Solenoid directional valves type DKE
direct operated, ISO 4401 size 10

Spool type, two or three position direct operated valves with threaded solenoids certified according the North American standard cURus.

Solenoids are made by:
- wet type screwed tube, different for AC and DC power supply, with integrated manual override pin
- interchangeable coils, specific for AC or DC power supply, easily replaceable without tools - see section B for available voltages

Standard coils protection IP65, optional coils with IP67 AMP Junior Timer or lead wire connections.

The valve body is 5 chamber type for all DC versions and for AC safety version /F and FV

Standard AC version uses 3 chamber type body.

Wide range of interchangeable spools, see section B.

The body is made by shell-moulding casting with wide internal passages ensuring low pressure drops

Mounting surface: ISO 4401 size 10
Max flow: 150 l/min
Max pressure: 350 bar

### 1 MODEL CODE

<table>
<thead>
<tr>
<th>DKE - 1</th>
<th>61</th>
<th>1/A - X</th>
<th>24 DC</th>
<th>**</th>
<th>/*</th>
</tr>
</thead>
</table>

Directional control valves size 10

Valve configuration, see section B

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

Spool type, see section B.

Options, see note 1 at section B.

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

<table>
<thead>
<tr>
<th>Configurations</th>
<th>Spools</th>
</tr>
</thead>
<tbody>
<tr>
<td>61</td>
<td>1 0 2 1 0 2 1 0 2 1 0 2 1 0 2</td>
</tr>
<tr>
<td>67</td>
<td>0 2 0 2</td>
</tr>
<tr>
<td>71</td>
<td>1 0 2 1 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Configurations</th>
<th>Spools</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>1 2</td>
</tr>
<tr>
<td>70</td>
<td>1 2</td>
</tr>
<tr>
<td>75</td>
<td>1 2</td>
</tr>
</tbody>
</table>

Seals material, see section B: 
- = NBR
PE = FKM
BT = HNBR

Series number

Voltage code, see section B: 
00-AC = AC solenoids without coils
00-DC = DC solenoids without coils
X = without connector
See section B for available connectors, to be ordered separately
Coils with special connectors, see section B
XJ = AMP Junior Timer connector
XK = Deutsch connector
XS = Lead Wire connection

Note: see also section B note 3 for special shaped spools
Assembly position / location

Subplate surface finishing

MTTFd values according to EN ISO 13849

Ambient temperature

Seals, recommended fluid temperature

Recommended viscosity

Fluid contamination class

Hydraulic fluid

Suitable seals type

Classification

Flow direction

Operating pressure

Rated flow

Maximum flow

3.1 Coils characteristics

Insulation class

Protection degree to DIN EN 60529

Relative duty factor

Supply voltage and frequency

Supply voltage tolerance

Certification

4 NOTES

1 Options

2 Type of electric connectors DIN 43650, to be ordered separately

3 Spools

5 ELECTRIC FEATURES

External supply nominal voltage

Voltage code

Type of connector

Power consumption

Code of spare coil

(1) In case of 60 Hz voltage frequency the performances are reduced by 10÷15% and the power consumption is 90 VA

(2) Average values based on tests performed at nominal hydraulic condition and ambient/coil temperature of 20°C.

(3) When solenoid is energized, the inrush current is approx 3 times the holding current.
**Q/A/P DIAGRAMS** based on mineral oil ISO VG 46 at 50°C

<table>
<thead>
<tr>
<th>Flow direction</th>
<th>Spool type</th>
<th>P-A</th>
<th>P-B</th>
<th>A-T</th>
<th>B-T</th>
<th>P-T</th>
<th>B-A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 0/1, 0/2, 2/2</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1, 1/1, 1/3, 6, 6</td>
<td>A</td>
<td>A</td>
<td>D</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3, 3/1, 7</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>B</td>
<td>B</td>
<td>C</td>
<td>C</td>
<td>G</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5, 5/6</td>
<td>A</td>
<td>A</td>
<td>C</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>B</td>
<td>C</td>
<td>B</td>
<td>C</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19, 91</td>
<td>F</td>
<td>F</td>
<td>G</td>
<td>G</td>
<td></td>
<td></td>
<td>H</td>
</tr>
<tr>
<td>39, 93</td>
<td>F</td>
<td>F</td>
<td>G</td>
<td>G</td>
<td></td>
<td></td>
<td>H</td>
</tr>
</tbody>
</table>

