

Operating manual CHROM-MICRO-SCALE

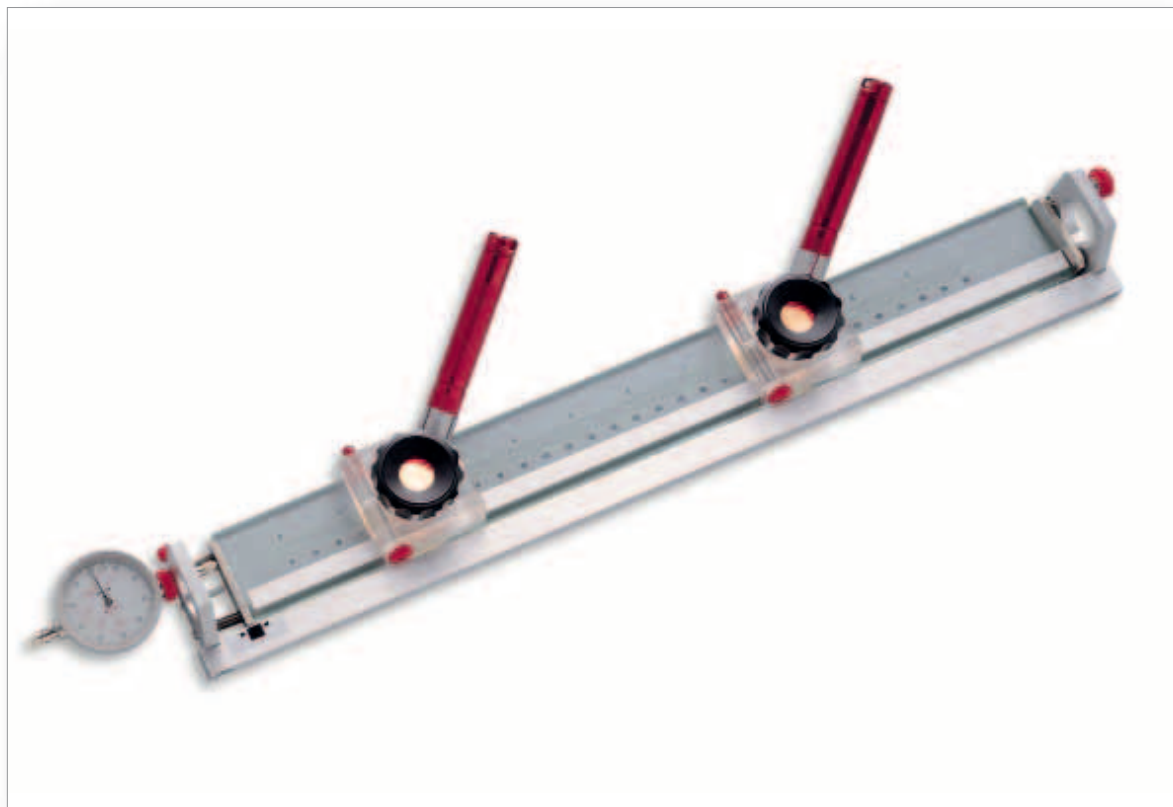


Table of contents

<i>General instructions</i>	2
<i>Requirements for accurate measurement</i>	2
<i>Preparation</i>	2
<i>Measuring</i>	3

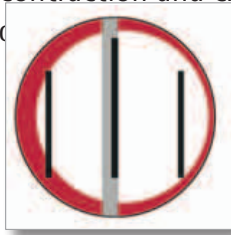
Operating manual CHROM-MICRO-SCALE

General instructions

- Both magnifying lenses can be adjusted for personal visual resolution by turning the focus ring **L**.
- For connection, removal and smooth sliding of the lens holder press the red button **G** on the back of the lens holder. This is important, as otherwise the rule can be pulled along with it!
- The auxiliary lights **H** are turned on by turning the handle to the left.
- The whole lamp **H** can be turned in its holder for varying or optimising the light.
- The red centring apertures help to control the viewing angle.
Centred ring = perpendicular angle.
- Dial gauge **A** is equipped with two scale ranges: black scale = metric, red scale = inches.

