



Service Report For Request 300451637

Date Received: 09 Sep 2022

Date Completed: 16 Sep 2022

Sold-To Customer: 13955
Deha-Haan & Wittmer GmbH
Keltenstrasse 8
71296 Heimsheim
Germany

Ship-To Customer: 13955
Gabi Mueller
Deha-Haan & Wittmer GmbH
Keltenstrasse 8
71296 Heimsheim
Germany

Customer PO: 1126

Service Performed: CL-4040 Kalibrierung eines Modells 4040

Model Serviced: 4040 Flowmeter, 300 L/min, Air, O2, N2, 22mm

Serial Number: 40402038075

CUSTOMER RETURN REASON:

Kalibrieren

CUSTOMER RETURN REASON CONFIRMED: YES

AS FOUND RESULT: PASS

TECHNICIAN:

Mahboob Hussain

TECHNICIAN'S FINDINGS:

No findings observed.

TECHNICIAN'S ACTIONS:

The following action items were taken to ensure proper operation:

The unit was cleaned, calibrated and a complete operational checkout was performed.

TSI STANDARD TASKS PERFORMED:

Through our quality policy we ensure that the best services are available to our customers. Below is a checklist of standard tasks that are performed on your instrument:

- As-Found calibration (if possible)
- Clean/replace mesh screen & o-rings
- End-to-end leak check
- As-Left calibration with NIST/UKAS traceable calibration, including performance evaluation against proprietary TSI calibration bench
- Clean flow sensor & thermistor
- Upgrade firmware (if applicable)
- Clean inlets, flowbody & cover



TSI GmbH
Neuköllner Straße 4
52068 Aachen
Germany

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TSI QUALITY COMMITMENT

TSI VISION

Creating a better world by helping protect people, products and the environment, and by optimizing research and industrial processes.

TSI MISSION

TSI provides trusted measurement, application guidance, and data analytics solutions that enable our customers to make informed decisions.

OUR QUALITY POLICY

The employees of TSI are committed to meet and, where possible, exceed our customer's requirements for application guidance, precision measurement solutions and data management through the continual improvement of our products and processes.



Thank you for the opportunity to service your instrument.



Mass Flowmeter Calibration Certificate

Model: 4040

Serial Number: 40402038075

As Found date: 16-Sep-2022

Rev: H

Summary Status

As-Found In Tolerance
 As-Left Out of Tolerance

Environmental Conditions

Pressure: 99.9 kPa

Temperature: 20.3 °C

Air Flow

Tolerance: $\pm(2.00\%$ of reading or 0.050 SLPM*)

Reference Measured (SLPM)	Allowable Range	
	Min	Max
0.552	0.502	0.602
2.052	2.002	2.102
5.969	5.850	6.088
14.54	14.25	14.83
28.86	28.17	29.44
45.64	44.73	46.55
61.64	60.41	62.87
80.05	78.45	81.65
99.97	98.00	102.0
109.9	107.7	112.1
139.7	136.9	142.5
180.1	176.5	183.7
219.7	215.3	224.1
259.9	254.7	265.1
300.9	294.9	306.9
PASS		

Oxygen Flow

Tolerance: $\pm(2.00\%$ of reading or 0.050 SLPM*)

Reference Measured (SLPM)	Allowable Range	
	Min	Max
0.552	0.502	0.602
2.046	1.996	2.096
6.145	6.022	6.268
14.44	14.15	14.73
28.88	28.30	29.46
45.40	44.49	46.31
61.49	60.26	62.72
79.92	78.32	81.52
99.95	98.00	101.9
109.9	107.7	112.1
140.4	137.6	143.2
180.2	176.6	183.8
220.1	215.7	224.5
260.8	255.6	266.0
301.2	295.2	307.2
PASS		

Pressure

Tolerance: ± 0.145 psia

Reference Measured (psia)	Allowable Range	
	Min	Max
14.49	14.34	14.63
21.66	21.52	21.81
PASS		

Temperature

Tolerance: ± 1.000 °C

Reference Measured (°C)	Allowable Range	
	Min	Max
20.11	19.11	21.11
PASS		

Internal Calibration Reference(s)

Measurement Type	Reference (FC12)	Due for Calibration
Flow	UKFC12	31-Oct-2022
Pressure	UKFC12P	31-Oct-2022
Temperature	UKFC12T	31-Oct-2022

TSI Std Conditions: 70 °F (21.11 °C) and 14.7 psia

Calibrated by:

Emile Pietersen

TSI Instruments Ltd.
Stirling Road
High Wycombe, Bucks HP12 3ST UK

*Tolerance specified: whichever is greater

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TSI does hereby certify that this flowmeter has been calibrated using TSI procedure 10000021269. The calibration of the reference standards maintain national laboratory traceability to members of the European co-operation for Accreditation (EA).



Mass Flowmeter Calibration Certificate

Model: 4040
Serial Number: 40402038075
Verification date: 16-Sep-2022

Rev: H

Summary Status

As-Found In Tolerance
 As-Left Out of Tolerance

Environmental Conditions

Pressure: 99.9 kPa
Temperature: 20.6 °C

Air Flow

Tolerance: $\pm(1.75\%$ of reading or 0.050 SLPM*)

Reference Measured (SLPM)	Allowable Range	
	Min	Max
0.552	0.502	0.602
2.047	1.997	2.097
6.017	5.912	6.122
14.42	14.17	14.67
29.00	28.92	29.50
45.52	44.72	46.31
61.38	60.30	62.45
79.69	78.29	81.08
99.91	98.16	101.7
109.4	107.5	111.3
140.6	138.2	143.1
179.9	176.8	183.1
219.4	215.5	223.2
259.3	254.8	263.8
301.9	296.6	307.2

PASS

Oxygen Flow

Tolerance: $\pm(1.75\%$ of reading or 0.050 SLPM*)

Reference Measured (SLPM)	Allowable Range	
	Min	Max
0.556	0.506	0.606
2.040	1.990	2.090
6.132	6.025	6.239
14.53	14.45	14.78
28.99	28.99	29.50
45.30	45.36	46.09
61.34	61.57	62.41
79.99	80.03	81.39
99.91	100.3	101.7
110.5	110.5	112.4
140.0	137.6	142.5
180.7	177.5	183.8
220.1	216.2	224.0
260.6	256.1	265.2
300.7	295.5	306.0

PASS

Pressure

Tolerance: ± 0.110 psia

Reference Measured (psia)	Allowable Range	
	Min	Max
14.49	14.49	14.60
21.67	21.68	21.78

PASS

Temperature

Tolerance: ± 1.000 °C

Reference Measured (°C)	Allowable Range	
	Min	Max
20.49	20.56	21.49

PASS

Internal Calibration Reference(s)

Measurement Type	Reference (FC12)	Due for Calibration
Flow	UKFC12	31-Oct-2022
Pressure	UKFC12P	31-Oct-2022
Temperature	UKFC12T	31-Oct-2022

TSI Std Conditions: 70 °F (21.11 °C) and 14.7 psia

Calibrated by:

Mahboob Hussain

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Stirling Road
High Wycombe, Bucks HP12 3ST UK

*Tolerance specified: whichever is greater

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