Hardware Updates

QUIKLOOK Users' Group 2024 Conference

Presented by:
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Jason Haglund – Engineering Mgr.- Design

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TLTS Diagnostic Systems

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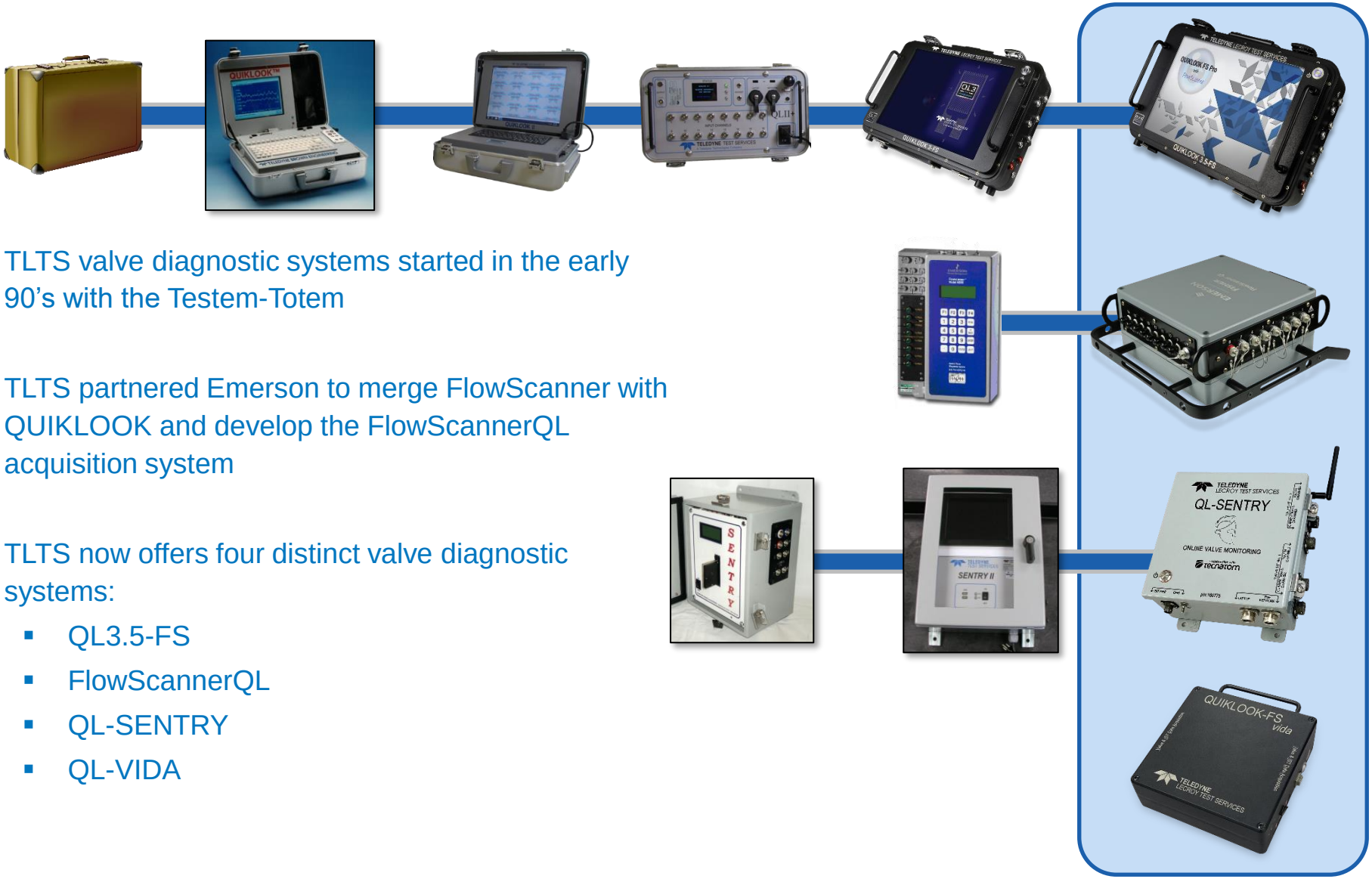
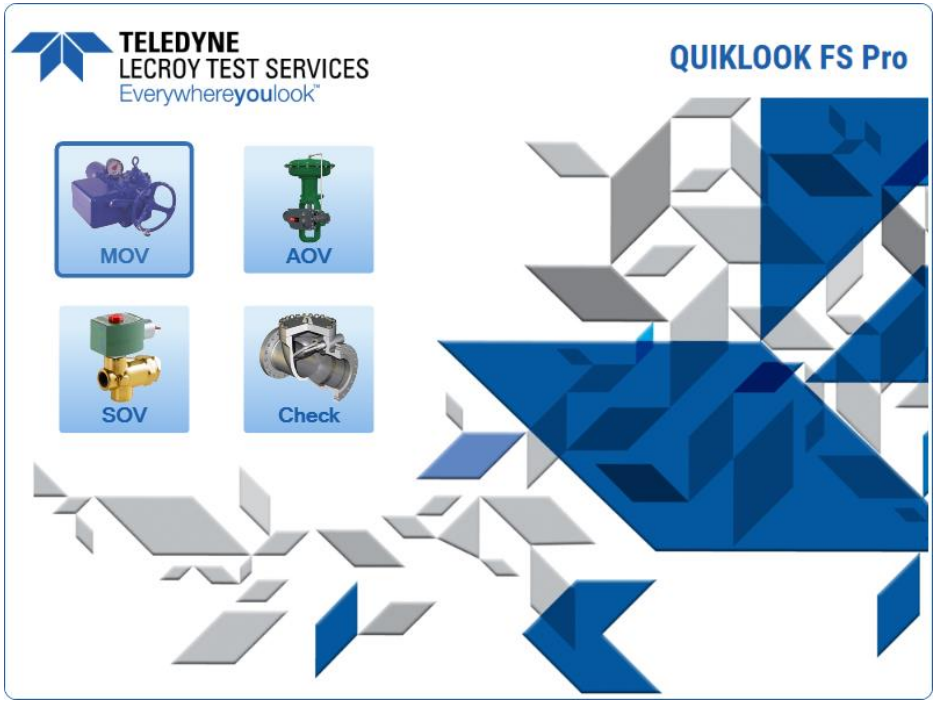
History of TLTS Valve Diagnostic Systems



