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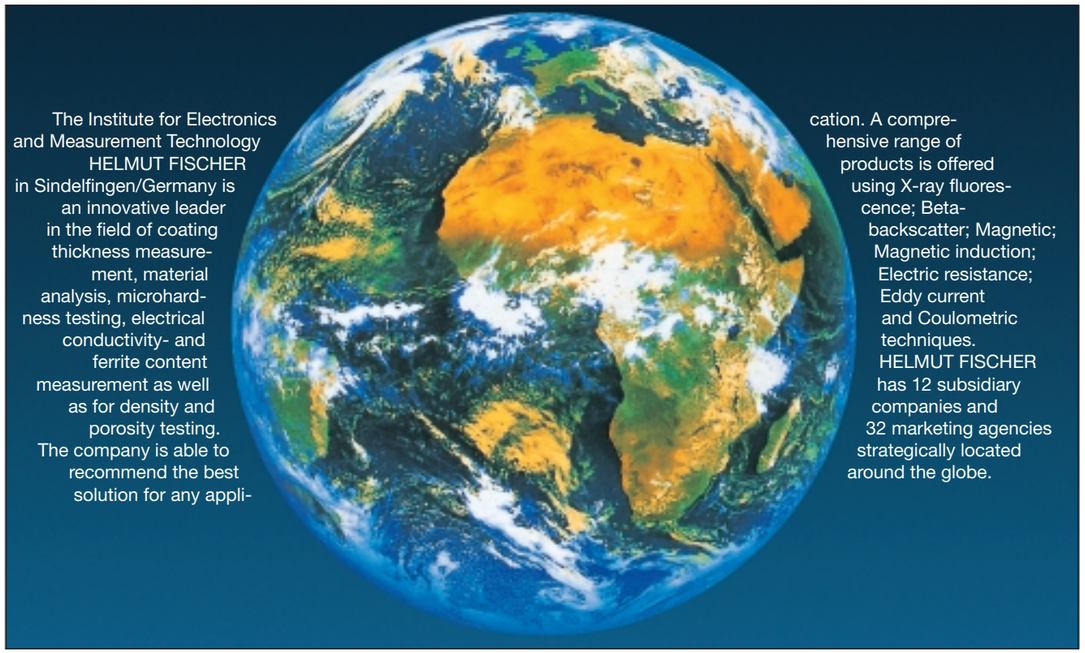
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The Institute for Electronics and Measurement Technology HELMUT FISCHER in Sindelfingen/Germany is an innovative leader in the field of coating thickness measurement, material analysis, microhardness testing, electrical conductivity- and ferrite content measurement as well as for density and porosity testing. The company is able to recommend the best solution for any application. A comprehensive range of products is offered using X-ray fluorescence; Beta-backscatter; Magnetic; Magnetic induction; Electric resistance; Eddy current and Coulometric techniques. HELMUT FISCHER has 12 subsidiary companies and 32 marketing agencies strategically located around the globe.



FISCHERSCOPE® X-RAY to measure coating thickness using the X-Ray fluorescence method.



Microhardness testing system FISCHERSCOPE® H100C.



POROSCOPE® HV20 to test for pores and pinholes in nonconductive coatings.

The high quality standard of FISCHER instruments is the result of our efforts to provide the very best instrumentation to our customers.

FISCHER is a reliable and competent partner, offering expert advice, extensive service, and training seminars.

Today, FISCHER instruments are used successfully in all technological fields of industry and research.

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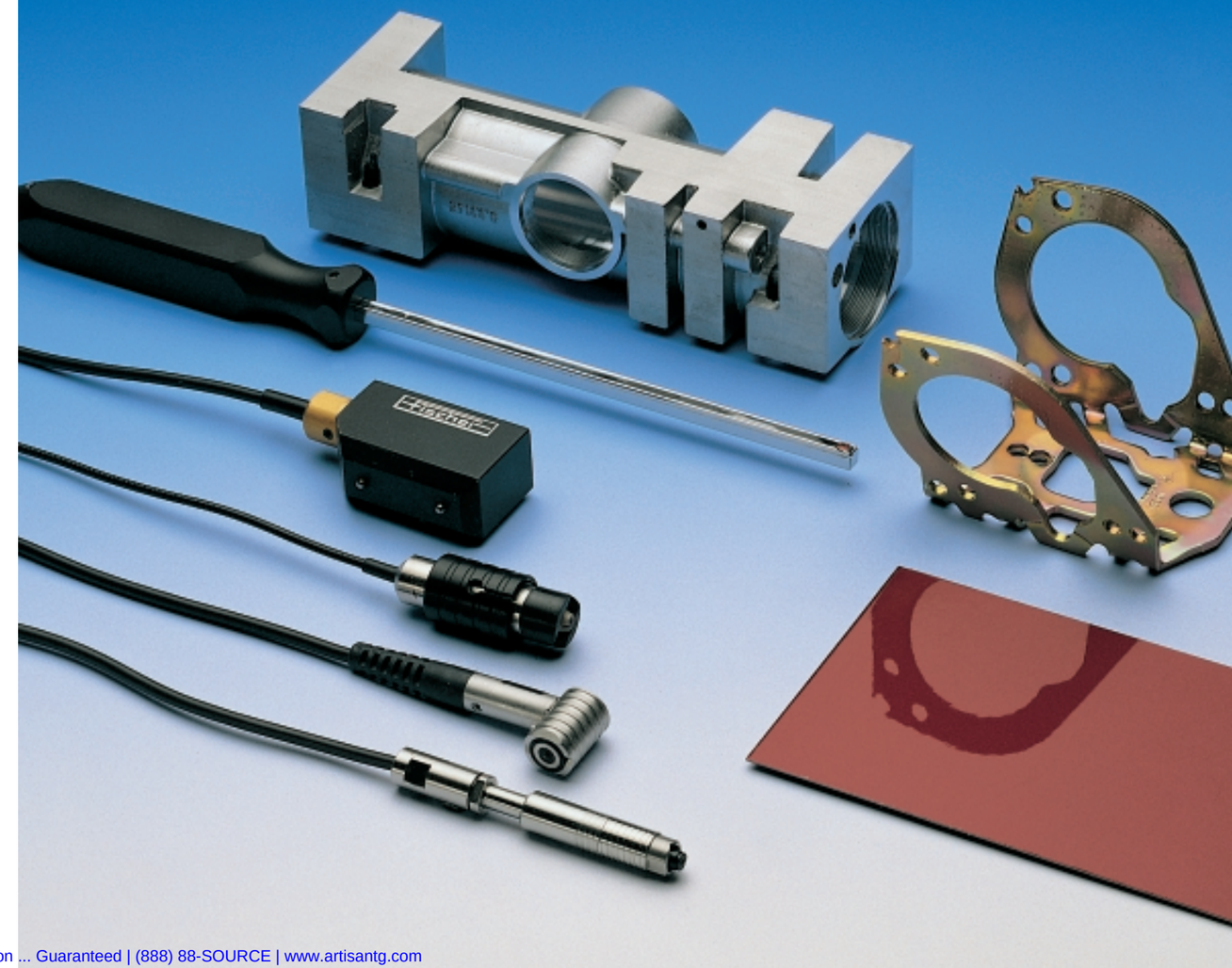
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01/01

Application Specific Probes
The key to successful coating measurement

Probes are the most important component of systems used to measure coating thickness with either magnetic, magnetic induction and eddy current methods. This is the reason significant efforts and resources are expended by FISCHER for the development and quality control of probes.

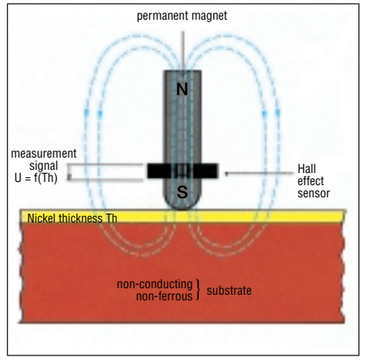
- **FISCHER probes are adapted and optimized for the application!**
  This guarantees accurate and reliable measurement results.
- **FISCHER probes are dependable and durable!**
  The probes are long lasting and durable, even when measurements are to be performed which test their “wear resistance”.
- **FISCHER probes are reliable!**
  This is due to their advanced design, their careful assembly and use of high quality components.



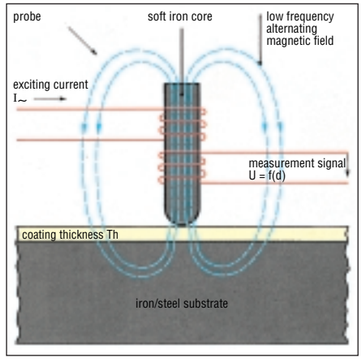
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Measuring Methods and Processing Measuring Signals

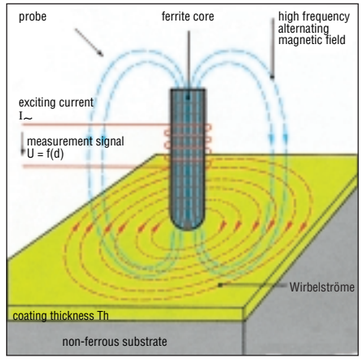
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Magnetic Method
A permanent magnet produces a continuous magnetic field (DIN EN ISO 2178) the strength of which depends upon the thickness of the coating to be measured (Ni/Fe), or the distance between probe and substrate (NF/Fe). The strength of the magnetic field is measured with an appropriate sensor and the coating thickness is calculated from this information.

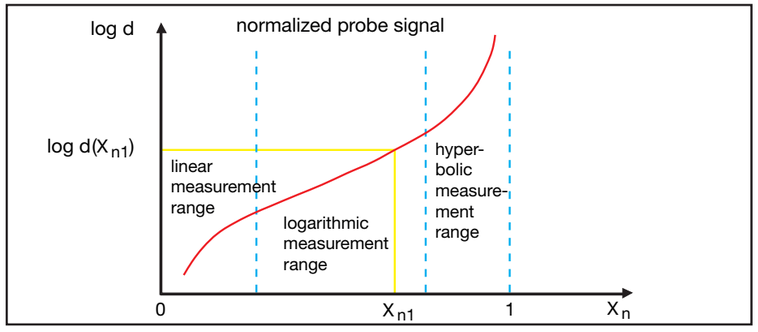


Magnetic Induction Method
The energizing alternating current produces a low frequency magnetic field (DIN EN ISO 2178) the strength of which depends upon the distance between the probe and the substrate. The magnetic flux density is measured by means of a pickup coil. The induced measurement signal obtained is converted into the coating thickness value through translation using the characteristic probe output function.



Eddy Current Method
The energizing current produces a high frequency magnetic field (DIN EN ISO 2360) which induces eddy currents in the substrate material (or in the coating material to be measured with the modified test method). The magnitude of the induced eddy currents depends upon the distance (coating thickness) between probe and substrate. The measurement signal is then evaluated as a function of the eddy currents produced.

Signal Processing
The electrical signal transmitted from the probe is processed by the measuring instrument and digitized. The processed signal is normalized to standardize the possible measuring range and to minimize any disturbing effects. With type E .... series smart probes this signal is then converted through a characteristic probe output function which is stored in the memory chip of the probe connector, into a measurement value indicative of the measured coating thickness. With other (older) probes this characteristic function is stored in the measuring system.



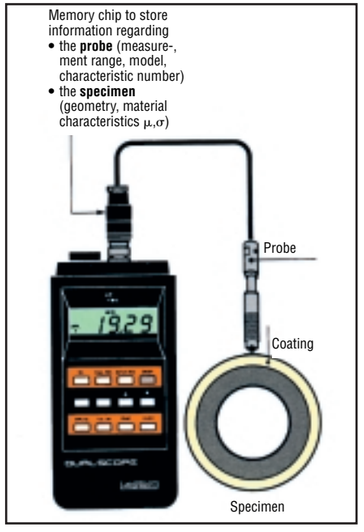
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$$X_n = \frac{X - X_O}{X_S - X_O}$$

The variables are:
X_O : probe signal from the uncoated substrate
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X : probe signal from the measured coating thickness d.

The normalized signal X_n therefore is only able to assume values between 0 and 1.

X_n is then converted over the characteristic probe output function into the measured coating thickness value d.



The characteristic probe output function is stored in the memory chip of the probe connector and thus the probe contains all information required for the measurement. The operator simply recalls the measurement application; the system is ready to measure immediately. Measurements performed at intermittent time intervals therefore always start with the same reference value.

Technical Data and Selection of Probes

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Measurement Accuracy
(DIN 55350 section 13, paragraph 2.1.1)
The measurement accuracy has been determined with plastic foils of specific thickness. The specified value u_S corresponds to the measured systematic deviation (bias) between the measured thickness value and true thickness value of the calibration foil.
Example: 50 - 1000 µm: 0.5%
$\triangleq u_S$

This parameter is a quality indicator showing how good the measurement signal from the probe has been converted over the characteristic probe output function stored in the memory of the probe into a corresponding coating thickness value.

Measurement Precision
(DIN 55350 section 13, paragraph 2.1.2.2)
The value shown represents the measured standard deviation, which can be obtained by replicate measurements on an appropriate plastic foil.

The measurement uncertainly of a group mean measurement is then calculated according to DIN 1319 section 3 as follows:

$$u_z = \frac{t}{\sqrt{n}} \cdot s$$

For group size n=10 a student's t value of 2.5 applies.

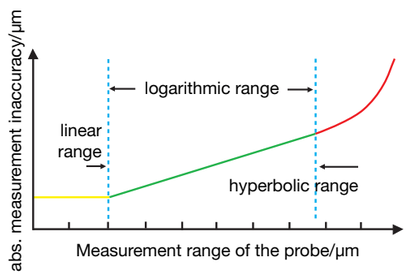
Comments
The most important quality attributes of a measurement method are mainly measurement accuracy, measurement precision and measurement uncertainty.
The measurement uncertainty u (DIN 55350 section 13, par 4.1) is calculated from u_z and u_s according to:

$$u = \sqrt{u_z^2 + u_s^2}$$

The measurement methods utilized here yield different values of u_z and u_s over the complete measurement range of a probe. Within the so called linear range of the probe (see graph to the right), their values are almost constant. If the same value applies for the hyperbolic as well as logarithmic range, the hyperbolic measurement uncertainty is not stated.

The values of u_s and u_z are listed in the following tables as either absolute values (for example: 1 µm) or as relative values referring to the measurement value (for example: 0.5 %).

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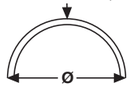


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For the above mentioned measurement methods the geometry of the measurement area influences the measurement value. The following tables list two values for each geometry dependent factor (except for substrate thickness).

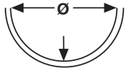
The upper value indicates the smallest diameter of the object that can be measured, for which the curvature dependent measurement bias will not exceed 10% of the true value. Calibration was performed on a flat surface of "infinite" area using the same substrate material.

The lower value indicates the limiting diameter at which if exceeded a measurement is no longer possible due to the geometry of the probe (for example: the probe tip no longer contacts the surface), or at which the measurement signal is too small due to insufficient material volume.

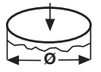
Measurement point



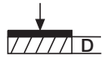
convex curvature diameter



concave curvature diameter



diameter of the test area



substrate thickness D

The limit value D indicates the substrate thickness below which the measurement value deviates more than 10% from an "infinitely" thick base metal.

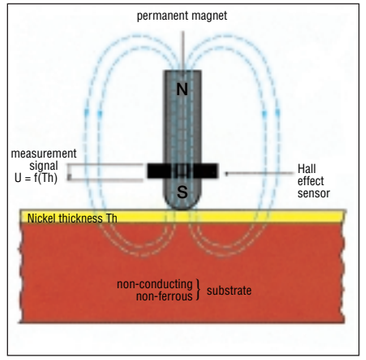
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With increasing measured thickness the 10% bias error is obtained with smaller curvature diameters, and respectively smaller substrate thicknesses.

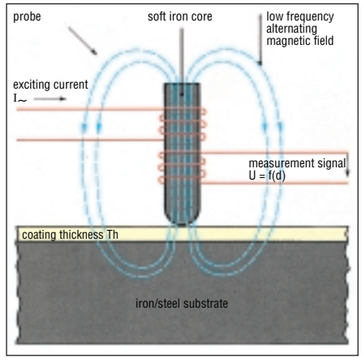
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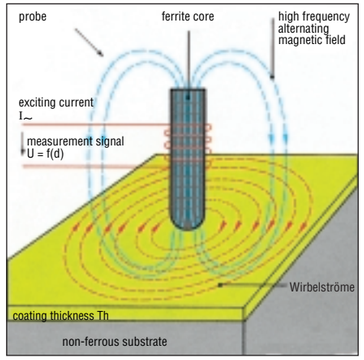
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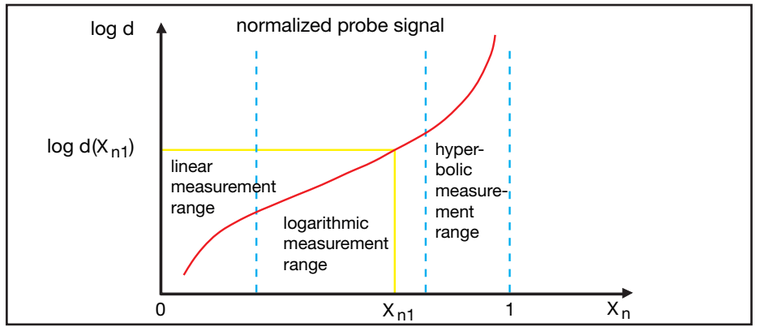


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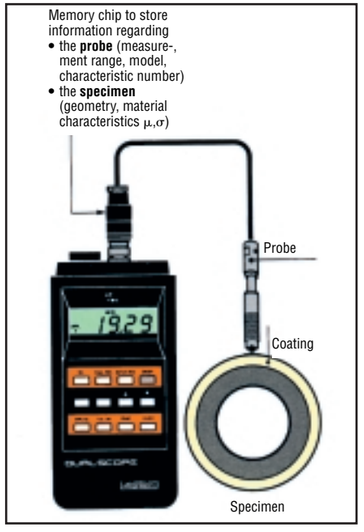
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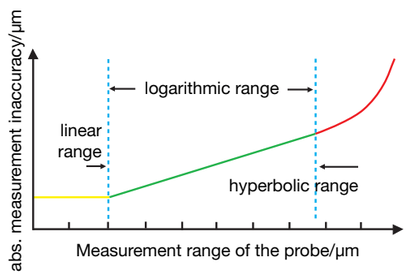
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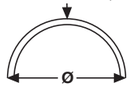


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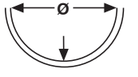
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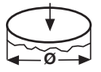
Measurement point



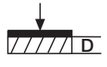
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Characteristic values and technical data of probes for the magnetic induction measurement method

Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number *Measurement range*	Measurement accuracy* u_s *Measurement precision** *s*	Measurement point Ø for 10% error min. Ø *Ø for 10% error* *min. Ø*	Ø for 10% error min. Ø *D for 10% error*	Probe tip radius *Probe tip material* replaceable probe tip	Height *Diameter/width* Length (see page 24	Type of probe Application
	EGA1.3 602-118 *0-1500 µm* *0-60 mils*	0-50 µm : 0.25 µm 50-1000 µm : 0.5 % 1000-1500 µm : < 2.5 % *0-50 µm : 0.1 µm* *50-1500 µm : 0.2 %*	ø : 14 mm (550 mils) min. ø : 2 mm (80 mils) *ø : 36 mm (1.4“)* *min. ø : 10 mm (400 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *Heat treated steel* yes	--- *10 mm (0.4“)* 110 mm (4.3“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Especially well suited for coating thicknesses of ≤ 10 µm. The probe tip is subject to wear on hard and abrasive surfaces. The EGAB1.3 probe should be used for coating thicknesses > 100 µm.
	EGAW1.3 602-119 *0-1500 µm* *0-60 mils*	0-50 µm : 0.25 µm 50-1000 µm : 0.5 % 1000-1500 µm : < 2.5 % *0-50 µm : 0.1 µm* *50-1500 µm : 0.2 %*	ø : 14 mm (550 mils) min. ø : 1 mm (40 mils) *ø : 36 mm (1.4“)* *min. ø : 18 mm (700 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *Heat treated steel* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip right angle probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Especially well suited for coating thicknesses of ≤ 10 µm (0.4 mil) in pipes, bore holes, recesses, etc. The probe tip is subject to wear on hard and abrasive surfaces. The EGAWB1.3 probe should be used for coating thicknesses > 100 µm (4 mils).
	EGAB1.3 601-793 EGAB1.3.L 602-794 EGAB1.3.T 602-359 *0-2000 µm* *0-80 mils*	0-100 µm : 0.5 µm 100-1000 µm : 0.5 % 1000-2000 µm : < 3 % *0-50 µm : 0.1 µm* *50-2000 µm : 0.2 %*	ø : 18 mm (700 mils) min. ø : 2 mm (80 mils) *ø : 35 mm (1.4“)* *min. ø : 10 mm (400 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *PVD coated* yes	--- *10 mm (0.4“)* 110 mm (4.3“	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Most commonly used probe for electroplated metal and organic coatings. For the measurement of nonferrous metal coatings on steel or iron. Scatter of the measuring values on rough (for example: grit blasted) surfaces is however relatively high. Double pole probes should be used in such instances if the geometry of the parts permits the use of this type of probe.
	EGABW1.3 601-964 EGABW1.3.L 602-925 *0-2000 µm* *0-80 mils*	0-100 µm : 0.5 µm 100-1000 µm : 0.5 % 1000-2000 µm : < 3 % *0-50 µm : 0.1 µm* *50-2000 µm : 0.2 %*	ø : 16 mm (640 mils) min. ø : 1 mm (40 mils) *ø : 35 mm (1.4“)* *min. ø : 18 mm (720 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *PVD coated* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip right angle probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Most commonly used probe for electroplated metal and organic coatings in pipes, bore holes, recesses, etc. Scatter of the measuring values on rough (for example: grit blasted) surfaces is however relatively high. Double pole probes should be used in such instances if the geometry of the parts permits the use of this type of probe.
	EGABI1.3-150 601-932 *0-1000 µm* *0-40 mils*	0-50 µm : 0.5 µm 50-1000 µm : 1 % *0-50 µm : 0.15 µm* *50-1000 µm : 0.3 %*	ø : 16 mm (630 mils) min. ø : 2 mm (80 mils) *ø : 35 mm (1.4“)* *min. ø : 9 mm (350 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *PVD coated* yes	6.5 mm (0.26“) *5.5 mm (0.22“)* 320 mm (12.6“)	Single pole probe for inside measurement applications with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Suitable for measurements in bore holes, pipes or grooves. To obtain the smallest possible measurement uncertainty, externally triggered measurement acquisition should be used when measuring small inside diameters to prevent measurement errors. Smallest permissible inside diameter: 9 mm (0.36“). Maximum insertion depth: 150 mm (6“).
	EGABI1.3-260 601-961 *0-1000 µm* *0-40 mils*	0-50 µm : 0.5 µm 50-1000 µm : 1 % *0-50 µm : 0.15 µm* *50-1000 µm : 0.3 %*	ø : 16 mm (630 mils) min. ø : 2 mm (80 mils) *ø : 35 mm (1.4“)* *min. ø : 9 mm (350 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *PVD coated* yes	6.5 mm (0.26“) *5.5 mm (0.22“)* 430 mm (17“)	Single pole probe for inside measurement applications with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Suitable for measurements in bore holes, pipes or grooves. To obtain the smallest possible measurement uncertainty, externally triggered measurement acquisition should be used when measuring small inside diameters to prevent measurement errors. Smallest permissible inside diameter: 9 mm (0.36“). Maximum insertion depth: 260 mm (10“).
	EGAB1.3-SD 602-107 *0-2000 µm* *0-80 mils*	0-50 µm : 0.5 µm 50-1000 µm : 1 % 1000-2000 µm : < 3 % *0-100 µm : 0.5 µm* *100-2000 µm : 0.5 %*	only for flat specimen *only for flat specimen*	ø : 8 mm (320 mils) min. ø : 8 mm (320 mils) *D : 0.2 mm (8 mils)*	flat: ø 8 mm (320 mils) *Polyamide* no	--- *18 mm (0.7“)* 100 mm (4“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). The flat surface probe tip is especially suited for soft coatings (screen printing material, soft plastic material, etc.). For the measurement of nonferrous metal coatings on steel or iron. The surface to be measured has to be completely clean. Any foreign matter or dirt particles on the test surface produces measurement errors.
	V1EGA1HR34 602-109 V1EGA1HR34L 602-367 *0-1000 µm* *0-40 mils*	0-50 µm : 0.5 µm 50-1000 µm : 1 % *0-100 µm : 0.2 µm* *100-1000 µm : 0.2 %*	ø : 18 mm (700 mils) min. ø : 2 mm (80 mils) *ø : 35 mm (1.4“)* *min. ø : 7 mm (280 mils)*	ø : 6 mm (240 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.8 mm (32 mils) *Tungsten carbide* no	4.3 mm (0.17“) *4 mm (0.16“)* 120 mm (4.7“)	Single tip probe for inside measurement applications with fixed measurement system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Suitable for measurements in bore holes, pipes or grooves. To obtain the smallest possible measurement uncertainty, externally triggered measurement acquisition should be used when measuring small inside diameters to prevent measurement errors. Smallest permissible inside diameter: 7 mm (0.28“). Maximum insertion depth: 60 mm (2.4“).

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Characteristic values and technical data of probes for the magnetic induction measurement method

Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number *Measurement range*	Measurement accuracy* u_s *Measurement precision** *s*	Measurement point Ø for 10% error min. Ø *Ø for 10% error* *min. Ø*	Ø for 10% error min. Ø *D for 10% error*	Probe tip radius *Probe tip material* replaceable probe tip	Height *Diameter/width* Length (see page 24	Type of probe Application
	EGA1.3 602-118 *0-1500 µm* *0-60 mils*	0-50 µm : 0.25 µm 50-1000 µm : 0.5 % 1000-1500 µm : < 2.5 % *0-50 µm : 0.1 µm* *50-1500 µm : 0.2 %*	ø : 14 mm (550 mils) min. ø : 2 mm (80 mils) *ø : 36 mm (1.4“)* *min. ø : 10 mm (400 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *Heat treated steel* yes	--- *10 mm (0.4“)* 110 mm (4.3“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Especially well suited for coating thicknesses of ≤ 10 µm. The probe tip is subject to wear on hard and abrasive surfaces. The EGAB1.3 probe should be used for coating thicknesses > 100 µm.
	EGAW1.3 602-119 *0-1500 µm* *0-60 mils*	0-50 µm : 0.25 µm 50-1000 µm : 0.5 % 1000-1500 µm : < 2.5 % *0-50 µm : 0.1 µm* *50-1500 µm : 0.2 %*	ø : 14 mm (550 mils) min. ø : 1 mm (40 mils) *ø : 36 mm (1.4“)* *min. ø : 18 mm (700 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *Heat treated steel* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip right angle probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Especially well suited for coating thicknesses of ≤ 10 µm (0.4 mil) in pipes, bore holes, recesses, etc. The probe tip is subject to wear on hard and abrasive surfaces. The EGAWB1.3 probe should be used for coating thicknesses > 100 µm (4 mils).
	EGAB1.3 601-793 EGAB1.3.L 602-794 EGAB1.3.T 602-359 *0-2000 µm* *0-80 mils*	0-100 µm : 0.5 µm 100-1000 µm : 0.5 % 1000-2000 µm : < 3 % *0-50 µm : 0.1 µm* *50-2000 µm : 0.2 %*	ø : 18 mm (700 mils) min. ø : 2 mm (80 mils) *ø : 35 mm (1.4“)* *min. ø : 10 mm (400 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *PVD coated* yes	--- *10 mm (0.4“)* 110 mm (4.3“	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Most commonly used probe for electroplated metal and organic coatings. For the measurement of nonferrous metal coatings on steel or iron. Scatter of the measuring values on rough (for example: grit blasted) surfaces is however relatively high. Double pole probes should be used in such instances if the geometry of the parts permits the use of this type of probe.
	EGABW1.3 601-964 EGABW1.3.L 602-925 *0-2000 µm* *0-80 mils*	0-100 µm : 0.5 µm 100-1000 µm : 0.5 % 1000-2000 µm : < 3 % *0-50 µm : 0.1 µm* *50-2000 µm : 0.2 %*	ø : 16 mm (640 mils) min. ø : 1 mm (40 mils) *ø : 35 mm (1.4“)* *min. ø : 18 mm (720 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *PVD coated* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip right angle probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Most commonly used probe for electroplated metal and organic coatings in pipes, bore holes, recesses, etc. Scatter of the measuring values on rough (for example: grit blasted) surfaces is however relatively high. Double pole probes should be used in such instances if the geometry of the parts permits the use of this type of probe.
	EGABI1.3-150 601-932 *0-1000 µm* *0-40 mils*	0-50 µm : 0.5 µm 50-1000 µm : 1 % *0-50 µm : 0.15 µm* *50-1000 µm : 0.3 %*	ø : 16 mm (630 mils) min. ø : 2 mm (80 mils) *ø : 35 mm (1.4“)* *min. ø : 9 mm (350 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *PVD coated* yes	6.5 mm (0.26“) *5.5 mm (0.22“)* 320 mm (12.6“)	Single pole probe for inside measurement applications with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Suitable for measurements in bore holes, pipes or grooves. To obtain the smallest possible measurement uncertainty, externally triggered measurement acquisition should be used when measuring small inside diameters to prevent measurement errors. Smallest permissible inside diameter: 9 mm (0.36“). Maximum insertion depth: 150 mm (6“).
	EGABI1.3-260 601-961 *0-1000 µm* *0-40 mils*	0-50 µm : 0.5 µm 50-1000 µm : 1 % *0-50 µm : 0.15 µm* *50-1000 µm : 0.3 %*	ø : 16 mm (630 mils) min. ø : 2 mm (80 mils) *ø : 35 mm (1.4“)* *min. ø : 9 mm (350 mils)*	ø : 8 mm (320 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.75 mm (30 mils) *PVD coated* yes	6.5 mm (0.26“) *5.5 mm (0.22“)* 430 mm (17“)	Single pole probe for inside measurement applications with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Suitable for measurements in bore holes, pipes or grooves. To obtain the smallest possible measurement uncertainty, externally triggered measurement acquisition should be used when measuring small inside diameters to prevent measurement errors. Smallest permissible inside diameter: 9 mm (0.36“). Maximum insertion depth: 260 mm (10“).
	EGAB1.3-SD 602-107 *0-2000 µm* *0-80 mils*	0-50 µm : 0.5 µm 50-1000 µm : 1 % 1000-2000 µm : < 3 % *0-100 µm : 0.5 µm* *100-2000 µm : 0.5 %*	only for flat specimen *only for flat specimen*	ø : 8 mm (320 mils) min. ø : 8 mm (320 mils) *D : 0.2 mm (8 mils)*	flat: ø 8 mm (320 mils) *Polyamide* no	--- *18 mm (0.7“)* 100 mm (4“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). The flat surface probe tip is especially suited for soft coatings (screen printing material, soft plastic material, etc.). For the measurement of nonferrous metal coatings on steel or iron. The surface to be measured has to be completely clean. Any foreign matter or dirt particles on the test surface produces measurement errors.
	V1EGA1HR34 602-109 V1EGA1HR34L 602-367 *0-1000 µm* *0-40 mils*	0-50 µm : 0.5 µm 50-1000 µm : 1 % *0-100 µm : 0.2 µm* *100-1000 µm : 0.2 %*	ø : 18 mm (700 mils) min. ø : 2 mm (80 mils) *ø : 35 mm (1.4“)* *min. ø : 7 mm (280 mils)*	ø : 6 mm (240 mils) min. ø : 2 mm (80 mils) *D : 0.2 mm (8 mils)*	0.8 mm (32 mils) *Tungsten carbide* no	4.3 mm (0.17“) *4 mm (0.16“)* 120 mm (4.7“)	Single tip probe for inside measurement applications with fixed measurement system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Suitable for measurements in bore holes, pipes or grooves. To obtain the smallest possible measurement uncertainty, externally triggered measurement acquisition should be used when measuring small inside diameters to prevent measurement errors. Smallest permissible inside diameter: 7 mm (0.28“). Maximum insertion depth: 60 mm (2.4“).

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Characteristic values and technical data of probes for the magnetic induction measurement method

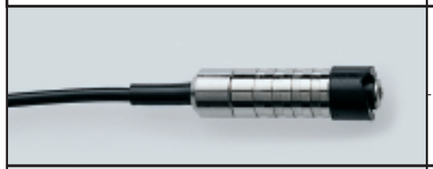
Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number *Measurement range*	Measurement accuracy* u_s *Measurement precision* *s*	Measurement point Ø for 10% error min. Ø *Ø for 10% error* *min. Ø*	Ø for 10% error min. Ø *D for 10% error*	Probe tip radius *Probe tip material* replaceable probe tip	Height *Diameter/width* Length (see page 24)	Type of probe Application
	EGA2H 602-121 EGA2HF 602-754 *0-1500 µm* *0-60 mils*	0-50 µm : 0.25 µm 50-500 µm : 0.5 % 500-1500 µm : < 1 % *0-50 µm : 0.15 µm* *50-1500 µm : 0.3 %*	ø : 25 mm (990 mils) min. ø : 2 mm (80 mils) *ø : 34 mm (1.3“)* *min. ø : 22 mm (870 mils)*	ø : 15 mm (590 mils) min. ø : 2 mm (80 mils) ø : 15 mm (590 mils) min. ø : 2 mm (80 mils)	2.25 mm (88 mils) *Tungsten carbide* yes	--- *13 mm (0.5“)* 80 mm (3.2“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Due to the larger probe tip diameter better suited for rough surfaces than the EGAB1.3 probe.
	EGAW2H 602-122 *0-1500 µm* *0-60 mils*	0-50 µm : 0.25 µm 50-500 µm : 0.5 % 500-1500 µm : < 1 % *0-50 µm : 0.15 µm* *50-1500 µm : 0.3 %*	ø : 25 mm (990 mils) min. ø : 2 mm (80 mils) *ø : 34 mm (1.3“)* *min. ø : 18 mm (700 mils)*	ø : 15 mm (590 mils) min. ø : 2 mm (80 mils) *D : 0.4 mm (16 mils)*	2.25 mm (88 mils) *Tungsten carbide* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Due to the larger probe tip diameter better suited for rough surfaces than the EGABW1.3 probe.
	EGB2 602-023 *0-5 mm* *0-200 mils*	0-0,2 mm : 0.002 mm 0,2-3 mm : 1 % 3-5 mm : < 5 % *0-0,2 mm : 0.0005 mm* *0,2-5 mm : 0.3 %*	ø : 30 mm (1.2“) min. ø : 2 mm (80 mils) *ø : 40 mm (1.6“)* *min. ø : 9 mm (350 mils)*	ø : 12 mm (470 mils) min. ø : 2 mm (80 mils) *D : 0.25 mm (10 mils)*	1.0 mm (40 mils) *PVD coated* yes	--- *10 mm (0.4“)* 110 mm (4.3“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Has the largest measurement range of all single tip probes. Due to unshielded magnetic field larger geometric influence, however smaller tilting effect.
	EGBW2 602-024 *0-5 mm* *0-200 mils*	0-0,2 mm : 0.002 mm 0,2-3 mm : 1 % 3-5 mm : < 5 % *0-0,2 mm : 0.0005 mm* *0,2-5 mm : 0.3 %*	ø : 30 mm (1.2“) min. ø : 2 mm (80 mils) *ø : 40 mm (1.6“)* *min. ø : 18 mm (700 mils)*	ø : 12 mm (470 mils) min. ø : 2 mm (80 mils) *D : 0.25 mm (10 mils)*	1.0 mm (40 mils) *PVD coated* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip angle probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Same as EGB2 probe, however preferably used for measurements in pipes, bore holes or recesses.
	EK4 602-123 *0-2000 µm* *0-80 mils*	0-100 µm : 1 µm 100-2000 µm : 1 % *0-25 µm : 0.1 µm* *25-2000 µm : 0.4 %*	ø : 22 mm (870 mils) min. ø : 2 mm (80 mils) *ø : 38 mm (1.5“)* *min. ø : 13 mm (510 mils)*	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils) *D : 0.4 mm (16 mils)*	1.25 mm (49 mils) *Heat treated steel* yes	21 mm (0.8“) *12 mm (0.5“)* 18 mm (0.7“)	Double pole probe for angular measurements with fixed measurement system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Double pole probe producing the lowest possible measurement uncertainty. The uncoated probe tips make this probe especially suited for thin coatings (for example: lubricant and phosphate coatings). Greater measuring precision on rough surfaces than single tip probes, however faster probe tip wear than with EKB4 probe.
	EKB4 602-108 *0-2000 µm* *0-80 mils*	0-100 µm : 0.5 µm 100-2000 µm : 0.5 % *0-50 µm : 0.15 µm* *50-2000 µm : 0.3 %*	ø : 20 mm (800 mils) min. ø : 2 mm (80 mils) *ø : 38 mm (1.5“)* *min. ø : 13 mm (510 mils)*	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils) *D : 0.4 mm (16 mils)*	1.25 mm (49 mils) *PVD coated* yes	21 mm (0.8“) *12 mm (0.5“)* 18 mm (0.7“)	Double pole probe for angular measurements with fixed measurement system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Well suited for thin coatings. Higher measurement precision on rough surfaces than single pole probes.
	V1EKB4 602-126 *0-2000 µm* *0-80 mils*	0-100 µm : 0.5 µm 100-2000 µm : 0.5 % *0-50 µm : 0.15 µm* *50-2000 µm : 0.3 %*	ø : 20 mm (800 mils) min. ø : 2 mm (80 mils) *ø : 38 mm (1.5“)* *min. ø : 20 mm (800 mils)*	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils) *D : 0.4 mm (16 mils)*	1.25 mm (49 mils) *PVD coated* yes	--- *8.5 mm (0.3“)* 300 mm (11.8“)	Double pole probe for inside measurements with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Suitable for measurement in bore holes, pipes or grooves. Greater measuring precision on rough surfaces than with EGABI1.3-150 (260) probe. Smallest permissible inside diameter: 8.5 mm (0.34“) Maximum insertion depth: 185 mm (7.4“)
	V7EK4 602-582 V7EK4L 602-605 *0-2000 µm* *0-80 mils*	0-100 µm : 1.5 µm 100-2000 µm : 1.5 % *0-25 µm : 0.1 µm* *25-2000 µm : 0.4 %*	ø : 22 mm (870 mils) min. ø : 2 mm (80 mils) *ø : 38 mm (1.5“)* *min. ø : 20 mm (800 mils)*	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils) *D : 0.4 mm (16 mils)*	1.25 mm (49 mils) *Heat treated steel* yes	--- *20 mm (0.8“)* 70 mm (2.8“)	Axial double-tip measurement probe with spring-loaded measuring element. Measures nonferrous and nonmetal coatings on steel or iron (NE, Iso/Fe). Especially well suited for thin layers (phosphorous coatings) because of uncoated probe tips. Higher repeatability than single tip probes when measuring rough surfaces. Spring loaded measuring system allows exact positioning and constant pressure force, which is advantageous for measuring weak coatings.

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Characteristic values and technical data of probes for the magnetic induction measurement method

