

Probe model **FD13H**
 Part no.¹ **604-508**



Probe model **FDW13H**
 Part no.¹ **604-800**



Applications Probes for measurements on virtually all metals. The probes work with two test methods and are therefore able to measure coating thicknesses on non-ferrous metals as well as on ferrous metals. Because of the large pole tip the probes are also well suited for measurements on rough (blasted) surfaces.

Examples

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| <p>Steel or iron base materials (Fe)</p> <ul style="list-style-type: none"> • Paint, varnish, rubber or plastic coatings on steel, iron or cast iron (Iso/Fe) • Chrome or copper coatings on steel or iron (NF/Fe) • Both electro-galvanized and hot galvanized coatings on steel, iron or cast iron (NF/Fe) | <p>Non-ferrous metal base materials (NF)</p> <ul style="list-style-type: none"> • Paint, varnish or plastic coatings on aluminium, copper or brass (NC/NF) <p><i>The probes feature a patented conductivity compensation. So that the different electrical conductivities of e.g. various aluminium alloys have no effect of the coating thickness measurement.</i></p> |
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Probe designs

- FD13H probe: Axial single tip probe with spring-loaded measuring system
- FDW13H probe: Single tip angle probe with spring-loaded measuring system
- Robust probe design with wear-resistant probe tip

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| Applications | Steel or iron base materials (Fe) NC/Fe or NF/Fe | Non-ferrous metal base materials (NF) NC/NF |
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* *The values for measurement range, trueness, repeatability precision and measurement deviations are valid for electrically non-conductive coating materials on steel or iron (NC/Fe). The values may differ for measurements on non-ferrous coating materials (NF).*

