

MOOG

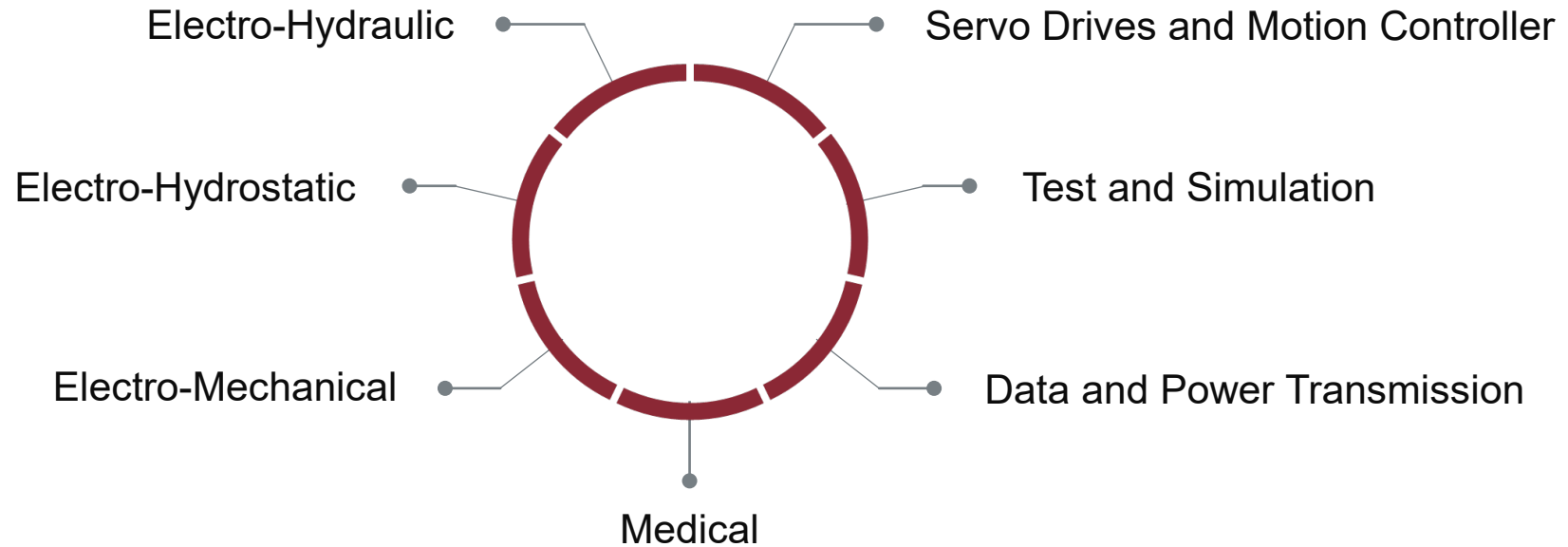
MOOG ELECTRICAL FEEDBACK VALVES

Tap to continue



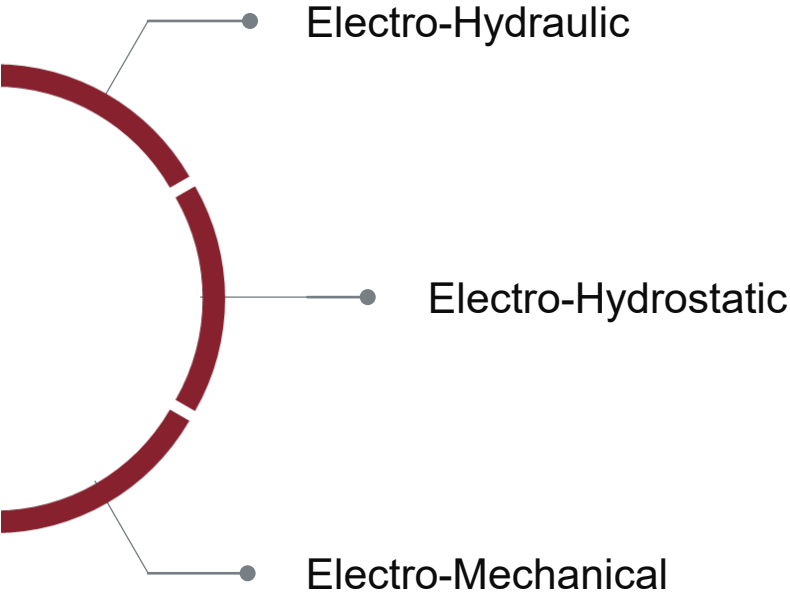
OUR OFFERING

MEETING INDUSTRIAL CHALLENGES WITH HIGH PERFORMANCE



OUR OFFERING

XXX



Servo & Proportional
Valves



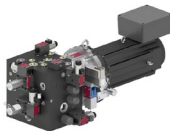
Radial Piston
Pumps



Cartridge & Servo
Cartridges



Hydraulic
Systems



Electro-Hydrostatic
Actuation Systems



Electro-Hydrostatic
Pump Unit



Ball and Roller
Screws



Servo Motors

OUR OFFERING

SERVO-PROPORTIONAL VALVES



2 Stage Servovalve



3 Stage Servovalve

Mechanical Feedback Valves



Direct Operated Valves



Pilot Operated Valves

Electrical Feedback Valves



MECHANICAL FEEDBACK VALVES (MFB)

FEATURES AND BENEFITS

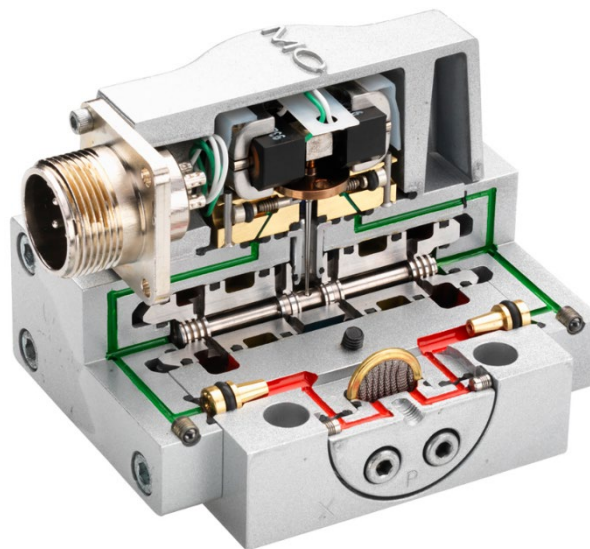
EXTREMELY ROBUST

SUPERIOR DURABILITY

VERY HIGH PERFORMANCE

UNIQUE SAFETY FEATURE

VERY COMPACT DESIGN



High Dynamic

Spool-in-Bushing design