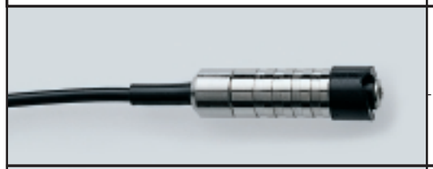
Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number *Measurement range*	Measurement accuracy* u_s *Measurement precision* *s*	Measurement point Ø for 10% error min. Ø *Ø for 10% error* *min. Ø*	Ø for 10% error min. Ø *D for 10% error*	Probe tip radius *Probe tip material* replaceable probe tip	Height *Diameter/width* Length (see page 24)	Type of probe Application
	EGA2H 602-121 EGA2HF 602-754 *0-1500 µm* *0-60 mils*	0-50 µm : 0.25 µm 50-500 µm : 0.5 % 500-1500 µm : < 1 % *0-50 µm : 0.15 µm* *50-1500 µm : 0.3 %*	ø : 25 mm (990 mils) min. ø : 2 mm (80 mils) *ø : 34 mm (1.3“)* *min. ø : 22 mm (870 mils)*	ø : 15 mm (590 mils) min. ø : 2 mm (80 mils) ø : 15 mm (590 mils) min. ø : 2 mm (80 mils)	2.25 mm (88 mils) *Tungsten carbide* yes	--- *13 mm (0.5“)* 80 mm (3.2“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Due to the larger probe tip diameter better suited for rough surfaces than the EGAB1.3 probe.
	EGAW2H 602-122 *0-1500 µm* *0-60 mils*	0-50 µm : 0.25 µm 50-500 µm : 0.5 % 500-1500 µm : < 1 % *0-50 µm : 0.15 µm* *50-1500 µm : 0.3 %*	ø : 25 mm (990 mils) min. ø : 2 mm (80 mils) *ø : 34 mm (1.3“)* *min. ø : 18 mm (700 mils)*	ø : 15 mm (590 mils) min. ø : 2 mm (80 mils) *D : 0.4 mm (16 mils)*	2.25 mm (88 mils) *Tungsten carbide* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Due to the larger probe tip diameter better suited for rough surfaces than the EGABW1.3 probe.
	EGB2 602-023 *0-5 mm* *0-200 mils*	0-0,2 mm : 0.002 mm 0,2-3 mm : 1 % 3-5 mm : < 5 % *0-0,2 mm : 0.0005 mm* *0,2-5 mm : 0.3 %*	ø : 30 mm (1.2“) min. ø : 2 mm (80 mils) *ø : 40 mm (1.6“)* *min. ø : 9 mm (350 mils)*	ø : 12 mm (470 mils) min. ø : 2 mm (80 mils) *D : 0.25 mm (10 mils)*	1.0 mm (40 mils) *PVD coated* yes	--- *10 mm (0.4“)* 110 mm (4.3“)	Axial single tip probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Has the largest measurement range of all single tip probes. Due to unshielded magnetic field larger geometric influence, however smaller tilting effect.
	EGBW2 602-024 *0-5 mm* *0-200 mils*	0-0,2 mm : 0.002 mm 0,2-3 mm : 1 % 3-5 mm : < 5 % *0-0,2 mm : 0.0005 mm* *0,2-5 mm : 0.3 %*	ø : 30 mm (1.2“) min. ø : 2 mm (80 mils) *ø : 40 mm (1.6“)* *min. ø : 18 mm (700 mils)*	ø : 12 mm (470 mils) min. ø : 2 mm (80 mils) *D : 0.25 mm (10 mils)*	1.0 mm (40 mils) *PVD coated* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip angle probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Same as EGB2 probe, however preferably used for measurements in pipes, bore holes or recesses.
	EK4 602-123 *0-2000 µm* *0-80 mils*	0-100 µm : 1 µm 100-2000 µm : 1 % *0-25 µm : 0.1 µm* *25-2000 µm : 0.4 %*	ø : 22 mm (870 mils) min. ø : 2 mm (80 mils) *ø : 38 mm (1.5“)* *min. ø : 13 mm (510 mils)*	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils) *D : 0.4 mm (16 mils)*	1.25 mm (49 mils) *Heat treated steel* yes	21 mm (0.8“) *12 mm (0.5“)* 18 mm (0.7“)	Double pole probe for angular measurements with fixed measurement system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Double pole probe producing the lowest possible measurement uncertainty. The uncoated probe tips make this probe especially suited for thin coatings (for example: lubricant and phosphate coatings). Greater measuring precision on rough surfaces than single tip probes, however faster probe tip wear than with EKB4 probe.
	EKB4 602-108 *0-2000 µm* *0-80 mils*	0-100 µm : 0.5 µm 100-2000 µm : 0.5 % *0-50 µm : 0.15 µm* *50-2000 µm : 0.3 %*	ø : 20 mm (800 mils) min. ø : 2 mm (80 mils) *ø : 38 mm (1.5“)* *min. ø : 13 mm (510 mils)*	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils) *D : 0.4 mm (16 mils)*	1.25 mm (49 mils) *PVD coated* yes	21 mm (0.8“) *12 mm (0.5“)* 18 mm (0.7“)	Double pole probe for angular measurements with fixed measurement system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Well suited for thin coatings. Higher measurement precision on rough surfaces than single pole probes.
	V1EKB4 602-126 *0-2000 µm* *0-80 mils*	0-100 µm : 0.5 µm 100-2000 µm : 0.5 % *0-50 µm : 0.15 µm* *50-2000 µm : 0.3 %*	ø : 20 mm (800 mils) min. ø : 2 mm (80 mils) *ø : 38 mm (1.5“)* *min. ø : 20 mm (800 mils)*	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils) *D : 0.4 mm (16 mils)*	1.25 mm (49 mils) *PVD coated* yes	--- *8.5 mm (0.3“)* 300 mm (11.8“)	Double pole probe for inside measurements with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Suitable for measurement in bore holes, pipes or grooves. Greater measuring precision on rough surfaces than with EGABI1.3-150 (260) probe. Smallest permissible inside diameter: 8.5 mm (0.34“) Maximum insertion depth: 185 mm (7.4“)
	V7EK4 602-582 V7EK4L 602-605 *0-2000 µm* *0-80 mils*	0-100 µm : 1.5 µm 100-2000 µm : 1.5 % *0-25 µm : 0.1 µm* *25-2000 µm : 0.4 %*	ø : 22 mm (870 mils) min. ø : 2 mm (80 mils) *ø : 38 mm (1.5“)* *min. ø : 20 mm (800 mils)*	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils) *D : 0.4 mm (16 mils)*	1.25 mm (49 mils) *Heat treated steel* yes	--- *20 mm (0.8“)* 70 mm (2.8“)	Axial double-tip measurement probe with spring-loaded measuring element. Measures nonferrous and nonmetal coatings on steel or iron (NE, Iso/Fe). Especially well suited for thin layers (phosphorous coatings) because of uncoated probe tips. Higher repeatability than single tip probes when measuring rough surfaces. Spring loaded measuring system allows exact positioning and constant pressure force, which is advantageous for measuring weak coatings.

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Characteristic values and technical data of probes for the magnetic induction measurement method

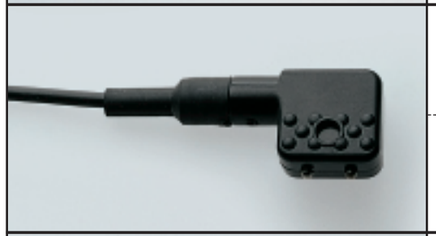
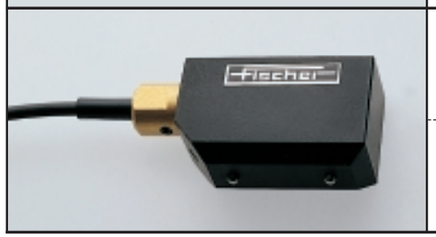
Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number	Measurement accuracy* u_s	Measurement point Ø for 10% error min. Ø	Ø for 10% error min. Ø	Probe tip radius	Height	Type of probe Application
	Measurement range	*Measurement precision* *s*	*Ø for 10% error* *min. Ø*	*D for 10% error*	Probe tip material	*Diameter/width*	
					replaceable probe tip	Length (see page 24)	
	V7EKB4 602-583 V7EKB4L 602-606	0-100 µm : 1 µm 100-2000 µm : 1 %	ø : 20 mm (800 mils) min. ø : 2 mm (80 mils)	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils)	1.25 mm (49 mils)	---	Axial double tip measurement probe with spring-loaded measuring system. Measurement of nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Higher measurement precision on rough surfaces than single tip probes. Spring-loaded measuring system provides better positioning and constant pressure force (advantageous for measuring soft coatings).
	0-2000 µm *0-80 mils*	*0-50 µm : 0.15 µm* *50-2000 µm : 0.3 %*	*ø : 38 mm (1.5“)* *min. ø : 20 mm (800 mils)*	*D : 0.4 mm (16 mils)*	*PVD coated*	*20 mm (0.8“)*	
					yes	70 mm (2.8“)	
	EKB10 602-225	0-0.5 mm : 0.005 mm 0.5-8 mm : 1 %	ø : 50 mm (2“) min. ø : 2 mm (80 mils)	ø : 30 mm (1.2“) min. ø : 20 mm (800 mils)	1.5 mm (60 mils)	27 mm (1.1“)	Double pole probe for angular measurements with fixed measurement system. Especially well suited for thick coatings. Greater measuring precision on rough surfaces than single pole probes.
	0-8 mm *0-320 mils*	*0-0.5 mm : 0.0025 mm* *0.5-8 mm : 0.5 %*	*ø : 75 mm (3“)* *min. ø : 24 mm (950 mils)*	*D : 0.5 mm (20 mils)*	*PVD coated*	*14 mm (0.5“)*	
					yes	50 mm (2“)	
	EKB10-OD 602-165 EKB10L-OD 602-760	0-0.5 mm : 0.005 mm 0.5-8 mm : 1 %	ø : 50 mm (2“) min. ø : 2 mm (80 mils)	ø : 30 mm (1.2“) min. ø : 38 mm (1.5“)	flat: 34 x 24 mm (1300 x 950 mils)	26 mm (1.0“)	Double pole probe for angular measurements with fixed measurement system. The large flat contact surface is especially well suited for thick and compressible soft coatings (for example rubber sheeting for offset printing).
	0-8 mm *0-320 mils*	*0-0.5 mm : 0.0015 mm* *0.5-8 mm : 0.3 %*	∞ ∞	*D : 0.5 mm (20 mils)*	*Polyamide*	*24 mm (1.0“)*	
					no	53 mm (2.1“)	
	V1EKB10 602-676	0-0.5 mm : 0.01 mm 0.5-8 mm : 2 %	ø : 50 mm (2“) min. ø : 2 mm (80 mils)	ø : 30 mm (1.2“) min. ø : 20 mm (800 mils)	1.5 mm (60 mils)	---	Double pole probe for angular measurements with spring-loaded measuring system. Suitable for thick coatings in bore holes, pipes, or recesses. Greater measuring precision on rough surfaces than with single pole probes. Externally triggered measurement acquisition should be used with small inside diameters to prevent measurement errors. Smallest permissible inside diameter: 13 mm (0.5“) Maximum insertion depth : 260 mm (10“)
	0-8 mm *0-320 mils*	*0-0.5 mm : 0.0025 mm* *0.5-8 mm : 0.5 %*	*ø : 75 mm (3“)* *min. ø : 24 mm (950 mils)*	*D : 0.5 mm (20 mils)*	*PVD coated*	*13 mm (0.5“)*	
					yes	380 mm (15“)	
	EKB25 601-952 EKB25L 602-913	0-1 mm : 0.02 mm 1-7 mm : 2 % 7-15 mm : < 5 %	ø : 60 mm (2.4“) min. ø : 10 mm (400 mils)	ø : 50 mm (2“) min. ø : 40 mm (1.6“)	1.5 mm (60 mils)	33 mm (1.3“)	Double pole probe for angular measurements with fixed measurement system. Especially suited for thick, nonmetallic coatings.
	0-15 mm *0-590 mils*	*0-0.5 mm : 0.01 mm* *0.5-15 mm : 2 %*	*ø : 85 mm (3.3“)* *min. ø : 20 mm (800 mils)*	*D : 0.7 mm (28 mils)*	*PVD coated*	*20 mm (0.8“)*	
					yes	65 mm (2.6“)	

Note concerning the application of probes using the magnetic induction measurement method:
Please consult with the manufacturer before measuring electrically conducting coatings with thicknesses > 500 µm (20 mils).

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Characteristic values and technical data of probes for the magnetic induction measurement method

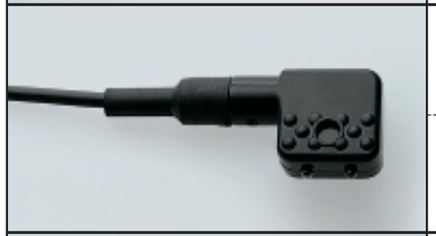
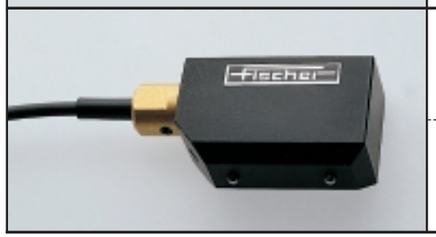
Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number	Measurement accuracy* u_s	Measurement point Ø for 10% error min. Ø	Ø for 10% error min. Ø	Probe tip radius	Height	Type of probe Application
	Measurement range	*Measurement precision* *s*	*Ø for 10% error* *min. Ø*	*D for 10% error*	Probe tip material	*Diameter/width*	
					replaceable probe tip	Length (see page 24)	
	V7EKB4 602-583 V7EKB4L 602-606	0-100 µm : 1 µm 100-2000 µm : 1 %	ø : 20 mm (800 mils) min. ø : 2 mm (80 mils)	ø : 30 mm (1.2“) min. ø : 15 mm (590 mils)	1.25 mm (49 mils)	---	Axial double tip measurement probe with spring-loaded measuring system. Measurement of nonferrous- and nonmetal coatings on steel or iron substrate (NF, Iso/Fe). Higher measurement precision on rough surfaces than single tip probes. Spring-loaded measuring system provides better positioning and constant pressure force (advantageous for measuring soft coatings).
	0-2000 µm *0-80 mils*	*0-50 µm : 0.15 µm* *50-2000 µm : 0.3 %*	*ø : 38 mm (1.5“)* *min. ø : 20 mm (800 mils)*	*D : 0.4 mm (16 mils)*	*PVD coated*	*20 mm (0.8“)*	
					yes	70 mm (2.8“)	
	EKB10 602-225	0-0.5 mm : 0.005 mm 0.5-8 mm : 1 %	ø : 50 mm (2“) min. ø : 2 mm (80 mils)	ø : 30 mm (1.2“) min. ø : 20 mm (800 mils)	1.5 mm (60 mils)	27 mm (1.1“)	Double pole probe for angular measurements with fixed measurement system. Especially well suited for thick coatings. Greater measuring precision on rough surfaces than single pole probes.
	0-8 mm *0-320 mils*	*0-0.5 mm : 0.0025 mm* *0.5-8 mm : 0.5 %*	*ø : 75 mm (3“)* *min. ø : 24 mm (950 mils)*	*D : 0.5 mm (20 mils)*	*PVD coated*	*14 mm (0.5“)*	
					yes	50 mm (2“)	
	EKB10-OD 602-165 EKB10L-OD 602-760	0-0.5 mm : 0.005 mm 0.5-8 mm : 1 %	ø : 50 mm (2“) min. ø : 2 mm (80 mils)	ø : 30 mm (1.2“) min. ø : 38 mm (1.5“)	flat: 34 x 24 mm (1300 x 950 mils)	26 mm (1.0“)	Double pole probe for angular measurements with fixed measurement system. The large flat contact surface is especially well suited for thick and compressible soft coatings (for example rubber sheeting for offset printing).
	0-8 mm *0-320 mils*	*0-0.5 mm : 0.0015 mm* *0.5-8 mm : 0.3 %*	∞ ∞	*D : 0.5 mm (20 mils)*	*Polyamide*	*24 mm (1.0“)*	
					no	53 mm (2.1“)	
	V1EKB10 602-676	0-0.5 mm : 0.01 mm 0.5-8 mm : 2 %	ø : 50 mm (2“) min. ø : 2 mm (80 mils)	ø : 30 mm (1.2“) min. ø : 20 mm (800 mils)	1.5 mm (60 mils)	---	Double pole probe for angular measurements with spring-loaded measuring system. Suitable for thick coatings in bore holes, pipes, or recesses. Greater measuring precision on rough surfaces than with single pole probes. Externally triggered measurement acquisition should be used with small inside diameters to prevent measurement errors. Smallest permissible inside diameter: 13 mm (0.5“) Maximum insertion depth : 260 mm (10“)
	0-8 mm *0-320 mils*	*0-0.5 mm : 0.0025 mm* *0.5-8 mm : 0.5 %*	*ø : 75 mm (3“)* *min. ø : 24 mm (950 mils)*	*D : 0.5 mm (20 mils)*	*PVD coated*	*13 mm (0.5“)*	
					yes	380 mm (15“)	
	EKB25 601-952 EKB25L 602-913	0-1 mm : 0.02 mm 1-7 mm : 2 % 7-15 mm : < 5 %	ø : 60 mm (2.4“) min. ø : 10 mm (400 mils)	ø : 50 mm (2“) min. ø : 40 mm (1.6“)	1.5 mm (60 mils)	33 mm (1.3“)	Double pole probe for angular measurements with fixed measurement system. Especially suited for thick, nonmetallic coatings.
	0-15 mm *0-590 mils*	*0-0.5 mm : 0.01 mm* *0.5-15 mm : 2 %*	*ø : 85 mm (3.3“)* *min. ø : 20 mm (800 mils)*	*D : 0.7 mm (28 mils)*	*PVD coated*	*20 mm (0.8“)*	
					yes	65 mm (2.6“)	

Note concerning the application of probes using the magnetic induction measurement method:
Please consult with the manufacturer before measuring electrically conducting coatings with thicknesses > 500 µm (20 mils).

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Characteristic values and technical data of probes for the eddy current measuring method

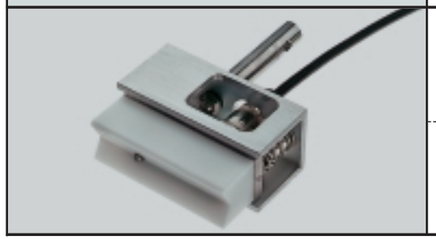
Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number	**Measurement accuracy* u_s**	Measurement point: **Ø for 10% error min. Ø**	**Ø for 10% error min. Ø**	**Probe tip radius**	**Height**	**Type of probe Application**
	Measurement range	***Measurement precision* s***	***Ø for 10% error min. Ø***	***D for 10% error***	**Probe tip material**	***Diameter/width***	
					replaceable probe tip	**Length (see page 24)**	
	EK50 602-127 EK50L 602-923	0-1 mm : 0.05 mm 1-10 mm : 5 % 10-30 mm : < 7 %	ø : 100 mm (4“) min. ø : 10 mm (400 mils)	ø : 84 mm (3.3“) min. ø : 70 mm (2.8“)	2.5 mm (98 mils) *Heat treated steel* yes	33 mm (1.3“) *20 mm (0.8“)* 95 mm (3.7“)	Double pole probe for angular measurements with fixed measurement system. Especially suited for very thick, nonmetallic coatings. For austenitic stainless steel coatings smaller measurement errors due to ferromagnetic delta ferrite content than with all other types of probes.
	0-30 mm *0-1200 mils*	*0-1 mm : 0.02 mm* *1-30 mm : 2%*	*ø : 140 mm (5.5“)* *min. ø : 14 mm (550 mils)*	*D : 1.2 mm (47 mils)*			
	EGA06H 602-936 EGA06H-L 602-626	0-50 µm : 0.3 µm 50-700 µm : < 2 %	ø : 18 mm (720 mils) min. ø : 1 mm (40 mils)	ø : 5 mm (200 mils) min. ø : 2 mm (80 mils)	0.3 mm (12 mils) *Tungsten carbide* no	110 mm (4.4“) *13 mm (0.52“)* ---	Axial single tip measurement probe with spring-loaded measuring system. Measures electrically nonconducting or nonferrous coatings on steel or iron (NF/Fe). Mechanical design especially suited for installation in customer-specific probe fixtures or guide devices for precise probe positioning.
	0-700 µm *0-28 mils*	*0-50 µm : 0.1 µm* *50-700 µm : < 0.3 %*	*ø : 30 mm (1.2“)* *min. ø : 20 mm (800 mils)*	*D : 0.25 mm (10 mils)*			
	EGA06H-MC 603-092	0-70 µm : 0.3 µm 70-700 µm : < 2 %	ø : 18 mm (720 mils) min. ø : 1 mm (40 mils)	ø : 5 mm (200 mils) min. ø : 2 mm (80 mils)	0.3 mm (12 mils) *Tungsten carbide* no	110 mm (4.4“) *13 mm (0.52“)* ---	Axial single tip measurement probe with spring-loaded measuringt system. Measures electrically nonconducting or nonferrous coatings on steel or iron (NF/Fe). Mechanical design especially suited for installation in customer-specific probe fixtures or guide devices for precise probe positioning.
	0-700 µm *0-28 mils*	*0-70 µm : 0.08 µm* *70-700 µm : < 0.08 %*	*ø : 30 mm (1.2“)* *min. ø : 20 mm (800 mils)*	*D : 0.25 mm (10 mils)*			
	V2EGA06H 603-112	0-50 µm : 0.3 µm 50-700 µm : < 2 %	ø : 18 mm (720 mils) min. ø : 1 mm (40 mils)	ø : 5 mm (200 mils) min. ø : 2 mm (80 mils)	0.3 mm (12 mils) *Tungsten carbide* no	--- *10 mm (0.4“)* 110 mm (4.4“)	Measures electrically nonconducting or nonferrous metal coatings on steel or iron (NF/Fe). Measuring element same as with EGA06H probe. Especially well suited for the integration in automated measurement systems. No measurement tip wear even after several million measurement cycles when used properly. Suited for cylindrical specimen with diameter range 8 to 25 mm. (0.32“ to 1“). Other diameters on request.
	0-700 µm *0-28 mils*	*0-50 µm : 0.1 µm* *50-700 µm : < 0.3 %*	---	*D : 0.25 mm (10 mils)*			

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Characteristic values and technical data of probes for the eddy current measuring method

