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TPF CONTROL

CALIBRATION RvA K 149

Calibration Certificate

51147

Applicant

Customer name	CCSTEC GesmbH
Address	Triesterstrasse 36 A-2512 Oeynhausen Austria
Order reference applicant	CP0999
Order reference TPF Control	51053

Instrument information

Instrument type	Flow Calibrator
Manufacturer	Mesalabs
Model	Definer 220H
Serial number	115673
Tag number	C63

Calibration method

The temperature calibration is done by compairing the DUT reading to a PT-100 reading in Air. The pressure DUT is directly, connected to a pressure standard to compare pressure readings. The flow measurements are made in a parallel setup.

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 1026 mBar.

Date (or period) of calibration

9 January 2019 - 10 January 2019

Results

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

Uncertainty

The reported expanded uncertainty is based on the standard uncertainty of the measurement multiplied by a coverage factor k, such that the coverage probability corresponds to 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

10 January 2019

Calibration Technician

Bart Vissers

Technical Manager

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Reproduction of the complete certifate is allowed.

Parts of the certificate may only be reproduced after written approval of the calibration laboratory.

This certificate is issued under the provision that the Raad voor Accreditatie does not assume any liability.

TPF CONTROL

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CALIBRATION RvA K 149

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Instrument specification [Device Under Test]

Qmax	:	30000 sccm	Serial number	:	115673
Reference conditions	:	21.1 °C & 1013.25 mBar	Tag number	:	C63

Calibration conditions

Calibration gas : Air

Calibration results

Instrument reading	Reference	Deviation (ERROR)			Uncertainty
Flow [sccm]	Flow [sccm]	Of rate [%]	DUT- REF [sccm]	Limit [%]	Calibration [%]
306.41	307.16	-0.24	-0.75	1.00	0.19
4978.7	5004.4	-0.51	-25.70	1.00	0.20
29872	29964	-0.31	-92.00	1.00	0.24
Temperature [°C]	**Temperature [°C]**	**Of rate [%]**	**DUT - REF [°C]**	**Limit [°C]**	**Calibration [°C]**
22.1	22.3	-0.90	-0.2	0.8	0.4
Pressure [mBar (a)]	**Pressure [mBar (a)]**	**Of rate [%]**	**DUT- REF [mBar (a)]**	**Limit [mBar (a)]**	**Calibration [mBar (a)]**
1019	1019	0.00	0	5	3

Calibration results after adjustment

Instrument reading	Reference	Deviation (ERROR)			Uncertainty
Flow [sccm]	Flow [sccm]	Of rate [%]	DUT- REF [sccm]	Limit [%]	Calibration [%]
301.28	300.34	0.31	0.94	1.00	0.18
5013.8	5008.4	0.11	5.40	1.00	0.18
29958	29873	0.28	85.00	1.00	0.18
Temperature [°C]	**Temperature [°C]**	**Of rate [%]**	**DUT - REF [°C]**	**Limit [°C]**	**Calibration [°C]**
21.4	21.4	0.00	0.0	0.8	0.4
Pressure [mBar (a)]	**Pressure [mBar (a)]**	**Of rate [%]**	**DUT- REF [mBar (a)]**	**Limit [mBar (a)]**	**Calibration [mBar (a)]**
1026	1026	0.00	0	5	3

Note

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

2 Calibrations are performed at mentioned pressure and temperature conditions. Reference temperatures are defined according the ITS-90.