

Von der Schweizerischen Akkreditierungsstelle akkreditierte Kalibrierstelle  
Laboratoire d'étalonnage accrédité par le Service d'Accréditation Suisse  
Calibration Laboratory accredited by the Swiss Accreditation Service

S Akkreditierungs-Nr.  
C No. d'accréditation **SCS 002**  
S Accreditation No.

The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Zertifikat Nr.  
No. du certificat 19406  
Certificate No.

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## KALIBRIER – ZERTIFIKAT CERTIFICAT D'ÉTALONNAGE CERTIFICATE OF CALIBRATION

Instrument  
Instrument  
Instrument

KF Resistor Unit 2

Hersteller  
Fabricant  
Manufacturer

MT

Typ  
Type  
Model

ME-51105620

Serien- / Inventar-Nr.  
No. de série- / inventaire  
Serial- / Inv. No.

TC02A0036

Kunde  
Client  
Customer

Mettler-Toledo AG Analytical, Schwerzenbach

Auftragsnummer  
No. de la commande  
Order No.

n/a

Bemerkungen  
Remarques  
Remarks

n/a

Datum der Kalibrierung  
Date de l'étalonnage  
Date of calibration

08. November 2016

Dieses Kalibrierzertifikat dokumentiert die Rückverfolgbarkeit auf nationale Normale zur Darstellung der physikalischen Einheiten (SI).  
Ce certificat d'étalonnage confirme le raccordement aux étalons nationaux qui matérialisent les grandeurs physiques (SI).  
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).

Messresultate, Messunsicherheiten mit Vertrauensbereich und Messverfahren sind auf den folgenden Seiten aufgeführt und sind Teil des Zertifikats.  
Les résultats, les incertitudes avec le niveau de confiance et les méthodes de mesure sont donnés aux pages suivantes et font partie du certificat.  
The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages and are part of the certificate.

Stempel und Datum  
Timbre et Date  
Stamp and date

**ELCAL**  
Messgeräte • Service • Kalibration

Dietikon, 08. November 2016

Leiter der Kalibrierstelle  
Chef du laboratoire d'étalonnage  
Head of the Calibration Laboratory

Jörg Stampfli

Dieses Kalibrierzertifikat darf ohne die schriftliche Zustimmung des Laboratoriums nicht auszugsweise vervielfältigt werden.  
Ce certificat ne doit pas être reproduit, sinon en entier, sans l'autorisation écrite du laboratoire.  
This calibration certificate shall not be reproduced except in full, without written approval of the laboratory.

Testreport  
391857

Certificate : SCS 19406  
Unit under Test : MT ME-51105620 KF Resistor Unit 2  
Serial No : TC02A0036  
Customer : Mettler-Toledo AG Analytical, Schwerzenbach  
Inventory No :  
Date : 08.11.2016  
Operator : M. Huerlemann

TRACEABILITY INFORMATION

Instruments used:	Serial No:	Inventory No:	Cal Due Date:
Agilent 3458A/02	2823A23959	LAB-182	23.01.2017
Fluke 5020A	A52024	LAB-195	15.03.2017

All listed result are direct traceable to the Swiss Federal Office of Metrology, as far as listed in the uncertainty table of the SCS Certificate. Measurements beyond the current accreditation are marked with \*.

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approx 95%.

SUMMARY OF LAST RECORDED CAL DATA

This certificate records the calibration status.  
Points where %Tol exceeds the adjustment threshold are marked with a "M".  
Points where %Tol exceeds the specification limit are marked with a "F".  
The calibration status is calculated neglecting the measurement uncertainty.

Number of Test Marginal: 0  
Number of Test Failed: 0

INSTRUMENTAL

<u>Testreport</u> 391857	Certificate : SCS 19406 Unit under Test : MT ME-51105620 KF Resistor Unit 2 Serial No : TC02A0036 Customer : Mettler-Toledo AG Analytical, Schwerzenbach Inventory No : Date : 08.11.2016 Operator : M. Huerlemann
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TEST RANGE	UUT INDICATED	SYSTEM ACTUAL	MODIFIER	ERROR	ERROR (%TOL)	EXP. M	UNCERT F
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Actual Ambient Temp. 23.1 ±0.5°C / Humidity 37.6%

Marginal limit 90% of UUT Tol.

METTLER TOLEDO: ME-51105620 KF Resistor Unit 2 Verification

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Test Rel. to 0.1% of Nominal Resistor Value

9.0909 Ohm 4Wire Resistor Test:

1	9.0909Ω	9.09184Ω	4W_@_100mA	0.010 %	10	143uΩ
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1 kOhm 4Wire Resistor Test:

2	1.00000kΩ	1.000240kΩ	4W_@_1mA	0.024 %	24	5.7mΩ
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10 kOhm 2Wire Resistor Test:

3	10.0000kΩ	10.00120kΩ	2W_@_100uA	0.012 %	12	157mΩ
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100 kOhm 2Wire Resistor Test:

4	100.000kΩ	100.0560kΩ	2W_@_100uA	0.056 %	56	667mΩ
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End of METTLER TOLEDO: ME-51105620 KF Resistor Unit 2 Verification