AANDERAA a xylem brand

TEST & SPECIFICATIONS

Form No. 847, Oct 2014

Product: SeaGuard II 5650 SW
Serial No: 2806

Component	Serial No.	Remarks
Main Assembly SeaGuard II 5655	3918	
HV HUB SeaGuard II Rev.D	202500005	
Doppler Current Sensor 4420	1934	
Pressure Sensor 4117B	2536	
Oxygen Optode 4330W	4681	

1. Visual and Mechanical Checks

1.1. Sensors fixed in correct position
1.2. Watertight receptacle and plugs connected
1.3. HUB connectors connected to main board
1.4. Pressure sensor filled with oil (only if installed)
1.5. Epoxy coating intact
1.6. Zinc anode installed
1.7. O-ring groove inspected, cleaned and greased

2. Pre-performance Setup

2.1. Hardware and sensors configured
2.2. Sensors detected and displayed in Real-Time Collector
2.3. Analog channels configured if used
2.4. Battery indicator calibrated
2.5. SD card operation
2.6. S-Flash operation
2.7. USB Connection to PC
2.8. Clock adjusted to correct UTC
2.9. Analog switch in correct position

3. Performance test

3.1. Current drain idle (max 30 mA) 14.9 mA
3.2. Current drain in Power Down Mode (max 1.4 mA) 0.72 mA
3.3. Pressure test
3.4. Field test and data analysis
3.5. Operation test, -5°C to +35°C (all sensors, 16 hours, data on SD)

Windows CE License-Key : 02219-164-824-051

Date: 06 Nov 2025

Sign:

Yngve Instefjord

Yngve Instefjord, Production Engineer

AANDERAA a xylem brand

TEST & SPECIFICATIONS

Form No. 728, Oct 2007

Product: SeaGuard II 5650 SW
Serial No: 2806

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1. Final Check prior to Shipment: (point 1.1 – 1.10 depending on sensors installed)

1.1. Doppler Current Sensor is tested with Test Unit 3731
1.2. Temperature readings correspond to room temperature
1.3. Conductivity Sensor reads correct with seawater loop
1.4. Check that the pressure sensor is oil filled
1.5. Pressure Sensor gives correct reading at air pressure
1.6. Turbidity reading increases when a reflector is placed 20cm in front of it
1.7. The oxygen sensor reads maximum in air
1.8. Inspect O-ring groove and clean and grease O-ring
1.9. Battery in lower slot,
   a) Type:
   b) Open loop voltage: V
   c) Voltage with 100 ohms load: V
1.10. Battery in upper slot,
   d) Type:
   e) Open loop voltage: V
   f) Voltage with 100 ohms load: V

Date: 06 Nov 2025

Sign:

Yngve Instefjord

Yngve Instefjord, Production Engineer

AANDERAA a xylem brand

PRESSURE CERTIFICATE

Form No. 667, Sept 2009

Product: SeaGuard II 5650 SW
Serial No: 2806
Date: 24.10.2025

Certificate No: 2475213072806

This is to certify that this product has been pressure tested with the following instrument, and we confirm that no irregularities were found during the test:

Autoklav 800 bar – sn: 0210005

Pressure readings:

Pressure (Bar)	Pressure time (hour)
30	1

Date: 30 Oct 2025

Sign:

Yngve Instefjord

Yngve Instefjord, Production Engineer

AANDERAA a xylem brand

TEST & SPECIFICATIONS

Form No. 848, Oct 2014

Product Name: Main Assembly SeaGuard II 5655 **Serial No:** 3918

Main Board Seaguard 9341 Serial No: 3918
Panel Board 9754 Serial No: 20250001

Mainboard
Main Board tested according to *Seaguard test main board 9341.xls*

1. Visual component check prior to assembly in covers

2. Initial hardware test after bootloader and image loaded and test display

2.1 Current drain after bootloader start-up (max 70mA)..... 24.00mA
2.2 Current drain with image loaded (max 130mA)..... 78.60mA
2.3 Voltage 3.3V (3.3V ± 0.1V)..... 3.30V
2.4 Voltage 1.25V (1.25V ± 0.13V)..... 1.27V
2.5 Check that the SD card is detected and found
2.6 Check that the S-Flash is present

3. Hardware test with covers

3.1 Current drain with image loaded (max 130mA)..... 78.60mA
3.2 Voltage 3.3V (3.3V ± 0.1V)..... 3.30V
3.3 Check that the SD card is detected and found
3.4 Check that the S-Flash is present
3.5 Check that the USB port is working

Main assembly with Main Board and Panel Board
Main assembly tested according to form *SeaGuard II test main assembly.xls*

