The DSE5J is a direct operated directional valve with electric proportional control, on-board electronics and feedback, with mounting interface in compliance with ISO 4401 standards.

It is used to control the direction and the speed of hydraulic actuators.

Transducer and digital card allow a fine control of the positioning of the cursor, reducing hysteresis and response time and optimizing the performance of the valve.

The valves are available with command signal in voltage or current and on board electronics with internal enable, external enable or 0V monitor on pin C.

The monitoring of the spool position is available on pin F.

The valve is easy to install. The driver directly manages digital settings (see par. 6). In the event of special applications, you can customize the settings using the optional kit (see par. 11).

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1 - IDENTIFICATION CODE

D S E 5 J - / 31 - K11

- Direct operated directional control valve
- Electric proportional control
- Size ISO 4401-05
- Digital integrated electronics for valves with feedback

Spool type:
- C = closed centre
- A = open centre
- Z = zero overlap
- RC = regenerative closed centre

Nominal flow rate of the spool (see par. 2)
- FS = Fail safe option (omit if not required). Available on spools type Z only.

Pin C function:
- A = external enable
- B = internal enable
- C = 0V monitor

Main connector 6 pin + PE

Reference signal:
- E0 = voltage ±10 V
- E1 = current 4 ÷ 20 mA

Seals:
- N = NBR seals for mineral oil (standard)
- V = FPM seals for special fluids

Series N. (the overall and mounting dimensions remain unchanged from 30 to 39)

2 - CONFIGURATIONS

The valve configuration depends on the combination of the following elements:
- number of proportional solenoids, spool type, rated flow.

Configuration 2 solenoids:
- 3 positions with spring centering

Configuration 1 solenoid on side A “SA”:
- 2 positions (central + external) with spring centering

Controlled flow with Δp 10 bar P-T:

<table>
<thead>
<tr>
<th>Value</th>
<th>Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>50 l/min</td>
</tr>
<tr>
<td>75</td>
<td>75 l/min</td>
</tr>
<tr>
<td>70/35</td>
<td>70 (P-A) / 35 (P-B) l/min</td>
</tr>
</tbody>
</table>

Controlled flow with Δp 5 bar:

<table>
<thead>
<tr>
<th>Value</th>
<th>Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>75/45</td>
<td>75 (P-A, A-T) / 45 (B-P) l/min</td>
</tr>
</tbody>
</table>
### 3 - ELECTRICAL CHARACTERISTICS

#### 3.1 - Electrical on board electronics

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duty cycle</td>
<td>100% (continuous operation)</td>
</tr>
<tr>
<td>Protection class according to EN 60529</td>
<td>IP65 / IP67</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>V DC 24 (from 19 to 30 VDC), ripple max 3 Vpp</td>
</tr>
<tr>
<td>Power consumption</td>
<td>VA 40</td>
</tr>
<tr>
<td>Maximum solenoid current</td>
<td>A 2.8</td>
</tr>
<tr>
<td>Fuse protection, external</td>
<td>3A</td>
</tr>
<tr>
<td>Command signals: voltage (E0) current (E1)</td>
<td>V DC mA ±10 (Impedance Ri &gt; 11 kOhm) 4 + 20 (Impedance Ri = 58 Ohm)</td>
</tr>
<tr>
<td>Monitor signals: voltage (E0) current (E1)</td>
<td>V DC mA ±10 (Impedance Ro &gt; 1 kOhm) 4 + 20 (Impedance Ro = 500 Ohm)</td>
</tr>
<tr>
<td>Managed breakdowns</td>
<td>Overload and electronics overheating, LVDT sensor error, cable breakdown, supply voltage failure</td>
</tr>
<tr>
<td>Communication</td>
<td>LIN-bus Interface (with the optional kit)</td>
</tr>
<tr>
<td>Connection</td>
<td>7 - pin MIL-C-5015-G (DIN-EN 175201-804)</td>
</tr>
<tr>
<td>Electromagnetic compatibility (EMC) emissions</td>
<td>EN 61000-6-4</td>
</tr>
<tr>
<td>Electromagnetic compatibility (EMC) immunity</td>
<td>EN 61000-6-2</td>
</tr>
</tbody>
</table>

