



## 4/2, 4/3 WAY DIRECTIONAL VALVE KV-5KL

- NG 6
- Up to 350 bar [5 076 PSI]
- Up to 80 L/min [21 GPM]
- Connection diagram and connecting dimensions ISO 4401
- 5-chamber model with good spool guidance
- Optimized flow paths for low losses of pressure
- Low internal leakage
- Wet pin solenoid with interchangeable coil
- Manual emergency control
- Fulfil EMC (89/336/EEC)
- Packaging in carton box



KV-4/3-5KL-6

### Operation

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

A valve basically consists of a housing (1), one or two solenoids (2a, 2b), control spool (3) and return spring (4).

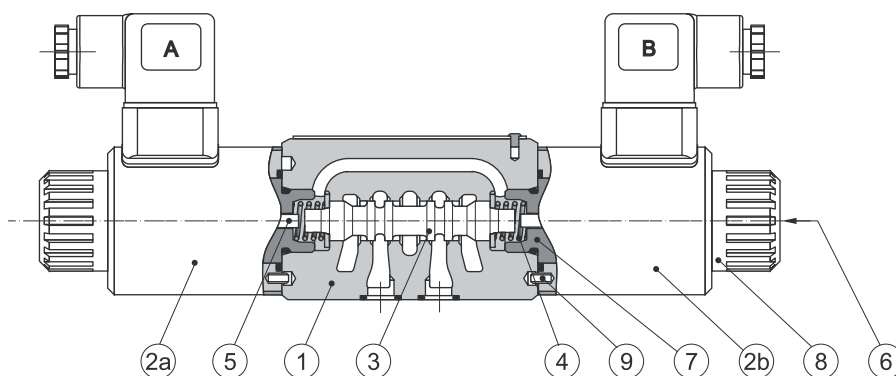
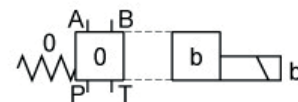
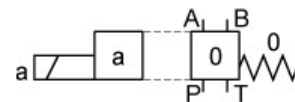
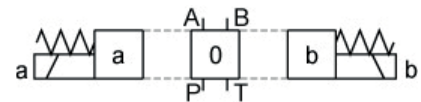
In 4/3 way directional valves the centre position of the spool is defined by 4 return springs which hold the spool in the neutral position. The change over to the operating position (a) or (b) is done by energizing the solenoids (2a/ 2b) respectively, whereby the solenoid plunger acts on the control spool (3) via the operating pin (5), thus clearing the corresponding flow ways and establishing relevant links between ports P, A, B and T. When the solenoid (2a/ 2b) is deenergized, the control spool (3) is returned to neutral position by the return spring (4). In 4/2 way directional valves the centre position of the spool is defined by return spring on the opposite side of the solenoid (2a or 2b).

Change-over of the control spool (3) can be done manually by pressing the pin (6) for emergency manual override in the solenoid core.

Solenoid coil is fastened to the solenoid core (7) by retaining nut (8). Position of the coil (orientation of the connector) is pre-defined by the positioning hole on the valve housing and by the fixation pin (9) on the coil.

