Simple Pocket Instruments for Fast Coating Thickness Measurement on Virtually all Metals

MP0 instrument series
## MP0 instrument series - Overview

Overview of the various models of the MP0 instrument series

<table>
<thead>
<tr>
<th>Instrument models</th>
<th>Application</th>
<th>Probe integrated in the instrument case</th>
<th>Probe with cable permanently connected at the instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERMASCOPE® MP0 605-361, see page 3</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>PERMASCOPE® MP0-FP 605-362, see page 3</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>DUALSCOPE® MP0 605-360, see page 7</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

**Note:**
- NC/Fe: Non conductive coating material on ferrous metals
- NF/Fe: Non magnetic coating material on ferrous metals
- NC/NF: Non conductive coating material on non-ferrous metals
PERMASCOPE® MP0
PERMASCOPE® MP0-FP

Pocket Instruments for Simple and Fast Coating Thickness Measurement on Steel and Iron
## Description

The PERMASCOPE measuring instruments measure coating thicknesses easily, quickly, non-destructively and with the precision that is typical for all Fischer instruments.

### Instrument properties
- Ideal for onsite applications due to the compact size, the light weight and the robust and durable instrument design
- Intuitive operation of the menu navigation and graphic display.
- Second display for reading the measurement results directly on the top side of the instrument, e.g., for measuring overhead
- Different languages are selectable
- Manufacturer’s certificate, included in the scope of supply

### Generating measurements
- The specimen’s shape and permeability have a comparatively low influence on the measurement results

## Applications

### Steel or iron substrates (Fe)

### Examples
- Zinc, chromium, copper, paint, varnish and plastic coatings on steel, iron or cast iron (Fe)
- Measurements both on smooth and rough surfaces

The instruments are particularly suited for highly precise measurements of thin coating.

## Models

- PERMASCOPE MP0: Probe integrated in the measuring instrument for single-handed operation
- PERMASCOPE MP0-FP: Probe with cable (80 cm; 31.5”) permanently connected to the instrument, for measurements on various specimen shapes

## Evaluation

### Statistics
Display of mean value, standard deviation, MIN, MAX and number of all measurements stored in the instrument memory
**Measurement Functions**

**Units of measurement**
Selectable μm or mils

**Continuous display mode**
Measurement in "continuous display mode" for continuous sampling of the surfaces, e.g., in the manufacture of tanks and containers.

**Normalization**
Adaptation to the substrate material and the shape of the specimen.

**Calibration**
- **Factory calibration**
  Each individual instrument is factory calibrated at several reference points with the greatest care to ensure the highest possible degree of trueness.
- **Calibration (Adjustment)**
  Adaptation to the substrate material and the shape of the specimen and to a thickness value using a calibration foil.
- **Simple Calibration**
  Adaptation to the coating and substrate material in one step using a coated reference part with a coating thickness higher than 200 μm (7.87 inches). This kind of calibration supplies only a lower accuracy.

**General Features**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring method</td>
<td>Magnetic induction method (ISO 2178, ASTM D7091, Measurement of non-magnetic coatings on magnetic substrates)</td>
</tr>
<tr>
<td>Probe</td>
<td>Probe tip radius: 2 mm (78 mils); Probe tip material: Hard metal</td>
</tr>
<tr>
<td>Data memory</td>
<td>Max. 1,000 individual readings; the contents of the memory is retained even without batteries</td>
</tr>
<tr>
<td>Measuring frequency</td>
<td>More than 70 measurements per minute</td>
</tr>
<tr>
<td>Measurement acquisition</td>
<td>Automatic upon placement of the probe; indication of the measurement with a beep visually with a green lit LED</td>
</tr>
<tr>
<td>Display</td>
<td>● Graphic display, in addition to the measurement reading the mean value and the standard deviation or the number of measurement reading can also be displayed</td>
</tr>
<tr>
<td></td>
<td>● LCD display on the top side of the instrument, e.g., for reading the measurement value for measurement overhead</td>
</tr>
<tr>
<td>Admissible ambient temperature</td>
<td>0 .... +40 °C (+32 ... +104 °F)</td>
</tr>
<tr>
<td>range during operation</td>
<td></td>
</tr>
<tr>
<td>Weight (incl. batteries)</td>
<td>MP0: 137 g (4.8 oz)</td>
</tr>
<tr>
<td></td>
<td>MP0-FP: 184 g (6.5 oz)</td>
</tr>
<tr>
<td>Power supply</td>
<td>2 Batteries, LR6, AA, 1.5 V</td>
</tr>
</tbody>
</table>
PERMASCOPE® MP0 Models

