J814 SERIES SERVO VALVES

Highly-Responsive Nozzle Flapper Type Compact Pneumatic Servo Valves.

Rev. B, July 2025

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J814 Series Pneumatic Servo Valves are highly responsive and accurate 3- and 4-way pneumatic servo valves. With excellent reproducibility between command signal and control pressure, these valves are suitable for pressure or power control, vibration control, and position control in pneumatic systems. The 3-way valves can also be used when a vacuum is applied.

The 3-way valves are single stage and available in both standard and high flow versions. The standard type has rated flow of 1 ~ 50 NL/min with valve pressure loss of 0.5 MPa, while the high flow type has rated flow up to 200 NL/min. A pair of nozzles and a flapper are driven by a torque motor with air gaps. The design is simple and durable for long term reliability.

The 4-way valves have an orifice in the upper stream of each nozzle, providing two control ports. These valves are also single-stage, with a rated flow of 1 ~ 14 NL/min, with a valve pressure loss of 0.5 MPa.

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The left image is the high flow type

Operating principle

- Input current flows through the coils of a torque motor, providing magnetic power and polarity to the armature.
- Due to the magnetic relationship between the upper and lower poles, the armature inclines depending on the size of the input current and the polarity (torque generation).
- The flapper is located between the left and right nozzles and is joined with the armature. Therefore, a change in the inclination of the armature changes the flapper position, changing the aperture of the left and right nozzles.
- In 3-way valves, the control pressure changes from the supply pressure to the air pressure according to the aperture of the left and right nozzles. Therefore, these valves can output control pressure according to the input current.
- In 4-way valves, two control ports provide output that is roughly proportional to the input current.

Characteristics

- Single-stage type nozzle flapper valves with torque motors
- High resolution and low hysteresis
- Compact and light
- Low power consumption
- High responsiveness
- Sturdy long-life design free of sliding surfaces

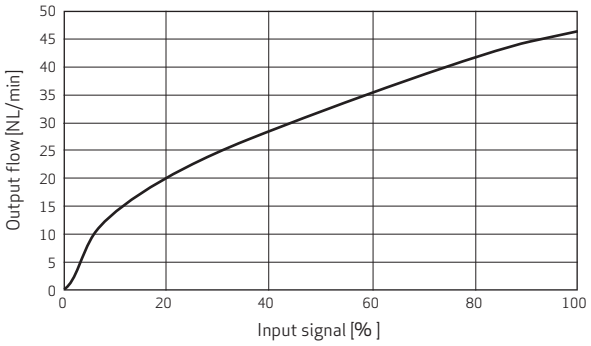
Technical Data

General technical data (standard type)

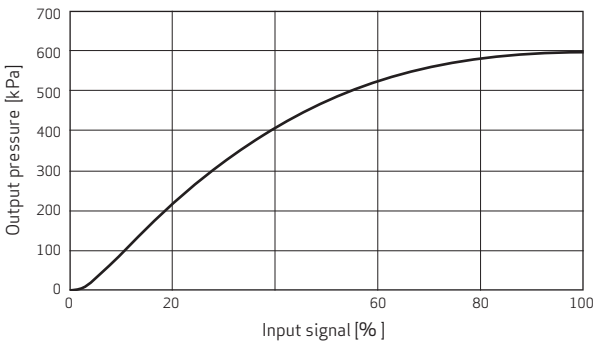
Item	J814 (3-way type)	J814 (4-way type)
Rated flow (@valve pressure drop 500 kPa)	1 ～ 50 NL/min	1 ～ 14 NL/min
Rated pressure	1,000 kPa	
Range of controlled pressure	0 ～ 1,000 kPa	
Supply-side pressure resistance	1,500 kPa	
Return-side pressure resistance	1,500 kPa	
Rated current	0 ～ 100 mA	± 100 mA
Hysteresis	≦3.0 %	
Operating temperature range	-10 - 60 ℃	
Fluid types	Compressed air	
Mass	Approximately 400 g	

High flow valves with a rated flow of up to 200 NL/min are available. Please contact Moog in Japan.

