



GEOSENSE QUALITY FORM
GQF-149
ISS. 11
DATE : AUG-24
SIG. GC

Nova House, Rougham Industrial Estate, Rougham, Bury St Edmunds

Tel: +44(0)1359 270457 - Fax: +44(0)1359 272860

Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378279	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 34	Temp °C:	20	M Marking:	1872m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9700.4	9698.6	9699.5	0.7	0.0	0.19	0.00
10.0	69.0	9030.3	9028.7	9029.5	68.9	69.0	-0.04	0.00
20.0	138.0	8356.3	8355.1	8355.7	137.4	138.0	-0.16	-0.01
30.0	207.0	7677.0	7676.2	7676.6	206.6	207.1	-0.13	0.02
40.0	276.0	6996.2	6995.8	6996.0	275.8	276.0	-0.05	-0.01
50.0	345.0	6310.0	6309.9	6309.9	345.6	345.0	0.19	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.01773E-1	-1.47604E-2	-1.03780E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.20482E-7	-6.09836E-8	-4.28774E-8
Poly Factor (B)	-9.50411E-2	-1.37841E-2	-9.69153E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.24642E-1	3.25804E-2	2.29072E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

CALIBRATED TO UKAS TRACEABLE STANDARD - ISO 9001:2015

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M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	17/01/2025	Readout No:	2108
Serial No:	378427	Baro:	1028	Cable Length:	33m
Works ID:	G117 9 182	Temp °C:	20	M Marking:	1300m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9776.6	9776.4	9776.5	0.7	0.0	0.19	0.00
10.0	69.0	9091.7	9091.6	9091.7	68.9	69.0	-0.04	0.00
20.0	138.0	8402.7	8402.9	8402.8	137.5	138.0	-0.15	0.00
30.0	207.0	7710.2	7710.5	7710.3	206.4	207.0	-0.16	-0.01
40.0	276.0	7012.2	7012.5	7012.4	275.9	276.1	-0.02	0.02
50.0	345.0	6312.3	6312.7	6312.5	345.6	345.0	0.18	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.95822E-2	-1.44427E-2	-1.01546E-2

	kPa	psi	mH ₂ O
Poly Factor (A)	-4.10020E-7	-5.94662E-8	-4.18105E-8
Poly Factor (B)	-9.29853E-2	-1.34859E-2	-9.48190E-3
Poly Factor (C)			

	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	3.81149E-1	5.52791E-2	3.88666E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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CALIBRATION REPORT

N. 2505198

Serial Number: P250944

Product Code: OPK20S70000

Model: PIEZOMETER 700 kPa

Type: Vibrating Wire + NTC

Calibration Date: 01/04/2025 17:06

Job Number: 25-00325

Project Code:

Cable (m): 55

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: $31 \pm 10\%$

Barometric Pressure: 997 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)
Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.3957748$ [kPa/°C]

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [kPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [kPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-2.2495E-01$ [kPa/digit] **B=** $1.8855E+03$ [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.2433 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [kPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $2.6908E-11$ [kPa/digit³] **B=** $-1.5642E-06$ [kPa/digit²] **C=** $-2.0742E-01$ [kPa/digit] **D=** $1.8314E+03$ [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0889 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [kPa]

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

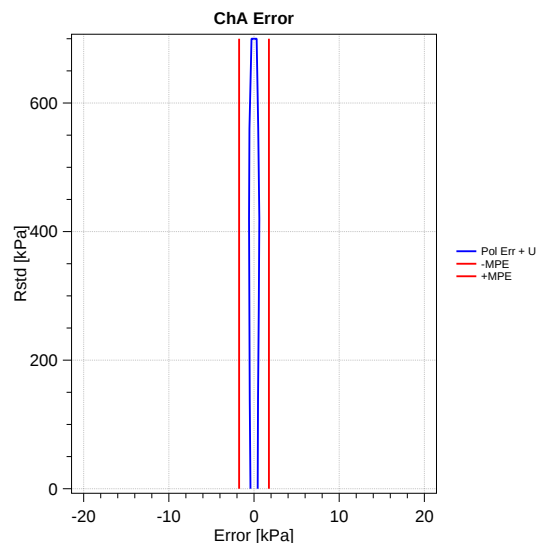
COMPLIANT

To the Datasheet

Issue Date: 02.04.2025

CQE: *Mario Brioni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	8375.186	0.1662006	1.53704	0.2517499
140	7759.211	0.1761502	140.1009	140.3259
280	7140.274	0.1887379	279.3311	280.3567
420	6517.987	0.2034745	419.3148	420.3824
560	5892.504	0.2199286	560.0175	560.3171
700	5264.058	0.2377438	701.3867	700.0569
700	5264.632	0.2377438	701.2576	699.9296
560	5895.153	0.2199286	559.4216	559.7263
420	6521.559	0.2034745	418.5113	419.5809
280	7143.495	0.1887379	278.6065	279.6299
140	7761.941	0.1761502	139.4868	139.7066
0	8377.447	0.1662006	1.028427	-0.2636711



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378301	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 56	Temp °C:	20	M Marking:	0416m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9537.5	9536.4	9537.0	0.5	0.1	0.14	0.01
10.0	69.0	8848.5	8847.7	8848.1	68.9	69.0	-0.04	-0.01
20.0	138.0	8156.1	8155.4	8155.7	137.6	137.9	-0.12	-0.02
30.0	207.0	7459.2	7458.7	7458.9	206.7	207.1	-0.08	0.02
40.0	276.0	6761.3	6761.1	6761.2	276.0	276.1	-0.01	0.02
50.0	345.0	6061.6	6061.5	6061.6	345.4	345.0	0.11	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.92355E-2	-1.43924E-2	-1.01192E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-2.71300E-7	-3.93473E-8	-2.76650E-8
Poly Factor (B)	-9.50035E-2	-1.37786E-2	-9.68770E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.64973E-1	3.84297E-2	2.70198E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378296	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 51	Temp °C:	20	M Marking:	1000m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	10030.4	10030.7	10030.5	0.9	0.0	0.26	0.00
10.0	69.0	9315.5	9316.1	9315.8	68.8	69.0	-0.05	0.00
20.0	138.0	8595.5	8596.0	8595.7	137.3	138.0	-0.21	-0.01
30.0	207.0	7869.9	7870.3	7870.1	206.3	207.0	-0.22	-0.01
40.0	276.0	7137.3	7137.7	7137.5	275.9	276.1	-0.03	0.02
50.0	345.0	6401.2	6401.7	6401.4	345.8	345.0	0.25	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.50473E-2	-1.37850E-2	-9.69216E-3

	kPa	psi	mH ₂ O
Poly Factor (A)	-5.00405E-7	-7.25750E-8	-5.10273E-8
Poly Factor (B)	-8.68244E-2	-1.25924E-2	-8.85366E-3
Poly Factor (C)			

	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.10393E-1	1.60107E-2	1.12570E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	19/11/2024	Readout No:	2108
Serial No:	377919	Baro:	987	Cable Length:	33m
Works ID:	G113 9 199	Temp °C:	20	M Marking:	1679m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9622.0	9622.4	9622.2	0.8	0.1	0.24	0.01
10.0	69.1	8889.5	8889.8	8889.7	68.9	69.0	-0.07	-0.03
20.0	138.0	8151.6	8152.1	8151.8	137.4	138.0	-0.17	0.01
30.0	207.0	7409.9	7410.1	7410.0	206.3	206.9	-0.20	-0.02
40.0	276.0	6660.0	6660.3	6660.1	276.0	276.1	-0.01	0.04
50.0	345.0	5908.9	5909.3	5909.1	345.7	344.9	0.21	-0.02

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.28828E-2	-1.34710E-2	-9.47145E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.26685E-7	-6.18832E-8	-4.35099E-8
Poly Factor (B)	-8.62557E-2	-1.25099E-2	-8.79567E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.47398E-1	2.13775E-2	1.50305E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



CALIBRATION REPORT

N. 2505209

Serial Number: P250955

Product Code: OPK20S70000

Model: PIEZOMETER 700 kPa

Type: Vibrating Wire + NTC

Calibration Date: 01/04/2025 17:06

Job Number: 25-00325

Project Code:

Cable (m): 55

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: 31 ± 10%

Barometric Pressure: 997 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.6719273 \text{ [kPa/°C]}$

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT \text{ [kPa]}$; $P_{tc} = R_{cp} + \Delta T \cdot kT \text{ [kPa]}$

Linear Sensitivity Factors: ⁽¹⁾ **A=** -2.2551E-01 [kPa/digit] **B=** 1.8868E+03 [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.1312 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B \text{ [kPa]}$

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** -1.5342E-10 [kPa/digit³] **B=** 3.5007E-06 [kPa/digit²] **C=** -2.5155E-01 [kPa/digit] **D=** 1.9498E+03 [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0803 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D \text{ [kPa]}$

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

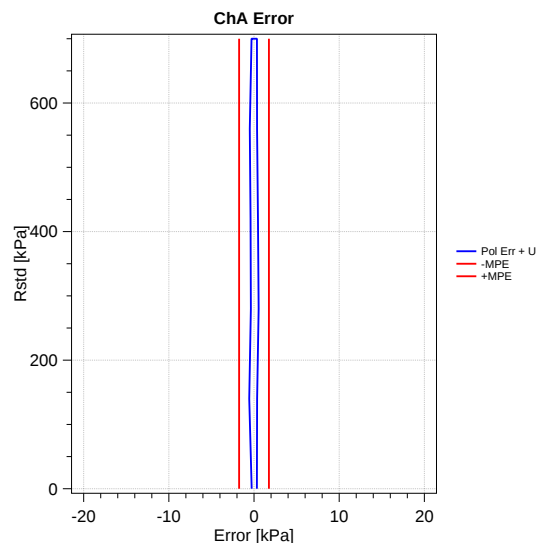
COMPLIANT

To the Datasheet

Issue Date: 02.04.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	8367.943	0.1665618	-0.248562	0.1075246
140	7744.568	0.176491	140.3264	140.3853
280	7123.115	0.189056	280.468	280.1811
420	6501.416	0.2037696	420.665	420.2038
560	5881.229	0.2202017	560.5211	560.2774
700	5265.033	0.2379964	699.4772	700.0539
700	5265.733	0.2379964	699.3193	699.8947
560	5883.055	0.2202017	560.1093	559.8642
420	6503.467	0.2037696	420.2025	419.7414
280	7125.491	0.189056	279.9322	279.6464
140	7747.108	0.176491	139.7536	139.814
0	8369.174	0.1665618	-0.5261603	-0.1696832



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378272	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 27	Temp °C:	20	M Marking:	933m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9093.1	9092.1	9092.6	0.0	0.1	-0.01	0.02
10.0	69.0	8399.3	8398.5	8398.9	69.0	68.9	-0.01	-0.02
20.0	138.0	7705.1	7704.5	7704.8	138.0	137.9	-0.01	-0.04
30.0	207.0	7009.0	7008.6	7008.8	207.2	207.1	0.05	0.02
40.0	276.0	6315.0	6314.9	6315.0	276.2	276.1	0.05	0.04
50.0	345.0	5624.6	5624.7	5624.7	344.8	344.9	-0.06	-0.03

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.94287E-2	-1.44204E-2	-1.01389E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	7.06395E-8	1.02450E-8	7.20325E-9
Poly Factor (B)	-1.00468E-1	-1.45712E-2	-1.02450E-2
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.29809E-1	3.33297E-2	2.34340E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

CALIBRATED TO UKAS TRACEABLE STANDARD - ISO 9001:2015

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M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378291	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 46	Temp °C:	20	M Marking:	1441m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9356.2	9356.6	9356.4	0.1	0.1	0.04	0.02
10.0	69.0	8659.3	8659.9	8659.6	68.9	68.9	-0.02	-0.02
20.0	138.0	7961.3	7961.7	7961.5	137.8	137.9	-0.05	-0.03
30.0	207.0	7260.1	7260.5	7260.3	207.0	207.1	0.01	0.03
40.0	276.0	6560.6	6561.1	6560.8	276.1	276.1	0.03	0.03
50.0	345.0	5862.7	5863.2	5862.9	345.0	344.9	-0.01	-0.02

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.87087E-2	-1.43160E-2	-1.00655E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.54959E-8	-5.14806E-9	-3.61959E-9
Poly Factor (B)	-9.81685E-2	-1.42376E-2	-1.00104E-2
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.36082E-1	1.97364E-2	1.38766E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



