Automated Hydraulic Control Valve Test Bench

Universal Validation for Mobile & Industrial Hydraulics.

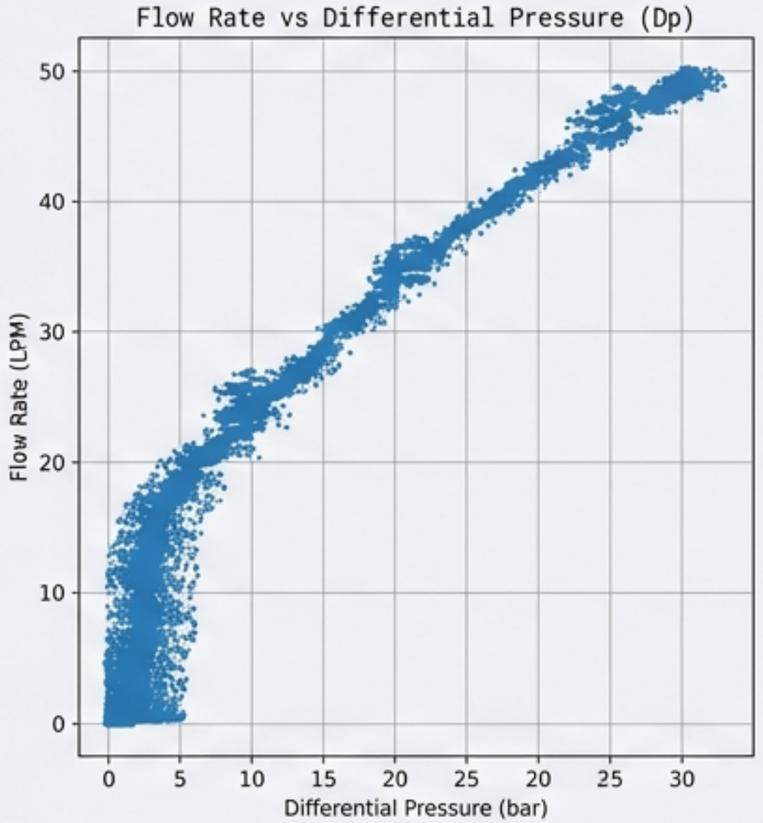
NEOMETRIX

Bridging the Gap Between R&D and Production.

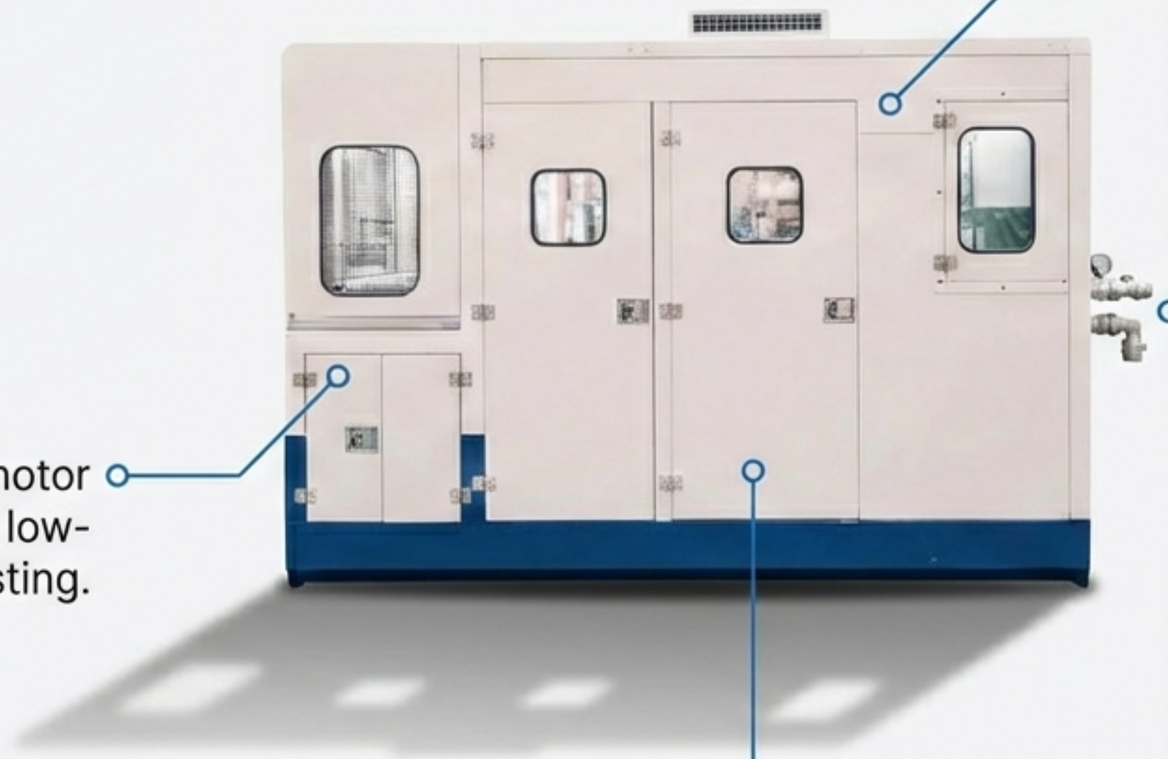
Lifecycle Support: Designed to handle incoming inspection, calibration/tuning, performance characterization, and endurance verification.

