
Shaping the way our world moves™

# CONFIDENTIAL

## EXTERNAL

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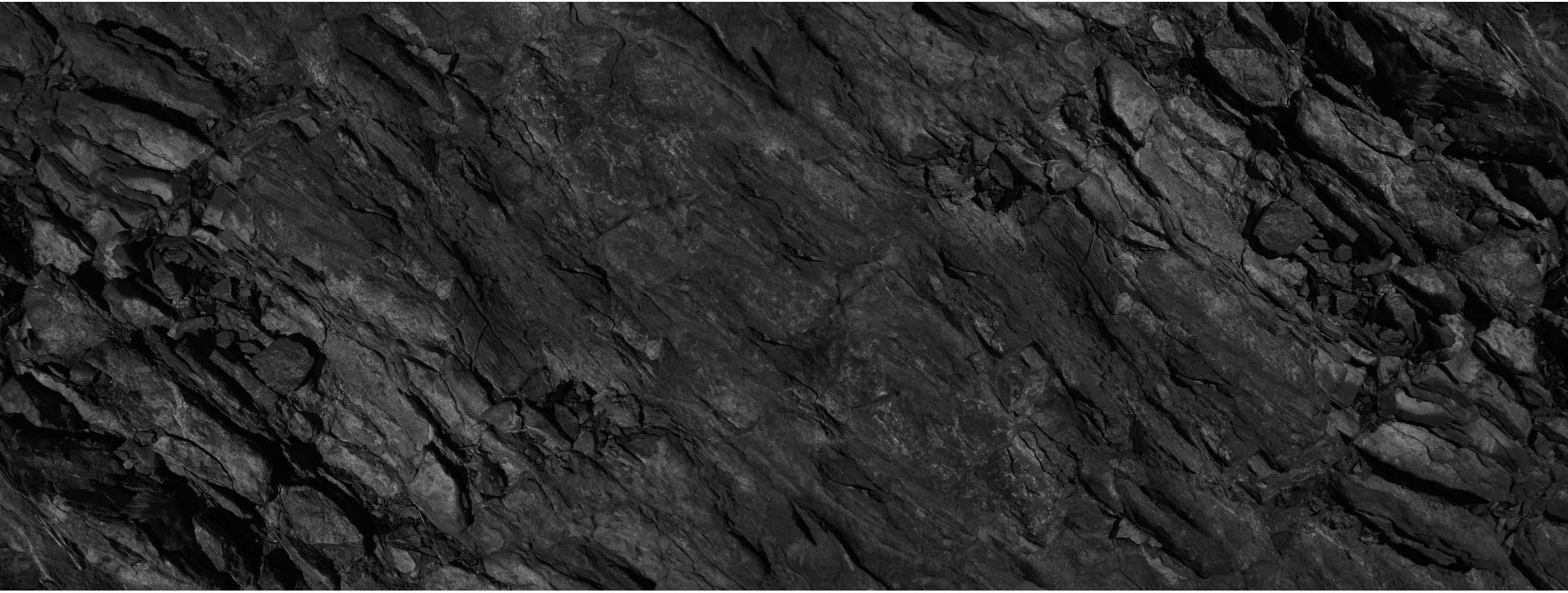

