

Certificate issued by

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Date of issue

July, 14th 2023

Calibration and certification software version

2.2.4

Certificate issued for

PERISSE TECHNOLOGY
Grande Avenue
01500 AMBRONAY

APTS Sensor General Data

Model	APTS-Q-D50
Range (max)	5 bar
Pressure Cell Serial Number	JS2870K9
Bladder Serial Number	22-409-5Z
Dallas ID	4E00001481C6262D
Type	Non-ratiometric
Soft cable length	9 m

Calibration Test Conditions

Temperature	22°C
Relative humidity	40%
Pressure range (Full scale)	4 bar
Excitation voltage	10 V

Instrumentation

Data acquisition system for the pressure bench

Type / Supplier / SN	DEWE43A / DEWESOFT / DB20121701
Calibration certificate nr. / date	DB2012701-00001-2023 / 13 JAN 2023
Firmware version	6.1.27.16
Instrumentation software version	2022.4

Data acquisition system for the biofidelity bench

Type / Supplier / SN	APTS DISPLAY / TRANSPOLIS / 2021-A-005
Calibration certificate nr. / date	230101-226946 / 24-JAN-2023
Type / Supplier / SN	LASER HG-C1100-P / PANASONIC / 0D0238
Calibration certificate nr. / date	P229161/1 / 16-FEV-2023

Reference pressure sensor

Type / Supplier / SN	PR-33X / 80794 / KELLER / 1093593
Calibration certificate nr. / date	FR233510858 / 31-AUG-2023

Summary of the calibration procedure

The calibration is performed by direct comparison of the pressure signal of the APTS sensor with the reference sensor.

- The sensors are placed four at a time in a pressure vessel.
- After offset adjustment, the air pressure inside the vessel is applied and increased slowly from 0 bar to 4 bar within about 30 seconds, then decreased from 4 bar to 0 bar within about 30 seconds.
- The pressure signals of the reference sensor and the APTS sensors are recorded with the data acquisition system.

The measurement results in the table below, are:

- Applied pressure Pr (Pressure measured by the reference sensor).
- Output signal, given by the APTS sensor.
- Modelling pressure, calculated with column 1 & 2 (linearization of the measurement curve).
- Non-linearity, which is the max value of deviation of the positive slope, given in percentage of the full scale (%FS).
- The sensitivity is the positive slope of the modelling curve, considering the excitation voltage.
- The sensitivity uncertainty is the standard deviation of the sensitivity taking into account 95% confidence interval
- Hysteresis is the maximum difference between increasing and decreasing values of the pressure, given in % of the FS.

