Service and calibration report

Microlab Technologies

Service & Calibration Report for

[redacted]

Certificate Reference: [redacted]
Instrument Serial No: [redacted]
Model: [redacted]
Instrument syringes: [redacted]

Date: [redacted]
Contract: [redacted]
Asset ID: [redacted]
Contract Type: B2

The enclosed pages contain a Calibration report supplied against a service contract for a **Hamilton Microlab** dispenser/diluter. The calibration is conducted over 3 test points (volumes) at 4, 10 and 30% aliquots of syringe volume to identify errors and confirm linearity, precision and accuracy of the dispensing functions.
Corrections and calculations are made for Barometric pressure, Temperature and Evaporation Constants, and are fully traceable to National or International Standards.
The report shows a summary table of the performance of each channel of the instrument with its defined syringe.

Certificate identifies:

- Serial No./Drive A/B
- Correction for temperature;
  Instrument model: **Digitron 2146T7**; Serial no: **4607115143**; performance: **±0.2°C**;
  Cert Ref: **LB002729**; UKAS Lab **J28463A**
- Correction for barometric pressure
  Instrument model: **Druck DPI 740**; Serial no: **74002220**; performance: **±0.5**mbar;
  Cert Ref: **Y13636-1**; UKAS Lab **0221**
- Correction for evaporation constant
- Mass correction against traceable reference
- Performance check against agreed metrics, i.e. inaccuracy and imprecision.
- Detail of consumables used
- Service notes
- Information relative to the Validated Software

PC-Volume is a software product that determines to performance of volumetric equipment using gravimetric analysis in accordance with NCCLS (National Committee for Clinical Laboratory Standards), as well as ISO and DIN. It runs under Microsoft Windows 3.1, Windows 95/98 and Windows NT(V4.0 or above), and interacts with a Mettler-Toledo balance using an RS232 serial interface

Balance performance validation

1g reference; expected value 1.00002 ± 0.00002
Ref: ZOO2875; Zwiebel Metrology, No: 2.1218

Ref Weight	Reading
1g	1.00001
1g	1.00003
1.g	1.00003
1g	1.00002
Mean/SD	1.000023/0.0000083

5g reference; expected value 5.00002 ± 0.00002
Ref: Z00 2874 , Zwiebel Metrology, No: 2.1218

Ref Weight	Reading
5g	5.00003
5g	5.00003
5.g	5.00002
5g	5.00001
Mean/SD	5.000011/ 0.0000113

Balance Performance to agreed metrics: ☒

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Equipment Inspection

Visual Examination — **Comment/Problem description**

Housing Damage

☒ None
☐ Type of damage:
☐ Damage repaired

Functional defects: — **Detail**

☒ None

Diagnostics

Syringe Drive		**Pass**	**Fail**	**Comment**		
Motor Sensors		☒	☐	OK		
Syringe Motor		☒	☐	OK		
Syringe Drive Assembly		**Pass**	**Fail**	**Replace**	**Lubricate**	**Clean**
Syringe Motor Assembly	P/N 39416	☒	☐			
Lead Screw	P/N 39418	☒	☐	☐	☒	☒
Lead Screw Pulley	P/N 39435	☒	☐	☐		☒
Lead Screw Bearing	P/N	☒	☐	☐	☒	☒
Syringe drive torque test		☒	☐			
Syringe Thumb Screw	P/N R35864	☐	☐	☐		

Valve Assembly Errors		**Pass**	**Fail**	**Comment/Replace**	**Lubricate**	**Clean**
Encoder Disc,	P/N 39404	☒	☐	OK	☐	☐
Valve Actuator	P/N 39402	☒	☐	OK		
Valve Optics Board	P/N 39676	☒	☐	OK		
Valve Motor Assembly	P/N 39415	☒	☐	OK		
Valve Locking Handle	P/N 0162302	☐	☐	☐	☐	☐

Headset Controller Validation

Controller Diagnostics		☐	☐	n/a
Interface Board	P/N 39669	☐	☐	☐
RS232 Controller cable	P/N	☐	☐	☐

Signal Strength

☒ Voltage (coms value) — 5.15V passed

Program Check ☐ ☐

	PASS	**FAIL**
Calibration to agreed metrics	☒	☐

Inspection: Notes:

Engineer: ..... Dated:

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Consumables used as Part of Routine Service Contract