4. Seaguard Main assembly test

4.1 Current drain with Panel Board connected (max 50mA)..... 14.1mA
4.2 Current drain in Sleep Mode (max 350µA)..... 317.0µA
4.3 Clock setting (check new clock setting after switching power on)
4.4 Battery setting (check battery setting after power off)
4.5 Compact flash storage
4.6 SD card storage
4.7 USB connection to PC
4.8 RS422 connection to PC
4.9 Status LEDs
4.10 Power spec test
4.11 Temperature test
4.12 Sensor setup test
4.13 Data collection test

Date: 06 Nov 2025 Sign:

Yngve Instefjord

Yngve Instefjord, Production Engineer

AANDERAA a xylem brand

TEST & SPECIFICATIONS

Form No. 846, Oct 2014

Product Name: HV HUB SeaGuard II Rev.D **Serial No:** 202500005

1. Visual component check prior to test

2. Hardware test

2.1	Output Voltage @12V input, no load (12.0V ± 0.2V)	12.0V
2.2	Current drain @12V input, no load (300µA ± 100µA)	322.0µA
2.3	Output Voltage @12V input, 8 ohm load, start (11.8V ± 0.2V)	11.8V
2.4	Output Voltage @12V input, 8 ohm load, after 1 min. (11.8V ± 0.3V)	11.8V
2.5	Output Voltage @24V input, no load (12.0V ± 0.2V)	12.0V

Date: 30 Sep 2025

Sign:

Yngve Instefjord

Yngve Instefjord, Production Engineer

AANDERAA a xylem brand

TEST & SPECIFICATIONS

Form No. 768, Jun 2008

Product: Doppler Current Sensor 4420
Serial No: 1934

Digital Board

1. Tested according to Test Procedure Form 754.

Analog Board

2. Tested according to Test Procedure Form 757.

Complete Sensor

3. Tested according to Test Procedure Form 759.

Performance test and results from Test Procedure Form 759

4. Visual Check

- 4.1. Inspection of o-ring grove.
- 4.2. Pressure tested.
- 4.3. Electrical isolation to flange after pressure test (only 4520).
- 4.4. Communication tested (AiCaP, Rs-232/Rs-422).

5. Current Consumption

5.1.	Quiescent, no ping (maximum 265 µA)	151.00µA
5.2.	Total with one ping each second (maximum 15.5 mA)	15.10mA

6. Compass and Tilt sensor

- 6.1. Compass calibrated and verified to be within ±2.0° at 0° tilt and ±3.5° at 30° tilt.

7. Tilt Compensation

- 7.1. Tilt sensor calibrated and verified to be within ±1.0° in the range from +35° to -35° on both axes.

8. Performance test

- 8.1. The sensor is tested with Test Unit 3731 during climatic tests to control sensor performance over the whole temperature range.
- 8.2 The direction data is also controlled by changing the direction of the Test Unit 3731.

Date: 17 Oct 2025

Sign:

André Herfindal

Andrè Herfindal, Production Engineer

AANDERAA a xylem brand

PRESSURE CERTIFICATE

Form No. 667, Sept 2009

Product: Doppler Current Sensor 4420
Serial No: 1934
Date: 24.10.2025

Certificate No: 2475221631934

This is to certify that this product has been pressure tested with the following instrument, and we confirm that no irregularities were found during the test:

Autoklav 800 bar – sn: 0210005

Pressure readings:

Pressure (Bar)	Pressure time (hour)
30	1

Date: 30 Oct 2025

Sign:

Yngve Instefjord

Yngve Instefjord, Production Engineer

AANDERAA a xylem brand

TEST & SPECIFICATIONS

Form No. 764, February 2021

Product: Pressure Sensor 4117B
Serial No: 2536
Program Version: 8.4.1

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1 **Visual and Mechanical Checks**:

1.1. Soldering quality	☑
1.2. Visual surface	☑
1.3. Galvanic isolation between housing and electronics	☑

2 **Voltages and Current Drain performance**:

2.1. DSP IO voltage, Tp3 (3.3±0.07V)	3.29	V
2.2. DSP core voltage, Tp2 (1.9±0.04V)	1.90	V
2.3. Analog voltage, Tp7 (3.3±0.15V)	3.30	V
2.4. RS232 Average current at 0.5Hz (Max: 6mA)	2.3	mA
2.5. RS232 Peak current (Max: 50mA)	32	mA
2.6. RS232 Sleep current (Max: 200µA)	161	µA
2.7. AiCaP Average current at 0.5Hz (Max: 6mA)	2.2	mA
2.8. AiCaP Peak current (Max: 50mA)	16	mA
2.9. AiCaP Sleep current (Max: 200µA)	127	µA
2.10. RS422 Average current at 0.5Hz (Max: 7mA)	N/A	mA
2.11. RS422 Peak current (Max: 50mA)	N/A	mA
2.12. RS422 Sleep current (Max: 1500µA)	N/A	µA

3 **Electronic performance test:**:

3.1. Raw data pressure reading at air pressure (-500000 to +1000000)	2437	LSB
3.2. Raw data temp. reading in room temperature (6500000 to 10000000)	8106451	LSB
3.3. Noise on pressure raw data (Max: 400LSB)	11	LSB
3.4. Noise on temperature raw data (Max: 5000 LSB)	329	LSB

Date: 09 Oct 2025

Sign:

Andrine Dale Raknes

Andrine Raknes, Production Engineer

AANDERAA a xylem brand

CALIBRATION CERTIFICATE

Certificate No:4117B_2536_45951
Range: 0-4000

Product: Pressure Sensor 4117B
Serial No: 2536
Calibration Date: 21 Oct 2025

This is to certify that this product has been calibrated using the following instruments:

JULABO Calibration Bath model 1001F	Serial: 10736614
Pressure Controller Fluke 6270A	Serial: 6496002
ASL Precision Thermometer model CTR2000	Serial: 056784-01

Parameter: Temperature

Calibration points and readings:

Temperature (°C)	1.16	14.17	27.19	40.20
Reading (LSB)	11847552.52	9700144.21	7533649.92	5614958.65

Giving these coefficients

Index	0	1	2	3
TempCoef	2.19409E01	-5.04662E01	8.07732E00	-1.92104E01

Parameter: Pressure

Giving these coefficients

Index	0	1	2	3
R1Coef0	9.58398E01	2.37884E01	-6.26466E-01	9.93227E00
R1Coef1	1.11411E04	-1.25239E03	2.11218E02	-4.88658E02
R1Coef2	-4.85429E-02	7.05888E01	7.79308E01	2.01239E01
R1Coef3	-2.36070E02	6.57925E01	-4.75621E02	2.73015E02
R1Coef4	5.67739E02	-1.70906E02	7.21070E02	-6.09586E02

Date: 21 Oct 2025

Sign:

Tor-Ove Kvalvaag, Calibration Engineer

AANDERAA a xylem brand

PRESSURE CERTIFICATE

Form No. 667, Sept 2009

Product: Pressure Sensor 4117B
Serial No: 2536
Date: 15.10.2025

Certificate No: 2466301032536

This is to certify that this product has been pressure tested with the following instrument, and we confirm that no irregularities were found during the test:

Autoklav 800 bar – sn: 0210005

Pressure readings:

Pressure (Bar)	Pressure time (hour)
40	1

Date: 15 Oct 2025

Sign:

Andrine Dale Raknes

Andrine Raknes, Production Engineer

AANDERAA a xylem brand

TEST & SPECIFICATIONS

Form No. 712 V3, May 2020

Program Version: 5.3.1

Product: Oxygen Optode 4330W
Serial No: 4681

Visual and Mechanical Checks:

1.1	Soldering quality		
1.2	Visual surface		
1.3	Galvanic isolation between housing and electronics		

Current Drain and Voltages:

2.1	Average current drain at 0.5 Hz sampling (Max.: 33 mA)	23.0	mA	
2.2	CANBus Current drain at 0.5 Hz sampling (Max.: 33 mA)	21.6	mA	
2.3	Current drain in sleep (Max.: 270 µA)	103	µA	
2.4	CANBus Current drain in sleep (Max.: 180 µA)	98	µA	
2.5	DSP IO voltage, J4.18 (3.3 ±0.15V)		3.29	V
2.6	DSP Core voltage, J4.17(1.8 ±0.05 V)	1.80	V	
2.7	Excitation driver voltage, C4 Analog Board (4.3 ±0.1 V)	4.31	V	

Performance test:	Channel:	Blue		Red	
3.1	Average of Receiver readings (0±150mV)	3.9	mV	1.8	mV
3.2	Standard Deviation of Receiver readings (Max.: 45mV/10mV)	1.73	mV	0.98	mV
3.3	Amplitude measurement with non-fluorescence foil (<60mV/650-1200mV)	14.2	mV	739.7	mV
3.4	CANBus Output test				

Function test from 0 to 40°C:	Channel:	Blue		Red	
4.1	Minimum amplitude measurement (Blue: >550 mV, Red >550 mV)	675.4	mV	602.5	mV
4.2	Maximum amplitude measurement (Blue: <1600 mV, Red <1400 mV)	945.6	mV	755.8	mV
4.3	Minimum phase measurement (Blue: >32°, Red: >3°)	34.99	°	8.59	°
4.4	Maximum phase measurement (Blue: <45°, Red: <10°)	40.18	°	9.07	°
4.5	Maximum standard deviation of Phase measurement: (< 0.07°)	0.06	°	0.02	°
4.6	Minimum temperature raw data measurement: (<-200 mV)			-433.6	mV
4.7	Maximum temperature raw data measurement: (>450 mV)			510	mV

Date: 22 Oct 2025

Sign:
Laila A. Skålnes

Laila Skålnes, Production Engineer