#### 3.2 - On-board electronics diagrams

**VERSION A - External Enable**

**VERSION B - Internal Enable**

**VERSION C - 0V Monitor**
4 - VERSIONS WITH VOLTAGE COMMAND (E0)

The reference signal is between -10V and +10V on double solenoid valves, and 0 + 10V on single solenoid valves SA. The monitor feature of versions B and C becomes available with a delay of 0,5 sec from the power-on of the card.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Values</th>
<th>version A</th>
<th>version B</th>
<th>version C</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>24 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>0 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Enable</td>
<td>not used</td>
<td>PIN F reference</td>
<td>0 V</td>
</tr>
<tr>
<td>D</td>
<td>± 10 V</td>
<td>Command (differential input)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>0 V</td>
<td></td>
<td>PIN D reference</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>± 10 V</td>
<td>Monitor (0V reference: pin B)</td>
<td>Monitor</td>
<td></td>
</tr>
<tr>
<td>PE</td>
<td>GND</td>
<td></td>
<td></td>
<td>Ground (Earth)</td>
</tr>
</tbody>
</table>

5 - VERSIONS WITH CURRENT COMMAND (E1)

The reference signal is supplied in current 4 ÷ 20 mA. If the current for command is lower, the card shows a breakdown cable error. To reset the error is sufficient to restore the signal.

The monitor feature of versions B and C becomes available with a delay of 0,5 sec from the power-on of the card.
6 - CHARACTERISTIC CURVES
(Obtained with mineral oil with viscosity of 36 cSt at 50°C and p = 140 bar)

Typical flow rate curves related to the reference signal and measured for the available spools. The ∆p values are measured between P and T valve ports.

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**SPOOL Z50**

![Graph for SPOOL Z50](#)

**SPOOL Z75**

![Graph for SPOOL Z75](#)

**SPOOLS A50 - C50**

![Graph for SPOOLS A50 - C50](#)

**SPOOLS A75 - C75**

![Graph for SPOOLS A75 - C75](#)
Flow P→B / A→T with valve in fail safe position, depending on the incoming pressure.

When a power failure (enabling OFF) occurs, the valve moves in ‘fail safe’ position by maintaining a minimum flow that allows the actuator to return slowly to a safety position.

During the black-out the centering springs retain the spool in fail safe-position.

7 - RESPONSE TIMES
(obtained with mineral oil with viscosity of 36 cSt at 50°C 140 bar Δp P→T)
**8 - OVERALL AND MOUNTING DIMENSIONS**

**Fastening bolts:** 4 SHC bolts M6x40 - ISO 4762

**Torque:** 8 Nm (A8.8)

**Threads of mounting holes:** M6x10

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<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mounting surface with sealing rings: 5 OR type 2050 (12.42x1.78) 90 Shore</td>
</tr>
<tr>
<td>2</td>
<td>Main connection</td>
</tr>
<tr>
<td>3</td>
<td>Coil removal space (solenoid B only)</td>
</tr>
<tr>
<td>4</td>
<td>Mating connector. To be ordered separately. See paragraph 11</td>
</tr>
<tr>
<td>5</td>
<td>Adjustment sealing performed at factory. Do not disassemble the transducer.</td>
</tr>
</tbody>
</table>
9 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

10 - INSTALLATION

DSE5J valves can be installed in any position without impairing correct operation.

Ensure that there is no air in the hydraulic circuit.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.

11 - ACCESSORIES

(to be ordered separately)

11.1 Mating connector

These valves have a plug for 7-pin mating connector, that is placed on the box of the integral motion control.

So as to avoid electromagnetic troubles and comply with the electromagnetic compatibility regulation EMC, it is recommended the use of a metal connector.

If a plastic connector is used, make sure that the protection characteristics IP and EMC of the valve are guaranteed.

Duplicomatic can provide a metal cable connector type MIL-C-5015-G (EN 175201-804).

name: EX7S/L/10 code 3890000003

11.2 - Connection cables size

Power supply:
- up to 20 m cable length: 1.0 mm²
- up to 40 m cable length: 1.5 mm²

Signal: 0.50 mm²

A suitable cable would have 7 isolated conductors, a separate screen for the signal wires and an overall screen.

11.3 - Kit for start-up LINPC-USB

Device for service start-up and diagnostic, see catalogue 89850.

12 - SUBPLATES

(see catalogue 51 000)

PMD4-A4G rear ports 3/4” BSP

PMD4-AL4G side ports 1/2” BSP