Valve Block, Single Dispenser, ML501A, ML510B, ML512BP,	Ref: **R35825**	☐
Valve Block, Diluter Valve, ML503A, ML530B, ML532BP,	Ref: **R35844**	☐
Valve Block, Dispenser Valve, ML504A, ML540B, ML542B,	Ref: **35842**	☐

Syringes

Diluter (Right Side)

25ul,	Ref: **80226**	☐
50ul,	Ref: **80926**	☐
100ul	Ref: **81026**	☐
250ul	Ref: **81126**	☐
500ul	Ref: **81226**	☐
1000ul	Ref: **81326**	☐

250ul, DAD-SAL Ref: 203450	☐
500ul, DAD-SAL Ref: 203460	☐
1000ul, DAD-SAL Ref: 203470	☐

Diluter (Left Side) **Dispenser** (Right/Left Side)

25ul	Ref: **R80222 TLLX**	☐
50ul	Ref: **80922 TLLX**	☐
100ul	Ref: **81022 TLLX**	☐
250ul	Ref: **81122 TLLX**	☐
500ul	Ref: **81222 TLLX**	☐
1000ul	Ref: **81323 TLLX** or	☐
1000ul	Ref: **81320 TLL**	☐
2500ul,	Ref: **81420 TLL**	☐
5000ul,	Ref: **81520 TLL**	☐
10000ul,	Ref: **81620 TLL**	☐
25000ul,	Ref; **R82521 TLL**	☐
250ul TLL-SAL,	Ref: 203220	☐
500ul TLL-SAL,	Ref: 203230	☐
1000ul TLL-SAL,	Ref: 203240	☐
2500ul TLL-SAL.	Ref: 203250	☐
5000ul TLL-SAL,	Ref: 203260	☐
10000ul TLL-SAL.	Ref: 203270	☐

Tubing:

Micro (18 gauge)

Fill, Ref: **240010** ☐ **Dispense,** Ref: **240130** ☐

Macro (12 gauge)

Fill, Ref: **240000** ☐ **Dispense,** Ref: **240360** ☒

Accessories:

Tubing Clip	Ref: **230010**	☐	**Hand Grip Holder,**	Ref: **35783** ☐
Sml Prts Kit	Ref: **35888**	☒	**Hand Actuator Concorde,**	Ref: **R35529** ☐
Actuator Dual,	Ref: **R35767**	☐	**Dispense tubing Grip,**	**Ref: 342-9892** ☒

Notes :

Engineer: ..... Dated:

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Instrument type:	Ham. ML530B Syr. A 10000 ul	**Test date:**	
Group:		**Due date:**	

Testing volume:	3000.0 µl		**Sample size:**	10
Sampling mode:	With blank test(s) / Ordinary sampling		**Z-Value:**	1.003483
Air pressure:	1024 mbar		**Liquid density:**	0.99759 g/cm³
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400			
Mean temperature:	22.8 ° C	**Inaccuracy:**	**E**	0.36 µl
			E%	0.01 %
Mean volume:	3000.36 µl	**Imprecision:**	**s**	3.96 µl
Range:	7.9 µl		**CV**	0.13 %
Test time:	10:00	**Test result:**	PASSED	

Testing volume:	1000.0 µl		**Sample size:**	10
Sampling mode:	With blank test(s) / Ordinary sampling		**Z-Value:**	1.003460
Air pressure:	1024 mbar		**Liquid density:**	0.99761 g/cm³
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400			
Mean temperature:	22.7 ° C	**Inaccuracy:**	**E**	0.48 µl
			E%	0.05 %
Mean volume:	1000.48 µl	**Imprecision:**	**s**	2.28 µl
Range:	7.5 µl		**CV**	0.23 %
Test time:	09:55	**Test result:**	PASSED	

Testing volume:	400.0 µl		**Sample size:**	10
Sampling mode:	With blank test(s) / Ordinary sampling		**Z-Value:**	1.003460
Air pressure:	1024 mbar		**Liquid density:**	0.99761 g/cm³
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400			
Mean temperature:	22.7 ° C	**Inaccuracy:**	**E**	0.31 µl
			E%	0.08 %
Mean volume:	400.31 µl	**Imprecision:**	**s**	0.57 µl
Range:	1.9 µl		**CV**	0.14 %
Test time:	09:51	**Test result:**	PASSED	

Operator:

Date/Signature: .....

Note: This instrument has been tested according to ISO and NCCLS guidelines.

