

VAISALA

Handled by
Huttunen Antti

Service Report

Date
13-OCT-2016

SR#
691252

Buyer's reference
FIN0010175SER

Page 1

Consignee

Vlaams Instituut voor de Zee
Wandelaarkaai 7
8400 Oostende
Belgium

Invoicing address(if not consignee)

Service Order	Description	Serial number - Lot Number	Quantity
390853	PTB210 Pressure Transmitter --REASON FOR RETURN-- Accredited calibration. --PROBLEM(S) FOUND -- No fault found. --ACTION(S) TAKEN-- Operation tested, adjustments made and unit calibrated. Accredited calibration certificate number K008-Z02998 (before and after adjustment) issued.	H2750004	1

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VAT Number FI01244162
Domicile Vantaa, Finland

CERTIFICATE OF CALIBRATION no K008-Z02998

Customer Vlaams Instituut voor de Zee vzw
Flanders Marine Institute
Wandelaarkaai 7
8400 Oostende
BELGIUM

Item Pressure Transmitter
Pressure range from 500 to 1100 hPa abs., calibrated from 500 to 1100 abs.
Resolution 0,01 hPa, read via serial port

Manufacturer Vaisala Oyj


Model PTB210

Serial number H2750004

Instrument number

Calibration performed On October 12, 2016

Date October 13, 2016

Signature 
Sauli Kela
Senior Calibration Engineer

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Documents attached -

NOTES Adjusted.

Conditions when received Reported in Service Report.

This Certificate may only be reproduced in full, except with the prior written permission by the issuing Laboratory. The measurements carried out and the Certificates of Calibration issued by an Accredited Calibration Laboratory comply with the measurement ranges and uncertainties approved by FINAS Finnish Accreditation Service. The measurement results issued by the Laboratory are traceable to national or international measurement standards. Measurement Standards Laboratory of Vaisala Oyj is a calibration laboratory K008 accredited by FINAS Finnish Accreditation Service, accreditation requirement ISO/IEC 17025. The accreditation is included in the Multilateral Agreement (EA MLA) of the European co-operation for Accreditation (EA).

Configuration

Before the measurements the transmitter's configuration and settings were read from the transmitter's memory.

Table 1. Configuration and settings

Setups read from the memory	
Software version	PTB210 Ver 2.01
CPU serial number	H2750004
Multipoint corr	ON
Meas per minute	60
Averaging	0
Pressure Min...Max	490 1110

PRESSURE CALIBRATION

Description

The above described Pressure Transmitter was calibrated from 500 to 1100 absolute pressure in the Measurement Standards Laboratory (MSL) of Vaisala Oyj on October 12, 2016 by Pekka Puttonen.

The readings of the transmitter were compared to the readings of the reference at above mentioned range. Pressure values were read via serial port with resolution of 0,01 hPa. Pressure readings of the transmitter were read with the MPC -corrections ON.

From the results were calculated new MPC -corrections and input them to the transmitter's memory.

The supply voltage during the calibration was 15,0 VDC \pm 0,3 DCV and the warm-up and stabilization time was more than 2 hours.

The used pressure transmitting medium was air and/or nitrogen.

References

DHI PPC3 Transfer Standard, serial number 722

Traceability

The measurement results are traceable to the international system of units (SI) through national metrology institutes (NIST in USA or equivalent) or accredited calibration laboratories.

Uncertainty

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %. The standard uncertainty of measurement has been determined in accordance with EA Publication EA-4/02.

- The uncertainty is calculated from the uncertainties caused from the reference equipment, calibration process and unit under calibration (UUC) including resolution, stability (short term), repeatability, hysteresis and rounding of the final results.
- The measurement results and uncertainty are representing the measurement points only.

The measurement uncertainty represents the situation at the time and conditions of calibration. When using the UUC at different conditions and at different time the effect of the conditions and stability of the UUC shall be evaluated separately.

Measurement results

One single measurement point consists of an average of ten readings of the reference and the transmitter.
Measured two increasing and decreasing pressure cycles consisting of 36 measurement points.

Table 2. Measurement results. 1st cycle

Reference [hPa]	As found		As left	
	Reading [hPa]	Correction [hPa]	Reading [hPa]	Correction [hPa]
1100,01	1100,20	- 0,19	1100,02	- 0,01
1050,04	1050,22	- 0,18	1050,03	+ 0,01
1000,04	1000,23	- 0,19	1000,03	+ 0,01
949,89	950,11	- 0,22	949,90	- 0,01
850,08	850,31	- 0,23	850,09	- 0,01
750,12	750,37	- 0,25	750,12	0,00
650,13	650,39	- 0,26	650,12	+ 0,01
550,15	550,44	- 0,29	550,15	0,00
500,08	500,38	- 0,30	500,08	0,00
500,03	500,32	- 0,29	500,03	0,00
550,00	550,28	- 0,28	550,00	0,00
649,96	650,22	- 0,26	649,96	0,00
749,96	750,21	- 0,25	749,96	0,00
849,96	850,19	- 0,23	849,96	0,00
949,96	950,18	- 0,22	949,97	- 0,01
1000,05	1000,24	- 0,19	1000,04	+ 0,01
1049,99	1050,17	- 0,18	1049,98	+ 0,01
1100,00	1100,19	- 0,19	1100,01	- 0,01

The correction shall be added algebraically to the reading.

