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Certificate of Calibration No

K026-17P5172

MC6

S/N: 601404

Calibration

Certificate

WORLD-CLASS CALIBRATION SOLUTIONS™

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ACCREDITED CALIBRATION LABORATORY

FINAS
Finnish Accreditation Service
K026 (EN ISO/IEC 17025)

ilac-MRA

Certificate of Calibration No K026-17P5172

Customer	BEAMEX MARKETING Ristisuonraitti 10 68600 PIETARSAARI Finland
Customer No	1000
Item	Advanced Field Calibrator and Communicator
Model	MC6
Manufactured by	Beamex Oy Ab
Serial Number	601404
Date	Nov 01, 2017
Page	1 (12)

Signatures

Duyanh Luong
Service Technician

Jari Kivelä
Calibration Engineer

Documents Attached

K026-17P5172

01.11.2017

MC6, S/N: 601404. Measurement Section (IN), S/N: 21091.

Voltage Measurement

Range: -1 ... 60 V, 1 Year Uncertainty: -1 ... 1 V ±(5 µV + 0.006% RDG) and
1 ... 60 V ±(0.25 mV + 0.006% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Input [V]	Indicated Value [V]	Difference [V]	Expanded Uncertainty (k=2) [V]	Specification Low Limit [V]	Specification High Limit [V]	Status
-0.9999961	**-0.999991**	0.0000051	±0.000011	-1.0000611	-0.9999311	**PASS**
-0.4999996	**-0.499997**	0.0000026	±0.0000062	-0.5000346	-0.4999646	**PASS**
-0.2500019	**-0.250001**	0.0000009	±0.0000039	-0.2500219	-0.2499819	**PASS**
-0.0000019	**-0.000002**	-0.0000001	±0.0000019	-0.0000069	0.0000031	**PASS**
0.2499999	**0.249998**	-0.0000019	±0.0000039	0.2499799	0.2500199	**PASS**
0.4999987	**0.499996**	-0.0000027	±0.0000062	0.4999637	0.5000337	**PASS**
0.9999971	**0.999991**	-0.0000061	±0.000011	0.9999321	1.0000621	**PASS**
4.999994	**4.99995**	-0.000044	±0.000055	4.999444	5.000544	**PASS**
9.999974	**9.99991**	-0.000064	±0.00011	9.999124	10.000824	**PASS**
20.00013	**20.0001**	-0.00003	±0.00032	19.99868	20.00158	**PASS**
40.00011	**39.9999**	-0.00021	±0.00054	39.99746	40.00276	**PASS**
59.99998	**59.9996**	-0.00038	±0.00077	59.99613	60.00383	**PASS**

Current Measurement

Range: ±100 mA, 1 Year Uncertainty: ±(1 µA + 0.01% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Input [mA]	Indicated Value [mA]	Difference [mA]	Expanded Uncertainty (k=2) [mA]	Specification Low Limit [mA]	Specification High Limit [mA]	Status
-100.0012	**-100.002**	-0.0008	±0.0057	-100.0122	-99.9902	**PASS**
-50.0003	**-50.001**	-0.0007	±0.0034	-50.0063	-49.9943	**PASS**
-20.00032	**-20.0004**	-0.00008	±0.0015	-20.00332	-19.99732	**PASS**
-0.00001	**0.0000**	0.00001	±0.00017	-0.00101	0.00099	**PASS**
4.00009	**4.0001**	0.00001	±0.00024	3.99869	4.00149	**PASS**
12.00011	**12.0002**	0.00009	±0.0011	11.99791	12.00231	**PASS**
20.00027	**20.0004**	0.00013	±0.0015	19.99727	20.00327	**PASS**
50.0003	**50.001**	0.0007	±0.0034	49.9943	50.0063	**PASS**
100.0011	**100.002**	0.0009	±0.0058	99.9901	100.0121	**PASS**