- TLTS valve diagnostic systems started in the early 90's with the Testem-Totem
- TLTS partnered Emerson to merge FlowScanner with QUIKLOOK and develop the FlowScannerQL acquisition system
- TLTS now offers four distinct valve diagnostic systems:
  - QL3.5-FS
  - FlowScannerQL
  - QL-SENTRY
  - QL-VIDA

TLTS Valve Diagnostic Systems – Current Lineup

- QUIKLOOK-FS Pro provides advanced analysis and reporting on all TLTS valve diagnostic test data



QUIKLOOK 3.5-FS

- QL3.5-FS is the TLTS flagship valve diagnostic system
- Released in 2022, it is the successor to the QL3-FS
- QL3.5-FS tests all valves
  - MOV
  - AOV
  - Check
  - Solenoid
- Integrated System
  - Windows PC
  - Touch screen
  - Water resistant keyboard
  - Battery manager/charger (5hr battery life)

FlowScannerQL

- Successor to FlowScanner6000
- Developed jointly with Emerson
- Tailored to AOV testing
  - 8 integrated pressure sensors
  - Also supports MOV / CHK / SOV testing
- Controlled by laptop PC running QLFS Pro
- Uses the same plug & play sensor recognition as QL3.5-FS
- Rugged IP56 rated enclosure
- Up to 5 hour run time (li-ion battery)

QL-SENTRY Online MOV Monitoring System

- Provides unattended data acquisition on up to two valves (no host PC required)
- Automatically triggers & records 7 channels of data when valve strokes
  - Motor Current (trigger source)
  - Thrust & Torque
  - Lights & Switches
- Data is retrieved remotely through a network connection (Wifi or Ethernet)
- Can also run “offline” (no network connection)

New for 2025 - QLFS vida

- Compact, lower cost 8-channel data acquisition system
- 3 Valve-specific hardware/software options
  - MOV
  - AOV
  - Check / Solenoid
- Compatible with all QL3.5-FS and FSQL sensors and accessories
- Controlled by laptop PC running QLFS Pro (ethernet connection)
- Up to 5 hour run time (li-ion battery)

