

Appendix F Water Quality Equipment Calibration Certificate



REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR EARTH WONG	WORK ORDER:	HK1831444
CLIENT:	ACUMEN ENVIRONMENTAL ENG & TECH CO LTD		
ADDRESS:	LOT 11, TAM KON SHAN ROAD, TSING YI (NORTH), N.T. HONG KONG	SUB-BATCH:	0
		LABORATORY:	HONG KONG
		DATE RECEIVED:	25-May-2018
		DATE OF ISSUE:	08-Jun-2018

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen, pH Value, Turbidity, Salinity, Redox Potential and Temperature
Equipment Type:	Multifunctional Meter
Brand Name:	YSI
Model No.:	ProDSS
Serial No.:	15M101091
Equipment No.:	--
Date of Calibration:	25 May, 2018

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr Chan Siu Ming, Vico
Manager - Inorganic

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



WORK ORDER: HK1831444
 SUB-BATCH: 0
 DATE OF ISSUE: 08-Jun-2018
 CLIENT: ACUMEN ENVIRONMENTAL ENG & TECH CO LTD

Equipment Type: Multifunctional Meter
 Brand Name: YSI
 Model No.: ProDSS
 Serial No.: 15M101091
 Equipment No.: --
 Date of Calibration: 25 May, 2018 Date of Next Calibration: 25 August, 2018

PARAMETERS:

Turbidity Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.06	--
4	4.34	+8.5
40	39.04	-2.4
80	80.17	+0.2
400	399.65	-0.1
800	786.96	-1.6
	Tolerance Limit (%)	±10.0

Salinity Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.01	--
10	9.96	-0.4
20	18.78	-6.1
30	28.80	-4.0
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

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WORK ORDER: HK1831444
 SUB-BATCH: 0
 DATE OF ISSUE: 08-Jun-2018
 CLIENT: ACUMEN ENVIRONMENTAL ENG & TECH CO LTD

Equipment Type: Multifunctional Meter
 Brand Name: YSI
 Model No.: ProDSS
 Serial No.: 15M101091
 Equipment No.: --
 Date of Calibration: 25 May, 2018 Date of Next Calibration: 25 August, 2018

PARAMETERS:

Redox Potential Method Ref: APHA (21st edition), 2580B
 Method Ref: Orion Research Instruction Manual and the Laboratory Manual
 the Environmental of Water, Wastewater and Soil (2nd edition), Rump & Krist (1992)

Expected Reading (mV)	Displayed Reading (mV)	Difference of A and B (mV)
Solution A (-234mV)	221.3	
Solution B (-300mV)	293.6	+72.3
	Tolerance Limit (mV)	>66

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical
 Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.5	10.3	+0.8
22.0	21.3	-0.7
39.0	37.6	-1.4
	Tolerance Limit (°C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
 Manager - Inorganic



Thank you for purchasing a Valeport instrument. Every care has been taken to ensure that the instrument has been manufactured to the highest possible standards, and as such it is covered under Valeport’s Warranty Policy as detailed below:

Standard Warranty Policy

The instrument detailed below is supplied with a Limited 3 Year Warranty against defects in materials and workmanship, valid from the date of despatch from Valeport’s premises, with the following exclusions, exceptions and limitations:

- 1) Sensors supplied by other manufacturers (including pressure sensors) are only warranted according to the warranty period provided by the original manufacturer (typically 1 year).
 - 2) Consumable items (including, but not limited to: batteries, o-rings, zinc anodes and electrolytes) are not covered by warranty.
 - 3) Reasonable wear and tear (as judged by Valeport) is not covered by warranty.
 - 4) Valeport Limited shall be under no liability for any consequential loss or damage of any kind whatsoever.
 - 5) Correctly performed standard maintenance procedures as described in the operating manual will not invalidate the warranty. Failures caused by improper care and handling, or by unskilled or poor quality repair and maintenance attempts are not covered under warranty. Modifications to the original design will invalidate the warranty, insofar as it relates to the modified part.
 - 6) All warranty repairs must be performed by Valeport personnel or their authorized representatives.
 - 7) Valeport Limited is the sole judge of the cause of any failure, and the validity of any warranty claim. Please refer to the “Spirit of the Warranty” section below.
- Goods for warranty assessment should be adequately packed (preferably in the original packing) and returned freight pre-paid to Valeport, complete with a description of the nature of the problem. It is preferable that an RMA (Returns Number) is obtained from us in advance, to allow us to schedule the repair.
 - All warranty claims are assessed on a case-by-case basis. You will be informed as soon as possible as to the validity of the warranty claim.
 - In the event of a valid warranty claim, the goods will be repaired or replaced as appropriate at the sole discretion of Valeport Limited. The repaired / replacement instrument will be returned to you at our cost, using our choice of shipping method.
 - In the event of an invalid warranty claim, you will be informed of any repairs that are necessary, and if acceptable, the instrument will be repaired as if it had been returned for service, with appropriate costs and return freight charges payable by you.
 - Any repairs made under warranty shall have no effect on the duration of the warranty period, i.e. the warranty shall continue as if no fault had occurred.
 - Valeport may, at our discretion, opt to despatch a replacement part for fitting in the field, if it is deemed to be the most appropriate response. In such circumstances, the user will be required to return the faulty part to Valeport (at the user’s cost) for assessment and confirmation that the failure is a valid warranty claim. Failure to return the faulty part, or if the fault is subsequently judged to fall outside the terms of the warranty, shall result in the user being invoiced for the replacement part and freight costs.