The Value: Whether validating a new spool/sleeve combination in the lab or troubleshooting field feedback, the system provides repeatable, operator-independent sequences.

Key Capability: Compare valve-to-valve variation across batches or prove compliance to customer specs with archived, reviewable datasets.



A 350 kW Powerhouse Architecture.



350 kW automated valve test stand.

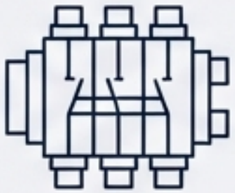
Flow up to ~400 LPM / Pressure up to ~420 bar.

Multi-pump, multi-motor architecture for stable low-flow & high-load testing.

1200 L reservoir with plate-type oil cooler (20°C–75°C window).

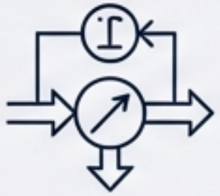
Configured for Virtually Any Architecture.

With flexible fixtures and plumbing, the bench supports a vast envelope of mobile and industrial designs.



Valve Types

- Sectional banks
- Electrohydraulic (EH)
- Proportional
- Cartridge valves



Functionality

- Directional control
- Pressure control
- Flow control
- Load-holding (counterbalance)

Sizes

From pilot valves to large Size-5 main stage valves (e.g., CMA, CLS180, SiCV).

Intelligent Automation & Sequence Control.

Operator-Independent Results: Automated test sequencing eliminates human variability.

Full Traceability: Multi-channel data acquisition provides full time-history logging.