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Service and calibration report

Microlab Technologies

Instrument Test Report for [redacted]

[redacted]

Instrument type:	Ham. ML530B Syr. A 10000 ul	**Test date:**	[redacted]
		Test time:	09:56
Group:	[redacted]	**Due date:**	[redacted]
1st temperature:	21.6 ° C	**Air pressure:**	1006 mbar
2nd temperature:	21.3 ° C	**Liquid density:**	0.99788 g/cm³
Testing volume:	3000.0 µl	**Sample size:**	10
Sampling mode:	With blank test(s) / Ordinary sampling	**Z-Value:**	1.003172
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400		

e-1)	-0.0001 g / -0.1 µl	e-2)	0.0000 g / 0.0 µl
1)	2.9901 g / 2999.6 µl		
2)	2.9913 g / 3000.8 µl		
3)	2.9907 g / 3000.2 µl		
4)	2.9946 g / 3004.1 µl		
5)	2.9888 g / 2998.3 µl		
6)	2.9937 g / 3003.2 µl		
7)	2.9899 g / 2999.4 µl		
8)	2.9938 g / 3003.3 µl		
9)	2.9898 g / 2999.3 µl		
10)	2.9936 g / 3003.1 µl		

Mean temperature:	21.5 ° C		
Mean volume:	3001.17 µl	**Range:**	5.8 µl

Inaccuracy:

E	1.17 µl	
E%	0.04 %	OK (<= ± 1.00 %)

Imprecision:

s	2.10 µl	
CV	0.07 %	OK (<= 0.20 %)

Note: This instrument has been tested according to ISO and NCCLS guidelines.

Test result: PASSED

Operator: [redacted]

Date/Signature: .....

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Service and calibration report

Microlab Technologies

Instrument Test Report for [redacted]

[redacted]

Instrument type: Ham. ML530B Syr. A 10000 ul

Test date: [redacted]
Test time: 09:41

Group: [redacted]

Due date: [redacted]

1st temperature: 21.7 ° C
2nd temperature: 21.6 ° C

Air pressure: 1006 mbar
Liquid density: 0.99784 g/cm³

Testing volume: 1000.0 µl
Sampling mode: With blank test(s) / Ordinary sampling
Balance: METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400
Sample size: 10
Z-Value: 1.003216

e-1)	0.0000 g / 0.0 µl	e-2)	0.0000 g / 0.0 µl
1)	0.9977 g / 1000.9 µl		
2)	0.9980 g / 1001.2 µl		
3)	0.9983 g / 1001.5 µl		
4)	0.9984 g / 1001.6 µl		
5)	0.9982 g / 1001.4 µl		
6)	0.9977 g / 1000.9 µl		
7)	0.9984 g / 1001.6 µl		
8)	0.9984 g / 1001.6 µl		
9)	0.9922 g / 995.4 µl		
10)	0.9979 g / 1001.1 µl		

Mean temperature: 21.7 ° C
Mean volume: 1000.73 µl

Range: 6.2 µl

Inaccuracy:

E	0.73 µl	
E%	0.07 %	OK (<= ± 1.20 %)

Imprecision:

s	1.90 µl	
CV	0.19 %	OK (<= 0.50 %)

Note: This instrument has been tested according to ISO and NCCLS guidelines

Test result: PASSED

Operator: [redacted]

Date/Signature: .....

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Service and calibration report

Microlab Technologies

Instrument Test Report for [redacted]

Instrument type: Ham. ML530B Syr. A 10000 ul

Test date: [redacted]
Test time: 09:37

Group: [redacted]

Due date: [redacted]

1st temperature: 21.7 ° C
2nd temperature: 21.7 ° C

Air pressure: 1006 mbar
Liquid density: 0.99784 g/cm³

Testing volume: 400.0 µl
Sampling mode: With blank test(s) / Ordinary sampling
Balance: METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400

Sample size: 10
Z-Value: 1.003216

e-1)	0.0000 g / 0.0 µl	e-2)	-0.0001 g / -0.1 µl
1)	0.3961 g / 397.4 µl		
2)	0.3985 g / 399.8 µl		
3)	0.3994 g / 400.7 µl		
4)	0.3989 g / 400.2 µl		
5)	0.3992 g / 400.5 µl		
6)	0.3993 g / 400.6 µl		
7)	0.3985 g / 399.8 µl		
8)	0.3996 g / 400.9 µl		
9)	0.3986 g / 399.9 µl		
10)	0.3996 g / 400.9 µl		

Mean temperature: 21.7 ° C
Mean volume: 400.10 µl

Range: 3.5 µl

Inaccuracy:

E	0.10 µl	
E%	0.03 %	OK (<= ± 3.00 %)

Imprecision:

s	1.03 µl	
CV	0.26 %	OK (<= 1.50 %)

Note: This instrument has been tested according to ISO and NCCLS guidelines

Test result: PASSED

Operator: [redacted]

Date/Signature: .....

