esz calibration & metrology

Calibration Certificate No. 405364-02

Passed

Object	Digital Multimeter Keysight 34401A
Serial No.	123456789
Customer	esz Marketing Max-Planck-Str. 16 82223 Eichenau
esz ID	405364
Test Equipment No.	n.a.
Inventory No.	n.a.
Customer Ref. No.	PO123456
Order No.	CD2021
Traceability	This calibration certificate documents the traceability to the International System of Units (SI, Système international d'unités). Quality management system, principles and calibration procedures comply with DIN EN ISO/ IEC 17025. The calibration fulfils the requirements according to DIN EN ISO 9001 ff. or other comparable quality management guidelines.
Date of Calibration	2021-01-27
Next Calibration	2022-01 The calibration laboratory does not make any suggestion on the calibration interval. The definition and compliance to intervals for recalibrations lie within the user's responsibility.

Approved by Andreas Böck on 2021-01-27

Laboratory Manager	Person in Charge
Philip M. Fleischmann	Katharina Schreck

1. Device Under Test

Manufacturer:	Keysight
Model:	34401A
Model type:	Digital Multimeter
Application(s):	AC DC
Type:	benchtop device
Inspection equipment No.:	n.a.
Inventory No.:	n.a.

All stated measurement and test results relate only to the item mentioned above.

2. Calibration Procedure

- Direct measurement procedure using fixed standards or a variable AC/DC–source according to QMH III.1
- Frequency calibration at an external synchronized generator according to esz QMH VIII.1.2

Calibration procedure revision 1.1, approved 2015-09-24 by Wilhelm Sandmeier

Calibration equipment and standards:

Standards	Manufacturer Model	Device	Traceable to	Cal. no.	Last cal.	Next cal.
004195	Fluke 5700A	Calibrator	D-K-15019-01-00	004195-14	2021-01	2022-01
098008	Precision Test Systems GPS10eR	Frequency Standard	GPS	098008-20	2020-02	2021-02
116398	esz 4-Wire-Cu Short	Short	D-K-15019-01-00	116398-01	2016-01	2026-01

Auxiliary equipment and devices:

Aux. devices	Manufacturer Model	Device	Traceable to	Cal. no.	Last cal.	Next cal.
063278	Agilent 33220A	Function Generator	D-K-15019-01-00	063278-08	2020-06	2021-06

3. Ambient Conditions

Temperature (22,6 to 22,9) °C ±1 K
Relative Humidity (27 to 29) % ±3 %
Barometric Pressure 953 mbar ±5 mbar

4. Test Conditions

Acquisition method:	automated
MetCal procedure:	34401A R1.4 (5700,395/33220A)
Preset(s) before calibration:	Electronic zero adjustment max. accuracy self-test
Remote setting(s) in delivery state:	GPIB ADDR: 01
Resolution:	6,5 Digit
Terminal sides:	Front panel

Appropriate storage time at ambient conditions and warm up time have been observed.

5. Place of Calibration

Max-Planck-Straße 16
82223 Eichenau
Germany

6. Measurement Uncertainties (MU)

The given measurement uncertainties are calculated in accordance to EA-4/02 M:2013 (GUM) and contain the uncertainties of the calibration method, the calibration equipment and of the DUT during calibration. Any long term instability is not considered. The uncertainty as stated is the expanded uncertainty obtained by multiplying the standard uncertainty by coverage factor k=2. The value of the measurands lies within the assigned range of values with a probability of 95%. Relative uncertainties are based on the nominal test point (calibration of measurement devices), otherwise on the measured value (calibration of sources or standards).

7. Method of Occupied Tolerance Calculation

Occupied Tolerance (%TOL) was calculated as a percentage of the specification range.

8. Additional Maintenance

☐ Adjustment ☐ Repair ☐ Function Test ☐ Cleaning

9. Summary

All measured values lie within the stated specifications. In agreement with the customer, the specifications were defined based on the manufacturer´s specifications or application requirements. Taking into account measurement uncertainty as well as in tolerance (PASS) or out of tolerance (FAIL) observations based on the stated specifications in column "Specification" follow the decision rule "ILAC evaluation PASS".

