DANISENSE

DANAK
CAL Reg.no. 613
Member EA MLA

Certificate of Calibration

This certificate provides measurement results that are traceable to the SI (The International System of Units) through internationally recognized standards.

Object	DC Current Transducer
Manufacturer	Danisense
Type	DW500UB-2V
Identification	-
Serial number	22462010001
Customer	Danisense A/S
Customer address	Malervej 10
	DK-2630 Taastrup
Calibration number	Example
Calibration method	D02
Performed by	Morten Birkerod Lillholm
Authorized by	_____
	Morten Birkerod Lillholm
Date Received	2022-11-17
Date of calibration	2022-11-17
Date of certificate	2025-06-19

The laboratory is accredited by DANAK, the national accreditation body in Denmark, according to the requirements in ISO/IEC 17025:2017. The results presented in this report relate only to the items calibrated. This report shall not be reproduced except in full without approval of the laboratory.

Calibration Details

The measured quantity is current expressed as the deviation (error) between the current indicated (reading) by the device under test (DUT) and the measured reference current. The indicated current is calculated from the secondary output (current or voltage) of the DUT and the nominal transfer ratio of the device, as provided by the customer or the datasheet of the DUT.

Quantity	Definition
I_{set}	Reference current
I_{rdg}	DUT current reading
$I_{rdg}(0)$	DUT offset current
I_{FS}	Nominal full scale current
I_U	Uncertainty in ampere
I_{tol}	Specified tolerance (specification) of error
I_{linreg}	Linear regression of error current (Least squares method)

Comments

Example report

Extent of Calibration

Full scale current: 500.0 A dc
Range: [-500 A; 500 A]
DUT nominal ratio: $A_{primary}/V_{secondary}$ = 250.0 A/V

Environment Conditions

Ambient temperature at the time of testing 23 ± 2 °C, relative humidity 36 ± 5 %

Uncertainty of Measurement

The uncertainty is based on the expanded uncertainty of measurement. Stated as the combined standard uncertainty multiplied by a coverage factor K=2 (Level of confidence at 95 percent). Error bars on graph show confidence interval of measurement points.

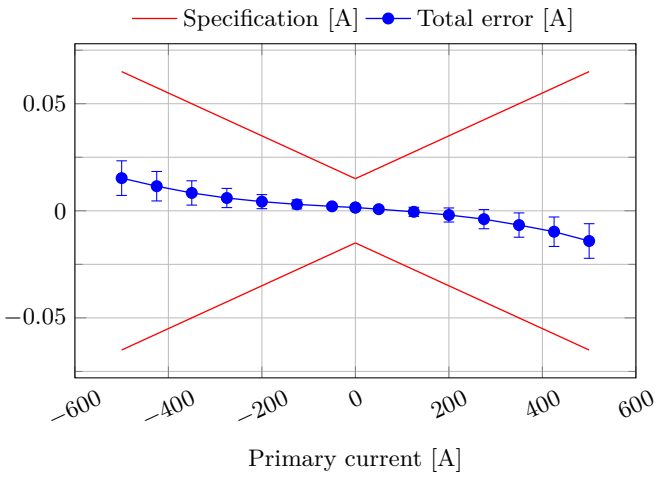
Instruments Used for Calibration

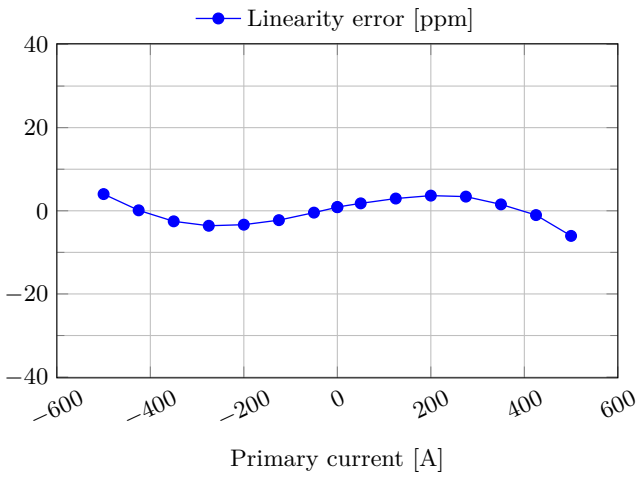
Danisense ID	Type	Description	Cal.due
100-750	Danisense DS REF DCCT	High Precision REF DCCT	2024-07-07
102	Resistor	1R	2023-05-24
59	Keysight 3458A	8.5 digit multimeter	2022-11-26
60	Keysight 3458A	8.5 digit multimeter	2022-11-25
63	Magna-power TSA5-1800/380	Current source	None

Report generated with software version 2.0.2 using report template 5.

DC Current Absolute Error

Results are expressed in ampere [A] referred to primary current, using the nominal transfer ratio of the DUT. Values expressed in [ppm] are relative to the full scale value I_{FS} = 500.0 A dc. 1 ppm = 0.0001%.