CALIBRATION REPORT

N. 2512664

Serial Number: P252809

Product Code: OPK20SE1000

Model: PIEZOMETER 1.0 MPa

Type: Vibrating Wire + NTC

Calibration Date: 26/08/2025 16:45

Job Number: 25-00887

Project Code:

Cable (m): 85

Test Conditions

Temperature: 22 ± 0.5 °C

Humidity: 44 ± 10%

Barometric Pressure: 998 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.0004594906 \text{ [MPa/°C]}$

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT \text{ [MPa]}$; $P_{tc} = R_{cp} + \Delta T \cdot kT \text{ [MPa]}$

Linear Sensitivity Factors: ⁽¹⁾ **A=** -2.0322E-04 [MPa/digit] **B=** 1.8166E+00 [MPa]

Maximum Linear Error + U: ⁽²⁾ 0.3531 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B \text{ [MPa]}$

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** 1.5427E-14 [MPa/digit³] **B=** -1.2480E-09 [MPa/digit²] **C=** -1.8910E-04 [MPa/digit] **D=** 1.7759E+00 [MPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0929 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D \text{ [MPa]}$

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

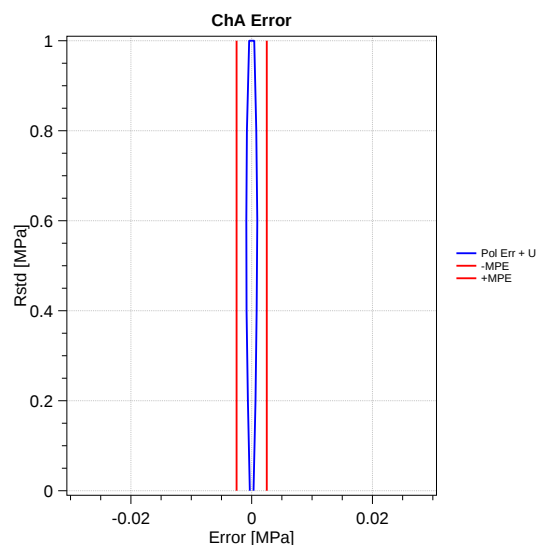
COMPLIANT

To the Datasheet

Issue Date: 26.08.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [MPa]	Rmeas ⁽⁷⁾ [digit]	U [MPa]	Rcl ⁽³⁾ [MPa]	Rcp ⁽⁵⁾ [MPa]
0	8923.3	0.000152175	0.003167273	0.0001537202
0.2	7955	0.0001684834	0.1999486	0.2004589
0.4	6979.139	0.0001898371	0.3982665	0.4006588
0.6	5995.493	0.0002147363	0.5981665	0.6006728
0.8	5003.165	0.0002420895	0.799831	0.8005489
1	4002.155	0.000271155	1.00326	1.000145
1	4003.657	0.000271155	1.002954	0.9998475
0.8	5008.503	0.0002420895	0.7987462	0.799479
0.6	6002.347	0.0002147363	0.5967737	0.5992855
0.4	6985.457	0.0001898371	0.3969826	0.3993682
0.2	7959.485	0.0001684834	0.1990372	0.1995349
0	8924.783	0.000152175	0.002865892	-0.0001542795



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378318	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 73	Temp °C:	20	M Marking:	0718m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9373.8	9374.1	9373.9	-0.1	0.1	-0.03	0.02
10.0	69.0	8696.8	8697.3	8697.0	68.9	68.9	-0.02	-0.03
20.0	138.0	8018.8	8019.2	8019.0	138.0	137.9	0.01	-0.03
30.0	207.0	7340.1	7340.4	7340.2	207.2	207.1	0.07	0.03
40.0	276.0	6664.1	6664.6	6664.4	276.1	276.1	0.04	0.03
50.0	345.0	5991.0	5991.5	5991.3	344.7	344.9	-0.07	-0.02

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.01935E-1	-1.47839E-2	-1.03945E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	1.13831E-7	1.65092E-8	1.16075E-8
Poly Factor (B)	-1.03684E-1	-1.50376E-2	-1.05729E-2
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.13127E-1	1.64071E-2	1.15358E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



CALIBRATION REPORT

N. 2505201

Serial Number: P250947

Product Code: OPK20S70000

Model: PIEZOMETER 700 kPa

Type: Vibrating Wire + NTC

Calibration Date: 01/04/2025 17:06

Job Number: 25-00325

Project Code:

Cable (m): 55

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: $31 \pm 10\%$

Barometric Pressure: 997 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.3893276$ [kPa/°C]

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [kPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [kPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-2.2245E-01$ [kPa/digit] **B=** $1.9415E+03$ [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.2390 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [kPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $5.4313E-11$ [kPa/digit³] **B=** $-2.0453E-06$ [kPa/digit²] **C=** $-2.0164E-01$ [kPa/digit] **D=** $1.8785E+03$ [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.1007 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [kPa]

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

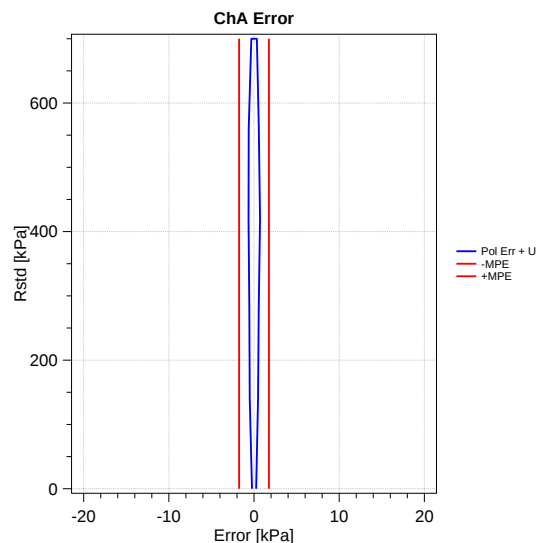
COMPLIANT

To the Datasheet

Issue Date: 02.04.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	8722.617	0.164577	1.194194	0.07356302
140	8097.908	0.1746191	140.1605	140.3293
280	7471.651	0.1873097	279.4712	280.3639
420	6842.268	0.2021505	419.4772	420.4432
560	6210.08	0.2187042	560.1072	560.4045
700	5575.431	0.2366116	701.2847	700.0798
700	5576.242	0.2366116	701.1043	699.9019
560	6213.47	0.2187042	559.3531	559.6561
420	6846.53	0.2021505	418.5291	419.497
280	7474.924	0.1873097	278.7431	279.6337
140	8100.7	0.1746191	139.5394	139.7037
0	8723.329	0.164577	1.03581	-0.08658373



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	19/11/2024	Readout No:	2108
Serial No:	377915	Baro:	987	Cable Length:	33m
Works ID:	G113 9 195	Temp °C:	20	M Marking:	198m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9628.1	9629.4	9628.8	0.7	0.1	0.21	0.02
10.0	69.1	8919.1	8920.0	8919.5	68.9	69.0	-0.06	-0.03
20.0	138.0	8205.9	8207.0	8206.4	137.5	138.0	-0.16	-0.01
30.0	207.0	7487.5	7488.2	7487.8	206.6	207.1	-0.13	0.02
40.0	276.0	6766.4	6767.1	6766.8	275.9	276.0	-0.04	0.00
50.0	345.0	6041.2	6041.5	6041.3	345.6	345.0	0.18	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.61462E-2	-1.39443E-2	-9.80422E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.79846E-7	-5.50901E-8	-3.87337E-8
Poly Factor (B)	-9.01938E-2	-1.30810E-2	-9.19724E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.36222E-1	1.97567E-2	1.38908E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

CALIBRATED TO UKAS TRACEABLE STANDARD - ISO 9001:2015

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M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



CALIBRATION REPORT

N. 2512662

Serial Number: P252807

Product Code: OPK20SE1000

Model: PIEZOMETER 1.0 MPa

Type: Vibrating Wire + NTC

Calibration Date: 26/08/2025 16:45

Job Number: 25-00887

Project Code:

Cable (m): 75

Test Conditions

Temperature: 22 ± 0.5 °C

Humidity: 44 ± 10%

Barometric Pressure: 998 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.0003823355 \text{ [MPa/}^\circ\text{C]}$

Reading thermally compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT \text{ [MPa]}$; $P_{tc} = R_{cp} + \Delta T \cdot kT \text{ [MPa]}$

Linear Sensitivity Factors: ⁽¹⁾ **A=** -2.0889E-04 [MPa/digit] **B=** 1.8605E+00 [MPa]

Maximum Linear Error + U: ⁽²⁾ 0.2968 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B \text{ [MPa]}$

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** 5.9670E-15 [MPa/digit³] **B=** -9.4963E-10 [MPa/digit²] **C=** -1.9733E-04 [MPa/digit] **D=** 1.8261E+00 [MPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0845 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D \text{ [MPa]}$

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

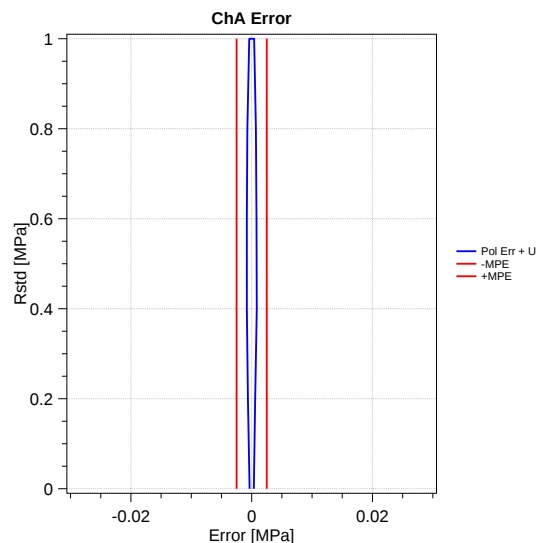
COMPLIANT

To the Datasheet

Issue Date: 26.08.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [MPa]	Rmeas ⁽⁷⁾ [digit]	U [MPa]	Rcl ⁽³⁾ [MPa]	Rcp ⁽⁵⁾ [MPa]
0	8893.736	0.0001558156	0.002714594	0.0001894825
0.2	7949.345	0.0001717786	0.1999901	0.2004493
0.4	6998.572	0.0001927677	0.3985987	0.4006078
0.6	6041.502	0.0002173314	0.5985227	0.6005866
0.8	5077.423	0.0002443943	0.7999109	0.8004713
1	4106.664	0.0002732147	1.002694	1.000128
1	4107.948	0.0002732147	1.002426	0.999865
0.8	5081.91	0.0002443943	0.7989736	0.7995447
0.6	6047.11	0.0002173314	0.5973513	0.5994192
0.4	7004.581	0.0001927677	0.3973435	0.3993474
0.2	7953.397	0.0001717786	0.1991436	0.1995932
0	8895.577	0.0001558156	0.002330025	-0.0002022917



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	17/01/2025	Readout No:	2108
Serial No:	378397	Baro:	1028	Cable Length:	33m
Works ID:	G117 9 152	Temp °C:	20	M Marking:	1801m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9798.2	9799.2	9798.7	0.9	0.0	0.25	0.00
10.0	69.0	9090.4	9091.4	9090.9	68.9	69.0	-0.04	0.00
20.0	138.0	8377.7	8378.7	8378.2	137.3	138.0	-0.20	0.00
30.0	207.0	7660.3	7661.2	7660.8	206.2	206.9	-0.22	-0.02
40.0	276.0	6935.7	6936.5	6936.1	275.9	276.1	-0.04	0.02
50.0	345.0	6207.3	6208.2	6207.8	345.8	345.0	0.24	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.60705E-2	-1.39334E-2	-9.79650E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.98545E-7	-7.23054E-8	-5.08377E-8
Poly Factor (B)	-8.80903E-2	-1.27760E-2	-8.98275E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	9.15855E-2	1.32829E-2	9.33916E-3

