

1mm Digital Mini Probe

A New Rugged Low Profile Transducer

Datasheet
502748
Issue 3
EDCR 18421



Features

- 1 mm Total Measurement Range
- Resolution Programmable to <math>< 0.01 \mu\text{m}</math>
- Simple Installation and Sensor Change
- Excellent Repeatability and Robustness in two planes
- Suitable for Operation in Bores with key slot
- Very Compact Size
- Changeable Tips
- Up to 3,906 Readings/Second
- IP65 Protection
- Laser Calibrated, Fully Traceable
- CE Marked

Description

The Solartron Digital 1 mm Mini Probe is a compact, low profile, transducer intended for measurements in confined spaces such as bores. The product is based on a parallel spring structure that is significantly more robust than a single leaf arrangement. This greatly improves the reliability of the sensor, extending its working life and allowing it to be used in more demanding applications, such as automatic gages. The parallel spring also ensures a high level of repeatability, both on axis and across axis, so that it can be used in dynamic applications where profiling is required.

The centreline of the tip is accurately aligned with respect to the two sides of the transducer to within 50 μm . Installation is simply a matter of positioning the device, and securing it via a single M3 screw. The standard tip height is factory set and the probe is calibrated in this configuration. The customer has the option to change the tip height by ± 0.25 mm if required.

The digital nature of the new Mini 1 mmProbe provides an unprecedented ease of setup, especially since the electrical zero does not need to be set. The probe forms part of Solartron's range of digital products sharing the same Orbit[®] Network interface. Mini Probes and other digital transducers can be connected via a single cable to a PC, PLC or Solartron's own digital readout.

The transducer is sealed using a Viton[®] boot to achieve IP65 requirements. Tips with an M2 thread are available to suit different applications, these can be replaced in the field without the need to return the product to Solartron.

Mechanical Outline

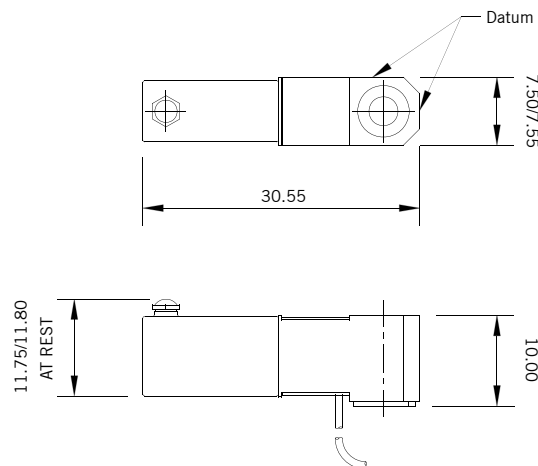


Figure showing general dimension and datum surfaces
(Please refer to the technical drawing for the complete set of dimensions)

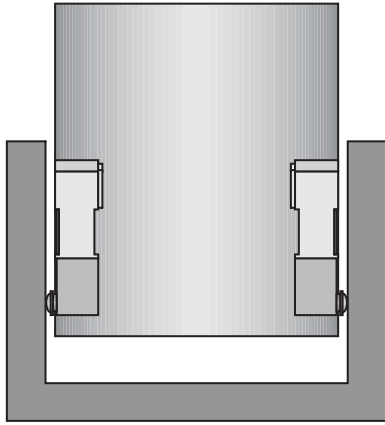


Fig. 1 - Measurement of Inner Diameters

Fig. 2 - Measurement of Outer Diameters in Confined Spaces

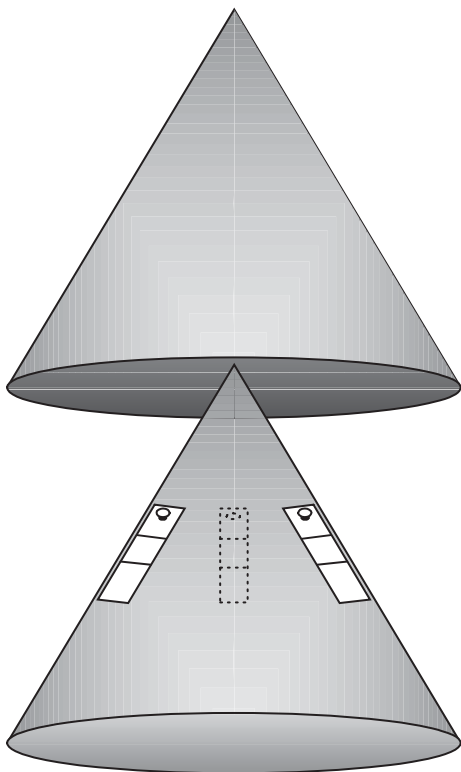
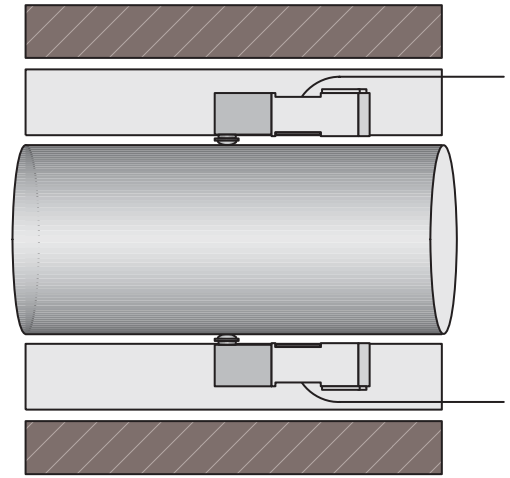


