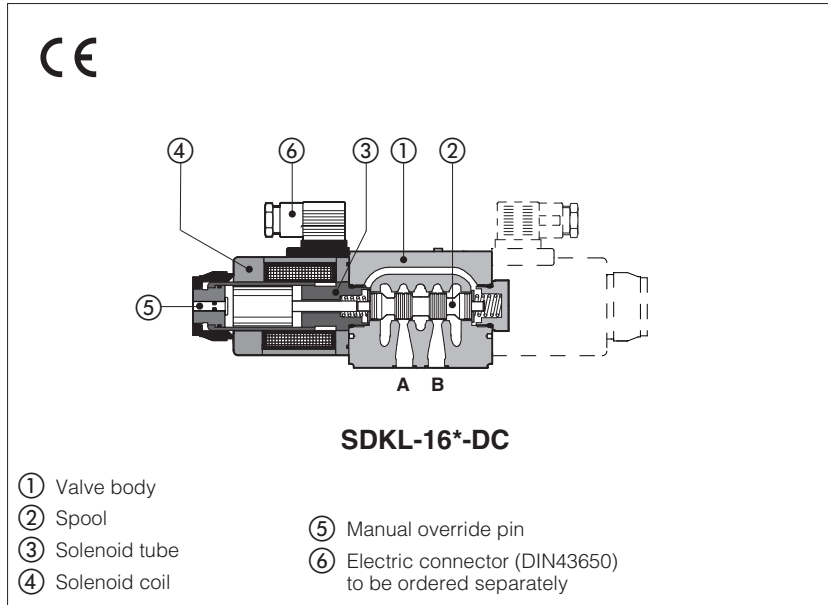


# Solenoid directional valves type SDKL

directed, spool type



Spool type, two or three position direct operated valves size 10.

Wet type solenoids are made by:

- screwed tube ③, with integrated manual override pin ⑤
  - interchangeable coils ④, specific for DC power supply, easily replaceable without tools - see section ⑥ for available voltages. Coils protection **IP65**. Interchangeable spools ②, see section ②.
- The valve body ① is 5 chamber type, made by shell-moulding casting with wide internal passages ensuring low pressure drops.

Mounting surface: **ISO 4401 size 10**

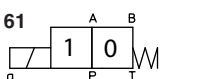
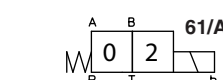
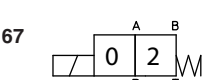
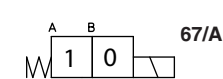
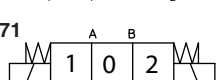
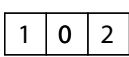
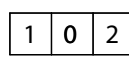
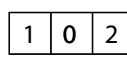
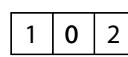
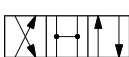
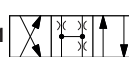
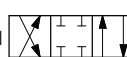
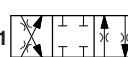
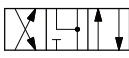
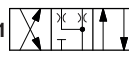
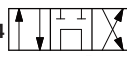

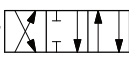
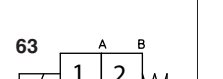

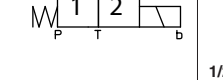
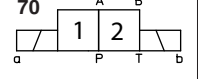
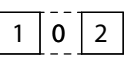


Max flow: **120 l/min**

Max pressure: **350 bar**

## 1 MODEL CODE

<b>SDKL - 1</b>	<b>61</b>	<b>1 / A</b>	<b>X</b>	<b>24 DC</b>	<b>**</b>	<b>*</b>
Solenoid directional valves size 10 light execution						Seals material, see section ④: - = NBR <b>PE</b> = FKM
Valve configuration, see section ② <b>61</b> = single solenoid, center plus external position, spring centered <b>63</b> = single solenoid, 2 external positions, spring offset <b>67</b> = single solenoid, center plus external position, spring offset <b>70</b> = double solenoid, 2 external positions, without springs <b>71</b> = double solenoid, 3 positions, spring centered <b>75</b> = double solenoid, 2 external positions, with detent					Series number	
Spool type, see section ②.					Voltage code, see section ⑥	
Options, see note 1 at section ④.			<b>X</b> = standard coil without connector			