Frequency Measurement

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

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Input [Hz]	Indicated Value [Hz]	Difference [Hz]	Expanded Uncertainty (k=2) [Hz]	Specification Low Limit [Hz]	Specification High Limit [Hz]	Status
1.099984	**1.09999**	0.000006	±0.000017	1.099942	1.100026	**PASS**
9.99986	**9.9999**	0.00004	±0.00017	9.99946	10.00026	**PASS**
99.9986	**99.999**	0.0004	±0.0017	99.9946	100.0026	**PASS**
999.986	**999.99**	0.004	±0.017	999.946	1000.026	**PASS**
9999.86	**9999.9**	0.04	±0.17	9999.46	10000.26	**PASS**
49999.29	**49999.5**	0.21	±0.30	49998.09	50000.49	**PASS**

MC6, S/N: 601404. Temperature Section (TC-R-OUT), S/N: 61065.

Low Voltage Measurement TC1

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: -1000 ... 1000 mV, 1 Year Uncertainty: ±(4 µV + 0.007% RDG)

Input [mV]	Indicated Value [mV]	Difference [mV]	Expanded Uncertainty (k=2) [mV]	Specification Low Limit [mV]	Specification High Limit [mV]	Status
-999.9982	**-999.984**	0.0142	±0.011	-1000.0722	-999.9242	**PASS**
-500.0009	**-499.993**	0.0079	±0.0062	-500.0399	-499.9619	**PASS**
-250.0026	**-249.999**	0.0036	±0.0039	-250.0241	-249.9811	**PASS**
-0.0023	**-0.002**	0.0003	±0.0019	-0.0063	0.0017	**PASS**
99.9994	**99.998**	-0.0014	±0.0026	99.9884	100.0104	**PASS**
250.0000	**249.996**	-0.0040	±0.0039	249.9785	250.0215	**PASS**
499.9992	**499.991**	-0.0082	±0.0062	499.9602	500.0382	**PASS**
749.9995	**749.989**	-0.0105	±0.0087	749.9430	750.0560	**PASS**
999.9984	**999.983**	-0.0154	±0.011	999.9244	1000.0724	**PASS**

Low Voltage Measurement TC2

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: -1000 ... 1000 mV, 1 Year Uncertainty: ±(4 µV + 0.007% RDG)

Input [mV]	Indicated Value [mV]	Difference [mV]	Expanded Uncertainty (k=2) [mV]	Specification Low Limit [mV]	Specification High Limit [mV]	Status
-999.9981	**-999.983**	0.0151	±0.011	-1000.0721	-999.9241	**PASS**
-500.0008	**-499.993**	0.0078	±0.0062	-500.0398	-499.9618	**PASS**
-250.0025	**-249.999**	0.0035	±0.0039	-250.0240	-249.9810	**PASS**
-0.0021	**-0.002**	0.0001	±0.0019	-0.0061	0.0019	**PASS**
99.9995	**99.998**	-0.0015	±0.0026	99.9885	100.0105	**PASS**
250.0001	**249.996**	-0.0041	±0.0039	249.9786	250.0216	**PASS**
499.9994	**499.992**	-0.0074	±0.0062	499.9604	500.0384	**PASS**
749.9996	**749.989**	-0.0106	±0.0087	749.9431	750.0561	**PASS**
999.9985	**999.983**	-0.0155	±0.011	999.9245	1000.0725	**PASS**

Low Voltage Generation TC1

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: -1000 ... 1000 mV, 1 Year Uncertainty: ±(4 µV + 0.007% RDG)

Generated Value [mV]	Measured Value [mV]	Difference [mV]	Expanded Uncertainty (k=2) [mV]	Specification Low Limit [mV]	Specification High Limit [mV]	Status
-1000.000	**-1000.0159**	-0.0159	±0.011	-1000.0740	-999.9260	**PASS**
-500.000	**-500.0079**	-0.0079	±0.0061	-500.0390	-499.9610	**PASS**
-250.000	**-250.0037**	-0.0037	±0.0037	-250.0215	-249.9785	**PASS**
0.000	**0.0002**	0.0002	±0.0016	-0.0040	0.0040	**PASS**
100.000	**100.0018**	0.0018	±0.0023	99.9890	100.0110	**PASS**
250.000	**250.0042**	0.0042	±0.0037	249.9785	250.0215	**PASS**
500.000	**500.0080**	0.0080	±0.0061	499.9610	500.0390	**PASS**
750.000	**750.0110**	0.0110	±0.0086	749.9435	750.0565	**PASS**
1000.000	**1000.0151**	0.0151	±0.011	999.9260	1000.0740	**PASS**

MC6, S/N: 601404. Temperature Section (TC-R-OUT), S/N: 61065.

