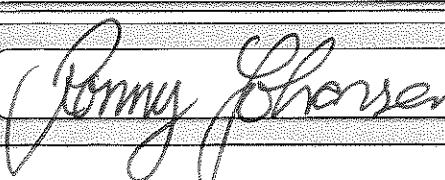


## Contents of the shipping box

Nortek order no:	41472-1-772		 Vangkroken 2 N-1361 RØA Norway Tel: +47 6717 4500 Fax: +47 6713 6770 Inquiry@nortek-as.com www.nortek.no		
Type of system:	SIGNATURE 100				
<b>Instrument type:</b>	<input type="checkbox"/> Aquadopp <input type="checkbox"/> Aquadopp 6000m <input type="checkbox"/> Vector <input type="checkbox"/> Signature55 <input type="checkbox"/> Signature1000 <input type="checkbox"/> Aquadopp profiler <input type="checkbox"/> AWAC <input type="checkbox"/> Vectrino <input type="checkbox"/> Signature250 <input type="checkbox"/> NortekDVL <input type="checkbox"/> Aquadopp 3000m <input type="checkbox"/> VM AWAC <input type="checkbox"/> Vectrino profiler <input type="checkbox"/> Signature500				
Software version:	SIGNATURE DEPLOYMENT	Firmware version:	14.4704.2206.14/165		
Other:					
<b>Cable:</b>	<input checked="" type="checkbox"/> 10m length <input type="checkbox"/> Other: _____				
<b>Connector:</b>	<input type="checkbox"/> 8-pin Inline <input type="checkbox"/> 12-pin UW <input checked="" type="checkbox"/> 6-pin Inline <input type="checkbox"/> 7-pin Souriau <input type="checkbox"/> Other: _____				
<b>Communication:</b>	<input type="checkbox"/> RS232 <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> RS422 <input type="checkbox"/> Other: _____				
<b>Options:</b>	<input type="checkbox"/> Analog input <input type="checkbox"/> Synch <input type="checkbox"/> Analog output <input type="checkbox"/> Other: _____				
<b>Battery cannister:</b>	<input type="checkbox"/> Paradopp battery cannister <input type="checkbox"/> Single battery aluminium cannister <input type="checkbox"/> Double battery aluminium cannister				
<b>Battery cables:</b>	<input type="checkbox"/> 2pin Inline-2pin <input type="checkbox"/> 8pin Inline-2pin <input type="checkbox"/> 8pin rectangular-2pin				
<b>Accessories:</b>	<input checked="" type="checkbox"/> Toolkit <input checked="" type="checkbox"/> Quick guide <input type="checkbox"/> Warranty card <input checked="" type="checkbox"/> Final test checklist <input type="checkbox"/> Seeding material <input type="checkbox"/> USB to serial converter RS232 <input type="checkbox"/> Altronix AL310 USB driver <input type="checkbox"/> Recorder kit/ProLog <input type="checkbox"/> Battery harness for 2 batteries				
<b>Batteries:</b>	<input type="checkbox"/> Alkaline 50Wh <span style="float: right;">13.5V</span> <input type="checkbox"/> Alkaline 100Wh <span style="float: right;">13.5V</span> <input type="checkbox"/> Alkaline 540Wh <span style="float: right;">13.5V</span> <input type="checkbox"/> Alkaline 540Wh <span style="float: right;">18V</span> <input type="checkbox"/> Alkaline 90Wh <span style="float: right;">15V (Signature100)</span> <input type="checkbox"/> Alkaline 180Wh <span style="float: right;">18V (Signature500)</span>		<b>Extra set:</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<b>AC/DC Power supply</b>	<input type="checkbox"/> 15V standard <input type="checkbox"/> 48V Signature55 <input type="checkbox"/> 24V Vectrino <input checked="" type="checkbox"/> 24V DC/DC & Signature <input type="checkbox"/> EU <input type="checkbox"/> UK <input checked="" type="checkbox"/> US				
<b>Other:</b>					
Date:	07.09.2018.		Responsible:		
NQM 03-080-10					



# Final test checklist AD2CP

Order number:  
41472-1-773

Name: *Signature 100*  
 Instrument serial number: *101132*  
 Frequency: *100KHz* Main board: *AD2CP-1252*  
 Firmware versions: *1.4.4704.2206-14/165*



Label checked <input checked="" type="checkbox"/> OK	Comments:
Dock test <input checked="" type="checkbox"/> OK	
Baudrate 115200 <input checked="" type="checkbox"/> OK	

