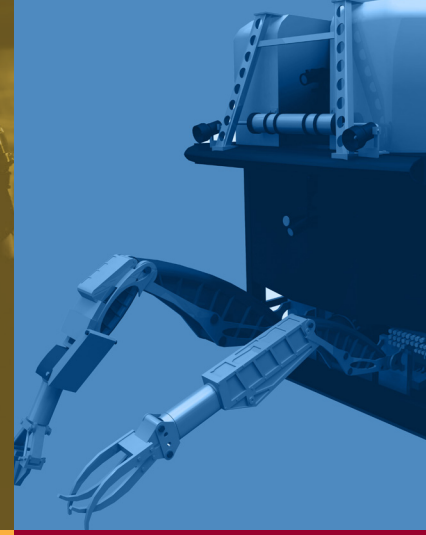


30 SERIES MICRO SERVO VALVES

A high response, high efficiency valve in a compact package



The 30 Series is a two-stage, flow control, double-nozzle, mechanical feedback servo valve with a stainless steel body and integrated torque motor in an environmentally sealed compartment. The valve's nozzle-flapper design is a reliable and proven technology for applications that require high response, stability and accuracy within a compact package.

The 30 Series Servo Valve is designed to perform reliably over a long service life even in potentially extreme environments, where temperatures might drop to -40 °F (-40 °C) or be as high as 400 °F (204.4 °C). The stainless steel body and a self-contained envelope provide a rugged construction, that allows the valve to be used in environments with potentially high acceleration, or where they are exposed to high shock and vibration. This product is part of our micro-hydraulic offering which delivers high power to weight ratio and high efficiency. It achieves this all while delivering high dynamics and precise flow control for better overall system control.



Compact, light-weight package with a high power to weight ratio. Micro-hydraulics are ideal for applications requiring high power density.

ADVANTAGES

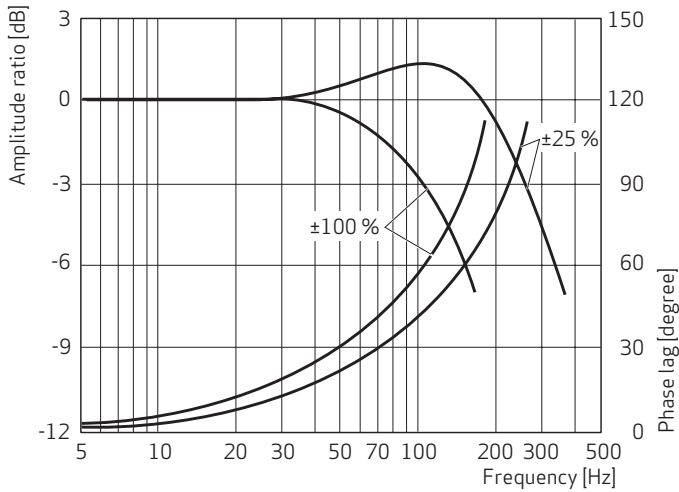
- High response improves control capability
- Compact light weight package for mobile applications
- Can be used in extreme temperature environments
- Stainless steel body suitable for use in aggressive operational settings
- Magnetically adjusted null flow independent of other system parameters allows for adjustment in the field

APPLICATIONS

- Remotely operated vehicle
- Automated guided vehicle
- Manipulators
- Downhole tools
- Entertainment
- Mobile robotics including construction

SPECIFICATIONS

RESPONSE PLOT

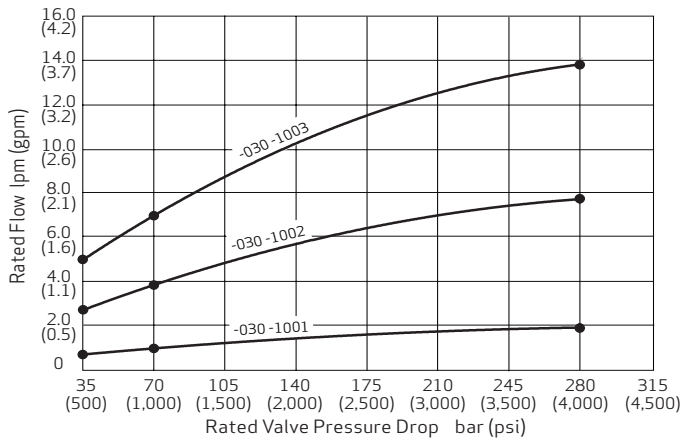


Typical responses for peak sinusoidal inputs of $\pm 25\%$ and $\pm 100\%$ rated current

Supply 210 bar (3,000 psi)

Oil temperature 38°C (100°F)

PERFORMANCE CURVE



DYNAMIC TECHNICAL SPECIFICATIONS

Response limits at $\pm 25\%$ input and 210 bar (3,000 psi) supply per table:

Frequency of 90 degree phase	200 Hz
Step response time for 0 to 100 % stroke	2.5 ms
Amplitude ratio	< 2 dB
First order time constant	1.5 ms
2nd order natural frequency	200 Hz
Damping ratio	0.50

