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Certificate of Calibration No

K026-25P7469

MC6-Ex

S/N: 704144

Calibration

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Certificate of Calibration No K026-25P7469

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Item Advanced Ex Calibrator and Communicator

Model MC6-Ex

Manufactured by Beamex Oy Ab

Serial Number 704144

Date Nov 07, 2025

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Signatures

Merja Raappana
Calibration Technician

Jari Kivelä
Calibration Engineer

Documents Attached Assessment of compliance with manufacturer's specification



K026-25P7469



07.11.2025

MC6-Ex, S/N: 704144. Measurement Section (IN), S/N: 83429.
Voltage Measurement

Range: ± 30 V, 1 Year Uncertainty: $-30 \dots -0.5$ V $\pm(0.25$ mV + 0.006% RDG),
 $-0.5 \dots 0.5$ V $\pm(5$ μ V + 0.006% RDG), $0.5 \dots 30$ V $\pm(0.25$ mV + 0.006% RDG)

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[V]	[V]	[V]	[V]	[V]	[V]	
-29.99971	-29.9998	-0.00009	± 0.00042	-30.00176	-29.99766	PASS
-10.00002	-10.0001	-0.00008	± 0.00019	-10.00087	-9.99917	PASS
-5.000010	-5.00004	-0.000030	± 0.000055	-5.000560	-4.999460	PASS
-1.000002	-1.00000	0.000002	± 0.000020	-1.000312	-0.999692	PASS
-0.5000013	-0.500002	-0.0000007	± 0.0000062	-0.5000363	-0.4999663	PASS
-0.4000008	-0.400002	-0.0000012	± 0.0000053	-0.4000298	-0.3999718	PASS
-0.2500003	-0.250001	-0.0000007	± 0.0000039	-0.2500203	-0.2499803	PASS
-0.0000002	-0.000001	-0.0000008	± 0.0000019	-0.0000052	0.0000048	PASS
0.2499998	0.250000	0.0000002	± 0.0000039	0.2499798	0.2500198	PASS
0.4000003	0.400000	-0.0000003	± 0.0000053	0.3999713	0.4000293	PASS
0.5000004	0.500001	0.0000006	± 0.0000062	0.4999654	0.5000354	PASS
1.000000	1.00001	0.000010	± 0.000020	0.999690	1.000310	PASS
5.000010	5.00003	0.000020	± 0.000055	4.999460	5.000560	PASS
10.00001	10.0001	0.00009	± 0.00019	9.99916	10.00086	PASS
29.99972	29.9999	0.00018	± 0.00042	29.99767	30.00177	PASS

Current Measurement

Range: ± 100 mA, 1 Year Uncertainty: $\pm(1$ μ A + 0.01% RDG)

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[mA]	[mA]	[mA]	[mA]	[mA]	[mA]	
-100.0029	-100.003	-0.0001	± 0.0058	-100.0139	-99.9919	PASS
-50.0013	-50.001	0.0003	± 0.0034	-50.0073	-49.9953	PASS
-20.00043	-20.0004	0.00003	± 0.0015	-20.00343	-19.99743	PASS
0.00001	0.0001	0.00009	± 0.00017	-0.00099	0.00101	PASS
4.00010	4.0003	0.00020	± 0.00024	3.99870	4.00150	PASS
12.00025	12.0003	0.00005	± 0.0011	11.99805	12.00245	PASS
20.00044	20.0004	-0.00004	± 0.0015	19.99744	20.00344	PASS
50.0011	50.001	-0.0001	± 0.0034	49.9951	50.0071	PASS
100.0028	100.003	0.0002	± 0.0058	99.9918	100.0138	PASS