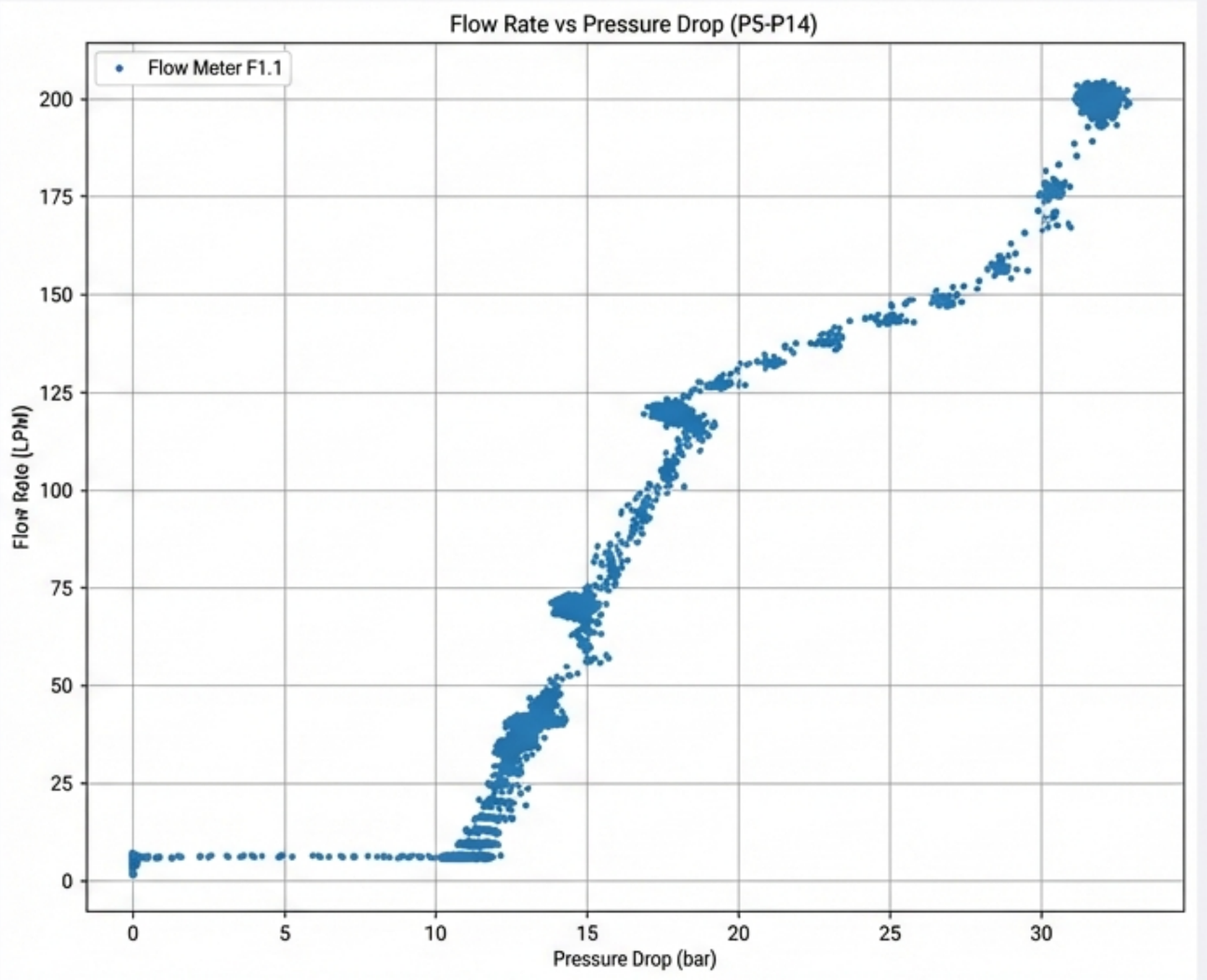
Scope: Manages complex routines including flow sweeps, pressure steps, and endurance cycling without manual intervention.

Characterizing Flow & Efficiency.

Test A (Pressure Drop): Quantifies energy losses through the metering path. Validates hydraulic efficiency and prevents heat loss.

Test C (Max Flow): Confirms valve reaches rated flow under command. Identifies incorrect spool/sleeve combinations.

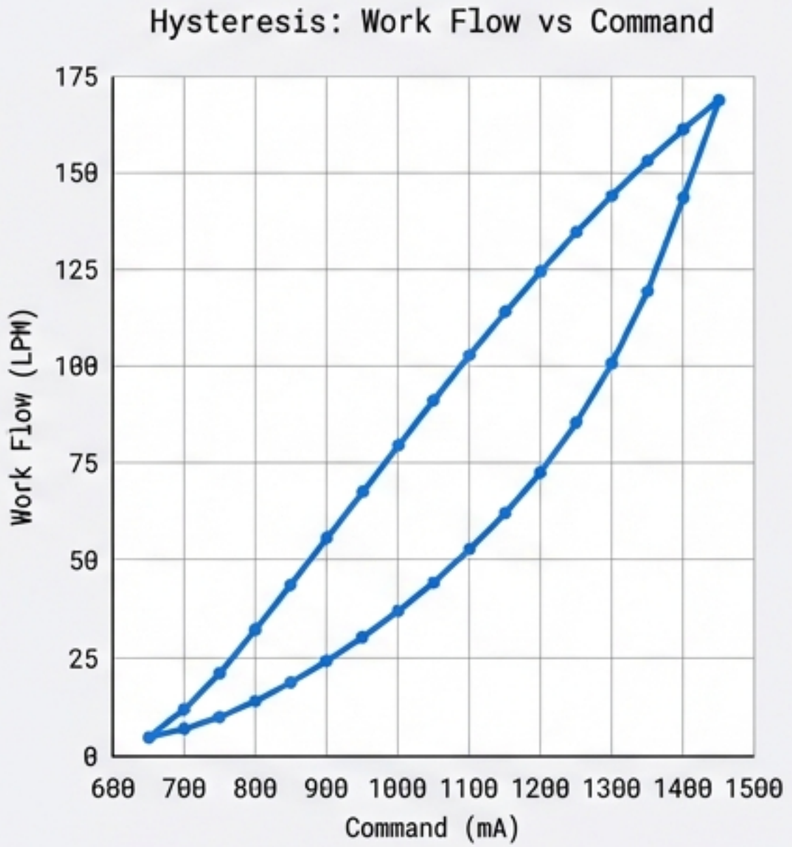
Context: Repeat runs at stabilized temperatures separate true valve behavior from fluid viscosity effects.

