USM ANCILLARIES

Part Code	Description
60235	10' (approx 3m) Transducer Cable, Lemo 00 to Microdot RG174
60235.RA	10' (approx 3m) Transducer Cable, Lemo 00 to Microdot RG174 with right angle connector
60236	20' (approx 6m) Transducer Cable, Lemo 00 to Microdot RG174
60236.RA	20' (approx 6m) Transducer Cable, Lemo 00 to Microdot RG174 with right angle connector
60235.HITEMP	10' (approx 3m) Transducer Cable High Temperature 200°C Teflon
60235.ARM	10' (approx 3m) Transducer Cable High Temperature 200°C Teflon Armour Coated
60270	10' (approx 3m) Transducer Cable Lemo 00 to probe for use with glue on transducers
61116	6' RS232 (Serial Lead) Transfer Cable DB9 Male/Female
39208	UK Mains Lead (3 pin plug)
39453	Mains transformer and Flying Lead
61112	Bottle of Ultrasonic couplant 4 oz (approx 0.12 l)
39454	Pelican Case for USM-3 including Foam Insert
39455	Soft Carrying Case for USM-3
60271	Digital Temperature Probe (Accuracy ±0.5%°C/±1°F)
61117	Length Bar Set 3" & 6" (76mm & 152mm) with certificate from accredited body
-	USM-3 Manual - available from Website

GLOBAL SERVICE

Norbar is the only torque equipment manufacturer capable of offering tool and instrument recalibration services to the original factory standard on four continents. Accredited laboratories in Australia, USA, Singapore, China and India operate the same equipment and procedures as the UKAS accredited laboratory within our headquarters in the UK.

NORBAR TORQUE TOOLS LTD
Wildmere Road, Banbury, Oxfordshire, OX16 3JU
UNITED KINGDOM
Tel + 44 (0)1295 753600
Email sales@norbar.com

NORBAR TORQUE TOOLS
45-47 Raglan Avenue, Edwardstown, SA 5039
AUSTRALIA
Tel + 61 (0)8 8292 9777
Email enquiry@norbar.com.au

NORBAR TORQUE TOOLS INC
36400 Biltmore Place, Willoughby, Ohio 44094
USA
Tel + 1 866 667 2272
Email inquiry@norbar.us

NORBAR TORQUE TOOLS PTE LTD
194 Pandan Loop, #07-20 Pantech Business Hub
SINGAPORE 128383
Tel + 65 6841 1371
Email enquires@norbar.sg

NORBAR TORQUE TOOLS (SHANGHAI) LTD
7 / F, Building 91, No. 1122, Qinzhou North Road,
Xuhui District, Shanghai
CHINA 201103
Tel + 86 21 6145 0368
Email sales@norbar.com.cn

NORBAR TORQUE TOOLS INDIA PVT. LTD
Plot No A – 168 Khairne Industrial Area
Thane Belapur Road, Mahape, Navi Mumbai – 400 709
INDIA
Tel + 91 22 2778 8480
Email enquiry@norbar.in

www.norbar.com

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NORBAR PRODUCT PORTFOLIO

- Torque Screwdrivers
- Torque Wrenches
- Electronic Torque Wrenches
- Hand Torque Multipliers
- Pneumatic Torque Multipliers
- Electronic Torque Tools
- Torque Measurement
- Torque Transducers
- Ultrasonic Bolt Measurement
- Calibration Services

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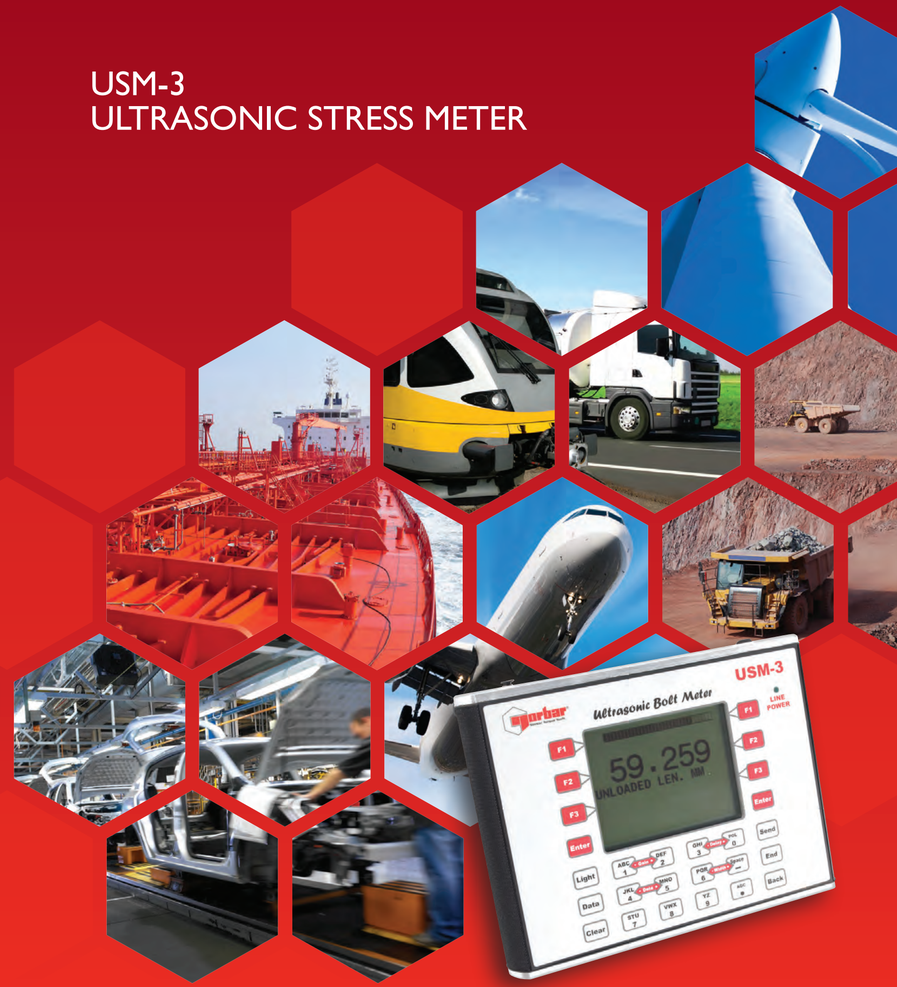
FLOW VALVE

