

E024 SERIES SERVO VALVE

With Energy Efficient Low Flow
Pilot Stage



Moog has developed two special versions of the well-established E024 series Motorsport Servo Valve - with low-flow pilot stages. The Low Leakage and Ultra Low Leakage Servo Valve versions have been developed to meet the forthcoming requirement of Formula 1 to adopt more hydraulic actuators under the proposed 2014 regulations. Utilising these more energy-efficient valves potentially allows the use of a smaller hydraulic pump.

Valve Response Options*		
E024 Valve Version	Quiescent Pilot Stage Flow	Response
Standard	0.3 l/min @ 210 bar (0.082 USg/min at 3045 psi)	90 deg phase lag > 250 Hz -3dB flow attenuation > 250 Hz
Low Leakage	0.18 l/min at 210 bar (0.048 USg/min at 3045 psi)	90 deg phase lag > 200 Hz -3dB flow attenuation > 120 Hz
Ultra Low Leakage	0.12 l/min at 210 bar (0.032 USg/min at 3045 psi)	90 deg phase lag > 120 Hz -3dB flow attenuation > 80Hz.

*Valve responses quoted are with +/- 25% of full signal.

Typically the standard valves can be used on applications requiring high resolution and high speed, -such as gearbox selector drum positioning. The lower response versions could be used in applications where valve response isn't so critical such as differential control.



FEATURES

- Interchangeable with standard version
- FIA Homologated design
- Energy efficient low flow pilot stage
- All existing valve functions available
- Robust contamination resistant construction

PRODUCT HOMOLOGATION

All Moog electro-hydraulic products used in Formula 1 are homologated by the FIA, this indicates they are approved for use with the mandated Formula 1 Electronic Control Unit (ECU).

INDUSTRY APPLICATION

Motorsport Formula 1





TECHNICAL DATA E024 SERVO VALVE (LOW AND ULTRA-LOW FLOW)	
Maximum Supply Pressure	210 bar (3045 psi)
Rated Flow @ 70 bar (1015 psi) Valve Pressure Drop	Up to 7 l/min NB: Flow tolerance +/-10%
Pilot Flow @ 210 bar (3045 psi) Supply	Pilot Flow @ 210 bar (3045 psi) Supply < 0.18 l/min (0.048 USg/min) [Low Flow] < 0.12 l/min (0.032 USg/min) [Ultra Low Flow]
Electrical Input Signal (Coils in Parallel)	+/- 10mA into 360 ohm. Inductance 1.4 Henry
Dynamic Performance 25% signal @ 210 bar (3045 psi) & 40°C (100°F)	90° phase lag > 200 Hz -3dB attenuation > 120 Hz -Low flow 90° phase lag > 120 Hz -3dB attenuation > 80 Hz -Ultra low flow
Null Shift	With supply pressure < 4% of full signal over the range of 124-228 bar (1798-3307 psi) With fluid temperature < 5% of full signal over a range of 30-100 °C (86-212°F)
Environmental Survivability Limits	165 °C (329°F) and 25G shock load (Any axis)
ENVIRONMENTAL OPERATING CONDITIONS	
Pressure Supply	160 – 250 bar (2321 - 3626 psi)
Return Line Pressure	2 – 5 bar (29 - 72 psi)
Temperature Range	0 – 135°C (0 - 275°F)
Fluids Viscosity	>4 CSt
Filtration	NAS 1638 Class 3/ISO 4406 12/8 or better
ADDITIONAL APPLICATION NOTES	
Operation of Valves in Close Proximity	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, however we do not recommend directly on the motor-cap. It may be possible to operate the valve in certain applications outside of these limits, but this must be checked and validated by the customer.

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

e-mail: info@moog.com

www.moog.com/industrial

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E024 Datasheet Low Flow Pilot Stage
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