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	17/01/2025	Readout No:	2108
Serial No:	378390	Baro:	1028	Cable Length:	33m
Works ID:	G117 9 145	Temp °C:	20	M Marking:	1166m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9266.3	9266.2	9266.2	0.6	0.0	0.17	0.01
10.0	69.0	8574.6	8574.6	8574.6	68.9	69.0	-0.04	-0.01
20.0	138.0	7878.9	7879.4	7879.2	137.5	137.9	-0.15	-0.02
30.0	207.0	7178.6	7179.1	7178.9	206.6	207.0	-0.12	0.01
40.0	276.0	6476.0	6476.4	6476.2	275.9	276.1	-0.02	0.02
50.0	345.0	5770.7	5771.2	5770.9	345.5	345.0	0.15	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.86805E-2	-1.43119E-2	-1.00627E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.47414E-7	-5.03864E-8	-3.54265E-8
Poly Factor (B)	-9.34563E-2	-1.35542E-2	-9.52992E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.47909E-1	2.14517E-2	1.50826E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378271	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 26	Temp °C:	20	M Marking:	398m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9648.6	9647.2	9647.9	0.6	0.1	0.15	0.01
10.0	69.0	8943.9	8942.8	8943.3	68.9	69.0	-0.04	-0.01
20.0	138.0	8235.5	8234.6	8235.0	137.5	137.9	-0.13	-0.02
30.0	207.0	7523.0	7522.2	7522.6	206.6	207.0	-0.11	0.01
40.0	276.0	6807.5	6807.0	6807.3	276.0	276.1	0.00	0.02
50.0	345.0	6091.0	6090.8	6090.9	345.4	344.9	0.13	-0.02

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.69594E-2	-1.40623E-2	-9.88715E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-2.93275E-7	-4.25344E-8	-2.99058E-8
Poly Factor (B)	-9.23436E-2	-1.33928E-2	-9.41646E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.20508E-1	3.19808E-2	2.24856E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378306	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 61	Temp °C:	20	M Marking:	0248m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9956.8	9957.2	9957.0	0.6	0.0	0.17	0.00
10.0	69.0	9262.5	9263.0	9262.8	68.9	69.0	-0.03	0.00
20.0	138.0	8564.8	8565.1	8564.9	137.5	138.0	-0.13	0.00
30.0	207.0	7863.9	7864.2	7864.1	206.5	207.0	-0.15	-0.01
40.0	276.0	7158.0	7158.4	7158.2	275.9	276.1	-0.02	0.02
50.0	345.0	6450.4	6450.8	6450.6	345.6	345.0	0.16	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.83779E-2	-1.42680E-2	-1.00318E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.48824E-7	-5.05909E-8	-3.55703E-8
Poly Factor (B)	-9.26545E-2	-1.34379E-2	-9.44816E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.48654E-1	2.15597E-2	1.51585E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378266	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 21	Temp °C:	20	M Marking:	431m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9190.4	9191.0	9190.7	0.3	0.1	0.09	0.01
10.0	69.0	8524.6	8524.9	8524.8	68.9	68.9	-0.03	-0.02
20.0	138.0	7855.9	7856.8	7856.3	137.7	137.9	-0.08	-0.02
30.0	207.0	7184.5	7186.2	7185.4	206.8	207.0	-0.05	0.01
40.0	276.0	6511.5	6514.9	6513.2	276.0	276.1	0.01	0.03
50.0	345.0	5841.2	5842.2	5841.7	345.2	344.9	0.06	-0.02

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.02976E-1	-1.49348E-2	-1.05006E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-1.70777E-7	-2.47683E-8	-1.74145E-8
Poly Factor (B)	-1.00409E-1	-1.45625E-2	-1.02389E-2
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.29573E-1	3.32956E-2	2.34101E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378293	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 48	Temp °C:	20	M Marking:	1806m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9456.9	9456.1	9456.5	0.9	0.0	0.24	0.00
10.0	69.0	8752.7	8752.2	8752.4	68.8	69.0	-0.05	0.00
20.0	138.0	8043.4	8043.1	8043.2	137.3	138.0	-0.20	-0.01
30.0	207.0	7328.1	7327.9	7328.0	206.4	207.0	-0.18	0.01
40.0	276.0	6608.6	6608.7	6608.6	275.8	276.0	-0.05	0.00
50.0	345.0	5883.8	5884.0	5883.9	345.8	345.0	0.23	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.65546E-2	-1.40036E-2	-9.84587E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.81600E-7	-6.98477E-8	-4.91097E-8
Poly Factor (B)	-8.91663E-2	-1.29320E-2	-9.09247E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.71501E-1	3.93764E-2	2.76855E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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CALIBRATION REPORT

N. 2512661

Serial Number: P252806

Product Code: OPK20SE1000

Model: PIEZOMETER 1.0 MPa

Type: Vibrating Wire + NTC

Calibration Date: 26/08/2025 16:45

Job Number: 25-00887

Project Code:

Cable (m): 75

Test Conditions

Temperature: 22 ± 0.5 °C

Humidity: $44 \pm 10\%$

Barometric Pressure: 998 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.0004620692$ [MPa/°C]

Reading thermally compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [MPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [MPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-2.0255E-04$ [MPa/digit] **B=** $1.6740E+00$ [MPa]

Maximum Linear Error + U: ⁽²⁾ 0.2104 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [MPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $-1.2340E-13$ [MPa/digit³] **B=** $1.7565E-09$ [MPa/digit²] **C=** $-2.0987E-04$ [MPa/digit] **D=** $1.6826E+00$ [MPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0879 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [MPa]

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

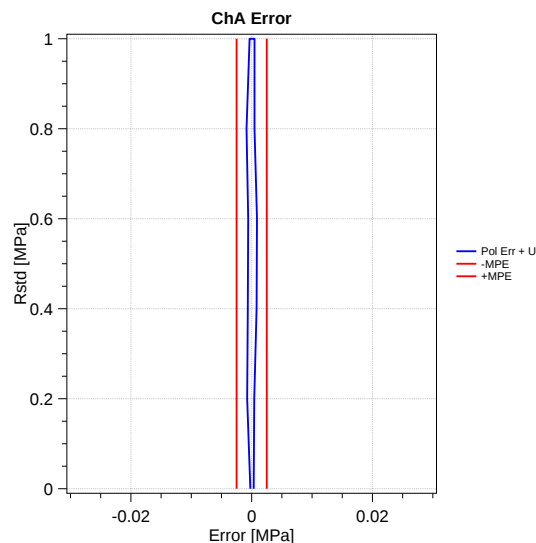
COMPLIANT

To the Datasheet

Issue Date: 26.08.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [MPa]	Rmeas ⁽⁷⁾ [digit]	U [MPa]	Rcl ⁽³⁾ [MPa]	Rcp ⁽⁵⁾ [MPa]
0	8256.232	0.0001517445	0.001679175	6.915494E-05
0.2	7277.901	0.0001680946	0.1998419	0.2005802
0.4	6293.856	0.0001894921	0.3991619	0.4004526
0.6	5304.11	0.0002144314	0.5996367	0.6003639
0.8	4310.688	0.0002418191	0.8008561	0.8006104
1	3322.698	0.0002709136	1.000975	1.000075
1	3324.054	0.0002709136	1.000701	0.9998009
0.8	4314.837	0.0002418191	0.8000157	0.7997739
0.6	5309.212	0.0002144314	0.5986033	0.599335
0.4	6299.168	0.0001894921	0.398086	0.3993773
0.2	7282.001	0.0001680946	0.1990114	0.1997441
0	8257.453	0.0001517445	0.001431859	-0.0001825023



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

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Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378320	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 75	Temp °C:	20	M Marking:	0181m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9487.0	9487.3	9487.1	0.5	0.1	0.13	0.01
10.0	69.0	8791.2	8791.3	8791.2	68.9	69.0	-0.03	-0.01
20.0	138.0	8092.2	8092.2	8092.2	137.6	137.9	-0.12	-0.02
30.0	207.0	7388.6	7388.9	7388.7	206.8	207.1	-0.07	0.03
40.0	276.0	6684.9	6685.4	6685.1	275.9	276.0	-0.02	0.00
50.0	345.0	5978.1	5978.6	5978.3	345.4	345.0	0.12	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.83008E-2	-1.42568E-2	-1.00239E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-2.54711E-7	-3.69414E-8	-2.59734E-8
Poly Factor (B)	-9.43615E-2	-1.36855E-2	-9.62223E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	9.95527E-2	1.44384E-2	1.01516E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

Linear calc = k (kPa) * (Current Reading - Site Zero Reading) + T * (Current Temp - Site Zero Temp)

Polynomial calculation = A * (Reading)² + B * (Reading) + C + T * (Current Temp - Site Zero Temp)

C = -A * (Site Zero Reading)² - B * (Site Zero Reading)

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	15/01/2025	Readout No:	2108
Serial No:	378277	Baro:	1026	Cable Length:	33m
Works ID:	G117 9 32	Temp °C:	20	M Marking:	1540m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9576.5	9576.6	9576.5	0.9	0.0	0.24	0.00
10.0	69.0	8867.5	8867.5	8867.5	68.9	69.0	-0.04	0.00
20.0	138.0	8153.2	8153.1	8153.2	137.3	138.0	-0.19	0.00
30.0	207.0	7434.2	7434.0	7434.1	206.3	207.0	-0.21	-0.01
40.0	276.0	6708.1	6708.0	6708.0	275.9	276.1	-0.03	0.02
50.0	345.0	5979.2	5979.3	5979.3	345.8	345.0	0.23	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.58837E-2	-1.39063E-2	-9.77745E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.74193E-7	-6.87735E-8	-4.83544E-8
Poly Factor (B)	-8.85071E-2	-1.28364E-2	-9.02524E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.77042E-1	2.56769E-2	1.80534E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378286	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 41	Temp °C:	20	M Marking:	1740m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9774.7	9774.8	9774.8	0.9	0.0	0.24	0.00
10.0	69.0	9083.4	9083.7	9083.6	68.9	69.0	-0.04	0.01
20.0	138.0	8387.3	8387.6	8387.5	137.3	138.0	-0.19	0.01
30.0	207.0	7686.9	7687.2	7687.1	206.2	206.9	-0.22	-0.02
40.0	276.0	6979.3	6979.7	6979.5	275.9	276.0	-0.04	0.01
50.0	345.0	6267.7	6268.3	6268.0	345.8	345.0	0.25	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.83768E-2	-1.42678E-2	-1.00317E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-5.21485E-7	-7.56323E-8	-5.31768E-8
Poly Factor (B)	-9.00105E-2	-1.30545E-2	-9.17855E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.09764E-1	3.04227E-2	2.13901E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378294	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 49	Temp °C:	20	M Marking:	1474m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9016.7	9017.0	9016.9	-0.7	0.2	-0.22	0.05
10.0	69.0	8360.7	8361.0	8360.8	69.0	68.8	0.00	-0.06
20.0	138.0	7705.9	7706.2	7706.1	138.6	137.8	0.17	-0.05
30.0	207.0	7054.1	7054.4	7054.2	207.9	207.1	0.25	0.04
40.0	276.0	6409.1	6409.5	6409.3	276.4	276.2	0.12	0.07
50.0	345.0	5774.2	5774.5	5774.3	343.9	344.8	-0.32	-0.05

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.06288E-1	-1.54153E-2	-1.08384E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	6.57362E-7	9.53389E-8	6.70325E-8
Poly Factor (B)	-1.16011E-1	-1.68254E-2	-1.18299E-2
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.00559E-1	2.90877E-2	2.04515E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378259	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 14	Temp °C:	20	M Marking:	565m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	10020.5	10020.0	10020.2	0.9	0.0	0.24	0.00
10.0	69.0	9327.3	9327.0	9327.2	68.8	69.0	-0.05	0.00
20.0	138.0	8628.9	8628.7	8628.8	137.3	138.0	-0.19	0.00
30.0	207.0	7926.1	7925.8	7926.0	206.3	207.0	-0.21	-0.01
40.0	276.0	7216.7	7216.6	7216.7	275.9	276.0	-0.04	0.01
50.0	345.0	6503.4	6503.5	6503.4	345.8	345.0	0.24	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.80901E-2	-1.42263E-2	-1.00024E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-5.07093E-7	-7.35451E-8	-5.17093E-8
Poly Factor (B)	-8.97107E-2	-1.30110E-2	-9.14798E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.46109E-1	2.11905E-2	1.48990E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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CALIBRATION REPORT

N. 2505335

Serial Number: P250899

Product Code: OPK20S35000

Model: PIEZOMETER 350 kPa

Type: Vibrating Wire + NTC

Calibration Date: 04/04/2025 09:23

Job Number: 25-00325

Project Code:

Cable (m): 33

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: 34 ± 10%

Barometric Pressure: 1005 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.3529139 \text{ [kPa/°C]}$

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT \text{ [kPa]}; P_{tc} = R_{cp} + \Delta T \cdot kT \text{ [kPa]}$