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MEETING WITH XXXXXXXXXXX

# AXP PUMP TECHNOLOGY

September 2025


INTRODUCTIONS

ABOUT MOOG

AXP PRODUCT LINE

TECHNICAL CAPABILITIES

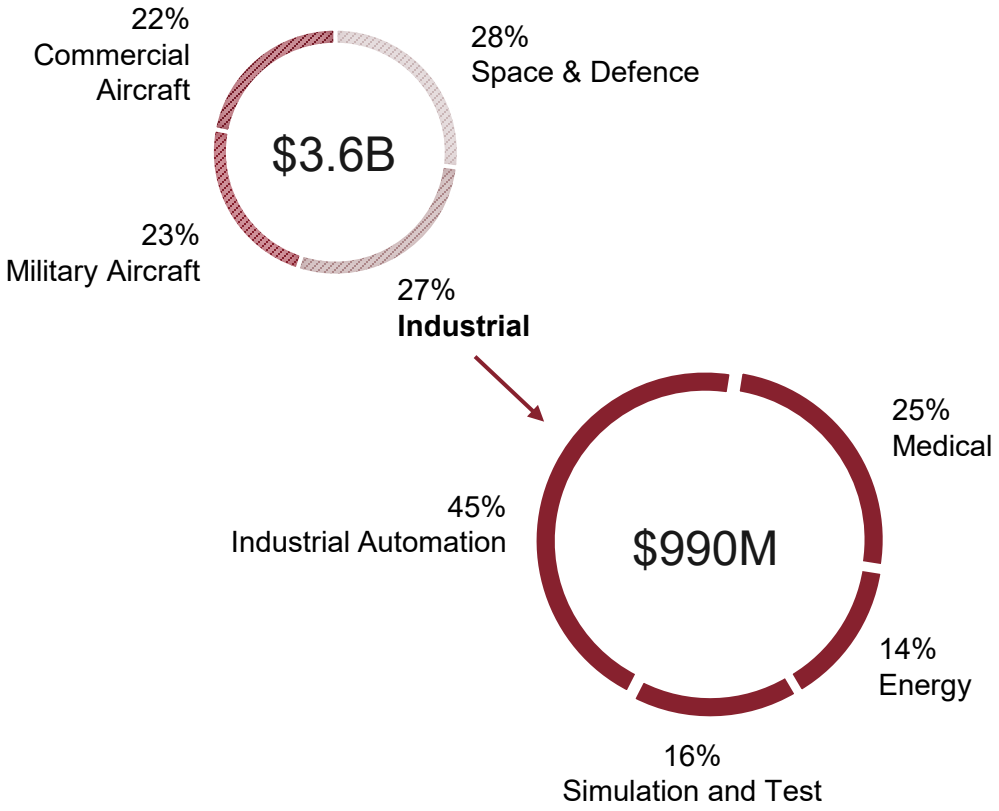
OUR PROPOSAL

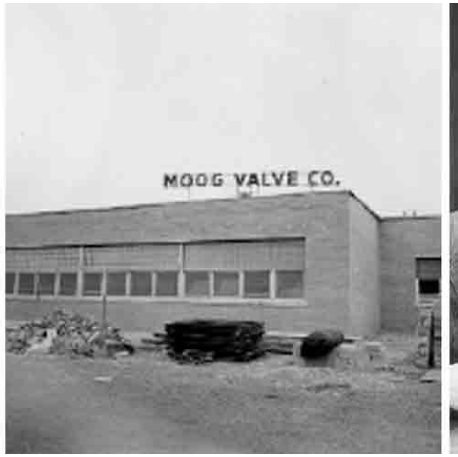
ACTIONS

# MOOG AT A GLANCE

## INNOVATING SINCE 1951

### FY24 REVENUE MOOG INC.

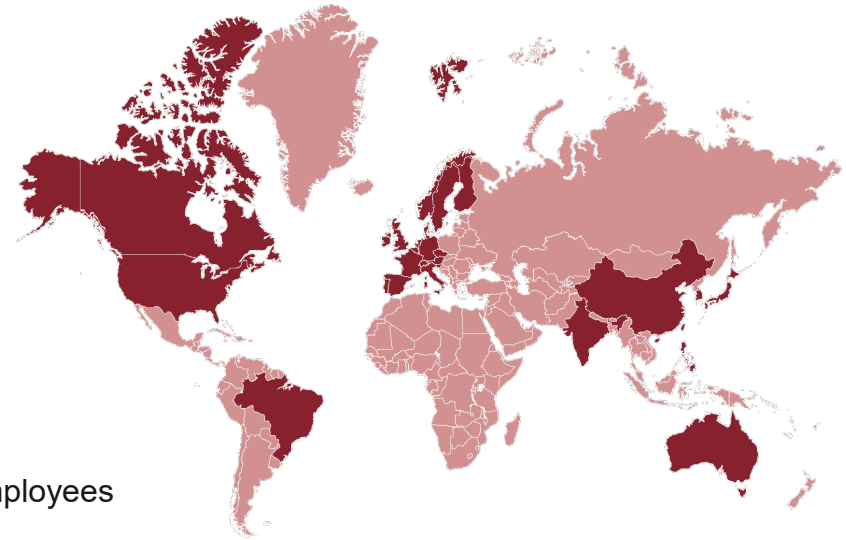



**71** Years of experience

Operating in **20** countries

**13,000+** Employees





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# MOOG INDUSTRIAL GROUP

