J079-100
J079-200 SERIES

3-Stage Servovalves with Integrated Electronics

WHAT MOVES YOUR WORLD
The J079-100 and J079-200 Series are throttle valves for 3-way and 4-way applications. They have been developed specifically for demanding applications requiring both high flow rates and high response. The internal amplifier is designed for high reliability, using SMD technology for concussion resistance. The valves are offered with 730 or 761 2-stage pilot valves. Electrical feedback J769 and J739 Series are available for longer life and higher response. The valves are also available in standard (21MPa) and high (35MPa) pressure versions. The J079-100 Series can deliver rated flow of 114 or 228 l/min and the J079-200 up to 757 l/min. These valves are suitable for pressure or force control, position, and speed control on high response systems.

**Principle of operation**

An electrical command signal is applied to the integrated control amplifier which drives a current through the pilot valve coils. The pilot valve produces differential pressure in its control ports. This pressure difference results in pilot flow which causes main spool displacement.

The position transducer which is excited via an oscillator measures the position of the main spool. This signal is then demodulated and fed back to the control amplifier where it is compared with the command signal. The control amplifier drives the pilot valve until the error between command signal and feedback signal is zero. Thus, the position of the main spool is proportional to the electrical command signal.

**Operational features**

- Electrical position feedback with pressure isolated position transducer, eliminates wear
- Integrated SMD electronics with false polarity protection
- Optional external pilot supply and return connections via fifth and sixth port in valve body
- Low hysteresis and threshold, and excellent null stability
- Pre-adjusted at the factory

The actual flow depends on the electrical command signal and the valve pressure drop, and may be calculated using the square root function for a sharp-edged orifice. The flow value Q calculated in this way should not exceed an average flow velocity 30 m/s in port P, C1, C2 and R.

\[
Q = Q_N \sqrt{\frac{\Delta P}{\Delta P_N}}
\]

- Q [l/min] = calculated flow
- QN [l/min] = rated flow
- ΔP [MPa] = actual valve pressure drop
- ΔPN [MPa] = rated valve pressure drop

If large flow rates with high valve pressure drops are required, an appropriate higher pilot pressure has to be chosen to overcome the flow forces. An approximate value can be calculated as follows:

\[
P_x > 0.025 \times \frac{Q}{A_k} \times \sqrt{\Delta P}
\]

- Q [l/min] = max. flow
- ΔP [MPa] = valve pressure drop with Q
- A_k [cm²] = spool drive area
- P_x [MPa] = pilot pressure

This pilot pressure P_x has to be at least 1.5MPa above the return pressure of the pilot stage.
**Technical data**

**Operating pressure range**

Main Stage
- Ports P, C1, and C2
  - With X internal: 21MPa (option 35MPa)
  - With X external: 35MPa
- Port R
  - With Y internal: 21MPa
  - With Y external: 35MPa

Pilot Valve
- Ports P, C1, and C2: 21MPa (option 35MPa)
- Port R: 21MPa

**Temperature**

- Ambient: -20 to +60°C
- Fluid: -20 to +80°C

**Seal material**: NBR (others on request)

**Operating fluid**: Mineral oil based hydraulic fluid (others on request)

**Recommended viscosity**: 10 to 100 mm²/s

**Class of cleanliness**: The cleanliness of the hydraulic fluid greatly effects the performance (spool positioning, high resolution) and wear (metering edges, pressure gain, leakage) of the valve.

**Recommended cleanliness class**
- ISO 4406 < 14/11 (normal operation)
- ISO 4406 < 13/10 (extended life)

**Recommended filter rating**: $\beta_{10} \geq 75$

**Installation options**: Any position, fixed or movable

**Vibration**: 10g, 3 axes

<table>
<thead>
<tr>
<th>Function</th>
<th>Standard</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>+15 VDC ± 3%</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>−15 VDC ± 3%</td>
<td></td>
</tr>
<tr>
<td>Supply/signal ground</td>
<td>(0V)</td>
<td></td>
</tr>
<tr>
<td>Input signal</td>
<td>± 10V</td>
<td>± 10mA / 4 to 20mA</td>
</tr>
<tr>
<td>Input signal</td>
<td>± 10V</td>
<td>± 10mA / 4 to 20mA</td>
</tr>
<tr>
<td>Spool monitor signal</td>
<td>± 10V</td>
<td>± 10mA / 4 to 20mA</td>
</tr>
</tbody>
</table>
J079-100 Series

