FLOWSCANNER QL Valve Diagnostic System

Maximize efficiency, enhance safety and reduce operational and maintenance expenses with a single platform for testing critical valves.

FEATURES

- Plug and Play sensor recognition
- Wireless or wired remote operation via laptops, tablets and smartphones (depending on the Ethernet wire length)
- Long battery life
- MOV/AOV/Check and solenoid valve capable
- Automated remote excitation voltage sensing
- Sealed rugged waterproof case

TECHNICAL DATA

There are 2 types of FlowScanner QL available, each with its own set of specifications and features.

- **FS-QL 16 Input Channels:** 8 pressure sensors, 7 user-programmable with excitation voltage sensing, 1 digital
- **FS-QL 24 Input Channels:** 8 pressure sensors, 14 user-programmable with excitation voltage sensing, 2 digitals

GENERAL APPLICATION

The FlowScanner QL (FS-QL) Valve Diagnostic System is a versatile solution capable of testing all types of valves. It excels in acquiring precise and reliable data while minimizing setup time, ensuring efficient testing procedures. By maximizing the principles of ALARA (As Low As Reasonably Achievable), it prioritizes safety and radiation protection.

The accompanying QUIKLOOK FS Pro software offers a range of powerful diagnostic tools and time-saving features, simplifying the valve testing process. It supports industry standard sensors, providing flexibility and compatibility with existing setups.

Overall, the FS-QL represents a significant technological advancement in valve testing specifically designed for the nuclear power industry. Its capabilities enable clean and accurate data acquisition, streamlined testing procedures and improved efficiency, making it an invaluable tool for nuclear power plants.

FIGURE 1
MoV Valve Diagnostic

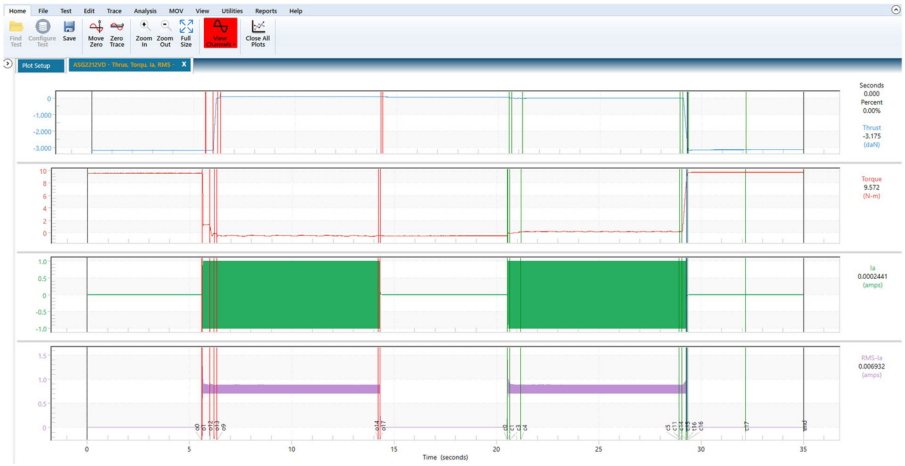

TABLE 1

Input Range	Differential and single-ended ± 10, 30, 100 and 300 mV; ± 1, 3 and 10 V; Strain Gage ± 1, 3 and 10 mV/V
Sensor Excitation	10 V on all input channels, 28 mA maximum current per channel
Sample Rate	10, 100, 1k, 2k, 5k, 10k, 20k, 50k s/s (Hardware capable of 200k s/s)
Analog Output Channels	1 selectable 0 to 10 V, ± 10 V, 4 to 20 mA, 10 to 55 mA
Input Power	110/220 VAC (50/60 Hz), 9 watts
Battery Operation	Lithium-Ion, 5+ hours continuous operation
Sensor Recognition	IEEE P1451.4/2.0 "TEDS" plug and play on all input channels
Ports	1 Ethernet
Software Language	English, French and Spanish
Maximum Operating Temperature	52º C
Application Software	QUIKLOOK FS Pro Software
Weight	6 kg

PRODUCT DESCRIPTION

Accurate Data, Clean Traces

FS-QL acquires data with 24-bit resolution and user selectable sample rates from 10 Hz to 50 kHz. This high-resolution acquisition combined with advanced signal processing produces extremely clean traces even in the highest EMI/RFI environments.

Flexible, Time-Saving Software

The intuitive QUIKLOOK FS Pro software is easy to set up and it shortens test times. Test and replay capabilities plus advanced triggering functions for unattended "Sentry Mode" data collection increases flexibility. Automated trace marking for AOVs and MOVs, as well as automated report generation simplify operation.

OPERATION

The FS-QL incorporates the use of open-source industry standard IEEE P1451.4/2.0 (TEDS) plug and play sensor recognition technology. This advanced feature significantly reduces test setup time and enhances the reliability of setup data, ensuring a more efficient and streamlined diagnostic process.

To perform a diagnostic testing, an external computer, tablet or Toughbook is required. These devices provide the necessary interface for data analysis and control of the FS-QL system. Additionally, the FS-QL system can be accessed remotely using a wireless connection, allowing for convenient operation and monitoring from a distance.

The FS-QL system offers flexibility in power options. It can be operated using online power or with the use of battery power. The system is equipped with Lithium-Ion battery packs, which provide a runtime of over 5 hours, ensuring extended usability and portability during testing procedures.