## 2 CONFIGURATIONS and SPOOLS (representation according to ISO 1219-1)

Configurations	Spools	Configurations	Spools
<b>61</b>  <b>61/A</b>  <b>67</b>  <b>67/A</b>  <b>71</b> 	    <b>0</b>  <b>0/1</b>  <b>1</b>  <b>1/1</b>  <b>3</b>  <b>3/1</b>  <b>4</b>  <b>6</b>  <b>7</b> 	<b>63</b>  <b>63/A</b>  <b>70</b>  <b>75</b> 	 <b>0/2</b>  <b>1/2</b> 

### 2.1 Special spools

- spools type **0/1** and **3/1** have restricted oil passages in central position, from user ports to tank.
- spool type **1/1** is properly shaped to reduce the water-hammer shocks during the switching.

### 3 MAIN CHARACTERISTICS

Assembly position / location	Any position for all valves except for type - 170* (without springs) that must be installed with horizontal axis if operated by impulses
Subplate surface finishing	Roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101)
MTTFd values according to EN ISO 13849	150 years, for further details see technical table P007
Ambient temperature	<b>Standard</b> execution = -30°C ÷ +70°C <b>/PE</b> option = -20°C ÷ +70°C
Flow direction	As shown in the symbols of table 2
<b>Operating pressure</b>	Ports P,A,B: <b>350</b> bar; Port T <b>210</b> bar;
Rated flow	See diagrams Q/Δp at section 8
<b>Maximum flow</b>	<b>120 l/min</b> , see operating limits at section 9

#### 3.1 Coils characteristics

Insulation class	<b>H</b> (180°C) Due to the occurring surface temperatures of the solenoid coils, the European standards EN ISO 13732-1 and EN ISO 4413 must be taken into account
Protection degree to DIN EN 60529	<b>IP 65</b> (with connectors 666, 667 correctly assembled)
Relative duty factor	100%
Supply voltage and frequency	See electric feature 6
Supply voltage tolerance	± 10%

### 4 SEALS AND HYDRAULIC FLUID - for other fluids not included in below table, consult our technical office

Seals, recommended fluid temperature	NBR seals (standard) = -20°C ÷ +80°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C		
Recommended viscosity	15 ÷ 100 mm <sup>2</sup> /s - max allowed range 2,8 ÷ 500 mm <sup>2</sup> /s		
Max fluid contamination level	ISO4406 class 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog		
<b>Hydraulic fluid</b>	<b>Suitable seals type</b>	<b>Classification</b>	<b>Ref. Standard</b>
Mineral oils	NBR, FKM	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR	HFC	

### 5 OPTIONS

**A** = Solenoid mounted at side of port B (only for single solenoid valves). In standard versions, solenoid is mounted at side of port A.  
**WP** = prolonged manual override protected by rubber cap - see section 12.

### 6 ELECTRIC FEATURES

External supply nominal voltage ± 10%	Voltage code	Type of connector	Power consumption	Code of spare coil
12 DC	<b>12 DC</b>	666 or	38 W	CAL-12DC
24 DC	<b>24 DC</b>			CAL-24DC
28 DC	<b>28 DC</b>	667		CAL-28DC

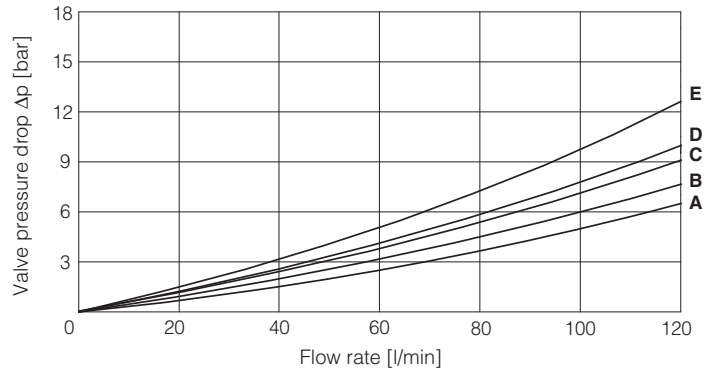
### 7 ELECTRIC CONNECTORS ACCORDING TO DIN 43650 (to be ordered separately)

**666** = standard connector IP-65 for direct connection to electric supply source.  
**667** = as 666, but with built-in signal led.