Mechanical feedback

High vibration
resistance

No electronic

Torque Motor pilot

Redundancy and
Intrinsically Safe

Dual Coil Torque Motor

Specific coil option

Wear Resistance

Carbide ball-in-bore feedback
mechanism

Hardened bushing and Spool

ELECTRICAL FEEDBACK VALVES (EFB)

FEATURES AND BENEFITS

HIGH PERFORMANCE

ROBUST

DURABLE & RELIABLE

EXTREMELY VERSATILE

HIGHLY CUSTOMIZABLE



High Dynamic

Spool-in-Bushing (BSA) design

Short spool stroke

High accuracy and wear resistance

Integrated Fail-Safe options

Broad variety of spool designs

High vibration resistance

Uncoupled electronic

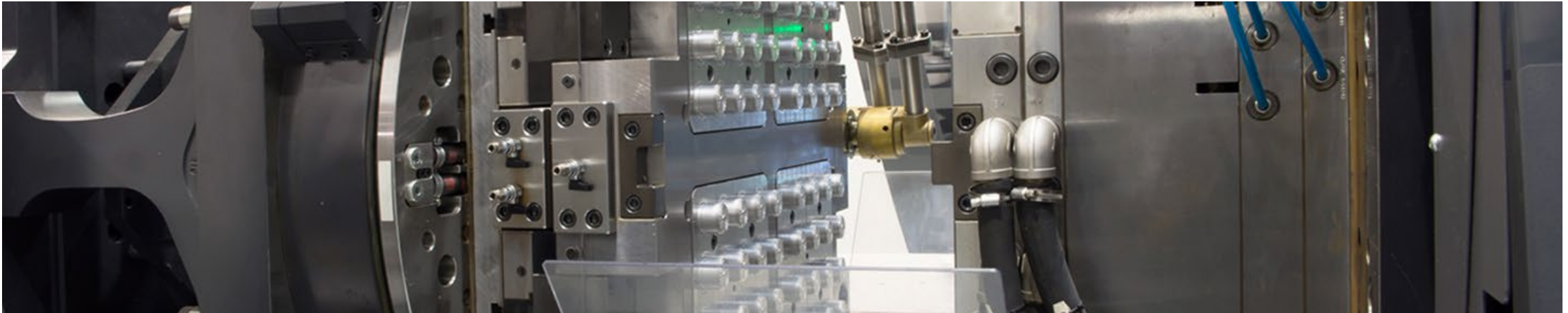
Glued components

Low thermal stress

Energy efficient components

Uncoupled electronics housing

CUSTOMER NEEDS



- › **Precise control** of position, speed, pressure and force in open and closed loop control systems
- › Constant **High quality finished parts**