## FINDING THE BEST SOLUTION FOR YOUR APPLICATION

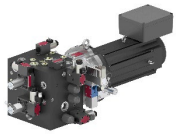
Servo & proportional valves

Piston pumps

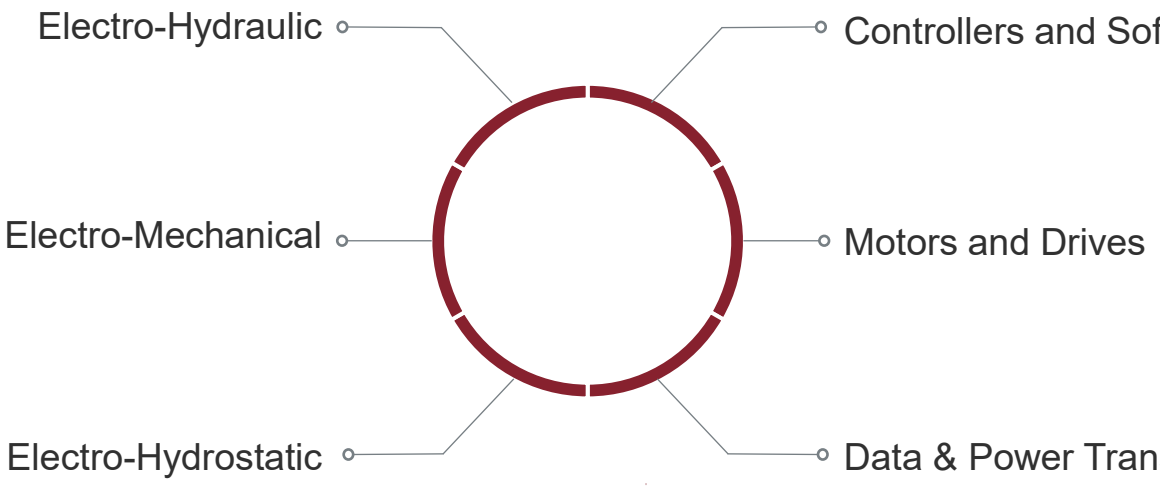
Linear Servo Actuators

Ball & Roller Screws

Electro-hydrostatic Pump Unit



Electro-hydrostatic Actuation Systems

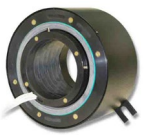



Machine and Motion Controllers

Software Solutions

Single & Multi-Axis Servo Drives

Servo Motors & Servo Actuators



Industrial Slip Rings

Fiber Optic Rotary Joints



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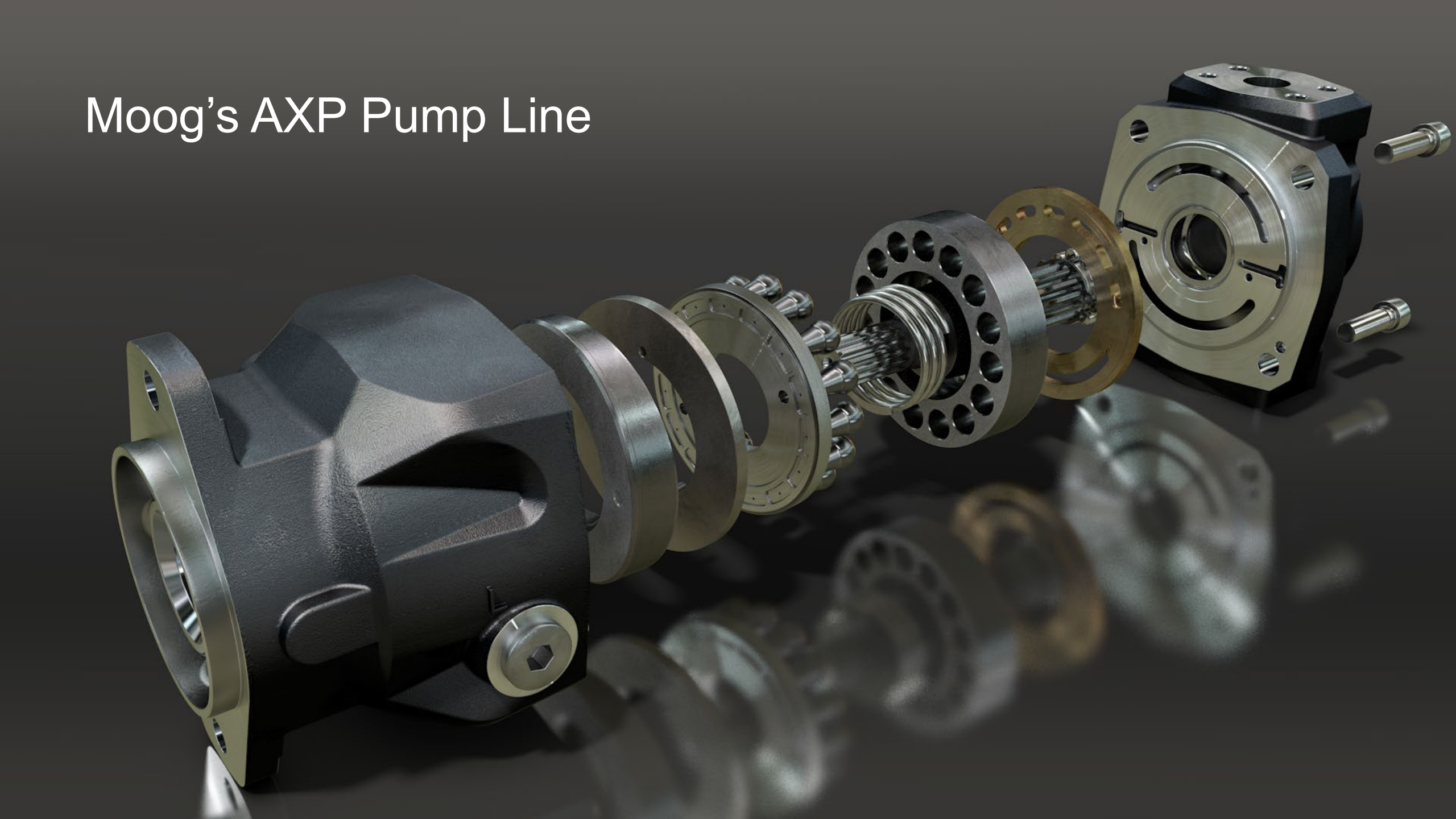
# Moog’s AXP Pump Line