### Hydraulic symbols

Spool types





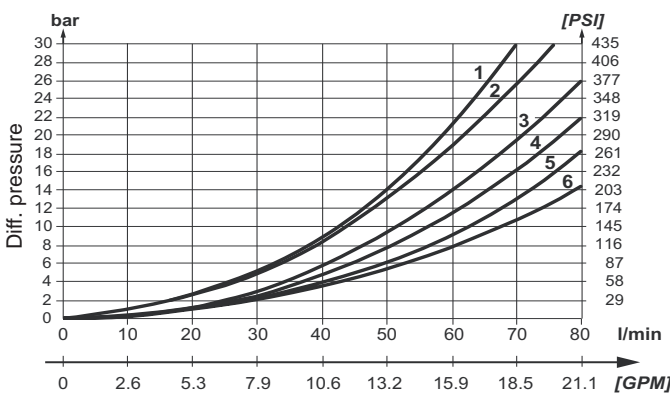
**Features**

<b>Hydraulic Size</b>		<b>6</b>	
<b>Flow rate</b>		L/min [GPM]	see ΔP-Q curves
<b>Operating pressure</b>	Ports A, B, P	bar [PSI]	350 [5 076]
	Port T	bar [PSI]	250 [3 625]
<b>Viscosity range</b>		mm <sup>2</sup> /s [SUS]	15 to 380 [69.5 to 1 760]
<b>Oil temperature range</b>		°C [°F]	-20 to +70[-4 to 158]
<b>Filtration</b>		ISO 4406:1999	19/17/14
<b>Mass</b>	4/2	kg [lb]	1,6 [3.6]
	4/3		2,2 [4.9]
<b>Mounting position</b>		Optional	
<b>Electrical</b>			
<b>Supply voltage</b>	Direct	V	12, 24, 48
	Alternating		110, 230
<b>Max. allowable voltage variation</b>			+/- 10 %
<b>Power</b>		W	31
<b>Switch-on time*</b>		ms	200 to 260
<b>Switch-off time*</b>		ms	100 to 120
<b>Switching frequency</b>		1/h	15 000
<b>Ambient temperature</b>		°C [°F]	to 50 [122]
<b>Coil temperature</b>		°C [°F]	to 180 [356]
<b>Duty cycle</b>			Continuous
<b>Protection class to EN 50529 / IEC 60529</b>			
	- Connector EN 175301		- IP65
	- Connector AMP		- IP65
	- Connector Deutsch		- IP69K

\* Measured on unloaded valve

**ΔP-Q Performance curves**

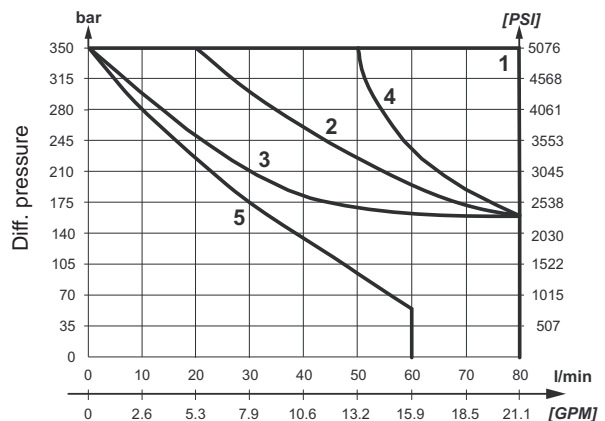
Measured at 50°C [122°F] and viscosity of 32 mm<sup>2</sup>/s [148 SUS].



Spool	Flow path				
	P-A	P-B	A-T	B-T	P-T
1	5	5	4	4	-
2	3	3	1	1	1
3	6	6	3	3	3
6	3	3	4	4	-
51A, 51B	4	4	2	2	-
41A, 41B	4	4	-	-	-

**ΔP-Q Operating limits**

Measured at 50°C [122°F] and viscosity of 32 mm<sup>2</sup>/s [148 SUS].