Frequency Measurement

Range: 0.0027... 50000 Hz, 1 Year Uncertainty: 0.0027 ... 0.5 Hz $\pm(0.000002$ Hz + 0.002% RDG),
0.5 ... 5 Hz $\pm(0.00002$ Hz + 0.002 % RDG), 5 ... 50 Hz $\pm(0.0002$ Hz + 0.002 % RDG),
50 ... 500 Hz $\pm(0.002$ Hz + 0.002 % RDG), 500 ... 5000 Hz $\pm(0.02$ Hz + 0.002 % RDG) and
5000 ... 50000 Hz $\pm(0.2$ Hz + 0.002 % RDG)

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[Hz]	[Hz]	[Hz]	[Hz]	[Hz]	[Hz]	
1.099999	1.10000	0.000001	± 0.000017	1.099957	1.100041	PASS
9.99999	10.0000	0.00001	± 0.00017	9.99959	10.00039	PASS
99.9999	100.000	0.0001	± 0.0017	99.9959	100.0039	PASS
999.999	1000.00	0.001	± 0.017	999.959	1000.039	PASS
9999.99	10000.0	0.01	± 0.17	9999.59	10000.39	PASS
49999.95	49999.9	-0.05	± 0.30	49998.75	50001.15	PASS

MC6-Ex, S/N: 704144. Temperature Section (TC-R-OUT), S/N: 93431.

Low Voltage Measurement TC1

Range: -500 ... 500 mV, 1 Year Uncertainty: $\pm(4 \mu\text{V} + 0.007\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[mV]	[mV]	[mV]	[mV]	[mV]	[mV]	
-500.0041	-500.004	0.0001	± 0.0062	-500.0431	-499.9651	PASS
-350.0013	-350.002	-0.0007	± 0.0048	-350.0298	-349.9728	PASS
-250.0004	-250.001	-0.0006	± 0.0039	-250.0219	-249.9789	PASS
0.0022	0.002	-0.0002	± 0.0019	-0.0018	0.0062	PASS
50.0026	50.004	0.0014	± 0.0022	49.9951	50.0101	PASS
100.0031	100.003	-0.0001	± 0.0026	99.9921	100.0141	PASS
250.0047	250.005	0.0003	± 0.0039	249.9832	250.0262	PASS
350.0056	350.006	0.0004	± 0.0048	349.9771	350.0341	PASS
500.0078	500.008	0.0002	± 0.0062	499.9688	500.0468	PASS

Low Voltage Measurement TC2

Range: -500 ... 500 mV, 1 Year Uncertainty: $\pm(4 \mu\text{V} + 0.007\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[mV]	[mV]	[mV]	[mV]	[mV]	[mV]	
-500.0042	-500.004	0.0002	± 0.0062	-500.0432	-499.9652	PASS
-350.0015	-350.002	-0.0005	± 0.0048	-350.0300	-349.9730	PASS
-250.0005	-250.001	-0.0005	± 0.0039	-250.0220	-249.9790	PASS
0.0022	0.002	-0.0002	± 0.0019	-0.0018	0.0062	PASS
50.0026	50.003	0.0004	± 0.0022	49.9951	50.0101	PASS
100.0029	100.004	0.0011	± 0.0026	99.9919	100.0139	PASS
250.0045	250.005	0.0005	± 0.0039	249.9830	250.0260	PASS
350.0055	350.006	0.0005	± 0.0048	349.9770	350.0340	PASS
500.0078	500.008	0.0002	± 0.0062	499.9688	500.0468	PASS

Low Voltage Generation TC1

Range: -500 ... 500 mV, 1 Year Uncertainty: $\pm(4 \mu\text{V} + 0.007\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Generated Value	Measured Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[mV]	[mV]	[mV]	[mV]	[mV]	[mV]	
-500.000	-499.9957	0.0043	± 0.0062	-500.0390	-499.9610	PASS
-350.000	-349.9972	0.0028	± 0.0047	-350.0285	-349.9715	PASS
-250.000	-249.9975	0.0025	± 0.0038	-250.0215	-249.9785	PASS
0.000	-0.0002	-0.0002	± 0.0017	-0.0040	0.0040	PASS
50.000	49.9987	-0.0013	± 0.0019	49.9925	50.0075	PASS
100.000	99.9986	-0.0014	± 0.0023	99.9890	100.0110	PASS
250.000	249.9971	-0.0029	± 0.0037	249.9785	250.0215	PASS
350.000	349.9965	-0.0035	± 0.0047	349.9715	350.0285	PASS
500.000	499.9952	-0.0048	± 0.0062	499.9610	500.0390	PASS