Linear Sensitivity Factors: ⁽¹⁾ **A=** -1.0580E-01 [kPa/digit] **B=** 9.6730E+02 [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.2621 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B \text{ [kPa]}$

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** 2.5024E-11 [kPa/digit³] **B=** -1.0806E-06 [kPa/digit²] **C=** -9.3890E-02 [kPa/digit] **D=** 9.2885E+02 [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0879 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D \text{ [kPa]}$

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

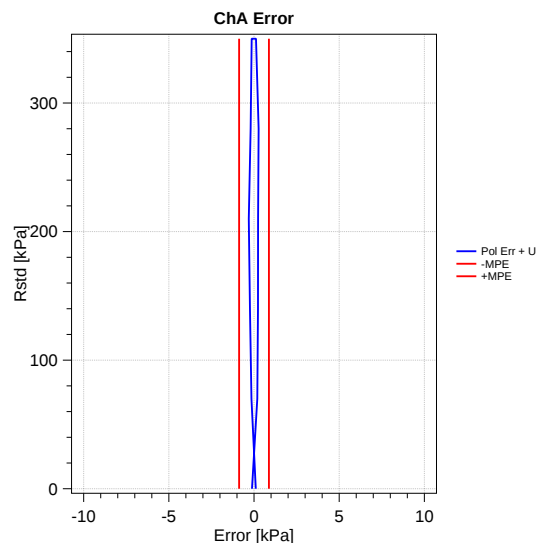
COMPLIANT

To the Datasheet

Issue Date: 04.04.2025

CQE: *Mario Brioni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	9135.865	0.07603574	0.7083588	-0.02715052
70	8481.353	0.08013759	69.95672	70.07047
140	7823.403	0.08578658	139.5688	140.153
210	7161.599	0.09270031	209.5887	210.2151
280	6496.964	0.1006184	279.9081	280.0982
350	5826.843	0.1093228	350.8079	350.0278
350	5827.171	0.1093228	350.7732	349.9937
280	6499.522	0.1006184	279.6374	279.8302
210	7165.018	0.09270031	209.2269	209.8543
140	7826.226	0.08578658	139.2701	139.8531
70	8483.062	0.08013759	69.7759	69.88791
0	9135.208	0.07603574	0.7778704	0.04339015



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	17/01/2025	Readout No:	2108
Serial No:	378355	Baro:	1028	Cable Length:	33m
Works ID:	G117 9 110	Temp °C:	20	M Marking:	1233m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9655.3	9656.4	9655.8	0.7	0.0	0.21	0.00
10.0	69.0	8959.2	8960.1	8959.6	68.9	69.0	-0.04	0.01
20.0	138.0	8258.6	8259.7	8259.2	137.4	138.0	-0.16	0.01
30.0	207.0	7555.1	7556.2	7555.7	206.3	206.9	-0.20	-0.03
40.0	276.0	6843.9	6844.8	6844.4	275.9	276.1	-0.02	0.03
50.0	345.0	6131.1	6131.9	6131.5	345.7	345.0	0.21	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.78835E-2	-1.41963E-2	-9.98138E-3

	kPa	psi	mH ₂ O
Poly Factor (A)	-4.43920E-7	-6.43829E-8	-4.52674E-8
Poly Factor (B)	-9.08751E-2	-1.31799E-2	-9.26672E-3
Poly Factor (C)			

	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.26443E-1	1.83384E-2	1.28937E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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CALIBRATION REPORT

N. 2505190

Serial Number: P250936

Product Code: OPK20S70000

Model: PIEZOMETER 700 kPa

Type: Vibrating Wire + NTC

Calibration Date: 01/04/2025 17:06

Job Number: 25-00325

Project Code:

Cable (m): 55

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: $31 \pm 10\%$

Barometric Pressure: 997 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTI, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.345893$ [kPa/°C]

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [kPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [kPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-2.3113E-01$ [kPa/digit] **B=** $2.0197E+03$ [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.1968 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [kPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $-3.5070E-11$ [kPa/digit³] **B=** $1.0561E-07$ [kPa/digit²] **C=** $-2.2711E-01$ [kPa/digit] **D=** $1.9991E+03$ [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.1069 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [kPa]

CRITERIA |Max Lin. Err. + U < |MPE Lin. |

|Max Pol. Err. + U < |MPE Pol. |

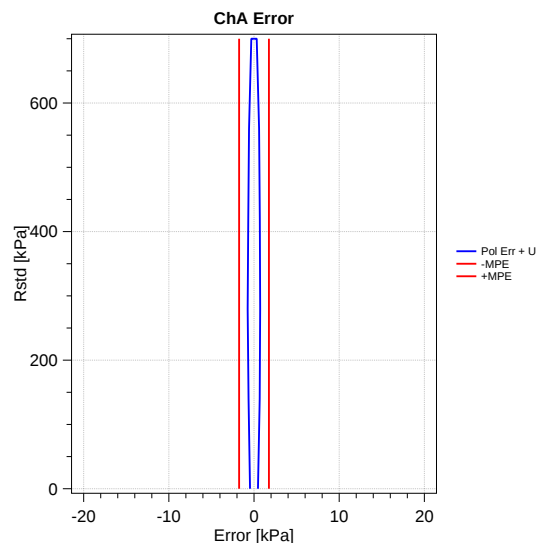
COMPLIANT

To the Datasheet

Issue Date: 02.04.2025

CQE: *Mario Brioni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	8733.634	0.1702228	1.119861	0.2997277
140	8131.582	0.1799501	140.2731	140.4631
280	7527.487	0.1922892	279.8985	280.5557
420	6921.999	0.2067729	419.8458	420.4688
560	6314.606	0.2229837	560.2335	560.3633
700	5706.197	0.2405728	700.856	700.0787
700	5706.868	0.2405728	700.7009	699.9248
560	6317.801	0.2229837	559.4951	559.6286
420	6926.083	0.2067729	418.9019	419.5266
280	7532.177	0.1922892	278.8145	279.4701
140	8135.671	0.1799501	139.328	139.513
0	8736.174	0.1702228	0.5327873	-0.2928247



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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 Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378310	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 65	Temp °C:	20	M Marking:	0450m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9428.2	9429.3	9428.8	0.7	0.0	0.20	0.00
10.0	69.0	8724.6	8725.6	8725.1	68.9	69.0	-0.04	0.00
20.0	138.0	8017.2	8018.0	8017.6	137.4	137.9	-0.18	-0.02
30.0	207.0	7303.5	7304.1	7303.8	206.5	207.1	-0.14	0.02
40.0	276.0	6587.5	6588.3	6587.9	275.9	276.0	-0.04	0.00
50.0	345.0	5866.7	5867.4	5867.1	345.7	345.0	0.19	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.68484E-2	-1.40462E-2	-9.87583E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.02254E-7	-5.83400E-8	-4.10187E-8
Poly Factor (B)	-9.06954E-2	-1.31538E-2	-9.24839E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	8.97961E-2	1.30234E-2	9.15669E-3

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



CALIBRATION REPORT

N. 2505329

Serial Number: P250893

Product Code: OPK20S35000

Model: PIEZOMETER 350 kPa

Type: Vibrating Wire + NTC

Calibration Date: 04/04/2025 09:23

Job Number: 25-00325

Project Code:

Cable (m): 33

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: $34 \pm 10\%$

Barometric Pressure: 1005 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTI, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.3343174$ [kPa/°C]

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [kPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [kPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-1.0943E-01$ [kPa/digit] **B=** $9.7690E+02$ [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.1661 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [kPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $-9.6382E-11$ [kPa/digit³] **B=** $2.3185E-06$ [kPa/digit²] **C=** $-1.2769E-01$ [kPa/digit] **D=** $1.0239E+03$ [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0963 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [kPa]

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

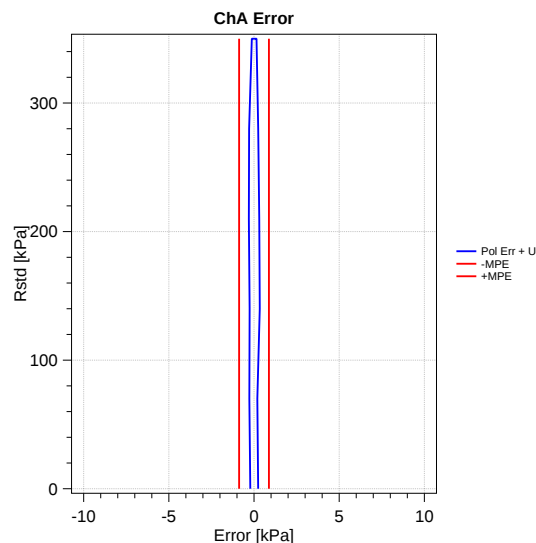
COMPLIANT

To the Datasheet

Issue Date: 04.04.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	8927.575	0.078463	-0.05461575	0.1407332
70	8286.112	0.08244418	70.14157	70.19209
140	7644.739	0.08794513	140.3279	140.1699
210	7003.617	0.09470141	210.4868	210.2092
280	6365.259	0.102465	280.3432	280.1859
350	5731.729	0.1110247	349.6712	350.0181
350	5732.208	0.1110247	349.6188	349.9651
280	6368.25	0.102465	280.0159	279.8572
210	7007.469	0.09470141	210.0652	209.7878
140	7648.578	0.08794513	139.9078	139.7509
70	8288.896	0.08244418	69.83691	69.88831
0	8930.37	0.078463	-0.3604765	-0.1648591



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378276	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 31	Temp °C:	20	M Marking:	1939m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9709.2	9709.3	9709.2	0.1	0.1	0.03	0.01
10.0	69.0	9045.3	9045.5	9045.4	69.0	69.0	-0.01	-0.01
20.0	138.0	8380.4	8380.6	8380.5	137.9	138.0	-0.03	-0.01
30.0	207.0	7714.7	7714.8	7714.7	206.9	207.0	-0.02	0.00
40.0	276.0	7047.7	7047.9	7047.8	276.1	276.1	0.02	0.03
50.0	345.0	6382.6	6382.9	6382.7	345.0	345.0	0.01	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.03681E-1	-1.50372E-2	-1.05726E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-5.45895E-8	-7.91725E-9	-5.56660E-9
Poly Factor (B)	-1.02803E-1	-1.49098E-2	-1.04830E-2
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.11183E-1	3.06284E-2	2.15347E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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CALIBRATION REPORT

N. 2505188

Serial Number: P250934

Product Code: OPK20S70000

Model: PIEZOMETER 700 kPa

Type: Vibrating Wire + NTC

Calibration Date: 01/04/2025 17:06

Job Number: 25-00325

Project Code:

Cable (m): 55

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: $31 \pm 10\%$

Barometric Pressure: 997 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTI, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.3705986$ [kPa/°C]

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [kPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [kPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-2.1346E-01$ [kPa/digit] **B=** $2.0647E+03$ [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.2526 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [kPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $-3.5062E-11$ [kPa/digit³] **B=** $5.9358E-08$ [kPa/digit²] **C=** $-2.0756E-01$ [kPa/digit] **D=** $2.0326E+03$ [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0886 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [kPa]

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

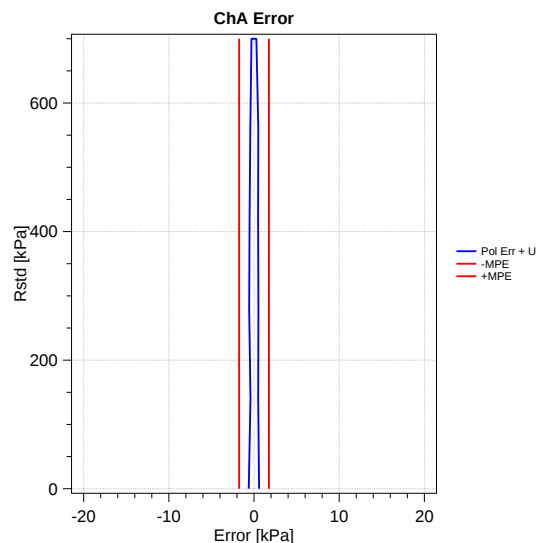
COMPLIANT

To the Datasheet

Issue Date: 02.04.2025

CQE: *Mario Brioni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	9664.937	0.1587595	1.609743	0.4611321
140	9016.678	0.1691474	139.987	140.2455
280	8363.259	0.1822195	279.4658	280.3864
420	7707.508	0.1974432	419.4423	420.3233
560	7048.899	0.2143608	560.0289	560.2198
700	6387.724	0.2326028	701.1631	700.0662
700	6388.243	0.2326028	701.0524	699.9566
560	7051.295	0.2143608	559.5174	559.7119
420	7710.345	0.1974432	418.8367	419.7193
280	8366.625	0.1822195	278.7473	279.6663
140	9019.312	0.1691474	139.4248	139.679
0	9669.086	0.1587595	0.7240984	-0.4360483