Voltage Generation

Range: -3 ... 24 V, 1 Year Uncertainty: ±(0.1 mV + 0.007% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Generated Value [V]	Measured Value [V]	Difference [V]	Expanded Uncertainty (k=2) [V]	Specification Low Limit [V]	Specification High Limit [V]	Status
-3.00000	**-3.000096**	-0.000096	±0.000034	-3.000310	-2.999690	**PASS**
-1.00000	**-1.000046**	-0.000046	±0.000016	-1.000170	-0.999830	**PASS**
0.00000	**-0.000001**	-0.000001	±0.000012	-0.000100	0.000100	**PASS**
1.00000	**0.999997**	-0.000003	±0.000016	0.999830	1.000170	**PASS**
2.50000	**2.500031**	0.000031	±0.000030	2.499725	2.500275	**PASS**
5.00000	**5.000098**	0.000098	±0.000053	4.999550	5.000450	**PASS**
10.0000	**10.00021**	0.00021	±0.00011	9.99920	10.00080	**PASS**
15.0000	**15.00029**	0.00029	±0.00022	14.99885	15.00115	**PASS**
20.0000	**20.00039**	0.00039	±0.00028	19.99850	20.00150	**PASS**
24.0000	**24.00048**	0.00048	±0.00032	23.99822	24.00178	**PASS**

Current Generation, Internal Supply (Source)

Range: 0 ... 55 mA, 1 Year Uncertainty: 0 ... 25 mA ±(1 µA + 0.01% RDG) and 25 ... 55 mA ±(2 µA + 0.01% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Generated Value [mA]	Measured Value [mA]	Difference [mA]	Expanded Uncertainty (k=2) [mA]	Specification Low Limit [mA]	Specification High Limit [mA]	Status
0.0000	**0.00000**	0.00000	±0.000048	-0.00100	0.00100	**PASS**
4.0000	**3.99997**	-0.00003	±0.00018	3.99860	4.00140	**PASS**
12.0000	**11.99994**	-0.00006	±0.0011	11.99780	12.00220	**PASS**
20.0000	**20.00006**	0.00006	±0.0015	19.99700	20.00300	**PASS**
30.000	**30.0002**	0.0002	±0.0020	29.9950	30.0050	**PASS**
40.000	**40.0002**	0.0002	±0.0025	39.9940	40.0060	**PASS**
55.000	**55.0002**	0.0002	±0.0033	54.9925	55.0075	**PASS**

Current Generation, External Supply (Sink)

Range: 0 ... 55 mA, 1 Year Uncertainty: 0 ... 25 mA ±(1 µA + 0.01% RDG) and 25 ... 55 mA ±(2 µA + 0.01% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Generated Value [mA]	Measured Value [mA]	Difference [mA]	Expanded Uncertainty (k=2) [mA]	Specification Low Limit [mA]	Specification High Limit [mA]	Status
0.0000	**0.00000**	0.00000	±0.000048	-0.00100	0.00100	**PASS**
4.0000	**4.00003**	0.00003	±0.00018	3.99860	4.00140	**PASS**
12.0000	**12.00008**	0.00008	±0.0011	11.99780	12.00220	**PASS**
20.0000	**20.00010**	0.00010	±0.0015	19.99700	20.00300	**PASS**
30.000	**30.0002**	0.0002	±0.0020	29.9950	30.0050	**PASS**
40.000	**40.0002**	0.0002	±0.0025	39.9940	40.0060	**PASS**
55.000	**55.0002**	0.0002	±0.0033	54.9925	55.0075	**PASS**

MC6, S/N: 601404. Temperature Section (TC-R-OUT), S/N: 61065.