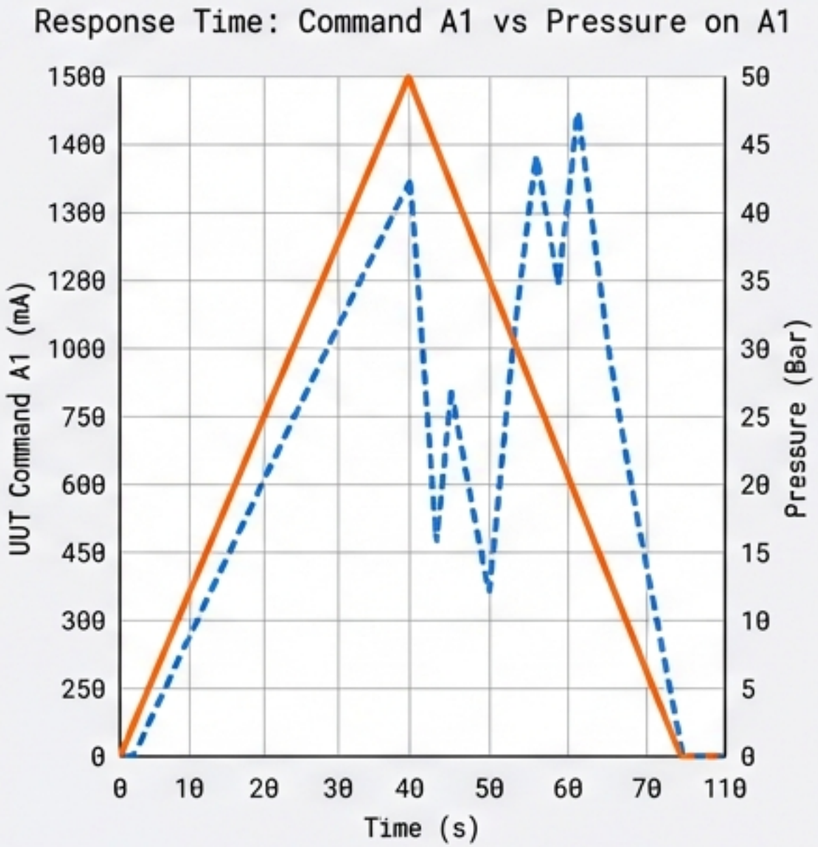


Defining Control and ‘Feel’.

Test B (Hysteresis):
Ramps command up and down to identify sticky spools or friction. Correlates to “smooth” vs. “jerky” machine feel.

Test E (Response Time):
Measures how fast the valve reaches commanded flow. Essential for closed-loop controller stability.