Fig. 3 - Measurement of Conical Bores

Technical Specification

Measurement

Mechanical Travel	1.1 mm	
Measurement Range	1.0 mm	
Start of Measuring Range	20 μm to 40 μm from limit stop	
Accuracy	$\pm 0.1 \mu\text{m} \pm D \times 0.2\%$ (where D is the distance from setting master)	
Operational Repeatability* using standard tip at position 100 μm from limit stop at position 500 μm from limit stop at position 500 μm from limit stop	On axis	Cross axis
	0.1 μm	0.1 μm
	0.15 μm	0.1 μm
	0.30 μm	0.15 μm
Resolution	<0.01 μm	
Measurement Bandwidth	Programmable from 6 Hz to 460 Hz	
Tip Force	0.7 N $\pm 25\%$ (center of measurement range)	
Temperature Coefficient	0.018 $\mu\text{m}/^\circ\text{C}$ at full scale	

* Obtained by step gauging: Repeatedly pushing the probe against the edge of the intended target prior to recording the measurement. This replicates the actual mini probe operation in the field.

Mechanical

Mass	12 g (0.027 lbs)
Recommended tip adjustment	$\pm 0.25 \text{ mm}$
Mounting	Retain using 1 x M3 screw (supplied with transducer)

Material

Mini Probe Frame	Chromium Steel
Gaiter	Viton®

Environmental

Storage Temperature	-20°C to +85°C	
Operating Temperature	0°C to +60°C	
IP Rating	Transducer	IP65
	Electronics	IP43
Shock	To maintain best performance the Mini Probe should be protected from shock and dropping	

Electrical Interface

Energising Voltage	5 V ± 0.25 VDC (powered from Orbit Network)
Energising Current	55 mA (at 5 VDC) (powered by the Orbit Network)
Interface	Orbit Network

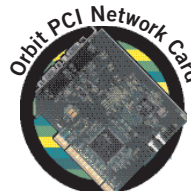
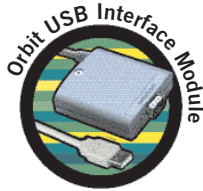
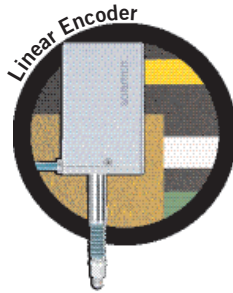
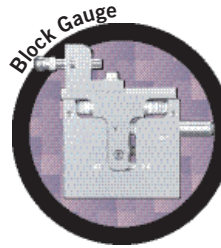
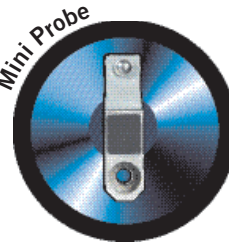
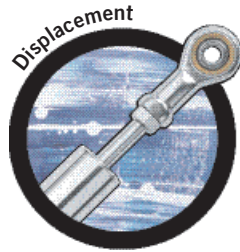
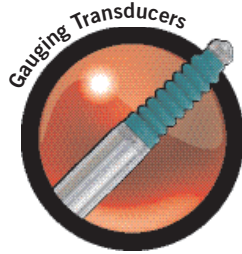
Ordering Guide for the Digital Mini Probe

The Digital Mini Probe can be supplied with either a standard tip, or with an extended tip.

Digital Mini Probe DM/1/S

	Part Number
(with standard 1.5 mm radius Tungsten Carbide tip)	973097

Accessories	Part Number
Ø3 mm Tungsten Carbide ball tip	208910
Ø3 mm Silicon Nitride ball tip	804982
Ø3 mm Silicon Nitride 5.75 mm extended ball tip	804981
Ø3 mm Ruby ball tip	804582
Ball tip spanner wrench	208597



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