Resistance Measurement R1

Range: 0 ... 4000 Ω, 1 Year Uncertainty: 0 ... 100 Ω ±(6 mΩ), 100 ... 110 Ω ±(0.006% RDG), 110 ... 150 Ω ±(0.007% RDG), 150 ... 300 Ω ±(0.008% RDG), 300 ... 400 Ω ±(0.009% RDG) and 400 ... 4000 Ω ±(12 mΩ + 0.015% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Input [Ω]	Indicated Value [Ω]	Difference [Ω]	Expanded Uncertainty (k=2) [Ω]	Specification Low Limit [Ω]	Specification High Limit [Ω]	Status
5.0016	**5.002**	0.0004	±0.0017	4.9956	5.0076	**PASS**
100.0008	**99.999**	-0.0018	±0.0028	99.9948	100.0068	**PASS**
200.0002	**199.998**	-0.0022	±0.0041	199.9842	200.0162	**PASS**
400.0034	**399.999**	-0.0044	±0.0071	399.9674	400.0394	**PASS**
600.005	**599.99**	-0.015	±0.019	599.903	600.107	**PASS**
1000.002	**999.98**	-0.022	±0.023	999.840	1000.164	**PASS**
1500.003	**1499.98**	-0.023	±0.033	1499.766	1500.240	**PASS**
2500.004	**2499.96**	-0.044	±0.048	2499.617	2500.391	**PASS**
4000.022	**3999.96**	-0.062	±0.071	3999.410	4000.634	**PASS**

Resistance Measurement R2

Range: 0 ... 4000 Ω, 1 Year Uncertainty: 0 ... 100 Ω ±(6 mΩ), 100 ... 110 Ω ±(0.006% RDG), 110 ... 150 Ω ±(0.007% RDG), 150 ... 300 Ω ±(0.008% RDG), 300 ... 400 Ω ±(0.009% RDG) and 400 ... 4000 Ω ±(12 mΩ + 0.015% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Input [Ω]	Indicated Value [Ω]	Difference [Ω]	Expanded Uncertainty (k=2) [Ω]	Specification Low Limit [Ω]	Specification High Limit [Ω]	Status
5.0057	**5.006**	0.0003	±0.0017	4.9997	5.0117	**PASS**
99.9998	**99.999**	-0.0008	±0.0028	99.9938	100.0058	**PASS**
199.9997	**199.998**	-0.0017	±0.0041	199.9837	200.0157	**PASS**
400.0048	**400.001**	-0.0038	±0.0071	399.9688	400.0408	**PASS**
600.006	**599.99**	-0.016	±0.019	599.904	600.108	**PASS**
1000.002	**999.99**	-0.012	±0.023	999.840	1000.164	**PASS**
1500.002	**1499.98**	-0.022	±0.033	1499.765	1500.239	**PASS**
2500.001	**2499.97**	-0.031	±0.048	2499.614	2500.388	**PASS**
4000.003	**3999.94**	-0.063	±0.071	3999.391	4000.615	**PASS**

Resistance Simulation R1

Range: 0 ... 4000 Ω, 1 Year Uncertainty: 0 ... 100 Ω ±(20 mΩ), 100 ... 400 Ω ±(10 mΩ + 0.01% RDG) and 400 ... 4000 Ω ±(20 mΩ + 0.015% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Simulated Value [Ω]	Measured Value [Ω]	Difference [Ω]	Expanded Uncertainty (k=2) [Ω]	Specification Low Limit [Ω]	Specification High Limit [Ω]	Status
1.000	**1.0004**	0.0004	±0.0023	0.9800	1.0200	**PASS**
100.000	**100.0016**	0.0016	±0.0023	99.9800	100.0200	**PASS**
200.000	**200.0016**	0.0016	±0.0037	199.9700	200.0300	**PASS**
300.000	**300.0012**	0.0012	±0.0053	299.9600	300.0400	**PASS**
400.000	**400.0037**	0.0037	±0.0069	399.9500	400.0500	**PASS**
500.00	**499.999**	-0.001	±0.0087	499.905	500.095	**PASS**
1000.00	**1000.022**	0.022	±0.017	999.830	1000.170	**PASS**
2000.00	**2000.024**	0.024	±0.037	1999.680	2000.320	**PASS**
2500.00	**2500.056**	0.056	±0.045	2499.605	2500.395	**PASS**
4000.00	**4000.052**	0.052	±0.069	3999.380	4000.620	**PASS**