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378285	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 40	Temp °C:	20	M Marking:	1408m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9112.0	9112.5	9112.2	0.1	0.1	0.02	0.01
10.0	69.0	8438.5	8438.7	8438.6	69.0	69.0	-0.01	-0.01
20.0	138.0	7764.6	7764.3	7764.5	137.9	137.9	-0.03	-0.02
30.0	207.0	7088.6	7088.4	7088.5	207.0	207.0	0.01	0.01
40.0	276.0	6413.4	6413.6	6413.5	276.0	276.1	0.01	0.02
50.0	345.0	5739.2	5739.5	5739.3	345.0	345.0	0.00	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.02257E-1	-1.48305E-2	-1.04273E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-2.01437E-8	-2.92149E-9	-2.05409E-9
Poly Factor (B)	-1.01957E-1	-1.47871E-2	-1.03968E-2
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.22903E-1	3.23282E-2	2.27299E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	17/01/2025	Readout No:	2108
Serial No:	378369	Baro:	1028	Cable Length:	33m
Works ID:	G117 9 124	Temp °C:	20	M Marking:	1333m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9710.3	9709.8	9710.1	0.8	0.0	0.23	0.00
10.0	69.0	9019.9	9019.5	9019.7	68.9	69.0	-0.03	0.01
20.0	138.0	8325.7	8325.8	8325.8	137.3	138.0	-0.20	-0.01
30.0	207.0	7625.3	7625.3	7625.3	206.4	207.0	-0.18	0.01
40.0	276.0	6921.3	6921.5	6921.4	275.8	276.0	-0.06	-0.01
50.0	345.0	6210.9	6211.2	6211.0	345.8	345.0	0.24	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.86040E-2	-1.43008E-2	-1.00548E-2

	kPa	psi	mH ₂ O
Poly Factor (A)	-5.00402E-7	-7.25747E-8	-5.10270E-8
Poly Factor (B)	-9.06367E-2	-1.31453E-2	-9.24241E-3
Poly Factor (C)			

	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.26297E-1	3.28204E-2	2.30759E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

CALIBRATED TO UKAS TRACEABLE STANDARD - ISO 9001:2015

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M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



CALIBRATION REPORT

N. 2505195

Serial Number: P250941

Product Code: OPK20S70000

Model: PIEZOMETER 700 kPa

Type: Vibrating Wire + NTC

Calibration Date: 01/04/2025 17:06

Job Number: 25-00325

Project Code:

Cable (m): 55

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: $31 \pm 10\%$

Barometric Pressure: 997 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTI, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.2616155$ [kPa/°C]

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [kPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [kPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-2.2257E-01$ [kPa/digit] **B=** $1.9904E+03$ [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.1529 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [kPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $-1.2898E-10$ [kPa/digit³] **B=** $2.5487E-06$ [kPa/digit²] **C=** $-2.3886E-01$ [kPa/digit] **D=** $2.0241E+03$ [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.1083 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [kPa]

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

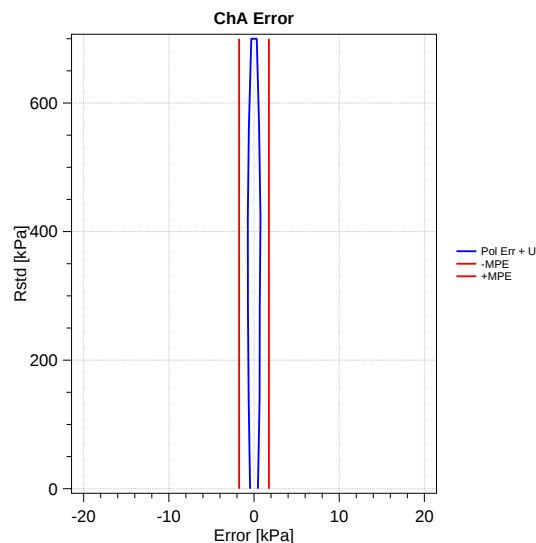
COMPLIANT

To the Datasheet

Issue Date: 02.04.2025

CQE: *Mario Brioni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	8939.538	0.1646537	0.7913133	0.298397
140	8312.998	0.1746915	140.239	140.4529
280	7684.462	0.1873771	280.131	280.5272
420	7054.747	0.202213	420.2854	420.5277
560	6425.015	0.218762	560.4435	560.3884
700	5796.25	0.236665	700.3864	700.0836
700	5797.005	0.236665	700.2184	699.9158
560	6428.478	0.218762	559.6727	559.6193
420	7059.625	0.202213	419.1997	419.444
280	7689.016	0.1873771	279.1174	279.5137
140	8317.176	0.1746915	139.3091	139.5203
0	8942.17	0.1646537	0.2055145	-0.2917454



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378309	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 64	Temp °C:	20	M Marking:	0966m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9761.4	9762.2	9761.8	0.9	0.0	0.25	-0.01
10.0	69.0	9068.6	9069.2	9068.9	68.9	69.1	-0.02	0.03
20.0	138.0	8372.7	8373.0	8372.8	137.3	138.0	-0.21	0.00
30.0	207.0	7671.0	7671.5	7671.2	206.2	206.9	-0.24	-0.03
40.0	276.0	6961.3	6961.9	6961.6	275.8	276.0	-0.05	0.01
50.0	345.0	6247.5	6248.0	6247.7	345.9	345.0	0.27	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.81869E-2	-1.42403E-2	-1.00123E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-5.61368E-7	-8.14167E-8	-5.72438E-8
Poly Factor (B)	-8.91996E-2	-1.29368E-2	-9.09586E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.37230E-1	1.99029E-2	1.39937E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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 Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378321	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 76	Temp °C:	20	M Marking:	0147m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	8831.8	8831.5	8831.6	0.8	0.0	0.22	0.00
10.0	69.0	8129.8	8129.4	8129.6	68.8	69.0	-0.05	-0.01
20.0	138.0	7422.2	7421.5	7421.8	137.5	138.1	-0.16	0.02
30.0	207.0	6711.0	6711.0	6711.0	206.4	207.0	-0.18	-0.01
40.0	276.0	5994.4	5994.7	5994.5	275.8	276.0	-0.05	0.00
50.0	345.0	5272.9	5273.3	5273.1	345.8	345.0	0.22	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.69465E-2	-1.40604E-2	-9.88583E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.46907E-7	-6.48160E-8	-4.55720E-8
Poly Factor (B)	-9.06426E-2	-1.31461E-2	-9.24301E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.31055E-1	3.35105E-2	2.35611E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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 Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378311	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 66	Temp °C:	20	M Marking:	0617m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9273.5	9273.7	9273.6	0.3	0.1	0.08	0.02
10.0	69.0	8580.7	8580.9	8580.8	68.9	68.9	-0.04	-0.03
20.0	138.0	7884.5	7884.6	7884.5	137.8	138.0	-0.06	-0.01
30.0	207.0	7186.1	7186.5	7186.3	206.9	207.1	-0.03	0.02
40.0	276.0	6488.1	6488.6	6488.4	276.0	276.0	0.00	0.01
50.0	345.0	5789.5	5790.0	5789.8	345.2	345.0	0.05	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.89906E-2	-1.43569E-2	-1.00943E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-1.24321E-7	-1.80305E-8	-1.26772E-8
Poly Factor (B)	-9.71178E-2	-1.40853E-2	-9.90330E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.34411E-1	1.94940E-2	1.37062E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378274	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 29	Temp °C:	20	M Marking:	1525m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9489.3	9489.6	9489.5	0.7	0.0	0.19	0.00
10.0	69.0	8799.0	8799.2	8799.1	68.9	69.0	-0.03	0.01
20.0	138.0	8105.6	8106.0	8105.8	137.4	138.0	-0.16	-0.01
30.0	207.0	7407.0	7407.2	7407.1	206.5	207.0	-0.14	0.01
40.0	276.0	6705.4	6705.7	6705.5	275.9	276.0	-0.04	0.00
50.0	345.0	5999.2	5999.6	5999.4	345.7	345.0	0.19	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.88481E-2	-1.43362E-2	-1.00797E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.00472E-7	-5.80816E-8	-4.08370E-8
Poly Factor (B)	-9.26450E-2	-1.34366E-2	-9.44720E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.26062E-1	3.27863E-2	2.30520E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	19/11/2024	Readout No:	2108
Serial No:	377911	Baro:	987	Cable Length:	33m
Works ID:	G113 9 191	Temp °C:	20	M Marking:	1480m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9664.4	9667.5	9665.9	0.7	0.0	0.20	0.00
10.0	69.1	8983.4	8985.7	8984.5	68.9	69.1	-0.05	-0.02
20.0	138.0	8299.0	8300.2	8299.6	137.5	138.1	-0.13	0.02
30.0	207.0	7611.1	7612.2	7611.6	206.5	207.0	-0.16	0.00
40.0	276.0	6918.6	6919.3	6918.9	275.8	276.0	-0.05	0.00
50.0	345.0	6221.6	6221.9	6221.8	345.7	345.0	0.19	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.00168E-1	-1.45276E-2	-1.02143E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.18424E-7	-6.06851E-8	-4.26675E-8
Poly Factor (B)	-9.35199E-2	-1.35634E-2	-9.53641E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.11515E-1	1.61733E-2	1.13714E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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CALIBRATION REPORT

N. 2513471

Serial Number: P252879

Product Code: OPK20SE1000

Model: PIEZOMETER 1.0 MPa

Type: Vibrating Wire + NTC

Calibration Date: 03/09/2025 16:53

Job Number: 25-00894

Project Code:

Cable (m): 85

Test Conditions

Temperature: 22 ± 0.5 °C

Humidity: $45 \pm 10\%$

Barometric Pressure: 993 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.0003088605$ [MPa/°C]

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [MPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [MPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-1.9197E-04$ [MPa/digit] **B=** $1.7681E+00$ [MPa]

Maximum Linear Error + U: ⁽²⁾ 0.3709 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [MPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $2.6638E-14$ [MPa/digit³] **B=** $-1.4209E-09$ [MPa/digit²] **C=** $-1.7686E-04$ [MPa/digit] **D=** $1.7254E+00$ [MPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0767 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [MPa]

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

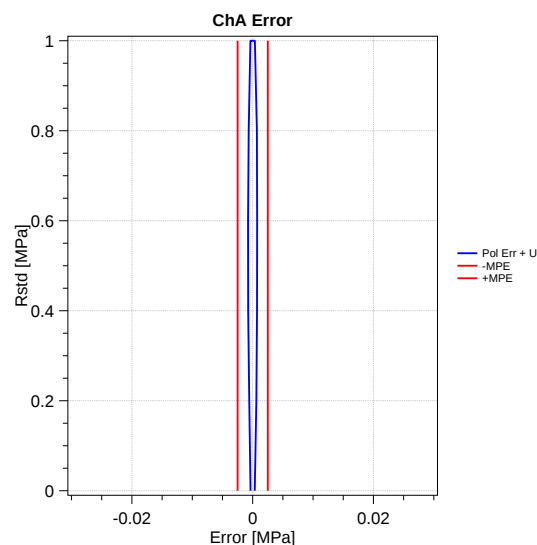
COMPLIANT

To the Datasheet

Issue Date: 03.09.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [MPa]	Rmeas ⁽⁷⁾ [digit]	U [MPa]	Rcl ⁽³⁾ [MPa]	Rcp ⁽⁵⁾ [MPa]
0	9192.81	0.0001449897	0.003350913	0.0002120201
0.2	8168.793	0.0001620229	0.1999286	0.2004045
0.4	7136.607	0.0001841273	0.3980745	0.4005634
0.6	6095.806	0.0002097056	0.5978741	0.6005573
0.8	5044.999	0.0002376385	0.7995946	0.8004212
1	3983.116	0.0002671887	1.003441	1.000108
1	3984.202	0.0002671887	1.003233	0.9999049
0.8	5049.659	0.0002376385	0.7987	0.7995397
0.6	6101.498	0.0002097056	0.5967814	0.5994689
0.4	7142.301	0.0001841273	0.3969814	0.399464
0.2	8173.158	0.0001620229	0.1990907	0.1995544
0	9194.902	0.0001449897	0.002949318	-0.0001984915



