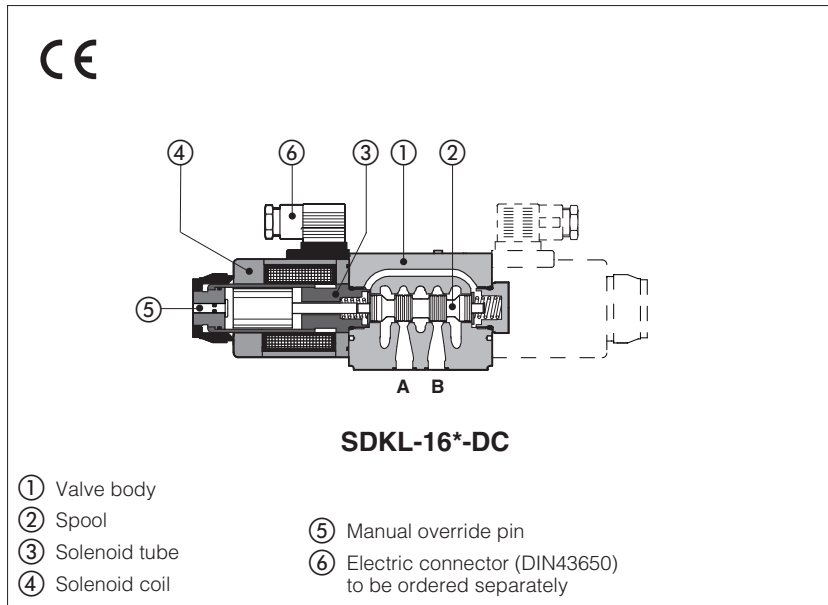


Solenoid directional valves type **SDKL**

direct operated, spool type, ISO 4401 size 10



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 ④ 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**

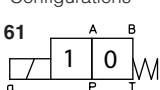
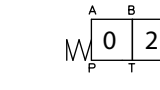
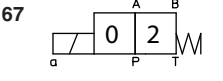

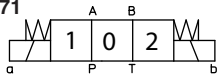
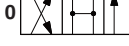
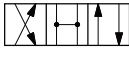



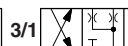
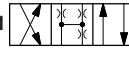
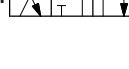
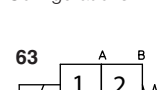
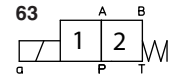
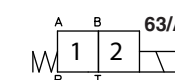
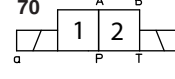
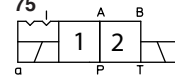


Max flow: **120 l/min**

Max pressure: **350 bar**

1 MODEL CODE

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

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

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

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	Standard execution = -30°C ÷ +70°C /PE option = -20°C ÷ +70°C
Flow direction	As shown in the symbols of table 2
Operating pressure	Ports P,A,B: 350 bar; Port T 210 bar;
Rated flow	See diagrams Q/Δp at section 8
Maximum flow	120 l/min , see operating limits at section 9

3.1 Coils characteristics

Insulation class	H (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	IP 65 (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 ² /s - max allowed range 2,8 ÷ 500 mm ² /s		
Max fluid contamination level	ISO4406 class 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog		
Hydraulic fluid	Suitable seals type	Classification	Ref. Standard
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	12 DC	666 or	38 W	CAL-12DC
24 DC	24 DC			CAL-24DC
28 DC	28 DC	667		CAL-28DC

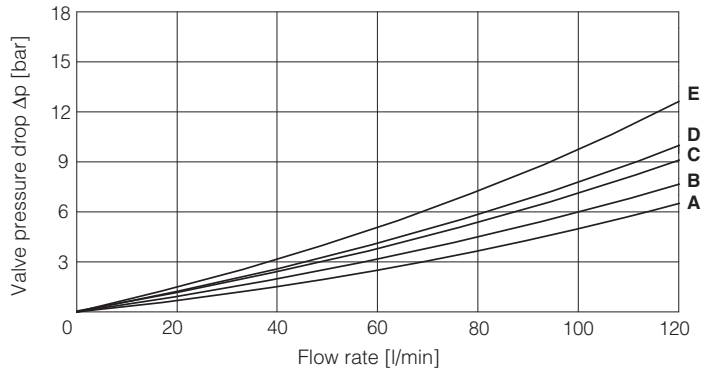
7 ELECTRIC CONNECTORS ACCORDING TO DIN 43650 (to be ordered separately)

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	
		666, 667 1 = Positive ⊕ 2 = Negative ⊖ ⊕ = Coil ground	
		SUPPLY VOLTAGES	
		666 All voltages	667 only for 24 DC

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

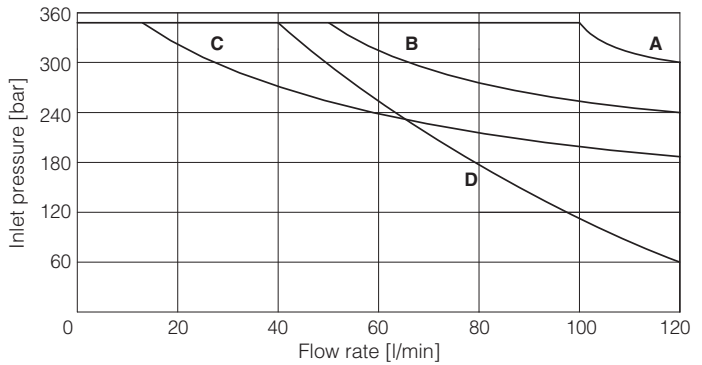
Spool type	Flow direction				
	P→A	P→B	A→T	B→T	P→T
0, 0/1, 0/2	A	A	B	B	
1, 1/1, 6	A	A	D	C	
3, 3/1, 7	A	A	C	D	
4	B	B	B	B	E
1/2	B	C	C	B	



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 surface

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