

CERTIFICADO DE CALIBRACIÓN / CALIBRATION CERTIFICATE

INNOVATECIS CIA LTDA

General José María Guerrero N69-170 y Alfonso del Hierro

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Certificado No. (Certificate #): 61964.1

Fecha de Recepción (Reception Date): 2025-10-02

Fecha de Calibración (Calibration Date): 2025-10-02

Próxima Fecha de Calibración (Calibration Due): 2026-10

Fecha de Emisión (Emission Date): 2025-10-10

Cliente (Client): MISSIONPETROLEUM S.A.
JIVINO VERDE (EL PROYECTO) KM1, VÍA SHUSHUFINDI

Información del Instrumento (Instrument Information)

Equipo (Instrument):	Controlador de temperatura	Int. de Medición:	(90 a 900) °C	Ubicación:	Horno de tratamiento térmico
Marca (Brand):	Yudian	División de escala:	0.1 °C	Lugar de Calibración:	In Situ
Modelo (Model):	*****			(Place of Calibration):	On Site
Serie (Serial #):	GB17466.1.24				
Código (Code #):	*****				

Datos de Calibración (Calibration Info)

Procedimiento (Procedure): INN-PC-29

Condiciones Ambientales (Environmental Conditions)

Temp. Inicial (Initial Temp.):	28.5 °C	Hum. Inicial (Initial Hum.):	64.8 %HR
Temp. Final (Final Temp.):	28.9 °C	Hum. Final (Final Hum.):	64.1 %HR

Trazabilidad (Traceability Info)

Patrón (Standard)	Marca (Brand)	Cert. #	Última Calibración (Last Cal.)	Período (Period)
Termocupla	-	56710, 56711, 56712, 56713	2025-05-14	1 año
Termocupla	-	56721, 56721, 56722, 56725	2025-05-14	1 año
-	-	-	-	-

Resultados (Results)

Ver Resultados en Hoja Adjunta

See results in attached Sheet

El presente Certificado de Calibración posee la trazabilidad en esta magnitud hacia el Patrón Nacional, a través de la realización de la unidad de medida en el NPL, NIST, u otro Laboratorio Nacional reconocido al Sistema Internacional de Medidas. La calibración fue realizada bajo un Sistema de Gestión de Laboratorio conforme a la Norma ISO/IEC 17025:2017. Los resultados y su incertidumbre reportada con un nivel de confianza de k=2, 95% son relacionados a este instrumento y en el tiempo que se realizó las medidas. Este Laboratorio no se responsabiliza de los perjuicios que pueda ocasionar el uso inadecuado del instrumento calibrado. La reproducción parcial es prohibida, la reproducción total deberá hacerse con la autorización escrita aprobada por INNOVATEC Industrial Solutions. *This Certificate of Calibration provides traceability of measurement to the National Standard, through units of measurement realized at the NPL, NIST or other recognized National Standard Laboratories to the International System of Units. The calibration was performed under a Laboratory Management System in accordance with the ISO/IEC 17025:2017 Standard. The results and the reported uncertainty at a confidence level of k=2, 95% are related only to this instrument and at the time of measurement. This Laboratory is not responsible for any damages that may result from improper use of the calibrated instrument. Partial reproduction is forbidden, the total reproduction must have an approved written authorization by INNOVATEC Industrial Solutions.*

Comentarios: Los resultados fueron evaluados bajo las normas: Specific for Drill-through Equipment, API Specification 16A, Fourth Edition, April 2017, Effective Date: October 1, 2017; Specification for Wellhead and Christmas Tree Equipment ANSI/API Specification 6A, Twentieth Edition, October 2010, Effective Date: April 1, 2011. El horno se encuentra dentro de las tolerancias especificadas por las mismas normas en Error Máximo Permitido (± 13 °C), pero no dentro de Estabilidad Máxima: (± 8 °C)

Calibrado por: Jonathan Fonseca
Calibrated by:

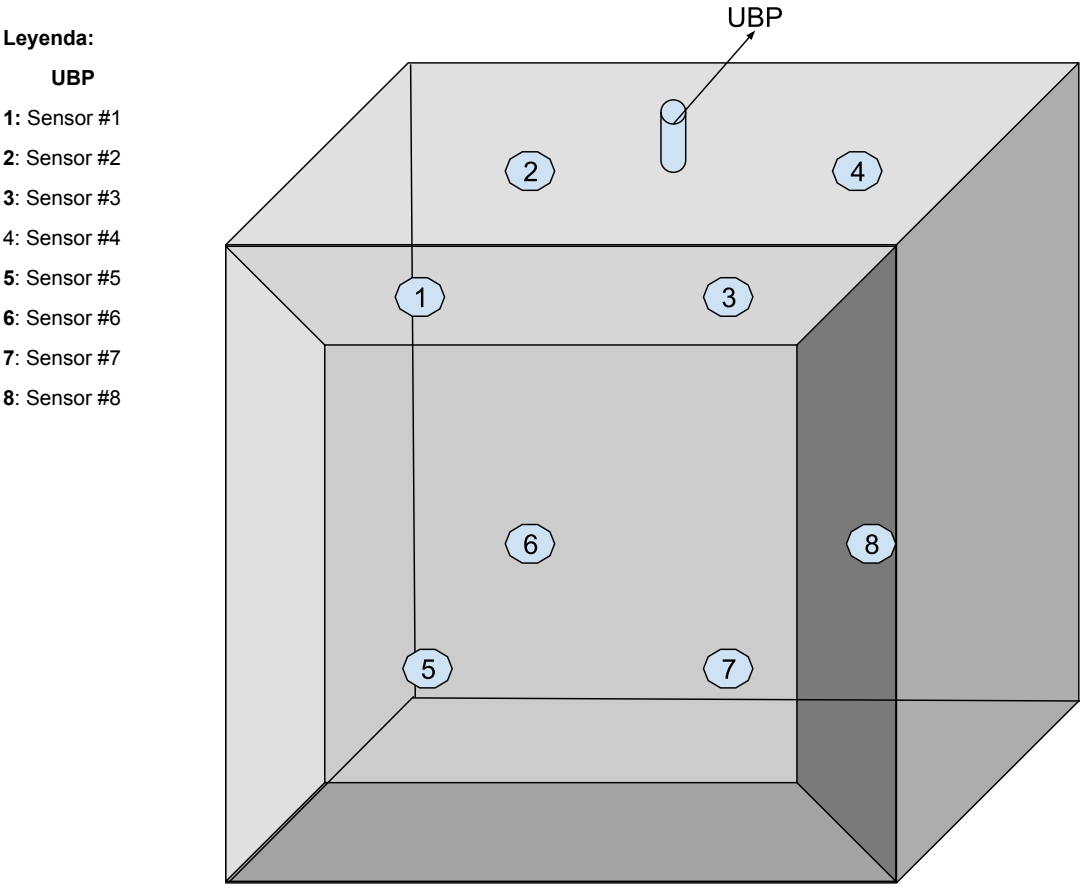
Aprobado por:
Approved by:



Fin de Certificado (End of Certificate)

