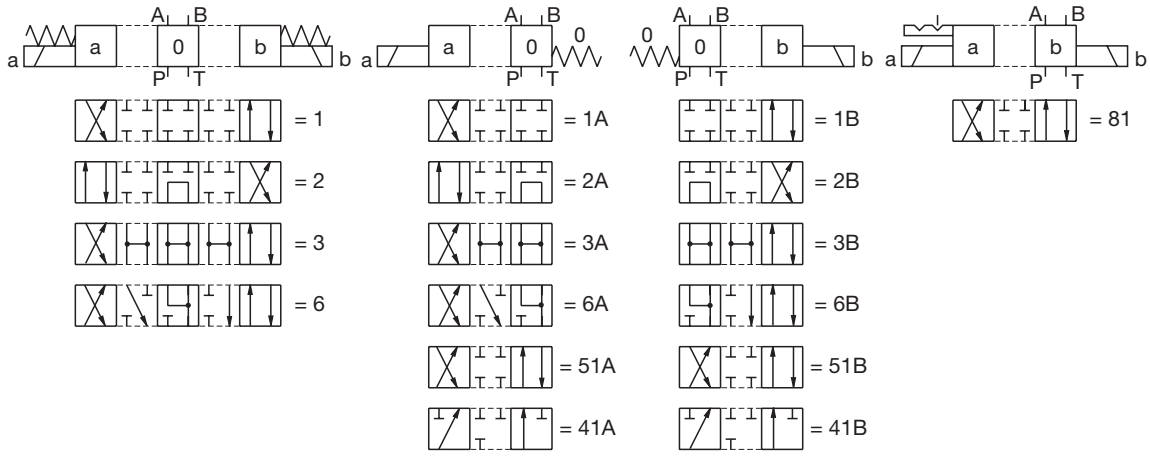
Seal type

NBR seals for mineral oil HL, HLP, to DIN 51524 **= no desig.**
FPM seals for HETG, HEES, HEPG to VDMA 24568 and ISO 15380 **= E**

Constant action restrictor

Without restrictor **= no desig.**
Restrictor 0,5 dia. **= UD**

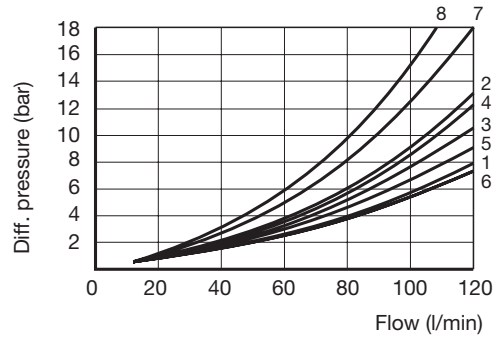
Spool types



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

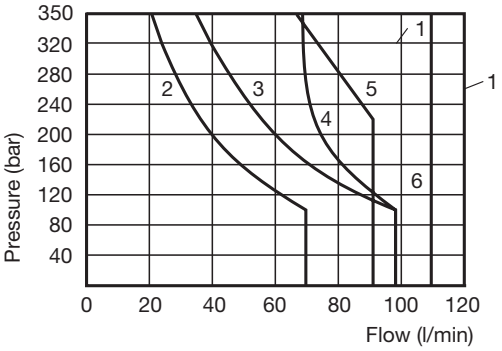
Important note:
Valves with adjustment of the switching time - a constant or short - time static oil pressure of at least ≧ 4 bar must prevail at connection T of the directional control valve to maintain the pressure in the spring chambers.

Δp - Q Performance curves (measured at t = 50 °C and υ = 28 mm²/s)



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

p - Q Operating limits (measured at t = 50 °C and υ = 28 mm²/s)