Tilt check	Clock <input checked="" type="checkbox"/> Set clock	Pressure  Psensortemp <input checked="" type="checkbox"/> OK tolerance: +/- 0.1 % of <i>1500</i> m	Temperature <input checked="" type="checkbox"/> OK tolerance: +/- 0.1 °
<input checked="" type="checkbox"/> Pitch up <input checked="" type="checkbox"/> Roll up <input checked="" type="checkbox"/> Status bit <input checked="" type="checkbox"/> Pitch down <input checked="" type="checkbox"/> Roll down  pitch & roll within +/- 0.2 °	<b>Heading</b> <input checked="" type="checkbox"/> Up <input checked="" type="checkbox"/> Down  tolerance: +/- 2 °		

Beam check	Velocity direction <i>To heavy to Verify Matrix Correct.</i>																															
<table border="1"> <thead> <tr> <th>Correct order</th> <th>Beam Imp</th> <th>Noise floor</th> <th>Amplitude in tank</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>Beam 1 <input checked="" type="checkbox"/> OK</td> <td><i>84</i> Ω</td> <td><i>25</i> dB</td> <td><i>&gt; 80</i> dB</td> <td><input checked="" type="checkbox"/> OK</td> </tr> <tr> <td>Beam 2 <input checked="" type="checkbox"/> OK</td> <td><i>71</i> Ω</td> <td><i>25</i> dB</td> <td><i>&gt; 80</i> dB</td> <td><input checked="" type="checkbox"/> OK</td> </tr> <tr> <td>Beam 3 <input checked="" type="checkbox"/> OK</td> <td><i>68</i> Ω</td> <td><i>25</i> dB</td> <td><i>&gt; 80</i> dB</td> <td><input checked="" type="checkbox"/> OK</td> </tr> <tr> <td>Beam 4 <input checked="" type="checkbox"/> OK</td> <td><i>69</i> Ω</td> <td><i>25</i> dB</td> <td><i>&gt; 80</i> dB</td> <td><input checked="" type="checkbox"/> OK</td> </tr> <tr> <td>Beam 5 <input checked="" type="checkbox"/> OK</td> <td><i>568</i> Ω</td> <td><i>25</i> dB</td> <td><i>&gt; 80</i> dB</td> <td><input checked="" type="checkbox"/> OK</td> </tr> </tbody> </table>	Correct order	Beam Imp	Noise floor	Amplitude in tank	Range	Beam 1 <input checked="" type="checkbox"/> OK	<i>84</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK	Beam 2 <input checked="" type="checkbox"/> OK	<i>71</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK	Beam 3 <input checked="" type="checkbox"/> OK	<i>68</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK	Beam 4 <input checked="" type="checkbox"/> OK	<i>69</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK	Beam 5 <input checked="" type="checkbox"/> OK	<i>568</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK	XYZ coordinate system X <input type="checkbox"/> OK Y <input type="checkbox"/> OK Z <input type="checkbox"/> OK Z <sub>2</sub> <input type="checkbox"/> OK	E <input type="checkbox"/> OK N <input type="checkbox"/> OK U <input type="checkbox"/> OK U <sub>2</sub> <input type="checkbox"/> OK
Correct order	Beam Imp	Noise floor	Amplitude in tank	Range																												
Beam 1 <input checked="" type="checkbox"/> OK	<i>84</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK																												
Beam 2 <input checked="" type="checkbox"/> OK	<i>71</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK																												
Beam 3 <input checked="" type="checkbox"/> OK	<i>68</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK																												
Beam 4 <input checked="" type="checkbox"/> OK	<i>69</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK																												
Beam 5 <input checked="" type="checkbox"/> OK	<i>568</i> Ω	<i>25</i> dB	<i>&gt; 80</i> dB	<input checked="" type="checkbox"/> OK																												

Head file	Serial communication	Recorder erased
<input checked="" type="checkbox"/> Headfile checked <input checked="" type="checkbox"/> Saved as read only	RS422 RS232	<input checked="" type="checkbox"/> OK Rec size: <i>128GB</i>

Ethernet	DHCP enabled <input checked="" type="checkbox"/>
MAC address: <i>8C:68:78:00:04:E4</i>	FTP OK <input checked="" type="checkbox"/>
Static IP address:	
Set host name: <i>101132</i>	

Licenses						
Averaging mode <input checked="" type="checkbox"/>	Wave mode <input type="checkbox"/>	Vertical velocity <input type="checkbox"/>	64GB recorder <input type="checkbox"/>	Calibration license erased <input checked="" type="checkbox"/>		
Burst Five beams <input type="checkbox"/>	Echo Sounder <input checked="" type="checkbox"/>	Dual frequency low <input type="checkbox"/>	128GB recorder <input checked="" type="checkbox"/>	Production license erased <input checked="" type="checkbox"/>		
Bottom track <input type="checkbox"/>	Ice Measurement <input type="checkbox"/>	Dual frequency high <input type="checkbox"/>	256GB recorder <input type="checkbox"/>	Default configuration set <input checked="" type="checkbox"/>		
High Resolution <input type="checkbox"/>	Altimeter <input type="checkbox"/>	16GB recorder <input type="checkbox"/>				