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| Measurement ranges* | Steel or iron base materials (Fe) 0 ... 2000 µm / 0 ... 78.74 mils | Non-ferrous metal base materials (NF) 0 ... 2000 µm / 0 ... 78.74 mils |
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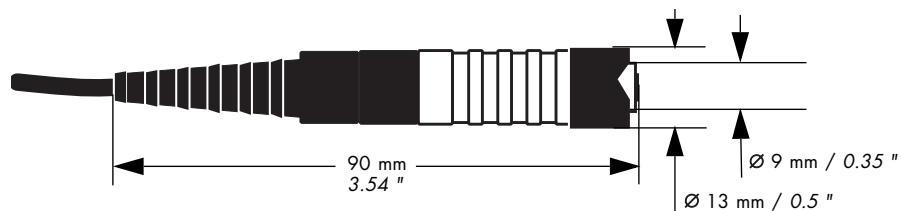
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| Trueness* based on Fischer factory calibration standards | Steel or iron base materials (Fe) 0 ... 75 µm: ≤ 1.5 µm 75 ... 1000 µm: ≤ 2 % of nominal value 1000 ... 2000 µm: ≤ 3 % of nominal value 0 ... 2.95 mils: ≤ 0.06 mils 2.95 ... 39.37 mils: ≤ 2 % of nominal value 39.37 ... 78.74 mils: ≤ 3 % of nominal value | Non-ferrous metal base materials (NF) 0 ... 50 µm: ≤ 1 µm 50 ... 1000 µm: ≤ 2 % of nominal value 1000 ... 2000 µm: ≤ 3 % of nominal value 0 ... 1.97 mils: ≤ 0.039 mils 1.97 ... 39.37 mils: ≤ 2 % of nominal value 39.37 ... 78.74 mils: ≤ 3 % of nominal value |
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| Repeatability precision* based on Fischer factory calibration standards, 5 single readings per standard | Steel or iron base materials (Fe) 0 ... 50 µm: ≤ 0.25 µm 50 ... 2000 µm: ≤ 0.5 % of reading 0 ... 1.97 mils: ≤ 0.0098 mils 1.97 ... 78.74 mils: ≤ 0.5 % of reading | Non-ferrous metal base materials (NF) 0 ... 100 µm: ≤ 0.5 µm 100 ... 2000 µm: ≤ 0.5 % of reading 0 ... 3.94 mils: ≤ 0.02 mils 3.94 ... 78.74 mils: ≤ 0.5 % of reading |
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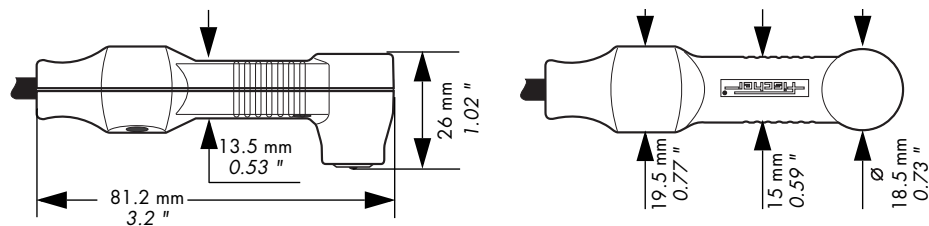
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| Influences* | Steel or iron base materials (Fe) | Non-ferrous metal base materials (NF) |
| <p>The following values are valid for a coating thickness with a nominal value of 75 µm / 2.95 mils. The quantity of the influences are stated with the expanded measurement uncertainty U with the expanded factor of k = 2 (defines an interval with the confidence level of 95.45 %) - according to DIN V ENV 13005 "Leitfaden zur Angabe der Unsicherheit beim Messen" (Guide to the expression of uncertainty in measurement).</p> | | |
| Curvature (R), measurement deviation from the nominal value with reference to master calibration on flat surface | | |
| <p>Measuring spot</p> | <p>No measurement deviation within the trueness as of $R = 55 \text{ mm} \pm 9 \text{ mm}$ / $R = 2.17'' \pm 0.35''$ Measurement deviation of 10 % for $R = 28 \text{ mm} \pm 1.6 \text{ mm}$ / $R = 1.10'' \pm 0.063''$ Probe needs a minimum of $R = 25 \text{ mm}$ (support stand necessary) / $R = 0.98''$</p> | <p>No measurement deviation within the trueness as of $R = 550 \text{ mm} \pm 56 \text{ mm}$ / $R = 21.65'' \pm 2.2''$ Measurement deviation of 10 % for $R = 110 \text{ mm} \pm 5.6 \text{ mm}$ / $R = 4.33'' \pm 0.22''$ Probe needs a minimum of $R = 25 \text{ mm}$ (support stand necessary) / $R = 0.98''$</p> |
| Curvature (R), measurement deviation from the nominal value with reference to master calibration on flat surface | | |
| <p>Measuring spot</p> | <p>No measurement deviation within the trueness as of $R = 80 \text{ mm} \pm 5 \text{ mm}$ / $R = 3.14'' \pm 0.2''$ Measurement deviation of 10 % for $R = 16 \text{ mm} \pm 1.2 \text{ mm}$ / $R = 0.63'' \pm 0.047''$ FD13H probe needs a minimum of $R = 1.5 \text{ mm}$ (support stand necessary) / $R = 0.06''$ FDW13H probe needs a minimum of $R = 2 \text{ mm}$ (support stand necessary) / $R = 0.08''$</p> | <p>No measurement deviation within the trueness as of $R = 447 \text{ mm} \pm 28 \text{ mm}$ / $R = 17.6'' \pm 1.1''$ Measurement deviation of 10 % for $R = 92 \text{ mm} \pm 3.4 \text{ mm}$ / $R = 3.62'' \pm 0.13''$ FD13H probe needs a minimum of $R = 1.5 \text{ mm}$ (support stand necessary) / $R = 0.06''$ FDW13H probe needs a minimum of $R = 2 \text{ mm}$ (support stand necessary) / $R = 0.08''$</p> |
| Edge distance (R), specification from probe tip centre, measurement deviation from the nominal value | | |