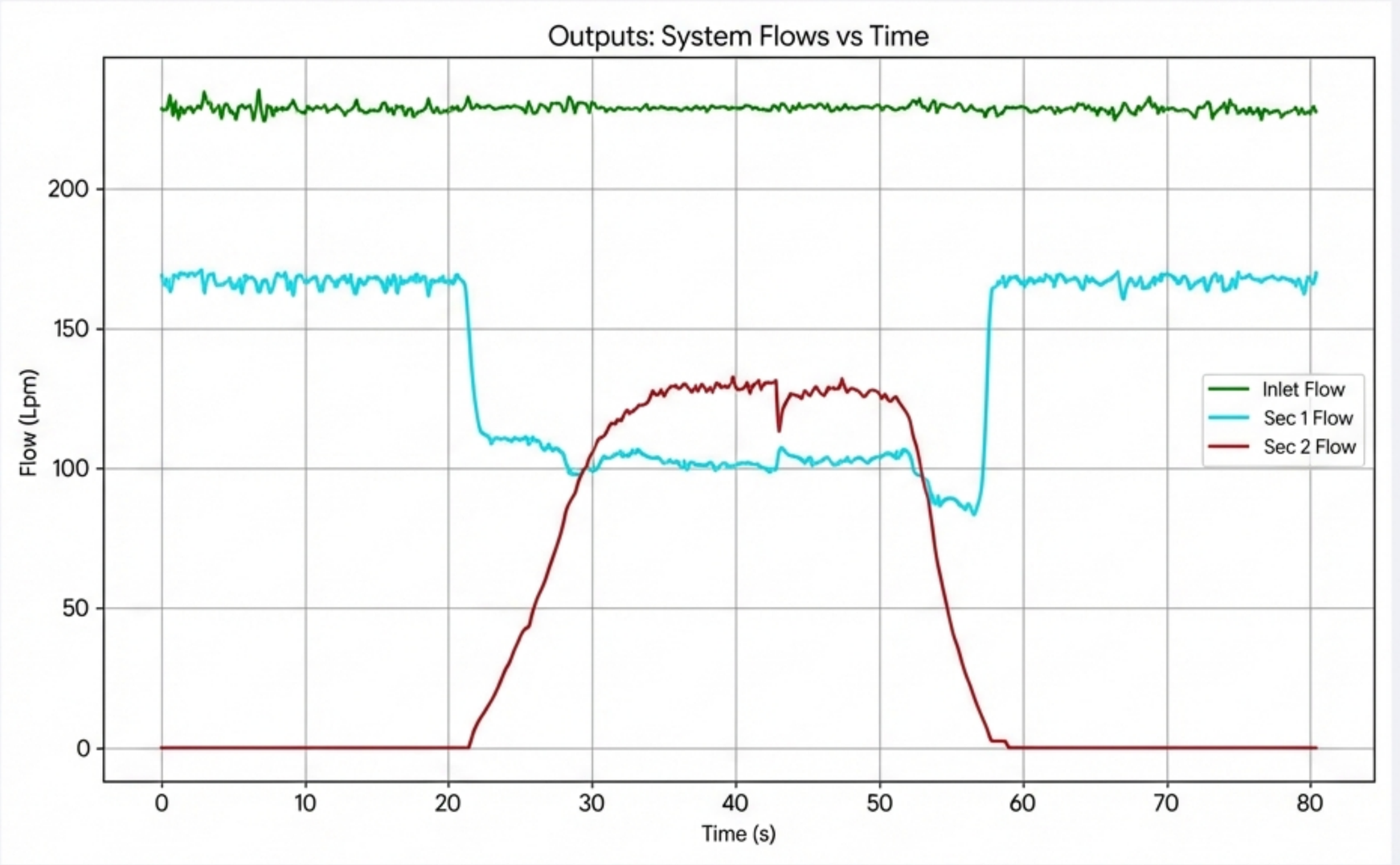




Stability Under Complex Loads.