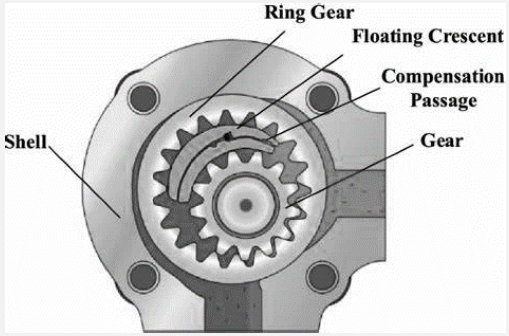


# OTHER PUMP DESIGNS WERE LACKING

## A NEW APPROACH WAS NEEDED.

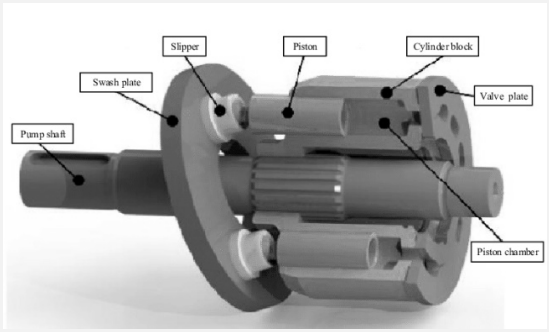
### INTERNAL GEAR PUMP

+ Low Noise
+ Low Cost
+ High Speed
− Fix displacement
− Does not last




### PISTON PUMP

− High Noise
− High Cost
− Low Speed
+ Var displacement
+ Robust




**Takes the best of both designs.**

**The features you really need.**



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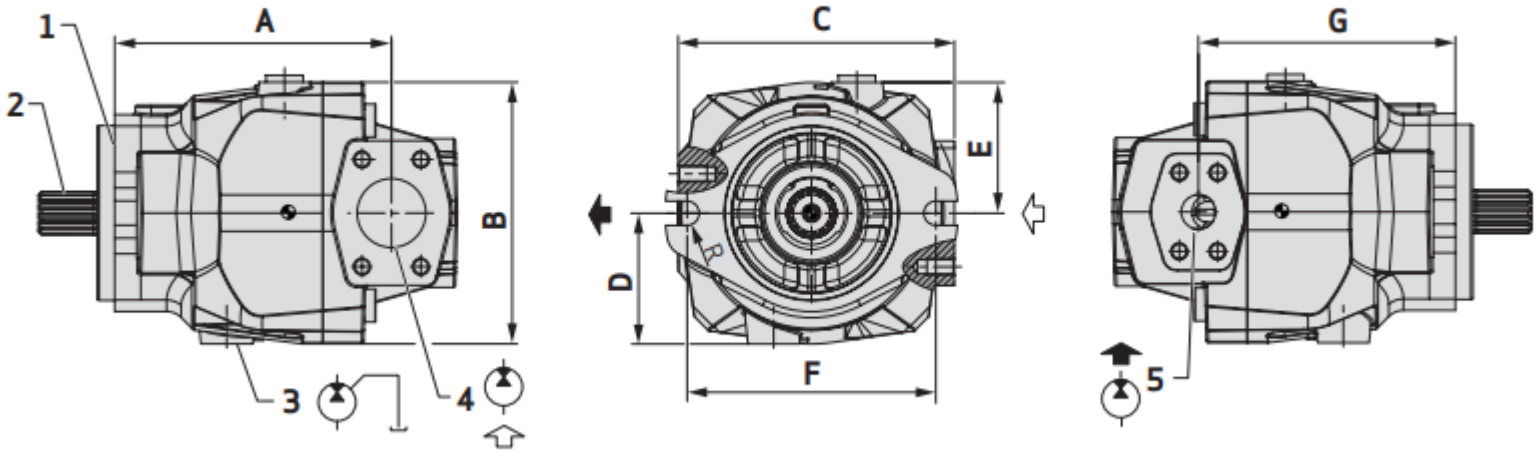
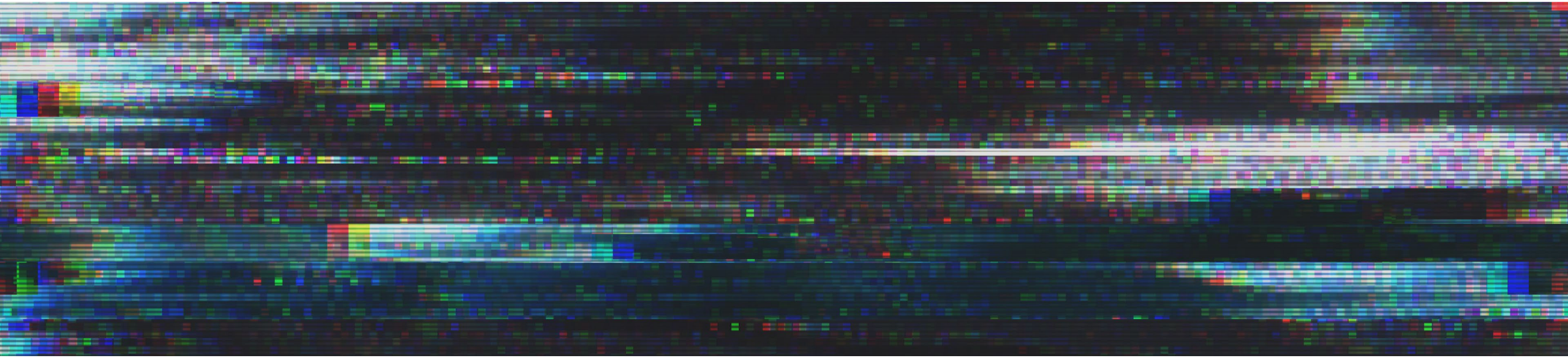
# Built to last.