MC6, S/N: 601404. Temperature Section (TC-R-OUT), S/N: 61065.

Frequency Generation

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: 0.0005... 50000 Hz, 1 Year Uncertainty: 0.0005 ... 0.5 Hz ±(0.000002 Hz + 0.002% RDG), 0.5 ... 5 Hz ±(0.00002 Hz + 0.002 % RDG), 5 ... 50 Hz ±(0.0002 Hz + 0.002 % RDG), 50 ... 500 Hz ±(0.002 Hz + 0.002 % RDG), 500 ... 5000 Hz ±(0.02 Hz + 0.002 % RDG) and 5000 ... 50000 Hz ±(0.2 Hz + 0.002 % RDG)

Generated Value [Hz]	Measured Value [Hz]	Difference [Hz]	Expanded Uncertainty (k=2) [Hz]	Specification Low Limit [Hz]	Specification High Limit [Hz]	Status
1.10000	**1.100000**	0.000000	±0.000017	1.099958	1.100042	**PASS**
10.0000	**10.00000**	0.00000	±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**
10000.0	**10000.00**	0.00	±0.17	9999.60	10000.40	**PASS**
50000.0	**49999.99**	-0.01	±0.30	49998.80	50001.20	**PASS**

Pt100 Measurement R1

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: -200 ... 850°C ITS90, 1 Year Uncertainty: -200 ... 0°C ±0.015°C, 0°C ... 850°C ±(0.015°C + 0.012% RDG)

Input [Ω]	Corresponding Temperature [°C]	Indicated Value [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
18.9569	-198.989	**-198.989**	0.000	±0.0026	-199.004	-198.974	**PASS**
100.0011	0.003	**-0.001**	-0.004	±0.0062	-0.012	0.018	**PASS**
138.5106	100.013	**100.008**	-0.005	±0.0074	99.986	100.040	**PASS**
280.9785	500.003	**499.992**	-0.011	±0.015	499.928	500.078	**PASS**
390.1926	849.014	**849.000**	-0.014	±0.023	848.897	849.131	**PASS**

Temperature/resistance conversions are based on standard IEC 60751 ed2.0. 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 ed2.0.

Pt100 Measurement R2

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: -200 ... 850°C ITS90, 1 Year Uncertainty: -200 ... 0°C ±0.015°C, 0°C ... 850°C ±(0.015°C + 0.012% RDG)

Input [Ω]	Corresponding Temperature [°C]	Indicated Value [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
18.9546	-198.995	**-198.995**	0.000	±0.0026	-199.010	-198.980	**PASS**
100.0029	0.008	**0.005**	-0.003	±0.0062	-0.007	0.023	**PASS**
138.5105	100.013	**100.010**	-0.003	±0.0074	99.986	100.040	**PASS**
280.9799	500.007	**499.999**	-0.008	±0.015	499.932	500.082	**PASS**
390.1876	848.997	**848.983**	-0.014	±0.023	848.880	849.114	**PASS**

Temperature/resistance conversions are based on standard IEC 60751 ed2.0. 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 ed2.0.

MC6, S/N: 601404. Temperature Section (TC-R-OUT), S/N: 61065.