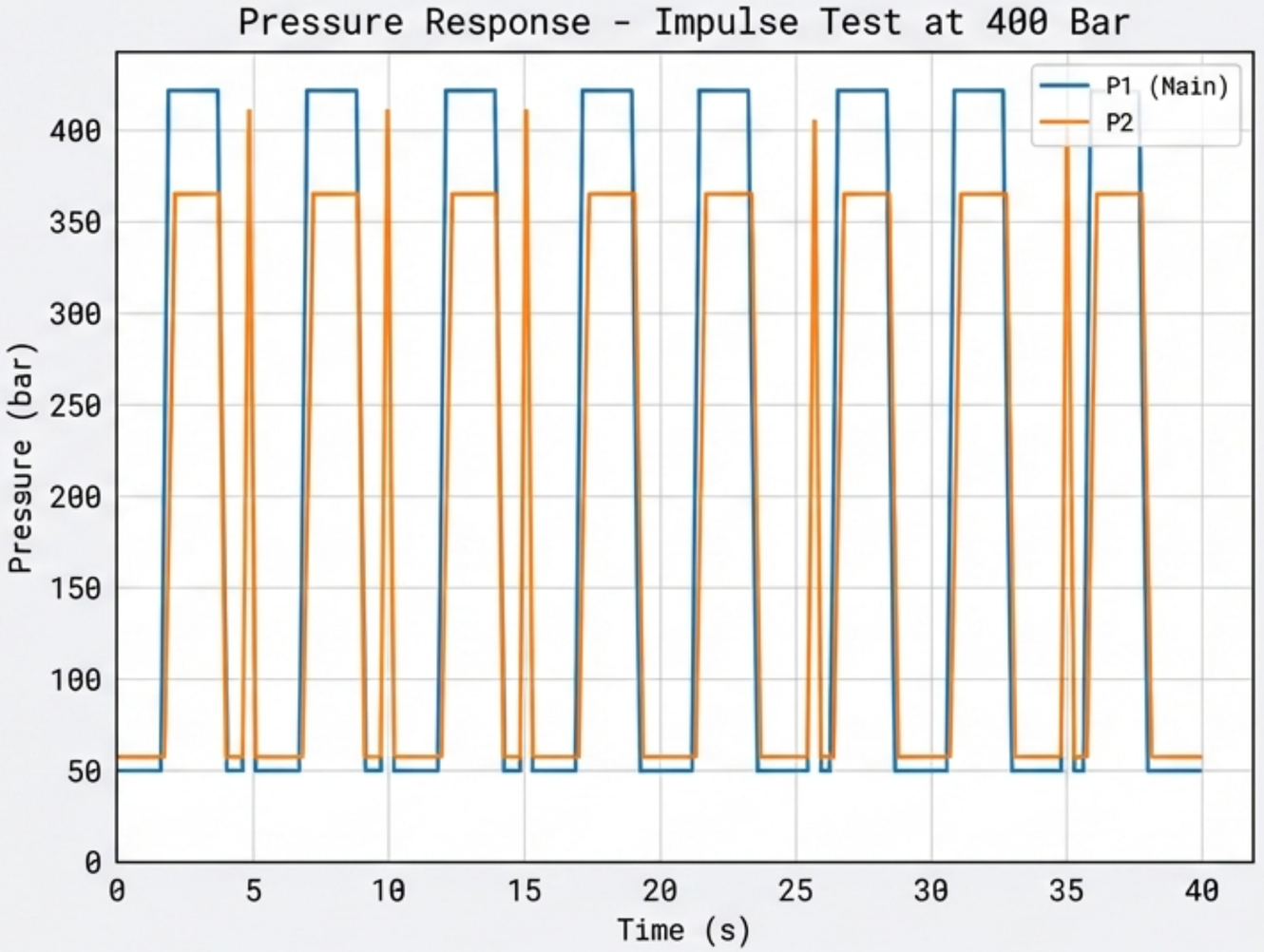
Test H (Flow Sharing): Validates behavior when multiple sections are used simultaneously. Ensures priority functions don’t “steal” flow unpredictably.

Test I (Flow Compensation): Verifies metered flow stability as inlet/load pressures change—replicating real-world actuator load changes mid-motion.



Validating Robustness & Endurance

- **Test F (Impulse/Cycling):** Runs programmed pressure impulses to simulate harsh real-world conditions.
- **The Goal:** Reveals weak points that steady-state tests miss, such as seal degradation, fatigue, or dynamic drift.
- **Quality Assurance:** Uses event-to-event repeatability as a primary quality indicator.