UT & Digital Radiography Systems

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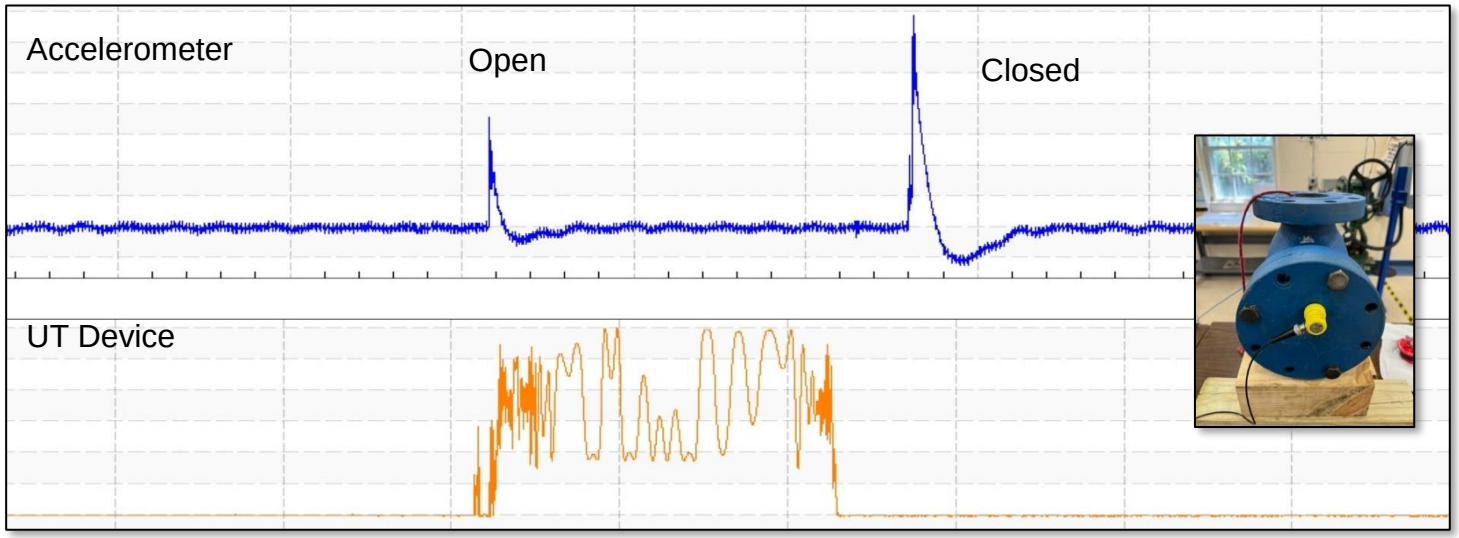
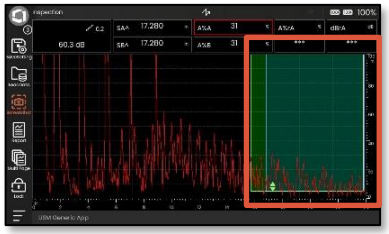
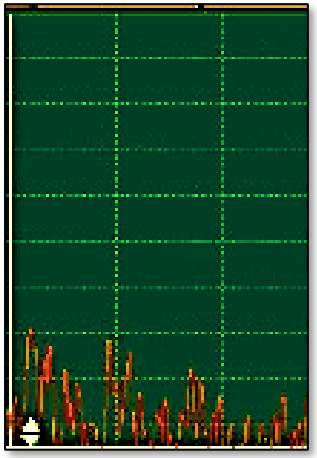
Ultrasonic Test System

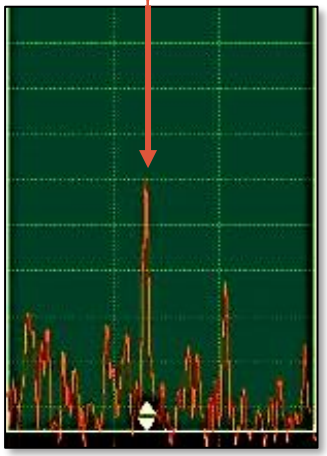
- Handheld UT device with analog output function
- Multiple probes, tips & fixtures available for better results on challenging surfaces & geometries
- UT device output + screen capture + accelerometer data provide detailed check valve reports in QUIKLOOK-FS Pro
- Hot-swappable batteries 5 hours on a single charge