Table 3. Measurement results. 2nd cycle

Reference [hPa]	As found		As left	
	Reading [hPa]	Correction [hPa]	Reading [hPa]	Correction [hPa]
1100,01	1100,20	- 0,19	1100,02	- 0,01
1050,03	1050,21	- 0,18	1050,02	+ 0,01
1000,04	1000,23	- 0,19	1000,03	+ 0,01
950,06	950,28	- 0,22	950,07	- 0,01
850,09	850,32	- 0,23	850,10	- 0,01
750,11	750,35	- 0,24	750,11	0,00
650,00	650,25	- 0,25	649,99	+ 0,01
550,15	550,44	- 0,29	550,15	0,00
500,07	500,36	- 0,29	500,07	0,00
500,03	500,32	- 0,29	500,03	0,00
550,00	550,28	- 0,28	549,99	+ 0,01
649,96	650,22	- 0,26	649,96	0,00
749,96	750,21	- 0,25	749,96	0,00
849,96	850,20	- 0,24	849,97	- 0,01
949,94	950,16	- 0,22	949,95	- 0,01
999,96	1000,15	- 0,19	999,95	+ 0,01
1049,97	1050,15	- 0,18	1049,96	+ 0,01
1099,99	1100,18	- 0,19	1100,00	- 0,01

The correction shall be added algebraically to the reading.

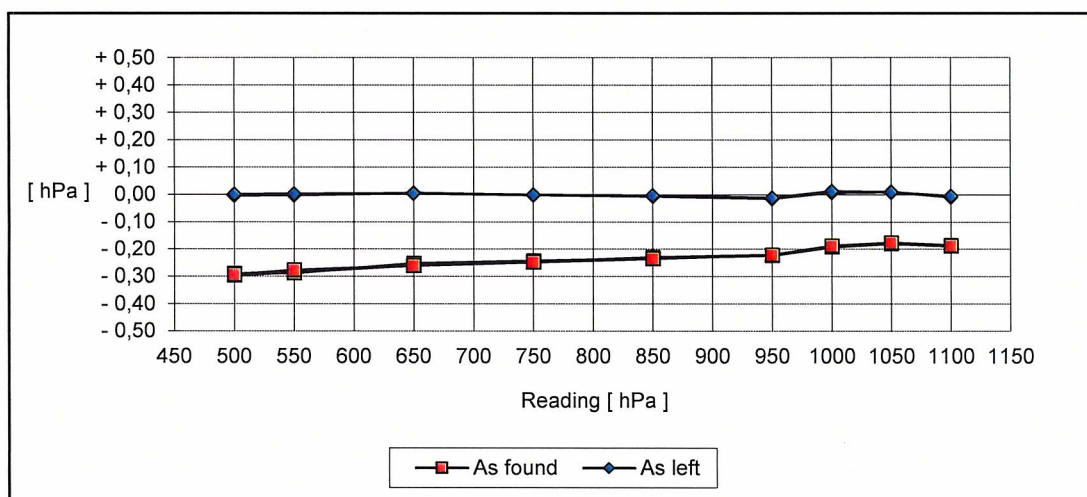


Figure 1. Measurement results

Results

The values in table 4 are averages of the measured values.

Table 4. Final results

Reference [hPa]	As found		As left		Uncertainty [hPa]
	Calculated [hPa]	Correction [hPa]	Calculated [hPa]	Correction [hPa]	
1100,00	1100,19	- 0,19	1100,01	- 0,01	± 0,04
1050,01	1050,19	- 0,18	1050,00	+ 0,01	± 0,04
1000,02	1000,21	- 0,19	1000,01	+ 0,01	± 0,05
949,96	950,18	- 0,22	949,97	- 0,01	± 0,05
850,02	850,25	- 0,23	850,03	- 0,01	± 0,05
750,04	750,29	- 0,25	750,04	0,00	± 0,05
650,01	650,27	- 0,26	650,00	+ 0,01	± 0,05
550,08	550,36	- 0,28	550,08	0,00	± 0,06
500,05	500,34	- 0,29	500,05	0,00	± 0,06

The correction shall be added algebraically to the reading.

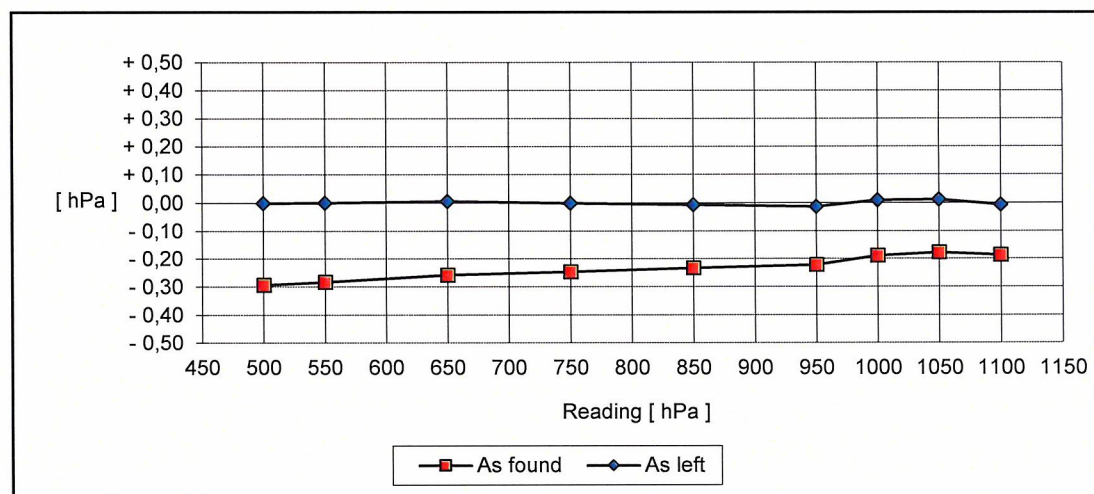


Figure 2. Final results

Conditions

Pressure 1031,1 hPa ± 0 hPa
Temperature + 23,1 °C ± 0,3 °C
Humidity 41 %RH ± 3 %RH