Requirements for accurate measurement

- Straight, even placement surface
- Direct contact between test material and rule scale (to minimise parallax errors)
- The object to be tested and the rule should be sufficiently stabilised and acclimatised to the environment (temperature & relative humidity)
- Constant thermal environment (ideal = 20°C)
Watch out for:
 - radiant heat from the lighting
 - body temperature of the person carrying out the test
- Take into account the measuring accuracy of the device, individual measurement variance and the coefficients of contraction and expansion of different materials
- Perpendicular to the magnifying lenses:



offset view = reading error



perpendicular view = no reading error

Measuring with the Chrom Micro-Scale

Preparation

- In order to guarantee a safe sliding of the glass scale within the metal frame, from time to time the latter must be cleaned with pure benzene and rubbed off with talcum. Viscous materials such as films are likewise to be treated with pure benzene and talcum.
- Slide in dial gauge **A** as far as stop **C** and secure with knurled screw **D**. Warning: excessive turning of the screw can jam the dial gauge!
- Lay the object to be measured in an even position (Very important! Even the smallest deflections lead to errors in measurement.). If materials are being measured that are shorter than the metal frame of the rule, then pieces of the same material thickness must be laid underneath at the edge.
- Lay Chrom-Micro-Scale on the object to be measured and align roughly to the measuring section
- Adjust both magnifying lenses for personal visual resolution by turning the focus ring **L**.
- Using adjustable screw **E** slide the glass scale until mark **B** is approximately in the middle of measurement range markings **F**.

Measuring

- 1) Position the left magnifying lens approximately above the zero reference mark and the right magnifying lens approximately above the end of the measuring section.
- 2) Check the position of the scale in relation to the measuring section (look through both magnifying lenses) and adjust the rule as necessary.
- 3) Place the left magnifying lens precisely above the zero reference mark on the scale (press red button **G** to slide the lens holder), look perpendicularly through the magnifying lens (check using the centring ring) and slide the entire rule so that the division ends up -0.2 approximately next to line a (start of the section to be measured).
- 4) Check whether the position of the scale at the end of the measurement section (right magnifying lens) is still correct. If not, hold the rule tight on the left and on the right gently lift and align. Then check the position of the zero reference mark again and go back to 3).
- 5) Only when the rule is perfectly aligned can the process continue. For this purpose look perpendicularly through the left magnifying lens (check using the centring ring), secure the rule by means of gentle pressure on the frame **M** and by readjusting the adjusting screw **E** obtain precise alignment of the scale's zero mark with line a. Warning: for sighting, always readjust adjusting screw **E** in the same "pressure" direction (clock-wise)! If it is moved too far, go back and sight again by turning the adjusting screw clockwise.
- 6) Set dial gauge **A** to "0" by turning graduated collar **K**.
- 7) Place the right magnifying lens exactly perpendicularly above the end of the section to be measured (to slide the lens holder, press red button **G** and secure the rule by means of light pressure on frame **M**).
- 8) Look perpendicularly through the right magnifying lens (check using centring ring), secure the rule by means of light pressure on frame **M** and by turning the adjusting screw **E** clockwise to obtain precise alignment of the next division of the scale to the right of line b (at the end of the section to be measured), in our example 154.2 mm, with line b.
- 9) Read off and record the scale values of the rule, e.g. 154.2 mm, and dial gauge, e.g. -0.02 mm.
- 10) Check again whether the rule is still perfectly aligned. If not, repeat the measurement!
- 11) The actual size for the distance from line a to line b is produced by the correctly signed addition of both scale values.

$$\text{Distance a-b} = (+154.20 \text{ mm}) + (-0.02 \text{ mm}) = (+154.18 \text{ mm}).$$