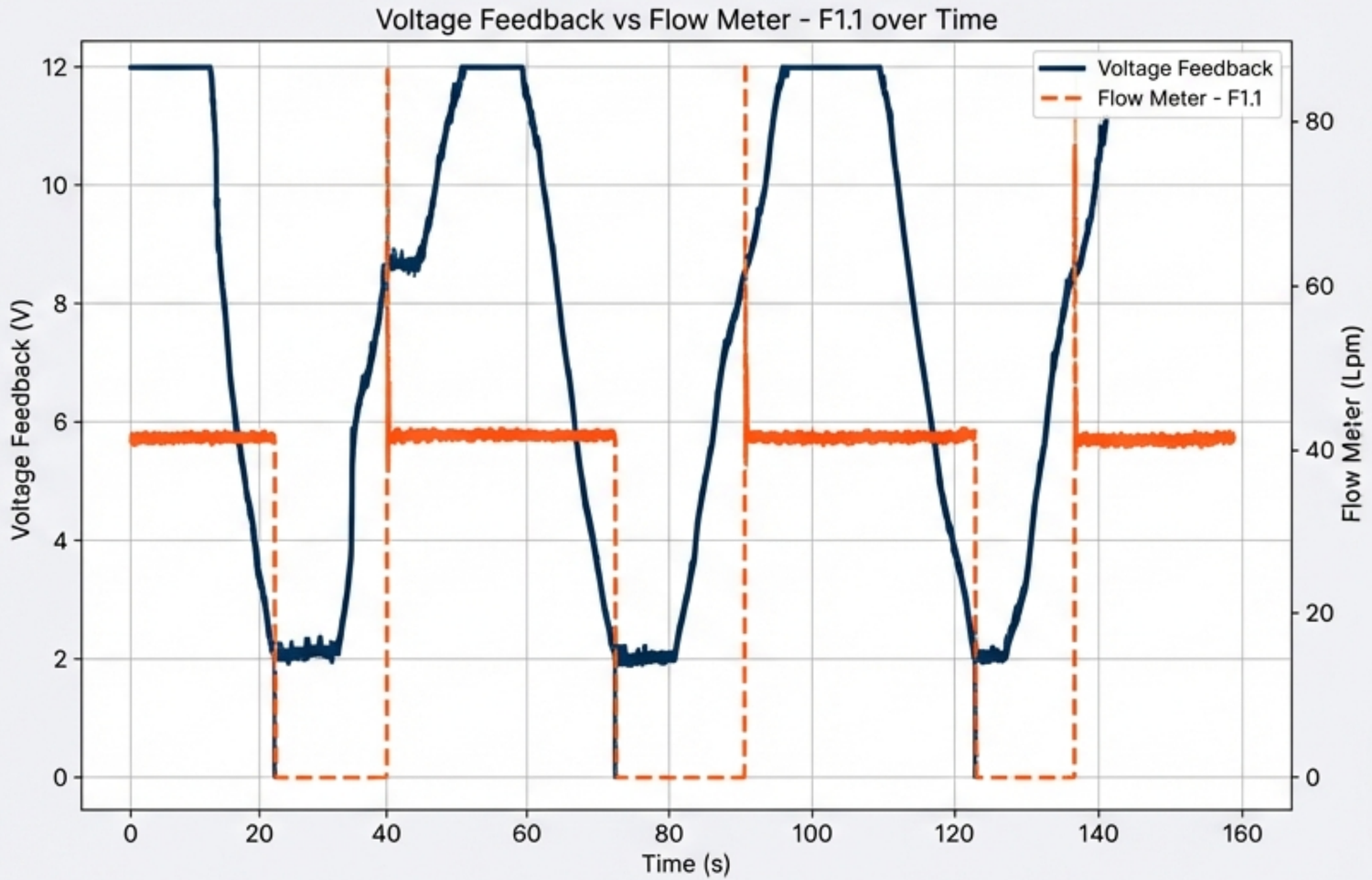


Critical Safety & Electrical Integrity.

Test D (Leakage): Measures internal/external leakage. Critical for load-holding safety and thermal efficiency.

Test G (Electrical Behavior): Verifies Pull-in Current and Drop-out Voltage.

Why It Matters: Isolates hydraulic faults (friction) from electrical faults (coil health), streamlining troubleshooting.