Pt100 Simulation R1

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: -200 ... 850°C ITS90, 1 Year Uncertainty: -200 ... 0°C ±0.05°C, 0°C ... 850°C ±(0.05°C + 0.014% RDG)

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	**18.9548**	-198.994	0.006	±0.0025	-199.050	-198.950	**PASS**
0.000	100.0000	**100.0019**	0.005	0.005	±0.0068	-0.050	0.050	**PASS**
100.000	138.5055	**138.5060**	100.001	0.001	±0.0078	99.936	100.064	**PASS**
500.000	280.9775	**280.9808**	500.010	0.010	±0.018	499.880	500.120	**PASS**
849.000	390.1884	**390.1922**	849.013	0.013	±0.024	848.831	849.169	**PASS**

Temperature/resistance conversions are based on standard IEC 60751 ed2.0. 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 ed2.0.

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

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: -270°C ... 1372°C ITS90, 1 Year Uncertainty: -270°C ... -200°C ±(0.007% of thermovoltage + 4 µV), -200°C ... 0°C ±(0.1°C + 0.1% RDG), 0°C ... 1000°C ±(0.1°C + 0.007% RDG), 1000 ... 1372°C ±0.017% RDG

Input [mV]	Corresponding Temperature [°C]	Indicated Value [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
-5.893	-200.14	**-200.14**	0.00	±0.071	-200.44	-199.84	**PASS**
-0.002	-0.06	**-0.07**	-0.01	±0.030	-0.16	0.04	**PASS**
20.643	499.96	**499.95**	-0.01	±0.033	499.82	500.10	**PASS**
41.274	999.97	**999.94**	-0.03	±0.040	999.80	1000.14	**PASS**
54.851	1370.97	**1370.94**	-0.03	±0.049	1370.74	1371.20	**PASS**

Temperature/voltage conversions are based on the IEC 60584-1 ed2.0 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 ed2.0.

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

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: -270°C ... 1372°C ITS90, 1 Year Uncertainty: -270°C ... -200°C ±(0.007% of thermovoltage + 4 µV), -200°C ... 0°C ±(0.1°C + 0.1% RDG), 0°C ... 1000°C ±(0.1°C + 0.007% RDG), 1000 ... 1372°C ±0.017% RDG

Input [mV]	Corresponding Temperature [°C]	Indicated Value [°C]	Difference [°C]	Expanded Uncertainty (k=2) [°C]	Specification Low Limit [°C]	Specification High Limit [°C]	Status
-5.893	-200.12	**-200.13**	-0.01	±0.071	-200.42	-199.82	**PASS**
-0.002	-0.05	**-0.05**	0.00	±0.030	-0.15	0.05	**PASS**
20.643	499.97	**499.96**	-0.01	±0.033	499.84	500.10	**PASS**
41.275	999.97	**999.96**	-0.01	±0.040	999.80	1000.14	**PASS**
54.852	1370.97	**1370.95**	-0.02	±0.049	1370.74	1371.20	**PASS**

Temperature/voltage conversions are based on the IEC 60584-1 ed2.0 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 ed2.0.

MC6, S/N: 601404. Temperature Section (TC-R-OUT), S/N: 61065.

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

Calibrated By: Duyanh Luong
Calibration Date: Oct 31, 2017

Range: -270°C ... 1372°C ITS90, 1 Year Uncertainty: -270°C ... -200°C ±(0.007% of thermovoltage + 4 µV), -200°C ... 0°C ±(0.1°C + 0.1% RDG), 0°C ... 1000°C ±(0.1°C + 0.007% RDG), 1000 ... 1372°C ±0.017% RDG

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**	-200.03	-0.03	±0.11	-200.30	-199.70	**PASS**
0.00	0.000	**0.000**	0.00	0.00	±0.039	-0.10	0.10	**PASS**
500.00	20.644	**20.645**	500.01	0.01	±0.040	499.86	500.14	**PASS**
1000.00	41.276	**41.276**	1000.02	0.02	±0.047	999.83	1000.17	**PASS**
1371.00	54.852	**54.853**	1371.03	0.03	±0.057	1370.77	1371.23	**PASS**

Temperature/voltage conversions are based on the IEC 60584-1 ed2.0 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 ed2.0.