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378263	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 18	Temp °C:	20	M Marking:	899m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9558.9	9558.4	9558.6	0.6	0.1	0.16	0.01
10.0	69.0	8873.1	8872.5	8872.8	68.8	68.9	-0.05	-0.02
20.0	138.0	8182.7	8182.3	8182.5	137.5	137.9	-0.13	-0.02
30.0	207.0	7488.4	7488.0	7488.2	206.6	207.0	-0.10	0.01
40.0	276.0	6791.7	6791.5	6791.6	276.0	276.1	-0.01	0.02
50.0	345.0	6093.3	6093.3	6093.3	345.5	344.9	0.13	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.95223E-2	-1.44340E-2	-1.01485E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.18016E-7	-4.61227E-8	-3.24287E-8
Poly Factor (B)	-9.45446E-2	-1.37121E-2	-9.64090E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.10017E-1	3.04594E-2	2.14159E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

CALIBRATED TO UKAS TRACEABLE STANDARD - ISO 9001:2015

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M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



CALIBRATION REPORT

N. 2505321

Serial Number: P250885

Product Code: OPK20S35000

Model: PIEZOMETER 350 kPa

Type: Vibrating Wire + NTC

Calibration Date: 04/04/2025 09:23

Job Number: 25-00325

Project Code:

Cable (m): 33

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: 34 ± 10%

Barometric Pressure: 1000 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTI, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.3058647 \text{ [kPa/°C]}$

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT \text{ [kPa]}$; $P_{tc} = R_{cp} + \Delta T \cdot kT \text{ [kPa]}$

Linear Sensitivity Factors: ⁽¹⁾ **A=** -1.0523E-01 [kPa/digit] **B=** 1.0196E+03 [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.1511 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B \text{ [kPa]}$

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** -8.2972E-11 [kPa/digit³] **B=** 1.8866E-06 [kPa/digit²] **C=** -1.1930E-01 [kPa/digit] **D=** 1.0540E+03 [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.1002 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D \text{ [kPa]}$

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

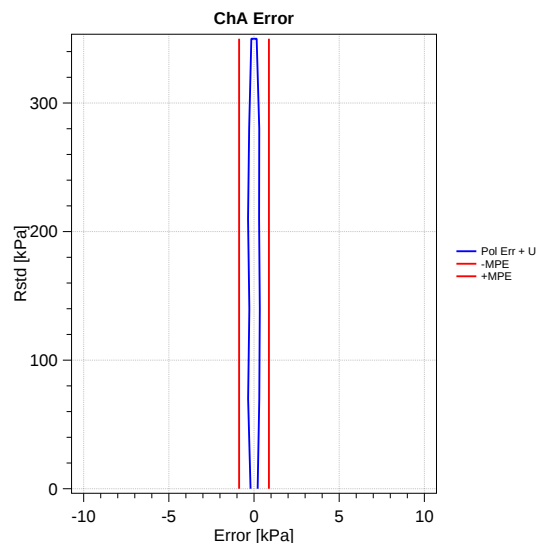
COMPLIANT

To the Datasheet

Issue Date: 04.04.2025

CQE: *Mario Brioni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	9685.688	0.07565674	0.3639799	0.1284099
70	9022.711	0.07977808	70.13168	70.26659
140	8358.78	0.08545085	139.9998	140.1892
210	7691.824	0.0923897	210.1862	210.2583
280	7025.981	0.1003323	280.2555	280.1856
350	6361.91	0.1090596	350.1383	350.0482
350	6362.793	0.1090596	350.0454	349.9551
280	7029.716	0.1003323	279.8625	279.7931
210	7696.235	0.0923897	209.722	209.7952
140	8362.99	0.08545085	139.5567	139.7465
70	9027.407	0.07977808	69.6375	69.77107
0	9688.191	0.07565674	0.1005793	-0.1371716



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



CALIBRATION REPORT

N. 2505304

Serial Number: P250868

Product Code: OPK20S35000

Model: PIEZOMETER 350 kPa

Type: Vibrating Wire + NTC

Calibration Date: 04/04/2025 09:22

Job Number: 25-00325

Project Code:

Cable (m): 33

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: 34 ± 10%

Barometric Pressure: 1000 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTI, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.3336644 \text{ [kPa/°C]}$

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT \text{ [kPa]}$; $P_{tc} = R_{cp} + \Delta T \cdot kT \text{ [kPa]}$

Linear Sensitivity Factors: ⁽¹⁾ **A=** -1.0844E-01 [kPa/digit] **B=** 9.9986E+02 [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.2100 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B \text{ [kPa]}$

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** -8.7618E-11 [kPa/digit³] **B=** 1.6255E-06 [kPa/digit²] **C=** -1.1778E-01 [kPa/digit] **D=** 1.0159E+03 [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0889 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D \text{ [kPa]}$

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

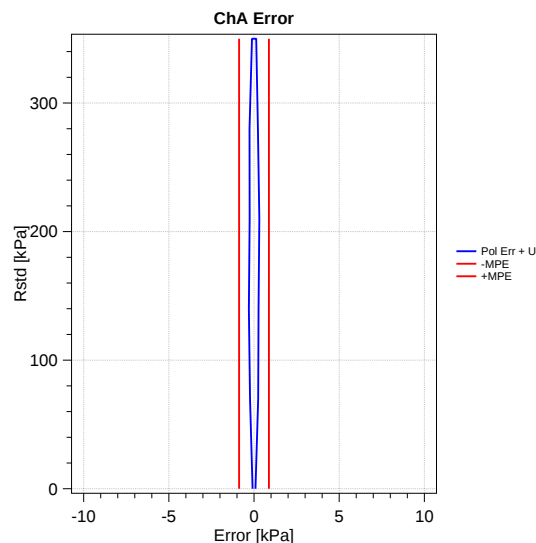
COMPLIANT

To the Datasheet

Issue Date: 04.04.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	9214.543	0.07780269	0.59428	0.006927075
70	8574.95	0.081816	69.95478	70.15281
140	7931.384	0.08735653	139.7461	140.2157
210	7285.372	0.09415504	209.8027	210.1625
280	6636.623	0.1019602	280.1562	280.1626
350	5988.371	0.1105591	350.4557	350.009
350	5988.622	0.1105591	350.4285	349.982
280	6639.307	0.1019602	279.8651	279.8733
210	7288.885	0.09415504	209.4218	209.7829
140	7935.016	0.08735653	139.3523	139.8215
70	8577.837	0.081816	69.6417	69.83744
0	9214.669	0.07780269	0.5806159	-0.006951375



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



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Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	19/11/2024	Readout No:	2108
Serial No:	377909	Baro:	987	Cable Length:	33m
Works ID:	G113 9 189	Temp °C:	20	M Marking:	1381m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9283.1	9282.5	9282.8	0.7	0.0	0.20	0.01
10.0	69.1	8590.7	8590.2	8590.4	68.9	69.0	-0.05	-0.02
20.0	138.0	7895.2	7895.3	7895.2	137.5	138.0	-0.16	-0.01
30.0	207.0	7194.2	7194.3	7194.2	206.5	207.1	-0.13	0.02
40.0	276.0	6490.5	6490.6	6490.5	275.9	276.0	-0.03	0.01
50.0	345.0	5783.3	5783.5	5783.4	345.6	345.0	0.17	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.85655E-2	-1.42952E-2	-1.00509E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.90925E-7	-5.66969E-8	-3.98634E-8
Poly Factor (B)	-9.26757E-2	-1.34410E-2	-9.45032E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.24133E-1	1.80034E-2	1.26581E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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 Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378298	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 53	Temp °C:	20	M Marking:	0684m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9437.3	9437.1	9437.2	0.7	0.0	0.19	0.01
10.0	69.0	8749.3	8749.3	8749.3	68.9	69.0	-0.04	-0.01
20.0	138.0	8057.2	8057.2	8057.2	137.4	138.0	-0.16	-0.01
30.0	207.0	7359.9	7360.0	7360.0	206.5	207.1	-0.13	0.02
40.0	276.0	6660.1	6660.3	6660.2	275.9	276.0	-0.04	0.00
50.0	345.0	5956.2	5956.5	5956.4	345.6	345.0	0.18	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.90956E-2	-1.43721E-2	-1.01050E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.97262E-7	-5.76160E-8	-4.05096E-8
Poly Factor (B)	-9.29801E-2	-1.34851E-2	-9.48136E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.95547E-1	2.83608E-2	1.99404E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378249	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 4	Temp °C:	20	M Marking:	298m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9203.4	9198.8	9201.1	0.4	0.1	0.12	0.01
10.0	69.0	8507.7	8503.8	8505.7	68.9	69.0	-0.03	0.00
20.0	138.0	7809.6	7806.3	7808.0	137.6	137.9	-0.11	-0.02
30.0	207.0	7107.2	7104.5	7105.9	206.7	207.0	-0.08	0.01
40.0	276.0	6403.5	6401.6	6402.5	276.0	276.1	0.00	0.02
50.0	345.0	5698.8	5697.4	5698.1	345.3	345.0	0.10	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.84573E-2	-1.42795E-2	-1.00399E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-2.38122E-7	-3.45354E-8	-2.42818E-8
Poly Factor (B)	-9.49094E-2	-1.37650E-2	-9.67811E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	3.34678E-1	4.85392E-2	3.41278E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	17/01/2025	Readout No:	2108
Serial No:	378365	Baro:	1028	Cable Length:	33m
Works ID:	G117 9 120	Temp °C:	20	M Marking:	1727m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9060.2	9060.8	9060.5	0.6	0.0	0.18	0.00
10.0	69.0	8363.9	8364.9	8364.4	68.9	69.0	-0.03	0.00
20.0	138.0	7664.0	7665.0	7664.5	137.5	138.0	-0.14	0.00
30.0	207.0	6960.7	6961.6	6961.1	206.5	207.0	-0.15	-0.01
40.0	276.0	6252.9	6253.7	6253.3	275.9	276.0	-0.04	0.00
50.0	345.0	5541.3	5542.1	5541.7	345.6	345.0	0.18	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.80436E-2	-1.42195E-2	-9.99770E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.83616E-7	-5.56369E-8	-3.91181E-8
Poly Factor (B)	-9.24417E-2	-1.34071E-2	-9.42647E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.13811E-1	3.10096E-2	2.18027E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	17/01/2025	Readout No:	2108
Serial No:	378391	Baro:	1028	Cable Length:	33m
Works ID:	G117 9 146	Temp °C:	20	M Marking:	1366m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9462.2	9462.8	9462.5	0.7	0.0	0.20	0.01
10.0	69.0	8785.2	8785.8	8785.5	68.9	69.0	-0.04	0.00
20.0	138.0	8104.5	8105.0	8104.7	137.4	137.9	-0.17	-0.02
30.0	207.0	7417.9	7418.5	7418.2	206.5	207.1	-0.14	0.02
40.0	276.0	6728.9	6729.4	6729.2	275.9	276.0	-0.03	0.01
50.0	345.0	6036.0	6036.6	6036.3	345.6	345.0	0.19	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.00677E-1	-1.46015E-2	-1.02662E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-4.27256E-7	-6.19661E-8	-4.35682E-8
Poly Factor (B)	-9.40550E-2	-1.36410E-2	-9.59097E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.67650E-1	2.43147E-2	1.70956E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	15/01/2025	Readout No:	2108
Serial No:	378315	Baro:	1026	Cable Length:	33m
Works ID:	G117 9 70	Temp °C:	20	M Marking:	0114m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	10439.8	10439.6	10439.7	0.9	0.0	0.25	0.00
10.0	69.0	9746.1	9746.0	9746.0	68.8	69.0	-0.05	0.00
20.0	138.0	9046.9	9046.9	9046.9	137.3	138.0	-0.20	0.00
30.0	207.0	8342.1	8342.2	8342.1	206.3	207.0	-0.19	0.01
40.0	276.0	7633.1	7633.2	7633.2	275.8	276.0	-0.06	-0.01
50.0	345.0	6917.6	6917.8	6917.7	345.9	345.0	0.25	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.79458E-2	-1.42053E-2	-9.98773E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-5.15256E-7	-7.47290E-8	-5.25417E-8
Poly Factor (B)	-8.90019E-2	-1.29082E-2	-9.07570E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.35579E-1	1.96634E-2	1.38253E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378300	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 55	Temp °C:	20	M Marking:	0517m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	8958.8	8957.9	8958.4	0.4	0.0	0.12	0.01
10.0	69.0	8267.0	8266.3	8266.6	68.9	69.0	-0.03	-0.01
20.0	138.0	7572.0	7571.3	7571.7	137.7	138.0	-0.10	-0.01
30.0	207.0	6874.3	6873.8	6874.0	206.7	207.0	-0.09	0.01
40.0	276.0	6174.3	6174.1	6174.2	275.9	276.0	-0.02	0.01
50.0	345.0	5472.4	5472.5	5472.5	345.4	345.0	0.11	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.89515E-2	-1.43512E-2	-1.00903E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-2.47962E-7	-3.59626E-8	-2.52852E-8
Poly Factor (B)	-9.53731E-2	-1.38322E-2	-9.72538E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.24472E-1	3.25558E-2	2.28899E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	17/01/2025	Readout No:	2108
Serial No:	378366	Baro:	1028	Cable Length:	33m
Works ID:	G117 9 121	Temp °C:	20	M Marking:	1199m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9796.2	9797.3	9796.7	0.5	0.0	0.14	0.00
10.0	69.0	9113.7	9114.5	9114.1	68.9	69.0	-0.03	0.00
20.0	138.0	8428.3	8429.4	8428.9	137.6	138.0	-0.11	-0.01
30.0	207.0	7740.4	7741.3	7740.9	206.6	207.0	-0.12	-0.01
40.0	276.0	7048.0	7048.9	7048.5	276.0	276.1	0.00	0.03
50.0	345.0	6355.7	6356.4	6356.0	345.4	345.0	0.12	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.00252E-1	-1.45398E-2	-1.02229E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-2.90604E-7	-4.21471E-8	-2.96335E-8
Poly Factor (B)	-9.55580E-2	-1.38590E-2	-9.74424E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.37574E-1	1.99528E-2	1.40287E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	17/01/2025	Readout No:	2108
Serial No:	378426	Baro:	1028	Cable Length:	33m
Works ID:	G117 9 181	Temp °C:	20	M Marking:	1834m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9121.6	9122.3	9122.0	0.3	0.1	0.09	0.01
10.0	69.0	8430.6	8431.2	8430.9	68.9	69.0	-0.03	-0.01
20.0	138.0	7737.5	7738.5	7738.0	137.7	137.9	-0.08	-0.02
30.0	207.0	7041.2	7042.1	7041.6	206.8	207.0	-0.04	0.01
40.0	276.0	6344.4	6345.1	6344.8	276.0	276.1	0.01	0.03
50.0	345.0	5647.7	5648.5	5648.1	345.2	344.9	0.06	-0.02