| <p>Measuring spot in the centre of the circular surface</p> | <p>No measurement deviation within the trueness as of $R = 11.5 \text{ mm} \pm 0.3 \text{ mm}$ / $R = 0.45'' \pm 0.012''$ Measurement deviation of 10 % for $R = 6.4 \text{ mm} \pm 0.3 \text{ mm}$ / $R = 0.25'' \pm 0.012''$ Probe needs a minimum of $R = 2.5 \text{ mm}$ (support stand necessary) / $R = 0.098''$</p> | <p>No measurement deviation within the trueness as of $R = 3.2 \text{ mm} \pm 0.2 \text{ mm}$ / $R = 0.13'' \pm 0.0079''$ Measurement deviation of 10 % for $R = 2.4 \text{ mm} \pm 0.04 \text{ mm}$ / $R = 0.094'' \pm 0.0016''$ Probe needs a minimum of $R = 1.7 \text{ mm}$ (support stand necessary) / $R = 0.067''$</p> |
| Edge distance (X), specification from probe tip centre, measurement deviation from the nominal value | | |
| <p>Measuring spot = Probe pole centre</p> | <p>No measurement deviation within the trueness as of $X = 3.6 \text{ mm} \pm 0.3 \text{ mm}$ / $X = 0.14'' \pm 0.012''$ Measurement deviation of 10 % for $X = 1.0 \text{ mm} \pm 0.05 \text{ mm}$ / $X = 0.039'' \pm 0.002''$</p> | <p>No measurement deviation within the trueness - for FD13H probe as of $X = 2.2 \text{ mm} \pm 0.05 \text{ mm}$ / $X = 0.087'' \pm 0.002''$ - for FDW13H probe as of $X = 2.2 \text{ mm} \pm 0.1 \text{ mm}$ / $X = 0.087'' \pm 0.004''$ Measurement deviation of 10 % for $X = 1.9 \text{ mm} \pm 0.04 \text{ mm}$ / $X = 0.075'' \pm 0.0016''$</p> |
| Base material thickness (D), measurement deviation from the nominal value | | |
| <p>Measuring spot</p> | <p>Steel or iron base materials (Fe) No measurement deviation within the trueness as of $D = 1.0 \text{ mm} \pm 0.1 \text{ mm}$ / $D = 39.4 \text{ mils} \pm 3.94 \text{ mils}$ Measurement deviation of 10 % for $D = 0.5 \text{ mm} \pm 0.03 \text{ mm}$ / $D = 19.7 \text{ mils} \pm 1.18 \text{ mils}$</p> | <p>Base material Aluminium No measurement deviation within the trueness as of $D = 0.1 \text{ mm} \pm 0.01 \text{ mm}$ / $D = 3.94 \text{ mils} \pm 0.39 \text{ mils}$ Measurement deviation of 10 % for $D = 0.02 \text{ mm} \pm 0.001 \text{ mm}$ / $D = 0.79 \text{ mils} \pm 0.039 \text{ mils}$</p> |
| Base material | <p>Steel or iron base materials (Fe) Influence of the permeability of the base material (Fe) with reference to Fischer calibration standards (master calibration): No measurement error for a ferrite content from 137 FN ± 0.2 FN onwards. Measurement error of 10 % for ferrite content of 123 FN ± 0.8 FN.</p> | <p>Non-ferrous metal base materials (NF) Influence of the el. conductivity of the base material (NF) in the range from 30 to 100 % IACS: Measurement deviation ≤ 2 %, valid for the total measurement range.</p> |
| Admissible ambient temperature at operation -10 °C ... +40 °C / +14 °F ... +104 °F | | |

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| Admissible specimen temperature | max. +40 °C / +104 °F | |
| Probe tip material | Hard metal | |
| Probe tip replaceable | No | |
| Probe tip radius | 2 mm / 0.079 " | |
| Measuring methods | Magnetic induction method according to ISO 2178, ASTM D7091 | Amplitude sensitive eddy current method according to ISO 2360, ASTM D7091 |
| Scope of supply | Probe, metal plates ISO/NF and NF/FE for instrument check, calibration foil sets 605-413 and 605-415, prism adapter for measurements on pipes and bars (for probe FD13H only) | |
| Option, FD13H probe only | Adapter for support stand: 600-173, is supplied by default with the support stand | |
| Instruments | All DUALSCOPE® hand-held instruments of the series FMP and FISCHERSCOPE® MMS® PC2 with F-Module PERMASCOPE® | |
| Dimensions | Cable length: 1.5 m / 59.06 ", other cable lengths on request ¹ | |

FD13H probe



FDW13H probe



¹ FD13H and FDW13H probes with special cable lengths have own part no. and probe model names. This data sheet is also valid for these probes.



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