666, 667		CONNECTOR WIRING	
		<b>666, 667</b> 1 = Positive ⊕ 2 = Negative ⊖ ⊕ = Coil ground	
		SUPPLY VOLTAGES	
		<b>666</b> All voltages	<b>667</b> only for 24 DC

**8 Q/ΔP DIAGRAMS** based on mineral oil ISO VG 46 at 50°C

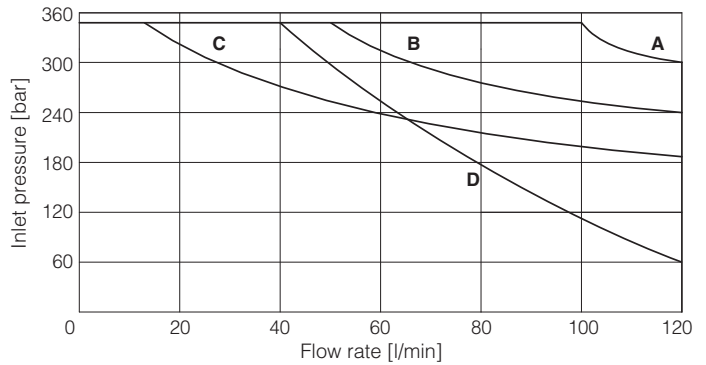
Spool type	Flow direction				
	P→A	P→B	A→T	B→T	P→T
0, 0/1, 0/2	A	A	B	B	
1, 1/1, 6	A	A	D	C	
3, 3/1, 7	A	A	C	D	
4	B	B	B	B	E
1/2	B	C	C	B	



**9 OPERATING LIMITS** based on mineral oil ISO VG 46 at 50°C

The diagrams have been obtained with warm solenoids and power supply at lowest value ( $V_{nom} - 10\%$ ). The curves refer to application with symmetrical flow through the valve (i.e. P→A and B→T). In case of asymmetric flow and if the valves have the devices for controlling the switching times the operating limits must be reduced.

Curve	Spool type
A	0/2, 1/1, 1/2, 3/1
B	1, 3
C	0, 0/1, 6, 7
D	4



**10 SWITCHING TIMES** (average values in msec)

Valve	Switch-on	Switch-off
SDKL + 666 / 667	60	35

Test conditions: - 50 l/min; 150 bar  
 - nominal supply voltage  
 - 2 bar of back pressure on port T  
 - mineral oil ISO VG 46 at 50°C

The elasticity of the hydraulic circuit and the variations of the hydraulic characteristics and temperature affect the response time.

**11 SWITCHING FREQUENCY**

Valve	DC (cycles/h)
SDKL + 666 / 667	15000

**12 INSTALLATION DIMENSIONS [mm]**

Valve's bottom view

**ISO 4401: 2005**  
**Mounting surface according to 4401-05-05-0-05**  
 Fastening bolts:  
 4 socket head screws M6x40 class 12.9  
 Tightening torque = 15 Nm  
 Seals: 5 OR 2050 and 1 OR 108  
 Ports P,A,B,T: Ø = 11.5 mm (max)  
 Ports Y: Ø = 5 mm

**P = PRESSURE PORT**  
**A, B = USE PORT**  
**T = TANK PORT**  
 For the max pressures on ports, see section 3

**SDKL-16\*-DC**

Mass: 4,5 kg

**Option /WP**

**SDKL-17\*-DC**

Mass: 6,1 kg

① Standard manual override PIN. The manual override operation can be possible only if the pressure at T ports is lower than 50 bar