A brand new pump technology with **floating pistons**, designed with **fewer parts**, direct coupling options, and **external drain**.
This means **longer life**, higher uptime, and **more resistance against contamination**.



# Versatile and efficient.

With **zero-speed** and **high-speed** capabilities, the Moog Axial Piston Pump helps users **save energy at idle**, **downsize** motors, and optimize productivity with an extended working range.

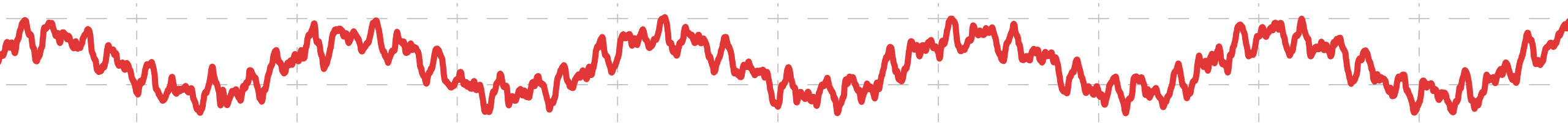


# Reduced noise.

Specifically designed to be quieter than other piston pumps, the Moog AXP Pump has the best mix of performance and features to sound output.

# Smooth and precise.

Thanks to an all new pump technology with 15 floating pistons that reduces pulsation, users experience smooth accurate operation. Ideal for precision machinery and modern drive systems.



# Superior performance to price.

The perfect balance of what you need out of a pump to maximize your equipment and your profit.