Internal Reference Junction TC1

Thermocouple, Type K

Calibrated By: Duyanh Luong
Calibration Date: Nov 01, 2017

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	**0.02**	0.02	±0.075	-0.18	0.18	**PASS**

Temperature / voltage conversion is based on the IEC 60584-1 ed2.0 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: Duyanh Luong
Calibration Date: Nov 01, 2017

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 ed2.0 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, S/N: 601404. Pressure Module, S/N: 48805.

P1C Pressure Measurement

Range: -100 ... 100 kPa gauge, 1 Year Uncertainty: ±(0.015% FS + 0.025% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Nov 01, 2017

Input [kPa]	Indicated Value [kPa]	Difference [kPa]	Expanded Uncertainty (k=2) [kPa]	Specification Low Limit [kPa]	Specification High Limit [kPa]	Status
-0.0008	**-0.001**	-0.0002	±0.0014	-0.0158	0.0142	**PASS**
20.0005	**19.999**	-0.0015	±0.0029	19.9805	20.0205	**PASS**
39.9998	**39.999**	-0.0008	±0.0051	39.9748	40.0248	**PASS**
59.9999	**59.997**	-0.0029	±0.0072	59.9699	60.0299	**PASS**
79.9997	**79.996**	-0.0037	±0.0093	79.9647	80.0347	**PASS**
99.9996	**99.995**	-0.0046	±0.012	99.9596	100.0396	**PASS**
79.9996	**79.998**	-0.0016	±0.0093	79.9646	80.0346	**PASS**
59.9999	**59.999**	-0.0009	±0.0072	59.9699	60.0299	**PASS**
39.9992	**39.999**	-0.0002	±0.0051	39.9742	40.0242	**PASS**
20.0003	**20.001**	0.0007	±0.0029	19.9803	20.0203	**PASS**
-0.0003	**0.001**	0.0013	±0.0014	-0.0153	0.0147	**PASS**
-19.9996	**-19.999**	0.0006	±0.0032	-20.0196	-19.9796	**PASS**
-40.0001	**-40.000**	0.0001	±0.0053	-40.0251	-39.9751	**PASS**
-60.0004	**-60.001**	-0.0006	±0.0074	-60.0304	-59.9704	**PASS**
-79.9999	**-80.003**	-0.0031	±0.0094	-80.0349	-79.9649	**PASS**
-92.9997	**-93.006**	-0.0063	±0.011	-93.0379	-92.9615	**PASS**

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

MC6, S/N: 601404. Pressure Module, S/N: 49042.

P20C Pressure Measurement

Range: -100 ... 2000 kPa gauge, 1 Year Uncertainty: ±(0.01% FS + 0.025% RDG)

Calibrated By: Duyanh Luong
Calibration Date: Nov 01, 2017

Input [kPa]	Indicated Value [kPa]	Difference [kPa]	Expanded Uncertainty (k=2) [kPa]	Specification Low Limit [kPa]	Specification High Limit [kPa]	Status
0.000	**0.00**	0.000	±0.013	-0.200	0.200	**PASS**
399.998	**399.92**	-0.078	±0.057	399.698	400.298	**PASS**
799.996	**799.86**	-0.136	±0.099	799.596	800.396	**PASS**
1200.001	**1199.82**	-0.181	±0.14	1199.501	1200.501	**PASS**
1600.002	**1599.78**	-0.222	±0.19	1599.402	1600.602	**PASS**
1999.985	**1999.68**	-0.305	±0.23	1999.285	2000.685	**PASS**
1599.993	**1599.73**	-0.263	±0.19	1599.393	1600.593	**PASS**
1200.003	**1199.79**	-0.213	±0.14	1199.503	1200.503	**PASS**
799.993	**799.81**	-0.183	±0.099	799.593	800.393	**PASS**
399.998	**399.89**	-0.108	±0.057	399.698	400.298	**PASS**
0.000	**-0.02**	-0.020	±0.013	-0.200	0.200	**PASS**
-20.000	**-20.00**	0.000	±0.013	-20.205	-19.795	**PASS**
-40.000	**-40.00**	0.000	±0.014	-40.210	-39.790	**PASS**
-60.000	**-60.01**	-0.010	±0.015	-60.215	-59.785	**PASS**
-80.000	**-80.01**	-0.010	±0.016	-80.220	-79.780	**PASS**
-93.000	**-93.00**	0.000	±0.019	-93.223	-92.777	**PASS**

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

MC6, S/N: 601404. Barometric Module, S/N: 48083.