- › **Easy installation**, commissioning and monitoring
- › High machine availability by **reduced total costs** of ownership
- › **Sustainable** production

MOOG SOLUTION



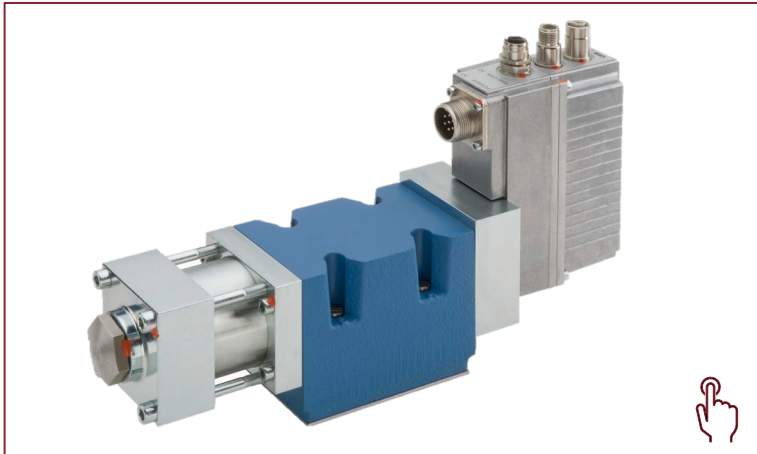
MOOG ELECTRICAL FEEDBACK VALVES WITH ONBOARD ELECTRONICS



- › **Broad range** of servo and proportional valves
- › **Proven** technology
- › High **reliability** and **longevity**
- › Outstanding **quality**

MOOG SOLUTION

MOOG DIGITAL CONTROL VALVES, OPTIONAL WITH FIELD BUS INTERFACE



| Direct Operated Valves with Q- or p/Q-functionality



| Pilot Operated Valves with Q- functionality



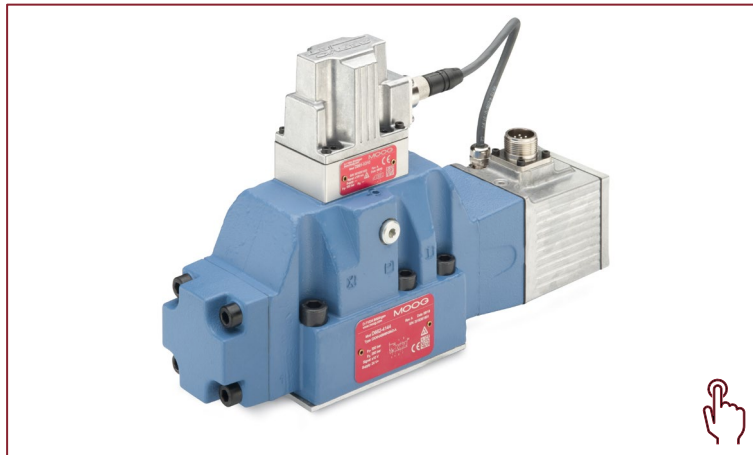
| Pilot Operated Valves with p/Q- functionality

