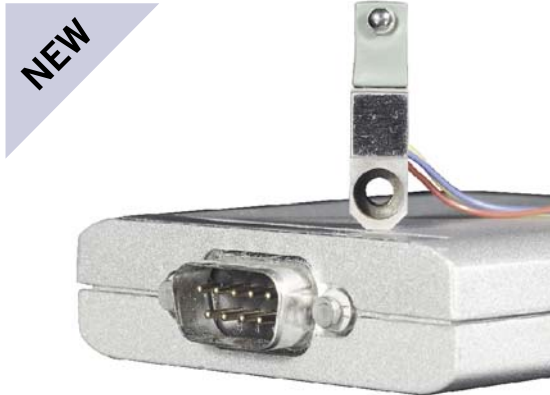


Digital Mini Probe

A New Rugged Low Profile Transducer

Datasheet
502597
Issue 1.1



Features

- 0.5 mm Total Measurement Range
- Resolution Programmable to $< 0.01 \mu\text{m}$
- 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
- Traceable Calibration
- CE Marked

Description

The Solartron Digital 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 to one side of the transducer to provide a reference datum surface. Installation is simply a matter of positioning the device, and securing it via a single M3 screw. This requires accurate machining of the pocket in which the transducer is housed, with the resultant benefit of reduced installation and changeover time.

The digital nature of the new Mini Probe 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

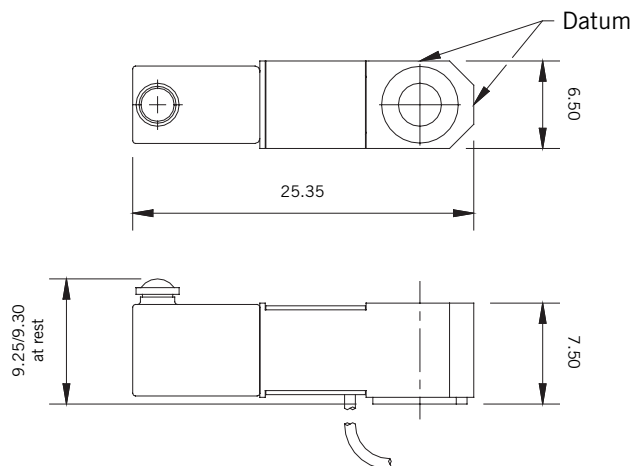


Figure showing general dimension and datum surfaces
(Please refer to the technical drawing for the complete set of dimensions)

