

sonoecho™



Artificial Lift

The Leutert sonoecho™ meters the fluid level in the casing of a pumping well. This embedded recorder makes it easy to find and calculate accurate fluid level data.

Description

When you focus on only one thing, you tend to be better, smarter. The Leutert sonoecho™ finds and calculate accurate fluid level data. That is all it does. No Dynos, no GPS tracking, no need to travel the world to attend a three to five days training course.

Main components of the Leutert sonoecho™ are: A field hand-held data acquisition unit with a 5" display, a gas gun, and a powerful diagnostic software. The hardware is intrinsically safe and ATEX certified. A must when working in hazardous areas like the well head.

The gas gun sends a gas pressure pulse down the annulus of the well. The pressure pulse echoes from each collar and the fluid as it travels down the well. These echoes are detected by an internal microphone within the gas gun and recorded by the sonoecho™ handheld unit. The sonoecho™ picks the fluid level automatically and shows it on the display.

Knowing the liquid level is one thing. Oil operators are usually more curious to know the gas free liquid above their pumps (dead oil). Reasons:

1. Only the liquid column significantly contributes to the hydrostatic backpressure held on the formation. The hydrostatic backpressure equals the Producing Bottom Hole Pressure. The lower the PBHP, the greater the pressure drawdown on the reservoir, and the greater the well's production.
2. The downhole pump is only intended to produce liquids. No gases. The dead liquid height above the pump represents how much pumpable liquid the pump can produce. Even if the fluid level shot indicates the top of the fluid level is 2,000 ft above the pump, the amount of pumpable liquid the pump can produce might only be 100 ft if the well produces a lot of gas. Knowing this fact makes a huge difference in interpreting how efficiently the well is drawing down the reservoir, and drawing conclusions on what changes (if any) should be made to optimize the well.

Therefore the sonoecho™ incorporates a pressure sensor that is used to record surface casing pressure and pressure buildup as soon as the valve to the casing flowline is closed. Based on the tubing-casing annulus volume being pressured up by the inflowing gas the sonoecho™ software automatically calculates the gas flow rate and the gas content within the liquid column in the well representative the dead liquid column. Another valuable use of the pressure sensor is to acquire the static bottom hole pressure.



Cased sonoecho™



Pressure sensor (optional)

Features

- Embedded system, no computer required in the field
- All necessary system components are effectively stored in single carrying case.
- Acquisition of the acoustic record can be completed in a minimum of time with a minimum of intervention from even an unskilled user.
- Programmable handheld unit prevents manipulation of raw survey data
- Automatic fluid level detection
- Raised protection cage on gas gun allows for ease of handling on hot well heads
- Quick connectors allow for speedy hook-up and ensure gas tight joints when filling with Nitrogen or CO₂
- Rotating quick connectors ensure accessible positioning of charge connector and visibility of gauge
- ATEX (intrinsically safe) & NACE approved for use in hazardous areas
- No tools required to disassemble Gas Gun for cleaning
- The handheld unit complies with the protection class IP 54 and is therefore dust and splash proved.
- Implosion or explosion mode possible