MOOG SOLUTION

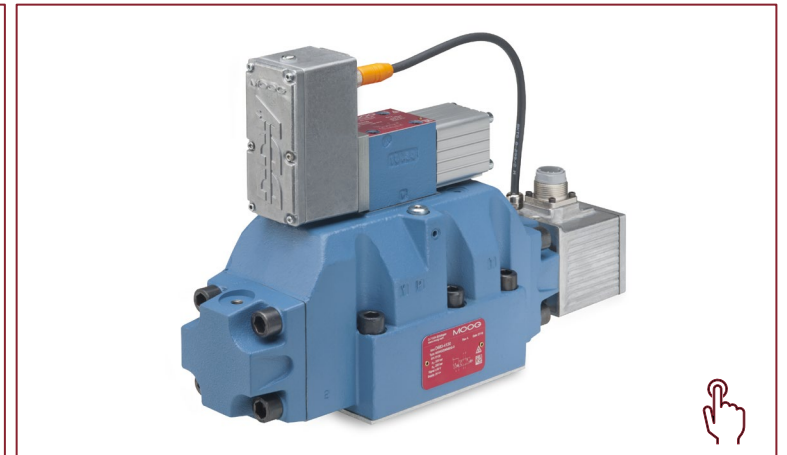
MOOG ELECTRICAL FEEDBACK VALVES WITH ONBOARD ELECTRONICS



Direct Operated Valves (DDV)
with analogue electronics



Pilot Operated Valves (ServoJet)
with analogue electronics



Pilot Operated Valves (DDV pilot)
with analogue electronics

MOOG SOLUTION

MOOG DIGITAL CONTROL VALVES, OPTIONAL WITH FIELD BUS INTERFACE

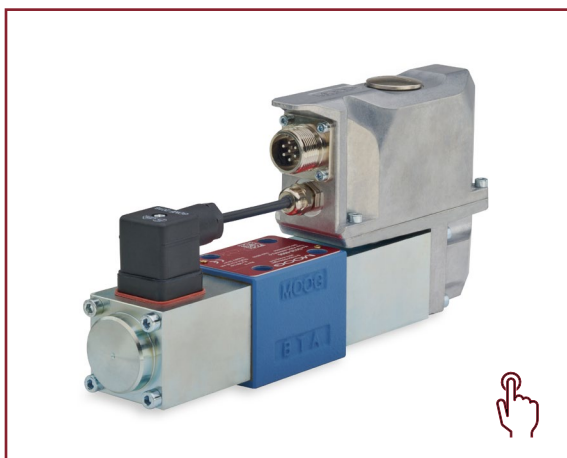


Moog Digital Control Valves with electronic load compensation

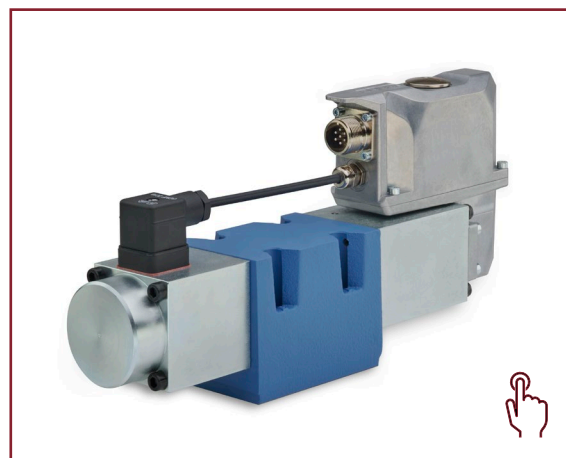
MOOG SOLUTION



DIRECT-OPERATED SERVO-PROPORTIONAL AND PROPORTIONAL VALVES FOR ANALOG SIGNALS



Direct Operated Proportional Valves
for Analog Signals – D926 Series



Direct-Operated Proportional Valves
for Analog Signals – D927 Series



Direct-Operated Servo-Proportional
Proportional Valves for Analog
Signals – D936 Series



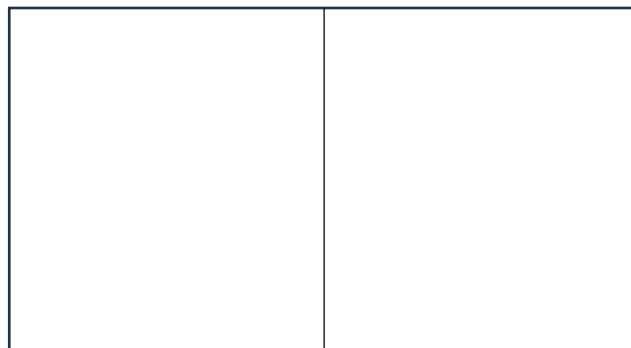
Direct-Operated Servo-Proportional
Valves for Analog Signals – D937
Series

CONDITION MONITORING

- › Valve wear / leakage corresponds with pressure build-up in the actuator › Introduction of wear index

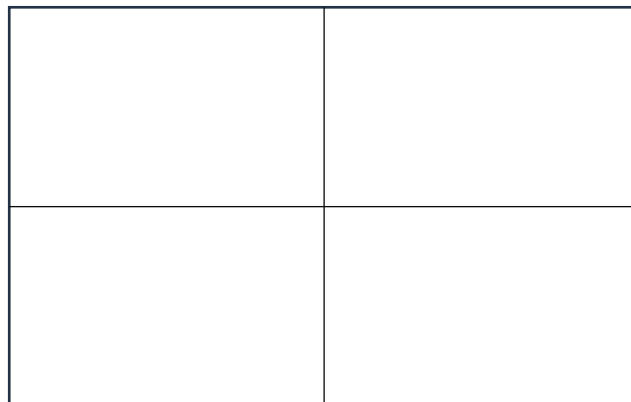
› Depending on utilization and environmental conditions such as oil contamination the **leakage** increases over time

LEAKAGE CURVE



› Depending on utilization and environmental conditions such as oil contamination the **pressure gain** decreases over time