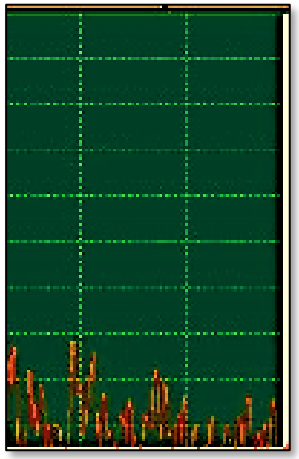
Ultrasonic Test System







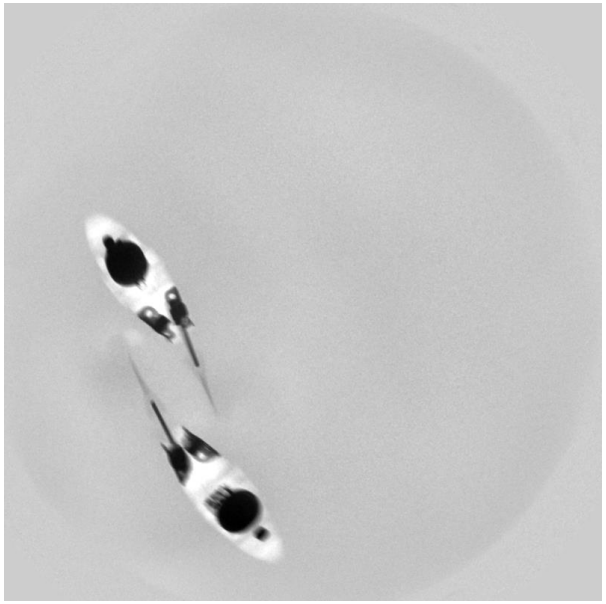




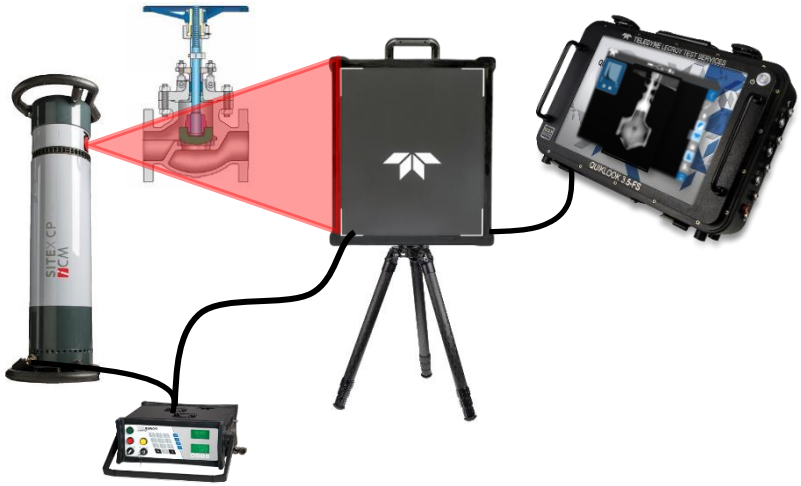
Valve Internal Imaging via X-Ray

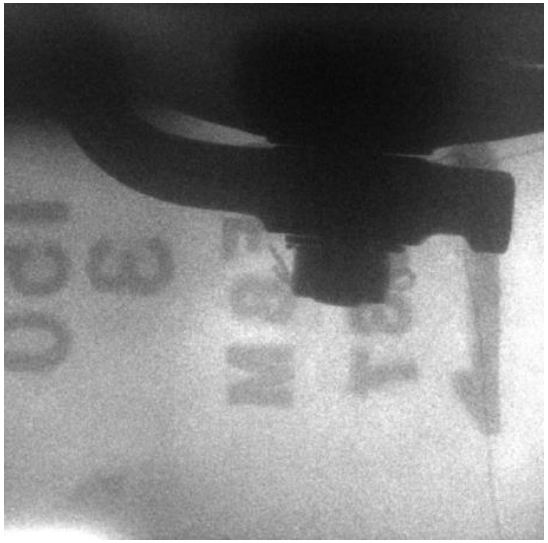
- X-Ray Tubehead
  - SITEX CP300D Portable X-Ray Tubehead (300 kV, 2.6” steel penetration)
    - <500 mrem/h at 1 m (full output)
  - SITEX CP200DS Portable X-Ray Tubehead (200 kV, 1.6” steel penetration)
    - <200 mrem/h at 1 m (full output)
  - PowerBox Control Unit
- Detector:
  - GO-SCAN 3025 Detector (11.8” x 9.8”)
  - GO-SCAN 1510 HR Detector (4.0” x 6.0”) – live x-ray imaging (video)
  - GO-SCAN 1510 Power Unit (10 to 225 kV)
- Sherlock Imaging and Control Software

Valve Internal Imaging via X-Ray

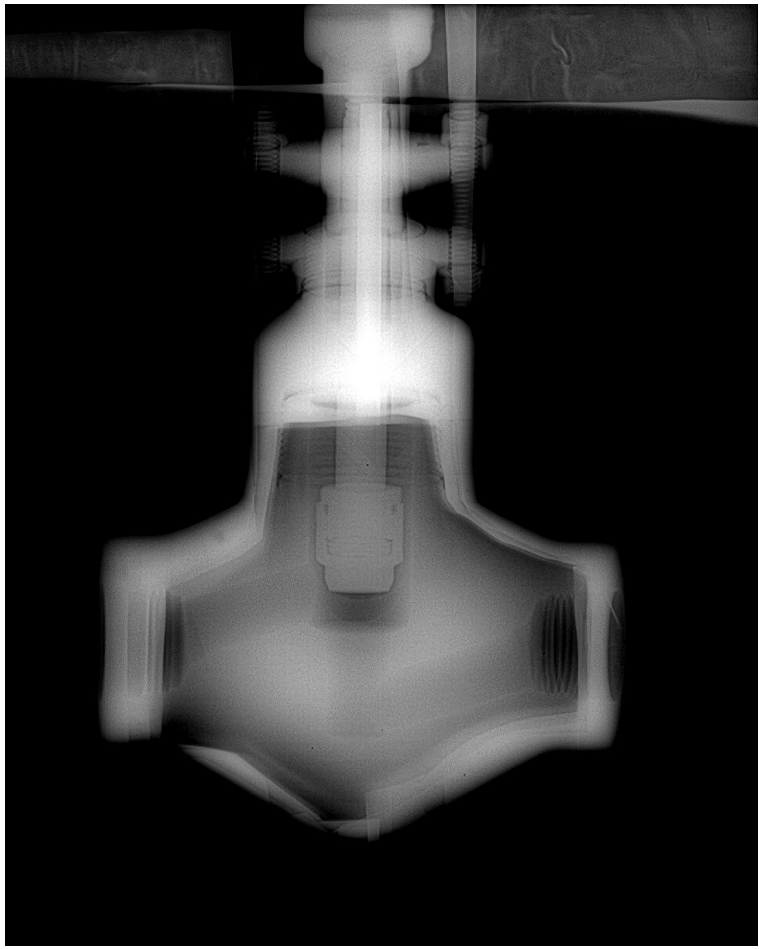


Valve Internal Imaging via X-Ray





3” 150# Swing Check Valve



1” 1500# Unbalanced Globe Valve

Sensors & Accessories

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Presented by:
Jason Haglund – Engineering Mgr.- Design