MC6-Ex, S/N: 704144. Temperature Section (TC-R-OUT), S/N: 93431.
Voltage Generation

Range: -1.5 ... 10.5 V, 1 Year Uncertainty: $\pm(0.1 \text{ mV} + 0.007\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Generated Value	Measured Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[V]	[V]	[V]	[V]	[V]	[V]	
-1.50000	-1.499998	0.000002	± 0.000022	-1.500205	-1.499795	PASS
-1.00000	-1.000003	-0.000003	± 0.000017	-1.000170	-0.999830	PASS
0.00000	0.000002	0.000002	± 0.000013	-0.000100	0.000100	PASS
2.00000	1.999999	-0.000001	± 0.000027	1.999760	2.000240	PASS
4.00000	3.999985	-0.000015	± 0.000049	3.999620	4.000380	PASS
6.00000	5.999975	-0.000025	± 0.000072	5.999480	6.000520	PASS
8.00000	7.999962	-0.000038	± 0.000090	7.999340	8.000660	PASS
10.00000	9.999990	-0.000010	± 0.00011	9.999200	10.000800	PASS

Current Generation, Internal Supply (Source)

Range: 0 ... 25 mA, 1 Year Uncertainty: $\pm(1 \text{ } \mu\text{A} + 0.01\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Generated Value	Measured Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[mA]	[mA]	[mA]	[mA]	[mA]	[mA]	
0.0000	0.00000	0.00000	± 0.000012	-0.00100	0.00100	PASS
4.0000	4.00001	0.00001	± 0.00018	3.99860	4.00140	PASS
12.0000	12.00007	0.00007	± 0.0011	11.99780	12.00220	PASS
16.0000	16.00007	0.00007	± 0.0013	15.99740	16.00260	PASS
20.0000	20.00005	0.00005	± 0.0015	19.99700	20.00300	PASS
25.0000	24.99993	-0.00007	± 0.0018	24.99650	25.00350	PASS

Current Generation, External Supply (Sink)

Range: 0 ... 25 mA, 1 Year Uncertainty: $\pm(1 \text{ } \mu\text{A} + 0.01\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Generated Value	Measured Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[mA]	[mA]	[mA]	[mA]	[mA]	[mA]	
0.1000	0.10004	0.00004	± 0.00012	0.09899	0.10101	PASS
4.0000	3.99999	-0.00001	± 0.00018	3.99860	4.00140	PASS
12.0000	11.99989	-0.00011	± 0.0011	11.99780	12.00220	PASS
16.0000	15.99999	-0.00001	± 0.0013	15.99740	16.00260	PASS
20.0000	20.00002	0.00002	± 0.0015	19.99700	20.00300	PASS
25.0000	25.00001	0.00001	± 0.0018	24.99650	25.00350	PASS

MC6-Ex, S/N: 704144. Temperature Section (TC-R-OUT), S/N: 93431.
Resistance Measurement R1

