



## ServoChoke®

Continuously modulating chokes used in applications like Managed Pressure Drilling (MPD) must be built to ensure precise and consistent control no matter what type of conditions may be encountered. Whether on-shore or off-shore, in tropical or arctic climates, ServoChoke will give the performance and reliability required.

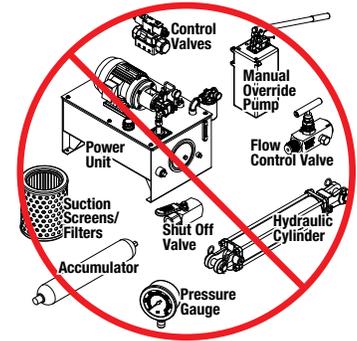
### Tolomatic's ServoChoke solution provides superior performance for choke control applications

An electric linear choke actuator has many benefits over hydraulics for choke control. The table below shows the several advantages over hydraulics when used in these types of applications.

Advantages of ServoChoke for Managed Pressure Drilling	
FEATURE	BENEFIT
Speeds as high as 19.6 mm/sec (0.77"/sec)	<ul style="list-style-type: none"> <li>• Full open to full close (51mm/2" travel) in less than 3.5 seconds at full force</li> <li>• 3 mm (0.125") adjustments happen in less than 0.5 second</li> </ul>
Programmable/Full Motion Profile Control	<ul style="list-style-type: none"> <li>• Adjustments executed from host controller can be triggered by down-hole events or operator intervention</li> <li>• Controlled accel/decel can reduce or eliminate gate/seat damage due to "valve slap"</li> <li>• High performance control system allows the electric actuator to respond in milliseconds to execute motion commands</li> </ul>
Positional repeatability to within 0.08% of span or better	<ul style="list-style-type: none"> <li>• Repeatability maintained throughout designed service life</li> <li>• Based on 51 mm (2") of valve travel</li> </ul>
Temperature range: -40° to +60°C (-40° to +140° F)	<ul style="list-style-type: none"> <li>• Consistent performance across wide range of temperatures</li> <li>• No cold weather start-up issues</li> </ul>
Planetary roller screw for long life and no maintenance	<ul style="list-style-type: none"> <li>• Reduced down time</li> <li>• No fluids or filters to change</li> <li>• Minimal to no maintenance</li> </ul>

# ELECTRIC VS. HYDRAULIC CONTROL OF CHOKE VALVES IN MANAGED PROCESSED DRILLING APPLICATIONS

Set-up and configuration/calibration times can be reduced with an electric motion control system. There is no need to inspect hoses or connections, no wiring of peripheral sensors, no filters to change or fluid levels to maintain and no initial filling and purging air from the system. All of these maintenance issues take time and can require constant attention. Hydraulic control systems also have very limited data collection, lack performance feedback and cannot self-compensate to maintain position. All of these issues when added together create a host of obstacles to overcome.



LIMITATIONS OF HYDRAULIC TECHNOLOGY FOR CHOKE CONTROL			
CAUSE	EFFECT	CONTROL	ServoChoke® SOLUTION
Temperature fluctuations (oil & ambient temps)	Variable speed and force repeatability	Manual system adjustments and recalibration	Designed to operate consistently from -40°C to +60°C (-40° to +140° F)
Maintenance neglect	Increase in hydraulic leaks, diminished system performance, and premature component failure	Consistent maintenance required	Designed for maintenance free deployment
Lack of service parts	Inability to fix leaks and components	Stock and maintain parts on rig at the drill site	No parts to replace — designed for years of trouble free service
Component wear	Performance inconsistency of seals, valve spools and pump	Regular setup, fine tuning, calibration, and adjustments to address component wear	All steel internal mechanical components are optimized for millions of adjustments at peak continuous thrust
Not adjusting flow controls/needle valves	Fluctuating speed control	Frequent manual adjustment of controls and valves or in some cases adding expensive and complex peripheral equipment	Motion control systems are designed to self-compensate— position, speed and force are precisely controlled

Tolomatic is committed to being the premier supplier of world class motion control products. For over 65 years, we have been a privately held company specializing in innovative, high performance actuator solutions. Find out which ServoChoke solution is right for you.



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