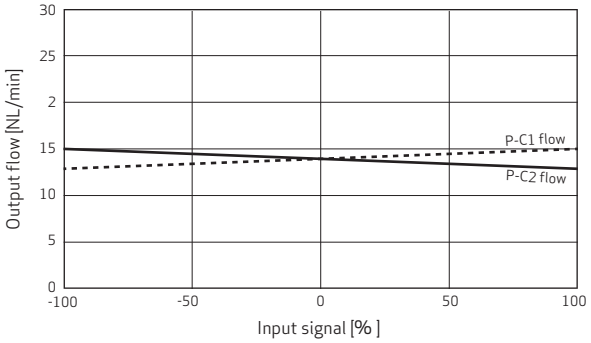
Servovalve flow characteristics (3-way valves)



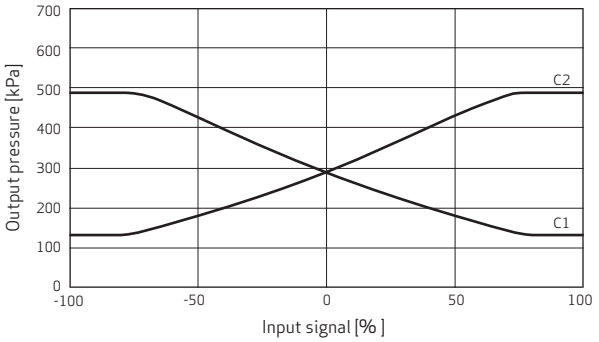
Servovalve pressure characteristics (3-way valves)



Servovalve flow characteristics (4-way valves)

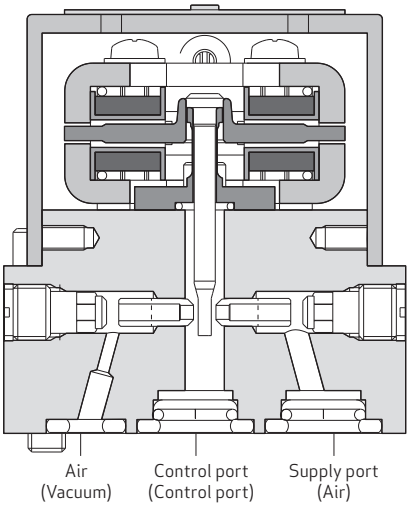


Servovalve pressure characteristics (4-way valves)