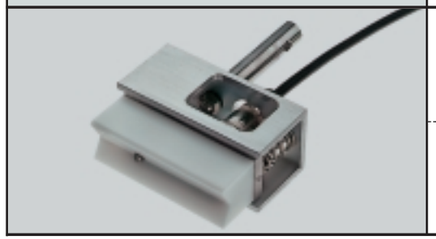
Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number	**Measurement accuracy* u_s**	Measurement point: **Ø for 10% error min. Ø**	**Ø for 10% error min. Ø**	**Probe tip radius**	**Height**	**Type of probe Application**
	Measurement range	***Measurement precision* s***	***Ø for 10% error min. Ø***	***D for 10% error***	**Probe tip material**	***Diameter/width***	
					replaceable probe tip	**Length (see page 24)**	
	EK50 602-127 EK50L 602-923	0-1 mm : 0.05 mm 1-10 mm : 5 % 10-30 mm : < 7 %	ø : 100 mm (4“) min. ø : 10 mm (400 mils)	ø : 84 mm (3.3“) min. ø : 70 mm (2.8“)	2.5 mm (98 mils) *Heat treated steel* yes	33 mm (1.3“) *20 mm (0.8“)* 95 mm (3.7“)	Double pole probe for angular measurements with fixed measurement system. Especially suited for very thick, nonmetallic coatings. For austenitic stainless steel coatings smaller measurement errors due to ferromagnetic delta ferrite content than with all other types of probes.
	0-30 mm *0-1200 mils*	*0-1 mm : 0.02 mm* *1-30 mm : 2%*	*ø : 140 mm (5.5“)* *min. ø : 14 mm (550 mils)*	*D : 1.2 mm (47 mils)*			
	EGA06H 602-936 EGA06H-L 602-626	0-50 µm : 0.3 µm 50-700 µm : < 2 %	ø : 18 mm (720 mils) min. ø : 1 mm (40 mils)	ø : 5 mm (200 mils) min. ø : 2 mm (80 mils)	0.3 mm (12 mils) *Tungsten carbide* no	110 mm (4.4“) *13 mm (0.52“)* ---	Axial single tip measurement probe with spring-loaded measuring system. Measures electrically nonconducting or nonferrous coatings on steel or iron (NF/Fe). Mechanical design especially suited for installation in customer-specific probe fixtures or guide devices for precise probe positioning.
	0-700 µm *0-28 mils*	*0-50 µm : 0.1 µm* *50-700 µm : < 0.3 %*	*ø : 30 mm (1.2“)* *min. ø : 20 mm (800 mils)*	*D : 0.25 mm (10 mils)*			
	EGA06H-MC 603-092	0-70 µm : 0.3 µm 70-700 µm : < 2 %	ø : 18 mm (720 mils) min. ø : 1 mm (40 mils)	ø : 5 mm (200 mils) min. ø : 2 mm (80 mils)	0.3 mm (12 mils) *Tungsten carbide* no	110 mm (4.4“) *13 mm (0.52“)* ---	Axial single tip measurement probe with spring-loaded measuringt system. Measures electrically nonconducting or nonferrous coatings on steel or iron (NF/Fe). Mechanical design especially suited for installation in customer-specific probe fixtures or guide devices for precise probe positioning.
	0-700 µm *0-28 mils*	*0-70 µm : 0.08 µm* *70-700 µm : < 0.08 %*	*ø : 30 mm (1.2“)* *min. ø : 20 mm (800 mils)*	*D : 0.25 mm (10 mils)*			
	V2EGA06H 603-112	0-50 µm : 0.3 µm 50-700 µm : < 2 %	ø : 18 mm (720 mils) min. ø : 1 mm (40 mils)	ø : 5 mm (200 mils) min. ø : 2 mm (80 mils)	0.3 mm (12 mils) *Tungsten carbide* no	--- *10 mm (0.4“)* 110 mm (4.4“)	Measures electrically nonconducting or nonferrous metal coatings on steel or iron (NF/Fe). Measuring element same as with EGA06H probe. Especially well suited for the integration in automated measurement systems. No measurement tip wear even after several million measurement cycles when used properly. Suited for cylindrical specimen with diameter range 8 to 25 mm. (0.32“ to 1“). Other diameters on request.
	0-700 µm *0-28 mils*	*0-50 µm : 0.1 µm* *50-700 µm : < 0.3 %*	---	*D : 0.25 mm (10 mils)*			

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Characteristic values and technical data of probes for the eddy current measuring method

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Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number *Measurement range*	Measurement accuracy* u_s *Measurement precision** *s*	Measurement point Ø for 10% error min. Ø *Ø for 10% error* *min. Ø*	Ø for 10% error min. Ø *D for 10% error*	Probe tip radius Probe tip material replaceable probe tip	Height *Diameter/width* Length (see page 24)	Type of probe Application
	ETA3.3H 602-128 ETA3.3HL 602-799 *0-1200 µm* *0-45 mils*	0-50 µm : 0.25 µm 50-800 µm : 0.5 % 800-1200 µm : < 2 % *0-50 µm : 0.15 µm* *50-1200 µm : 0.3 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) *ø : 50 mm (2“)* *min. ø : 30 mm (1.2“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	1.2 mm (47 mils) *Tungsten carbide* yes	--- *18 mm (0.7“)* 70 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Highly impact- and shatter resistant probe tip. Standard probe for paint and plastic coatings. Should not be used when surfaces exhibit a damp condition (acidic contamination of test surface).
	ETA3.3 601-797 *0-1200 µm* *0-45 mils*	0-100 µm : 0.5 µm 100-800 µm : 0.5 % 800-1200 µm : < 3 % *0-100 µm : 0.2 µm* *100-1200 µm : 0.2 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) *ø : 55 mm (2.2“)* *min. ø : 30 mm (1.2“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	1.2 mm (47 mils) *Jewel tip* yes	--- *18 mm (0.7“)* 70 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Standard probe for paint and plastic coatings, as well as for anodized coatings. Can possibly also be used when surfaces exhibit a damp condition (acidic contamination of test surface). Smaller tilting effect than with ETA3.3F probe.
	ETA3.3FG 602-623 *0-1200 µm* *0-45 mils*	0-50 µm : 0.25 µm 50-1200 µm : 0.5 % *0-50 µm : 0.1 µm* *50-1200 µm : 0.2 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) ∞ ∞	ø : 15 mm (590 mils) min. ø : 7 mm (280 mils) *D : 0.09 mm (3.5 mils)*	2.5 mm (98 mils) *Polyamide* yes	--- *18 mm (0.7“)* 70 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Especially suited for anodized coatings when surfaces exhibit a wet (acidic) contamination of the test surface. Larger tilting effect than with ETA3.3 probe.
	ETA3.3-5.6 602-645 *0-1200 µm* *0-45 mils*	0-100 µm : 0.5 µm 100-800 µm : 0.5 % 800-1200 µm : < 3 % *0-100 µm : 0.2 µm* *100-1200 µm : 0.2 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) *ø : 50 mm (2“)* *min. ø : 30 mm (1.2“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	2.8 mm (110 mils) *Jewel tip* yes	--- *18 mm (0.7“)* 70 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Due to the larger radius of the probe tip lower measurement scatter on rough surfaces than with ETA3.3 probe.
	EAW3.3 602-025 EAW3.3L 602-922 *0-1200 µm* *0-45 mils*	0-50 µm : 0.75 µm 50-1200 µm : 1.5 % *0-50 µm : 0.25 µm* *50-1200 µm : 0.5 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) *ø : 50 mm (2“)* *min. ø : 34 mm (1.6“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	1.2 mm (47 mils) *Jewel tip* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip angle probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurements on flat objects or in pipes, bore holes and recesses. Can also be used when surfaces exhibit a damp condition (acidic contamination of test surface).
	EAI3.3-150 602-026 *0-800 µm* *0-32 mils*	0-200 µm : 1 µm 200-800 µm : 0.5 % *0-100 µm : 0.3 µm* *100-800 µm : 0.3 %*	ø : 60 mm (2.4“) min. ø : 2 mm (80 mils) *ø : 55 mm (2.2“)* *min. ø : 9 mm (350 mils)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	1.2 mm (47 mils) *Jewel tip* yes	6.5 mm (0.26“) *5.5 mm (0.22“)* 320 mm (12.6“)	Single tip angle probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurements in pipes, bore holes and recesses, etc. Can possibly also be used when surfaces exhibit a wet condition (acidic contamination of test surface). To avoid positioning errors externally triggered measurement acquisition should be used.
	EA9 601-965 *0-3.5 mm* *0-140 mils*	0-0.25 mm : 0.005 mm 0.25-2.5 mm : 2 % 2.5-3.5 mm : < 3.5 % *0-1 mm : 0.002 mm* *1-3.5 mm : 0.2 %*	ø : 160 mm (6.3“) min. ø : 2 mm (80 mils) *ø : 160 mm (6.3“)* *min. ø : 40 mm (1.6“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	8 mm (320 mils) *Heat treated steel* no	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip angle probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurement of thicker plastic- or rubber coatings.
	EA30 602-027 EA30L 602-633 *0-20 mm* *0-800 mils*	0-2 mm : 0.05 mm 2-20 mm : 2.5 % *0-1 mm : 0.002 mm* *1-20 mm : 0.2 %*	ø : 1200 mm (47“) min. ø : 200 mm (7.9“) ∞ ∞	ø : 42 mm (1.6“) min. ø : 34 mm (1.3“) *D : 0.09 mm (3.5 mils)*	flat: ø 34 mm (1.3“) *Polyamide* *no*	43 mm (1.7“) *34 mm (1.3“)* 60 mm (2.4“)	Single tip angle probe with fixed measurement systems. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurement of thicker plastic- or rubber coatings. Also to measure wall thickness of, for example, plastic tanks with an aluminum backing foil. For surfaces with larger curvature a V-groove adapter shoe has to be used.

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Characteristic values and technical data of probes for the eddy current measuring method

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Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number *Measurement range*	Measurement accuracy* u_s *Measurement precision** *s*	Measurement point Ø for 10% error min. Ø *Ø for 10% error* *min. Ø*	Ø for 10% error min. Ø *D for 10% error*	Probe tip radius Probe tip material replaceable probe tip	Height *Diameter/width* Length (see page 24)	Type of probe Application
	ETA3.3H 602-128 ETA3.3HL 602-799 *0-1200 µm* *0-45 mils*	0-50 µm : 0.25 µm 50-800 µm : 0.5 % 800-1200 µm : < 2 % *0-50 µm : 0.15 µm* *50-1200 µm : 0.3 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) *ø : 50 mm (2“)* *min. ø : 30 mm (1.2“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	1.2 mm (47 mils) *Tungsten carbide* yes	--- *18 mm (0.7“)* 70 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Highly impact- and shatter resistant probe tip. Standard probe for paint and plastic coatings. Should not be used when surfaces exhibit a damp condition (acidic contamination of test surface).
	ETA3.3 601-797 *0-1200 µm* *0-45 mils*	0-100 µm : 0.5 µm 100-800 µm : 0.5 % 800-1200 µm : < 3 % *0-100 µm : 0.2 µm* *100-1200 µm : 0.2 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) *ø : 55 mm (2.2“)* *min. ø : 30 mm (1.2“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	1.2 mm (47 mils) *Jewel tip* yes	--- *18 mm (0.7“)* 70 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Standard probe for paint and plastic coatings, as well as for anodized coatings. Can possibly also be used when surfaces exhibit a damp condition (acidic contamination of test surface). Smaller tilting effect than with ETA3.3F probe.
	ETA3.3FG 602-623 *0-1200 µm* *0-45 mils*	0-50 µm : 0.25 µm 50-1200 µm : 0.5 % *0-50 µm : 0.1 µm* *50-1200 µm : 0.2 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) ∞ ∞	ø : 15 mm (590 mils) min. ø : 7 mm (280 mils) *D : 0.09 mm (3.5 mils)*	2.5 mm (98 mils) *Polyamide* yes	--- *18 mm (0.7“)* 70 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Especially suited for anodized coatings when surfaces exhibit a wet (acidic) contamination of the test surface. Larger tilting effect than with ETA3.3 probe.
	ETA3.3-5.6 602-645 *0-1200 µm* *0-45 mils*	0-100 µm : 0.5 µm 100-800 µm : 0.5 % 800-1200 µm : < 3 % *0-100 µm : 0.2 µm* *100-1200 µm : 0.2 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) *ø : 50 mm (2“)* *min. ø : 30 mm (1.2“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	2.8 mm (110 mils) *Jewel tip* yes	--- *18 mm (0.7“)* 70 mm (2.8“)	Axial single tip probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Due to the larger radius of the probe tip lower measurement scatter on rough surfaces than with ETA3.3 probe.
	EAW3.3 602-025 EAW3.3L 602-922 *0-1200 µm* *0-45 mils*	0-50 µm : 0.75 µm 50-1200 µm : 1.5 % *0-50 µm : 0.25 µm* *50-1200 µm : 0.5 %*	ø : 50 mm (2“) min. ø : 2 mm (80 mils) *ø : 50 mm (2“)* *min. ø : 34 mm (1.6“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	1.2 mm (47 mils) *Jewel tip* yes	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip angle probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurements on flat objects or in pipes, bore holes and recesses. Can also be used when surfaces exhibit a damp condition (acidic contamination of test surface).
	EAI3.3-150 602-026 *0-800 µm* *0-32 mils*	0-200 µm : 1 µm 200-800 µm : 0.5 % *0-100 µm : 0.3 µm* *100-800 µm : 0.3 %*	ø : 60 mm (2.4“) min. ø : 2 mm (80 mils) *ø : 55 mm (2.2“)* *min. ø : 9 mm (350 mils)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	1.2 mm (47 mils) *Jewel tip* yes	6.5 mm (0.26“) *5.5 mm (0.22“)* 320 mm (12.6“)	Single tip angle probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurements in pipes, bore holes and recesses, etc. Can possibly also be used when surfaces exhibit a wet condition (acidic contamination of test surface). To avoid positioning errors externally triggered measurement acquisition should be used.
	EA9 601-965 *0-3.5 mm* *0-140 mils*	0-0.25 mm : 0.005 mm 0.25-2.5 mm : 2 % 2.5-3.5 mm : < 3.5 % *0-1 mm : 0.002 mm* *1-3.5 mm : 0.2 %*	ø : 160 mm (6.3“) min. ø : 2 mm (80 mils) *ø : 160 mm (6.3“)* *min. ø : 40 mm (1.6“)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.09 mm (3.5 mils)*	8 mm (320 mils) *Heat treated steel* no	23 mm (0.9“) *14 mm (0.6“)* 72 mm (2.8“)	Single tip angle probe with spring-loaded measuring system. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurement of thicker plastic- or rubber coatings.
	EA30 602-027 EA30L 602-633 *0-20 mm* *0-800 mils*	0-2 mm : 0.05 mm 2-20 mm : 2.5 % *0-1 mm : 0.002 mm* *1-20 mm : 0.2 %*	ø : 1200 mm (47“) min. ø : 200 mm (7.9“) ∞ ∞	ø : 42 mm (1.6“) min. ø : 34 mm (1.3“) *D : 0.09 mm (3.5 mils)*	flat: ø 34 mm (1.3“) *Polyamide* *no*	43 mm (1.7“) *34 mm (1.3“)* 60 mm (2.4“)	Single tip angle probe with fixed measurement systems. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurement of thicker plastic- or rubber coatings. Also to measure wall thickness of, for example, plastic tanks with an aluminum backing foil. For surfaces with larger curvature a V-groove adapter shoe has to be used.

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Characteristic values and technical data of probes for the eddy current measuring method

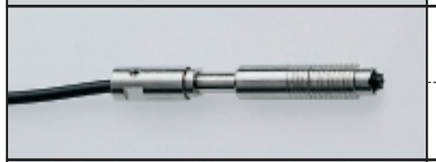
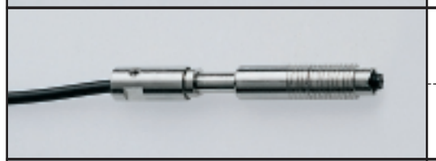
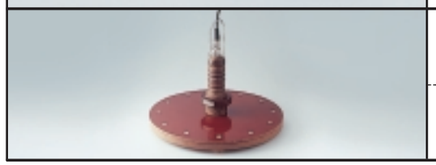
Note regarding probe designations:

L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m.

F: Measuring element protected against moist, aggressive media.

T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible.

* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number *Measurement range*	Measurement accuracy* u_s *Measurement precision* *s*	Measurement point Ø for 10% error min. Ø *Ø für 10%-Fehler* *min. Ø*	Ø for 10% error min. Ø *D for 10% error*	Probe tip radius *Probe tip material* replaceable probe tip	Height *Diameter/width* Length (see page 24)	Type of probe Application
	EA70 602-028 *0 - 50 mm* *0 - 2“*	0 - 5 mm : 0.05 mm 5 - 50 mm : 1 % *0 - 50 mm : 0.3 %*	ø : 2500 mm (98“) min. ø : 300 mm (11.9“) ∞ ∞	ø : 82 mm (3.2“) min. ø : 74 mm (2.9“) *D : 0.09 mm (3.5 mils)*	flat: ø 75 mm (3“) *Polyamide* no	43 mm (1.9“) *75 mm (3“)* 80 mm (3.1“)	Single tip angle probe with fixed measurement systems. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurements of very thick plastic- or rubber coatings, however mainly to measure wall thickness of, for example, plastic tanks with an aluminum backing foil. For surfaces with larger curvature a V-groove adapter shoe has to be used.
	ETA3.3-Cu** 602-550 ETA3.3F-Cu** 603-015 *0 - 150 µm* *0 - 6 mils* *Cu/Iso*	0 - 10 µm : 0.3 µm 10 - 130 µm : 3 % *0 - 20 µm : 0.2 µm* *20 - 130 µm : 1 %*	ø : 50 mm (2“) min. ø : 1 mm (40 mils) *ø : 55 mm (2.2“)* *min. ø : 10 mm (400 mils)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *no substrate influence*	1.2 mm (48 mils) *Jewel tip* yes	--- *10 mm (0.4“)* 110 mm (4.4“)	Axial single tip measurement probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on electrically nonconducting substrate (NF/Iso). Preferred application is copper thickness measurement on pc-board surfaces. The copper may not be lacquered.
	ETA3.3-CuMR1** 603-161 *0.5 - 15 µm* *0.02 - 0.6 mil*	0.5 - 15 µm : 0.3 µm *0.5 - 8 µm : 0.1 µm* *8 - 15 µm : 1.2 %*	--- ---	ø : 2 mm (80 mils) *board thickness (Epoxy)* *0.4 mm (16 mils)*	1.2 mm (48 mils) *Jewel tip* yes	70 mm (2.8“) *18 mm (0.7“)* ---	Axial single tip measurement probe with spring-loaded measuring system. Measures nonferrous metal coatings on nonferromagnetic substrate (ISO/NE). Especially well suited for measuring Cu coating thickness on pc-boards. The copper may not be laquered.
	ETA3.3-CuMR2** 603-164 *2 - 50 µm* *0.08 - 2 mils*	2 - 10 µm : 0.1 µm 10 - 50 µm : 1 % *2 - 10 µm : 0.05 µm* *10 - 50 µm : 0.5 %*	--- ---	ø : 2 mm (80 mils) *board thickness (Epoxy)* *0.8 mm (32 mils)*	1.2 mm (48 mils) *Jewel tip* yes	70 mm (2.8“) *18 mm (0.7“)* ---	Axial single tip measurement probe with spring-loaded measuring system. Same applications as ETA3.3-CuMR1 probe, however suitable for thicker coatings.
	ETA3.3-CuMR3** 603-167 *10 - 250 µm* *0.4 - 10 mils*	10 - 100 µm : 1.5 µm 100 - 250 µm : 1.5 % *10 - 100 µm : 0.5 µm* *100 - 250 µm : 0.5 %*	--- ---	ø : 2 mm (80 mils) *board thickness (Epoxy)* *1 mm (40 mils)*	1.2 mm (48 mils) *Jewel tip* yes	110 mm (4.4“) *10 mm (0.4“)* ---	Axial single tip measurement probe with spring-loaded measuring system. Same applications as ETA3.3-CuMR1 and -MR2 probes, however suitable for thicker coatings.
	ETA3.3-Cr** 602-607 *0 - 500 µm* *0 - 20 mils* *Cr/NF*	0 - 50 µm : 1 µm 50 - 500 µm : 2 % *0 - 50 µm : 0.5 µm* *50 - 500 µm : 1 %*	ø : 50 mm (2“) min. ø : 1 mm (40 mils) *ø : 55 mm (2.2“)* *min. ø : 10 mm (400 mils)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.7 mm (28 mils) (Al)*	1.2 mm (48 mils) *Jewel tip* yes	--- *10 mm (0.4“)* 110 mm (4.4“)	Axial single tip measurement probe with spring-loaded measuring system. Measures chrome coatings on nonferrous substrate like steel, aluminum or copper. Measuring of chrome coatings on stainless steel or titanium or other subtrates with very low electrical conductivity is not possible.
	ETD3.3 602-607 *0 - 800 µm* *0 - 32 mils*	0 - 100 µm : 1 µm 100 - 800 µm : 1 % *0 - 100 µm : 0.2 µm* *100 - 800 µm : 0.2 %*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *ø : < 40 mm (1.6“)* *min. ø : 40 mm (1.6“)*	ø : 6 mm (240 mils) min. ø : 3 mm (120 mils) *D : 0.09 mm (3.6 mils)*	1.2 mm (48 mils) *Jewel tip* yes	--- *16 mm (0.6“)* 70 mm (2.8“)	Patented axial single tip measurement probe with spring-loaded measuring system. Unique curvature compensation for measuring paint-, laquer-, plastic and anodized coatings on nonferrous metals. Especially well suited for curved surfaces like motorcar body sheet, blinds etc. Probe can be operated with Fischer instrument types DUALSCOPE® MP20 or MP40.
	ET280** 602-302 *1 - 30 cm* *0.4 - 12“*	0 - 10 cm : 0.05 cm 10 - 30 cm : 0.5 % *0 - 10 cm : 0.01 cm* *10 - 30 cm : 0.1 %*	--- ---	--- ---	--- *---* no	205 mm (8.2“) *300 mm (12“)* ---	Axial measurement probe with fixed measurement system. Measures nonmetal coatings on nonferromagnetic substrate materials (Iso/NF) or on steel and iron (Iso/Fe). Suited for measurements of the pavement thickness in road construction, thick synthetic or rubber coatings or for measuring the thickness of walls of, e.g., large-volume synthetic tanks by placing an aluminum foil on the other side.