Norbar® Norbar Torque Tools

USM-3
ULTRASONIC STRESS METER



ULTRASONIC STRESS METER

As design engineers push the envelope 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.

ABOUT USM-3

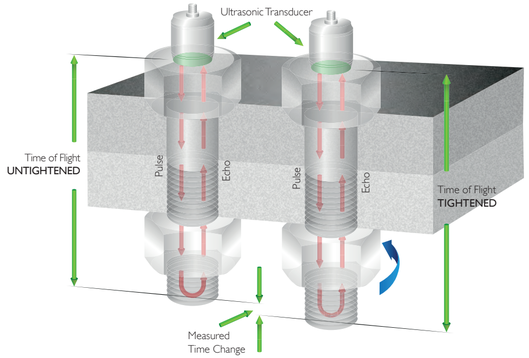
The basic principle behind this method of tension control is similar to sonar. The ultrasonic measurement of bolt tension is achieved by introducing a sonic pulse at one end of the fastener and accurately measuring the time of flight (TOF) required for the echo to return from the opposite end. Using 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 utilize 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

FEATURES

- Large 1/4 VGA back lit display is easily visible from a distance and in poor light.
- Can store up to 4000 bolts, 20,000 elongation and load readings.
- Rugged steel and aluminium case designed for production, field and construction environments.
- USM-3 is supplied in a rugged water tight (Pelican®) case complete with AC adaptor, nylon carrying case, 10' (approx. 3m) transducer cable, data transfer cable, 4 oz bottle of couplant, batteries and operators handbook.
- Measures fasteners of virtually any material from 1/2 inch (12mm) to over 50 feet (15m) in length.
- 0 - 10V analogue output for control of tightening tools such as a Norbar Pneutorque® multiplier.
- Fast update speeds.
- Measurement modes of pitch-catch and pulse-echo.
- Unit can be operated with mains power supply (96 to 264 Volts) or via 4 'C' cell batteries.
- Sealed membrane keypad with tactile keys.
- Works with magnetic and glue on transducers from 1 MHz to 10 MHz.

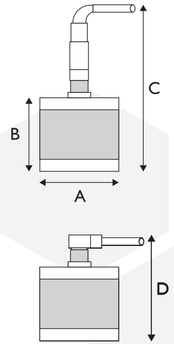


USM-3 ULTRASONIC STRESS METER

Part No.	Resolution	Dimensions	Weight
40334	0.00001 inch (0.0001 mm)	7 1/16" high x 9 7/16" wide x 2 1/16" deep 180mm high x 239mm wide x 53mm deep	2.25 Kg (4.95 lb) with batteries

STANDARD MAGNETIC TRANSDUCERS

Transducer Diameter#	Frequency	Part No.	Dimensions (mm)			
			A	B	C *	D †
3/16" (4.76 mm)	5.0 MHz	56016	9.7	13	54	29
3/16" (4.76 mm)	7.5 MHz	56017	9.7	13	54	29
3/16" (4.76 mm)	10.0 MHz	56018	9.7	13	54	29
1/4" (6.35 mm)	5.0 MHz	56009	19	19	60	35
1/4" (6.35 mm)	10.0 MHz	56019	19	19	60	35
1/2" (12.7 mm)	2.25 MHz	56011	25	19	60	35
1/2" (12.7 mm)	5 MHz	56010	25	19	60	35
3/4" (19.05 mm)	1.0 MHz	56020	30	19	60	35
3/4" (19.05 mm)	5.0 MHz	56012	30	19	60	35



This diameter refers to the nominal diameter of the piezo electric crystal. The annular magnet increases the diameter to the value of 'A' shown.
* Dimension 'C' represents the maximum clearance needed for the transducer fitted with a standard transducer cable.
† Dimension 'D' represents the maximum clearance needed for the transducer fitted with a right angle transducer lead.

- If the use of a right angle transducer lead does not provide enough clearance then we can supply transducers with side connectors. Add '.SIDE' after the part number when ordering, eg. 56016.SIDE.
- For operating temperatures in excess of 54°C (130°F) (the rating for a standard transducer) then a High Temperature Transducer with a maximum rating of 175°C (347°F) should be used. To order High Temperature transducers add '.HITEMP' to the part number when ordering, eg. 56016.HITEMP.

GLUE ON TRANSDUCERS

Size	Frequency	Part No.	Quantity
3mm x 3mm	7.5 MHz	56021	Box of 100