OD plug gauge for various bore diameters
Cross sleeve
Cross sleeve with runners

OD plug gauge in open design
Special designs
Accessories

OD plug gauge
for bores and internal profiles from dia. 2.5 mm
General Remarks

The OD plug gauge is a mechanical two-point contact comparator measuring instrument suited for manual or automatic measurement. Each measuring instrument is specially tailored to suit a specific diameter and the corresponding tolerance.

The OD plug gauge serves for the measurement of bores with a diameter from 2.5 up to 500 mm, as well as their deviations in form, without searching for the reversal point on the indicating unit. For the indication of the measuring value, precision indicators, mechanical or electronic dial gauges or electronic probes can be used.

Applications

The OD plug gauge is a robust and easy to use comparator measuring instrument, which is conceived for the series control of bores.

- The OD plug gauge meets the following requirements:
  - easy handling
  - quick measurement
  - maximal measurement certainty
  - robust and reliable measuring instrument

Functions

Centring

The surface line of the OD sleeve centres the measuring instrument automatically in the bore. The length of the sleeve is chosen in accordance with the diameter, in order to obtain an optimal alignment of the gauge in the bore.

Transfer of the measuring travel

An expanding probe with measuring contacts is located inside the plug gauge. This probe is split open by the wedge-shaped measuring needle made of wear-resistant tungsten carbide.

Through the wedge of the measuring needle, the radial movement of the measuring contacts is transferred free of backlash to the unit used for the length measurement. The precisely grinded wedge of the measuring needle guarantees an excellent linearity.

Construction

The OD system consists of the following components:

- indicating unit (dial gauge, precision indicator, etc.)
- holder with thread connection M 11 x 0.75 - suitable for all OD measuring sleeves
- exchangeable measuring sleeves made of hardened and ground tool steel, hard chromed on request, adjusted to each bore diameter with tolerance, with an integrated expanding probe and wedge-shaped needle
- options, for example depth stop, measuring depth extension, etc...
- reference, for example setting ring, reference piece, etc...

Applications

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  - easy handling
  - quick measurement
  - maximal measurement certainty
  - robust and reliable measuring instrument
OD plug gauge for various bore diameters

Cross sleeve for dia. 130-500 mm for blind bores or short centring shoulders

Cross sleeve with runners for dia. 130-500 mm for deep bores or through bores, alignment in the bore is made through the 4 runners

Advantages

Highest precision
The precision of a comparator gauge is shown clearly with the repeatability. For the OD plug gauge this is max. 0.5 to 1 µm (for standard design up to diameter 130 mm).

Easy handling
The OD plug gauge enables the measurement without searching for the reversal point on the indicating unit and is therefore also suitable for unskilled users.

High measuring certainty
Since the OD sleeve, which is exactly tailored for a specific measuring situation, centres and guides the measuring instrument in the bore, the influence of the user on the measuring result is minimised.

Fast measuring process
A stationary measuring value is obtained immediately when entering the bore to be measured. This enables a large number of measurements within the shortest period of time.

High flexibility
All the OD measuring sleeves and the corresponding holders have a thread connection M 11 x 0.75.
Therefore it is possible to choose any combination required, a quick adjustment to any measuring task is guaranteed.
Accessories, like for example an angle piece or measuring depth extensions, can be assembled without any problem.

No tilting
The unique insertion chamber of the measuring sleeve prevents any tilting when entering the measuring instrument in the bore.

High service life/robustness
The robust OD measuring sleeves are made of hardened tool steel, ground to the required diameter and are suitable for the use in the production.

As an option, hard chromed measuring sleeves are available, which offer more protection against wear and corrosion.
The measuring contacts are as a standard fitted with tungsten carbide balls. The wedge-shaped measuring needle is generally made of tungsten carbide.
Through the modular system, the OD system enables a very easy maintenance.

Easy setting
As setting references, setting rings are often used in practice; the use of master pieces or external micrometers is also possible.

Cross sleeve with runners
From diameter 130 mm, SCHWENK offers the so-called cross sleeve or cross sleeve with runners. In opposition to the conventional full round OD sleeve, the cross sleeve (with runners) presents advantages regarding the weight and the handling when measuring large diameters.
Special designs

The OD system offers many variation possibilities, in order to adapt the measuring instrument optimally to the measuring problem. Here are some examples:

- enlarged or reduced measuring travel
- sleeve with a specific undersize under the lower tolerance
- special material for the measuring contacts, for example synthetic, ceramic, ruby, hard chromed, etc...
- specific shape for the measuring contacts, for example mushroom-shaped with enlarged radius, wedge-shaped contacts, etc...
- measuring sleeve surface hard chromed or coated wear-resisting with "Dynamant"
- specific insertion chamfer, for example for automatic measurements
- plug gauge in 3-point design for polygonal workpieces
- other special solutions, for example for the measurement of tapers, with several measuring axes in one measuring sleeve, for plane parallel distances, for the measurement of grooves or profiles, etc...
- inspection certificate available on request for all OD measuring sleeves.

Accessories

- in different lengths
- with clamping shaft H6 or 3/8"
- for electronic probes, etc...
- with retraction to take off the measuring force

Measuring depth extensions
- out of Invar tubes, available from diameter 4 mm

Angle piece
- for awkwardly positioned bores

Depth stops
- for specific measuring depths and for a higher measuring certainty

Stand
- for stationary measurements

Floating holder
- suitable for automatic measuring stations and stands

Detailed technical descriptions about the OD plug gauge programme are shown in the documentation 300T and are available on request.

We would be pleased to solve your measuring problems!
Technical data of the OD measuring sleeves

<table>
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<th>Range of application</th>
<th>mm</th>
<th>mm</th>
<th>mm</th>
<th>mm</th>
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<td>16,1</td>
<td>30,1</td>
<td>45,1</td>
<td>130,1</td>
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<td>to</td>
<td>6</td>
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<td>45</td>
<td>130</td>
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<td>0,3</td>
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<td>Front distance h</td>
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<td>2,5/10</td>
<td>2,5/10</td>
<td>3,5/10</td>
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<td>9'/25'</td>
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<td>1,2</td>
<td>1,2</td>
<td>3</td>
<td>4</td>
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<td>(blind bores)</td>
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<td></td>
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<tr>
<td>Length of sleeve H</td>
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<td>33</td>
<td>33</td>
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<td>0,5</td>
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<td>1</td>
<td>2</td>
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<td>Thread G</td>
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Notice:
1. Cross sleeve (protected by patent design no 9404093)
2. Cross sleeve with runners (protected by patent design no 9404093)
3. *in a setting ring