Range: 0 ... 4000 Ω , 1 Year Uncertainty: 0 ... 100 $\Omega \pm(6 \text{ m}\Omega)$, 100 ... 110 $\Omega \pm(0.006\% \text{ RDG})$, 110 ... 150 $\Omega \pm(0.007\% \text{ RDG})$, 150 ... 300 $\Omega \pm(0.008\% \text{ RDG})$, 300 ... 400 $\Omega \pm(0.009\% \text{ RDG})$ and 400 ... 4000 $\Omega \pm(12 \text{ m}\Omega + 0.015\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[Ω]	[Ω]	[Ω]	[Ω]	[Ω]	[Ω]	
5.0001	5.000	-0.0001	± 0.0017	4.9941	5.0061	PASS
100.0003	100.000	-0.0003	± 0.0028	99.9943	100.0063	PASS
199.9996	200.000	0.0004	± 0.0041	199.9836	200.0156	PASS
399.9999	399.999	-0.0009	± 0.0071	399.9639	400.0359	PASS
599.996	600.00	0.004	± 0.019	599.894	600.098	PASS
999.995	999.99	-0.005	± 0.023	999.833	1000.157	PASS
1499.991	1499.99	-0.001	± 0.033	1499.754	1500.228	PASS
2499.991	2499.99	-0.001	± 0.048	2499.604	2500.378	PASS
4000.008	4000.00	-0.008	± 0.071	3999.396	4000.620	PASS

Resistance Measurement R2

Range: 0 ... 4000 Ω , 1 Year Uncertainty: 0 ... 100 $\Omega \pm(6 \text{ m}\Omega)$, 100 ... 110 $\Omega \pm(0.006\% \text{ RDG})$, 110 ... 150 $\Omega \pm(0.007\% \text{ RDG})$, 150 ... 300 $\Omega \pm(0.008\% \text{ RDG})$, 300 ... 400 $\Omega \pm(0.009\% \text{ RDG})$ and 400 ... 4000 $\Omega \pm(12 \text{ m}\Omega + 0.015\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[Ω]	[Ω]	[Ω]	[Ω]	[Ω]	[Ω]	
5.0001	5.000	-0.0001	± 0.0017	4.9941	5.0061	PASS
100.0004	100.001	0.0006	± 0.0028	99.9944	100.0064	PASS
199.9995	199.999	-0.0005	± 0.0041	199.9835	200.0155	PASS
399.9996	399.998	-0.0016	± 0.0071	399.9636	400.0356	PASS
599.995	599.99	-0.005	± 0.019	599.893	600.097	PASS
999.994	999.99	-0.004	± 0.023	999.832	1000.156	PASS
1499.990	1499.99	0.000	± 0.033	1499.753	1500.227	PASS
2499.991	2499.99	-0.001	± 0.048	2499.604	2500.378	PASS
4000.007	4000.01	0.003	± 0.071	3999.395	4000.619	PASS

Resistance Simulation R1

Range: 0 ... 4000 Ω , 1 Year Uncertainty: 0 ... 100 $\Omega \pm(20 \text{ m}\Omega)$, 100 ... 400 $\Omega \pm(10 \text{ m}\Omega + 0.01\% \text{ RDG})$ and 400 ... 4000 $\Omega \pm(20 \text{ m}\Omega + 0.015\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Simulated Value	Measured Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[Ω]	[Ω]	[Ω]	[Ω]	[Ω]	[Ω]	
1.000	0.9985	-0.0015	± 0.0039	0.9800	1.0200	PASS
100.000	100.0014	0.0014	± 0.0030	99.9800	100.0200	PASS
200.000	199.9967	-0.0033	± 0.0048	199.9700	200.0300	PASS
300.000	300.0008	0.0008	± 0.0058	299.9600	300.0400	PASS
400.000	399.9998	-0.0002	± 0.0075	399.9500	400.0500	PASS
500.00	499.989	-0.011	± 0.015	499.905	500.095	PASS
1000.00	999.991	-0.009	± 0.022	999.830	1000.170	PASS
2000.00	1999.979	-0.021	± 0.045	1999.680	2000.320	PASS
2500.00	2499.991	-0.009	± 0.055	2499.605	2500.395	PASS
4000.00	3999.985	-0.015	± 0.074	3999.380	4000.620	PASS