Current I_{set} [A]	Reading I_{rdg} [A]	Total error $I_{rdg} - I_{set}$ [A]	Uncertainty I_U [A]	Specification I_{tol} [A]	Note
0	0.0015	0.00154	0.0006	0.015	*
50	50.0008	0.0008	0.0010	0.02	*
125	124.9995	-0.0005	0.0021	0.0275	*
200	199.998	-0.0020	0.0033	0.035	*
275	274.9961	-0.0039	0.0045	0.0425	*
350	349.9933	-0.0067	0.0057	0.05	*
425	424.9902	-0.0098	0.0069	0.0575	*
500	499.9859	-0.0141	0.0081	0.065	*
0	0.0015	0.00152	0.0006	0.015	*
-50	-49.9979	0.0021	0.0011	0.02	*
-125	-124.997	0.0030	0.0021	0.0275	*
-200	-199.9957	0.0043	0.0033	0.035	*
-275	-274.994	0.0060	0.0045	0.0425	*
-350	-349.9917	0.0083	0.0057	0.05	*
-425	-424.9885	0.0115	0.0069	0.0575	*
-500	-499.9847	0.0153	0.0081	0.065	*

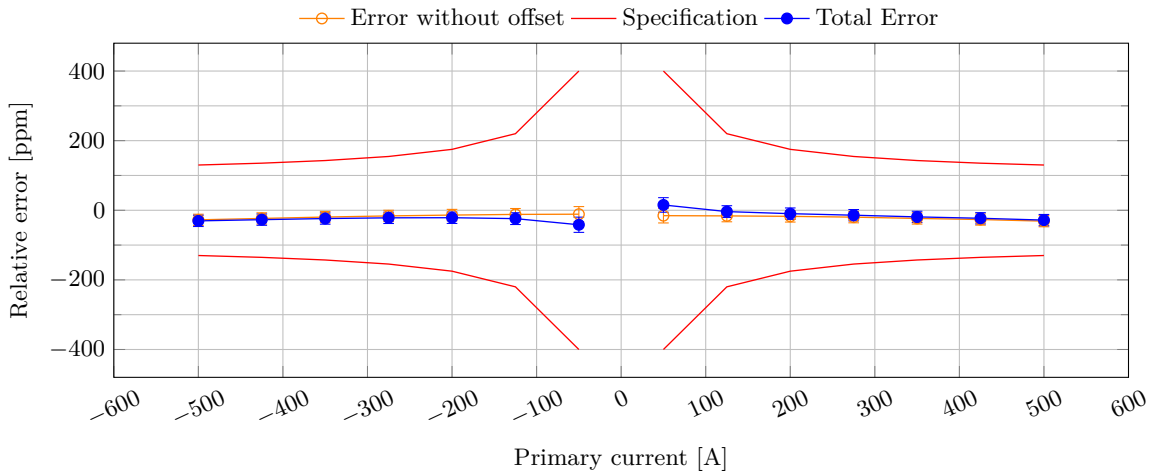
Measurement Notes

Non-binary statement with measurement uncertainty as guard band according to ILAC-G8:09/2019. The result is considered as the total error reported in the above table.

*	Pass: Result is within the specification minus the measurement uncertainty.
**	Conditional pass: Result is within the specification, but the result plus measurement uncertainty is outside the specification
***	Conditional fail: Result is outside the specification, but the result minus measurement uncertainty is inside the specification
****	No statement: Result is inside the specification, but the measurement uncertainty is larger than the specification.
F	Fail: Result minus measurement uncertainty is outside the specification.

DC Current Relative Error

Values expressed in [ppm] are relative to the reading, as referred to the primary current, using the nominal transfer ratio of the DUT. 1 ppm = 0.0001%.



Current I_{set} [A]	Total error $\frac{I_{rdg}-I_{set}}{I_{set}}$ [ppm]	Error without offset $\frac{I_{rdg}-I_{rdg}(0)-I_{set}}{I_{set}}$ [ppm]	Uncertainty $\frac{I_U}{I_{set}}$ [ppm]	Specification $\frac{I_{tol}}{I_{set}}$ [ppm]	Note
50	15	-16	21	400	*
125	-4	-16	17	220	*
200	-10	-17	16	175	*
275	-14	-20	16	155	*
350	-19	-23	16	143	*
425	-23	-27	16	135	*
500	-28	-31	16	130	*
-50	-42	-11	22	400	*
-125	-24	-12	17	220	*
-200	-21	-14	16	175	*
-275	-22	-16	16	155	*
-350	-24	-19	16	143	*
-425	-27	-23	16	135	*
-500	-31	-27	16	130	*

Measurement Notes

Non-binary statement with measurement uncertainty as guard band according to ILAC-G8:09/2019. The result is considered as the total error reported in the above table.

*	Pass: Result is within the specification minus the measurement uncertainty.
**	Conditional pass: Result is within the specification, but the result plus measurement uncertainty is outside the specification
***	Conditional fail: Result is outside the specification, but the result minus measurement uncertainty is inside the specification
****	No statement: Result is inside the specification, but the measurement uncertainty is larger than the specification.
F	Fail: Result minus measurement uncertainty is outside the specification.

Terms of Sale and Delivery of Calibration Services

Application

The general terms of sale and delivery set out below shall apply to all sales and deliveries of Calibration services by DaniSense A/S (the ”Seller”), unless otherwise agreed in writing between the Seller and a buyer (separately or collectively referred to as ”Party” or ”Parties”, as the case may be).

Offers

Offers made by the Seller shall be open for acceptance for 30 days from the date of the offer. An offer will always include a sample report for customer acceptance of actual report content, price with INCOTERMS and lead time from receiving part for calibration.

Confidentiality

Danisense Calibration is responsible for the management of all information obtained of created during the performance of laboratory activities. All information shared by buyer is considered confidential information. All results are the property of buyer, and seller has no right to disclose any results to third parties, unless agreed upon by the costumer. The measurement results are used by seller for statistical purposes to improve the performance of the calibration lab. Information may be shared with DANAK, the national accreditation body in Denmark without notifying the costumer. If for any reason the seller is required by law or special circumstances to disclose any data, the buyer must be informed in a timely manner. If seller is using sub suppliers for any service, these suppliers are informed about the confidentiality required, but seller will try to avoid disclosing any confidential information to suppliers.

Delivery

Unless otherwise agreed between the Parties, the goods shall be delivered Ex Works (Incoterms 2010). Delivery is effected at the buyer’s expense and risk.

Disclaimer

The lab is not responsible if information given by the customer alters the validity of the results.