**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 (Vnom - 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.

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

<table>
<thead>
<tr>
<th>Valve</th>
<th>Switch-on AC</th>
<th>Switch-on DC</th>
<th>Switch-off AC</th>
<th>Switch-off DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DKE + 666 / 667</td>
<td>40</td>
<td>60</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>DKE + 669</td>
<td>60</td>
<td>—</td>
<td>90</td>
<td>—</td>
</tr>
<tr>
<td>DKE-<em>/L</em></td>
<td>—</td>
<td>75-150</td>
<td>—</td>
<td>45-150</td>
</tr>
<tr>
<td>DKE-<em>/L7 - DKE-</em>/L8</td>
<td>—</td>
<td>100-150</td>
<td>—</td>
<td>100-150</td>
</tr>
</tbody>
</table>

**SWITCHING FREQUENCY**

<table>
<thead>
<tr>
<th>Valve</th>
<th>AC (cycles/h)</th>
<th>DC (cycles/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DKE + 666 / 667</td>
<td>7200</td>
<td>15000</td>
</tr>
</tbody>
</table>

**DEVICES FOR SWITCHING TIME CONTROL**

These devices are only available for DC valve version (5 chambers body) and can control the switching time and therefore reduce the coil hammering in the hydraulic circuit. The different types are available shown in the figure:

- **L**: controls and regulates the switching time in both moving directions of the spool: regulation is carried out by screwing/unscrewing the element itself (regulating choke);
- **L1/L2/L3**: controls the switching time in both moving directions of the spool by means of fixed calibrated restrictor (gauged flow). The restrictor is positioned in the valve’s body ØL1 = 1.25 mm, ØL2 = 1 mm, ØL3 = 0.75 mm;
- **LR**: controls and regulates the switching time in the B→A direction of the spool movement. The device does not control the switching time (standard time) in the opposite direction A→B of the spool movement.
- **L7/L8**: controls the switching time in both moving directions of the spool by means of fixed calibrated restrictor (gauged flow). The restrictor is installed in the solenoid’s anchor.

For a correct operation of the switching time control, the passage in which the control device is installed must be completely filled with oil.
11 COILS TYPE CAE WITH SPECIAL CONNECTORS (only for 12DC, 14DC, 24DC and 28DC)

Options -XJ
Coil type CAEJ
AMP Junior Timer connector
Protection degree IP67

Options -XK
Coil type CAEK
Deutsch connector, DT-04-2P male
Protection degree IP67

Options -XS
Coil type CAES
Lead Wire connection
Cable length = 180 mm

ISO 4401: 2005
Mounting surface according to 4401-05-05-0-05
(without X port, Y port optional)
Fastening bolts: 4 socket head screws M6x40 class 12.9
Tightening torque = 15 Nm
Seals: 5 O R 2050 and 1 O R 108
Ports P, A, B, T: Ø = 11.5 mm (max)
Ports Y: Ø = 5 mm

12 INSTALLATION DIMENSIONS [mm]

ISO 4401: 2005
Mounting surface according to 4401-05-05-0-05
(without X port, Y port optional)
Fastening bolts: 4 socket head screws M6x40 class 12.9
Tightening torque = 15 Nm
Seals: 5 O R 2050 and 1 O R 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
Y = DRAIN PORT (only for option /Y)
For the max pressures on ports, see section [ ]

The subplates are supplied with 4 fastening bolts M6x40. Also available are multi-station subplates and modular subplates.

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

14 MOUNTING SUBPLATES

<table>
<thead>
<tr>
<th>Model</th>
<th>Ports location</th>
<th>GAS Ports A-B-P-T (X-Y)</th>
<th>Ø Counterbore [mm] A-B-P-T (X-Y)</th>
<th>Mass [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA-308 (Y)</td>
<td>Ports A, B, P, T (X, Y) underneath</td>
<td>1/2&quot; (1/4&quot;)</td>
<td>30 (21.5)</td>
<td>2.5</td>
</tr>
<tr>
<td>BA-428 (Y)</td>
<td>Ports A, B, P, T (X, Y) underneath</td>
<td>3/4&quot; (1/4&quot;)</td>
<td>36.5 (21.5)</td>
<td>5.5</td>
</tr>
<tr>
<td>BA-434 (Y)</td>
<td>Ports P, T, Y (X, Y) underneath, ports A, B on lateral side</td>
<td>3/4&quot; (1/4&quot;)</td>
<td>36.5 (21.5)</td>
<td>8.5</td>
</tr>
</tbody>
</table>

The subplates are supplied with 4 fastening bolts M6x40. Also available are multi-station subplates and modular subplates.
For further details see table K280.