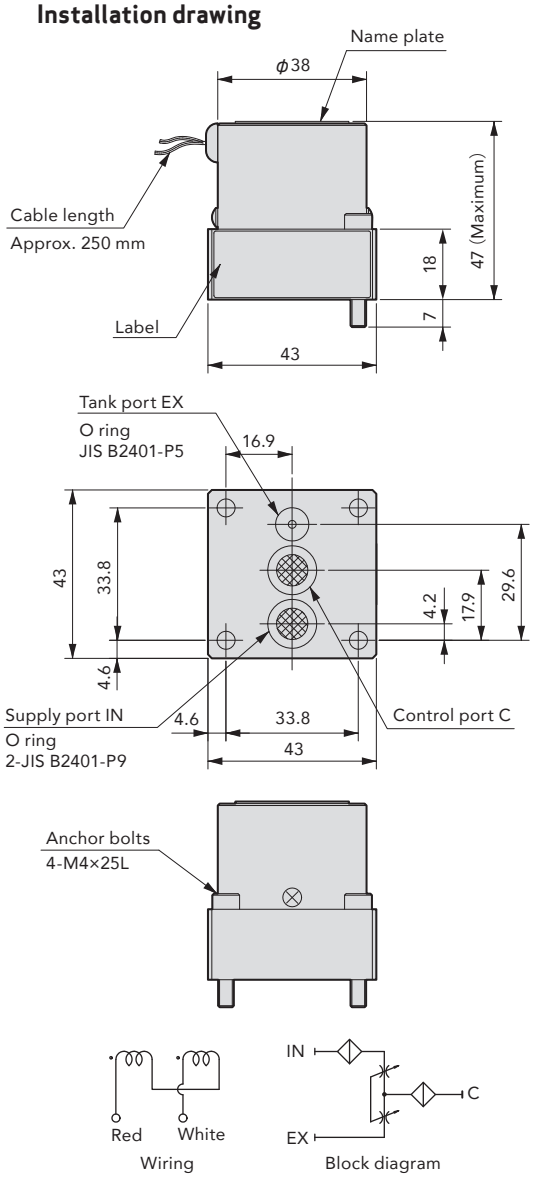
3-way valves

Cross section (nozzle flapper valve)



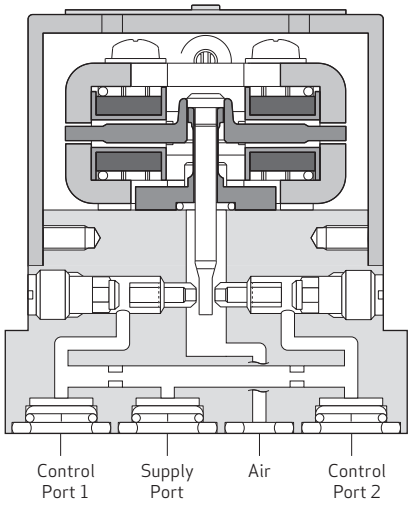
*Parentheses show conditions for vacuum use

Installation drawing

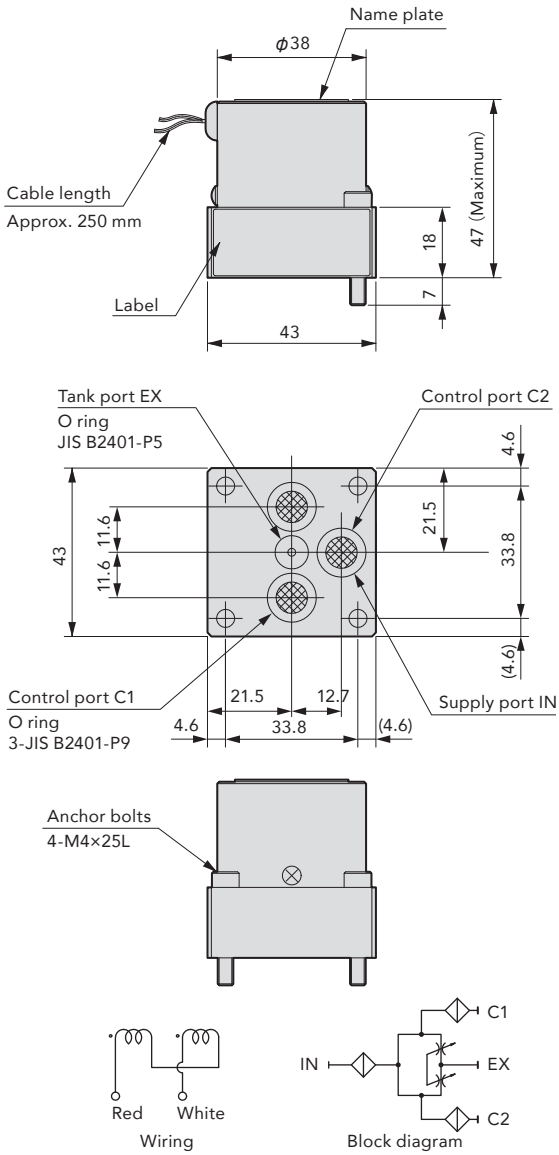


4-way valves

Cross section (nozzle flapper valve)