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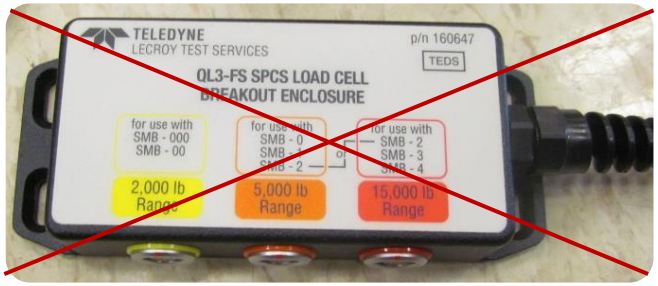
Valve Testing Sensor Updates

- Spring Pack Calibration Stand Load Cell
- SPe-HR and SPe Sensors
- SPMDe Magnetic Base
- K110 DC/AC Microprobe
- Limit Switch Adjustment Tool
- SMARTSTEM RTV

SPCS Load Cell

Spring Pack Calibration Stand (SPCS) is used to characterize the load versus displacement (spring rate) of spring packs from SMB 000 through SMB 4 Limitorque actuators.

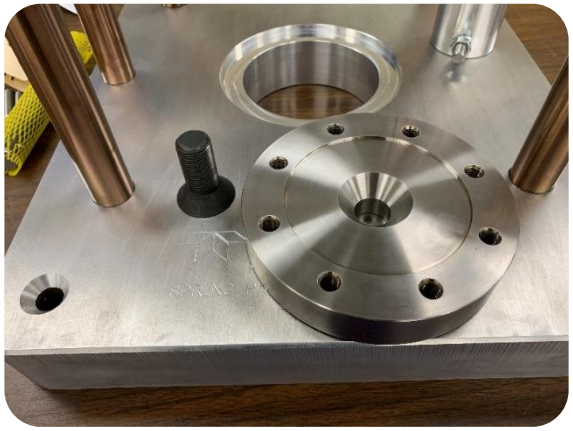
- Updated 15,000 lbs Load Cell
- Added Load Button & Revised CBL
- No Change in LC Accuracy:
  - +/- 0.5% RDG, 20-100% Capacity
  - +/- 0.25% FS, under 20% Capacity
- Breakout Enclosure Eliminated

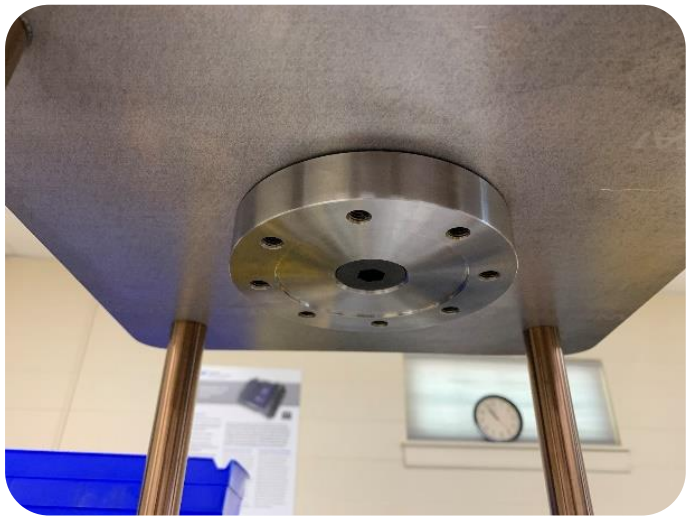


SPCS Load Cell Mounting

Adapter plate removal is done with a strap wrench and ½” Hex drive.

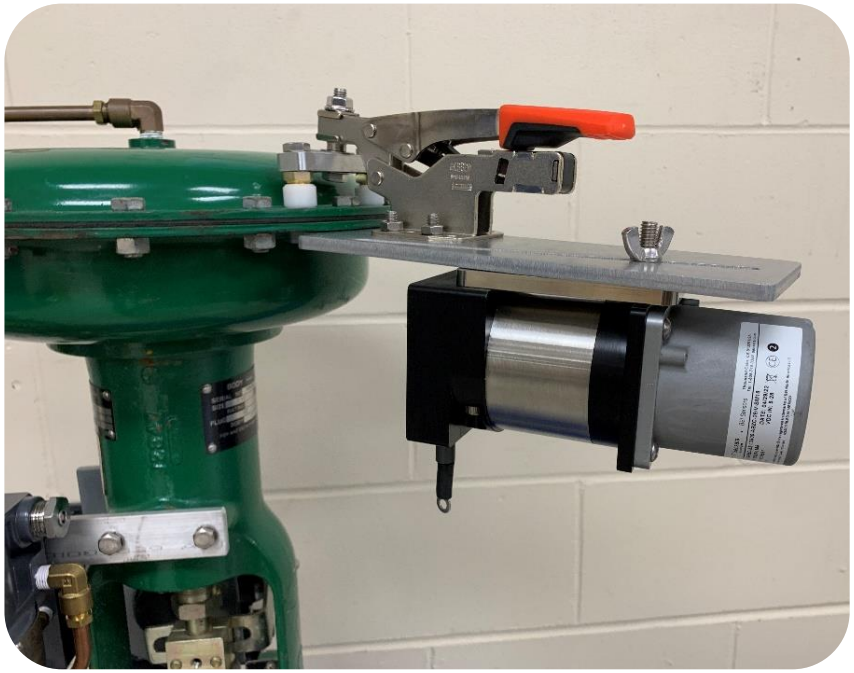
- Fully Extend Hydraulic Cylinder
- Close off Needle Valve
- Hold Cylinder with Strap Wrench
- Loosen ¾”-16 FHSC screw