Spirit of the Warranty

This warranty is offered on the basis that Valeport fully expects the instrument to perform satisfactorily for many years. We have built a reputation on reliability, longevity and quality, and therefore the aim of this warranty is your satisfaction and peace of mind. The “rules” as detailed above are the framework within which we operate our warranty policy, and the minimum that you can expect from us in resolving any warranty issue. However, each case is considered on its own merit, and we may decide that in certain circumstances, alternative arrangements or solutions to a warranty issue are appropriate. Equally, we hope that our customers accept this warranty in the spirit in which it is given, and to respect that whilst our primary concern is always to try and ensure that any issues are resolved as quickly and as satisfactorily as possible, we do also have a responsibility to objectively assess the validity of any warranty claim, and to consider the interests of Valeport Limited in any actions taken.

Matthew Quartley
Managing Director

Instrument Type.....106CM
Serial Number(s).....65621
Pressure Test.....50Bar
Date of Despatch.....11/06/2018

Valeport Limited | St. Peter’s Quay | Totnes | Devon | TQ9 5EW UK
+44 (0) 1803 869292 | sales@valeport.co.uk | www.valeport.co.uk



VALEPORT LTD.
COMPASS TEST REPORT

Type Number: 104/105 Series Date: 08-06-2018 Time: 11:43:30
 Fluxgate S/N: 138775
 ADC Board S/N: 139371
 Micro Board S/N: 144340

TEST	VALUE	LO-LIMIT	HI-LIMIT	RESULT
X axis offset (counts)	+127.540	+113.000	+143.000	PASS
Y axis offset (counts)	+125.900	+113.000	+143.000	PASS
X axis scale factor (counts/40uT)	+88.540	+85.000	+115.000	PASS
Y axis scale factor (counts/40uT)	+87.470	+85.000	+115.000	PASS
X axis heading error (degs.)	+0.000	-3.000	+3.000	PASS
Y axis heading error (degs.)	+0.000	-3.000	+3.000	PASS
X axis gimbale error (degs.)	-0.184	-2.000	+2.000	PASS
Y axis gimbale error (degs.)	+0.010	-2.000	+2.000	PASS
X,Y orthogonality error (degs.)	+0.000	-2.000	+2.000	PASS
Maximum compass swing error (degs.)	-1.350	-3.000	+3.000	PASS

Number of tests: 10
 Tests passed: 10
 Tests failed: 0

** PASSED ** PASSED ** PASSED **

CALIBRATION COEIFFS:-

A (X sf): +1.1294E+00 B (X os): +1.2754E+02 C (X pt): -2.8581E-02
 D (Y sf): +1.1432E+00 E (Y os): +1.2590E+02 F (Y pt): +5.6415E-02
 G (X os change wrt gain): -5.4000E-01
 H (Y os change wrt gain): -1.1940E+01

COMPASS SWING RESULTS - DEGREES (U.K. LATITUDE)

HEADING	COMPASS OUTPUT	COMPASS ERROR
0	359.1	-0.9
15	13.6	-1.4
30	28.8	-1.2
45	44.0	-1.0
60	59.4	-0.6
75	74.4	-0.6
90	89.9	-0.1
105	105.0	-0.0
120	120.2	+0.2
135	135.1	+0.1
150	150.4	+0.4
165	165.3	+0.3
180	180.5	+0.5
195	195.9	+0.9
210	211.1	+1.1
225	226.2	+1.2
240	241.2	+1.2
255	256.2	+1.2
270	270.5	+0.5
285	285.7	+0.7
300	300.2	+0.2
315	314.8	-0.2
330	329.6	-0.4
345	343.9	-1.1
360	359.1	-0.9

VALEPORT LTD.
COMPASS SWING REPORT

Type Number: 104/105 Series
Serial Number: 138775
Report Date: 08-06-2018
Report Time: 12:03:35

HORIZONTAL FIELD: 38 uT
VERTICAL FIELD: 24 uT
MAXIMUM ERROR: 0.2 DEGREES

COMPASS SWING RESULTS - DEGREES

HEADING	COMPASS OUTPUT	COMPASS ERROR
0	0.0	+0.0
15	15.0	-0.0
30	30.1	+0.1
45	45.2	+0.2
60	59.9	-0.1
75	75.1	+0.1
90	90.1	+0.1
105	104.9	-0.1
120	119.8	-0.2
135	135.1	+0.1
150	150.0	+0.0
165	165.1	+0.1
180	180.1	+0.1
195	195.0	+0.0
210	210.1	+0.1
225	225.1	+0.1
240	239.9	-0.1
255	255.1	+0.1
270	269.9	-0.1
285	284.9	-0.1
300	299.8	-0.2
315	315.1	+0.1
330	330.0	+0.0
345	345.0	+0.0
360	0.0	+0.0



This document certifies that the instrument detailed below has been calibrated according to Valeport Limited's Standard Procedures, using equipment with calibrations traceable to UKAS or National Standards.

Calibration Certificate Number: 54273

Instrument Type: 106CM

Instrument Serial Number: 65621

Calibrated By: P.HARRINGTON

Date: 11/06/2018

Signed:

A handwritten signature in blue ink, appearing to be 'P.H.', is written over the 'Signed:' label.

Full details of the results from the calibration procedure applied to each fitted sensor are available, on request, via email. This summary certificate should be kept with the instrument.



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