FIGURE 2

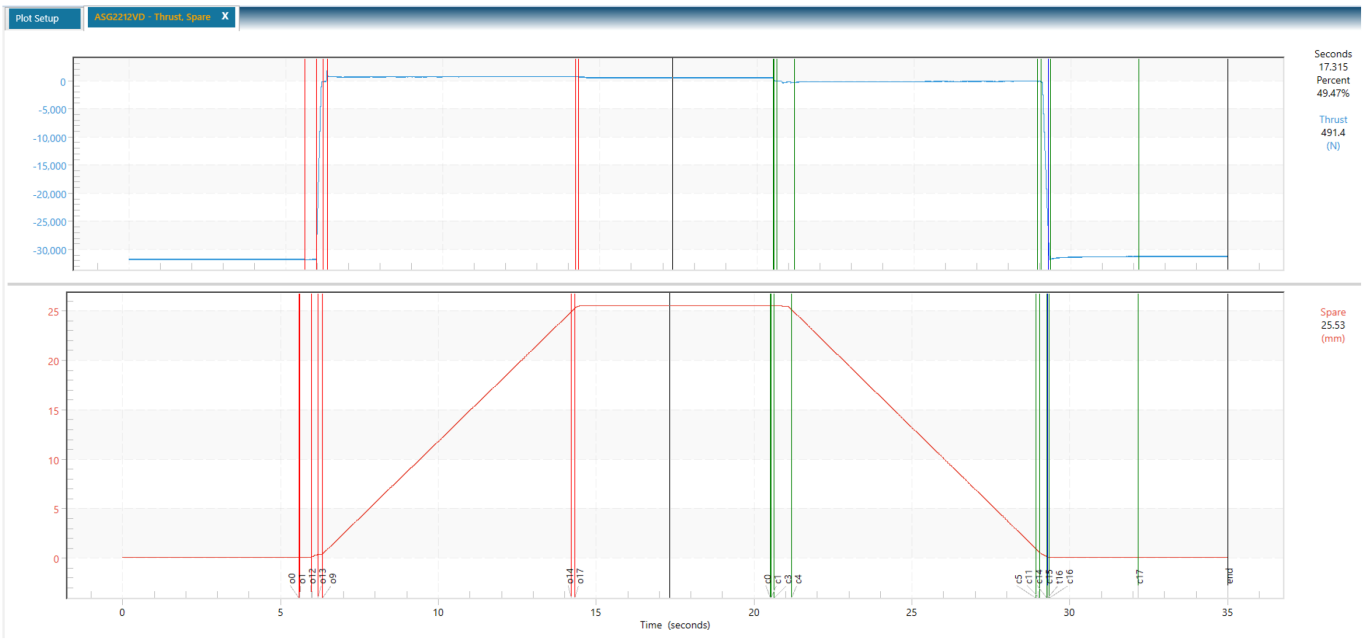

TABLE 2

Key MoV Features		
Analysis	**Configuration**	**Plots**
• Automarking of traces • Average running loads, lights and stroke times • Stem Factor and COF calculations • Analysis of motor power phasing with sensor self-correction feature • Calculated channels are recalculated when the dependent channel is revised • FFT may be performed on a trending plot • Unlimited number of math channels • Delta Y Function • Spike Removal	• Channel configuration is automatically loaded through sensor recognition technology • Up to 14 channels may be configured for acquisition as strain gage, single-ended or differential • Up to 2 channels may be configured for digital inputs • Channel configuration includes sensor details such as calibration information • RMS, filter and motor power channels may be predefined • C-Clamp sensitivity calculator, Pretension Screen, warning if pretension is lost • Warning for out-of-calibration sensors	• No limit to the number of traces that can be plotted in a pane; up to 6 panes may be displayed on the screen at once • Panes are independently resizable • Plot annotations available: data point values, text and footnotes • Markers shown on trending plots: none, all or currently-selected test only • X and Y plotting • Can display markers on X and Y plots • Plot preference controls: color/background, maximum number of points, default title, legend style and channel unit groups • Customized plots can be saved or exported in .pdf format • FFT Y-axis scaling may be logarithmic or linear; additional resolution choices available

TABLE 3

Key AoV Features		
Data Acquisition	AoV Control Signal Option	• 0 to 10 Volts • -10 to +10 Volts • 4 to 20 Milliamps • 10 to 55 Milliamps
	Tests Performed	• Dynamic Scan • Step Change • Static Point • Step Study • Stepped Ramp • Sensitivity Test • HDRL Test • Sinewave • Drop Tests • Custom Tests
QUIKLOOK FS Pro Software	Can manage up to 16 channels of input data, including:	• Pressures • Currents • Voltages • Strain Gauges (Torque and Thrust) • Displacements (Analog and Digital)
	Channel configuration	• Automatically loaded through sensor recognition
	Others features	• Acquisition screen supports manual control of the valve with readouts from all channels for valve setup • Configuration Database with actuator design parameters
	Test Data	• Unlimited comments may be stored with the test • Channel names and numbers are customizable
Plots Analysis	Predefined plots used for analysis	• Overall Calibration • Mechanical Properties • Transducer Calibration • Positioner Calibration • Static Point • Drop Test • Stroke Time • Step Study • Sensitivity
	Others features	• Time-based plots • X and Y plots • Customized plots can be saved or exported in .pdf format
	Calculated Results Include	• Seat Load • Service Seat Load • Unseating force • Valve Friction • Stroke Length • Spring Rate • Benchset • Supply pressure: Initial, Average, Minimum, Maximum, % Decrease • Pilot Stroke Length • Pilot Spring Rate • Pilot Seat Load • Transducer HD Error • Positioner HD Error • Overall HD Error • Stroke Times • Pressure Drop
	Others features	• Automarking of traces • Predefined Plots show applicable results on-screen • Unlimited number of math channels

FIGURE 3