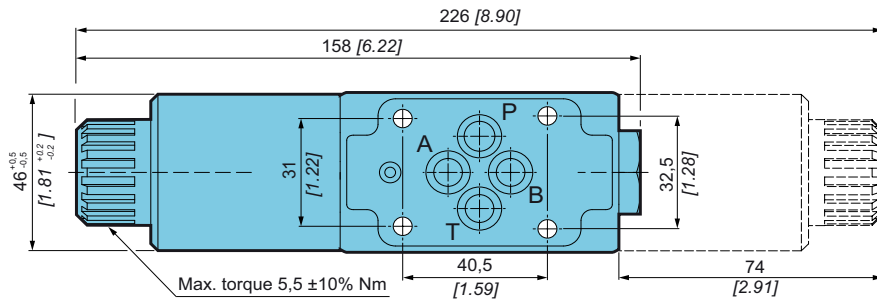


Spool	Curve
1	1
2	2
3	3
6	4
51A, 51B	1
41A, 41B	5

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

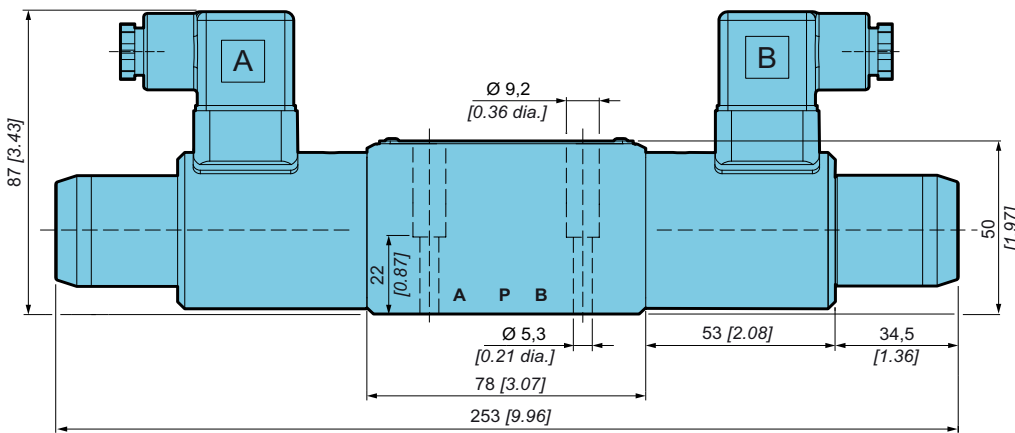


**Dimensions**



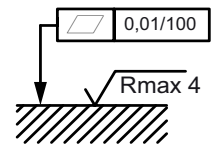
**KV-4/2-5KL-6**

Connection diagram and connecting dimensions to ISO 4401.

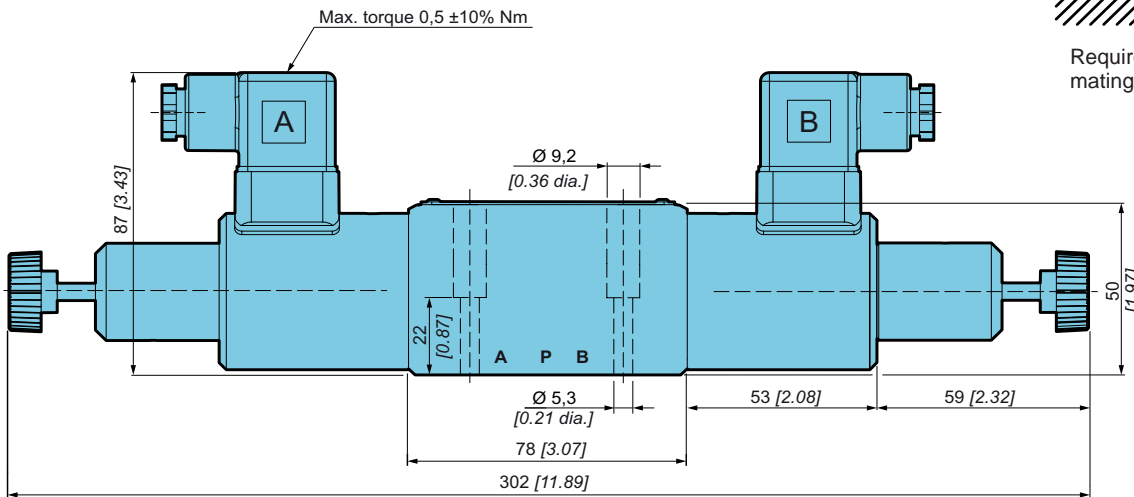


**KV-4/3-5KL-6-G...**

Manual override with rubber cover



Required quality of the mating surface.

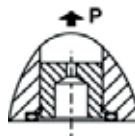


**KV-4/3-5KL-6-C...**

Lockable manual override

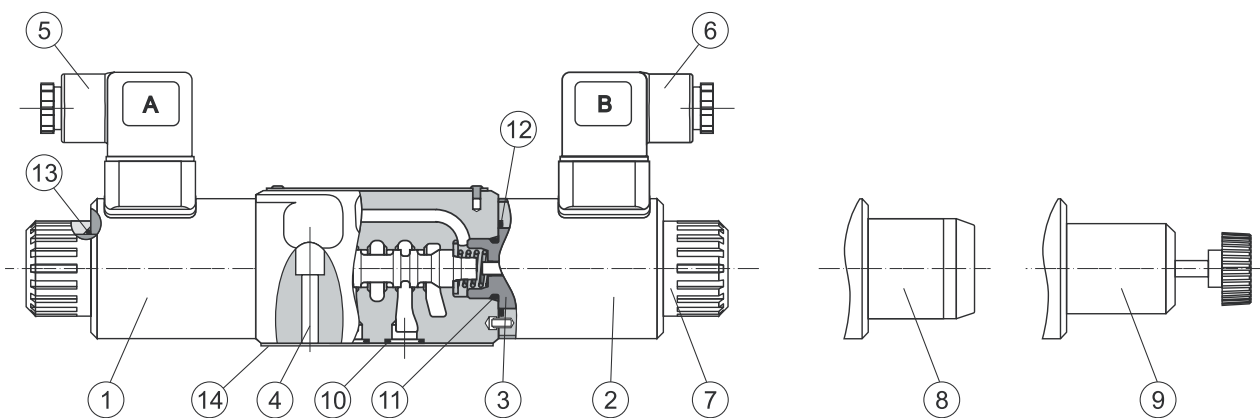
**Cartridge throttle**

If flow rates greater than permissible occur during change-over, a cartridge throttle must be fitted into P-line of the directional valve. (option D08/D10/D12 in the model code)