** Probe can not be connected to FISCHERSCOPE® MMS®

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Characteristic values and technical data of probes for the eddy current measuring method

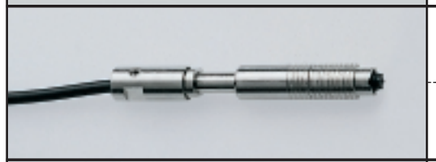
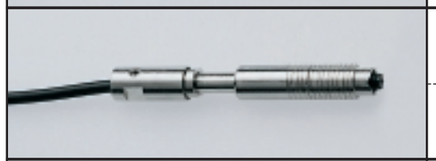
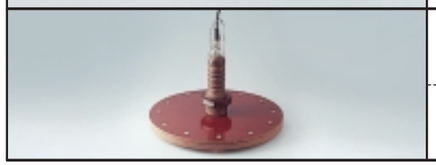
Note regarding probe designations:

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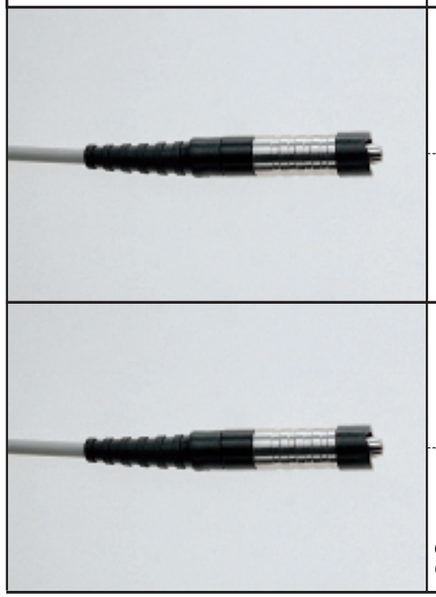
* Note: Probe capability (accuracy and precision) tested under controlled conditions.

	Description Order Number *Measurement range*	Measurement accuracy* u_s *Measurement precision* *s*	Measurement point Ø for 10% error min. Ø *Ø für 10%-Fehler* *min. Ø*	Ø for 10% error min. Ø *D for 10% error*	Probe tip radius *Probe tip material* replaceable probe tip	Height *Diameter/width* Length (see page 24)	Type of probe Application
	EA70 602-028 *0 - 50 mm* *0 - 2“*	0 - 5 mm : 0.05 mm 5 - 50 mm : 1 % *0 - 50 mm : 0.3 %*	ø : 2500 mm (98“) min. ø : 300 mm (11.9“) ∞ ∞	ø : 82 mm (3.2“) min. ø : 74 mm (2.9“) *D : 0.09 mm (3.5 mils)*	flat: ø 75 mm (3“) *Polyamide* no	43 mm (1.9“) *75 mm (3“)* 80 mm (3.1“)	Single tip angle probe with fixed measurement systems. Measurement of nonconductive coatings on nonferromagnetic substrate (Iso/NF). Suitable for measurements of very thick plastic- or rubber coatings, however mainly to measure wall thickness of, for example, plastic tanks with an aluminum backing foil. For surfaces with larger curvature a V-groove adapter shoe has to be used.
	ETA3.3-Cu** 602-550 ETA3.3F-Cu** 603-015 *0 - 150 µm* *0 - 6 mils* *Cu/Iso*	0 - 10 µm : 0.3 µm 10 - 130 µm : 3 % *0 - 20 µm : 0.2 µm* *20 - 130 µm : 1 %*	ø : 50 mm (2“) min. ø : 1 mm (40 mils) *ø : 55 mm (2.2“)* *min. ø : 10 mm (400 mils)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *no substrate influence*	1.2 mm (48 mils) *Jewel tip* yes	--- *10 mm (0.4“)* 110 mm (4.4“)	Axial single tip measurement probe with spring-loaded measuring system. Measures nonferrous- and nonmetal coatings on electrically nonconducting substrate (NF/Iso). Preferred application is copper thickness measurement on pc-board surfaces. The copper may not be lacquered.
	ETA3.3-CuMR1** 603-161 *0.5 - 15 µm* *0.02 - 0.6 mil*	0.5 - 15 µm : 0.3 µm *0.5 - 8 µm : 0.1 µm* *8 - 15 µm : 1.2 %*	--- ---	ø : 2 mm (80 mils) *board thickness (Epoxy)* *0.4 mm (16 mils)*	1.2 mm (48 mils) *Jewel tip* yes	70 mm (2.8“) *18 mm (0.7“)* ---	Axial single tip measurement probe with spring-loaded measuring system. Measures nonferrous metal coatings on nonferromagnetic substrate (ISO/NE). Especially well suited for measuring Cu coating thickness on pc-boards. The copper may not be laquered.
	ETA3.3-CuMR2** 603-164 *2 - 50 µm* *0.08 - 2 mils*	2 - 10 µm : 0.1 µm 10 - 50 µm : 1 % *2 - 10 µm : 0.05 µm* *10 - 50 µm : 0.5 %*	--- ---	ø : 2 mm (80 mils) *board thickness (Epoxy)* *0.8 mm (32 mils)*	1.2 mm (48 mils) *Jewel tip* yes	70 mm (2.8“) *18 mm (0.7“)* ---	Axial single tip measurement probe with spring-loaded measuring system. Same applications as ETA3.3-CuMR1 probe, however suitable for thicker coatings.
	ETA3.3-CuMR3** 603-167 *10 - 250 µm* *0.4 - 10 mils*	10 - 100 µm : 1.5 µm 100 - 250 µm : 1.5 % *10 - 100 µm : 0.5 µm* *100 - 250 µm : 0.5 %*	--- ---	ø : 2 mm (80 mils) *board thickness (Epoxy)* *1 mm (40 mils)*	1.2 mm (48 mils) *Jewel tip* yes	110 mm (4.4“) *10 mm (0.4“)* ---	Axial single tip measurement probe with spring-loaded measuring system. Same applications as ETA3.3-CuMR1 and -MR2 probes, however suitable for thicker coatings.
	ETA3.3-Cr** 602-607 *0 - 500 µm* *0 - 20 mils* *Cr/NF*	0 - 50 µm : 1 µm 50 - 500 µm : 2 % *0 - 50 µm : 0.5 µm* *50 - 500 µm : 1 %*	ø : 50 mm (2“) min. ø : 1 mm (40 mils) *ø : 55 mm (2.2“)* *min. ø : 10 mm (400 mils)*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *D : 0.7 mm (28 mils) (Al)*	1.2 mm (48 mils) *Jewel tip* yes	--- *10 mm (0.4“)* 110 mm (4.4“)	Axial single tip measurement probe with spring-loaded measuring system. Measures chrome coatings on nonferrous substrate like steel, aluminum or copper. Measuring of chrome coatings on stainless steel or titanium or other subtrates with very low electrical conductivity is not possible.
	ETD3.3 602-607 *0 - 800 µm* *0 - 32 mils*	0 - 100 µm : 1 µm 100 - 800 µm : 1 % *0 - 100 µm : 0.2 µm* *100 - 800 µm : 0.2 %*	ø : 4 mm (160 mils) min. ø : 2 mm (80 mils) *ø : < 40 mm (1.6“)* *min. ø : 40 mm (1.6“)*	ø : 6 mm (240 mils) min. ø : 3 mm (120 mils) *D : 0.09 mm (3.6 mils)*	1.2 mm (48 mils) *Jewel tip* yes	--- *16 mm (0.6“)* 70 mm (2.8“)	Patented axial single tip measurement probe with spring-loaded measuring system. Unique curvature compensation for measuring paint-, laquer-, plastic and anodized coatings on nonferrous metals. Especially well suited for curved surfaces like motorcar body sheet, blinds etc. Probe can be operated with Fischer instrument types DUALSCOPE® MP20 or MP40.
	ET280** 602-302 *1 - 30 cm* *0.4 - 12“*	0 - 10 cm : 0.05 cm 10 - 30 cm : 0.5 % *0 - 10 cm : 0.01 cm* *10 - 30 cm : 0.1 %*	--- ---	--- ---	--- *---* no	205 mm (8.2“) *300 mm (12“)* ---	Axial measurement probe with fixed measurement system. Measures nonmetal coatings on nonferromagnetic substrate materials (Iso/NF) or on steel and iron (Iso/Fe). Suited for measurements of the pavement thickness in road construction, thick synthetic or rubber coatings or for measuring the thickness of walls of, e.g., large-volume synthetic tanks by placing an aluminum foil on the other side.

** Probe can not be connected to FISCHERSCOPE® MMS®

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Characteristic values and technical data of probes for the modified eddy current measuring method

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	**Description** **Order Number** ***Measurement range***	**Measurement accuracy*** **u_s** ***Measurement precision**** ***s***	Measurement point **Ø for 10% error** **min. Ø** ***Ø for 10% error*** ***min. Ø***
	EDX10 603-084 *0 - 800 µm (32 mils)* *Total paint + Zn (NF/Fe) or only paint (paint/Fe)*	NF/Fe Zn 15-30 µm (0.6-1.2 mils) : 15 % Zn ≥ 30 µm (1.2 mils) : 5 % Iso/NF Paint 0-50 µm (2 mils) : 5 % Paint ≥ 50 µm (2 mils) : 1 % *NF/Fe* *Zn 15-30 µm (0.6-1.2 mils) : 0.6 µm* *Zn ≥ 30 µm (1.2 mils) : 2 %* *Iso/Fe* *Paint ≤ 1.5 µm (0.06 mil)*	ø : 13 mm (520 mils) (NF/Fe) min. ø : 1 mm (40 mils) (NF/Fe) ø : 45 mm (1.8“) (Iso/NF) min. ø : 1 mm (40 mils) (Iso/NF) *ø : 30 mm (1.2“) (NF/Fe)* *min. ø : 15 mm (600 mils) (NF/Fe)* *ø : 45 mm (1.8“) (Iso/Fe)* *min. ø : 15 mm (600 mils) (Iso/Fe)*
	ED10 602-796 ED10L 602-093 *Dual Mode* *0-800 µm (0-32 mils) (NE/Fe)* *0-800 µm (0-32 mils) (Iso/NE)* *Single Mode* *0-1500 µm (0-60 mils) (NE/Fe)* *0-1200 µm (0-48 mils) (Iso/Fe)*	NF/Fe 0-50 µm : 0.2 µm (0.008 mil) 50-1500 µm (0-60 mils) : 1 % Iso/NF 0-100 µm : 0.5 µm (0.02 mil) 100-1200 µm (4-48 mils) : 0.5 % *NF/Fe* *0-50 µm : 0.1 µm (0.004 mil)* *50-1500 µm (2-60 mils) : 0.5 %* *Iso/NF* *0-100 µm : 0.2 µm (0.008 mil)* *100-1200 µm : 0.5 %*	ø : 15 mm (600 mils) (NF/Fe) min. ø : 1 mm (40 mils) (NF/Fe) ø : 75 mm (3“) (Iso/NF) min. ø : 1 mm (40 mils) (Iso/NF) *ø : 30 mm (1.2“) (NF/Fe)* *min. ø : 15 mm (600 mils) (NF/Fe)* *ø : 75 mm (3“) (Iso/NF)* *min. ø : 15 mm (600 mils) (Iso/NF)*

Note: Electrical conductivity changes of the base material in the range between 17 MS/m and 58 MS/m (30-100% IACS) cause a measurement error of < 2% with all eddy current probes listed in the tables.

Ø for 10% error **min. Ø** ***D for 10% error***	**Probe tip radius** ***Probe tip material*** **replaceable probe tip**	**Height** ***Diameter/width*** **Length** **(see page 24)**	**Type of probe** **Application**
NF/Fe Edge effect: 0.5 mm (20 mils) Min. ø : 2 mm (28 mils) Iso/Fe Edge effect: 0.7 mm Min. ø : 2 mm (28 mils)	0.75 mm (30 mils)	---	Axial measurement probe for simultaneous measurement of individual coating thicknesses of duplex coatings (paint/zinc) on steel sheets (e.g., in household appliance manufacturing) or on steel constructions in structural metal engineering. Both electro-galvanized and hot galvanized coatings can be measured. Probe can be connected to measuring instrument models DUALSCOPE® MP20 and MP40.
	Tungsten carbide	*13 mm (0.5“)*	
NF/Fe *ø : 0.4 mm (16 mils)* *Iso/Fe* *depending on the normalization layer*	no	100 mm (4“)	
ø :12 mm (480 mils) (NF/Fe) min. ø : 2 mm (80 mils) (NF/Fe) ø : 4 mm (160 mils) (Iso/NF) min. ø : 2 mm (80 mils) (Iso/NF)	0.75 mm (30 mils)	---	Axial measurement probe for simultaneous measurement of individual coating thicknesses according to the magnetic induction method and eddy current method. Especially well suited for measuring paint- and laquer thicknesses on steel or iron or aluminum or copper etc. Because of small probe tip not suited for measuring on rough e.g. shot-blasted surfaces. Both electro-galvanized and hot galvanized coatings can be measured. Probe can be connected to instrument models DUALSCOPE® MP10/20/30/40 (depending on the measuring method) and FISCHERSCOPE® MMS® module PERMASCOPE®.
D : 0.2 mm (8 mils) (NF/Fe)	*Tungsten carbide*	*13 mm (0.5“)*	
D : 0.09 mm (4 mils) (Iso/NF)	no	100 mm (4“)	

Characteristic values and technical data of probes for the phase-sensitive eddy current measurement method

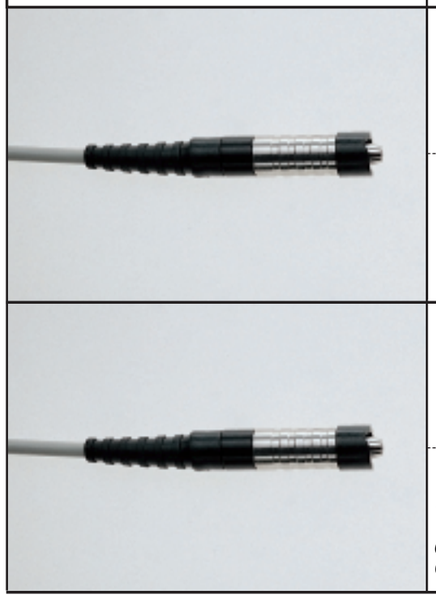
	Description/No.	**u_s*** ***s****	**Lift-off h** ***Convex curvature***
	ESD1[1] 602-307 ESD1L[1] 602-898	0-500 µm (0-20 mils) (Zn/Fe) 0-180 µm (0-7.2 mils) (Cu/Fe) 0-100 µm (0-4 mils) (Ni/Fe) *0.04 µm (0.0016 mils) or 1 % (Zn/Fe)* *0.1 µm (0.004 mils) or 2 % Ni/Fe)*	h : 0-700 µm (0-28 mils) (NF/Fe) h : 0-200 µm (0-8 mils) (Ni/Fe) *ø 10%: 4 mm/2 mm (160/80 mils) at 25 µm (1 mil) Zn/Fe* *min ø: 4 mm/2 mm (160 mils/80 mils) at 25 µm (1 mil) Ni/Fe*
	ESD2 602-308	0-200 µm (0-8 mils) (Zn/Fe) 0-80 µm 80-3.2 mils) (Cu/Fe) 0-50 µm (0-2 mils) (Ni/Fe) *0.02 µm (0.008 mils) or 0.5 % (Zn/Fe)* *0.05 µm (0.002 mils) or 1 % (Ni/Fe)*	h : 0-700 µm (0-28 mils) (NF/Fe) h : 0-200 µm (0-8 mils) (Ni/Fe) *ø 10%: 4 mm/2 mm (160/80 mils) at 25 µm (1 mil) Zn/Fe* *min ø: 4 mm/2 mm (160 mils/80 mils) at 25 µm (1 mil) Ni/Fe*

Ø for 10% error ***D for 10% error***	**Probe tip radius** ***Probe tip material*** **replaceable probe tip**	**Height** ***Diameter/width*** **Length (see page 24)**	**Type of probe** **Application**
6 mm/4 mm (240/160 mils) at 25 µm (1 mil) Zn/Fe 6 mm/4 mm (240/160 mils) at 25 µm (1 mil) Ni/Fe	flat: ø 5.5 mm (220 mils)	---	Measurement of nonferrous metal coatings on steel and iron (NF/Fe) or nonferrous metal coatings on nonferrous substrates (NF/NF), as well as electroplated nickel coatings on steel (Ni/Fe). Suited especially for fast, non-destructive measurement of nickel coatings. Produces very little measurement scatter when measuring NF-coatings on very rough steel surfaces. Measurement of NF-coatings on NF-substrate if the electrical conductivity of the coating material is at least double the conductivity of the substrate material. Due to lift-off compensation of the test signal it is possible to perform noncontacting measurements or measurements of coatings under a nonconductive coating up to 700 µm (28 mils) (for Ni up to 200 µm (8 mils)) thickness. The measurement system is moisture proof.
0.1 mm (4 mils)	*Polyamide*	*16 mm (0.6“)*	
0.1 mm (4 mils)	no	110 mm (4.3“)	
6 mm/2 mm (240/80 mils) at 25 µm (1 mil) Zn/Fe 6 mm/2 mm (240/80 mils) at 25 µm (1 mil) Ni/Fe	flat: ø 5.5 mm (220 mils)	---	Axial single tip measurement probe with spring-loaded measuring element. Measures nonferrous metal coatings on steel or iron (NF/Fe) or on nonferrous metal coatings (NF/NF) and galvanized nickel coatings on steel or iron (Ni/Fe). Same applications and characteristics as ESD1 probe, however suitable for thinner coatings. As with probes ESD1 and ESD3 very little influence from test area geometry.
0.1 mm (4 mils)	*Polyamide*	*16 mm (0.6“)*	
0.1 mm (4 mils)	no	110 mm (4.3“)	

Index description see page 22.

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Characteristic values and technical data of probes for the modified eddy current measuring method

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	**Description** **Order Number** ***Measurement range***	**Measurement accuracy*** **u_s** ***Measurement precision**** ***s***	Measurement point **Ø for 10% error** **min. Ø** ***Ø for 10% error*** ***min. Ø***
	EDX10 603-084 *0 - 800 µm (32 mils)* *Total paint + Zn (NF/Fe) or only paint (paint/Fe)*	NF/Fe Zn 15-30 µm (0.6-1.2 mils) : 15 % Zn ≥ 30 µm (1.2 mils) : 5 % Iso/NF Paint 0-50 µm (2 mils) : 5 % Paint ≥ 50 µm (2 mils) : 1 % *NF/Fe* *Zn 15-30 µm (0.6-1.2 mils) : 0.6 µm* *Zn ≥ 30 µm (1.2 mils) : 2 %* *Iso/Fe* *Paint ≤ 1.5 µm (0.06 mil)*	ø : 13 mm (520 mils) (NF/Fe) min. ø : 1 mm (40 mils) (NF/Fe) ø : 45 mm (1.8“) (Iso/NF) min. ø : 1 mm (40 mils) (Iso/NF) *ø : 30 mm (1.2“) (NF/Fe)* *min. ø : 15 mm (600 mils) (NF/Fe)* *ø : 45 mm (1.8“) (Iso/Fe)* *min. ø : 15 mm (600 mils) (Iso/Fe)*
	ED10 602-796 ED10L 602-093 *Dual Mode* *0-800 µm (0-32 mils) (NE/Fe)* *0-800 µm (0-32 mils) (Iso/NE)* *Single Mode* *0-1500 µm (0-60 mils) (NE/Fe)* *0-1200 µm (0-48 mils) (Iso/Fe)*	NF/Fe 0-50 µm : 0.2 µm (0.008 mil) 50-1500 µm (0-60 mils) : 1 % Iso/NF 0-100 µm : 0.5 µm (0.02 mil) 100-1200 µm (4-48 mils) : 0.5 % *NF/Fe* *0-50 µm : 0.1 µm (0.004 mil)* *50-1500 µm (2-60 mils) : 0.5 %* *Iso/NF* *0-100 µm : 0.2 µm (0.008 mil)* *100-1200 µm : 0.5 %*	ø : 15 mm (600 mils) (NF/Fe) min. ø : 1 mm (40 mils) (NF/Fe) ø : 75 mm (3“) (Iso/NF) min. ø : 1 mm (40 mils) (Iso/NF) *ø : 30 mm (1.2“) (NF/Fe)* *min. ø : 15 mm (600 mils) (NF/Fe)* *ø : 75 mm (3“) (Iso/NF)* *min. ø : 15 mm (600 mils) (Iso/NF)*

Note: Electrical conductivity changes of the base material in the range between 17 MS/m and 58 MS/m (30-100% IACS) cause a measurement error of < 2% with all eddy current probes listed in the tables.