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.92808E-2	-1.43990E-2	-1.01239E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-1.58931E-7	-2.30502E-8	-1.62065E-8
Poly Factor (B)	-9.69333E-2	-1.40585E-2	-9.88449E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.90762E-1	2.76667E-2	1.94524E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378312	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 67	Temp °C:	20	M Marking:	0349m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9326.2	9326.7	9326.4	0.6	0.1	0.15	0.01
10.0	69.0	8641.5	8641.9	8641.7	68.9	69.0	-0.03	-0.01
20.0	138.0	7953.8	7954.0	7953.9	137.5	137.9	-0.14	-0.03
30.0	207.0	7260.8	7260.9	7260.8	206.7	207.1	-0.09	0.02
40.0	276.0	6566.6	6566.8	6566.7	275.9	276.0	-0.02	0.01
50.0	345.0	5870.1	5870.4	5870.2	345.4	345.0	0.13	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.97906E-2	-1.44729E-2	-1.01758E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.08809E-7	-4.47874E-8	-3.14899E-8
Poly Factor (B)	-9.50976E-2	-1.37923E-2	-9.69729E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.92952E-1	2.79844E-2	1.96757E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	19/01/2024	Readout No:	2108
Serial No:	370782	Baro:	1014	Cable Length m:	55M
Works ID:	G24 12 95	Temp °C:	20		

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9333.7	9334.2	9333.9	1.3	0.0	0.25	0.00
15.1	104.0	8517.6	8518.4	8518.0	103.7	104.0	-0.05	0.00
30.2	208.0	7695.4	7696.1	7695.7	206.9	207.9	-0.20	-0.01
45.2	312.0	6866.5	6867.3	6866.9	310.9	312.0	-0.20	0.00
60.3	416.0	6031.3	6032.1	6031.7	415.7	416.0	-0.04	0.01
75.4	520.0	5190.8	5191.6	5191.2	521.2	519.9	0.24	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.25495E-1	-1.82008E-2	-1.27970E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-5.65340E-7	-8.19928E-8	-5.76489E-8
Poly Factor (B)	-1.17283E-1	-1.70098E-2	-1.19596E-2
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.48789E-1	3.60825E-2	2.53695E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	09/01/2025	Readout No:	2108
Serial No:	378257	Baro:	1004	Cable Length:	33m
Works ID:	G117 9 12	Temp °C:	20	M Marking:	599m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9100.3	9098.6	9099.4	0.3	0.0	0.09	0.00
10.0	69.0	8416.8	8415.1	8415.9	68.9	69.0	-0.02	0.00
20.0	138.0	7730.0	7730.3	7730.1	137.8	138.0	-0.07	0.01
30.0	207.0	7043.2	7042.9	7043.0	206.7	207.0	-0.08	-0.01
40.0	276.0	6353.4	6353.4	6353.4	275.9	276.0	-0.02	0.00
50.0	345.0	5661.6	5661.8	5661.7	345.3	345.0	0.10	0.00

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-1.00354E-1	-1.45545E-2	-1.02333E-2
	kPa	psi	mH ₂ O
Poly Factor (A)	-2.09183E-7	-3.03384E-8	-2.13308E-8
Poly Factor (B)	-9.72657E-2	-1.41067E-2	-9.91838E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	2.50211E-1	3.62887E-2	2.55145E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

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CALIBRATION REPORT

N. 2505193

Serial Number: P250939

Product Code: OPK20S70000

Model: PIEZOMETER 700 kPa

Type: Vibrating Wire + NTC

Calibration Date: 01/04/2025 17:06

Job Number: 25-00325

Project Code:

Cable (m): 55

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: $31 \pm 10\%$

Barometric Pressure: 997 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.389221$ [kPa/°C]

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [kPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [kPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-2.2802E-01$ [kPa/digit] **B=** $2.0373E+03$ [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.2168 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [kPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $1.6518E-11$ [kPa/digit³] **B=** $-1.1116E-06$ [kPa/digit²] **C=** $-2.1432E-01$ [kPa/digit] **D=** $1.9909E+03$ [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.1113 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [kPa]

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

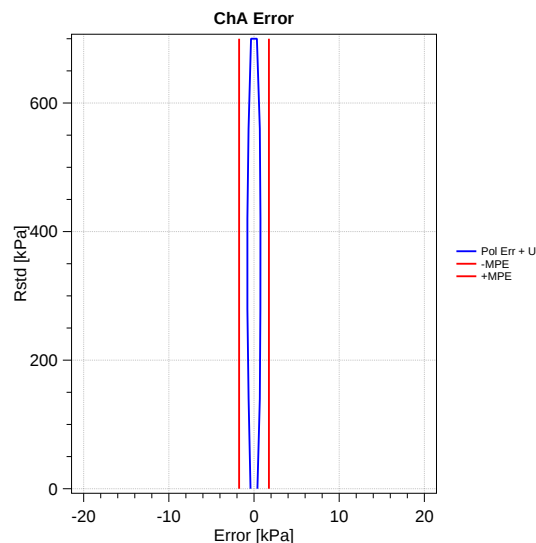
COMPLIANT

To the Datasheet

Issue Date: 02.04.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	8929.838	0.1681952	1.166325	0.2440894
140	8319.688	0.1780334	140.2915	140.4592
280	7707.636	0.1904966	279.8505	280.5882
420	7093.812	0.2051069	419.8134	420.5738
560	6478.071	0.2214398	560.2135	560.421
700	5860.369	0.2391424	701.0607	700.1113
700	5861.296	0.2391424	700.8494	699.9021
560	6481.958	0.2214398	559.3272	559.5401
420	7098.75	0.2051069	418.6875	419.4499
280	7712.646	0.1904966	278.7081	279.4433
140	8323.883	0.1780334	139.335	139.4969
0	8931.896	0.1681952	0.6970634	-0.2297036



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



CALIBRATION REPORT

N. 2513449

Serial Number: P252864

Product Code: OPK20S70000

Model: PIEZOMETER 700 kPa

Type: Vibrating Wire + NTC

Calibration Date: 03/09/2025 16:13

Job Number: 25-00894

Project Code:

Cable (m): 55

Test Conditions

Temperature: 22 ± 0.5 °C

Humidity: 45 ± 10%

Barometric Pressure: 993 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.3234048 \text{ [kPa/°C]}$

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT \text{ [kPa]}$; $P_{tc} = R_{cp} + \Delta T \cdot kT \text{ [kPa]}$

Linear Sensitivity Factors: ⁽¹⁾ **A=** -1.9765E-01 [kPa/digit] **B=** 1.9059E+03 [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.2404 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B \text{ [kPa]}$

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** 2.9771E-11 [kPa/digit³] **B=** -1.4940E-06 [kPa/digit²] **C=** -1.7974E-01 [kPa/digit] **D=** 1.8442E+03 [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.1012 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D \text{ [kPa]}$

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

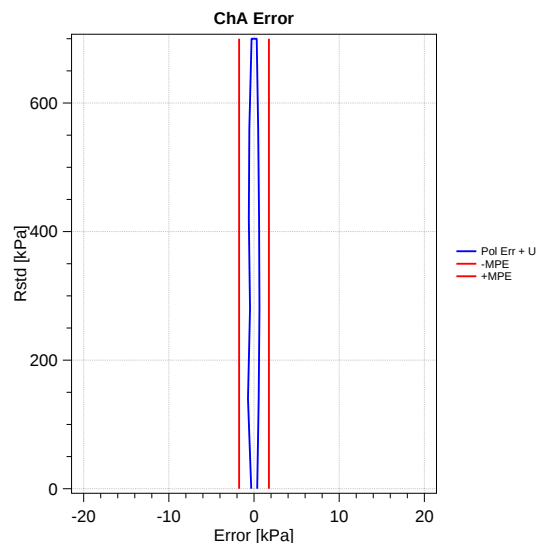
COMPLIANT

To the Datasheet

Issue Date: 03.09.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	9635.718	0.1486068	1.466184	0.1770364
140	8933.097	0.1596566	140.3362	140.5489
280	8230.159	0.1734454	279.2689	280.2962
420	7521.502	0.1893758	419.3319	420.4213
560	6809.666	0.2069539	560.0233	560.3434
700	6094.264	0.2257952	701.4194	700.0621
700	6095.043	0.2257952	701.2655	699.9105
560	6812.844	0.2069539	559.3952	559.7207
420	7525.678	0.1893758	418.5066	419.5979
280	8234.001	0.1734454	278.5096	279.5344
140	8937.799	0.1596566	139.4069	139.6117
0	9637.724	0.1486068	1.069706	-0.2246533



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



CALIBRATION REPORT

N. 2505207

Serial Number: P250953

Product Code: OPK20S70000

Model: PIEZOMETER 700 kPa

Type: Vibrating Wire + NTC

Calibration Date: 01/04/2025 17:06

Job Number: 25-00325

Project Code:

Cable (m): 55

Test Conditions

Temperature: 21 ± 0.5 °C

Humidity: $31 \pm 10\%$

Barometric Pressure: 997 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)
Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.3134086$ [kPa/°C]

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT$ [kPa]; $P_{tc} = R_{cp} + \Delta T \cdot kT$ [kPa]

Linear Sensitivity Factors: ⁽¹⁾ **A=** $-2.1022E-01$ [kPa/digit] **B=** $1.7957E+03$ [kPa]

Maximum Linear Error + U: ⁽²⁾ 0.2395 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B$ [kPa]

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** $1.7297E-11$ [kPa/digit³] **B=** $-1.2802E-06$ [kPa/digit²] **C=** $-1.9512E-01$ [kPa/digit] **D=** $1.7479E+03$ [kPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0625 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D$ [kPa]