Further guidance on definitions, legends and decision rules are available on www.esz-ag.de/definitions.pdf

The specifications were derived from the following source(s):
File path(s): K:\Dokumentation Hersteller\Keysight\34401A\34401A_manual.pdf

10. Remarks

none

11. Detailed Results:

The definition of test points has been done considering the laboratory's measurement capabilities and technical infrastructure according to the following source(s):
File path(s): N:\AA0097-Kalibrierumfang-Multimeter.doc

The comma is used as decimal separator.

Function Test

Test	Result
Self-Test	PASS

DC-Current

Zero Offset Tests (Front Inputs)

Range	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
10 mA	0,00000 mA	0,00017 mA	± 0,02 %FS	0,00017 mA	9 %	$0{,}0058 \cdot 10^{-3}$ mA		
100 mA	0,0000 mA	-0,0001 mA	± 0,005 %FS	-0,0001 mA	2 %	$0{,}058 \cdot 10^{-3}$ mA		
1 A	0,000000 A	0,000000 A	± 0,01 %FS		0 %	$0{,}58 \cdot 10^{-6}$ A		
3 A	0,00000 A	0,00001 A	± 0,02 %FS	0,00001 A	2 %	$0{,}0058 \cdot 10^{-3}$ A		

DC-Voltage

Zero Offset Tests

Range	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
100 mV	0,0000 mV	-0,0002 mV	± 35 D	-0,0002 mV	6 %	$0{,}068 \cdot 10^{-3}$ mV		
1 V	0,000000 V	0,000000 V	± 7 D		0 %	$0{,}58 \cdot 10^{-6}$ V		
10 V	0,00000 V	0,00000 V	± 5 D		0 %	$0{,}0058 \cdot 10^{-3}$ V		
100 V	0,0000 V	0,0000 V	± 6 D		0 %	$0{,}058 \cdot 10^{-3}$ V		
1000 V	0,000 V	0,000 V	± 10 D		0 %	$0{,}58 \cdot 10^{-3}$ V		

DC-Resistance

Zero Offset Tests, 4-Wire

Range	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
100 Ω	0,0000 Ω	0,0008 Ω	± 40 D	0,0008 Ω	20 %	$0{,}058 \cdot 10^{-3}$ Ω		
1 kΩ	0,000000 kΩ	0,000001 kΩ	± 10 D	0,000001 kΩ	10 %	$0{,}58 \cdot 10^{-6}$ kΩ		
10 kΩ	0,00000 kΩ	0,00001 kΩ	± 10 D	0,00001 kΩ	10 %	$0{,}0058 \cdot 10^{-3}$ kΩ		
100 kΩ	0,0000 kΩ	0,0001 kΩ	± 10 D	0,0001 kΩ	10 %	$0{,}058 \cdot 10^{-3}$ kΩ		
1 MΩ	0,000000 MΩ	0,000000 MΩ	± 10 D		0 %	$0{,}58 \cdot 10^{-6}$ MΩ		
10 MΩ	0,00000 MΩ	0,00000 MΩ	± 10 D		0 %	$0{,}0058 \cdot 10^{-3}$ MΩ		
100 MΩ	0,0000 MΩ	0,0000 MΩ	± 100 D		0 %	$0{,}058 \cdot 10^{-3}$ MΩ		