Ø for 10% error **min. Ø** ***D for 10% error***	**Probe tip radius** ***Probe tip material*** **replaceable probe tip**	**Height** ***Diameter/width*** **Length** **(see page 24)**	**Type of probe** **Application**
NF/Fe Edge effect: 0.5 mm (20 mils) Min. ø : 2 mm (28 mils) Iso/Fe Edge effect: 0.7 mm Min. ø : 2 mm (28 mils)	0.75 mm (30 mils)	---	Axial measurement probe for simultaneous measurement of individual coating thicknesses of duplex coatings (paint/zinc) on steel sheets (e.g., in household appliance manufacturing) or on steel constructions in structural metal engineering. Both electro-galvanized and hot galvanized coatings can be measured. Probe can be connected to measuring instrument models DUALSCOPE® MP20 and MP40.
	Tungsten carbide	*13 mm (0.5“)*	
NF/Fe *ø : 0.4 mm (16 mils)* *Iso/Fe* *depending on the normalization layer*	no	100 mm (4“)	
ø :12 mm (480 mils) (NF/Fe) min. ø : 2 mm (80 mils) (NF/Fe) ø : 4 mm (160 mils) (Iso/NF) min. ø : 2 mm (80 mils) (Iso/NF)	0.75 mm (30 mils)	---	Axial measurement probe for simultaneous measurement of individual coating thicknesses according to the magnetic induction method and eddy current method. Especially well suited for measuring paint- and laquer thicknesses on steel or iron or aluminum or copper etc. Because of small probe tip not suited for measuring on rough e.g. shot-blasted surfaces. Both electro-galvanized and hot galvanized coatings can be measured. Probe can be connected to instrument models DUALSCOPE® MP10/20/30/40 (depending on the measuring method) and FISCHERSCOPE® MMS® module PERMASCOPE®.
D : 0.2 mm (8 mils) (NF/Fe)	*Tungsten carbide*	*13 mm (0.5“)*	
D : 0.09 mm (4 mils) (Iso/NF)	no	100 mm (4“)	

Characteristic values and technical data of probes for the phase-sensitive eddy current measurement method

	Description/No.	**u_s*** ***s****	**Lift-off h** ***Convex curvature***
	ESD1[1] 602-307 ESD1L[1] 602-898	0-500 µm (0-20 mils) (Zn/Fe) 0-180 µm (0-7.2 mils) (Cu/Fe) 0-100 µm (0-4 mils) (Ni/Fe) *0.04 µm (0.0016 mils) or 1 % (Zn/Fe)* *0.1 µm (0.004 mils) or 2 % Ni/Fe)*	h : 0-700 µm (0-28 mils) (NF/Fe) h : 0-200 µm (0-8 mils) (Ni/Fe) *ø 10%: 4 mm/2 mm (160/80 mils) at 25 µm (1 mil) Zn/Fe* *min ø: 4 mm/2 mm (160 mils/80 mils) at 25 µm (1 mil) Ni/Fe*
	ESD2 602-308	0-200 µm (0-8 mils) (Zn/Fe) 0-80 µm 80-3.2 mils) (Cu/Fe) 0-50 µm (0-2 mils) (Ni/Fe) *0.02 µm (0.008 mils) or 0.5 % (Zn/Fe)* *0.05 µm (0.002 mils) or 1 % (Ni/Fe)*	h : 0-700 µm (0-28 mils) (NF/Fe) h : 0-200 µm (0-8 mils) (Ni/Fe) *ø 10%: 4 mm/2 mm (160/80 mils) at 25 µm (1 mil) Zn/Fe* *min ø: 4 mm/2 mm (160 mils/80 mils) at 25 µm (1 mil) Ni/Fe*

Ø for 10% error ***D for 10% error***	**Probe tip radius** ***Probe tip material*** **replaceable probe tip**	**Height** ***Diameter/width*** **Length (see page 24)**	**Type of probe** **Application**
6 mm/4 mm (240/160 mils) at 25 µm (1 mil) Zn/Fe 6 mm/4 mm (240/160 mils) at 25 µm (1 mil) Ni/Fe	flat: ø 5.5 mm (220 mils)	---	Measurement of nonferrous metal coatings on steel and iron (NF/Fe) or nonferrous metal coatings on nonferrous substrates (NF/NF), as well as electroplated nickel coatings on steel (Ni/Fe). Suited especially for fast, non-destructive measurement of nickel coatings. Produces very little measurement scatter when measuring NF-coatings on very rough steel surfaces. Measurement of NF-coatings on NF-substrate if the electrical conductivity of the coating material is at least double the conductivity of the substrate material. Due to lift-off compensation of the test signal it is possible to perform noncontacting measurements or measurements of coatings under a nonconductive coating up to 700 µm (28 mils) (for Ni up to 200 µm (8 mils)) thickness. The measurement system is moisture proof.
0.1 mm (4 mils)	*Polyamide*	*16 mm (0.6“)*	
0.1 mm (4 mils)	no	110 mm (4.3“)	
6 mm/2 mm (240/80 mils) at 25 µm (1 mil) Zn/Fe 6 mm/2 mm (240/80 mils) at 25 µm (1 mil) Ni/Fe	flat: ø 5.5 mm (220 mils)	---	Axial single tip measurement probe with spring-loaded measuring element. Measures nonferrous metal coatings on steel or iron (NF/Fe) or on nonferrous metal coatings (NF/NF) and galvanized nickel coatings on steel or iron (Ni/Fe). Same applications and characteristics as ESD1 probe, however suitable for thinner coatings. As with probes ESD1 and ESD3 very little influence from test area geometry.
0.1 mm (4 mils)	*Polyamide*	*16 mm (0.6“)*	
0.1 mm (4 mils)	no	110 mm (4.3“)	

Index description see page 22.

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Characteristic values and technical data of probes for the phase-sensitive eddy current measurement method

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	Description Order Number	Measurement range ***Measurement precision* s (the greater value applies)***	Probe / h / Coating: **Lift-off h** Measurement point / ø: ***Ø for 10% error/min. Ø***
	ESD3[1] 602-309	0 - 2000 µm (Zn/Fe) 0 - 1000 µm (Cu/Fe)	0 - 700 µm (28 mils)
		0.2 µm or 0.5 % (Cu/Fe)	*22 mm/6 mm (870/240 mils) at 200 µm (8 mils) Cu/Fe*
	ESL08A[1] 602-224	5 - 80 µm (Cu/Iso)	Lift-off compensation for bore diameters of 0.8 - 1.8 mm (32 to 70 mils)
		0.3 µm or 1 %	*only for measurements in boreholes with 0.8 to 2.0 mm (32 to 80 mils) diameter*
	SL08A[6] 602-385	5 - 80 µm (Cu/Iso)	Lift-off compensation for bore diameters of 0.8 - 1.8 mm (32 to 70 mils)
		0.3 µm or 1 %	*only for measurements in boreholes with 0.8 to 2.0 mm (32 to 80 mils) diameter*
	ESG2[7] 602-311 ESG2L[7] 602-724	1 - 800 µm (paint/Zn) 1 - 100 µm (Zn/Fe)	no lift-off compensation
		1 µm or 1 % (paint/Zn) *1 µm or 1 % (Zn/Fe)*	*ø : 20 mm (800 mils) (paint/Zn)* *ø : 6 mm (240 mils) (Zn/Fe)*
	ESC1[1] 602-658	0 - 170 µm (Cu/Iso) 0 - 700 µm (Cr/Cu)	h : 0 - 300 µm (12 mils) no lift-off compensation
		0.04 µm or 1 % (Cu/Iso) *0.1 µm or 2 % (Cr/Cu)*	*6 mm/3 mm (240/120 mils) at 100 µm (4 mils) Cu/Iso* *35 mm/2 mm (1400/80 mils) at 230 µm (9 mils) Cr/Al*
	ESC2 602-237	0 - 90 µm (Cu/Iso) 0 - 200 µm (Cr/Cu)	h : 0 - 300 µm (12 mils) no lift-off compensation
		0.02 µm or 0.5 % (Cu/Iso) *0.05 µm or 1 % (Cr/Cu)*	*6 mm/3 mm (240/120 mils)* *35 mm/2 mm (1400/80 mils)* *at 150 µm (6 mils) Cr/Al*
	ESC3[1] 603-039	*90 - 1000 µm (Cu/Iso)*	0 - 500 µm (0 - 20 mils)
		0.3 µm/0.5 %	*not relevant*

Index description see page 22.

Ø for 10% error/min. Ø ***D for 10% error***	Probe tip radius ***Probe tip material*** replaceable probe tip	Height ***Diameter/width*** Length (see page 24)	Type of probe Application
15 mm/10 mm (0.6/0.4“) at 200 µm (8 mils) Cu/Fe	flat: ø 15 mm (600 mils)	---	Measures nonferrous metal coatings on steel or iron (NF/Fe) or nonferrous metal coatings (NF/NF). Same applications (except Ni/Fe) and characteristics as ESD1 probe, however suitable for thicker coatings.
	Polyamide	*35 mm (1.4“)*	
0.2 mm (8 mils)	no	130 mm (5.2“)	
not relevant	ø Probe tip: 0.78 mm (31 mils)	---	Single tip axial probe for inside measurements with fixed measurement system. Designed specifically to measure the thickness of copper plating (even under a Sn- or SnPb-coating) in metallized through holes of PC-boards. Smallest permissible PTH diameter: 0.8 mm (32 mils).
	Austenitic steel	*13 mm (0.5“)*	
board thickness from D = 0.5 mm (20 mils) to 2.5 mm (100 mils) can be entered	no	100 mm (4“)	
not relevant	ø Probe tip: 0.78 mm (31 mils)	---	Single pole probe for inside measurements with fixed measurement system. Same as ESL08A probe, however used only for CU-SCOPE CMP1A.
	Austenitic steel	*13 mm (0.5“)*	
board thickness from D = 0.5 mm (20 mils) to 2.5 mm (100 mils) can be entered	no	100 mm (4“)	
10 mm/4 mm (400/160 mils)	ø Probe tip: 0.78 mm (31 mils)	---	Axial single tip probe with spring-loaded measuring system. Simultaneous measurement of a double coating, i.e. paint over zinc on steel. Suitable to measure so-called Duplex coatings (paint over zinc and zinc alloy on galvanized surfaces) on sheet metal or strips. Not suitable for thick, hot dipped galvanized coatings, because of the nonhomogeneous alloy composition with unknown material properties and characteristics.
	Austenitic steel	*20 mm (0.8“)*	
0.2 mm (8 mils) Fe	no	100 mm (4“)	
8 mm/6 mm (320/240 mils) at 100 µm (4 mils) Cu/Iso 10 mm/6 mm (400/240 mils) at 230 µm (9 mils) Cr/Al	flat: ø 5.5 mm (220 mils)	---	Measurement of nonferrous metal coatings on nonconductive substrates (NF/NC) and nonferrous metal substrates (NF/NF). Main application is to measure Cu-cladding thickness on PC-boards, also under a conformal coating; also measures the thickness of metal foils, as well as Cr-coatings on copper, aluminum or brass.
	Polyamide	*16 mm (0.63“)*	
--- *0.9 mm (35 mils) CuZn*	no	110 mm (4.3“)	
8 mm/4 mm (320/160 mils) at 60 µm (2.4 mils) Cu/Iso 10 mm/4 mm (400/160 mils) at 150 µm (6 mils) Cr/Al	flat: ø 5.5 mm (220 mils)	---	Same application as ESC1 probe, however for thinner coatings.
	Polyamide	*16 mm (0.63“)*	
--- *0.5 mm (20 mils) CuZn*	no	110 mm (4.3“)	
15 mm (600 mils)	no tip, flat: ø 15 mm (600 mils)	130 mm (5.2“)	Axial single tip measurement probe with spring-loaded measuring element. Measures nonferrous metal coatings on nonmetal (NF/Iso) or on nonferrous metal substrate materials (NF/NF). Same applications as ESC1 probe, but for thicker coatings.
	Polyamide	*18 mm (0.7“)*	
not relevant	no	---	

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Characteristic values and technical data of probes for the phase-sensitive eddy current measurement method

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	Description Order Number	Measurement range ***Measurement precision* s (the greater value applies)***	Probe / h / Coating: **Lift-off h** Measurement point / ø: ***Ø for 10% error/min. Ø***
	ESD3[1] 602-309	0 - 2000 µm (Zn/Fe) 0 - 1000 µm (Cu/Fe)	0 - 700 µm (28 mils)
		0.2 µm or 0.5 % (Cu/Fe)	*22 mm/6 mm (870/240 mils) at 200 µm (8 mils) Cu/Fe*
	ESL08A[1] 602-224	5 - 80 µm (Cu/Iso)	Lift-off compensation for bore diameters of 0.8 - 1.8 mm (32 to 70 mils)
		0.3 µm or 1 %	*only for measurements in boreholes with 0.8 to 2.0 mm (32 to 80 mils) diameter*
	SL08A[6] 602-385	5 - 80 µm (Cu/Iso)	Lift-off compensation for bore diameters of 0.8 - 1.8 mm (32 to 70 mils)
		0.3 µm or 1 %	*only for measurements in boreholes with 0.8 to 2.0 mm (32 to 80 mils) diameter*
	ESG2[7] 602-311 ESG2L[7] 602-724	1 - 800 µm (paint/Zn) 1 - 100 µm (Zn/Fe)	no lift-off compensation
		1 µm or 1 % (paint/Zn) *1 µm or 1 % (Zn/Fe)*	*ø : 20 mm (800 mils) (paint/Zn)* *ø : 6 mm (240 mils) (Zn/Fe)*
	ESC1[1] 602-658	0 - 170 µm (Cu/Iso) 0 - 700 µm (Cr/Cu)	h : 0 - 300 µm (12 mils) no lift-off compensation
		0.04 µm or 1 % (Cu/Iso) *0.1 µm or 2 % (Cr/Cu)*	*6 mm/3 mm (240/120 mils) at 100 µm (4 mils) Cu/Iso* *35 mm/2 mm (1400/80 mils) at 230 µm (9 mils) Cr/Al*
	ESC2 602-237	0 - 90 µm (Cu/Iso) 0 - 200 µm (Cr/Cu)	h : 0 - 300 µm (12 mils) no lift-off compensation
		0.02 µm or 0.5 % (Cu/Iso) *0.05 µm or 1 % (Cr/Cu)*	*6 mm/3 mm (240/120 mils)* *35 mm/2 mm (1400/80 mils)* *at 150 µm (6 mils) Cr/Al*
	ESC3[1] 603-039	*90 - 1000 µm (Cu/Iso)*	0 - 500 µm (0 - 20 mils)
		0.3 µm/0.5 %	*not relevant*

Index description see page 22.

Ø for 10% error/min. Ø ***D for 10% error***	Probe tip radius ***Probe tip material*** replaceable probe tip	Height ***Diameter/width*** Length (see page 24)	Type of probe Application
15 mm/10 mm (0.6/0.4“) at 200 µm (8 mils) Cu/Fe	flat: ø 15 mm (600 mils)	---	Measures nonferrous metal coatings on steel or iron (NF/Fe) or nonferrous metal coatings (NF/NF). Same applications (except Ni/Fe) and characteristics as ESD1 probe, however suitable for thicker coatings.
	Polyamide	*35 mm (1.4“)*	
0.2 mm (8 mils)	no	130 mm (5.2“)	
not relevant	ø Probe tip: 0.78 mm (31 mils)	---	Single tip axial probe for inside measurements with fixed measurement system. Designed specifically to measure the thickness of copper plating (even under a Sn- or SnPb-coating) in metallized through holes of PC-boards. Smallest permissible PTH diameter: 0.8 mm (32 mils).
	Austenitic steel	*13 mm (0.5“)*	
board thickness from D = 0.5 mm (20 mils) to 2.5 mm (100 mils) can be entered	no	100 mm (4“)	
not relevant	ø Probe tip: 0.78 mm (31 mils)	---	Single pole probe for inside measurements with fixed measurement system. Same as ESL08A probe, however used only for CU-SCOPE CMP1A.
	Austenitic steel	*13 mm (0.5“)*	
board thickness from D = 0.5 mm (20 mils) to 2.5 mm (100 mils) can be entered	no	100 mm (4“)	
10 mm/4 mm (400/160 mils)	ø Probe tip: 0.78 mm (31 mils)	---	Axial single tip probe with spring-loaded measuring system. Simultaneous measurement of a double coating, i.e. paint over zinc on steel. Suitable to measure so-called Duplex coatings (paint over zinc and zinc alloy on galvanized surfaces) on sheet metal or strips. Not suitable for thick, hot dipped galvanized coatings, because of the nonhomogeneous alloy composition with unknown material properties and characteristics.
	Austenitic steel	*20 mm (0.8“)*	
0.2 mm (8 mils) Fe	no	100 mm (4“)	
8 mm/6 mm (320/240 mils) at 100 µm (4 mils) Cu/Iso 10 mm/6 mm (400/240 mils) at 230 µm (9 mils) Cr/Al	flat: ø 5.5 mm (220 mils)	---	Measurement of nonferrous metal coatings on nonconductive substrates (NF/NC) and nonferrous metal substrates (NF/NF). Main application is to measure Cu-cladding thickness on PC-boards, also under a conformal coating; also measures the thickness of metal foils, as well as Cr-coatings on copper, aluminum or brass.
	Polyamide	*16 mm (0.63“)*	
--- *0.9 mm (35 mils) CuZn*	no	110 mm (4.3“)	
8 mm/4 mm (320/160 mils) at 60 µm (2.4 mils) Cu/Iso 10 mm/4 mm (400/160 mils) at 150 µm (6 mils) Cr/Al	flat: ø 5.5 mm (220 mils)	---	Same application as ESC1 probe, however for thinner coatings.
	Polyamide	*16 mm (0.63“)*	
--- *0.5 mm (20 mils) CuZn*	no	110 mm (4.3“)	
15 mm (600 mils)	no tip, flat: ø 15 mm (600 mils)	130 mm (5.2“)	Axial single tip measurement probe with spring-loaded measuring element. Measures nonferrous metal coatings on nonmetal (NF/Iso) or on nonferrous metal substrate materials (NF/NF). Same applications as ESC1 probe, but for thicker coatings.
	Polyamide	*18 mm (0.7“)*	
not relevant	no	---	

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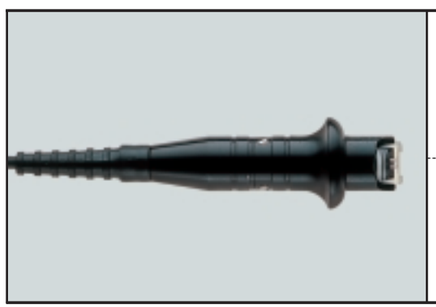
Characteristic values and technical data of probes for the modified magnetic method

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	**Description** **Order Number**	**Measurement accuracy u_s**	Measurement point **Ø for 10% error** **min. Ø**
	Measurement range	***Measurement precision* s (the greater value applies)***	***Ø for 10% error min. Ø***
	EN3 602-305	0 - 0.25 mm : 0.002 mm 0.25 - 2 mm : 1 % 2 - 4 mm : < 2 % 1 - 15 µm : 0.3 µm 15 - 150 µm : 2 %	ø : 22 mm (870 mils) (NF/Fe) min. ø : 2 mm (80 mils) ø : 10 mm (400 mils) (Ni/NF) min. ø : 2 mm (80 mils)
	0 - 4 mm *(0 - 160 mils) (NF/Fe)* *0 -150 µm* *(0 - 6 mils) (Ni/NF)*	*0 - 0.25 mm : 0.0003 mm* *0.25 - 4 mm : < 0.5 %* *1 - 20 µm : 0.2 µm* *20 - 150 µm : 1 %*	*ø : 40 mm (1.6“) (NF/Fe)* *min. ø : 50 mm (2“)* *ø : < 10 mm (0.7“) (Ni/NF)* *min. ø : 50 mm (2“)*
	ENW3 602-380	0 - 0.25 mm : 0.002 mm 0.25 - 2 mm : 1 % 2 - 4 mm : < 2 % 1 - 15 µm : 0.3 µm 15 - 150 µm : 2 %	ø : 22 mm (870 mils) (NF/Fe) min. ø : 2 mm (80 mils) ø : 10 mm (400 mils) (Ni/NF) min. ø : 2 mm (80 mils)
	0 - 4 mm *(0 - 160 mils) (NF/Fe)* *0 - 150 µm* *(0 - 6 mils) (Ni/NF)*	*0 - 0.25 mm : 0.0003 mm* *0.25 - 4 mm : < 0.5 %* *1 - 20 µm : 0.2 µm* *20 - 150 µm : 1 %*	*ø : 40 mm (1.6“) (NF/Fe)* *min. ø : 40 mm (1.6“)* *ø : < 10 mm (0.7“) (Ni/NF)* *min. ø : 40 mm (2“)*

All probes can be connected to FISCHERSCOPE® MMS® Module NICKELSCOPE®

Ø for 10% error **min. Ø**	**Probe tip radius**	**Height**	**Type of probe** **Application**
	Probe tip material	***Diameter/width***	
D for 10% error	**replaceable probe tip**	**Length** **(see page 24)**	
ø : 22 mm (870 mils) min. ø : 2 mm (80 mils) ø : 8 mm (320 mils) min. ø : 2 mm (80 mils)	flat: 0.75 mm (30 mils)	---	Axial single tip probe with spring-loaded measuring system. Measurement of nonferrous metal coatings on steel and iron (NF/Fe) or electroplated nickel coatings on nonferrous substrates (Ni/NF). Ideally suited for the measurement of electroplated nickel coatings on, for example: PC-board contacts, also under a thin coating of gold. Also used to measure thick NF metal coatings on steel, not subject to eddy current induced measurement errors in thick conductive coatings.
	Heat treated steel	*13 mm (0.5“)*	
D : 0.1 mm (4 mils) *not relevant (Ni/NF)*	no	80 mm (3.1“)	
ø : 22 mm (870 mils) min. ø : 2 mm (80 mils) ø : 8 mm (320 mils) min. ø : 2 mm (80 mils)	flat: 0.75 mm (30 mils)	23 mm (0.9“)	Single tip angle probe with spring-loaded measuring system. Same as probe EN3, however designed for measurements in pipes, bore holes or recesses.
	Heat treated steel	*14 mm (0.6“)*	
D : 0.1 mm (4 mils) *not relevant (Ni/NF)*	no	72 mm (2.8“)	

Characteristic values and technical data of probes for the electrical conductivity method