Cable/Harness	Electrical isolation test	External sensors
Communication <input checked="" type="checkbox"/> Battery <input type="checkbox"/>	Harness <input checked="" type="checkbox"/> 50V Ok <input checked="" type="checkbox"/>	

Power down	Date	Signature
<input checked="" type="checkbox"/> OK	Day <i>7</i> Month <i>9</i> Year <i>18</i>	<i>Bjørn Nærum</i> Signature





# Certificate of Calibrations and Tests

Page 1 of 3

## Instrument Information

<b>Customer Reference No.</b>	41472-1-773
<b>Instrument Type</b>	Signature100
<b>Instrument Frequency</b>	100 kHz
<b>Instrument S/N</b>	101132
<b>Head S/N</b>	D-1132
<b>Interface Board S/N</b>	1252
<b>Interface Board Mfr. S/N</b>	4MO0476290007
<b>Digital Board Mfr. S/N</b>	4MO0344030020
<b>Analog Board Mfr. S/N</b>	
<b>Analog Board #2 Mfr. S/N</b>	
<b>Sensor Board Mfr. S/N</b>	4MO0319780037
<b>Interface Board Rev.</b>	H-1(High-Power)
<b>Digital Board Rev.</b>	I-3
<b>Analog Board Rev.</b>	B-0(High-Power Echo)
<b>Analog Board #2 Rev.</b>	
<b>Sensor Board Rev.</b>	I-0

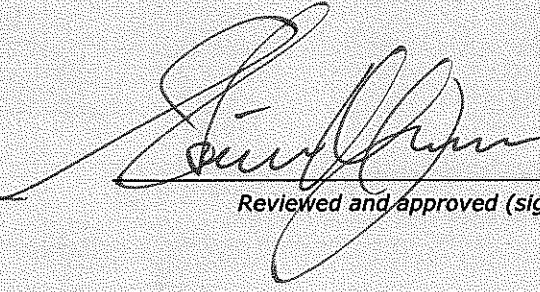
## Calibrations and tests performed

<b>Pressure</b>	Passed
<b>Tilt and Compass</b>	Passed

All the tested values are within Nortek AS specifications

September 3, 2018

Date

  
Reviewed and approved (sign.)





# Pressure Report

Page 2 of 3

## Details

Instrument Type	Signature100
Instrument S/N	101132
Pressure Range	1500 dBar
Date	August 31, 2018
Operator	Daniel Røyert
Location	Nortek Factory Norway
Result	Passed

## Description

Verification is performed in an automated pressure chamber. Fixed-point measurements are collected to verify the sensor.

Criteria of acceptance is  $\pm 0.1\%$  of full scale.

Reference: Telemark Technologies - Vessel Pressure Sensor Inlet.

## Verification Results

Reference (dBar)	Pressure Diff. (dBar)	Pressure Diff. (% of FS)
331.67	-1.32	-0.09
627.63	-0.87	-0.06
922.02	-0.82	-0.05
1222.91	0.46	0.03
1517.20	1.32	0.09





# Tilt and Compass Report

Page 3 of 3

## Details

Instrument Type	Signature100
Instrument S/N	101132
Date	August 28, 2018
Operator	Asle Martinsen
Location	Nortek Factory Norway
Result	Passed

## Description

Calibration and verification is performed in a two axis automated jig. Continuous and fixed-point measurements are collected to calibrate and verify the sensor.

Criteria of acceptance for tilt sensor is  $\pm 0.2^\circ$ .

Criteria of acceptance for compass sensor is  $\pm 2^\circ$ .

Reference: Digital Protractor Series 950 Pro 3600. Accuracy  $\pm 0.05^\circ$ .

## Tilt Verification Results

Reference ( $^\circ$ )	Diff. Up		Diff. Down	
	Pitch ( $^\circ$ )	Roll ( $^\circ$ )	Pitch ( $^\circ$ )	Roll ( $^\circ$ )
-30.00	-0.16	-0.07	-0.16	0.11
-15.00	0.00	-0.04	0.03	-0.08
0.00	0.17	-0.03	0.17	-0.07
15.00	-0.17	0.06	-0.17	0.11
30.00	-0.04	-0.10	0.03	0.00

## Compass Verification Results

Reference ( $^\circ$ )	Heading Diff. Up ( $^\circ$ )	Heading Diff. Down ( $^\circ$ )
0.00	0.36	0.48
45.00	0.07	-0.23
90.00	-0.09	-0.58
135.00	-0.06	-0.33
180.00	0.05	0.28
225.00	0.29	1.19
270.00	0.59	1.34
315.00	0.24	1.16