DC-Voltage

Range	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
100 mV	100,0000 mV	100,0000 mV	± 0,005 % ± 0,0035 %FS		0 %	$12 \cdot 10^{-6}$		
100 mV	-100,0000 mV	-99,9990 mV	± 0,005 % ± 0,0035 %FS	$10 \cdot 10^{-6}$	12 %	$12 \cdot 10^{-6}$		
1 V	1,000000 V	0,999996 V	± 0,004 % ± 0,0007 %FS	$-4{,}0 \cdot 10^{-6}$	9 %	$4{,}0 \cdot 10^{-6}$		
1 V	-1,000000 V	-0,999999 V	± 0,004 % ± 0,0007 %FS	$1{,}0 \cdot 10^{-6}$	2 %	$4{,}0 \cdot 10^{-6}$		
10 V	10,00000 V	9,99995 V	± 0,0035 % ± 0,0005 %FS	$-5{,}0 \cdot 10^{-6}$	13 %	$3{,}7 \cdot 10^{-6}$		
10 V	-10,00000 V	-9,99999 V	± 0,0035 % ± 0,0005 %FS	$1{,}0 \cdot 10^{-6}$	3 %	$3{,}7 \cdot 10^{-6}$		
100 V	100,0000 V	99,9992 V	± 0,0045 % ± 0,0006 %FS	$-8{,}0 \cdot 10^{-6}$	16 %	$4{,}2 \cdot 10^{-6}$		
100 V	-100,0000 V	-99,9995 V	± 0,0045 % ± 0,0006 %FS	$5{,}0 \cdot 10^{-6}$	10 %	$4{,}2 \cdot 10^{-6}$		
1000 V	900,000 V	899,992 V	± 0,0045 % ± 0,001 %FS	$-8{,}9 \cdot 10^{-6}$	16 %	$6{,}5 \cdot 10^{-6}$		
1000 V	-900,000 V	-899,997 V	± 0,0045 % ± 0,001 %FS	$3{,}3 \cdot 10^{-6}$	6 %	$6{,}5 \cdot 10^{-6}$		

DC-Voltage
Linearity

Range	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
10 V	1,00000 V	1,00000 V	± 0,0035 % ± 0,0005 %FS		0 %	$7{,}0 \cdot 10^{-6}$		
10 V	2,00000 V	1,99999 V	± 0,0035 % ± 0,0005 %FS	$-5{,}0 \cdot 10^{-6}$	8 %	$5{,}3 \cdot 10^{-6}$		
10 V	3,00000 V	3,00000 V	± 0,0035 % ± 0,0005 %FS		0 %	$3{,}4 \cdot 10^{-6}$		
10 V	4,00000 V	3,99999 V	± 0,0035 % ± 0,0005 %FS	$-2{,}5 \cdot 10^{-6}$	5 %	$3{,}4 \cdot 10^{-6}$		
10 V	5,00000 V	4,99998 V	± 0,0035 % ± 0,0005 %FS	$-4{,}0 \cdot 10^{-6}$	9 %	$3{,}5 \cdot 10^{-6}$		
10 V	6,00000 V	5,99998 V	± 0,0035 % ± 0,0005 %FS	$-3{,}3 \cdot 10^{-6}$	8 %	$3{,}5 \cdot 10^{-6}$		
10 V	7,00000 V	6,99997 V	± 0,0035 % ± 0,0005 %FS	$-4{,}3 \cdot 10^{-6}$	10 %	$3{,}6 \cdot 10^{-6}$		
10 V	8,00000 V	7,99997 V	± 0,0035 % ± 0,0005 %FS	$-3{,}8 \cdot 10^{-6}$	9 %	$3{,}6 \cdot 10^{-6}$		
10 V	9,00000 V	8,99996 V	± 0,0035 % ± 0,0005 %FS	$-4{,}4 \cdot 10^{-6}$	11 %	$3{,}7 \cdot 10^{-6}$		

Diagram: -1,3 -1,0 -0,5 0,0 0,5 1,0 1,3

AC-Voltage, sine, RMS

Range	Condition	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
100 mV	55 Hz	100,0000 mV	99,9409 mV	± 0,06 % ± 0,04 %FS	-0,059 %	59 %	0,018 %		
100 mV	100 Hz	100,0000 mV	99,9426 mV	± 0,06 % ± 0,04 %FS	-0,057 %	57 %	0,018 %		
100 mV	400 Hz	100,0000 mV	99,9530 mV	± 0,06 % ± 0,04 %FS	-0,047 %	47 %	0,018 %		
100 mV	1 kHz	100,0000 mV	99,9543 mV	± 0,06 % ± 0,04 %FS	-0,046 %	46 %	0,018 %		
100 mV	10 kHz	100,0000 mV	99,9575 mV	± 0,06 % ± 0,04 %FS	-0,043 %	43 %	0,018 %		
100 mV	100 kHz	100,0000 mV	99,9099 mV	± 0,6 % ± 0,08 %FS	-0,090 %	13 %	0,10 %		
100 mV	300 kHz	100,0000 mV	99,4699 mV	± 4 % ± 0,5 %FS	-0,53 %	12 %	0,13 %		