PRESSURE CURVE



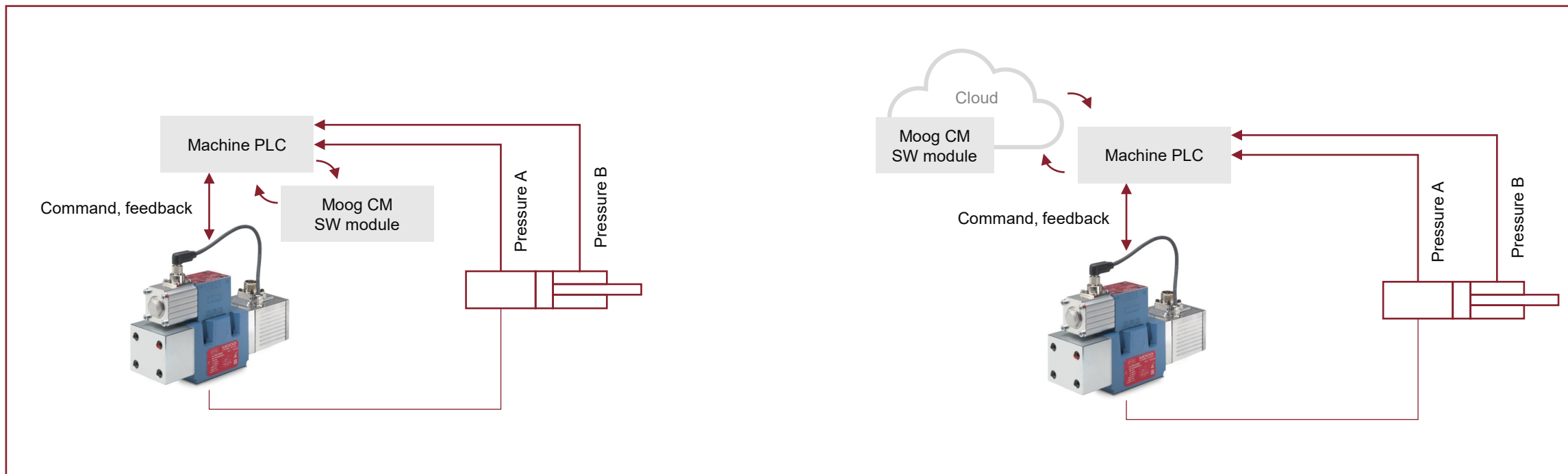
MOOG Condition Monitoring Software
Module

Moog CM
SW module

CONDITION MONITORING MODULES



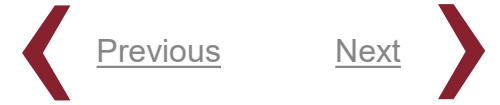
MOOG SERVO VALVE HEALTH INDICATOR



- › Pure SW functionality to be **integrated** in target HW
- › Using measured **values** provided by already existing sensors

- › CM Module can run on **different HW environments**

BENEFITS



CONDITION MONITORING MODULES – MOOG SERVO VALVE HEALTH INDICATOR

ELAPSED VALVE SPOOL DISTANCE

- › **No reference** measurement necessary
- › **No failure** due to signal noise
- › **Easy parameterization**: Valve strokes for common series listed in module
- › Parameter helps for to learn **deeper process understanding**

PRESSURE CURVE EVALUATION

- › Customer has **full control** of measurement routine › **machine safety** concept is not touched
- › Factor indicates wear / leakage of valve or cylinder

BENEFITS



CONDITION MONITORING MODULES – MOOG SERVO VALVE HEALTH INDICATOR

CONCLUSION

- › **No extra hardware** necessary
- › Applicable for valves with **analog and digital** electronics
- › **Upgrade** for existing valve fleet
- › Planned **maintenance**
- › **Reduction** of machine downtime
- › Reduction of **operating costs**