Dimensions

Instrument

Width: 64 mm (2.5 “); depth: 28 mm (1.1 “); height: 85 mm (3.35 “)

Probe of instrument MP0-FP

Measurement Range

0 ... 2500 μm (97.5 mils)

Trueness

based on factory calibration standards of the Helmut Fischer GmbH

<table>
<thead>
<tr>
<th>Measurement Range</th>
<th>Trueness</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 100 μm</td>
<td>≤ 1.5 μm</td>
</tr>
<tr>
<td>100 ... 1000 μm</td>
<td>≤ 1.5 % of reading</td>
</tr>
<tr>
<td>1000 ... 2500 μm</td>
<td>≤ 3 % of reading</td>
</tr>
<tr>
<td>0 ... 3.9 mils</td>
<td>≤ 0.06 mils</td>
</tr>
<tr>
<td>3.9 ... 39 mils</td>
<td>≤ 1.5 % of reading</td>
</tr>
<tr>
<td>39 ... 97.5 mils</td>
<td>≤ 3 % of reading</td>
</tr>
</tbody>
</table>

Repeatability Precision

based on factory calibration standards of the Helmut Fischer GmbH, 5 single measurement readings on each standard

<table>
<thead>
<tr>
<th>Measurement Range</th>
<th>Repeatability Precision</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 100 μm</td>
<td>≤ 0.3 μm</td>
</tr>
<tr>
<td>100 ... 2500 μm</td>
<td>≤ 0.3 % of reading</td>
</tr>
<tr>
<td>0 ... 3.9 mils</td>
<td>≤ 0.0117 mils</td>
</tr>
<tr>
<td>3.9 ... 97.5 mils</td>
<td>≤ 0.3 % of reading</td>
</tr>
</tbody>
</table>

Ordering Data

605-361
PERMASCOPE MP0, probe integrated in the measuring instrument

605-362
PERMASCOPE MP0-FP, probe with cable (80 cm; 31.5 “) permanently connected to the instrument

Scope of Supply

Instrument case; protective instrument cover; 2 batteries; metal plate NF/FE for testing purposes; calibration foil (foil thickness about 75 μm (2.95 inches)); operator’s manual; manufacturer’s certificate

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www.helmut-fischer.com
DUALSCOPE® MP0

Pocket Instrument for Simple and Fast Coating Thickness Measurement on Virtually all Metals
Description

The DUALSCOPE MP0 measuring instrument measures coating thicknesses easily, quickly, non-destructively and with the precision that is typical for all Fischer instruments.

Instrument properties

- Ideal for onsite applications due to the compact size, the light weight and the robust and durable instrument design
- Intuitive operation of the menu navigation and graphic display.
- Second display for reading the measurement results directly on the top side of the instrument, e.g., for measuring overhead
- Different languages are selectable
- Manufacturer’s certificate, included in the scope of supply

Generating measurements

- The specimen’s shape and permeability have a comparatively low influence on the measurement results
- Patented conductivity compensation for measurements on non-magnetic substrate materials

Applications

<table>
<thead>
<tr>
<th>Steel or iron substrates (Fe)</th>
<th>Nonferrous metal substrates (NF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td></td>
</tr>
<tr>
<td>• Zinc, chromium, copper, paint, varnish and plastic coatings on steel, iron or cast iron (Fe)</td>
<td>• Paint, varnish or plastic coatings on aluminium, copper or brass</td>
</tr>
<tr>
<td>• Anodized coatings on aluminium</td>
<td></td>
</tr>
</tbody>
</table>

The instrument is applicable for measurements both on smooth and rough surfaces

Evaluation

Statistics

Display of mean value, standard deviation, MIN, MAX and number of all measurements stored in the instrument memory

Measurement Functions

Units of measurement

Selectable μm or mils

Continuous display mode

Measurement in "continuous display mode" for continuous sampling of the surfaces, e.g., in the manufacture of tanks and containers.

Normalization

Adaptation to the substrate material and the shape of the specimen.