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Service and calibration report

Microlab Technologies

Instrument type:	Hamilton ML530B Syr. B 1000 ul	**Test date:**	
Group:		**Due date:**	

Testing volume:	300.0 µl		**Sample size:**	4
Sampling mode:	With blank test(s) / Ordinary sampling		**Z-Value:**	1.003483
Air pressure:	1024 mbar		**Liquid density:**	0.99759 g/cm³
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400			
Mean temperature:	22.8 ° C	**Inaccuracy:**	**E**	0.29 µl
			E%	0.10 %
Mean volume:	300.29 µl	**Imprecision:**	**s (est.)**	0.08 µl
Range:	0.3 µl		**CV (est.)**	0.03 %
Test time:	10:08	**Test result:**	PASSED	

Testing volume:	100.0 µl		**Sample size:**	4
Sampling mode:	With blank test(s) / Ordinary sampling		**Z-Value:**	1.003483
Air pressure:	1024 mbar		**Liquid density:**	0.99759 g/cm³
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400			
Mean temperature:	22.8 ° C	**Inaccuracy:**	**E**	-0.33 µl
			E%	-0.33 %
Mean volume:	99.67 µl	**Imprecision:**	**s (est.)**	0.10 µl
Range:	0.4 µl		**CV (est.)**	0.10 %
Test time:	10:06	**Test result:**	PASSED	

Testing volume:	40.00 µl		**Sample size:**	4
Sampling mode:	With blank test(s) / Ordinary sampling		**Z-Value:**	1.003483
Air pressure:	1024 mbar		**Liquid density:**	0.99759 g/cm³
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400			
Mean temperature:	22.8 ° C	**Inaccuracy:**	**E**	-0.009 µl
			E%	-0.02 %
Mean volume:	39.991 µl	**Imprecision:**	**s (est.)**	0.083 µl
Range:	0.33 µl		**CV (est.)**	0.21 %
Test time:	10:04	**Test result:**	PASSED	

Operator:

Date/Signature: .....

Note: This instrument has been tested according to ISO and NCCLS guidelines.

Service and calibration report

Microlab Technologies

Instrument Test Report for [redacted]

[redacted]

Instrument type:	Hamilton ML530B Syr. B 1000 ul	**Test date:**	[redacted]
		Test time:	10:08
Group:	[redacted]	**Due date:**	[redacted]
1st temperature:	22.8 ° C	**Air pressure:**	1024 mbar
2nd temperature:	22.8 ° C	**Liquid density:**	0.99759 g/cm³
Testing volume:	300.0 µl	**Sample size:**	4
Sampling mode:	With blank test(s) / Ordinary sampling	**Z-Value:**	1.003483
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400		

e-1)	-0.0001 g / -0.1 µl
1)	0.2990 g / 300.1 µl
2)	0.2992 g / 300.3 µl
3)	0.2991 g / 300.2 µl
4)	0.2993 g / 300.4 µl

Mean temperature:	22.8 ° C		
Mean volume:	300.29 µl	**Range:**	0.3 µl
Inaccuracy:			
E	0.29 µl		
E%	0.10 %	OK (<= ± 1.00 %)	
Imprecision:			
s (est.)	0.08 µl		
CV (est.)	0.03 %	OK (<= 0.20 %)	

Note: This instrument has been tested according to ISO and NCCLS guidelines.

Test result: PASSED

Operator: [redacted]

Date/Signature: .....

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Service and calibration report

Microlab Technologies

Instrument Test Report for [redacted]

[redacted]

Instrument type:	Hamilton ML530B Syr. B 1000 ul	**Test date:**	[redacted]
		Test time:	10:06
Group:	[redacted]	**Due date:**	[redacted]
1st temperature:	22.8 ° C	**Air pressure:**	1024 mbar
2nd temperature:	22.8 ° C	**Liquid density:**	0.99759 g/cm³
Testing volume:	100.0 µl	**Sample size:**	4
Sampling mode:	With blank test(s) / Ordinary sampling	**Z-Value:**	1.003483
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400		

e-1)	-0.0001 g / -0.1 µl
1)	0.0990 g / 99.4 µl
2)	0.0994 g / 99.8 µl
3)	0.0993 g / 99.7 µl
4)	0.0992 g / 99.6 µl

Mean temperature:	22.8 ° C		
Mean volume:	99.67 µl	**Range:**	0.4 µl

Inaccuracy:

E	-0.33 µl	
E%	-0.33 %	OK (<= ± 1.20 %)

Imprecision:

s (est.)	0.10 µl	
CV (est.)	0.10 %	OK (<= 0.50 %)

Note: This instrument has been tested according to ISO and NCCLS guidelines.