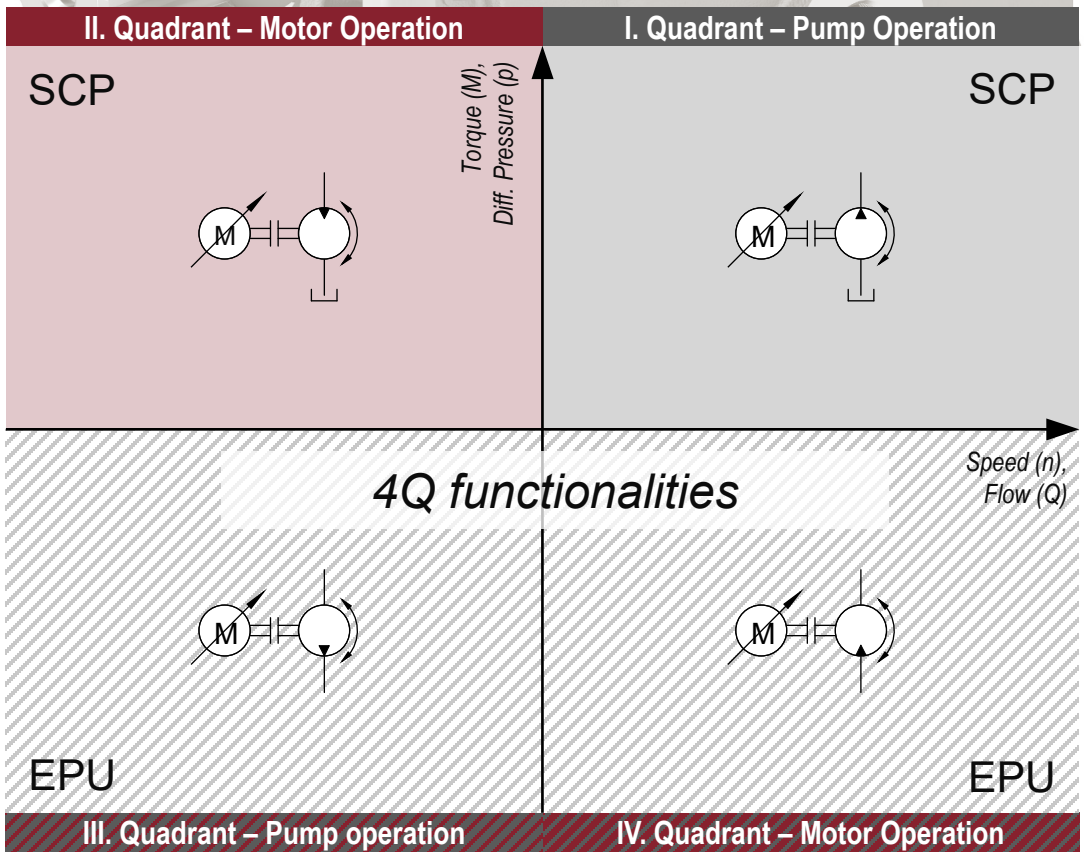
# AXP PUMP FAMILY

## PORTFOLIO PRESENTATION WITH MAIN OPTIONS

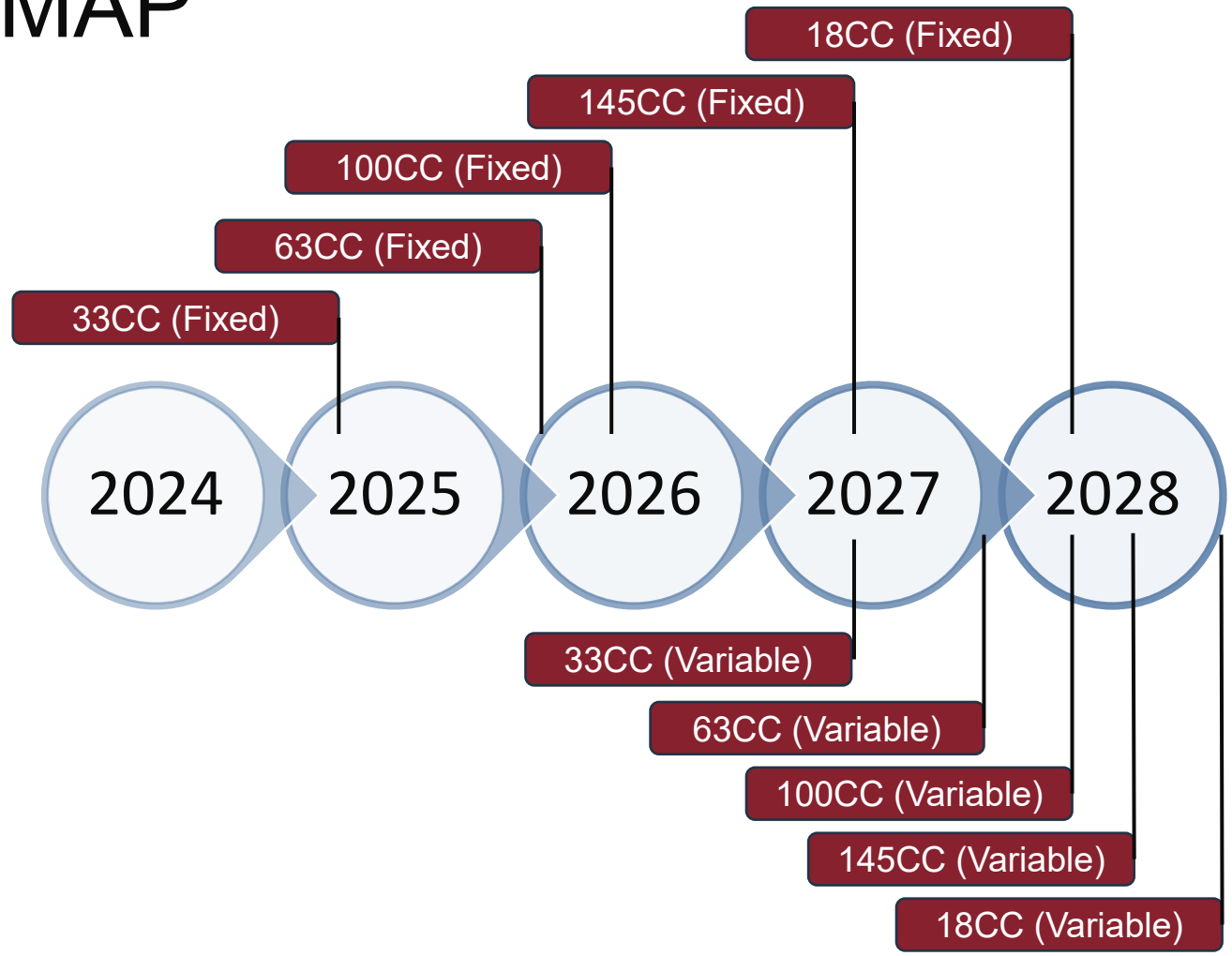
| FRAME SIZE | DISPL. | DISPL. SELECTION | MAX SPEED (1) | MAX FLOW |
|---|---|---|---|---|
| **18** *cc* | Fix & Var | TBD | 5 000 | 90 *lpm* |
| **33** *cc* | Fix & Var | 20, 25, 33 *cc* | 3 700 | 122 *lpm* |
| **63** *cc* | Fix & Var | 40, 50, 63 *cc* | 3 000 | 189 *lpm* |
| **100** *cc* | Fix & Var | 80, 100 cc | 2 600 | 260 *lpm* |
| **145** *cc* | Fix & Var | TBD | 2 200 | 319 *lpm* |
| | | | *rpm* | *lpm* |

