

TESA UNIMASTER: The most accurate measuring instrument for large dimensions on the market

When we talk about the products that have made and continue to make the history and expertise of TESA, the TESA UNIMASTER is amongst them.

By its concept, the TESA UNIMASTER is synonymous with reliability and increased accuracy; the set contains universal application equipment for the direct or indirect measurement of internal and external lengths up to several metres.

In fact, during direct measurement, only the measuring element needs to be calibrated. Therefore, there is no need to repeat this action after the coupling of the extensions. This minimises the acquisition of setting gauges for each measured dimension.



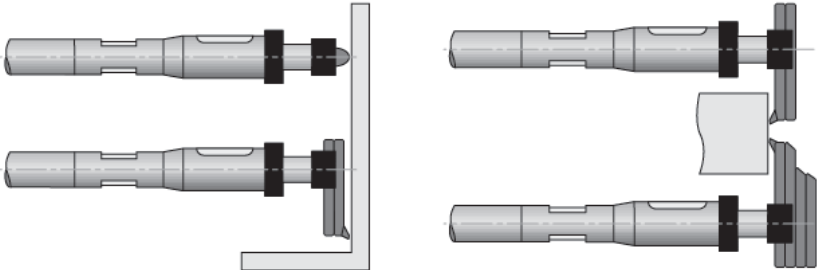
TESA UNIMASTER measuring device

For over half a century, the TESA UNIMASTER has been unrivalled in the market. It is the most accurate and the most suitable instrument for measuring large dimensions (even of over 2 metres).

No other instrument on the market could compete when faced with the demanding requirements solved by the TESA UNIMASTER.

Whether in horizontal or vertical position, it quickly adapts to various constraints that arise during the quality control of large-volume pieces.

In fact, the UNIMASTER is suitable for both internal and external measurements, thanks to bolts that can be centred or offset, and to a reversible measuring force allowing for consistent results in either the internal or external measuring direction.



When the contact points are positioned in the instrument axis, the TESA UNIMASTER respects the Abbe principle.

Therefore, there is no need to store large and expensive gauges. Thanks to the setting gauge delivered with the instrument, the basic measuring element is calibrated separately and the user can easily add the extensions equipped with built in gauge rods to obtain the length required.

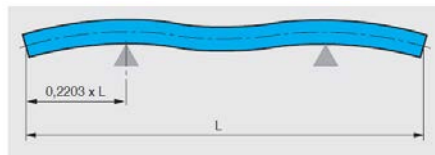


Table of maximum errors

(For example: 28 µm over 2 m length, measuring internally along the axis)

When measuring large dimensions, factors like weight, stiffness and thermal expansion can have extremely harmful effects on the handling and precision of such instruments, but the TESA UNIMASTER offers an optimal solution for each of these problems.

The deformation pressures caused by the weight of the instrument are minimised thanks to the stiffness of the extensions, their strong coupling, the robustness of the measuring bolts and the optional support rollers that reduce the flexion of the neutral axis (see Bessel points theory; Metrology File, p.78; Karl Tischler).



Bessel points theory drawing

The extensions, on the other hand, protect the gauge rods from heat transfer, making them insensitive to expansion.

It's important to mention also the unique shockproof system of the measuring element that guarantees robustness and exceptional durability.

The complete set of accessories and extensions delivered with the instrument help avoid metrological constraints, minimising the environmental and human uncertainties that can interfere when measuring large components.



The TESA UNIMASTER complete set offers a measuring range of 250 ÷ 1475 mm (Internal measurement)

Able to meet the high requirements of the domains in which it is used thanks to its versatility, stability and absolute precision, the TESA UNIMASTER remains an indisputable reference for aerospace, oil and gas industries, as well as the manufacture of large engines and wind turbines in the field of renewable energy.



TESA UNIMASTER used by Rössl & Duso for measurement of a Pelton turbine

We thank the company Rössl & Duso (Vedelago, Treviso – Italy) for the TESA UNIMASTER application picture and for their friendly cooperation and authorisation