Diagram: -1,3 -1,0 -0,5 0,0 0,5 1,0 1,3

AC-Voltage, sine, RMS

Range	Condition	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
1 V	55 Hz	1,000000 V	0,999350 V	± 0,06 % ± 0,03 %FS	$-650 \cdot 10^{-6}$	72 %	$71 \cdot 10^{-6}$		
1 V	100 Hz	1,000000 V	0,999352 V	± 0,06 % ± 0,03 %FS	$-648 \cdot 10^{-6}$	72 %	$71 \cdot 10^{-6}$		
1 V	400 Hz	1,000000 V	0,999489 V	± 0,06 % ± 0,03 %FS	$-511 \cdot 10^{-6}$	57 %	$71 \cdot 10^{-6}$		
1 V	1 kHz	1,000000 V	0,999526 V	± 0,06 % ± 0,03 %FS	$-474 \cdot 10^{-6}$	53 %	$71 \cdot 10^{-6}$		
1 V	10 kHz	1,000000 V	0,999584 V	± 0,06 % ± 0,03 %FS	$-416 \cdot 10^{-6}$	46 %	$71 \cdot 10^{-6}$		
1 V	100 kHz	1,000000 V	1,000312 V	± 0,6 % ± 0,08 %FS	0,031 %	5 %	0,028 %		
1 V	300 kHz	1,000000 V	1,003082 V	± 4 % ± 0,5 %FS	0,308 %	7 %	0,052 %		

AC-Voltage, sine, RMS

Range	Condition	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
10 V	55 Hz	10,00000 V	9,99331 V	± 0,06 % ± 0,03 %FS	$-669 \cdot 10^{-6}$	74 %	$71 \cdot 10^{-6}$		
10 V	100 Hz	10,00000 V	9,99333 V	± 0,06 % ± 0,03 %FS	$-667 \cdot 10^{-6}$	74 %	$71 \cdot 10^{-6}$		
10 V	400 Hz	10,00000 V	9,99469 V	± 0,06 % ± 0,03 %FS	$-531 \cdot 10^{-6}$	59 %	$71 \cdot 10^{-6}$		
10 V	1 kHz	10,00000 V	9,99506 V	± 0,06 % ± 0,03 %FS	$-494 \cdot 10^{-6}$	55 %	$71 \cdot 10^{-6}$		
10 V	10 kHz	10,00000 V	9,99570 V	± 0,06 % ± 0,03 %FS	$-430 \cdot 10^{-6}$	48 %	$71 \cdot 10^{-6}$		
10 V	100 kHz	10,00000 V	10,00886 V	± 0,6 % ± 0,08 %FS	0,089 %	13 %	0,025 %		

AC-Voltage, sine, RMS

Range	Condition	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
									-1,3 -1,0 -0,5 0,0 0,5 1,0 1,3
100 V	55 Hz	100,0000 V	99,9350 V	± 0,06 % ± 0,03 %FS	$-650 \cdot 10^{-6}$	72 %	$78 \cdot 10^{-6}$		
100 V	100 Hz	100,0000 V	99,9369 V	± 0,06 % ± 0,03 %FS	$-631 \cdot 10^{-6}$	70 %	$78 \cdot 10^{-6}$		
100 V	400 Hz	100,0000 V	99,9447 V	± 0,06 % ± 0,03 %FS	$-553 \cdot 10^{-6}$	61 %	$78 \cdot 10^{-6}$		
100 V	1 kHz	100,0000 V	99,9469 V	± 0,06 % ± 0,03 %FS	$-531 \cdot 10^{-6}$	59 %	$78 \cdot 10^{-6}$		
100 V	50 kHz	100,0000 V	99,9560 V	± 0,12 % ± 0,04 %FS	-0,044 %	28 %	0,023 %		