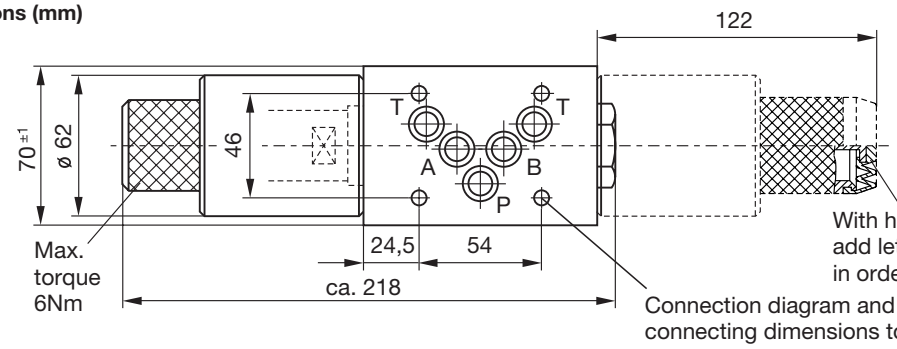


Spool type	Curve
1	1
2	4
3	5
6	3
9	6
81	1
51A, 51B	1
41A, 41B	2

The operating limits of the valve are determined at a voltage 10% below the nominal rating. The curves refer to application with symetrical flow throw the valve (P-A and B-T). In the case of asymetric 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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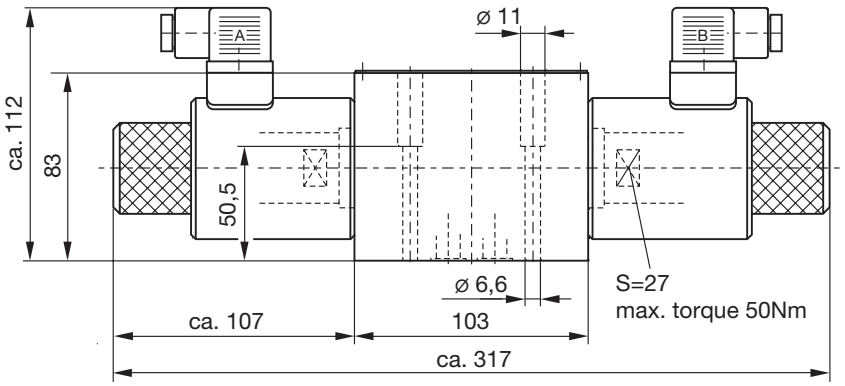
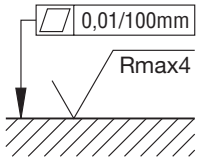
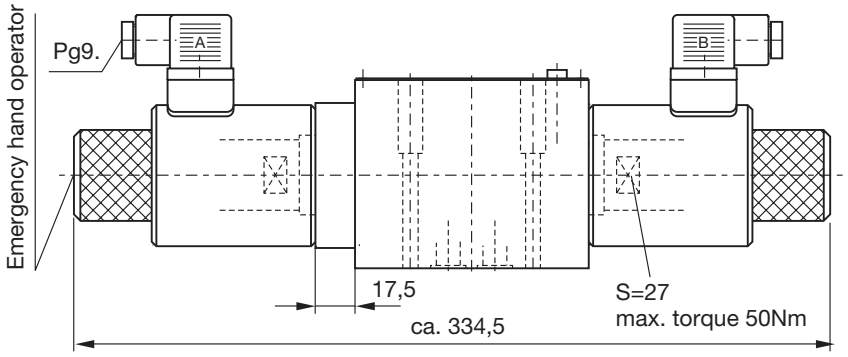