*All pump size have drive through capability, with selected combination*

*(1) At 0,8b absolute inlet pressure*

# PRODUCT ROADMAP



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# TECHNICAL SPECS

| Size | | | 33 | 63 | 100 |
|---|---|---|---|---|---|
| **Displacement, geometric, per revolution** | | $cm^3$ | 33 [1)] | 63 [2)] | 100 [3)] |
| **Type of construction** | | | Axial piston pump for open circuit and 2-quadrant operation, fixed displacement | | |
| **Type of mounting** | | | SAE mounting flange to DIN 3019-1 (imperial dimensions) | | |
| **Mounting position** | | | Any | | |
| **Weight** | Without through drive | kg (lb) | 21.0 (46.3) | 37.7 (83.1) | 48.9 (107.8) |
| | Double pump | | 43 (94.8) | 79 (174.2) | 103.2 (227.5) |
| **Inertia** | Single pump | kg $cm^2$ (lb $in^2$) | 35.7 (12.2) | 107.5 (36.7) | 235.2 (80.4) |
| | Double pump | | 72.1 (24.6) | 214.8 (73.4) | 474.9 (162.3) |
| **Direction of rotation** | | | Clockwise (viewed on drive shaft) | | |
| **Pressure port** | Maximum operating pressure | bar (psi) | 350 (5,000) | | |
| | Peak operating pressure | | 380 (5,500) | | |
| | Single operating period | ms | 15 | | |
| | Maximum number of pressure peaks | | 1 million | | |
| **Suction port** | Minimum inlet pressure permanent | bar (psi) | 0.8 abs (12 abs) | | |
| | Minimum inlet pressure at acceleration | | 0.6 abs (9 abs) | | |
| | Maximum inlet pressure | | 25 abs (360 abs) | | |
| **Drain port L** | Maximum housing pressure | | 2 abs (29 abs) | | |
| **Speed** | Maximum speed at 1 bar (15 psi) inlet pressure | rpm | 3,700 | 3,000 | 2,600 |
| | Minimum speed | | 0 (up to 350 bar) | | |

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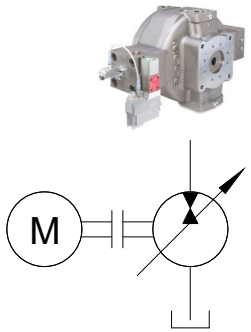
# THE EVOLUTION OF VARIABLE SPEED

## SMART MOTORS TAKING FIXED DISPLACEMENT TO THE NEXT LEVEL

1 » 2 » 3 » 4 » 5 »

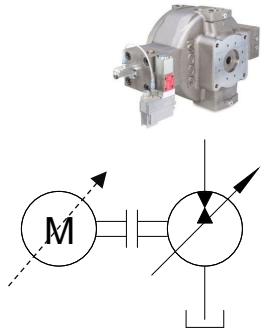
### Variable displacement

*Drive the pump at constant speed*



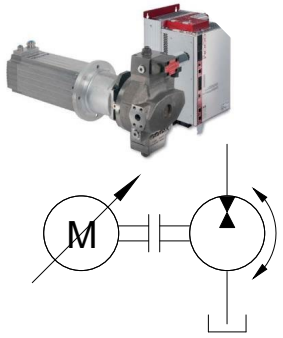

### Optimize rpm

Start at stop E-pump
Idle mode with low revs




### ePump Motor-Pump unit

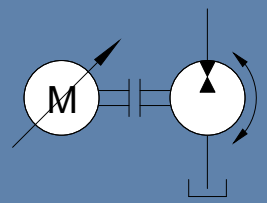
Fix displacement pump.
➔ Full benefit of E-motor