Calibration

Factory calibration

Each individual instrument is factory calibrated at several reference points with the greatest care to ensure the highest possible degree of trueness.

Calibration (Adjustment)

Adaptation to the substrate material and the shape of the specimen and to a thickness value using a calibration foil.

Simple Calibration

Adaption to the coating and substrate material in one step using a coated reference part with a coating thickness higher than 200 μm (7.87 inches). Nevertheless, this kind of calibration supplies only a lower accuracy as specified in the sections Trueness and Repeatability Precision.
**General Features**

**Measuring method**
Magnetic induction method (ISO 2178, ASTM D7091, Measurement of non-magnetic coatings on magnetic substrates);
Eddy current method (ISO 2360, ASTM D7091, Measurement of non-conductive coatings on non-magnetic substrate metals);
Automatic selection of the measuring method corresponding to the substrate material

**Probe**
Probe tip radius: 2 mm (78 mils); Probe tip material: Hard metal

**Data memory**
Max. 1000 individual readings; the contents of the memory is retained even without batteries

**Measuring frequency**
More than 70 measurements per minute

**Measurement acquisition**
Automatic upon placement of the probe; indication of the measurement with a beep visually with a green lit LED

**Display**
- Graphic display, in addition to the measurement reading the mean value and the standard deviation or the number of measurement reading can also be displayed
- LCD display on the top side of the instrument, e.g., for reading the measurement value for measuring overhead

**Languages**
Many different display languages are selectable: German, English and several other European and Asian languages

**Admissible ambient temperature range during operation**
0 … +40 °C (+32 … 104 °F)

**Weight (incl. batteries)**
137 g (4.8 oz)

**Power supply**
2 Batteries, LR6, AA, 1.5 V

**Dimensions**
Instrument Width: 64 mm (2.52 “); Depth: 28 mm (1.10 “); Height: 85 mm (3.35 “)

**Measurement Range**

<table>
<thead>
<tr>
<th>Steel or iron substrates (Fe)</th>
<th>Nonferrous metal substrates (NF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 … 2000 μm (78 mils)</td>
<td>0 … 2000 μm (78 mils)</td>
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</tbody>
</table>

**Trueness**

<table>
<thead>
<tr>
<th>Steel or iron substrates (Fe)</th>
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</thead>
<tbody>
<tr>
<td>based on factory calibration standards of the Helmut Fischer GmbH</td>
<td></td>
</tr>
<tr>
<td>0 … 75 μm: ≤ 1.5 μm</td>
<td>0 … 50 μm: ≤ 1 μm</td>
</tr>
<tr>
<td>75 … 1000 μm: ≤ 2 % of reading</td>
<td>50 … 1000 μm: ≤ 2 % of reading</td>
</tr>
<tr>
<td>1000 … 2000 μm: ≤ 3 % of reading</td>
<td>1000 … 2000 μm: ≤ 3 % of reading</td>
</tr>
<tr>
<td>0 … 2.9 mils: ≤ 0.06 mils</td>
<td>0 … 2 mils: ≤ 0.039 mils</td>
</tr>
<tr>
<td>2.9 … 39 mils: ≤ 2 % of reading</td>
<td>2 … 39 mils: ≤ 2 % of reading</td>
</tr>
<tr>
<td>39 … 78 mils: ≤ 3 % of reading</td>
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### Repeatability Precision

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<tr>
<td>0 … 50 μm: ≤ 0.25 μm</td>
<td>0 … 100 μm: ≤ 0.5 μm</td>
</tr>
<tr>
<td>50 … 2000 μm: ≤ 0.5 % of reading</td>
<td>100 … 2000 μm: ≤ 0.5 % of reading</td>
</tr>
<tr>
<td>0 … 2 mils: ≤ 0.0098 mils</td>
<td>0 … 3.9 mils: ≤ 0.0195 mils</td>
</tr>
<tr>
<td>2 … 78 mils: ≤ 0.5 % of reading</td>
<td>3.9 … 78 mils: ≤ 0.5 % of reading</td>
</tr>
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</table>

### Ordering Data

- 605-360: DUALSCOPE MP0, probe integrated in the measuring instrument

### Scope of Supply

- Instrument case; protective instrument cover; 2 batteries; metal plates NF/FE and ISO/NF for testing purposes; calibration foil (foil thickness about 75 μm [2.95 inches]); operator’s manual; manufacturer’s certificate

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