KV-4/3-5KO-10



Required quality of the mating surface



KV-4/2-5KO-10-81

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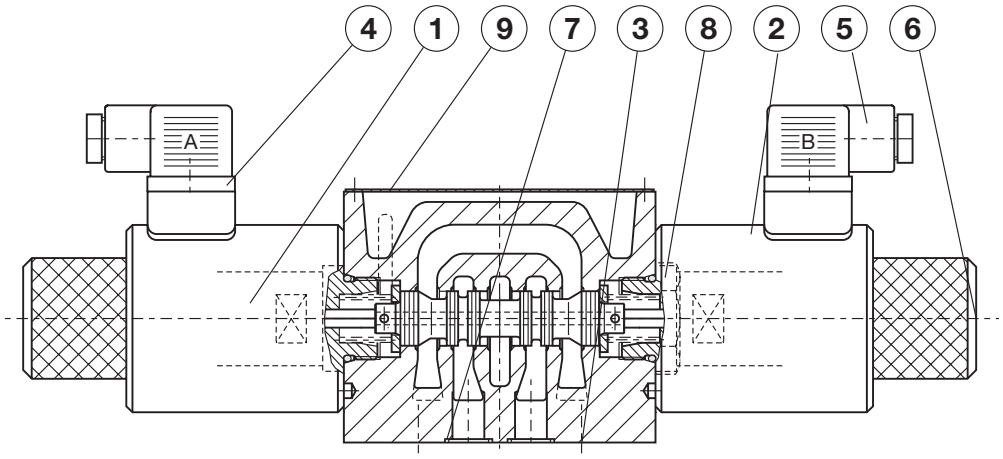
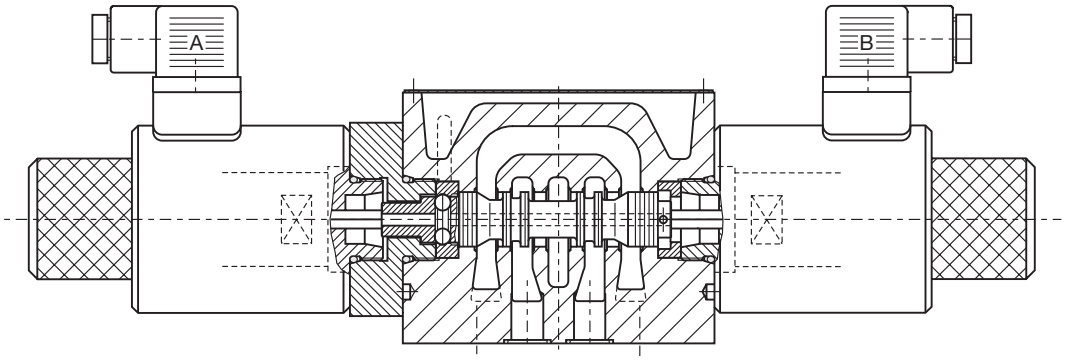
Function drawing



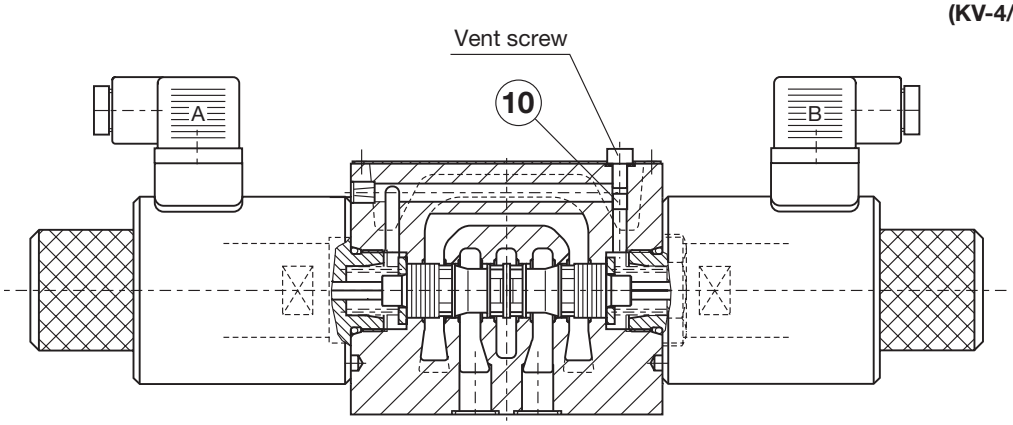
KV-4/3-5KO-10
(KV-4/2-5KO-10)

1 Solenoid "a" - MR-060
2 Solenoid "b" - MR-060
3 Fixing screws 4 pcs M6 x 60 to DIN EN ISO 4762 -10.9 must be ordered separately Required tightening torque Md = 15 Nm
4 Plug-in connector "a" - grey
5 Plug-in connector "b" - black
6 Emergency hand operator
7 O-ring 12,42 x 1,87
8 Valve cap
9 Nameplate
10 Constant action restrictor

KV-4/2-5KO-10-81



KV-4/3-5KO-10-2-UD
(KV-4/2-5KO-10-2-UD)



Instalation

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 schould be refielld 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.