MC6-Ex, S/N: 704144. Temperature Section (TC-R-OUT), S/N: 93431.
Frequency Generation

Range: 0.0005... 10000 Hz, 1 Year Uncertainty: 0.0005 ... 0.5 Hz $\pm(0.000002 \text{ Hz} + 0.002\% \text{ RDG})$,
0.5 ... 5 Hz $\pm(0.00002 \text{ Hz} + 0.002\% \text{ RDG})$, 5 ... 50 Hz $\pm(0.0002 \text{ Hz} + 0.002\% \text{ RDG})$,
50 ... 500 Hz $\pm(0.002 \text{ Hz} + 0.002\% \text{ RDG})$, 500 ... 5000 Hz $\pm(0.02 \text{ Hz} + 0.002\% \text{ RDG})$,
5000 ... 10000 Hz $\pm(0.2 \text{ Hz} + 0.002\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Generated Value	Measured Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[Hz]	[Hz]	[Hz]	[Hz]	[Hz]	[Hz]	
1.10000	1.100000	0.000000	± 0.000017	1.099958	1.100042	PASS
10.0000	10.00000	0.000000	± 0.00017	9.99960	10.00040	PASS
100.000	100.0000	0.0000	± 0.0017	99.9960	100.0040	PASS
1000.00	1000.000	0.000	± 0.017	999.960	1000.040	PASS
3000.00	3000.000	0.000	± 0.022	2999.920	3000.080	PASS
10000.0	10000.00	0.00	± 0.17	9999.60	10000.40	PASS

Pt100 Measurement R1

Range: -200 ... 850°C ITS90, 1 Year Uncertainty: -200 ... 0°C $\pm 0.015^\circ\text{C}$,
0°C ... 850°C $\pm(0.015^\circ\text{C} + 0.012\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Corresponding Temperature	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[Ω]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	
18.9523	-198.9998	-199.001	-0.0012	± 0.0033	-199.0148	-198.9848	PASS
100.0003	0.0008	0.001	0.0002	± 0.0065	-0.0142	0.0158	PASS
138.5055	100.0000	100.001	0.0010	± 0.0077	99.9730	100.0270	PASS
280.9775	500.0000	500.002	0.0020	± 0.015	499.9250	500.0750	PASS
390.1878	848.9980	848.997	-0.0010	± 0.023	848.8811	849.1149	PASS

Temperature/resistance conversions are based on standard IEC 60751 ed3.0. The expanded uncertainties of the temperature measurements are based on electrical measurements. The expanded uncertainty of the electrical measurements is converted to the temperature in measurement points according to the standard IEC 60751 ed3.0.

Pt100 Measurement R2

Range: -200 ... 850°C ITS90, 1 Year Uncertainty: -200 ... 0°C $\pm 0.015^\circ\text{C}$,
0°C ... 850°C $\pm(0.015^\circ\text{C} + 0.012\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Corresponding Temperature	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[Ω]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	[$^\circ\text{C}$]	
18.9523	-198.9998	-199.002	-0.0022	± 0.0033	-199.0148	-198.9848	PASS
100.0004	0.0011	0.001	-0.0001	± 0.0065	-0.0139	0.0161	PASS
138.5056	100.0002	100.001	0.0008	± 0.0077	99.9732	100.0272	PASS
280.9776	500.0003	500.001	0.0007	± 0.015	499.9253	500.0753	PASS
390.1880	848.9985	848.993	-0.0055	± 0.023	848.8816	849.1154	PASS

Temperature/resistance conversions are based on standard IEC 60751 ed3.0. The expanded uncertainties of the temperature measurements are based on electrical measurements. The expanded uncertainty of the electrical measurements is converted to the temperature in measurement points according to the standard IEC 60751 ed3.0.

MC6-Ex, S/N: 704144. Temperature Section (TC-R-OUT), S/N: 93431.