AC-Voltage, sine, RMS

Range	Condition	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
									-1,3 -1,0 -0,5 0,0 0,5 1,0 1,3
750 V	55 Hz	600,000 V	599,539 V	± 0,06 % ± 0,03 %FS	$-768 \cdot 10^{-6}$	79 %	$76 \cdot 10^{-6}$		
750 V	100 Hz	600,000 V	599,602 V	± 0,06 % ± 0,03 %FS	$-663 \cdot 10^{-6}$	68 %	$76 \cdot 10^{-6}$		
750 V	400 Hz	600,000 V	599,685 V	± 0,06 % ± 0,03 %FS	$-525 \cdot 10^{-6}$	54 %	$76 \cdot 10^{-6}$		
750 V	1 kHz	600,000 V	599,708 V	± 0,06 % ± 0,03 %FS	$-487 \cdot 10^{-6}$	50 %	$76 \cdot 10^{-6}$		
750 V	55 Hz	220,000 V	219,873 V	± 0,06 % ± 0,03 %FS	$-577 \cdot 10^{-6}$	36 %	$74 \cdot 10^{-6}$		
750 V	55 Hz	240,000 V	239,844 V	± 0,06 % ± 0,03 %FS	$-650 \cdot 10^{-6}$	42 %	$85 \cdot 10^{-6}$		
750 V	60 Hz	110,000 V	109,964 V	± 0,06 % ± 0,03 %FS	$-327 \cdot 10^{-6}$	12 %	$77 \cdot 10^{-6}$		
750 V	60 Hz	120,000 V	119,981 V	± 0,06 % ± 0,03 %FS	$-158 \cdot 10^{-6}$	6 %	$77 \cdot 10^{-6}$		

AC-Voltage, sine, RMS

Linearity

Range	Condition	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
10 V	1 kHz	1,00000 V	0,99961 V	± 0,06 % ± 0,03 %FS	$-390 \cdot 10^{-6}$	11 %	$71 \cdot 10^{-6}$		
10 V	1 kHz	2,00000 V	1,99878 V	± 0,06 % ± 0,03 %FS	$-610 \cdot 10^{-6}$	29 %	$68 \cdot 10^{-6}$		
10 V	1 kHz	3,00000 V	2,99822 V	± 0,06 % ± 0,03 %FS	$-593 \cdot 10^{-6}$	37 %	$85 \cdot 10^{-6}$		
10 V	1 kHz	4,00000 V	3,99760 V	± 0,06 % ± 0,03 %FS	$-600 \cdot 10^{-6}$	44 %	$80 \cdot 10^{-6}$		
10 V	1 kHz	5,00000 V	4,99710 V	± 0,06 % ± 0,03 %FS	$-580 \cdot 10^{-6}$	48 %	$77 \cdot 10^{-6}$		
10 V	1 kHz	6,00000 V	5,99657 V	± 0,06 % ± 0,03 %FS	$-572 \cdot 10^{-6}$	52 %	$75 \cdot 10^{-6}$		
10 V	1 kHz	7,00000 V	6,99584 V	± 0,06 % ± 0,03 %FS	$-594 \cdot 10^{-6}$	58 %	$74 \cdot 10^{-6}$		
10 V	1 kHz	8,00000 V	7,99523 V	± 0,06 % ± 0,03 %FS	$-596 \cdot 10^{-6}$	61 %	$73 \cdot 10^{-6}$		
10 V	1 kHz	9,00000 V	8,99510 V	± 0,06 % ± 0,03 %FS	$-544 \cdot 10^{-6}$	58 %	$72 \cdot 10^{-6}$		

Diagram: -1,3 -1,0 -0,5 0,0 0,5 1,0 1,3

DC-Current

Range	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
10 mA	10,00000 mA	10,00095 mA	± 0,05 % ± 0,02 %FS	$95 \cdot 10^{-6}$	14 %	$12 \cdot 10^{-6}$		
100 mA	100,0000 mA	100,0118 mA	± 0,05 % ± 0,005 %FS	$118 \cdot 10^{-6}$	21 %	$25 \cdot 10^{-6}$		
1 A	1,000000 A	1,000453 A	± 0,1 % ± 0,01 %FS	$453 \cdot 10^{-6}$	41 %	$36 \cdot 10^{-6}$		
3 A	2,00000 A	2,00092 A	± 0,12 % ± 0,02 %FS	$460 \cdot 10^{-6}$	31 %	$36 \cdot 10^{-6}$		