Valve assembly- spare parts

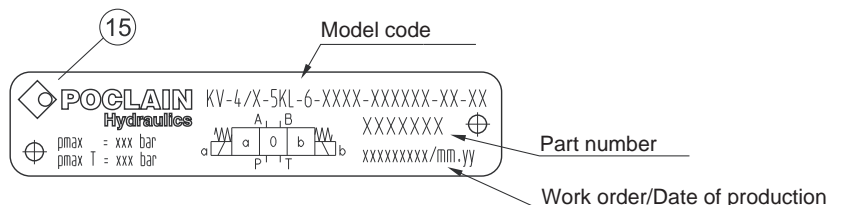
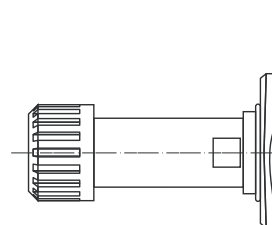
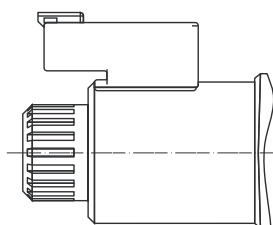
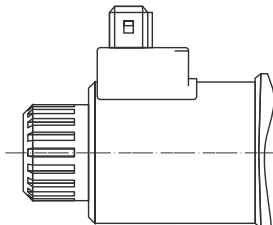
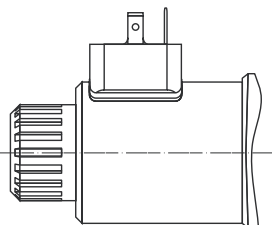


EN 175301-803 connector

AMP Junior timer connector

Deutsch connector

Without coil



1. Solenoid coil "a" - Type **MR-045-O** (by default) or type **SR-045-O** (option S1 in model code)
2. Solenoid coil "b" - Type **MR-045-O** (by default) or type **SR-045-O** (option S1 in model code)
3. Solenoid core - Type **MR-045-O** (by default) or type **ACTUATOR SR-045** (option S1 in model code)
4. Fixing screws 4 pcs **M5x30 to ISO 476210.9**, not supplied with the valve; must be ordered separately  
Required tightening torque: 9<sup>+/-</sup> 10%Nm - steel tapped holes, 7<sup>+/-</sup> 10% Nm - aluminium tapped holes
5. Plug-in connector EN 175301-803 "a" - grey - Type **MR-K-A**
6. Plug-in connector EN 175301-803 "b" - black - Type **MR-K-B**
7. Retaining nut - Type **MR-045-M** (by default) or type **SR-045-M** (option S1 in model code)
8. Retaining nut for manual override with rubber cover - Type **MR-045-M-G** (by default) or type **SR-045-M-G** (option S1 in model code)
9. Retaining nut for lockable manual override - Type **MR-045-M-C** (by default) or type **SR-045-M-C** (option S1 in model code)
10. **O-ring FI 9,25x1,78**
11. **O-ring FI 17x2**
12. **O-ring FI 26x2**
13. **O-ring FI 22x1,5**
14. Protection plate
15. Nameplate

Detail technical data regarding the solenoids and Model codes for ordering are available in catalogue chapter SOLENOIDS.

