

# E024 - 800 SERIES

## SUB MINIATURE SERVO VALVE

With integrated spool monitoring  
transducer



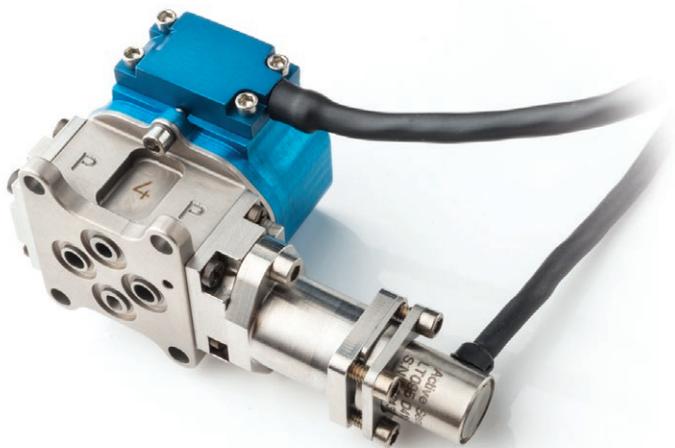
Motorsport presents a number of unique challenges to motion control suppliers, particularly Formula 1's requirements of low weight, small size and performance.

The E024 Series Miniature Servo valve was developed from the proven E030 series aerospace servo valve widely used for flight control in civil and military aircraft.

This special version of the E024 Series motorsport servo valve incorporates an integral Linear Variable Differential Transformer (LVDT) position sensor. The LVDT allows the valve spool position to be continuously monitored during normal operation, with a spool position transducer incorporating a 5 wire LVDT with high temperature capability.

This valve is designed to be used in safety critical control systems where it is essential that the correct operation of the valve is continuously monitored. Typical applications include motorsport braking systems and other applications requiring control loop integrity.

They can also be employed for evaluating the spool response of the servo valve when testing a complete system.



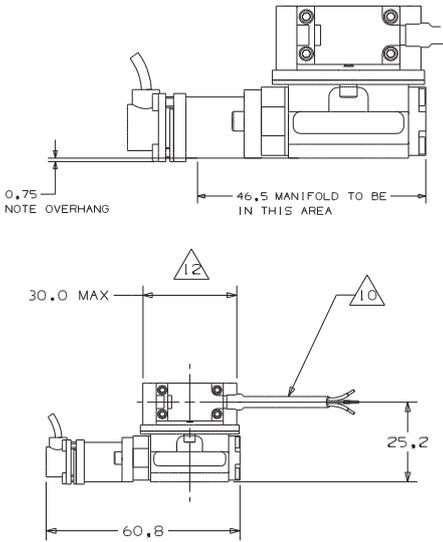
### ADVANTAGES

- Available for existing E024 models
- Low weight 149gm (5.25 oz)
- Compact package
- High power density
- Low input signal (10mA)
- Compatible with F1 ECU
- Fast response to command inputs
- Excellent energy efficiency
- High peak flow capability
- Precise, repeatable characteristic control
- Fast and accurate spool position measurement

### INDUSTRY APPLICATIONS

- Formula 1 (Throttle actuation, Differential control, Gearbox actuation, Power assisted steering, clutch control, Waste-gate control)
- Medical
- Subsea equipment
- Special effects in film and theatre

# SPECIFICATIONS



1. For Full Installation Information, Contact Moog: Drawing Number CB65841
2. Position sensor extends below the manifold mounting face.

## TECHNICAL DATA E024 SUB MINIATURE SERVOVALVES

All existing E024 are available with the spool position monitoring feature.

	E024	E024 Dual Flow Rate
<b>Maximum Supply Pressure:</b>	250 Bar (3626 PSi)	
<b>Valve Function:</b>	Axis-cut linear flow control.	Axis-cut flow control with dual gain [Ratio 2.5:1].
<b>Rated Flow: @ 70 Bar (1015 PSi) Valve Pressure Drop</b>	Axis-cut valves: 0.4, 1.0, 1.5, 2.0, 3.8, 5.0, 7.0 l/m. (0.1, 0.3, 0.4, 0.5, 1.0, 1.3, 1.8 USg/min). NB Flow Tolerance +/-10%.	2.0, 3.8, 7.0 l/min (0.5, 1.0, 1.8 USg/min). NB: Flow tolerance +/-10%.
<b>Leakage Flow:</b>	Pilot stage flow: < 0.30 l/min (0.08 USg/min) (std version). Spool leakage at null: < 5% of rated flow (Axis-cut versions).	Pilot stage flow: < 0.30 l/min (0.08 USg/min). Spool leakage at null: < 2% of rated flow (Axis-cut versions).
<b>Electrical Input Signal: (coils in parallel)</b>	+/- 10mA into a 360 ohm. Inductance 1.4 Henry.	
<b>Dynamic Performance:</b>	<b>25% signal @ 210 Bar (3045 PSi) &amp; 40°C (104°F)</b> 90° phase lag > 250 Hz -3dB attenuation > 250 Hz.	<b>25% signal @ 210 Bar (3045 PSi) &amp; 40°C (104°F)</b> 90° phase lag > 250 Hz -3dB attenuation > 250 Hz.
<b>Null Shift:</b>	With supply pressure: < 3% of full signal over the range of 124 Bar (1798 PSi) -228 Bar (3307 PSi). With fluid temperature < 5% of full signal over a range of 35-135 °C (95°F-275°F).	With supply pressure: < 3% of full signal over the range of 124 (1798 PSi) -228 Bar (3307 PSi). (Corresponding to 1.6% of full flow). With fluid temperature < 5% of full signal over a range of 35-135 °C. (95°F-275°F). (Corresponding to 2% of full flow).
<b>Accuracy of Flow Control:</b>	Hysteresis < 3%. Threshold < 0.5%.	Hysteresis < 3% of full signal (Corresponding to 1.2% of full flow). Threshold < 0.5% of full signal (Corresponding to 0.2% of full flow).
<b>LVDT Characteristic:</b>	Excitation Voltage: 3V RMS Excitation Frequency Range: 8-15 KHz Summed Output Voltage 1.26V/Vin +/- 10% Output Voltage offset at hydraulic null < +/- 10% of full scale.	
<b>Environmental Survivability Limits:</b>	165°C (329°F) & 25G shock load (Any axis).	
<b>Mass (Including Cables):</b>	149g (5.25 oz).	

## ENVIRONMENTAL OPERATING ENVELOPE FOR ALL E024 SERVOVALVES

<b>Pressure Supply:</b>	160 (2321 PSi) – 250 Bar (3626 PSi).
<b>Return Line Pressure:</b>	2 (29 PSi) – 5 Bar (72 PSi).
<b>Temperature Range:</b>	0 – 135 °C (0 - 275°F).
<b>Fluids Viscosity:</b>	> 4 CSt.
<b>Filtration:</b>	NAS 1638 Class 3 / ISO 4406 12/8 or better. It may be possible to operate the valve in certain applications outside of these design limits, but this must be checked and validated by the customer.
<b>Operation of Valves in Close Proximity:</b>	Valves mounted in close proximity may experience magnetic interaction. The degree of interaction depends on the installation and may be minimized by the use of external shielding.

Moog has offices around the world. For further information, or the office nearest you, contact us online.

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[www.moog.com/industrial](http://www.moog.com/industrial)

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This technical data is based on current available information and is subject to change at anytime by Moog. Specifications for specific systems or applications may vary.

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