C87
(1/2)

TPF CONTROL

ilac-MRA

RvA CALIBRATION RvA K 149

Calibration Certificate

66078

Applicant

Customer name	CCSTEC GesmbH
Address	Triesterstrasse 36 2512 Oeynhausen Austria
Order reference applicant	CP0999
Order reference TPF Control	66021

Instrument information

Manufacturer	TSI
Instrument type	Volume Flow Device
Model	4043 H
Serial number	4043 1653 004
Tag number	C87

Calibration method

The device under test is directly, in line, connected to a flow calibrator to compare flow readings. An appropriate warm up time is incorporated.
A flow source is connected to the inlet of the instrument to generate a flow.

Environmental conditions

The laboratory environment was maintained at 21°C ± 2°C and 40%rh ± 20%rh.
The atmospheric pressure at the time of calibration was 1016 mBar.

Date (or period) of calibration

8 January 2021

Results

The results of the calibration are presented on the following page(s).

Uncertainty

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a 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-4/02.

Traceability

The measurements have been executed using standards for which the traceability to (inter)national standards has been demonstrated towards the RvA.

Date

8 January 2021

Calibration Technician

Jonny Crum

Technical Manager

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RvA is member of the European Co-operation for Accreditation (EA) and is one of the signatories to the EA Multilateral Agreement and to the ILAC Mutual Recognition Arrangements (MRA) for the mutual recognition of calibration certificates.

C87
(218

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Instrument specification [Device Under Test]

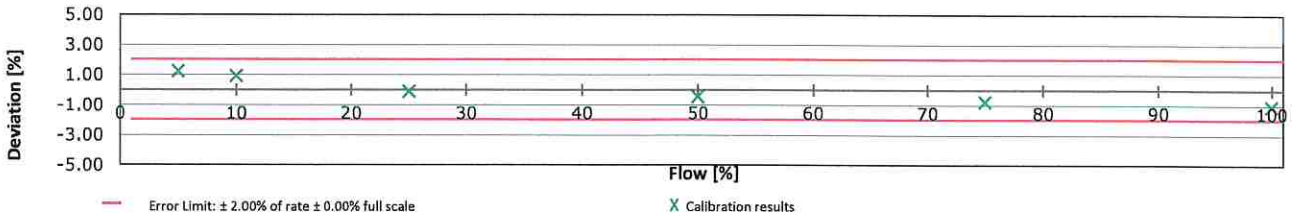
Process gas	:	Air	Input signal	:	n.a
Qmax	:	200 l/min	Output signal	:	Display
			Inlet pressure	:	0 Bar (g)
			Outlet pressure	:	0 Bar (g)

Calibration conditions

Calibration gas	:	Air	Calibration inlet pressure	:	0 Bar (g)
Gas conversion factor	:	1.0000 (TSI)	Calibration outlet pressure	:	0 Bar (g)

Calibration results

Instrument reading			Reference	Deviation (ERROR)			Uncertainty
Output Display	Full scale	Calculated flow	Flow	Of rate	DUT - REF	Limit	Calibration Flow
[l/min]	[%]	[l/min]	[l/min]	[%]	[l/min]	[%]	[%]
0.00							
10.04	5.02	10.04	9.9200	1.25	0.12	2.00	0.52
20.01	10.00	20.01	19.823	0.93	0.19	2.00	0.34
50.06	25.03	50.06	50.117	-0.12	-0.06	2.00	0.31
100.0	49.99	100.0	100.42	-0.44	-0.42	2.00	0.33
149.9	74.96	149.9	151.11	-0.79	-1.21	2.00	0.31
199.9	99.97	199.9	202.12	-1.08	-2.22	2.00	0.30



Note

1 The deviation is determined by : $\text{Deviation} = \frac{\text{Instrument reading - Reference}}{\text{Reference}} * 100\ \%$

2 The hysteresis of the DUT can be determined by the deviation between two series but is not included in the uncertainty.

3 The indicated Lab Standard Flow is derived applying the gas conversion factor. Calibration takes place with the calibration gas, results are reported in process gas (DUT).

4 Calibration done with inlet filter.