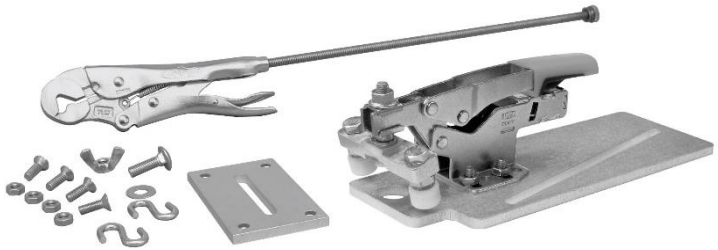




SPe-HR (High Resolution) Sensor

The Stem Position Encoder SPe-HR (high resolution) version provides a means to accurately measure valve stem position on high speed AOVs.



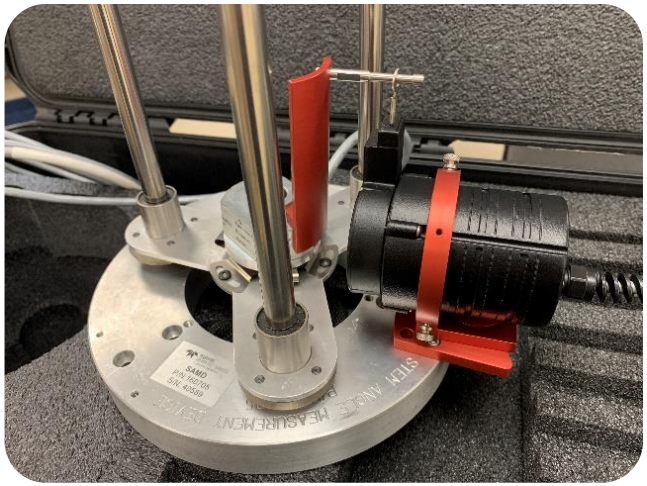


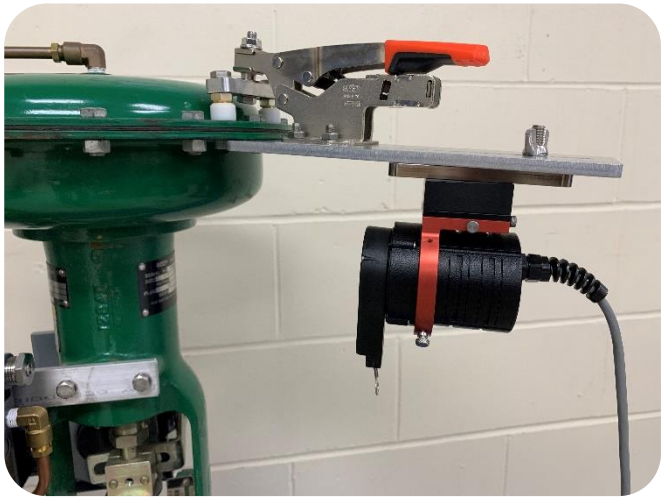
- 30 Inch SPe-HR (4000 Counts/Inch)
- Accuracy: +/- 0.04% FS
- IP-65 (NEMA 4)
- Mounting bracket for use with Emerson / Fisher AOV Travel Encoder Kits
- Replacement for TE CELESCO PT8600

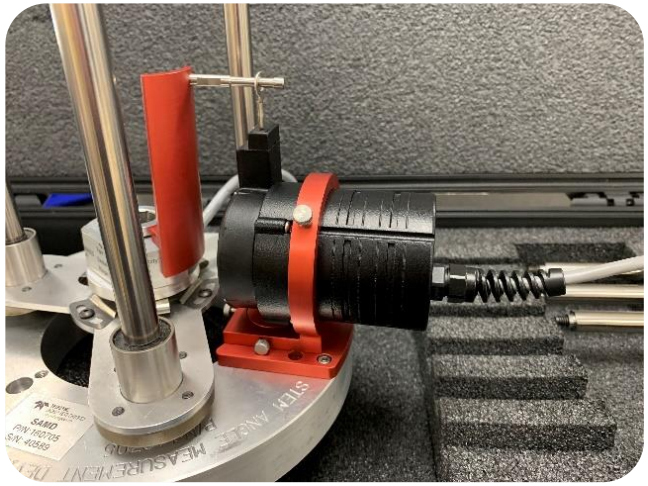
SPe Sensor

The Stem Position Encoder (SPe) provides the valve tester with a convenient means to accurately measure valve stem position. The housing and mounting options have been improved since the release in 2023.

