



Calibration Certificate Number:

24905

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

Instrument Type:	MIDAS SVP
Instrument Serial Number:	31665
Calibrated By:	J Harper
Date:	14/01/2010
Signed:	

Full details of the results from the calibration procedure applied to each fitted sensor are available in separate documents. This summary certificate should be kept with the instrument.

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Calibration History:	Certificate	Date
	24905	14/01/2010

Calibrations for each sensor/PCB are on separate sheets, with filenames defined by the sensor serial number

Sensor Calibration Record

KELLER PRESSURE

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PCB	
Serial no.	45341
Part no.	400507F
Firmware	4007116L
Module	21

Pressure sensor			
Type	Keller PAA-10LX		
Serial no.	42657		
Tx Range	3000	dBar/abs	
Set Tx Range	3000	dBar/abs	

Calibration Equipment used			
Instrument	Type	Serial No	
DWT	Budenburg	580DXA28894/162K/AS640	
Barometer	Fortin Model 54	4042	

Stage 1: Determine Local pressure conditions

Air temperature	21.0	°C
Grid reference (OSGB36)	280657 East, 059840 North	
Height above sea level	5	metres
Local Gravity	9.81125	M/sec²
Gravity std for barometer	9.80665	M/sec²
Atmospheric pressure	770.400	mmHg
	10.2408	dBar

Stage 2: Observe Raw Data

Nominal Deadweight	List weights applied	Deadweight pressure	Atmospheric Pressure	Total pressure	Raw Output	Pressure Error (Measured - Actual)	Acceptable Error	Pass/Fail		
dBar	(e.g. abfgk)	dBar	dBar	dBar	Pascals dBar Equivalent	dBar %FS				
0		0.0000	10.241	10.241	101806	10.181	-0.060	-0.002	±0.01	Pass
600	ah	600.2797	10.241	610.521	6101367	610.137	-0.384	-0.013	±0.01	Fail
1200	abk	1200.5658	10.241	1210.807	12105646	1210.565	-0.242	-0.008	±0.01	Pass
1800	abhki	1800.8430	10.241	1811.084	18110620	1811.062	-0.022	-0.001	±0.01	Pass
2400	abckj	2401.1184	10.241	2411.359	24117488	2411.749	0.390	0.013	±0.01	Fail
3000	abcd	3001.3667	10.241	3011.608	30121367	3012.137	0.529	0.018	±0.01	Fail

The sensor is out of specification. We recommend at least a Straight Line calibration. Select required fit from the drop down menu.

Fit Applied: 2nd Order Polynomial

Stage 3: Enter Calibration Data

#024;2;1;1;15;0.000000E+00;0.000000E+00;-1.680858E-15;1.000247E-04;1.523166E-01

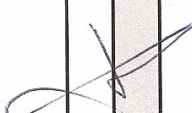
Gain & Offset:

#035;2;1;1;10000;0

Ensure that User calibration is OFF (#020;2;1;1;<space>) or set to linear fit (#022;2;1;1;15;0;0;0;0;1;0)

Stage 4: Post Calibration Check

Nominal Deadweight	List weights applied	Deadweight pressure	Atmospheric Pressure	Total pressure	Sensor Output	Pressure Error (Measured - Actual)	Acceptable Error	Pass/Fail
dBar	(e.g. abfkg)	dBar	dBar	dBar	dBar	dBar	%FS	
0		0.0000	10.241	10.241	10.417	0.176	0.006	±0.01 Pass
600	ah	600.2797	10.241	610.521	610.472	-0.049	-0.002	±0.01 Pass
1200	abk	1200.5658	10.241	1210.807	1210.856	0.049	0.002	±0.01 Pass
1800	abhki	1800.8430	10.241	1811.084	1811.152	0.068	0.002	±0.01 Pass
2400	abckj	2401.1184	10.241	2411.359	2411.543	0.184	0.006	±0.01 Pass
3000	abcd	3001.3667	10.241	3011.608	3011.579	-0.029	-0.001	±0.01 Pass

Name	J.HARPER
Date	18.01.10
Signed	

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Calibrated to Valeport's procedures using test equipment with calibrations traceable to NIMAS or national standards

21/01/2010 11:25

Sensor Calibration Record

TEMPERATURE

Valeport Ltd

PCB	Serial no.	45341
	Part no.	400507F
	Firmware	4007116L
	Thermistor Type	DS18B20
	Module	21

Temperature sensor	
Type	PRT
Serial no.	2751

Calibration Equipment used		
Instrument	Type	Serial No
Temp Bridge	MICRO K	270393
PRT	909L	36