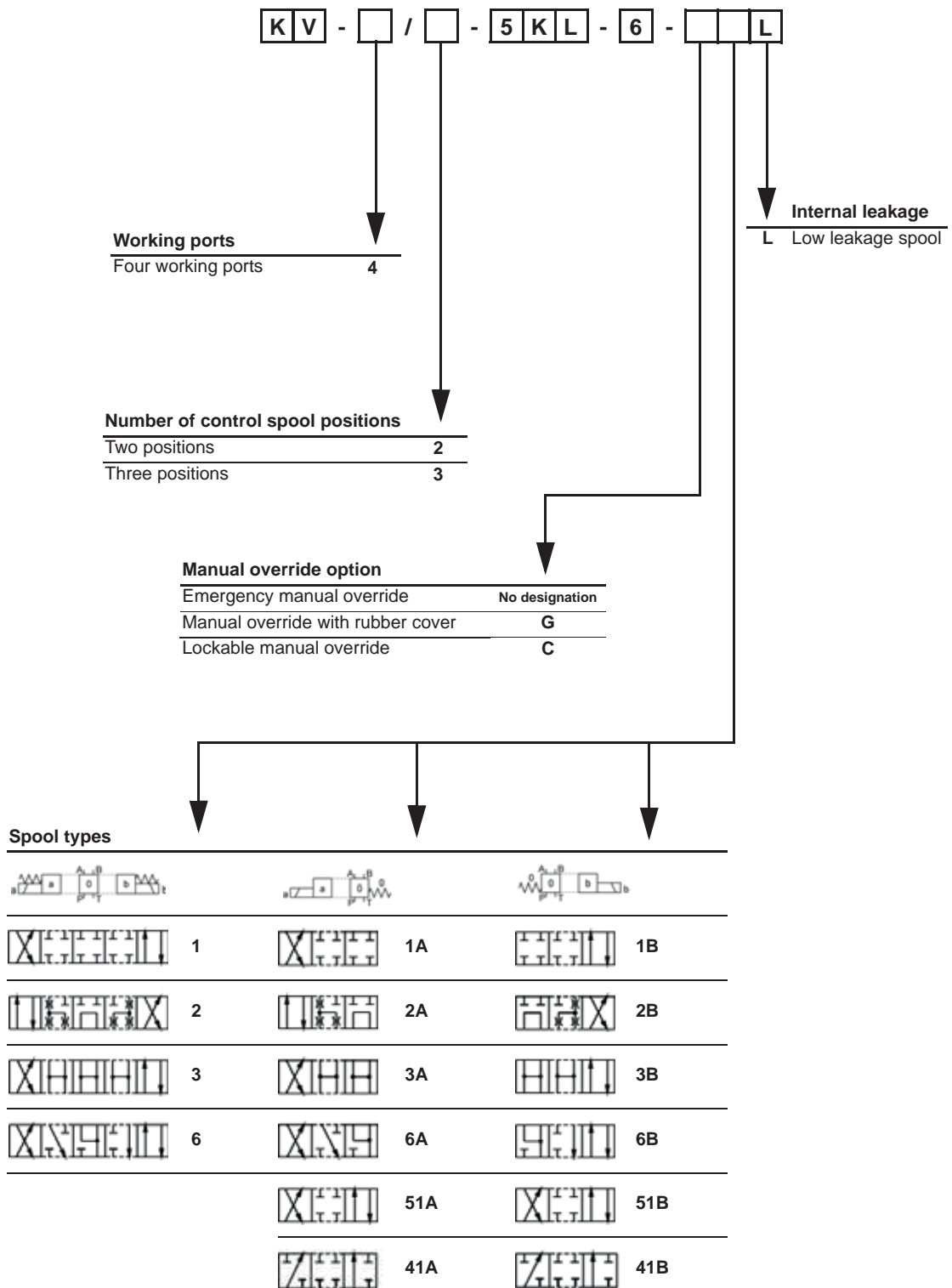
Mechanically operated

Hydraulically operated

Electrically operated



Model code



Port T in the valves with spool type 41A and 41B must be used as leakage line when working pressure is over 250 bar [3 625 PSI].



**Supply voltage**

	Direct voltage	Alternating voltage
12 V	12 DC	12 AC
24 V	No designation	24 AC
48 V	48 DC	48 AC
110 V	110 DC	110 AC
230 V	230 DC	230 AC*
Without coil	WC	WC

Alternating voltage solenoids must be used with connector with integrated rectifier bridge.  
 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.

**Coil terminal**

EN 175301-803 without signal lamp	No designation
EN 175301-803 with signal lamp	L
EN 175301-803 without connector	K
AMP junior timer without connector	M
Deutsch without connector	V

**Overvoltage protection**

Without overvoltage protection	No designation
With overvoltage protection	T

**Throttle mm [in]**

Without throttle in P line	No designation
Throttle Ø 0,8 [0.03 dia.]	D08
Throttle Ø 1,0 [0.04 dia.]	D10
Throttle Ø 1,2 [0.05 dia.]	D12

**Seal type**

NBR seals for mineral oil HL,HLP to DIN 51524	No designation
FPM seals for HETG, HEES, HEPG to VDMA 24568 and ISO 15380	E

**Special options**

Phosphate coated	-
Zinc coated	ZN
Solenoid type SR-045	S1
Painted	S3

Mechanically operated

Hydraulically operated

Electrically operated