- SPe Housing Redesign
- Increased Mounting Flexibility
- SAMD SPe Mounting Bracket
- CSS Bracket Compatibility





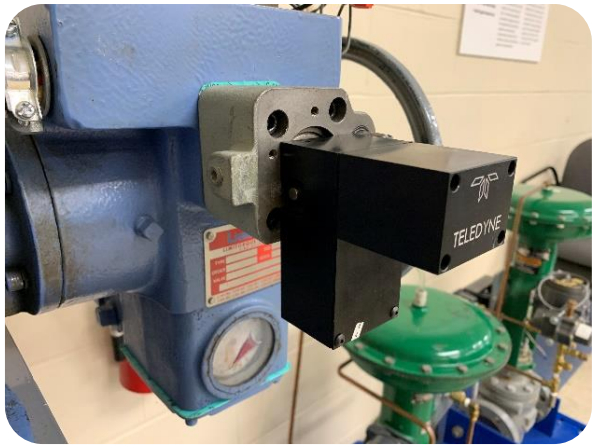


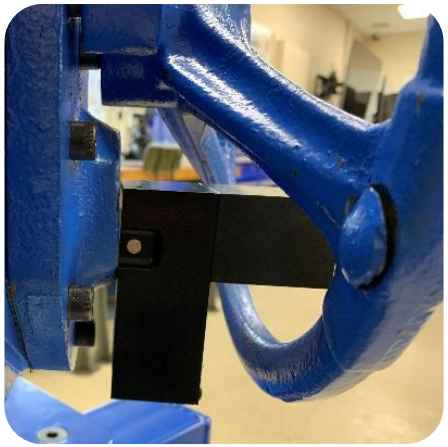
SPMDe Magnetic Base Redesign

Spring Pack Measurement Device (SPMDe) is used to measure spring pack displacement to provide an estimate of actuator torque. This sensor helps assure that the spring pack is operating within its calibrated range.

BEFORE

- Offset Plunger
- Unstable on Castings





AFTER

- Added Magnets to Center the Plunger
- Increased Adjustability

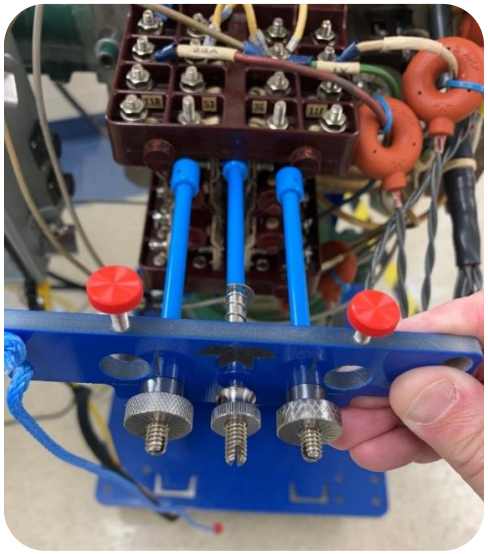
K110 DC/AC Microprobe Enhancement

30mA & 450mA DC/AC current probes experienced some durability issues at the cable exit locations.

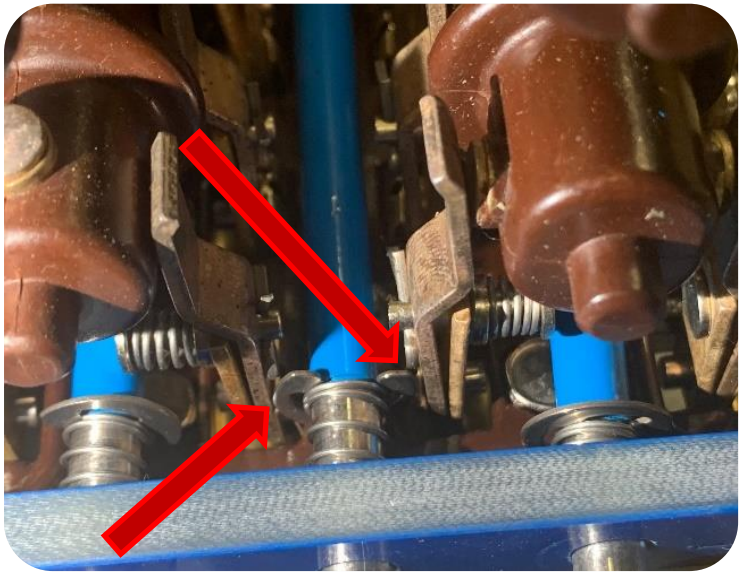
- BNC connection was locked down with an adapter sleeve to prevent disconnection
- Reinforced Clamp Cable Strain Relief

