



Water Draw Calibration Systems

Pipe Prover Base-Volume Determination Systems

A water draw system determines the base volume of a pipe prover (small-volume or unidirectional prover). Water is drawn through the prover between detector switches and collected in certified volumetric reference vessels — the prover's true volume is computed from that draw.

Lonetti designs complete water draw systems: certified reference vessels, pump skid, valving, detectors, temperature compensation, and the documentation required by API MPMS Ch. 4.9 and OIML R117.

SPECIFICATIONS

Parameter	Value
Method	Volumetric (API MPMS 4.9.2) · Gravimetric (4.9.3)
Reference vessels	Lonetti 304 SS prover tanks, $\pm 0.025\%$ class
Vessel sizing	Typically 1,000 L – 5,000 L (matched to prover base volume)
Pump	Variable-speed, low-pulsation centrifugal or PD
Valving	Full-port ball valves with detector interlocks
Temperature	PT100 RTDs on prover and reference vessel, ITS-90 compensation
Detector interface	4–20 mA · volt-free contact · 24 VDC compatible
System uncertainty	$\pm 0.02\%$ – $\pm 0.05\%$ (depending on configuration)
Standards	API MPMS Ch. 4.9 · OIML R117
Mounting	Trailer · skid · permanent installation

KEY FEATURES

- **Both methods supported** — volumetric (API MPMS 4.9.2) and gravimetric (4.9.3) in one system



- **Engineered as a complete system** — reference vessels, pump, valving, temperature probes, and instrumentation matched to your prover's geometry
- **±0.02% uncertainty** — achievable with class-0.025 reference vessels and ITS-90 temperature compensation
- **Field-mobile configuration** — trailer or skid mounting to bring calibration to the prover
- **Full documentation kit** — procedure documents, calibration certificates, and API math worksheet template
- **Detector switch interface** — 4–20 mA / volt-free contact interfaces to existing pipe prover instrumentation

TYPICAL APPLICATIONS

- **Pipe prover commissioning** — initial base-volume determination on new unidirectional or bidirectional pipe provers
- **Periodic recalibration** — 5-year recalibrations required by API MPMS and national regulatory regimes
- **Custody transfer audit** — independent verification of base volumes for fiscal metering audit trails
- **Reference traceability** — establishing field-to-lab traceability for petroleum measurement systems

CERTIFICATIONS & STANDARDS

API MPMS Chapter 4.9 · OIML R117 · NIST Handbook 105-3 · INTI

Reference vessels are calibrated per OIML R117 and NIST Handbook 105-3. Complete system documentation supports API-compliant base volume calculations. Third-party inspection by Bureau Veritas or SGS available on request.

OPTIONS & CUSTOMIZATION

- Reference vessels: single or multiple; any capacity matched to prover base volume
- Mounting: permanent installation · skid-mounted · trailer-mounted
- Methods: volumetric · gravimetric · dual (both)
- Temperature compensation: PT100 RTDs standard; Pt1000 on request
- Data output: Modbus · OPC · CSV export
- Pressurized systems: available for high-pressure pipe provers

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