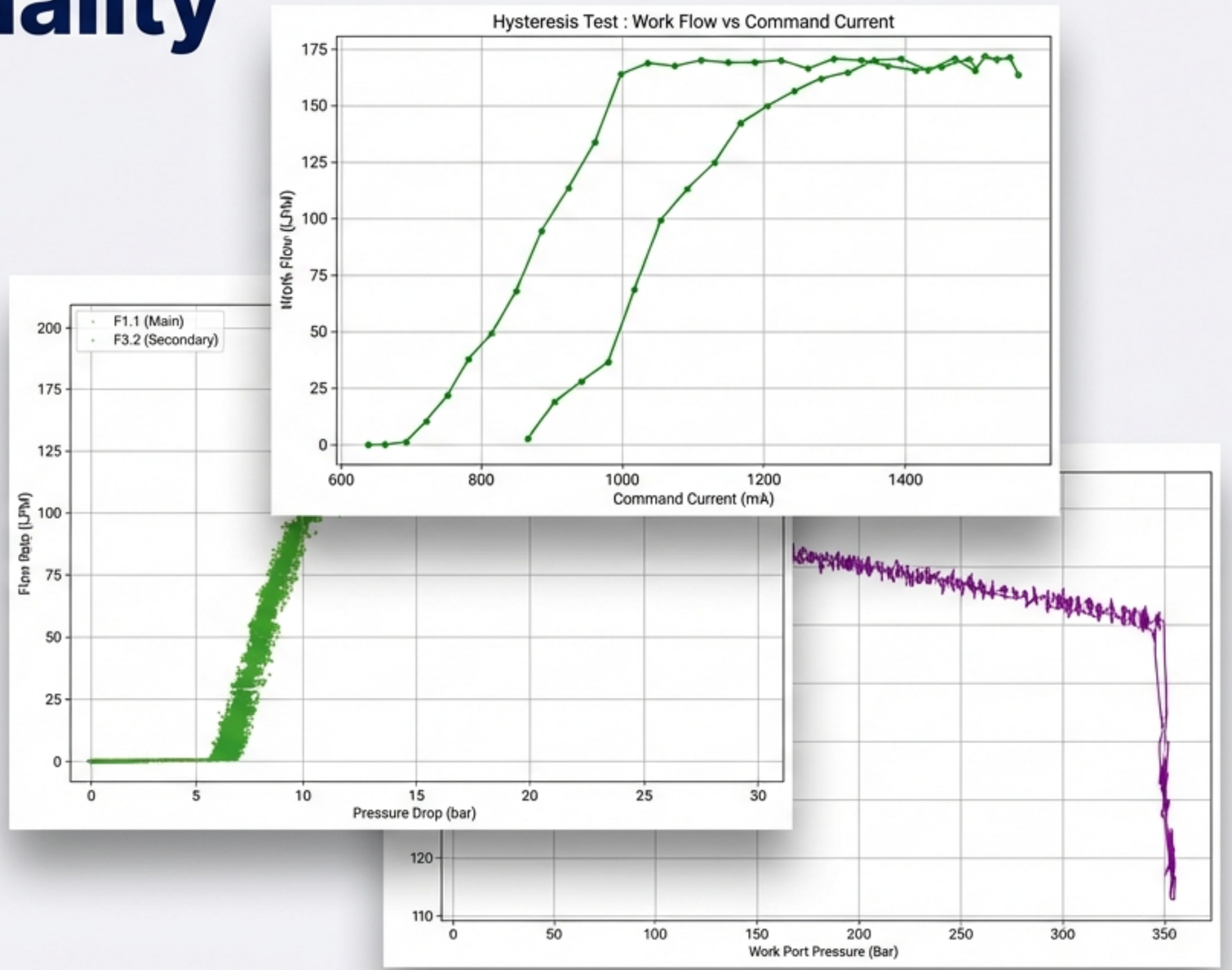


Data-Driven Quality Assurance.

Full Logging: Every test generates a traceable, archived dataset.

Benchmarking: Enable long-term comparison of manufacturing batches to detect production drift.

Proof: Provide definitive compliance records that can be reviewed months or years after delivery.



The Standard for Hydraulic Validation.

Scan for detailed specifications.

Intelligent: Automated sequencing for repeatable results.

Powerful: 350kW / 400 LPM / 420 Bar.

Universal: Adaptable fixtures for sectional, cartridge, & proportional valves.

NEOMETRIX