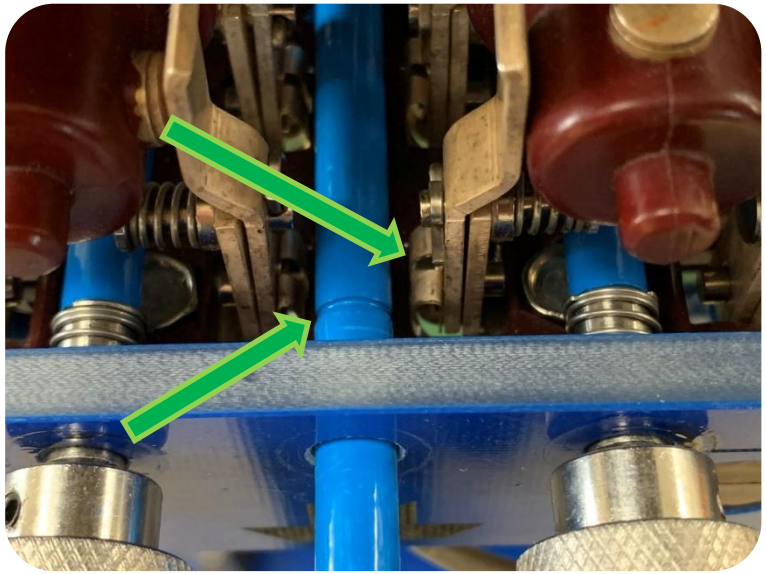
LSAT

Limit Switch Adjustment Tool (LSAT) used to aid in the safe adjustment of the Limit Switch Assembly.



- CSB 2022-02 LSAT Possible Shorting
  - Possible contact with the fingers on contacts 1c and 5c when de-clutching the limit switch. A short in this case would result in tripping the control fuse.
- Elimination of the center rod c-clip and spring
- Low profile spring retaining clips





SMARTSTEM RTV Revision

For decades, the SMARTSTEM sensors used DOWSIL 3145 RTV as a damage and environmental protection. Typically, the strain gage instrumentation is placed in a “neck down” section. This provides protection for the sensor and allows for a fully contained environmental coating.

In recent years, customers have been requesting that more nonstandard valve stem designs be converted into SMARTSTEM sensors. In these cases, the strain gages are either mounted directly onto the outside diameter or near some larger transition which cannot be fully encapsulated. Under these conditions, the DOWSIL 3145 RTV does not provide a strong enough bond to the stem substrate and leaves the instrumentation vulnerable to damage.

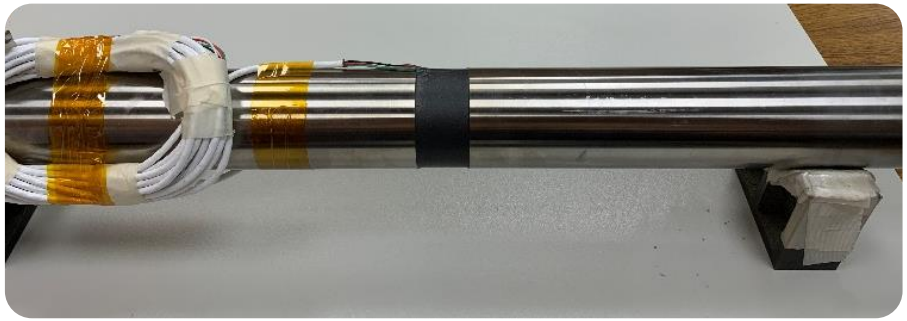
Standard SMARTSTEM “neck down” Section

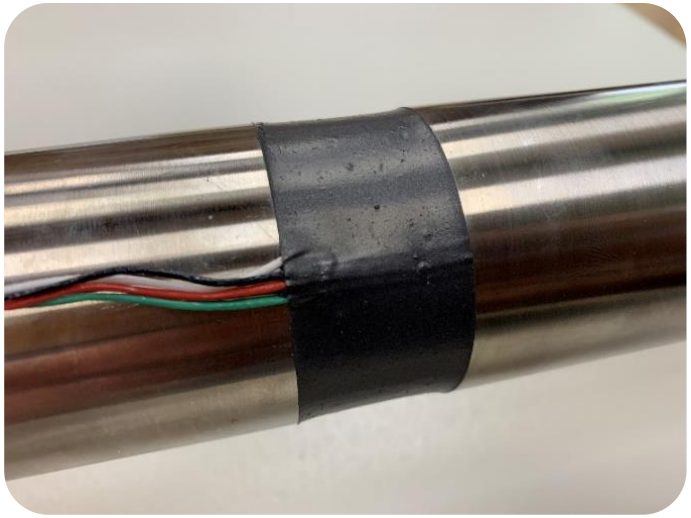
Nonstandard SMARTSTEM Sections

SMARTSTEM RTV Revision

TR-A707-A-4 SMARTSTEM RTV Test Report

- Permatex Ultra Black 24105 was evaluated in following areas:
  - Properties (Mechanical and Electrical)
  - Adhesion (Peel Strength)
  - High Temperature Degradation
  - Stem Thread Grease Influences
  - Analysis of Water Leachable Halogens





NOTE: The radiation effects on silicones used in nuclear power plants has been previously tested and were not reevaluated in this report. A sample of this analysis is found in the reference section of the report.

Any Questions?

Thank you
for your time.

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