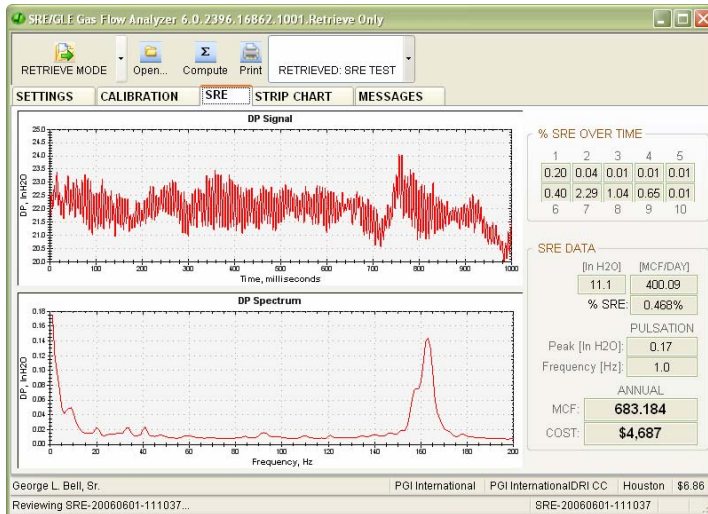




Does Pulsation Error Affect Your Natural Gas Measurement?

Lost and unaccounted for natural gas, particularly at pipeline custody transfer points, is becoming a focal point for both natural gas buyers and sellers. Even a small measurement error can result in large economic gains and losses at current natural gas prices. To



SRE/GLE6 software interface enables simple testing and reporting

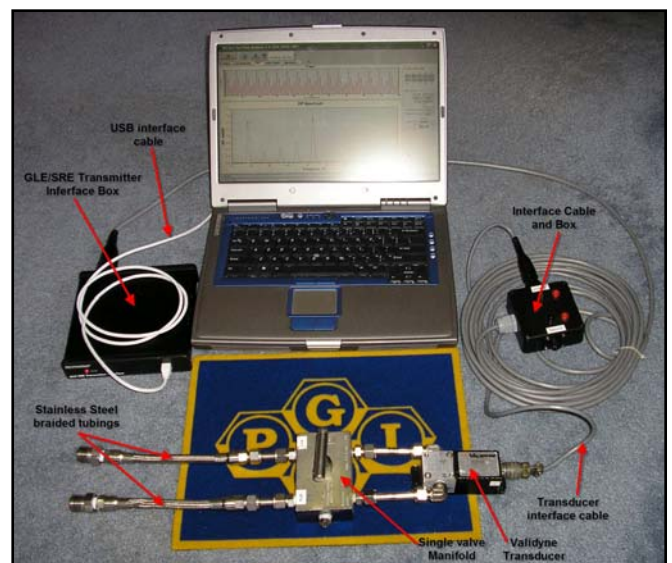
illustrate the magnitude of a potential error, consider a small 0.468% Square Root Error (SRE) on a meter that has a throughput of 400 MCFD of natural gas at a price of \$6.86/MMBTU. The annual SRE alone represents volume error of 683 MCFY, or \$ 4,687 of lost and unaccounted for natural gas. The same station flowing 1 MMCFD and SRE remains the same at 0.468% equals an annual error of 1.7 MMCFY at a cost of \$11,626.00. This error does not include any other measurement uncertainty within the actual orifice meter or other elements in your measurement system. One

relatively large source of measurement error is due to pulsation at the orifice meter induced by compressors, flow control valves, regulators and some piping configurations.

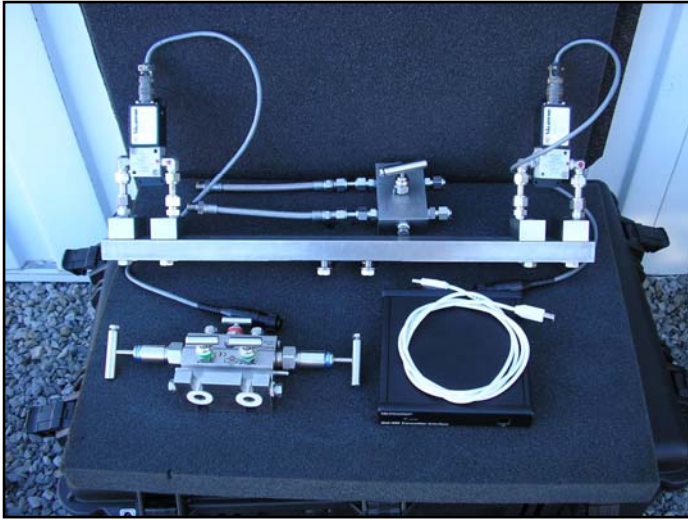
PGI International manufactures two products, the SRE6 and SRE/GLE6 Indicators that enables the field technician to detect, measure, and quantify the error induced by pulsation across the orifice plate and the corresponding gage line error.

PGI's Square Root Error Indicator 6 (SRE6) enables measurement technicians to connect directly to an orifice fitting and measure the frequency and magnitude of the pulsation across an orifice plate that adversely affects measurement. The equipment includes a high-speed digital transducer with an accuracy statement of +/- 0.1% full scale, and a sample rate that exceeds 2000 pulses/second.

The SRE6 and SRE/GLE6 software is a Windows XP based program that accurately calculates the Square Root Error from the transducer reading and displays the measurement error in both volume and dollar terms. The software includes a user-friendly interface that enables the technician to specify the meter, field, gas price, and other useful inputs to provide a complete, detailed report. The technician can easily perform and document multiple tests while adjusting field and flowing conditions to compare results in varying operational and flow conditions. This enables the technician to isolate, and possibly eliminate, operational effects that induce Square Root Error.



SRE6 Indicator (laptop not included)



SRE/GLE6 Indicator includes associated Direct-Mount™

is a safe, robust package consisting of PGI's patented stabilized connector system and associated instrumentation manifolds with 3/8" internal ports. The system enables unrestricted and quick response to any differential pressure changes.

When pulsation exists and causes square root error, the secondary element of the orifice meter could be subject to additional error called gage line error. The frequency and magnitude of the pulsation, pipeline pressure, gas composition, and flow rate are all components that affect gage line error. PGI International's **Gage Line Error Indicator 6 (GLE6)** can be used to measure this error. Technicians can now perform both square root and gage line error tests simultaneously when using the SRE/GLE6 Indicator. The GLE6 includes Direct-Mount™ and a second high speed transducer that will be installed at the end of the meter sense lines.

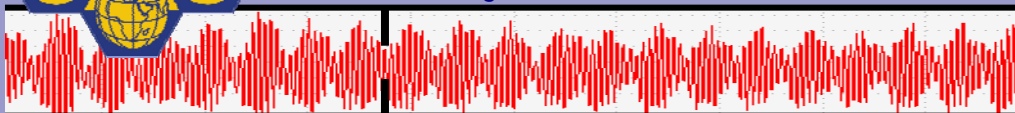
Gage line error can induce either positive or negative error on the measuring system that could be reduced or eliminated by installing PGI's Direct-Mount™ System (DMS) between the meter taps and the differential pressure transmitter. The DMS installation

Other PGI Measurement Accuracy Products include:

- Direct-Mount™ Systems
- Interceptor™ Gas Sampling System
- NOVA™ Gas & Liquid Sampling System
- ThermoSync™ Thermowells Temperature Measurement System
- Hot-Shot™ Heated Enclosure System
- Sample Cylinders & Accessories



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MEASUREMENT ACCURACY PRODUCTS