PCB internal temperature calibration

Stage 1: Obtain PCB temperature calibration data

PCB therm reading.	
% C [Internal]	Output counts
4	41372
14	41371
35	41370

Best fit slope	-0.062	Gain =	6.192
Best fit intercept	41372.09387	Offset =	-92.876

Normalised counts [20] counts	Reading counts	Temperature °C
41370.856	41371.000	35

Stage 2: Enter calibration string: #085;2;15;-93

PCB/Sensor calibration

Stage 1: Obtain Calibration data and Polynomial fit

Counts		Bath temp		Polynomial fit for raw data		Polynomial calculations		Acceptable Error	
mm		°C [90]		Order >>>>	Parameter	Value	Calc Temp °C [90]	Error [Calc - Actual] °C [90]	Pass/Fail
24483		2.115		a0	-2.193944E+01		2.115	0.000	Pass
47730		25.113		a1	9.790295E-04		25.113	0.000	Pass
57561		34.885		a2	1.420722E-10		34.885	0.000	Pass

Enter polynomial in cell E28

$$y = 1.420722E-10x^2 + 9.790295E-04x - 2.193944E+01$$

Stage 2: Enter calibration string:

#024;2;15;1;0;0;1.420722E-10;9.790295E-04;-2.193944E+01

Stage 3: Enter System Gain & Offset

#035;2;1;2;1000;-20000

Stage 4: Post Calibration Check

Reading	Bath temp	Error [Reading - Actual]	Acceptable Error	Pass/Fail
°C [90]	°C [90]	°C [90]	±0.005	
34.884	34.886	-0.002	±0.005	Pass

Name	J.HARPER
Date	05.01.10
Signed	

453411.xls

Calibrated to Valeport's procedures using test equipment with calibrations traceable to NAMAS or national standards

14/01/2010 10:47

Sensor Calibration Record

Sound Velocity

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Instrument Serial Number	31665
Transducer Type, mm	100
Transducer Ser No	48274
PCB Part No	0400564A
PCB Ser No	46621
SV Firmware Version	4007149B0
Module Number	12

Calibration Equipment used		
Instrument	Type	Serial No
Temp Bridge	MICRO K	270933
PRT	900L	15

Stage 1: First order fit

Temp	SOS from Bilanuk & Wong m/s	Measured ToF nsec*100	Coefficients	Calc SOS from coefficients m/s	Error (Calc - True) m/s	Acceptable Error m/s	Pass/Fail
°C90							
2.1166	1412.794	14346264	2.078850E+05	1412.795	0.000	±0.001	Pass
15.7932	1468.692	13808161	5.006352E+06	1468.693	0.000	±0.001	Pass

Stage 2: Enter calibration string

#02412.115:0.00.0.5.006352E+06;2.078850E+05

Stage 3: Check point

Temp	Actual SOS m/s	Measured SOS m/s	Error SOS Reading- Actual m/s	Acceptable Error m/s	Pass/Fail
°C90					
15.7938	1468.695	1468.696	0.000	±0.005	Pass

Name:	J.HARPER
Date:	13/01/2010
Signature:	

46621sv100113.xls

Calibrated to Valeport's procedures using test equipment with calibrations traceable to NAMAS or national standards

14/01/2010 10:48



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.

M. Quartley

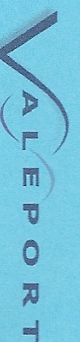
Matthew Quartley
Managing Director

Instrument Type *Midas SVP*
Serial Number(s) *31665*
Date of Despatch *22/01/10*

Valeport Limited, St. Peter's Quay, Totnes, Devon, TQ9 5EW, U.K.
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E-mail: sales@valeport.co.uk Web: www.valeport.co.uk

VAT No: GB 430 4453 84 Registered in England No: 1950444

Instrument Test Certificate



Valeport Contract Number:

5523

System Description:

Tidar SVP

Main Serial Number:

31665

Item	Serial Number	Assembly Completed		Service Completed		Calibration Completed		Functionality Test Completed		Pressure Test Completed		Immersion Test Completed		Post Immersion Functionality Test Completed	
		Init:	Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:	Date:
Tidar SVP	31665	PT	13/01/10	✓		274	14/01/10	PT	20/01/10	PT	21/01/10	✓		PT	21/01/10
		Init:	Date:	Init:	Date:	Certificate number 24905		Init:	Date:	Init:	Date:	Init:	Date:	Init:	Date:
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This document certifies that, where indicated above, the specified instrument and accessory items have undergone assembly, service, calibration and test procedures according to Valeport Limited's standard procedural documentation, and are declared ready for shipment.

Signed:

Contract Controller

Date:

22/01/10