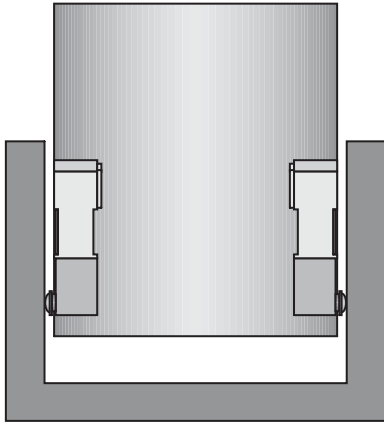


Fig. 1 - Measurement of Inner Diameters

Fig. 2 - Measurement of Outer Diameters in Confined Spaces

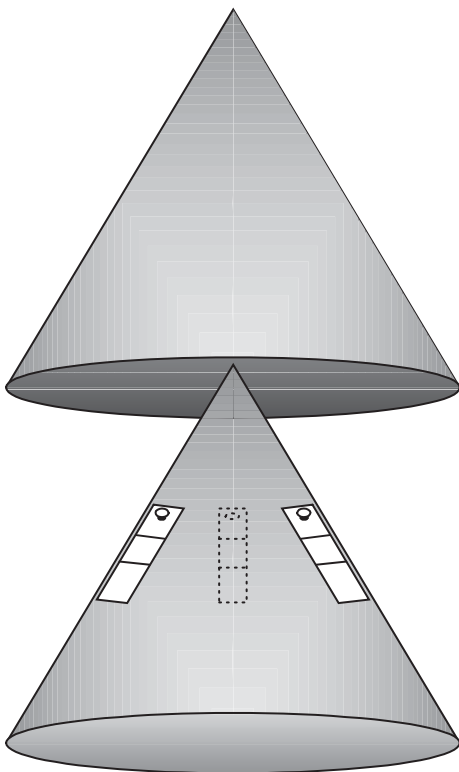
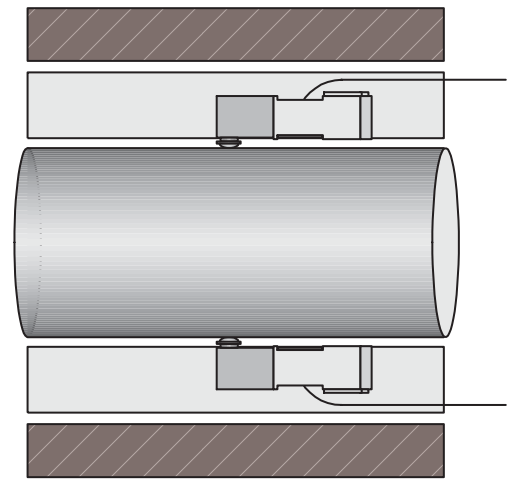


Fig. 3 - Measurement of Conical Bores

Technical Specification

Measurement

Mechanical Travel	0.6 mm	
Measurement Range	0.5 mm	
Start of Measuring Range	20 μm to 30 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	On axis	On cross axis
at position 100 μm from limit stop	0.1 μm	0.1 μm
at position 250 μm from limit stop	0.25 μm	0.15 μm
at position 500 μm from limit stop	0.5 μm	0.25 μm
Resolution	0.01 μm	
Measurement Bandwidth	Programmable from 6 Hz to 460 Hz	
Reading Speed	Up to 3906 readings/second in Dynamic Measurement Mode	
Tip Force	0.7N $\pm 25\%$ (when passing through the center of the measurement range)	
Temperature Coefficient	0.08 $\mu\text{m}/^\circ\text{C}$	

* 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	< 15 g (< 0.011 lbs)
Material	
Mini Probe chassis	Chromium Steel
Frame Gaiter	Viton®
Mounting	Retain using 1 x M3 screw (supplied with transducer)

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

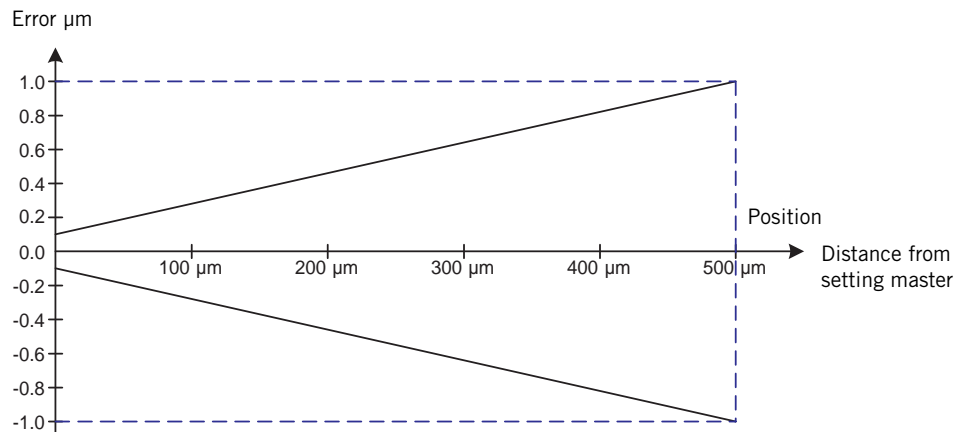


Fig. 4 - Accuracy of Mini Probe including both sensitivity and linearity contributions

Ordering Guide for the Digital Mini Probe

Digital Mini Probe DM/05/S	Part Number
with standard Ø3 mm Tungsten Carbide ball tip	973033

Accessories	Part Number
Ø3 mm Tungsten Carbide ball tip	804847
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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