GENERAL TECHNICAL SPECIFICATIONS

Weight	185 g (6.5 oz)
Maximum operating pressure	310 bar (4,500 psi)
Rated flow	0.47 to 6.9 l/min (0.125 to 1.85 gpm) @ Δp 70 bar (1,000 psi)
Mounting pattern	0.48 in. port circle [ISO 10372-01-01-0-92]
Static performance	
Rated flow tolerance	$\pm 10\%$
Linearity	< $\pm 7\%$
Null region	< $\pm 3\%$
Null bias	< $\pm 3\%$ initial; < $\pm 5\%$ long term
Hysteresis	< $\pm 3\%$
Threshold	< $\pm 1\%$
Operating temperature	
Standard model with FKM seals (option 8, V)	-20°F to +300°F (-29°C to +149°C)
Standard model with BUNA seals (option 8, N)	-40°F to +275°F (-40°C to +135°C)
High temperature model with FKM seals and high temperature components (contact Moog for ordering information)	-20°F to +400°F (-29°C to +204°C)
Internal leakage @ 3,000 psi	< $\pm 3\%$ rated flow plus < 0.50 cistare
Proof pressure	415 bar (6,000 psi) max (supply), 275 bar (4,000 psi) (return)
Burst pressure	690 bar (10,000 psi) max (supply), 345 bar (5,000 psi) (return)
Shock resistance	Will withstand 100 g peak any axis
Vibration resistance	Will withstand 25 grms (5 to 2,000 Hz) 30 minutes per axis

HYDRAULIC DATA

Seal material: FKM

System filtration: High pressure filter (without bypass but with dirt alarm) mounted in the main flow and if possible directly upstream of the valve.

Class of cleanliness: The cleanliness of the hydraulic fluid greatly affects the performance (e.g. spool positioning, high resolution) and wear (e.g. metering edges, pressure gain, leakage) of the servo valves.

Recommended cleanliness class

For functional safety ISO 4406 <17/14/11

For longer service life ISO 4406 <16/13/10

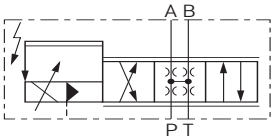
Filter rating recommended

For normal operation $\beta_{10} \geq 75$ (10 μm absolute)

For longer life $\beta_5 \geq 75$ (5 μm absolute)

Compatible fluids: Petroleum base or selected phosphate ester fluid, 10 to 97 centistokes at 38 °C (60 to 450 SSU at 100 °F)

HYDRAULIC VALVE SYMBOL



COIL RESISTANCE

The effects of coil resistance changes can be essentially eliminated through the use of a current feedback servoamplifier having a high output resistance, such as the Moog IN123-825 buffer amplifier.

Parallel coils			Series coils			Single coils		
R [Ω]	L [H]	i_R [mA]	R [Ω]	L [H]	i_R [mA]	R [Ω]	L [H]	i_R [mA]
40	0.18	40	160	0.56	20	80	0.22	40
103	0.59	20	412	2.2	10	206	0.72	20
500	2.6	10	2,000	9.7	5	1,000	3.2	10

Note:

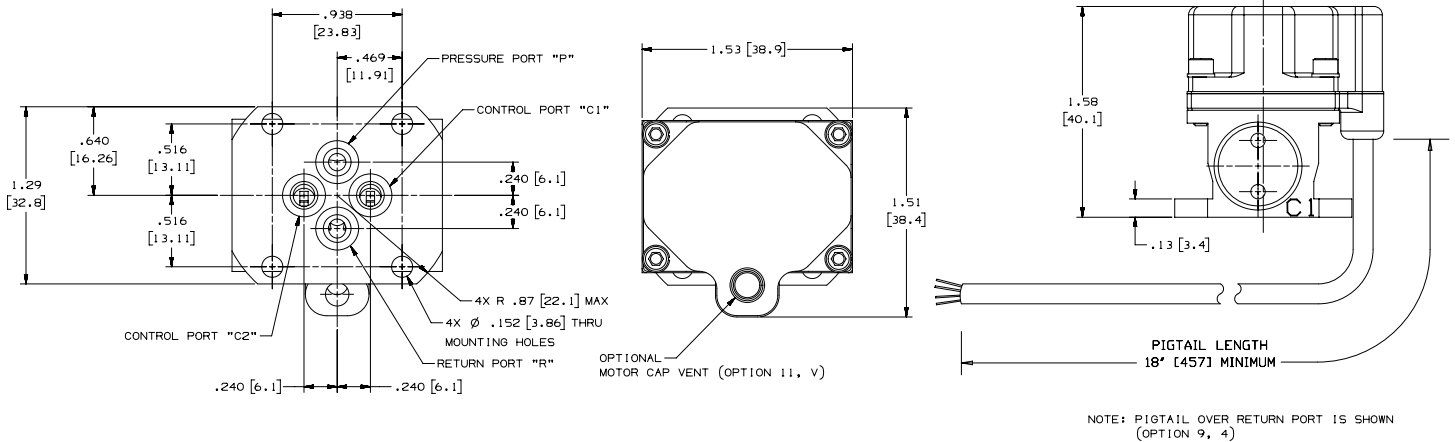
1. Resistance values at 20 °C (68 °F) 10 % tolerance

2. Inductance values are typical to 50 Hz, servo valve pressurized.
Inductance is not normally measured on individual servo valves.

MAGNETIC NULL ADJUST

The null flow of a servo valve can be adjusted independently of other system parameters. The magnetic null adjustment permits a minimum of 15 % adjustment of the null flow. The null adjuster is located at the top of the motor cap which, when rotated, biases the first stage torque motor magnetically. This does not permit the vented motor cap option.

STANDARD COMPONENTS AND DIMENSIONS



OPTIONAL COMPONENTS AND DIMENSIONS