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

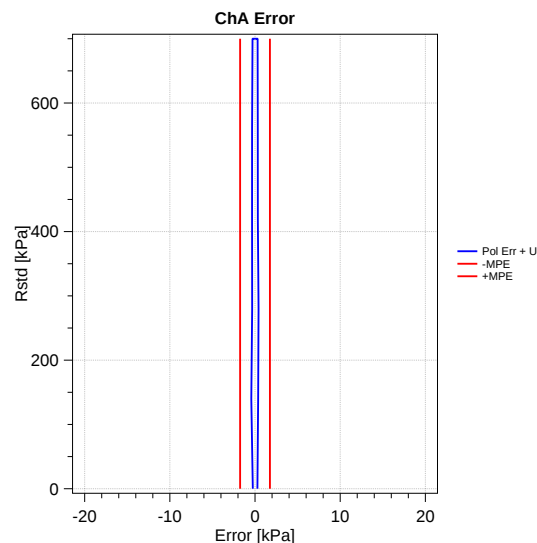
COMPLIANT

To the Datasheet

Issue Date: 02.04.2025

CQE: *Mario Brioni*

Ch. A				
Rstd ⁽⁶⁾ [kPa]	Rmeas ⁽⁷⁾ [digit]	U [kPa]	Rcl ⁽³⁾ [kPa]	Rcp ⁽⁵⁾ [kPa]
0	8534.701	0.1566738	1.450945	0.1028215
140	7875.509	0.1671913	140.0295	140.27
280	7214.062	0.1804052	279.082	280.1553
420	6548.306	0.1957701	419.0405	420.1514
560	5878.621	0.2128207	559.8248	560.1326
700	5204.96	0.2311843	701.4451	700.0624
700	5205.611	0.2311843	701.3082	699.9276
560	5879.79	0.2128207	559.5791	559.889
420	6549.672	0.1957701	418.7533	419.8651
280	7215.904	0.1804052	278.6948	279.7669
140	7877.725	0.1671913	139.5636	139.8001
0	8535.762	0.1566738	1.227896	-0.1233786



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



CALIBRATION REPORT

N. 2512663

Serial Number: P252808

Product Code: OPK20SE1000

Model: PIEZOMETER 1.0 MPa

Type: Vibrating Wire + NTC

Calibration Date: 26/08/2025 16:45

Job Number: 25-00887

Project Code:

Cable (m): 85

Test Conditions

Temperature: 22 ± 0.5 °C

Humidity: 44 ± 10%

Barometric Pressure: 998 ± 5 hPa

Calibration Method

Calibration is made by direct comparison method using a calibration bench.

Calibration is made at SISGEO laboratory. SISGEO S.r.l. is a Certified UNI EN ISO 9001 Company.

Calibration procedures: IST 10/01*; IST 10/04*; IST 10/06*; IST 10/13*; IST 10/28* (*: according to the instruments model in the current revision or in previous versions in case of discontinued instruments)

Calibration is made according to inclinometric, displacement, load and pressure conventions reported in standard for calibration equipment.

The metrological traceability of the reference standards is guaranteed by the calibration certificates issued by laboratories accredited by an accreditation body signatory of Mutual Recognition Agreements (EA - European cooperative for Accreditation, IAF - International Accreditation Forum, ILAC - International Laboratory Accreditation Cooperation for Mutual Recognition Agreements)

Sisgeo's Standard References:

Pressure Control Module 154: GE DRUCK, CM1, LAT150 1995/MP/2024

Universal counter 185: TTi, TF930, LAT 019 68779

- The measurement results reported in this Calibration Report were obtained following the calibration procedures and the reference standard written above. They relate only to the calibrated item and they are valid only for the time and conditions of calibration, unless otherwise specified.

- The measurements uncertainties (U) stated in this document have been determined according to the ISO/IEC Guide 98. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage k factor corresponding to a confidence level of about 95%. Usually the k factor is 2.

- MPE: Maximum Permissible Error

RESULTS

Temperature Linear Factor: $kT = 0.0004188088 \text{ [MPa/°C]}$

Reading thermically compensated: $P_{tc} = R_{cl} + \Delta T \cdot kT \text{ [MPa]}$; $P_{tc} = R_{cp} + \Delta T \cdot kT \text{ [MPa]}$

Linear Sensitivity Factors: ⁽¹⁾ **A=** -2.0212E-04 [MPa/digit] **B=** 1.6948E+00 [MPa]

Maximum Linear Error + U: ⁽²⁾ 0.3905 [%FS]

MPE Lin. = 0.4 [%FS]

Final Linear Reading: ⁽³⁾ $R_{cl} = A \cdot R_{meas} + B \text{ [MPa]}$

Polynomial Sensitivity Factors: ⁽⁴⁾ **A=** 2.3773E-14 [MPa/digit³] **B=** -1.4567E-09 [MPa/digit²] **C=** -1.8754E-04 [MPa/digit] **D=** 1.6576E+00 [MPa]

Maximum Polynomial Error + U: ⁽²⁾ 0.0993 [%FS]

MPE Pol. = 0.25 [%FS]

Final Polynomial Readings: ⁽⁵⁾ $R_{cp} = A \cdot R_{meas}^3 + B \cdot R_{meas}^2 + C \cdot R_{meas} + D \text{ [MPa]}$

CRITERIA |Max Lin. Err.| + U < |MPE Lin.|

|Max Pol. Err.| + U < |MPE Pol.|

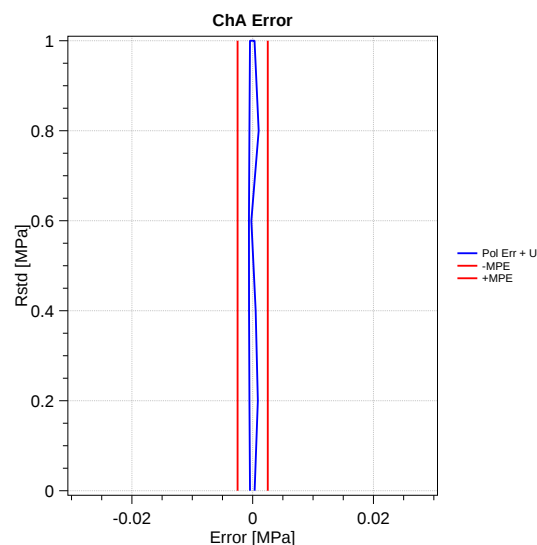
COMPLIANT

To the Datasheet

Issue Date: 26.08.2025

CQE: *Mario Bruni*

Ch. A				
Rstd ⁽⁶⁾ [MPa]	Rmeas ⁽⁷⁾ [digit]	U [MPa]	Rcl ⁽³⁾ [MPa]	Rcp ⁽⁵⁾ [MPa]
0	8367.295	0.0001514682	0.003594697	0.0002907933
0.2	7396.372	0.0001678452	0.199838	0.200367
0.4	6416.984	0.0001892709	0.3977923	0.4004124
0.6	5428.339	0.0002142359	0.5976176	0.6004044
0.8	4429.698	0.0002416458	0.7994633	0.8002954
1	3419.552	0.0002707589	1.003634	1.000174
1	3420.611	0.0002707589	1.00342	0.9999657
0.8	4434.958	0.0002416458	0.7984002	0.7992483
0.6	5430.315	0.0002142359	0.5972182	0.6000067
0.4	6420.516	0.0001892709	0.3970784	0.3996943
0.2	7401.509	0.0001678452	0.1987997	0.1993129
0	8369.531	0.0001514682	0.003142756	-0.0001718962



- LEGEND**
- (1): Linear factors obtained by means of linear formula according to the least squares method.
 - (2): The errors shows related to residual error on the calibration step applying:
 - linear/polynomial correction + Uncertainty (for analog instrument);
 - polynomial correction (internally applied) + Uncertainty (for digital instrument).
 - (3): Values calculated using linear correction (for analog instrument).
 - (4): Polynomial factors obtained by means of linear multiply regression formula (for analog instrument).
 - (5): Values calculated using polynomial correction (for analog instrument).
 - (6): Reference readings.
 - (7): Instruments readings.

- NOTES:**
- a) % F.S. error is calculated on whole range.
 - b) Resulting error depends on the effects of repeatability (for digital instrument) linearity and hysteresis.
 - c) The errors reported into the charts are the results of the sum of each step error and the related measure uncertainty (repeatability).

digit = Hz²/1000

WIRING: Red = VW; Black = VW; White = Thermistor; Green = Thermistor; Shield = Ground



GEOSENSE QUALITY FORM
GQF-149
ISS. 11
DATE : AUG-24
SIG. GC

Nova House, Rougham Industrial Estate, Rougham, Bury St Edmunds

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Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	27/11/2024	Readout No:	2108
Serial No:	378230	Baro:	998	Cable Length:	33m
Works ID:	G116 9 35	Temp °C:	20	M Marking:	1773m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9001.0	9000.9	9001.0	0.6	0.0	0.19	0.01
10.0	69.0	8286.6	8286.7	8286.6	68.9	69.0	-0.03	0.00
20.0	138.0	7568.9	7569.0	7569.0	137.4	137.9	-0.17	-0.02
30.0	207.0	6845.5	6845.5	6845.5	206.5	207.0	-0.13	0.01
40.0	276.0	6119.0	6119.2	6119.1	275.9	276.1	-0.02	0.02
50.0	345.0	5389.6	5389.8	5389.7	345.6	345.0	0.17	-0.01

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.55195E-2	-1.38535E-2	-9.74032E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-3.59713E-7	-5.21701E-8	-3.66807E-8
Poly Factor (B)	-9.03429E-2	-1.31027E-2	-9.21245E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.05781E-1	1.53417E-2	1.07867E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

CALIBRATED TO UKAS TRACEABLE STANDARD - ISO 9001:2015

THIS IS AN ELECTRONIC CERTIFICATE AND IS VALID WITHOUT A SIGNATURE

M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR



GEOSENSE QUALITY FORM
GQF-149
ISS. 11
DATE : AUG-24
SIG. GC

Nova House, Rougham Industrial Estate, Rougham, Bury St Edmunds
 Tel: +44(0)1359 270457 - Fax: +44(0)1359 272860
 Website: www.geosense.co.uk

STANDARD VW PIEZOMETER LAE CALIBRATION

Model:	VWP-3000	Cal Date:	19/11/2024	Readout No:	2108
Serial No:	377869	Baro:	987	Cable Length:	33m
Works ID:	G113 9 149	Temp °C:	20	M Marking:	164m

Applied Pressure		Readings [digit]			Calculated Pressure		Error % FSO	
psi	kPa	1st Cycle	2nd Cycle	avg.[digit]	lin.[kPa]	polyn.[kPa]	linear	polynomial
0.0	0.0	9287.7	9287.8	9287.7	0.3	0.1	0.09	0.02
10.0	69.1	8584.5	8584.8	8584.6	69.0	69.0	-0.04	-0.03
20.0	138.0	7880.3	7880.6	7880.5	137.7	137.9	-0.08	-0.02
30.0	207.0	7172.1	7172.3	7172.2	206.9	207.1	-0.03	0.02
40.0	276.0	6463.7	6464.0	6463.9	276.1	276.1	0.02	0.03
50.0	345.0	5755.9	5756.3	5756.1	345.2	344.9	0.05	-0.02

CALIBRATION FACTORS

	kPa per digit	psi per digit	mH ₂ O per digit
Linear Factor (K)	-9.76451E-2	-1.41617E-2	-9.95706E-3
	kPa	psi	mH ₂ O
Poly Factor (A)	-1.42845E-7	-2.07172E-8	-1.45662E-8
Poly Factor (B)	-9.54961E-2	-1.38501E-2	-9.73793E-3
Poly Factor (C)			
	kPa per °C	psi per °C	mH ₂ O per °C
Thermal (T)	1.70817E-1	2.47740E-2	1.74185E-2

THE EQUIPMENT USED IN THE CALIBRATION OF THE PRODUCT DETAILED ABOVE IS TRACEABLE TO
 NATIONAL/INTERNATIONAL STANDARDS

$$\text{Digits} = \text{Hz}^2 \times 10^{-3}$$

$$\text{Linear calc} = k (\text{kPa}) * (\text{Current Reading} - \text{Site Zero Reading}) + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$\text{Polynomial calculation} = A * (\text{Reading})^2 + B * (\text{Reading}) + C + T * (\text{Current Temp} - \text{Site Zero Temp})$$

$$C = -A * (\text{Site Zero Reading})^2 - B * (\text{Site Zero Reading})$$

CALIBRATED TO UKAS TRACEABLE STANDARD - ISO 9001:2015

THIS IS AN ELECTRONIC CERTIFICATE AND IS VALID WITHOUT A SIGNATURE

M MARKING TAKEN FROM SENSOR END, USED AS AN INDICATOR