Diagram: -1,3 -1,0 -0,5 0,0 0,5 1,0 1,3

AC-Current, sine

Range	Condition	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
1 A	55 Hz	0,600000 A	0,599819 A	± 0,1 % ± 0,04 %FS	-0,030 %	18 %	0,061 %		
1 A	1 kHz	0,600000 A	0,600046 A	± 0,1 % ± 0,04 %FS	$77 \cdot 10^{-6}$	5 %	0,061 %		
3 A	55 Hz	2,00000 A	1,99894 A	± 0,15 % ± 0,06 %FS	-0,053 %	22 %	0,057 %		
3 A	1 kHz	2,00000 A	1,99975 A	± 0,15 % ± 0,06 %FS	-0,013 %	5 %	0,057 %		

DC-Resistance
4-Wire

Range	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram
100 Ω	99,9978 Ω	99,9994 Ω	± 0,01 % ± 0,004 %FS	$16 \cdot 10^{-6}$	11 %	$14 \cdot 10^{-6}$		
1 kΩ	0,999940 kΩ	0,999960 kΩ	± 0,01 % ± 0,001 %FS	$20 \cdot 10^{-6}$	18 %	$11 \cdot 10^{-6}$		
10 kΩ	9,99947 kΩ	9,99963 kΩ	± 0,01 % ± 0,001 %FS	$16,0 \cdot 10^{-6}$	15 %	$9,5 \cdot 10^{-6}$		
100 kΩ	99,9921 kΩ	99,9940 kΩ	± 0,01 % ± 0,001 %FS	$19 \cdot 10^{-6}$	17 %	$11 \cdot 10^{-6}$		
1 MΩ	0,999870 MΩ	0,999891 MΩ	± 0,01 % ± 0,001 %FS	$21 \cdot 10^{-6}$	19 %	$16 \cdot 10^{-6}$		
10 MΩ	9,99853 MΩ	9,99847 MΩ	± 0,04 % ± 0,001 %FS	$-6,0 \cdot 10^{-6}$	1 %	$39 \cdot 10^{-6}$		

DC-Resistance
2-Wire

Range	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram (-1,3 -1,0 -0,5 0,0 0,5 1,0 1,3)
100 Ω	99,9978 Ω	100,0005 Ω	± 0,01 % ± 0,004 %FS	$27 \cdot 10^{-6}$	19 %	$14 \cdot 10^{-6}$		
1 kΩ	0,999940 kΩ	0,999959 kΩ	± 0,01 % ± 0,001 %FS	$19 \cdot 10^{-6}$	17 %	$11 \cdot 10^{-6}$		
10 kΩ	9,99947 kΩ	9,99956 kΩ	± 0,01 % ± 0,001 %FS	$9,0 \cdot 10^{-6}$	8 %	$11 \cdot 10^{-6}$		
100 kΩ	99,9921 kΩ	99,9945 kΩ	± 0,01 % ± 0,001 %FS	$24 \cdot 10^{-6}$	22 %	$11 \cdot 10^{-6}$		
1 MΩ	0,999870 MΩ	0,999892 MΩ	± 0,01 % ± 0,001 %FS	$22 \cdot 10^{-6}$	20 %	$16 \cdot 10^{-6}$		
10 MΩ	9,99853 MΩ	9,99855 MΩ	± 0,04 % ± 0,001 %FS	$2,0 \cdot 10^{-6}$	0 %	$39 \cdot 10^{-6}$		
100 MΩ	99,9967 MΩ	100,0076 MΩ	± 0,8 % ± 0,01 %FS	0,011 %	1 %	0,010 %		

Frequency

Range	Nominal value	Measured value	Specification	Deviation	%TOL	MU	Rem.	Diagram (-1,3 -1,0 -0,5 0,0 0,5 1,0 1,3)
100 Hz	100,0000 Hz	100,0001 Hz	± 0,01 %	$1,00 \cdot 10^{-6}$	1 %	$0,58 \cdot 10^{-6}$		
100 kHz	100,0000 kHz	100,0002 kHz	± 0,01 %	$2,00 \cdot 10^{-6}$	2 %	$0,58 \cdot 10^{-6}$		