

ULTRASONIC MEASUREMENT

As design engineers push the boundaries to provide greater strength and efficiency in bolted joints, the use of torque, torque and angle, or even tensioning as the method of tension control may not be adequate, leading to costly failures. In those applications, ultrasonic bolt elongation/load measurement is able to provide accuracy equal to strain gauging without the need to strain gauge a bolt. In addition, the use of ultrasonic bolt measurement allows the user to return at any time and re-verify the level of tension in each fastener over its service life. The USM-3 has been both laboratory and field-proven to be the most accurate, reliable and cost effective solution to bolting failures which could place workers at risk, lead to the loss of production and/or cause damage to capital equipment.

USM

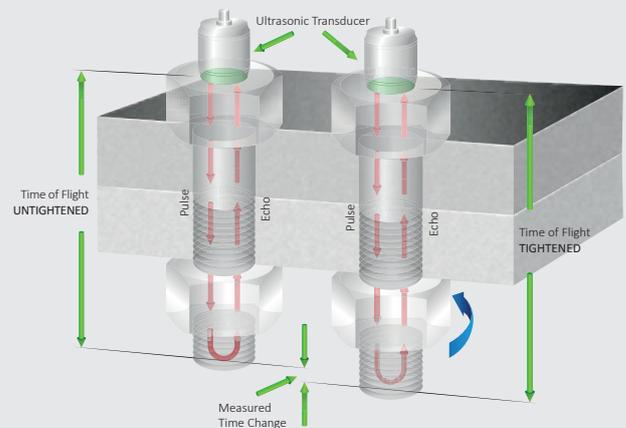


ABOUT USM-3

The basic principle behind this method of tension control is similar to sonar. The ultrasonic measurement of bolt tension is achieved by introducing a sonic pulse at one end of the fastener and accurately measuring the time of flight (TOF) required for the echo to return from the opposite end. Using material constants, the USM-3 converts this TOF into an "acoustic length" of the fastener, providing a baseline from which future measurements will be made. When the fastener is tightened: the TOF increases and the USM-3 will again utilise material constants to eliminate the effects of stress and temperature variations on sound velocity, providing an accurate elongation or load measurement.

The USM-3 uses state of the art hardware and digital signal processing to achieve these measurements with maximum automation, minimizing the need for operator interpretation. Once measurements have been recorded to the USM-3 internal memory, the included SonicBolt software will transfer the data to a computer for backup of files, creation of project reports, and conversion of data to Excel format for further analysis. In addition, the analogue signal output can be used to automatically shut-off powered torque and tensioning tools based on elongation or load, in even the most demanding applications.

For more information visit www.norbar.com





Ultrasonic measurement provides a very precise method of determining the elongation of a fastener due to tightening. This elongation is proportional to the load force generated by the fastener.



9 USM-3 ULTRASONIC STRESS METER

40334 USM-3 instrument with AC adaptor, nylon case, storage case, transducer cable, RS232 cable, couplant and manual

Magnetic Transducers - This standard style is used with ferrous materials, and consists of a rare earth magnet surrounding the piezo electric transducer.

9 TRANSDUCERS

- 56016 3/16" 5 MHz Magnetic Transducer
- 56017 3/16" 7.5 MHz Magnetic Transducer
- 56018 3/16" 10 MHz Magnetic Transducer
- 56009 1/4" 5 MHz Magnetic Transducer
- 56019 1/4" 10 MHz Magnetic Transducer
- 56011 1/2" 2.25 MHz Magnetic Transducer
- 56010 1/2" 5 MHz Magnetic Transducer
- 56020 3/4" 1 MHz Magnetic Transducer
- 56013 3/4" 2.25 MHz Magnetic Transducer
- 56012 3/4" 5 MHz Magnetic Transducer
- 56021 Glue on, 3mm square, 7.5 MHz, pack of 100

Operating temperature limit for transducers is 55°C. Contact Norbar for details of high temperature transducers with a temperature limit of 175°C.

9 TRANSDUCER LEADS

- 60235 Transducer Lead 10' (approx 3m)
- 60236 Transducer Lead 20' (approx 6m)
- 56023 Probe for glue on Ultrasonic TD's

9 SPARES & ACCESSORIES

- 61112 Ultrasonic Couplant Bottle 4oz (approx 0.12 litres)
- 61116 Serial Lead 6' DB9 M to DB9 F
- 61117 Length Bar Set 3" & 6" with certificate
- 60271 Digital Thermometer (Accuracy ±0.5°C / ±1°F)