### Optimized Motor pump unit

- ✓ Zero RPM capable
- ✓ High speed

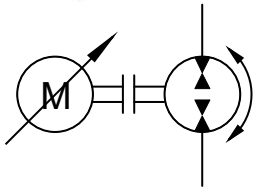
➔ Down size Emotor




### EHA hybrid axis

4Q

- 350b High pressure
- 25b Low pressure




*Low efficiency makes high demand of energy*

*Improved efficiency & energy recuperation*

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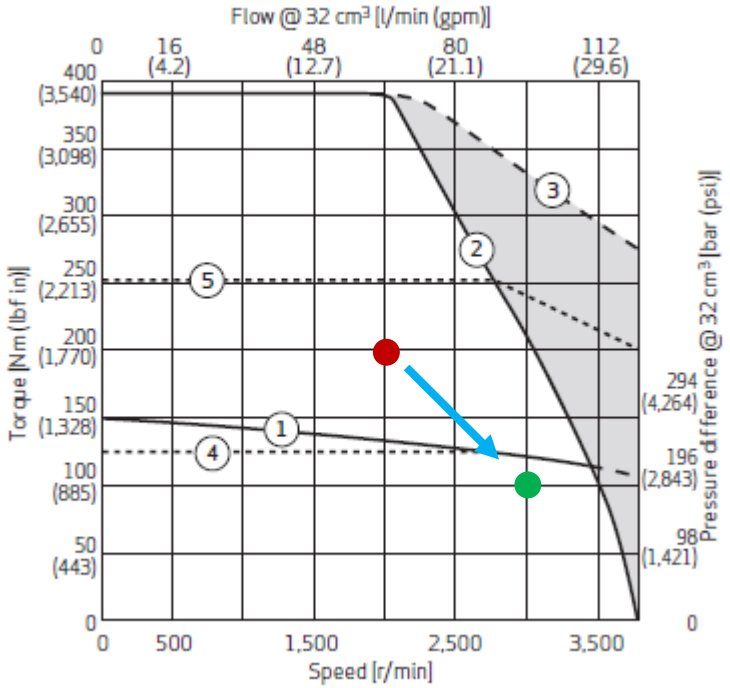
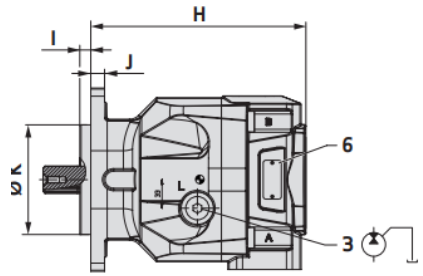
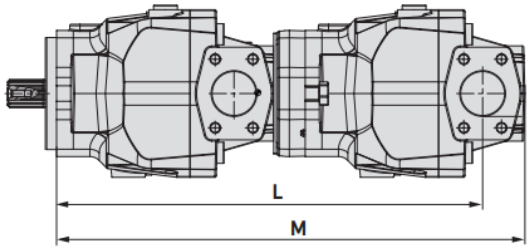
# DOWNSIZE AND UPSIZE

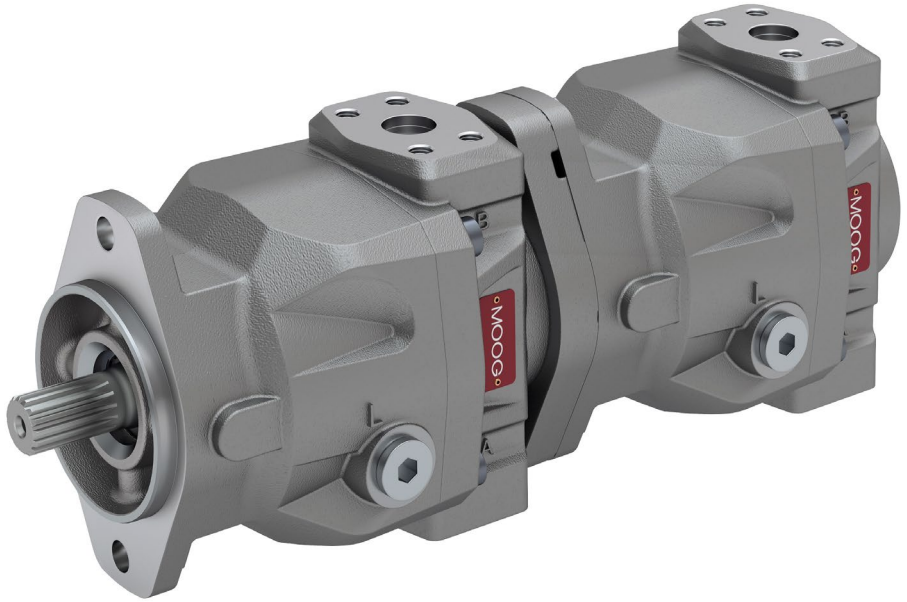
## HIGHLY VERSATILE PUMPS MEANS YOU CAN CHALLENGE EXISTING DESIGNS.




Need more out of your design? Pumps can be stacked instead of forcing you to go with a bigger pump.




Higher speed = Smaller pumps
Smaller pumps = less mass and cost

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