	ERCU N 603-220	Range I: 0.1 - 10 µm 0.1 - 5 µm = 0.075 µm 5 - 10 µm = 1.5 % Range II: 5 - 120 µm 5 - 50 µm = 0.5 µm 50 - 80 µm = 1 % > 80 µm = 2 %	only for flat specimen
	0.1-120 µm (0.04 - 4.8 mils) Cu/Epoxy	*Range I: 0.1 - 10 µm* *0.1 - 5 µm = 0.05 µm* *5 - 10 µm = 1 %* *Range II: 5 - 120 µm* *5 - 50 µm = 0.25 µm* *50 - 80 µm = 0.5 %* *> 80 µm = 2 %*	*only for flat specimen*

Probe can only be connected to FISCHERSCOPE® MMS® PCB

: 8 x 8 mm (320 x 320 mils) min. : 1 mm	50 µm (2 mils)	130 mm (5“)	Four-point probe measuring copper coating thicknesses on the surface of printed circuit boards according to the electric resistance method. No interference from underlying copper coatings separated by thin isolating layers.
	Heat treated steel	*32 mm (1.2“)*	
not relevant	no	---	

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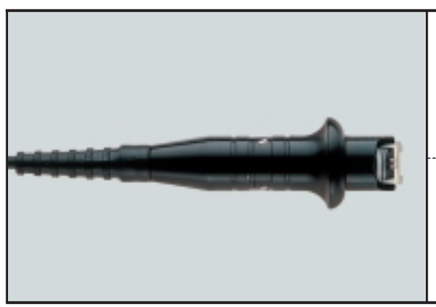
Characteristic values and technical data of probes for the modified magnetic method

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	**Description** **Order Number**	**Measurement accuracy u_s**	Measurement point **Ø for 10% error** **min. Ø**
	Measurement range	***Measurement precision* s (the greater value applies)***	***Ø for 10% error min. Ø***
	EN3 602-305	0 - 0.25 mm : 0.002 mm 0.25 - 2 mm : 1 % 2 - 4 mm : < 2 % 1 - 15 µm : 0.3 µm 15 - 150 µm : 2 %	ø : 22 mm (870 mils) (NF/Fe) min. ø : 2 mm (80 mils) ø : 10 mm (400 mils) (Ni/NF) min. ø : 2 mm (80 mils)
	0 - 4 mm *(0 - 160 mils) (NF/Fe)* *0 -150 µm* *(0 - 6 mils) (Ni/NF)*	*0 - 0.25 mm : 0.0003 mm* *0.25 - 4 mm : < 0.5 %* *1 - 20 µm : 0.2 µm* *20 - 150 µm : 1 %*	*ø : 40 mm (1.6“) (NF/Fe)* *min. ø : 50 mm (2“)* *ø : < 10 mm (0.7“) (Ni/NF)* *min. ø : 50 mm (2“)*
	ENW3 602-380	0 - 0.25 mm : 0.002 mm 0.25 - 2 mm : 1 % 2 - 4 mm : < 2 % 1 - 15 µm : 0.3 µm 15 - 150 µm : 2 %	ø : 22 mm (870 mils) (NF/Fe) min. ø : 2 mm (80 mils) ø : 10 mm (400 mils) (Ni/NF) min. ø : 2 mm (80 mils)
	0 - 4 mm *(0 - 160 mils) (NF/Fe)* *0 - 150 µm* *(0 - 6 mils) (Ni/NF)*	*0 - 0.25 mm : 0.0003 mm* *0.25 - 4 mm : < 0.5 %* *1 - 20 µm : 0.2 µm* *20 - 150 µm : 1 %*	*ø : 40 mm (1.6“) (NF/Fe)* *min. ø : 40 mm (1.6“)* *ø : < 10 mm (0.7“) (Ni/NF)* *min. ø : 40 mm (2“)*

All probes can be connected to FISCHERSCOPE® MMS® Module NICKELSCOPE®

Ø for 10% error **min. Ø**	**Probe tip radius**	**Height**	**Type of probe** **Application**
	Probe tip material	***Diameter/width***	
D for 10% error	**replaceable probe tip**	**Length** **(see page 24)**	
ø : 22 mm (870 mils) min. ø : 2 mm (80 mils) ø : 8 mm (320 mils) min. ø : 2 mm (80 mils)	flat: 0.75 mm (30 mils)	---	Axial single tip probe with spring-loaded measuring system. Measurement of nonferrous metal coatings on steel and iron (NF/Fe) or electroplated nickel coatings on nonferrous substrates (Ni/NF). Ideally suited for the measurement of electroplated nickel coatings on, for example: PC-board contacts, also under a thin coating of gold. Also used to measure thick NF metal coatings on steel, not subject to eddy current induced measurement errors in thick conductive coatings.
	Heat treated steel	*13 mm (0.5“)*	
D : 0.1 mm (4 mils) *not relevant (Ni/NF)*	no	80 mm (3.1“)	
ø : 22 mm (870 mils) min. ø : 2 mm (80 mils) ø : 8 mm (320 mils) min. ø : 2 mm (80 mils)	flat: 0.75 mm (30 mils)	23 mm (0.9“)	Single tip angle probe with spring-loaded measuring system. Same as probe EN3, however designed for measurements in pipes, bore holes or recesses.
	Heat treated steel	*14 mm (0.6“)*	
D : 0.1 mm (4 mils) *not relevant (Ni/NF)*	no	72 mm (2.8“)	

Characteristic values and technical data of probes for the electrical conductivity method

	ERCU N 603-220	Range I: 0.1 - 10 µm 0.1 - 5 µm = 0.075 µm 5 - 10 µm = 1.5 % Range II: 5 - 120 µm 5 - 50 µm = 0.5 µm 50 - 80 µm = 1 % > 80 µm = 2 %	only for flat specimen
	0.1-120 µm (0.04 - 4.8 mils) Cu/Epoxy	*Range I: 0.1 - 10 µm* *0.1 - 5 µm = 0.05 µm* *5 - 10 µm = 1 %* *Range II: 5 - 120 µm* *5 - 50 µm = 0.25 µm* *50 - 80 µm = 0.5 %* *> 80 µm = 2 %*	*only for flat specimen*

Probe can only be connected to FISCHERSCOPE® MMS® PCB

: 8 x 8 mm (320 x 320 mils) min. : 1 mm	50 µm (2 mils)	130 mm (5“)	Four-point probe measuring copper coating thicknesses on the surface of printed circuit boards according to the electric resistance method. No interference from underlying copper coatings separated by thin isolating layers.
	Heat treated steel	*32 mm (1.2“)*	
not relevant	no	---	

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Characteristic values and technical data of probes to measure the electrical volume conductivity

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	**Description** **Order Number**	**Measurement accuracy*** u_s	Probe h Coating **Lift-off h**	Ø for 10% error min. Ø	**Probe tip radius**	**Height**	**Type of probe** **Application**
	Measurement range	***Measurement precision*** ***s***	Measurement point ø ***Ø for 10% error min. Ø***	***D for 10% error***	***Probe tip material***	***Diameter/width***	
	ES1A[1] 602-222	0.3 % of measured value	0 - 700 µm (28 mils)	22 mm (870 mils) 15 mm (590 mils)	flat: ø 14 mm (550 mils)	---	Axial single tip probe with fixed measurement system. Used to measure volume conductivity of nonferrous metals. Used mainly in the aerospace industry, for NF-metal testing or processing. Also suitable to check heat treatment effects (material strength) or to check for microstructural changes. A separate V-groove adapter has to be used on curved surfaces.
	0.5 - 108 % IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.03 % of measured value*	*50 mm (200 mils)* *2 mm (80 mils)*	*0.91 mm (36 mils)* *at 52% IACS*	*Polyamide*	*35 mm (1.4“)*	
					no	130 mm (5.1“)	
	ESW1A[1] 602-389	0.3 % of measured value	0 - 700 µm (28 mils)	22 mm (870 mils) 15 mm (590 mils)	flat: ø 14 mm (550 mils)	40 mm (1.6“)	Single tip angle probe with fixed measurement system. Same application as ES1A probe, however designed for measurements in pipes, bore holes or recesses. A separate V-groove adapter has to be used on curved surfaces.
	0.5 - 108 % IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.03 % of measured value*	*50 mm (200 mils)* *2 mm (80 mils)*	*0.91 mm (36 mils)* *at 52% IACS*	*Polyamide*	*35 mm (1.4“)*	
					no	90 mm (3.5“)	
	ES2 602-223	0.5 % of measured value	0 - 500 µm (20 mils)	12 mm (470 mils) 5 mm (200 mils)	flat: ø 5.5 mm (220 mils)	---	Axial single tip probe with fixed measurement system. Same application as ES1A probe, however due to the higher measurement frequency especially suited for thinner specimen (strips, sheet metal, coatings).
	0.5 - 108 % IACS *0.3 - 63 MS/m*	*0.0 1% IACS or* *0.05 % of measured value*	*36 mm (1400 mils)* *2 mm (80 mils)*	*0.44 mm (17 mils)* *at 52% IACS*	*Polyamide*	---	
					no	110 mm (4.3“)	
	S1A[2] 601-568	0.3 % of measured value	0 - 700 µm (28 mils)	22 mm (870 mils) 15 mm (590 mils)	flat: ø 14 mm (550 mils)	---	Axial single tip probe with fixed measurement system. Same application as ES1A probe, however only in conjunction with the hand-held instruments SMP1B and SMP1BS.
	0.5 - 108% IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.03 % of measured value*	*50 mm (200 mils)* *2 mm (80 mils)*	*0.91 mm (36 mils)* *at 52% IACS*	*Polyamide*	*18 mm (0.7“)*	
					no	130 mm (5.1“)	
	SW1A[2] 601-615	0.3 % of measured value	0 - 700 µm (28 mils)	22 mm (870 mils) 15 mm (590 mils)	flat: ø 14 mm (550 mils)	40 mm (1.6“)	Single tip angle probe with fixed measurement system. Same application as S1A probe, however designed for measurements in pipes, bore holes and recesses.
	0.5 - 108% IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.03 % of measured value*	*50 mm (200 mils)* *2 mm (80 mils)*	*0.91 mm (36 mils)* *at 52% IACS*	*Polyamide*	*35 mm (1.4“)*	
					no	90 mm (3.5“)	
	S2[3] 601-569	0.5 % of measured value	0 - 500 µm (20 mils)	12 mm (470 mils) 5 mm (200 mils)	flat: ø 5.5 mm (220 mils)	---	Axial single tip probe with fixed measurement system. Same application as ES2 probe, however only in conjunction with the hand-held instrument SMP2.
	0.5 - 108% IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.05 % of measured value*	*36 mm (1400 mils)* *2 mm (80 mils)*	*0.44 mm (17 mils)* *at 52% IACS*	*Polyamide*	*16 mm (0.6“)*	
					no	110 mm (4.3“)	
	ES4B[4] ES40[5] 602-539 603-235	0,3 % of measured value	0 - 500 µm (20 mils)	10 mm (400 mils) 5 mm (200 mils)	flat: ø 14 mm (550 mils)	---	Axial single-tip measurement probe with fixed measuring element. Measures the electrical conductivity of nonferrous metals according to the eddy current method. Applications include material sorting, heat treatment inspections and analysis of structural conditions. Suitable for the following measurement frequencies: 120 kHz, 240 kHz and 480 kHz. Measurement ES40 probe is additionally suited for a frequency of 60 kHz and contains an integrated temperature sensor.
	0,5-108 % IACS *0,3-63 MS/m*	*0,01 % IACS or* *0,03 % of measured value*	*30 mm (1.2“)* *1 mm (40 mils)*	*0.35 mm* *at 30 MS/m and 480 kHz*	*Polyamide*	*18 mm (0.7“)*	
					no	90 mm (3.5“)	

[1] : Probe can only be connected to FISCHERSCOPE® MMS® module SIGMASCOPE® and module DUPLEX
[2] : Probe can only be connected to SIGMASCOPE® SMP1B
[3] : Probe can only be connected to SIGMASCOPE® SMP2
[4] : Probe can only be connected to FISCHERSCOPE® MMS® EURO HF
[5] : Probe can only be connected to SIGMASCOPE® SMP10
[6] : Probe can only be connected to CU-SCOPE® CMP1A
[7] : Probe can only be connected to FISCHERSCOPE® MMS Module DUPLEX

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Characteristic values and technical data of probes to measure the electrical volume conductivity

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	**Description** **Order Number**	**Measurement accuracy*** u_s	Probe h Coating **Lift-off h**	Ø for 10% error min. Ø	**Probe tip radius**	**Height**	**Type of probe** **Application**
	Measurement range	***Measurement precision*** ***s***	Measurement point ø ***Ø for 10% error min. Ø***	***D for 10% error***	***Probe tip material***	***Diameter/width***	
	ES1A[1] 602-222	0.3 % of measured value	0 - 700 µm (28 mils)	22 mm (870 mils) 15 mm (590 mils)	flat: ø 14 mm (550 mils)	---	Axial single tip probe with fixed measurement system. Used to measure volume conductivity of nonferrous metals. Used mainly in the aerospace industry, for NF-metal testing or processing. Also suitable to check heat treatment effects (material strength) or to check for microstructural changes. A separate V-groove adapter has to be used on curved surfaces.
	0.5 - 108 % IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.03 % of measured value*	*50 mm (200 mils)* *2 mm (80 mils)*	*0.91 mm (36 mils)* *at 52% IACS*	*Polyamide*	*35 mm (1.4“)*	
					no	130 mm (5.1“)	
	ESW1A[1] 602-389	0.3 % of measured value	0 - 700 µm (28 mils)	22 mm (870 mils) 15 mm (590 mils)	flat: ø 14 mm (550 mils)	40 mm (1.6“)	Single tip angle probe with fixed measurement system. Same application as ES1A probe, however designed for measurements in pipes, bore holes or recesses. A separate V-groove adapter has to be used on curved surfaces.
	0.5 - 108 % IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.03 % of measured value*	*50 mm (200 mils)* *2 mm (80 mils)*	*0.91 mm (36 mils)* *at 52% IACS*	*Polyamide*	*35 mm (1.4“)*	
					no	90 mm (3.5“)	
	ES2 602-223	0.5 % of measured value	0 - 500 µm (20 mils)	12 mm (470 mils) 5 mm (200 mils)	flat: ø 5.5 mm (220 mils)	---	Axial single tip probe with fixed measurement system. Same application as ES1A probe, however due to the higher measurement frequency especially suited for thinner specimen (strips, sheet metal, coatings).
	0.5 - 108 % IACS *0.3 - 63 MS/m*	*0.0 1% IACS or* *0.05 % of measured value*	*36 mm (1400 mils)* *2 mm (80 mils)*	*0.44 mm (17 mils)* *at 52% IACS*	*Polyamide*	---	
					no	110 mm (4.3“)	
	S1A[2] 601-568	0.3 % of measured value	0 - 700 µm (28 mils)	22 mm (870 mils) 15 mm (590 mils)	flat: ø 14 mm (550 mils)	---	Axial single tip probe with fixed measurement system. Same application as ES1A probe, however only in conjunction with the hand-held instruments SMP1B and SMP1BS.
	0.5 - 108% IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.03 % of measured value*	*50 mm (200 mils)* *2 mm (80 mils)*	*0.91 mm (36 mils)* *at 52% IACS*	*Polyamide*	*18 mm (0.7“)*	
					no	130 mm (5.1“)	
	SW1A[2] 601-615	0.3 % of measured value	0 - 700 µm (28 mils)	22 mm (870 mils) 15 mm (590 mils)	flat: ø 14 mm (550 mils)	40 mm (1.6“)	Single tip angle probe with fixed measurement system. Same application as S1A probe, however designed for measurements in pipes, bore holes and recesses.
	0.5 - 108% IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.03 % of measured value*	*50 mm (200 mils)* *2 mm (80 mils)*	*0.91 mm (36 mils)* *at 52% IACS*	*Polyamide*	*35 mm (1.4“)*	
					no	90 mm (3.5“)	
	S2[3] 601-569	0.5 % of measured value	0 - 500 µm (20 mils)	12 mm (470 mils) 5 mm (200 mils)	flat: ø 5.5 mm (220 mils)	---	Axial single tip probe with fixed measurement system. Same application as ES2 probe, however only in conjunction with the hand-held instrument SMP2.
	0.5 - 108% IACS *0.3 - 63 MS/m*	*0.01 % IACS or* *0.05 % of measured value*	*36 mm (1400 mils)* *2 mm (80 mils)*	*0.44 mm (17 mils)* *at 52% IACS*	*Polyamide*	*16 mm (0.6“)*	
					no	110 mm (4.3“)	
	ES4B[4] ES40[5] 602-539 603-235	0,3 % of measured value	0 - 500 µm (20 mils)	10 mm (400 mils) 5 mm (200 mils)	flat: ø 14 mm (550 mils)	---	Axial single-tip measurement probe with fixed measuring element. Measures the electrical conductivity of nonferrous metals according to the eddy current method. Applications include material sorting, heat treatment inspections and analysis of structural conditions. Suitable for the following measurement frequencies: 120 kHz, 240 kHz and 480 kHz. Measurement ES40 probe is additionally suited for a frequency of 60 kHz and contains an integrated temperature sensor.
	0,5-108 % IACS *0,3-63 MS/m*	*0,01 % IACS or* *0,03 % of measured value*	*30 mm (1.2“)* *1 mm (40 mils)*	*0.35 mm* *at 30 MS/m and 480 kHz*	*Polyamide*	*18 mm (0.7“)*	
					no	90 mm (3.5“)	

[1] : Probe can only be connected to FISCHERSCOPE® MMS® module SIGMASCOPE® and module DUPLEX
[2] : Probe can only be connected to SIGMASCOPE® SMP1B
[3] : Probe can only be connected to SIGMASCOPE® SMP2
[4] : Probe can only be connected to FISCHERSCOPE® MMS® EURO HF
[5] : Probe can only be connected to SIGMASCOPE® SMP10
[6] : Probe can only be connected to CU-SCOPE® CMP1A
[7] : Probe can only be connected to FISCHERSCOPE® MMS Module DUPLEX

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Characteristic values and technical data of probes to measure the ferrite content

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	**Description Order Number** ***Measurement range***	**Measurement accuracy* u_s** ***Measurement precision* s***	Measurement point **Ø for 5% error min. Ø** ***Ø for 5% error min. Ø***	**Ø for 5% error min. Ø** ***D for 5% error** ***D for 10% error***	**Probe tip radius** ***Probe tip material*** replaceable probe tip	**Height** ***Diameter/width*** Length (see page 24)	**Type of probe Application**
	EGAB1.3-FE 602-221	0 - 5 %Fe/5FN : 0.1 %FE/FN 5 %Fe/5FN - 80 %/110FN : 2 %	ø : 15 mm (590 mils) min. ø : 1 mm (80 mils)	ø : 10 mm (400 mils) min. ø : 2 mm (80 mils)	0.75 mm (30 mils)	---	Axial single tip probe with spring-loaded measuring system. Measurement of the Delta Ferrite content in ferrite percent or WRC ferrite number. Suitable for the measurement of delta ferrite content in weld metal and clad layers of austenitic or Duplex stainless steel. Also used to determine the ratio of martensite in austenitic stainless steels.
	0.1 - 80 % Fe *0.1 - 110 FN*	*0 - 10 %Fe/10FN : 0.05 %Fe/FN* *10 %Fe/10FN - 80 %Fe/110FN : 0.5 %*	*ø : 30 mm (1.2“)* *min. ø : 10 mm (400 mils)*	*D : 1 mm (40 mils)* *D : 1 mm (40 mils)*	*PVD coated*	*10 mm (0.4“)*	
					yes	110 mm (4.3“)	
	EGABW1.3-FE 602-304 EGABW1.3L-FE 602-614	0 - 5 %Fe/5FN : 0.1 %FE/FN 5 %Fe/5FN - 80 %/110FN : 2 %	ø : 15 mm (590 mils) min. ø : 1 mm (40 mils)	ø : 10 mm (400 mils) min. ø : 2 mm (80 mils)	0.75 mm (30 mils)	23 mm (0.9“)	Single pole angle probe with spring-loaded measuring system. Same application as EGAB1.3-FE probe, however preferred for measurements in pipes, bore holes or recesses.
	0.1 - 80 % Fe *0.1 - 110 FN*	*0 - 10 %Fe/10FN : 0.05 %Fe/FN* *10 %Fe/10FN - 80 %Fe/110FN : 0.5 %*	*ø : 36 mm (1.4“)* *min. ø : 18 mm (720 mils)*	*D : 1 mm (40 mils)* *D : 1 mm (40 mils)*	*PVD coated*	*14 mm (0.6“)*	
					yes	72 mm (2.8“)	
	EGABI1.3-150FE 602-706	0 - 5 %Fe/5FN : 0.1 %FE/FN 5 %Fe/5FN - 80 %/110FN : 2 %	ø : 15 mm (590 mils) min. ø : 2 mm (80 mils)	ø : 10 mm (400 mils) min. ø : 2 mm (80 mils)	0.75 mm (30 mils)	6.5 mm (0.26“)	Single tip probe for inside measurements with spring-loaded measuring system. Same application as EGAB1.3-FE probe, however designed for measurements in pipes, bore holes and grooves. Externally triggered measurement acquisition should be used when measuring small inside diameters to prevent measurement errors. Maximum insertion depth : 320 mm (12.8“).
	0.1 - 80% Fe *0.1 - 110 FN*	*0 - 10 %Fe/10FN : 0.05 %Fe/FN* *10 %Fe/10FN - 68 %Fe/110FN : 0.5 %*	*ø : 30 mm (1.2“)* *min. ø : 9 mm (350 mils)*	*D : 1 mm (40 mils)* *D : 1 mm (40 mils)*	*PVD coated*	*5.5 mm (0.22“)*	
					yes	320 mm (12.6“)	

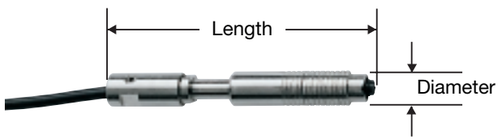
All probes can be connected to FISCHERSCOPE® MMS® module PERMASCOPE® and FERITSCOPE® MP30

(1) : Measurement of Delta Ferrite content in sheet material. Thickness of the sheet material.