CONFIGURATION/ PARAMETRIZATION

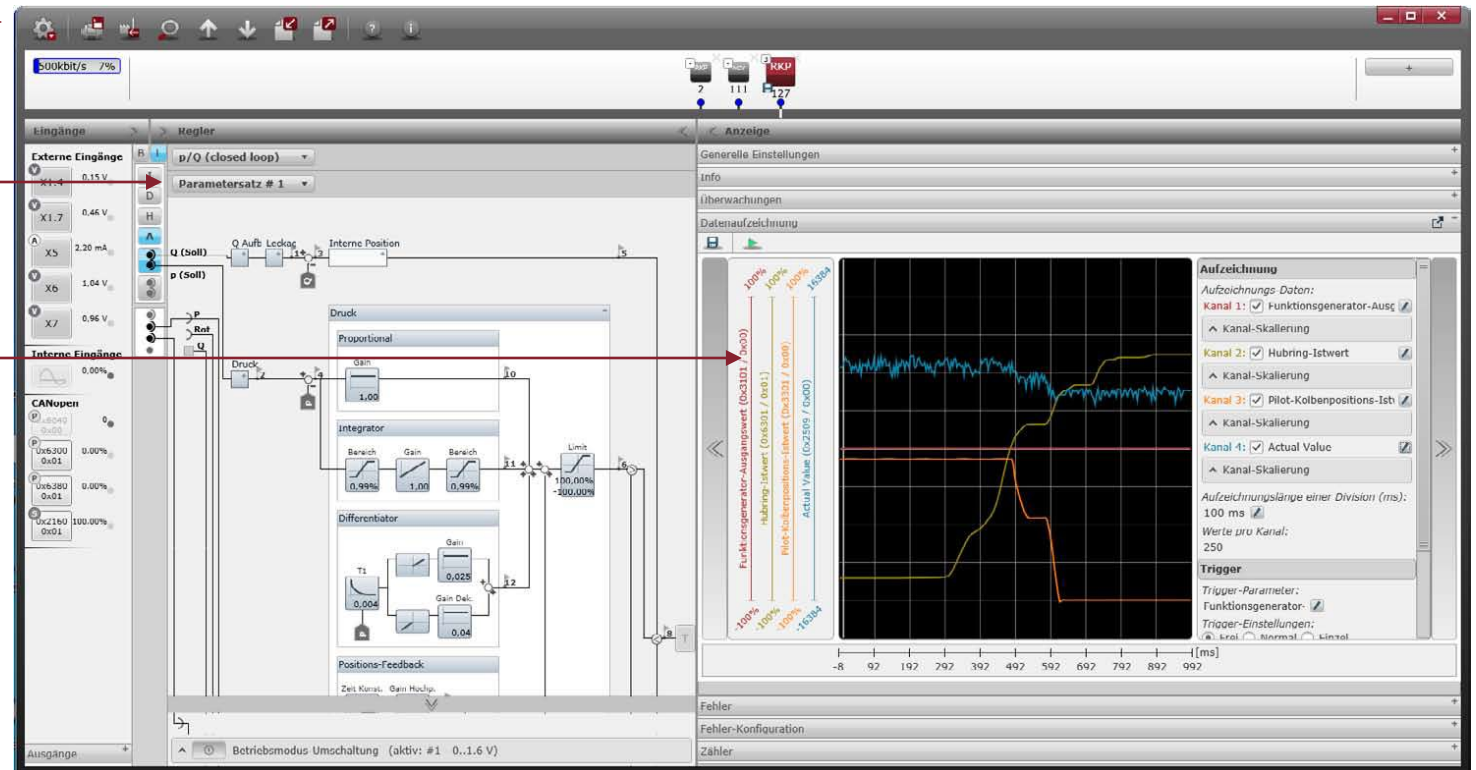


MOOG VALVE AND PUMP CONFIGURATION SOFTWARE

› Easy Interface Management

› Easy Controller Tuning

› Built in Oscilloscope



SUMMARY

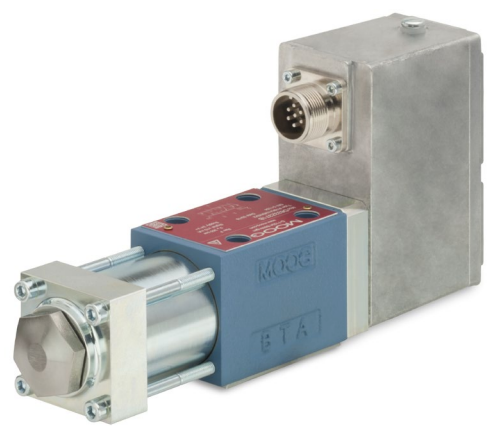
MOOG ELECTRICAL FEEDBACK VALVES WITH ONBOARD ELECTRONICS



- › **Reliable and robust** valves for broad range of applications
- › Excellent **static and dynamic behaviour**
- › **Enhanced functionality** and additional interfaces by utilization of digital onboard electronics
- › Digital Fieldbus Interfaces available
- › Moog Condition Monitoring Modules

- › [CUSTOMER NEEDS](#)
- › [MOOG SOLUTION](#)
- › [MONITORING](#)
- › [BENEFITS](#)
- › [INTERFACE](#)
- › [SUMMARY](#)