Pt100 Simulation R1

Range: -200 ... 850°C ITS90, 1 Year Uncertainty: -200 ... 0°C $\pm 0.05^\circ\text{C}$,
0°C ... 850°C $\pm (0.05^\circ\text{C} + 0.014\% \text{ RDG})$

Calibrated By: Merja Raappana
Calibration Date: Nov 06, 2025

Simulated Value [°C]	Corresp. Resistance [Ω]	Measured Value [Ω]	Corresp. Temperature [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
-199.000	18.9522	18.9514	-199.002	-0.002	± 0.0085	-199.050	-198.950	PASS
0.000	100.0000	100.0012	0.003	0.003	± 0.0070	-0.050	0.050	PASS
100.000	138.5055	138.5061	100.002	0.002	± 0.0082	99.936	100.064	PASS
500.000	280.9775	280.9780	500.001	0.001	± 0.016	499.880	500.120	PASS
849.000	390.1884	390.1887	849.001	0.001	± 0.024	848.831	849.169	PASS

Temperature/resistance conversions are based on standard IEC 60751 ed3.0. The expanded uncertainties of the temperature simulations are based on electrical measurements. The expanded uncertainty of the electrical measurements is converted to the temperature in measurement points according to the standard IEC 60751 ed3.0.

Thermocouple Measurement TC1, Type K (without cold junction comp. RJ=0°C)

Range: -270°C ... 1372°C ITS90, 1 Year Uncertainty: -270°C ... -200°C $\pm (0.007\% \text{ of thermovoltage} + 4 \mu\text{V})$,
-200°C ... 0°C $\pm (0.1^\circ\text{C} + 0.1\% \text{ RDG})$, 0°C ... 1000°C $\pm (0.1^\circ\text{C} + 0.007\% \text{ RDG})$, 1000 ... 1372°C $\pm 0.017\% \text{ RDG}$

Calibrated By: Merja Raappana
Calibration Date: Nov 06, 2025

Input [mV]	Corresponding Temperature [°C]	Indicated Value [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
-5.891	-199.962	-199.91	0.052	± 0.071	-200.262	-199.662	PASS
0.001	0.017	0.03	0.013	± 0.030	-0.083	0.117	PASS
20.645	500.014	500.04	0.026	± 0.033	499.879	500.149	PASS
41.276	1000.017	1000.05	0.033	± 0.040	999.847	1000.187	PASS
54.853	1371.018	1371.06	0.042	± 0.049	1370.785	1371.251	PASS

Temperature/voltage conversions are based on the IEC 60584-1 ed3.0 standard. The expanded uncertainties of the temperature measurements are based on electrical measurements. The expanded uncertainty of the electrical measurements is converted to the temperature in measurement points according to the standard IEC 60584-1 ed3.0.

Thermocouple Measurement TC2, Type K (without cold junction comp. RJ=0°C)

Range: -270°C ... 1372°C ITS90, 1 Year Uncertainty: -270°C ... -200°C $\pm (0.007\% \text{ of thermovoltage} + 4 \mu\text{V})$,
-200°C ... 0°C $\pm (0.1^\circ\text{C} + 0.1\% \text{ RDG})$, 0°C ... 1000°C $\pm (0.1^\circ\text{C} + 0.007\% \text{ RDG})$, 1000 ... 1372°C $\pm 0.017\% \text{ RDG}$

Calibrated By: Merja Raappana
Calibration Date: Nov 06, 2025

Input [mV]	Corresponding Temperature [°C]	Indicated Value [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
-5.891	-200.001	-199.96	0.041	± 0.071	-200.301	-199.701	PASS
0.000	0.002	0.02	0.018	± 0.030	-0.098	0.102	PASS
20.644	500.002	500.04	0.038	± 0.033	499.867	500.137	PASS
41.276	1000.008	1000.05	0.042	± 0.040	999.838	1000.178	PASS
54.853	1371.013	1371.06	0.047	± 0.049	1370.780	1371.246	PASS

Temperature/voltage conversions are based on the IEC 60584-1 ed3.0 standard. The expanded uncertainties of the temperature measurements are based on electrical measurements. The expanded uncertainty of the electrical measurements is converted to the temperature in measurement points according to the standard IEC 60584-1 ed3.0.

