

## ULLC2001 M ULTRASONIC LIQUID GAS LEVEL INDICATOR Marine Version

### For Fire Extinguishers : CO2, FM200, HALON and other liquid gas.

The Link Instruments ULLC2001 M Ultrasonic Level Comparator is one of the most advanced Liquid Levellers on the market. Both extremely easy to use and micro-pic controlled for greater precision in measurement. The transducer is placed against the cylinder body 120mm below the calculated liquid gas level, where the extinguisher fill should be certain (normally mathematically calculated). While retaining the transducer at this point the Comparator's ultrasonic level is set to around two or three divisions / bars-■■■, by use of the 0-10 Tune Control. This gives a reference level against which the signal at the gas level / air interface is compared.

By slowly sliding the transducer up the cylinder body, we will arrive at the gas level / air interface. At which point the signal will rise sharply. This is visible on the Comparator usually as all 16 divisions / bars-■■■■■■■■■■■■■■■■■■■■ and is due to the enhanced propagation of the Surface Acoustic Wave (SAW), across the liquid gas.

### Features :

- Large backlit 16 Bar LCD signal display
- Each unit personalised with your Company name on request
- Permanent ambient temperature display
- Complete with Ultrasonic Transducer
- Transducer extension pole for ships bulk system installations
- 0-10 Ultrasonic setting controller
- 100ml tub of ultrasonic gel
- Supplied in a carry case
- A UL listed product complying with NFPA requirements
- Warranty : 5 years instrument guarantee, 1 year for the transducer
- Easy to locate and estimate the liquid gas level within  $\pm$  2%
- NSN 6680-99-397-4405



### ULLC2001 M

### Ultrasonic Liquid Gas Level Indicator

### Marine Version

### Complete KIT

- . Ultrasonic Liquid Gas Level Indicator
- . Hand held Transducer,
- . Gel 100ml tub,
- . Transducer Extension Rod for Marine Applications
- . Batteries,
- . Carry Case,
- . Instruction Manual
- . Calibration certificate,
- . Certificate of Origin
- . Certificate of Conformity
- . UL Certificate
- . Warranty
- . Training Demo DVD



**IMPORTANT : No Radioactive elements - Non Hazardous**

## Ultrasonic Liquid Gas Level Indicator -> TECHNICAL INFORMATION

**The Theory of Operation** - Surface Acoustic Waves (SAW) were quantitatively described by Lord Rayleigh in 1885, when he showed theoretically that waves can be propagated over the plane boundary of an elastic half space and a vacuum or a sufficiently rarefied medium, (e.g. air), where the amplitude of the wave decay rapidly with depth. They are of course, mechanical, (acoustic) waves rather than electromagnetic. The destructive force of an earthquake propagates in this manner. The Comparator indicates the Surface Acoustic Wave via its 16 Bar Graph display, by sliding the transducer from below level up to the calculated level position.

**How the ULCC2001 M Comparator works** - The Transducer assembly transmits pulses of acoustic energy. The reverberation caused is dependent on the nature of the container (steel, glass, etc.) and the nature of the fluid, (liquid gas and air), contained within it.

Due to the way that the transducer couples with the surface of the container, most of the power tends to be transmitted at the centre of contact, allowing a fairly precise measure of the point at which the acoustic energy has been launched.

**Due to the variable nature of the reverberation, the "tune" control allows us to reduce or increase the amount of received energy in order to get it within the range of sensitivity of the instrument. The returned signal is then rectified and smoothed to give a measure of the signal level.**

**Using the Comparator to find Extinguisher Gas Levels:** The transducer is placed against the cylinder body, 120mm below the calculated liquid gas level, where the extinguisher fill should be certain (normally mathematically calculated). While retaining the transducer at this point the Comparators ultrasonic level is set to around two or three divisions / bars- , by use of the 0-10 Tune Control. This gives a reference level against which the signal at the gas level / air interface is compared.

By slowly sliding the transducer up the cylinder body, we will arrive at the gas level / air interface. At which point the signal will rise sharply, this is visible on the Comparator usually as all 16 divisions / bars- and is due to the enhanced propagation of the Surface Acoustic Wave (SAW), across the liquid gas.

The unit also incorporates an ambient temperature sensor; the temperature is indicated on the units display, this is useful for making temperature adjustments to the mathematically calculated level.

**Optional Comparator ancillary items for the Robo Transducer:** A mechanical Transducer system is also available if more precision is required. The Robo Transducer eliminates any possible human influence on the ultrasonic signals transmitted and received by the Comparator. Definition between signals and the interpretation of the SAW effect signal is made extremely clear. It is then simple to pin point the liquid level repeatedly.

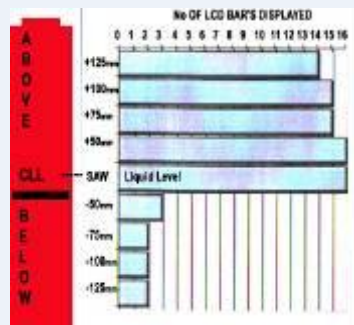
To use the Robo Transducer simply mark the cylinder with the calculate level, and apply a film of Ultrasonic Gel over the level mark. Fit the Robo Transducer lining it up with the Calculated Liquid Level and its transducer at the bottom which would be 4"/100mm below level. Tune the Comparator to suit the cylinder and then simply slide the Transducer up the rails until the SAW effect signal is clearly indicated. *(A full data sheet is available on request).*



Indicator in use



Transducer Extension Rod in use



Typical result & LCD indication



Optional Robo Transducer in use