

## CALIBRATION CERTIFICATE

FLUID NO. 1 OF 1

CERTIFICATE NO. MW08/CL9/025770

Calibration by comparison  
Calibration date: 7 Apr 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 W1520285A  
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 CO2  
Flow 5000 l/min  
Pressure 8.0 bar (g)  
Temperature 20.0 °C

**Calibration conditions**

Fluid AiR  
Flow 4767 l/min (equivalent flow)  
Pressure 5.0 bar (g)  
Temperature 16.6 °C  
Atm. pressure 960.3 hPa (a)

**Calibration and conversion results**

Point	Calibrated flow AiR	Conversion factor	Customer flow** CO2	Output signal
1	0.000 l/min	-	0.000 l/min	0.00% 4.000 mA
2	113.1 l/min	1.054	119.2 l/min	2.38% 4.382 mA
3	163.6 l/min	1.054	172.5 l/min	3.45% 4.552 mA
4	213.5 l/min	1.054	225.0 l/min	4.50% 4.720 mA
5	262.8 l/min	1.054	277.0 l/min	5.54% 4.886 mA
6	311.9 l/min	1.054	328.7 l/min	6.57% 5.052 mA
7	410.3 l/min	1.054	432.3 l/min	8.65% 5.383 mA
8	509.0 l/min	1.053	536.1 l/min	10.72% 5.716 mA
9	633.4 l/min	1.053	666.9 l/min	13.34% 6.134 mA
10	759.2 l/min	1.053	799.2 l/min	15.98% 6.557 mA
11	1012 l/min	1.053	1065 l/min	21.30% 7.409 mA
12	1255 l/min	1.053	1322 l/min	26.43% 8.229 mA
13	1506 l/min	1.052	1585 l/min	31.69% 9.071 mA
14	1753 l/min	1.051	1842 l/min	36.85% 9.895 mA
15	2006 l/min	1.050	2106 l/min	42.13% 10.741 mA
16	2509 l/min	1.049	2632 l/min	52.65% 12.423 mA
17	3024 l/min	1.049	3171 l/min	63.42% 14.147 mA
18	3533 l/min	1.048	3703 l/min	74.05% 15.848 mA
19	4050 l/min	1.047	4241 l/min	84.83% 17.573 mA
20	4566 l/min	1.049	4789 l/min	95.77% 19.323 mA
21	5084 l/min	1.049	5335 l/min	106.69% 21.070 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  $\pm 0.36\% Rd$ .

**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.

\*\*\* Analog output above 20 mA cannot be guaranteed.

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

Date

15 Apr 2015

Signed