MC6-Ex, S/N: 704144. Temperature Section (TC-R-OUT), S/N: 93431.
Thermocouple Simulation TC1, Type K (without cold junction comp. RJ=0°C)

Range: -270°C ... 1372°C ITS90, 1 Year Uncertainty: -270°C ... -200°C $\pm(0.007\%$ of thermovoltage + 4 μV),
-200°C ... 0°C $\pm(0.1^\circ\text{C} + 0.1\%$ RDG), 0°C ... 1000°C $\pm(0.1^\circ\text{C} + 0.007\%$ RDG), 1000 ... 1372°C $\pm 0.017\%$ RDG

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Simulated Value [°C]	Corresp. Voltage [mV]	Measured Value [mV]	Corresp. Temperature [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
-200.00	-5.891	-5.892	-200.01	-0.01	± 0.10	-200.30	-199.70	PASS
0.00	0.000	0.000	-0.01	-0.01	± 0.039	-0.10	0.10	PASS
500.00	20.644	20.643	499.98	-0.02	± 0.041	499.86	500.14	PASS
1000.00	41.276	41.274	999.96	-0.04	± 0.048	999.83	1000.17	PASS
1371.00	54.852	54.851	1370.96	-0.04	± 0.058	1370.77	1371.23	PASS

Temperature/voltage conversions are based on the IEC 60584-1 ed3.0 standard. The expanded uncertainties of the temperature simulations are based on electrical measurements. The expanded uncertainty of the electrical measurements is converted to the temperature in measurement points according to the standard IEC 60584-1 ed3.0.

Internal Reference Junction TC1

Thermocouple, Type K

Calibrated By: Merja Raappana

Calibration Date: Nov 07, 2025

Compensated Type K in ice bath [°C]	Ambient Temperature [°C]	Indicated Value [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
0.00	23	0.00	0.00	± 0.075	-0.18	0.18	PASS

Temperature / voltage conversion is based on the IEC 60584-1 ed3.0 standard. Calibration of the internal reference junction compensation has been made by measuring an ice bath (0°C) with the K type thermocouple specified in the calibration procedures.

Internal Reference Junction TC2

Thermocouple, Type K

Calibrated By: Merja Raappana

Calibration Date: Nov 07, 2025

Compensated Type K in ice bath [°C]	Ambient Temperature [°C]	Indicated Value [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
0.00	23	0.00	0.00	± 0.075	-0.18	0.18	PASS

Temperature / voltage conversion is based on the IEC 60584-1 ed3.0 standard. Calibration of the internal reference junction compensation has been made by measuring an ice bath (0°C) with the K type thermocouple specified in the calibration procedures.

MC6-Ex, S/N: 704144. Pressure Measurement Module, S/N: 96884.
P20C-Ex Pressure Measurement

Range: -100 ... 2000 kPa gauge, 1 Year Uncertainty: $\pm(0.01\% \text{ FS} + 0.025\% \text{ RDG})$