PB Pressure Measurement

Range: 70 ... 120 kPa abs, 1 Year Uncertainty: ±0.05 kPa

Calibrated By: Duyanh Luong
Calibration Date: Nov 01, 2017

Input [kPa]	Indicated Value [kPa]	Difference [kPa]	Expanded Uncertainty (k=2) [kPa]	Specification Low Limit [kPa]	Specification High Limit [kPa]	Status
70.000	**70.02**	0.020	±0.016	69.950	70.050	**PASS**
80.001	**80.02**	0.019	±0.017	79.951	80.051	**PASS**
90.000	**90.01**	0.010	±0.018	89.950	90.050	**PASS**
99.999	**100.01**	0.011	±0.019	99.949	100.049	**PASS**
109.999	**110.01**	0.011	±0.021	109.949	110.049	**PASS**
120.001	**120.01**	0.009	±0.022	119.951	120.051	**PASS**

Advanced Field Calibrator and Communicator MC6 **Serial No: 601404**

Calibration Procedure

Calibration was carried out according to the internal instruction no. 7.1.4.1.49

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	Model	Serial No.	Cert. No.	Calibrated
Pressure Controller	Ruska 7250xi	65095	K026-17P4654	Oct 02, 2017
Pressure Controller	Ruska 7250xi	65147	K026-17P4667	Oct 03, 2017
Digital Multimeter	Agilent 3458A	MY45047555	K026-17E3033	Jun 08, 2017
Frequency Counter	Agilent 53131A	MY47004895	K026-17F2173	Apr 24, 2017
Thermocouple	Beamex Type K	51	K026-16T5813	Dec 16, 2016
Thermocouple	Beamex Type K	38	K026-16T5839	Dec 19, 2016

Calibrations are traceable to national or international measurement standards.

Calibration Uncertainty

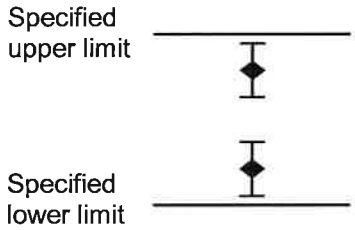
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance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

Calibration Conditions

The calibrations were made in controlled conditions where the temperature was 23°C ± 1°C / 73°F ± 2°F and the relative humidity was 50 %RH ± 10 %RH.

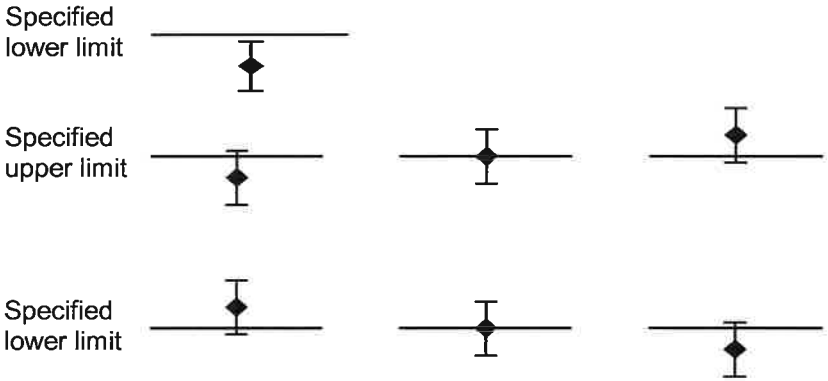
ASSESSMENT OF COMPLIANCE WITH MANUFACTURER'S SPECIFICATION

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).



(Based on ILAC-G8:03/2009)