



# Ultra high temperature piezo-electric microphone

## M/02/TI-1

1.5nC/bar nom. • 500°C max. temp.  
Case isolated

500°C operating, piezo-electric compression mode dynamic pressure transducer ; application areas include turbulence and cavitation measurement of high temperature fluid media without recourse to the added complexity of thermal barriers with the possible resultant loss of data. This type of acoustic sensor is suitable for operation where static background pressure up to 500bar may exist.

The M/02/TI-1 incorporates a design methodologies specific to long term stable and reliable high temperature operation, whilst retaining the basic properties and format of the M/01, M/02 devices. The signal is electrically isolated, reducing ground loop interference by around 60dB compared to the single pole configuration.

Some acoustic sensitivity loss, resultant upon the somewhat lower d33 of high Curie temperature piezo-ceramics, combined with additional background electrical noise at elevated temperatures, results in a wideband noise floor of around 10<sup>-4</sup>bar @ 500°C.

Vibration compensation is not included, 1g axial vibration is equivalent to approx. 5x10<sup>-3</sup> bar.

### ENVIRONMENTAL

Signal outlet is via integral hardline cable. There is a welded cable seal with additional crimped cable support. Leak testing (up to 150bar) is available where reliability must be assured. Leak testing is carried out in pressurised water at ambient temperature, and includes that portion of the cable exposed to service pressure.

### CALIBRATION

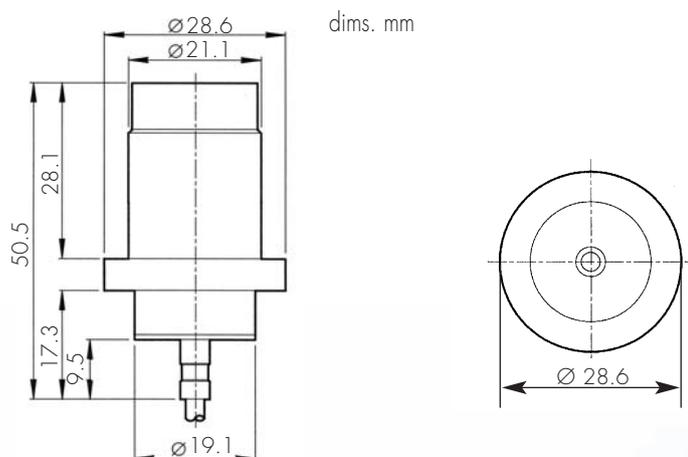
Dynamic pressure calibration is carried out at ambient pressure and temperature. Elevated temperature (to 500°C) pressure calibration, and pressure sensitivity linearity measurement up to 300bar @ ambient temperature are available.

### INSTRUMENTATION

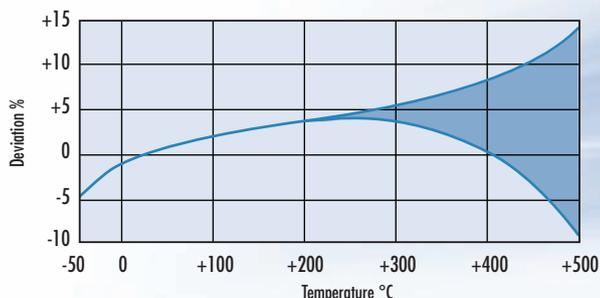
Elevated temperature operation will almost certainly be accompanied by high level pyro-electric noise generation. Minimum frequency should be restricted to that dictated by the application.

HL30 (two core) cable termination will necessitate use of a differential charge amplifier.

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### TEMPERATURE RESPONSE



TYPE	D33 COMPRESSION
Pressure sensitivity nC/bar @ 20°C	1.5
Vibration sens. pC/g @ 20°C	10
Capacitance pF	800 (ex cable)
Resonant frequency kHz	60
Temperature Range °C	-50/+500
Press./Vib. sensibility deviation re 20°C	-5% @ -50°C ±15% @ +500°C
Case seal	welded, hermetic
Case material	Inconel 600
Signal Outlet	Integral cable HL30, HL25