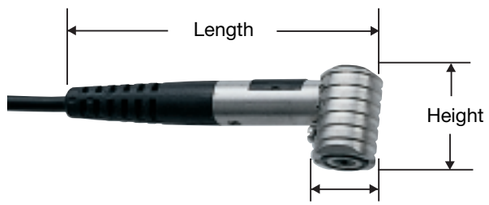
(2) : Measurement of Delta Ferrite content in clad layers. Thickness of the cladding.

Comments to probe dimensions:

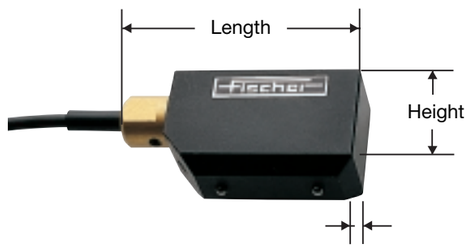
Listed are the maximum diameter (respective to width) and the maximum height of the probe, as well as the overall length from the probe tip to the cable entry point.



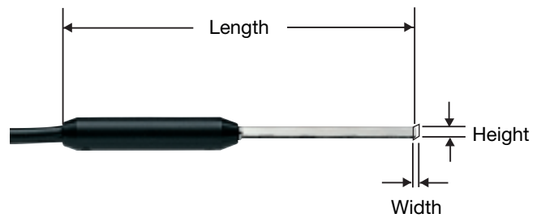
Example EGAB1.3



Example EGABW1.3



Example EKB25



Example V1EGA1HR34

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Characteristic values and technical data of probes to measure the ferrite content

Note regarding probe designations: L: cable length for magnetic induction probes 5 m and for eddy current probes 3 m instead of 1.5 m. F: Measuring element protected against moist, aggressive media. T: Intermittent measurements on specimens with temperatures up to 100 °C (212 °F) possible. * Note: Probe capability (accuracy and precision) tested under controlled conditions.	**Description Order Number** ***Measurement range***	**Measurement accuracy* u_s** ***Measurement precision* s***	Measurement point **Ø for 5% error min. Ø** ***Ø for 5% error min. Ø***	**Ø for 5% error min. Ø** ***D for 5% error** ***D for 10% error***	**Probe tip radius** ***Probe tip material*** replaceable probe tip	**Height** ***Diameter/width*** Length (see page 24)	**Type of probe Application**
	EGAB1.3-FE 602-221	0 - 5 %Fe/5FN : 0.1 %FE/FN 5 %Fe/5FN - 80 %/110FN : 2 %	ø : 15 mm (590 mils) min. ø : 1 mm (80 mils)	ø : 10 mm (400 mils) min. ø : 2 mm (80 mils)	0.75 mm (30 mils)	---	Axial single tip probe with spring-loaded measuring system. Measurement of the Delta Ferrite content in ferrite percent or WRC ferrite number. Suitable for the measurement of delta ferrite content in weld metal and clad layers of austenitic or Duplex stainless steel. Also used to determine the ratio of martensite in austenitic stainless steels.
	0.1 - 80 % Fe *0.1 - 110 FN*	*0 - 10 %Fe/10FN : 0.05 %Fe/FN* *10 %Fe/10FN - 80 %Fe/110FN : 0.5 %*	*ø : 30 mm (1.2“)* *min. ø : 10 mm (400 mils)*	*D : 1 mm (40 mils)* *D : 1 mm (40 mils)*	*PVD coated*	*10 mm (0.4“)*	
					yes	110 mm (4.3“)	
	EGABW1.3-FE 602-304 EGABW1.3L-FE 602-614	0 - 5 %Fe/5FN : 0.1 %FE/FN 5 %Fe/5FN - 80 %/110FN : 2 %	ø : 15 mm (590 mils) min. ø : 1 mm (40 mils)	ø : 10 mm (400 mils) min. ø : 2 mm (80 mils)	0.75 mm (30 mils)	23 mm (0.9“)	Single pole angle probe with spring-loaded measuring system. Same application as EGAB1.3-FE probe, however preferred for measurements in pipes, bore holes or recesses.
	0.1 - 80 % Fe *0.1 - 110 FN*	*0 - 10 %Fe/10FN : 0.05 %Fe/FN* *10 %Fe/10FN - 80 %Fe/110FN : 0.5 %*	*ø : 36 mm (1.4“)* *min. ø : 18 mm (720 mils)*	*D : 1 mm (40 mils)* *D : 1 mm (40 mils)*	*PVD coated*	*14 mm (0.6“)*	
					yes	72 mm (2.8“)	
	EGABI1.3-150FE 602-706	0 - 5 %Fe/5FN : 0.1 %FE/FN 5 %Fe/5FN - 80 %/110FN : 2 %	ø : 15 mm (590 mils) min. ø : 2 mm (80 mils)	ø : 10 mm (400 mils) min. ø : 2 mm (80 mils)	0.75 mm (30 mils)	6.5 mm (0.26“)	Single tip probe for inside measurements with spring-loaded measuring system. Same application as EGAB1.3-FE probe, however designed for measurements in pipes, bore holes and grooves. Externally triggered measurement acquisition should be used when measuring small inside diameters to prevent measurement errors. Maximum insertion depth : 320 mm (12.8“).
	0.1 - 80% Fe *0.1 - 110 FN*	*0 - 10 %Fe/10FN : 0.05 %Fe/FN* *10 %Fe/10FN - 68 %Fe/110FN : 0.5 %*	*ø : 30 mm (1.2“)* *min. ø : 9 mm (350 mils)*	*D : 1 mm (40 mils)* *D : 1 mm (40 mils)*	*PVD coated*	*5.5 mm (0.22“)*	
					yes	320 mm (12.6“)	

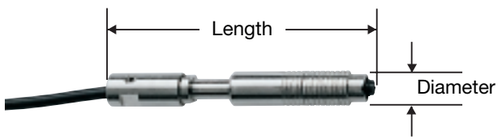
All probes can be connected to FISCHERSCOPE® MMS® module PERMASCOPE® and FERITSCOPE® MP30

(1) : Measurement of Delta Ferrite content in sheet material. Thickness of the sheet material.

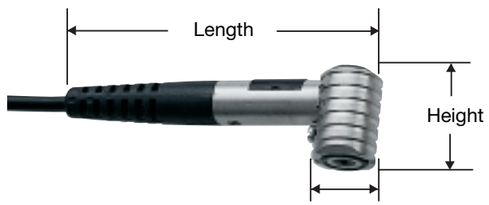
(2) : Measurement of Delta Ferrite content in clad layers. Thickness of the cladding.

Comments to probe dimensions:

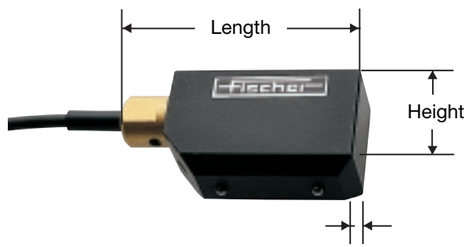
Listed are the maximum diameter (respective to width) and the maximum height of the probe, as well as the overall length from the probe tip to the cable entry point.



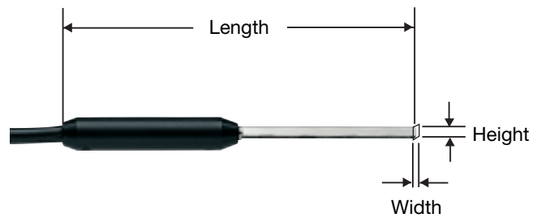
Example EGAB1.3



Example EGABW1.3



Example EKB25



Example V1EGA1HR34

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Accessories

For the accurate measurement of coating thickness on small parts, such as fasteners, stampings, sleeves, etc. or parts with complex geometry. Probe specific mounting adapters are required.

*: included with standard V12 measurement stand (order number 602-260) or V12-SP stand (order number 602-262)



V12 measurement stand with base* and adapter 600-796* to mount the following probes:
- ETA3.3H, ETA3.3F, ETA3.3T
- EGAB1.3-SD
- V6EKB4



V12 measurement stand with V-table*, adapter 600-173* and adapter 600-077 to mount the following probes:
- EGABW1.3, EGBW2, EGABW1.3FE
- EAW3.3, EA9
- ENW3



V12 measurement stand with adapter 600-213 to mount the following probes:
- ESD1, ESD2
- ESC1, ESC2
- ES2



V12 measurement stand with magnetic shuttle table 600-019 and adapter 600-173* to mount the following probes:
- EGA2H
- EN3



V12 measurement stand with V-table*, adapter 600-173* and adapter 601-691 to mount the following probes:
- EGABI1.3-150, EGABI1.3-260, V1EKB4, V1EKB10, EGABI1.3-150FE
- EAI3.3-150



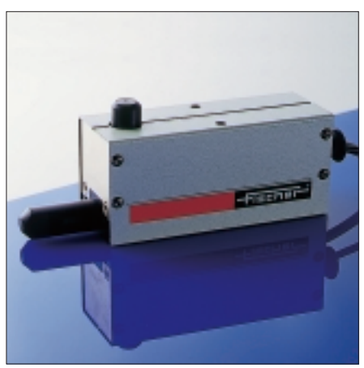
V12-SP measurement stand with quick loading screw fixture and adapter 602-370* to mount the following probes:
- EGAB1.3, EGB2, EGAB1.3FE



Screw measurement device for accurate measurements of coating thicknesses on metallic fasteners according to ISO DIN 4042.



Measuring stand V12 mot. MP for automated measurements specifically for paint coatings without indentation- or positioning errors.



Measuring head MD4 for automatic measurements of coatings on ferromagnetic substrate materials. Easy integration into production lines for 100% testing.

Test Instruments

A series of hand-held and bench top instruments are available for the probes listed. For magnetic induction based measurement the DELTASCOPE® MPxC series is used, the ISOSCOPE® MP series is used for eddy current coating thickness measurement, the DUALSCOPE® MP20 and MP40 series combine the magnetic induction and eddy current methods.



DELTASCOPE® MP10 displays individual measurement values without statistics, it has no serial interface (no printing, no data transfer) and does not store measurement values.



DUALSCOPE® MP20 with statistical measurement series evaluation capability. Does not store measurements, it has no serial interface.



Measurement of the paint coating thickness on a curved surface using ETD3.3 probe and DUALSCOPE® MP40.



Measurement of a duplex coating (paint/zinc coating on iron) using EDX10 probe and DUALSCOPE® MP40.



Measurement system Fischerscope® MMS with various methods for coating thickness measurement and material testing.



Hand-held NICKELSCOPE® NMP2 for the measurement of nickel or nonferrous metal coating on steel, as well as nonferrous metal coatings on nonconductive substrates.



The CU-SCOPE CMP1A is used to measure copper plating thickness in PCB through holes.



SIGMASCOPE® SMP10 for measuring the electrical conductivity of nonferromagnetic, electrically conducting metals.



The FERITSCOPE® MP30 determines the delta ferrite content in austenitic weld metal or duplex stainless steel.

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Accessories

For the accurate measurement of coating thickness on small parts, such as fasteners, stampings, sleeves, etc. or parts with complex geometry. Probe specific mounting adapters are required.

*: included with standard V12 measurement stand (order number 602-260) or V12-SP stand (order number 602-262)



V12 measurement stand with base* and adapter 600-796* to mount the following probes:
- ETA3.3H, ETA3.3F, ETA3.3T
- EGAB1.3-SD
- V6EKB4



V12 measurement stand with V-table*, adapter 600-173* and adapter 600-077 to mount the following probes:
- EGABW1.3, EGBW2, EGABW1.3FE
- EAW3.3, EA9
- ENW3



V12 measurement stand with adapter 600-213 to mount the following probes:
- ESD1, ESD2
- ESC1, ESC2
- ES2



V12 measurement stand with magnetic shuttle table 600-019 and adapter 600-173* to mount the following probes:
- EGA2H
- EN3



V12 measurement stand with V-table*, adapter 600-173* and adapter 601-691 to mount the following probes:
- EGABI1.3-150, EGABI1.3-260, V1EKB4, V1EKB10, EGABI1.3-150FE
- EAI3.3-150



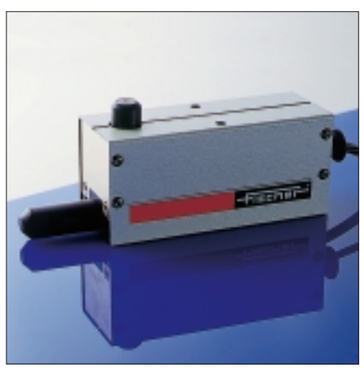
V12-SP measurement stand with quick loading screw fixture and adapter 602-370* to mount the following probes:
- EGAB1.3, EGB2, EGAB1.3FE



Screw measurement device for accurate measurements of coating thicknesses on metallic fasteners according to ISO DIN 4042.



Measuring stand V12 mot. MP for automated measurements specifically for paint coatings without indentation- or positioning errors.



Measuring head MD4 for automatic measurements of coatings on ferromagnetic substrate materials. Easy integration into production lines for 100% testing.

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DUALSCOPE® MP20 with statistical measurement series evaluation capability. Does not store measurements, it has no serial interface.



Measurement of the paint coating thickness on a curved surface using ETD3.3 probe and DUALSCOPE® MP40.



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Hand-held NICKELSCOPE® NMP2 for the measurement of nickel or nonferrous metal coating on steel, as well as nonferrous metal coatings on nonconductive substrates.



The CU-SCOPE CMP1A is used to measure copper plating thickness in PCB through holes.

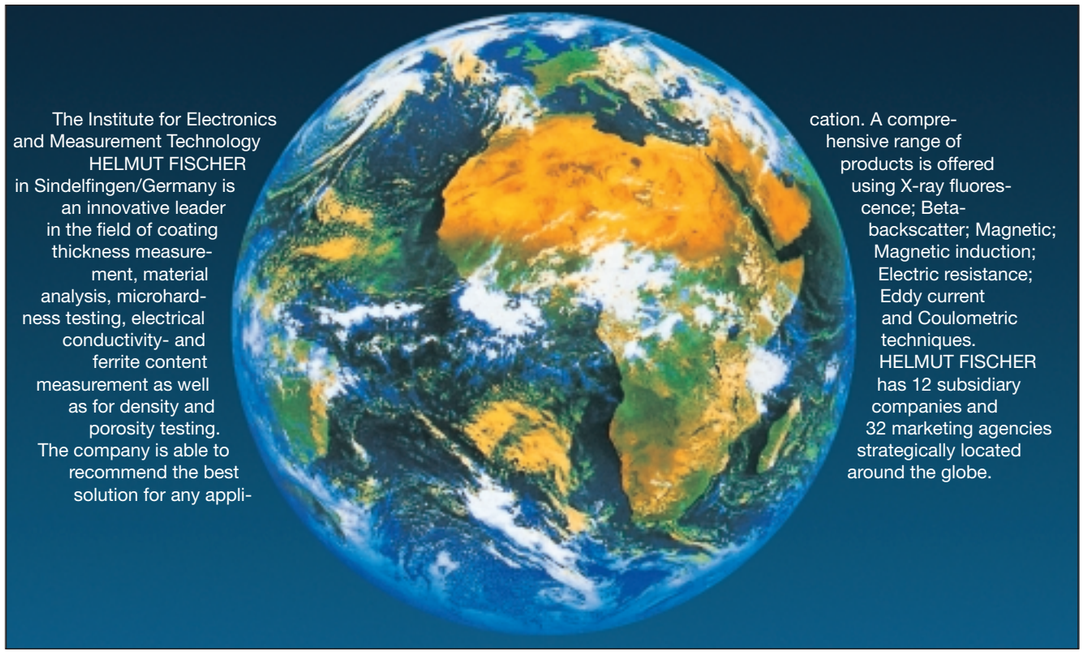


SIGMASCOPE® SMP10 for measuring the electrical conductivity of nonferromagnetic, electrically conducting metals.



The FERITSCOPE® MP30 determines the delta ferrite content in austenitic weld metal or duplex stainless steel.

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The Institute for Electronics and Measurement Technology HELMUT FISCHER in Sindelfingen/Germany is an innovative leader in the field of coating thickness measurement, material analysis, microhardness testing, electrical conductivity- and ferrite content measurement as well as for density and porosity testing. The company is able to recommend the best solution for any application. A comprehensive range of products is offered using X-ray fluorescence; Beta-backscatter; Magnetic; Magnetic induction; Electric resistance; Eddy current and Coulometric techniques. HELMUT FISCHER has 12 subsidiary companies and 32 marketing agencies strategically located around the globe.



FISCHERSCOPE® X-RAY to measure coating thickness using the X-Ray fluorescence method.



Microhardness testing system FISCHERSCOPE® H100C.



POROSCOPE® HV20 to test for pores and pinholes in nonconductive coatings.

The high quality standard of FISCHER instruments is the result of our efforts to provide the very best instrumentation to our customers.

FISCHER is a reliable and competent partner, offering expert advice, extensive service, and training seminars.

Today, FISCHER instruments are used successfully in all technological fields of industry and research.

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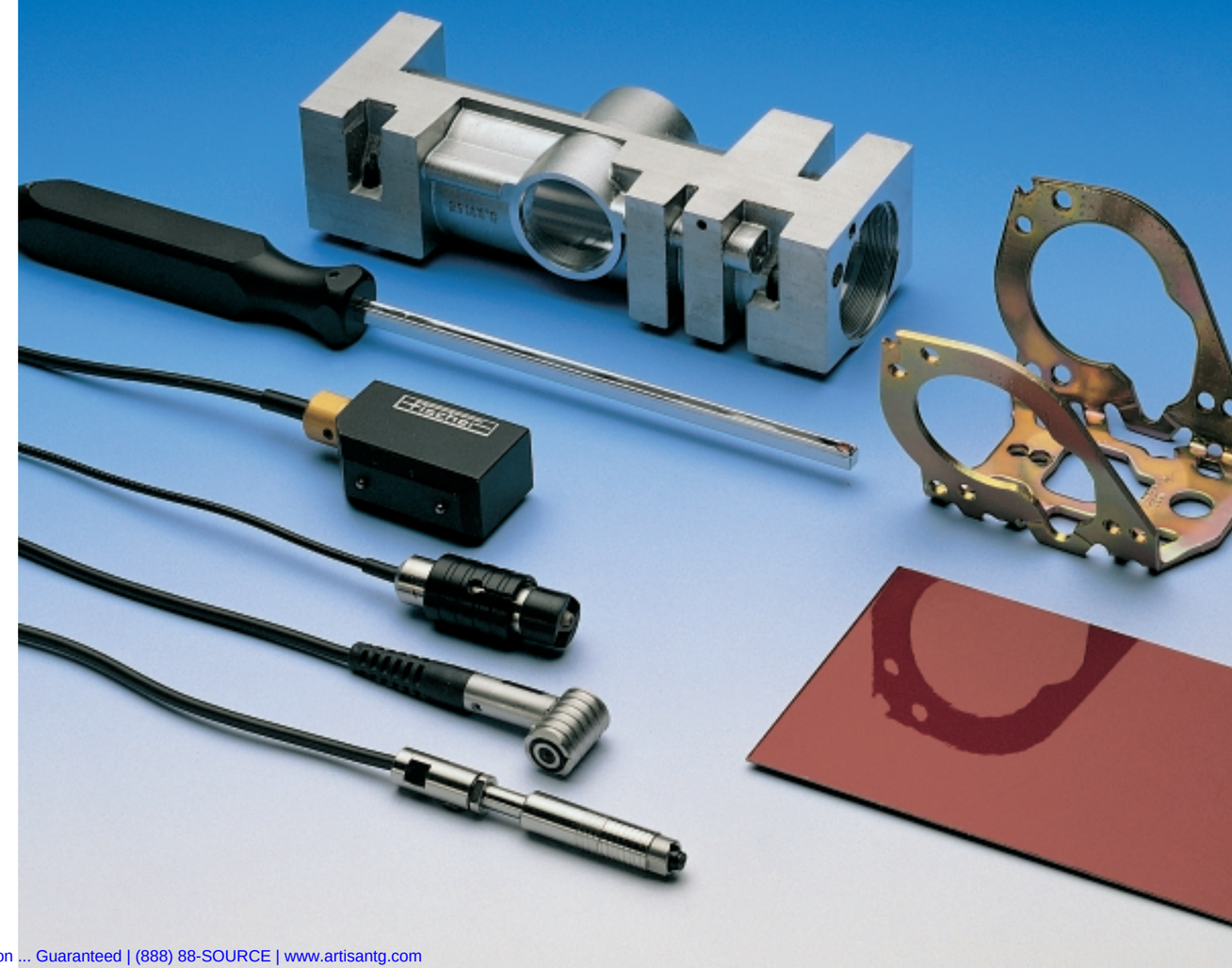
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