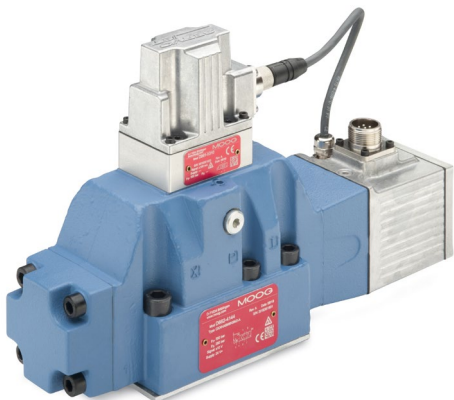
DIRECT OPERATED VALVES (DDV) WITH ANALOGUE ELECTRONICS



	D633	D634
Size	NG06	NG10
Rated Flow [l/min] at 35 bar per land pressure drop	5/10/20/40	60/100
Max. Pressure Main Stage [bar]	350	350

Tap to see less —

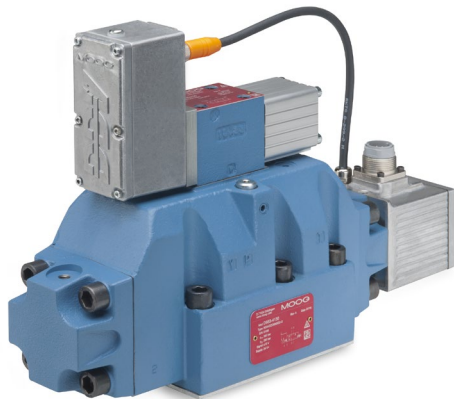
PILOT OPERATED VALVES (SERVOJET) WITH ANALOGUE ELECTRONICS



	D661	D662	D663	D664	D665
Size	NG10	NG16	NG25	NG25	NG32
Rated Flow [l/min] at 5 bar per land pressure drop	30/60/80	150/250	350	500	1000/1500
Max. Pressure Main Stage [bar]	350	350	350	350	350
Max. Pilot Pressure [bar]	350	350	350	350	350

Tap to see less —

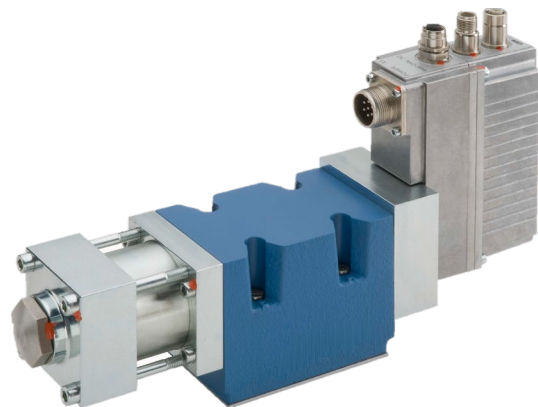
PILOT OPERATED VALVES (DDV) WITH ANALOGUE ELECTRONICS



	D681	D682	D683	D684	D685
Size	NG10	NG16	NG25	NG25	NG32
Rated Flow [l/min] at 5 bar per land pressure drop	30/60/80	150/250	350	500	1000/1500
Max. Pressure Main Stage [bar]	350	350	350	350	350
Max. Pilot Pressure [bar]	350	350	350	350	350

Tap to see less —

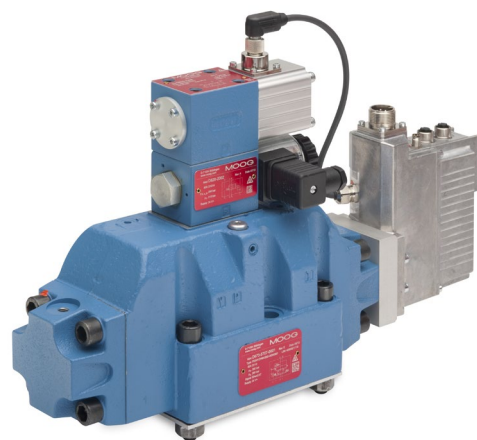
DIRECT OPERATED VALVES WITH Q- OR P/Q- FUNCTIONALITY



	D636	D637	D638	D639
Functionality	Q-control	Q-control	p/Q- control	p/Q-control
Size	NG06	NG10	NG06	NG10
Rated Flow [l/min] at 35 bar per land pressure drop	5/10/20/40	60/100	5/10/20/40	60/100
Max. Pressure Main Stage [bar]	350	350	350	350