Technical Specifications

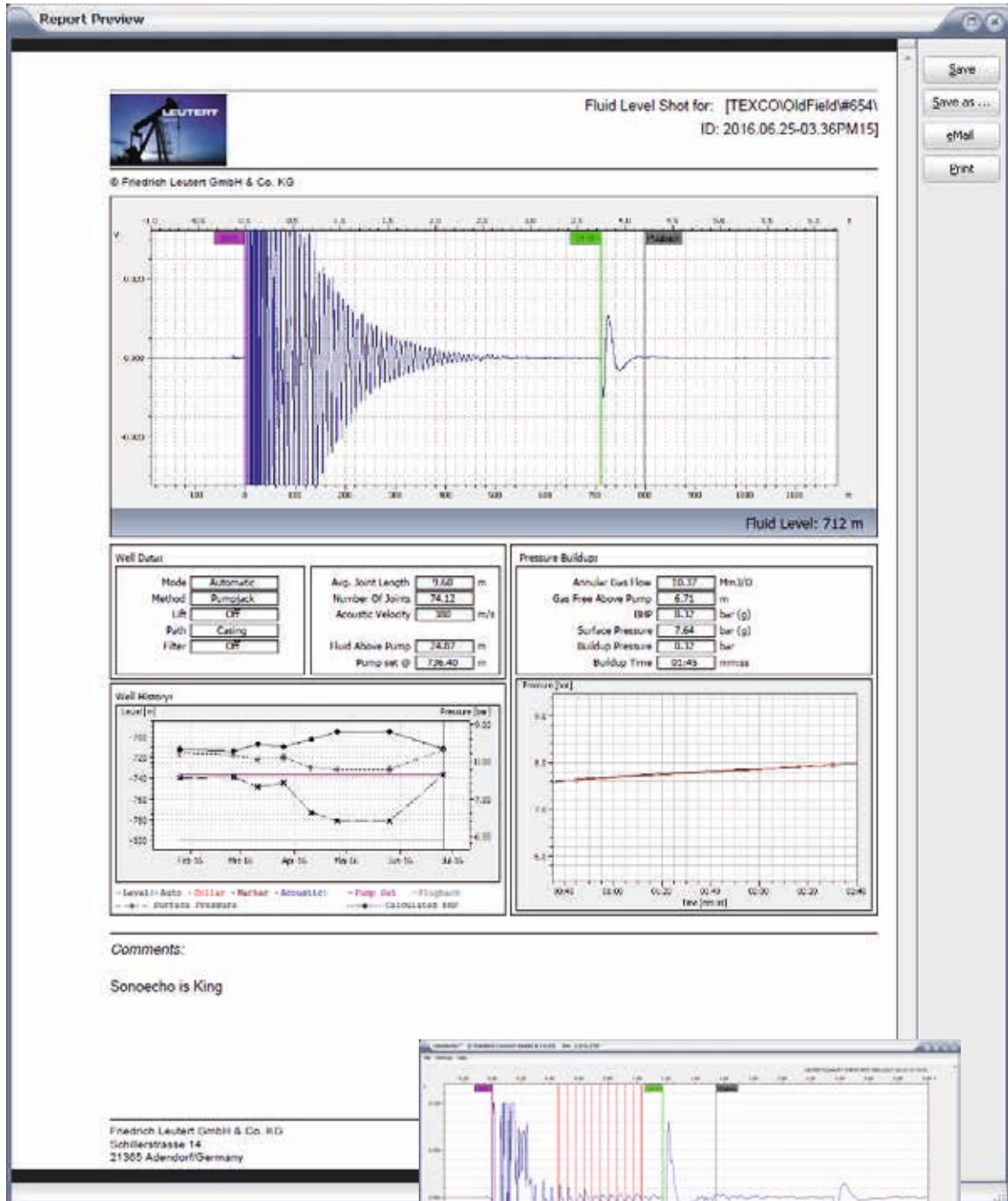
Power supply	: rechargeable battery, recharged over USB
Display	: 5" TFT-LC
Pressure rating	: 0 to 3,000 psi (0 to 200 bar) and 0 to 10,000 psi (0 to 690 bar)
Memory capacity	: 15,625 fluid levels may be stored in the handheld unit
Continuous operation	: 3.5 h
Gas gun connection	: 2" line pipe, ½" NPT
Operating temperature	: -4 to 140 °F (-20 to 60°C)
Dimensions (W x H x D)	: 9.13" x 4.76" x 1.29" (231.9 mm x 120.9 mm x 32.7 mm) handheld unit
Degree of protection	: IP 54 handheld unit
Weight	: 20.9 lbs (9.5 kg) case with accessories
Certification	: ATEX (intrinsically safe) & NACE approved

Software

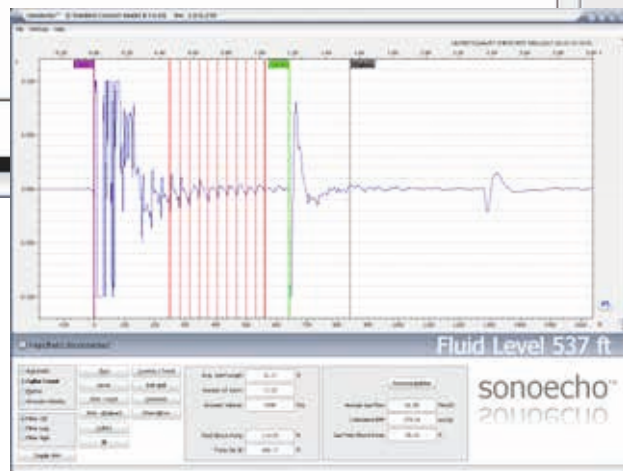
The sonoecho™ windows based diagnostic software allows the operator to fully analyses fluid level data. The software features are:

- Automatic level detection
- Manual collar count
- Marker based level finding
- Level detection based on acoustic velocity

Overlay of previous shots and display of trend curves help to understand the wells production life cycle. Editable reports may be printed, saved as data files or transmitted electronically as PDF files. All data files may also be stored as raw data to Excel.



Report



Fluid level diagram: count collars