

## CALIBRATION CERTIFICATE

FLUID NO. 1 OF 1

CERTIFICATE NO. MW08/CL9/024200

Calibration by comparison  
Calibration date: 15 Jan 2015

We hereby certify that the instrument mentioned below has been calibrated in accordance with the stated values and conditions. The calibration standards used are traceable to national standards of the Dutch Metrology Institute VSL.

**Calibrated instrument**

Type Flow controller (D)  
Serial number W1421333A  
Model number D-6383-DF/003BI  
Rated accuracy\*  $\pm(2\%FS)$

**Calibration standard**

Type Rotor meter  
Serial number 99201934E  
Certificate no. NMI/G13S3142  
Uncertainty  $\pm 0.3\% Rd$

**Customer conditions**

Fluid N2  
Flow 5000 l/min  
Pressure 8.0 bar (g)  
Temperature 20.0 °C

**Calibration conditions**

Fluid Air  
Flow 5000 l/min (equivalent flow)  
Pressure 5.0 bar (g)  
Temperature 16.7 °C  
Atm. pressure 960.5 hPa (a)

**Calibration and conversion results**

Point	Calibrated flow AIR	Conversion factor	Customer flow** N2	Output signal
1	0.000 l/min	-	0.000 l/min	0.00% 4.000 mA
2	113.5 l/min	1.000	113.5 l/min	2.27% 4.363 mA
3	163.9 l/min	1.000	163.9 l/min	3.28% 4.525 mA
4	213.8 l/min	1.000	213.8 l/min	4.28% 4.684 mA
5	263.2 l/min	1.000	263.2 l/min	5.26% 4.842 mA
6	312.3 l/min	1.000	312.3 l/min	6.25% 4.999 mA
7	410.5 l/min	1.000	410.5 l/min	8.21% 5.313 mA
8	509.0 l/min	1.000	509.0 l/min	10.18% 5.629 mA
9	632.9 l/min	1.000	632.9 l/min	12.66% 6.025 mA
10	758.1 l/min	1.000	758.1 l/min	15.16% 6.426 mA
11	1010 l/min	1.000	1010 l/min	20.20% 7.232 mA
12	1254 l/min	1.000	1254 l/min	25.08% 8.012 mA
13	1503 l/min	1.000	1503 l/min	30.07% 8.811 mA
14	1749 l/min	1.000	1749 l/min	34.98% 9.597 mA
15	2001 l/min	1.000	2001 l/min	40.02% 10.403 mA
16	2503 l/min	1.000	2503 l/min	50.07% 12.011 mA
17	3017 l/min	1.000	3017 l/min	60.34% 13.654 mA
18	3526 l/min	1.000	3526 l/min	70.53% 15.285 mA
19	4043 l/min	1.000	4043 l/min	80.86% 16.938 mA
20	4553 l/min	1.000	4553 l/min	91.07% 18.571 mA
21	5073 l/min	1.000	5073 l/min	101.46% 20.234 mA

The measurement uncertainty of the calibrated Air flow is  $\pm 0.4\% Rd$ .

The measured deviation between the flow indicated by the calibrated instrument and the reference flow indicated by the calibration standard is less than  $\pm 0.42\% Rd$ .

**Notes**

Flow unit l/min is defined at conditions 0.00 °C, 1013.25 hPa (a).

\* Rated accuracy is specified under calibration conditions.

\*\* The calibrated flow is converted to customer fluid and/or conditions using Bronkhorst High-Tech FLUIDAT® software.

Measurement uncertainties are based upon 95% (k=2) confidence limits. Although the item calibrated meets the specifications and performance at the time of calibration, due to any number of factors, this does not imply continuing conformance to the specifications.

Calibrator N.Se.

QC G.T.

Signed

*[Signature]*

Date 19 Jan 2015

Signed

*[Signature]*