Installation drawing

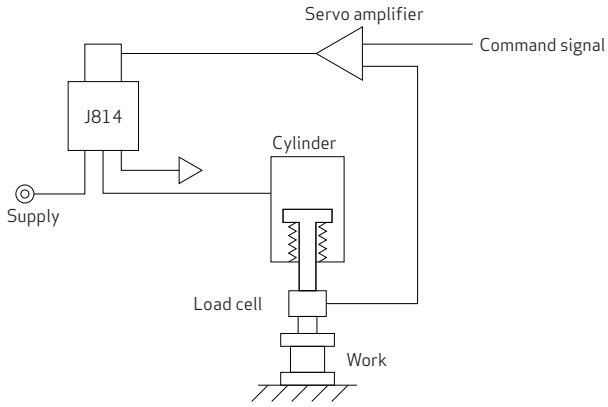


Typical applications

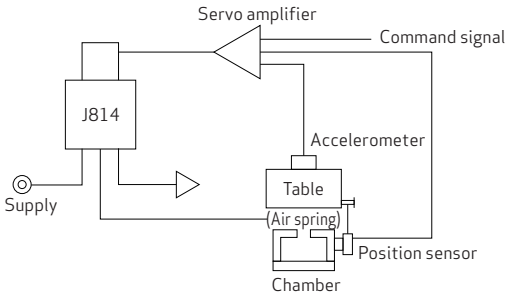
- Robotics
- Active vibration isolators
- Load testing machines
- Internal pressure control equipment
- Semiconductor manufacturing equipment
- Animatronics
- Pressing force control equipment

Example applications

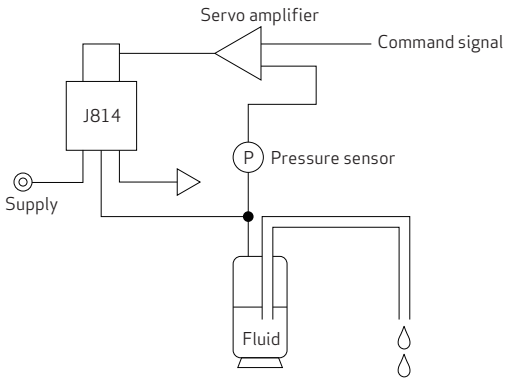
Load testing equipment



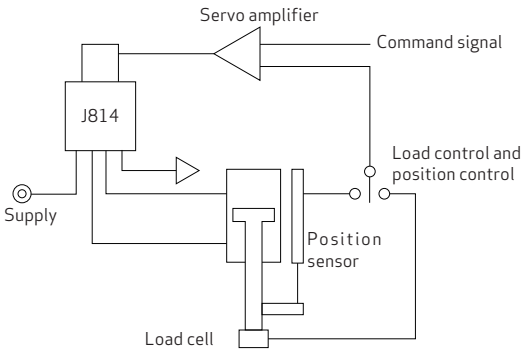
Active damping systems



Chamber internal pressure control



Position and load control equipment



FOR MORE SPECIFIC INFORMATION

For more specific information regarding Moog products, solutions or services, please Email us, or visit our website. You may also directly contact your local Moog office.

Australia
+61 3 9561 6044
info.australia@moog.com

Brazil
+55 11 3572 0400
info.brazil@moog.com

Canada
+1 716 652 2000
info.canada@moog.com

China
+86 21 2893 1600
info.china@moog.com

France
+33 1 4560 7000
info.france@moog.com

Germany
+49 7031 622 0
info.germany@moog.com

Hong Kong
+852 2 635 3200
info.hongkong@moog.com

India
+91 80 4057 6666
info.india@moog.com

Ireland
+353 21 451 9000
info.ireland@moog.com

Italy
+39 0332 421 111
info.italy@moog.com

Japan
+81 46 355 3767
info.japan@moog.com

Korea
+82 31 764 6711
info.korea@moog.com

The Netherlands
+31 252 462 000
info.thenetherlands@moog.com

Singapore
+65 677 36238
info.singapore@moog.com

Spain
+34 902 133 240
info.spain@moog.com

Sweden
+46 31 680 060
info.sweden@moog.com

Turkey
+90 216 663 6020
info.turkey@moog.com

United Kingdom
+44 168 429 6600

USA
+1 716 652 2000
info.usa@moog.com

www.moog.com

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