Test result: PASSED

Operator: [redacted]

Date/Signature: .....

Service and calibration report

Microlab Technologies

Instrument Test Report for [redacted]

[redacted]

Instrument type:	Hamilton ML530B Syr. B 1000 ul	**Test date:**	[redacted]
		Test time:	10:04
Group:	[redacted]	**Due date:**	[redacted]
1st temperature:	22.8 ° C	**Air pressure:**	1024 mbar
2nd temperature:	22.8 ° C	**Liquid density:**	0.99759 g/cm³
Testing volume:	40.00 µl	**Sample size:**	4
Sampling mode:	With blank test(s) / Ordinary sampling	**Z-Value:**	1.003483
Balance:	METTLER TOLEDO AG245 G-Standard 210.00900 g / 1114150400		

e-1)	-0.00023 g / -0.23 µl
1)	0.03982 g / 40.19 µl
2)	0.03966 g / 40.03 µl
3)	0.03952 g / 39.89 µl
4)	0.03949 g / 39.86 µl

Mean temperature:	22.8 ° C		
Mean volume:	39.991 µl	**Range:**	0.33 µl

Inaccuracy:

E	-0.009 µl	
E%	-0.02 %	OK (<= ± 3.00 %)

Imprecision:

s (est.)	0.083 µl	
CV (est.)	0.21 %	OK (<= 1.50 %)

Note: This instrument has been tested according to ISO and NCCLS guidelines.

Test result: PASSED

Operator: [redacted]

Date/Signature: .....

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CALIBRATION CERTIFICATE

Digitron
www.digitron.co.uk

CERTIFICATE SERIAL No LB002729

CUSTOMER MICROLAB TECHNOLOGIES
ORDER REF D97920
INSTRUMENT MODEL 2146T7
SERIAL No 4607115143
INSTRUMENT TYPE DIGITAL THERMOMETER
RANGE -40°C to 120°C
SENSOR TYPE THERMISTOR
SYSTEM ACCURACY : Better than ± 0.5°C over range -20°C to + 70°C. ± 0.8°C elsewhere when used with a Digitron supplied probe.

TEST CONDITIONS

AMBIENT TEMPERATURE 21 °C

	TEST EQUIPMENT	SERIAL No	UKAS Accredited Laboratories Certificate No.
1	2146T NTC	3034	J28463A
2			
3			

CALIBRATION RESULTS*

INPUT TEMPERATURE °C	INSTRUMENT READINGS °C
-35.0	-35.1
-20.0	-20.1
0.0	0.1
20.0	20.0
40.0	40.0
60.0	60.0

* Calibration results for instrument only when used with ideal Digitron thermistor probe. Tolerance ± 0.2°C range 0°C to +70°C

CALIBRATED BY KF DATE 08/08/06

CALIBRATED TO MANUFACTURER'S SPECIFICATION USING CALIBRATED TEST EQUIPMENT

A DIVISION OF SIFAM INSTRUMENTS LIMITED
WOODLAND ROAD TORQUAY DEVON TQ2 7AY ENGLAND TEL: 01803 407693 FAX: 01803 407699

CERTIFICATE OF CALIBRATION

ISSUED BY **DRUCK STANDARDS LABORATORY**

DATE OF ISSUE: 06 March 2006 **CERTIFICATE NUMBER:** 0013689

UKAS CALIBRATION
0221
Group

GE Druck

Druck Ltd
Fir Tree Lane, Groby, Leicester LE6 0FH, England
Tel: +44 (0) 116 231 7107 Fax: +44 (0) 116 231 7277
Email: lab@druck.com
www.druck.com

Approved Signatory
Name: SJ Kerr-Delworth
Signature:

Client:	Microlab Technologies Limited Orchard Lodge Royer Close Hawkwell Essex SS5 4LR
Customer Ref:	ML002
Druck Ref:	RGA 63160
Date Received:	21 February 2006

Item Submitted:	
Manufacturer:	Druck Limited
Model:	DPI 740
Serial No:	74002222
Condition On Arrival:	Repaired prior to calibration

Notes

1) The instrument was serviced prior to calibration,as received results not available.