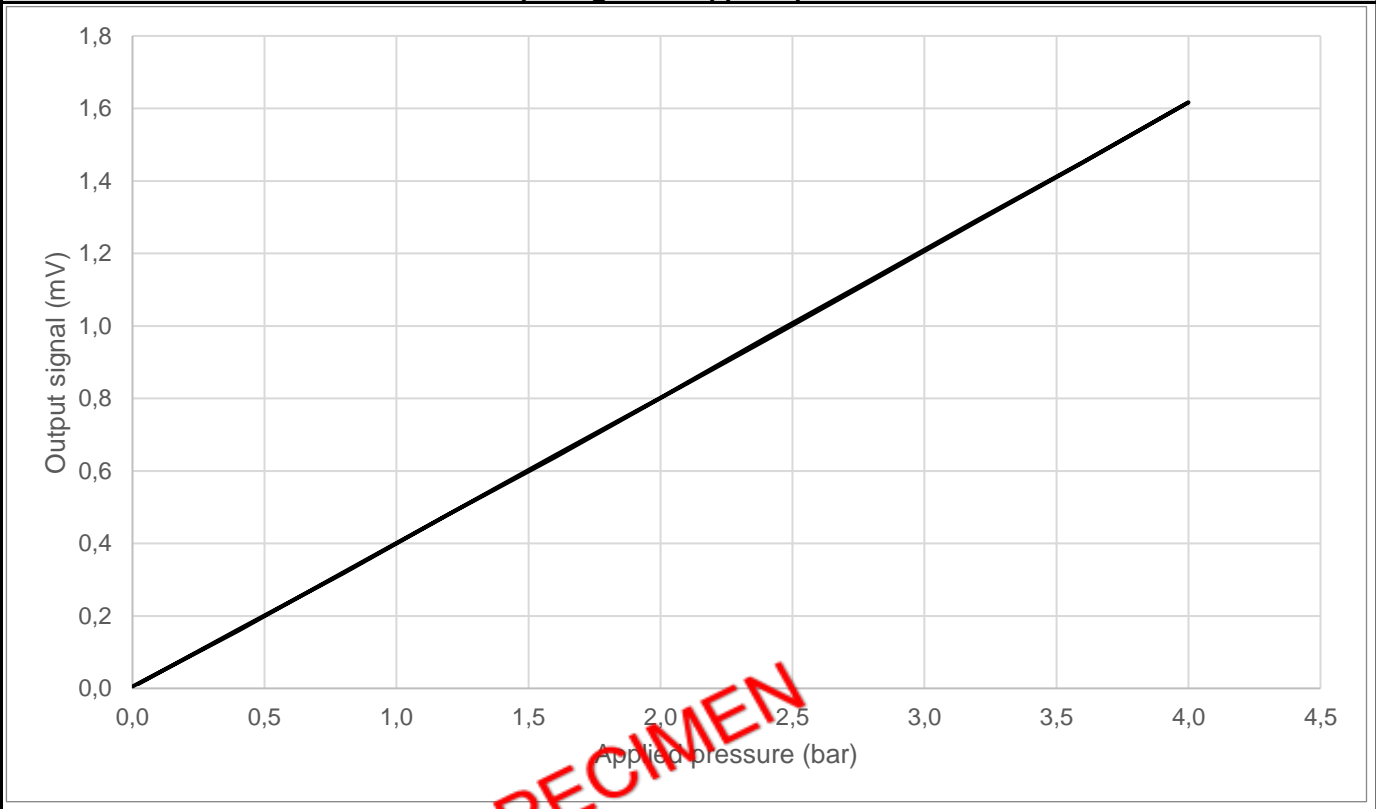
Results table

Applied pressure Pr (bar)	Output signal (mV)	Modelling pressure Pm (bar)	Deviation Pr-Pm (bar)	Non-linearity (%FS)
0,000	0,005	0,019	-0,019	0,5%
0,400	0,159	0,400	0,000	0,0%
0,800	0,321	0,801	-0,001	0,0%
1,200	0,481	1,198	0,002	0,0%
1,600	0,638	1,587	0,013	0,3%
2,000	0,801	1,991	0,009	0,2%
2,400	0,961	2,390	0,010	0,3%
2,800	1,124	2,793	0,007	0,2%
3,200	1,288	3,200	0,000	0,0%
3,600	1,451	3,604	-0,003	0,1%
4,000	1,617	4,015	-0,015	0,4%
3,600	1,452	3,606	-0,006	0,1%
3,200	1,291	3,208	-0,008	0,2%
2,800	1,129	2,804	-0,004	0,1%
2,400	0,968	2,405	-0,005	0,1%
2,000	0,802	1,994	0,006	0,1%
1,600	0,643	1,600	0,000	0,0%
1,200	0,481	1,199	0,001	0,0%
0,800	0,318	0,795	0,005	0,1%
0,400	0,162	0,408	-0,008	0,2%
0,022	0,012	0,037	-0,015	0,4%

APTS Calibration Data

Sensitivity (mV/bar)	0,403
Offset (mV)	-0,002
Sensitivity uncertainty U at k=2	1,3%
Non-linearity (%FS)	0,5%
Hysteresis (%FS)	0,4%

Output signal vs Applied pressure



APTS Certification Data : Biofidelity Static Response

Sensor specifications		Test results	
Delta Pressure (bar)	Deflection (mm)	Delta Pressure (bar)	Deflection (mm)
0,60 +/-10%	15,81 +/-10%	0,60	16,93
Test result		Passed	

Observation / Additional information

Empty box for observation or additional information.

Visa QC : G EIFFEL

Date : July, 14th 2023