**Technical data**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model number</td>
<td>J079-1...</td>
</tr>
<tr>
<td>Mounting pattern</td>
<td>ISO (X and Y excepted)</td>
</tr>
<tr>
<td>Valve body version</td>
<td>4-way</td>
</tr>
<tr>
<td></td>
<td>3-way (option)</td>
</tr>
<tr>
<td>Pilot valve</td>
<td>730 or 761 series (standard)</td>
</tr>
<tr>
<td></td>
<td>J739 or J769 series (option)</td>
</tr>
<tr>
<td>Pilot connection</td>
<td>Internal or external</td>
</tr>
<tr>
<td>Mass</td>
<td>13</td>
</tr>
<tr>
<td>Rated flow [l/min] @ ΔP=3.5MPa per land</td>
<td>114 or 228</td>
</tr>
<tr>
<td>Hysteresis [%]</td>
<td>≤ 1.0</td>
</tr>
<tr>
<td>Threshold [%]</td>
<td>≤ 0.5</td>
</tr>
<tr>
<td>Null shift [%]</td>
<td>≤ 2.0</td>
</tr>
<tr>
<td>Null leakage [l/min] total max</td>
<td>≤ 8.5</td>
</tr>
<tr>
<td>Pilot valve flow [l/min] for 100% step input</td>
<td>≤ 16.5</td>
</tr>
<tr>
<td>Main spool stroke [mm]</td>
<td>±0.84 / ±1.27</td>
</tr>
<tr>
<td>Main spool drive area [cm²]</td>
<td>2.85</td>
</tr>
</tbody>
</table>

@21MPa pilot or operating pressure and fluid viscosity 32mm³/s

Valve flow for maximum valve opening (100% command signal) as a function of the valve pressure drop
J079-200 Series

**Technical data**

<table>
<thead>
<tr>
<th>Model number</th>
<th>J079-2...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting pattern</td>
<td>Moog standard</td>
</tr>
<tr>
<td>Valve body version</td>
<td>4-way</td>
</tr>
</tbody>
</table>
| Pilot valve            | 730 or 761 series (standard)  
                          | J739 or J769 series (option) |
| Pilot connection       | Internal or external  
                          | X and Y port |
| Mass [kg]              | 17 |
| Rated flow [l/min] @ΔP=3.5MPa per land | 494 or 757 |
| Hysteresis [%]         | ≤ 1.0 |
| Threshold [%]          | ≤ 0.5 |
| Null shift [%]         | ≤ 2.0 |
| Null leakage [l/min] total max | ≤ 11.0 |
| Pilot valve flow [l/min] for 100% step input | ≤ 33.0 |
| Main spool stroke [mm] | ±1.3 / ±2.5 |
| Main spool drive area [cm²] | 7.14 |

@21MPa pilot or operating pressure and fluid viscosity 32mm²/s
Attachments and accessories for J079-100 Series

O-rings (standard attachment)
NBR 90D Shore
- for P, C1, C2, R __4 pcs__ ID 20.34 x SD 1.78 __P/N A47622-040
- for X, Y __2 pcs__ ID 7.65 x SD 1.78 __P/N A47622-012

Mating connector (standard attachment)
MS3106F14S6S _1 pc_ P/N -45054F014S006S

Flushing plate for pilot valve (accessory) __P/N A04231-001

Mounting bolts (standard attachment)
M10 x 50L 12.9T __4 pcs__ Required torque 58Nm __P/N A04001-010-050
**Attachments and accessories for J079-200 Series**

**O-rings (standard attachment)**
NBR 90D Shore
- for P, C1, C2, R _4 pcs_ ID 36.1 x SD 3.53 _P/N A47622-264_
- for X, Y _2 pcs_ ID 7.65 x SD 1.78 _P/N A47622-012_

**Mating connector (standard attachment)**
MS3106F14S6S _1 pc_ _P/N -45054F014S006S_

**Flushing plate for pilot valve (accessory)** _P/N A04231-001_

**Mounting bolts (standard attachment)**
M16 x 100L 12.9T _8 pcs_ Required torque 125Nm _P/N A04001-016-085_
TAKE A CLOSER LOOK

Solutions for flow control of high performance applications are available around the world. For more information, visit our Web site or contact one of the locations below.

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