The United Kingdom Accreditation Service (UKAS) is one of the signatories to the International Laboratory Accreditation Co-operation (ILAC) Arrangement for the mutual recognition of calibration certificates.
The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Program: PS 931 V1.00 using file 15986.rec

Test Equipment Used

Description	Serial Number	Certificate Number
Pressure Balance	50756	E05100475/1

The Calibration was undertaken using the equipment listed above that has maintained traceability to National Standards in accordance with the requirements of UKAS and international standard ISO/IEC 17025.

The readings are the results at the time of calibration only and they do not carry any implication regarding long term stability of the instrument being tested.

Calibration Procedure

1) The instrument was switched on and set up for pressure measurement according to the manufacturer's instructions. The instrument was allowed to stabilise to laboratory conditions for a minimum of 1 hour prior to calibration.
The instrument displays a digital value of applied pressure and was calibrated by applying pressures generated by the equipment listed.
Prior to each calibration the instrument was purged over its calibration range to flush the system with the pressurising medium. It was also pressure cycled, over its calibration range, to exercise the pressure sensor.

2) The pressurising medium was applied to the pressure port of the instrument with the reference level taken as the centre horizontal axis of this port.

3) The SI unit of pressure is the Pascal (Pa). The conversion factor between the Pa and the pressure units used in this calibration are taken from BS350 and are shown on the result pages.

SP

CERTIFICATE OF CALIBRATION

ISSUED BY **DRUCK STANDARDS LABORATORY**

UKAS ACCREDITED CALIBRATION LABORATORY No 0221

Certificate Number 0013689

AS RECEIVED

Calibrated Range: 750 to 1150 mbar absolute
Pressurising Media: Dry Air
Date: 06 March 2006
Environmental Conditions
Barometric Pressure: 1004.3 mBar
Relative Humidity: 43 %
Temperature: 19.8 °C

Applied Pressure mbar	Indicated Reading mbar	Deviation mbar	Expanded Uncertainty ±mbar
750.143	750.15	0.007	0.046
900.153	900.15	-0.003	0.053
950.150	950.15	-0.000	0.056
1000.155	1000.16	0.005	0.058
1049.880	1049.88	0.000	0.061
1150.172	1150.17	-0.002	0.066
1049.877	1049.88	0.003	0.061
1000.148	1000.15	0.002	0.058
950.147	950.15	0.003	0.056
900.152	900.16	0.008	0.053
750.134	750.14	0.006	0.046

The expanded uncertainty column indicates the contributions from the measurement of the generated pressure and the instrument being calibrated.

Notes

1) Conversion factor: 1 mbar = 100 Pa

CERTIFICATE OF CALIBRATION

NWML
NATIONAL WEIGHTS AND MEASURES LABORATORY

Issued By: NWML
Calibration Team
Stanton Avenue, Teddington, Middlesex, TW11 0JZ
Tel: 020 8943 7222 Fax: 020 8943 7270
Internet: www.nwml.gov.uk

Calibration Team Manager: J Pain

UKAS CALIBRATION
0205

Approved Signatories:
J Pain
R.Hynds

Issued under Section 6 of the Weights and Measures Act 1985

Date of issue: 30 June 2006 Certificate number: 06141

Client: Micro Lab Technologies
Crucible House
Endway
Hadleigh
Benfleet
Essex
SS7 2AN

Acceptance date: 29 June 2006

Equipment: 5 g & 1 g weights

Department No: 20301

Description: Both weights are integral cylindrical stainless steel weights

Markings: None.

Calibration method: The weights were compared with the Department's mass standards using Borda's substitution method, the standards being traceable to the national primary standard of mass via the National Physical Laboratory.

Results: The results of the measurements are shown below. The values quoted represent the mass of a hypothetical weight of density 8000 kg m^{-3} at 20 °C which in air of density 1.2 kg m^{-3} would balance the submitted weight.

Nominal Value	Measured Value g	Error from Nominal mg	Uncertainty of Measurement ± mg
5 g	5.000 004	0.004	0.015
1 g	1.000 012	0.012	0.01

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrated by: R. Harper Reference: C1206/0024/1

Date of Calibration: 29 June 2006 Page 1 of 1 page