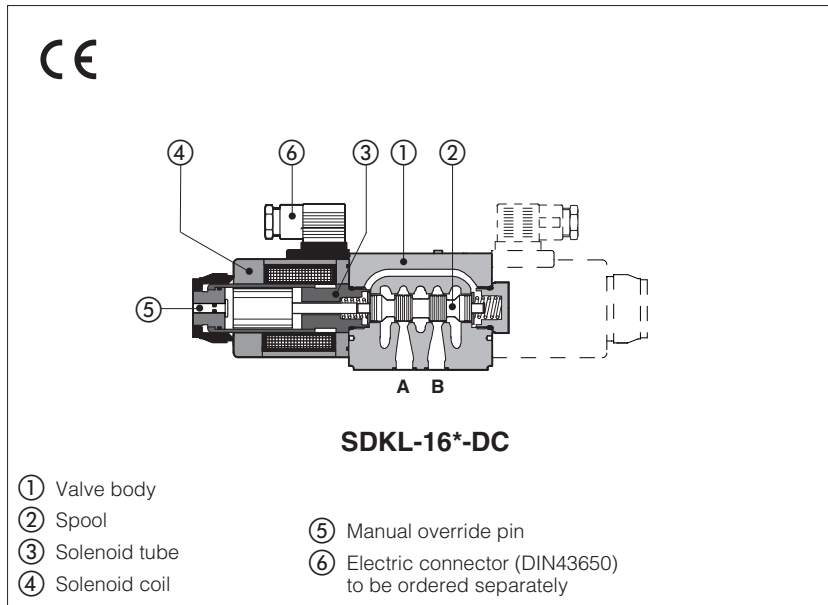


Solenoid directional valves type **SDKL**

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. | | | | | | | |
| Options, see note 1 at section ④. | | | | | | | |
| | | | | | | | Voltage code, see 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 | Configurations | Spools |
|---|------------------------------|--|----------|
| 61 61/A 67 67/A 71 | | 63 63/A 70 75 | |

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 9 |
| 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 |

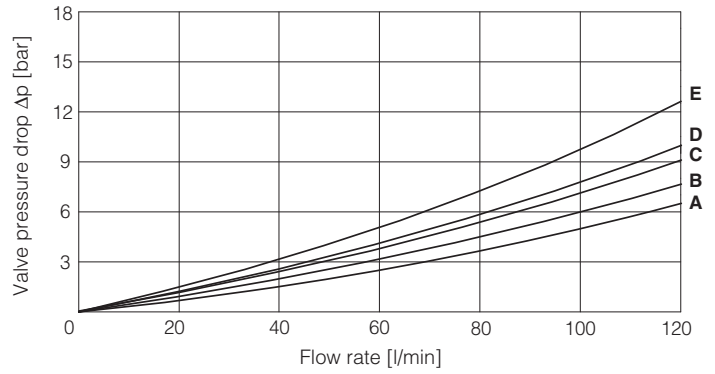
7 ELECTRIC CONNECTORS ACCORDING TO DIN 43650 (to be ordered separately)

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

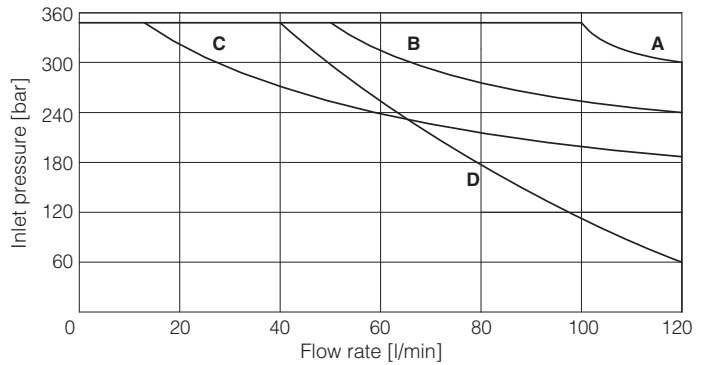
| Spool type | Flow direction | | | | |
|-------------|----------------|-----|-----|-----|-----|
| | P→A | P→B | A→T | B→T | P→T |
| 0, 0/1, 0/2 | A | A | B | B | |
| 1, 1/1, 6 | A | A | D | C | |
| 3, 3/1, 7 | A | A | C | D | |
| 4 | B | B | B | B | E |
| 1/2 | B | C | C | B | |



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