Calibrated By: Merja Raappana

Calibration Date: Nov 06, 2025

Input	Indicated Value	Difference	Expanded Uncertainty (k=2)	Specification Low Limit	Specification High Limit	Status
[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	
0.000	0.00	0.000	± 0.013	-0.200	0.200	PASS
399.990	399.98	-0.010	± 0.057	399.690	400.290	PASS
799.999	799.99	-0.009	± 0.099	799.599	800.399	PASS
1199.996	1199.99	-0.006	± 0.14	1199.496	1200.496	PASS
1600.002	1599.97	-0.032	± 0.19	1599.402	1600.602	PASS
1999.996	1999.96	-0.036	± 0.23	1999.296	2000.696	PASS
1599.999	1599.84	-0.159	± 0.19	1599.399	1600.599	PASS
1199.999	1199.87	-0.129	± 0.14	1199.499	1200.499	PASS
799.998	799.87	-0.128	± 0.099	799.598	800.398	PASS
400.000	399.90	-0.100	± 0.057	399.700	400.300	PASS
0.000	-0.04	-0.040	± 0.013	-0.200	0.200	PASS
-20.000	-20.00	0.000	± 0.013	-20.205	-19.795	PASS
-40.000	-39.99	0.010	± 0.014	-40.210	-39.790	PASS
-60.000	-59.99	0.010	± 0.015	-60.215	-59.785	PASS
-80.000	-79.98	0.020	± 0.016	-80.220	-79.780	PASS
-93.000	-92.97	0.030	± 0.019	-93.223	-92.777	PASS

The pressure sensor has been zeroed before calibration of negative gauge.

Advanced Ex Calibrator and Communicator MC6-Ex**Serial No: 704144****Calibration Procedure**

Calibration was carried out according to the internal instruction no. 7.1.4.1.55

Before starting the calibration of the unit, the unit was allowed to stabilise to the constant laboratory conditions for 2 hours.

Condition of the calibrated device

The device is new and no issues were detected.

Calibration Equipment Used

Equipment and Model	Serial No.	Cert. No.	Calibrated	Due Date
Digital Multimeter Keysight 3458A	MY45053770	K026-25E5998	Sep 01, 2025	Sep 01, 2026
Frequency Counter Keysight 53220A	MY58500105	K026-25F6000	Sep 01, 2025	Sep 01, 2026
Pressure Controller Ruska 7250xi	70440	K026-25P5752	Aug 19, 2025	Aug 19, 2026
Pressure Controller Ruska 7250xi	65147	K026-25P7176	Oct 22, 2025	Oct 22, 2026
Thermocouple Beamex Type K	89	K026-24T6521	Sep 30, 2024	Mar 24, 2026
Thermocouple Beamex Type K	90	K026-24T6521	Sep 30, 2024	Mar 24, 2026

Calibrations are traceable to national or international measurement standards.

Calibration Uncertainty

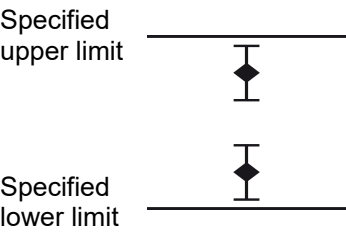
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA Publication EA-4/02.

Calibration Conditions

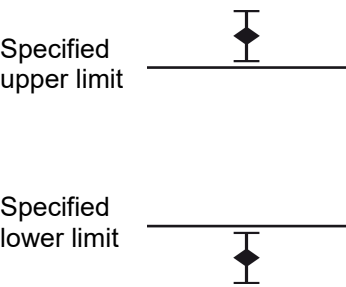
The calibrations were made in controlled conditions where the temperature was $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$ / $73^{\circ}\text{F} \pm 2^{\circ}\text{F}$ and the relative humidity was $50\% \text{RH} \pm 10\% \text{RH}$.

ASSESSMENT OF COMPLIANCE WITH MANUFACTURER'S SPECIFICATION

PASS = The measurement result is within the specification limit (the specification limits are not breached by the measurement result, extended by half of the expanded uncertainty interval at a level confidence of 95%).



FAIL = The measurement result is outside the specification limit even though it is extended downwards/upwards by half of the expanded uncertainty interval at a level confidence of 95%.



UD = The measurement result is above/below/equal to the specification limit by a margin less than the half of the expanded uncertainty interval; it is therefore not possible to state PASS/FAIL based on 95% level of confidence (UD=UNDEFINED=CONDITIONAL PASS/CONDITIONAL FAIL).