Tap to see less —

PILOT OPERATED VALVES WITH Q- FUNCTIONALITY



	D671	D672	D673	D674	D675
Size	NG10	NG16	NG25	NG25	NG32
Rated Flow [l/min] at 5 bar per land pressure drop	30/60/80	150/250	350	550	1000/1500
Max. Pressure Main Stage [bar]	350	350	350	350	350
Max. Pilot Pressure [bar]	350	350	350	350	350

Tap to see less —

PILOT OPERATED VALVES WITH p/Q- FUNCTIONALITY



	D941
Size	NG10
Rated Flow [l/min] at 5 bar per land pressure drop	8/30/60/80
Max. Pressure Main Stage [bar]	350
Max. Pilot Pressure [bar]	350

Tap to see less —

MOOG DIGITAL CONTROLLED VALVES WITH ELECTRONIC LOAD COMPENSATION

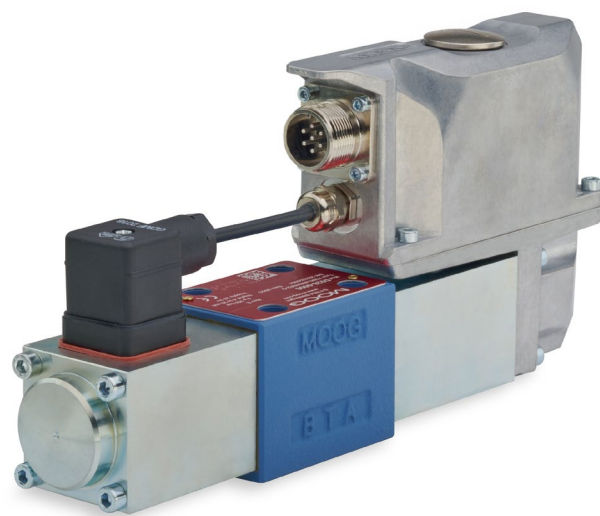


	D638	D639
Functionality	Q- and p/Q-Control	Q- and p/Q-Control
Size	NG06	NG10
Rated Flow [l/min] at 35 bar per land pressure drop	5/10/20/40	24/40/60 at 5 bar
Max. Pressure Main Stage [bar]	350	350

Tap to see less —

MOOG SOLUTION

D926 DIRECT-OPERATED PROPORTIONAL VALVES FOR ANALOG SIGNALS

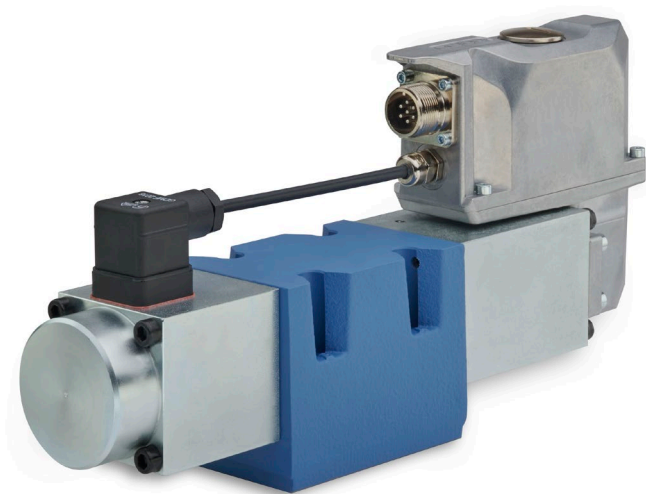


Rated Flow at 5 bar pressure drop per land [l/min (gpm)]	4 to 32 (1 to 8.5)
Rated Pressure [bar (psi)]	350 (5,000)

Tap to see less —

MOOG SOLUTION

D927 DIRECT-OPERATED PROPORTIONAL VALVES FOR ANALOG SIGNALS



Rated Flow at 5 bar pressure drop per land [l/min (gpm)]	25 to 75 (6.6 to 19.8)
Rated Pressure [bar (psi)]	350 (5,000)

Tap to see less —

MOOG SOLUTION

D936 DIRECT-OPERATED SERVO-PROPORTIONAL VALVES FOR ANALOG SIGNALS



Rated flow at 35 bar pressure drop per land [l/min (gpm)]	4 to 40 (1 to 10.6)
Rated Pressure [bar (psi)]	350 (5,000)

Tap to see less

MOOG SOLUTION

D937 DIRECT-OPERATED SERVO-PROPORTIONAL VALVES FOR ANALOG SIGNALS



Rated flow at 35 bar pressure drop per land [l/min (gpm)]	50 or 100 (13.2 or 26.4)
Rated Pressure [bar (psi)]	350 (5,000)

Tap to see less

MOOG

/ THANK YOU /

LETS MAKE THE IMPOSSIBLE POSSIBLE
TOGETHER

/ click to connect /