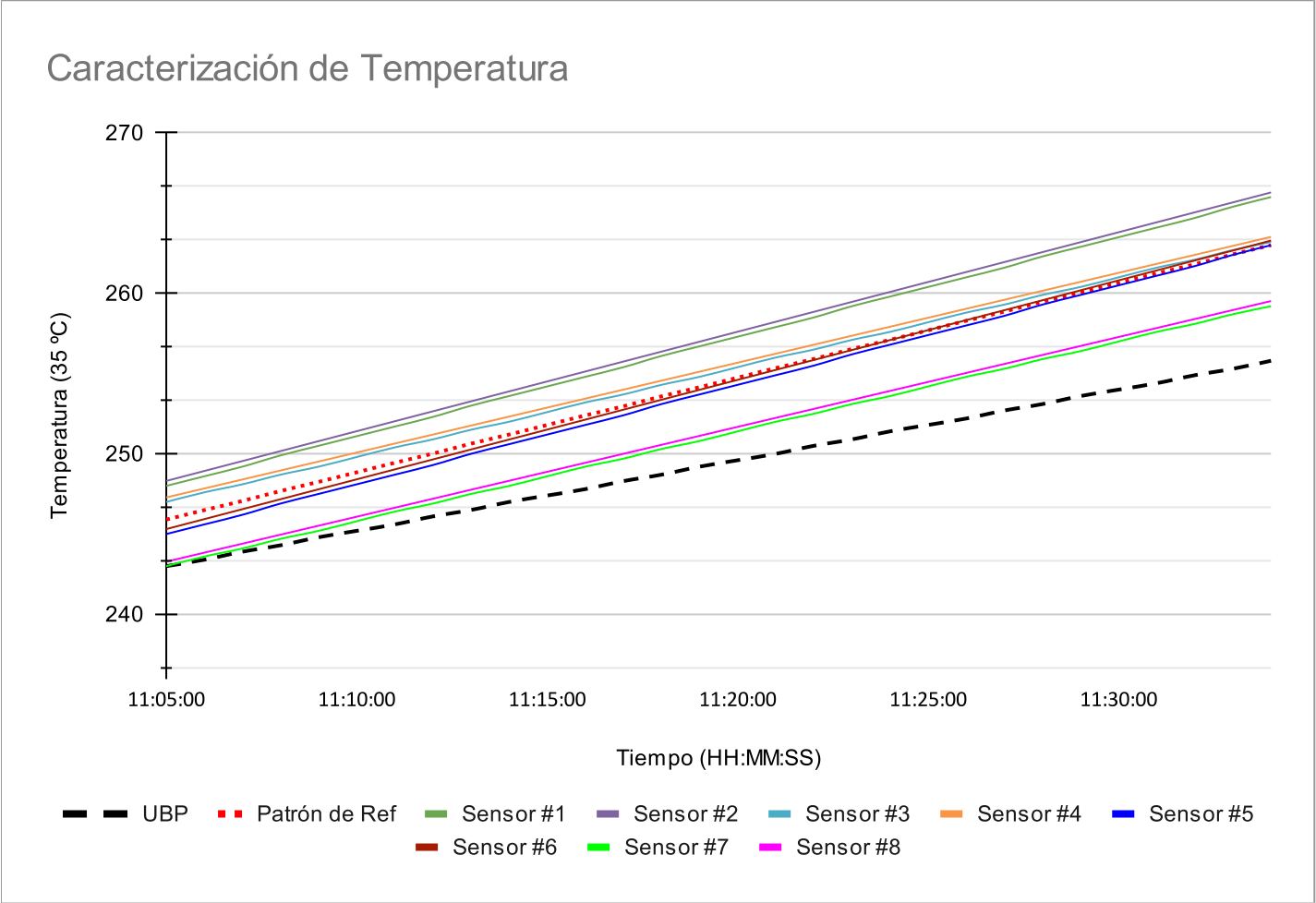
Certificado No.:		61964.1		Equipo (Instrument): Controlador de temperatura			
Fecha de Calibración:		2025-10-02		Marca (Brand): Yudian			
Nominal (Nominal)	Patrón (Standard)	UBP (UUT)	Error (Error)	Precisión (Accuracy)	Estabilidad (Stability)	Uniformidad (Uniformity)	Incertidumbre (Uncertainty)
250 °C	254.453 °C	249.38 °C	-5.073 °C	± 8.0 °C	11.838 °C	3.803 °C	± 7.6 °C
450 °C	446.327 °C	442.05 °C	-4.277 °C	± 8.0 °C	12.127 °C	3.957 °C	± 7.0 °C
650 °C	659.612 °C	653.92 °C	-5.689 °C	± 8.0 °C	2.728 °C	2.728 °C	± 4.5 °C

Diagram de Posición de Sensores (Sensor Position Diagram)



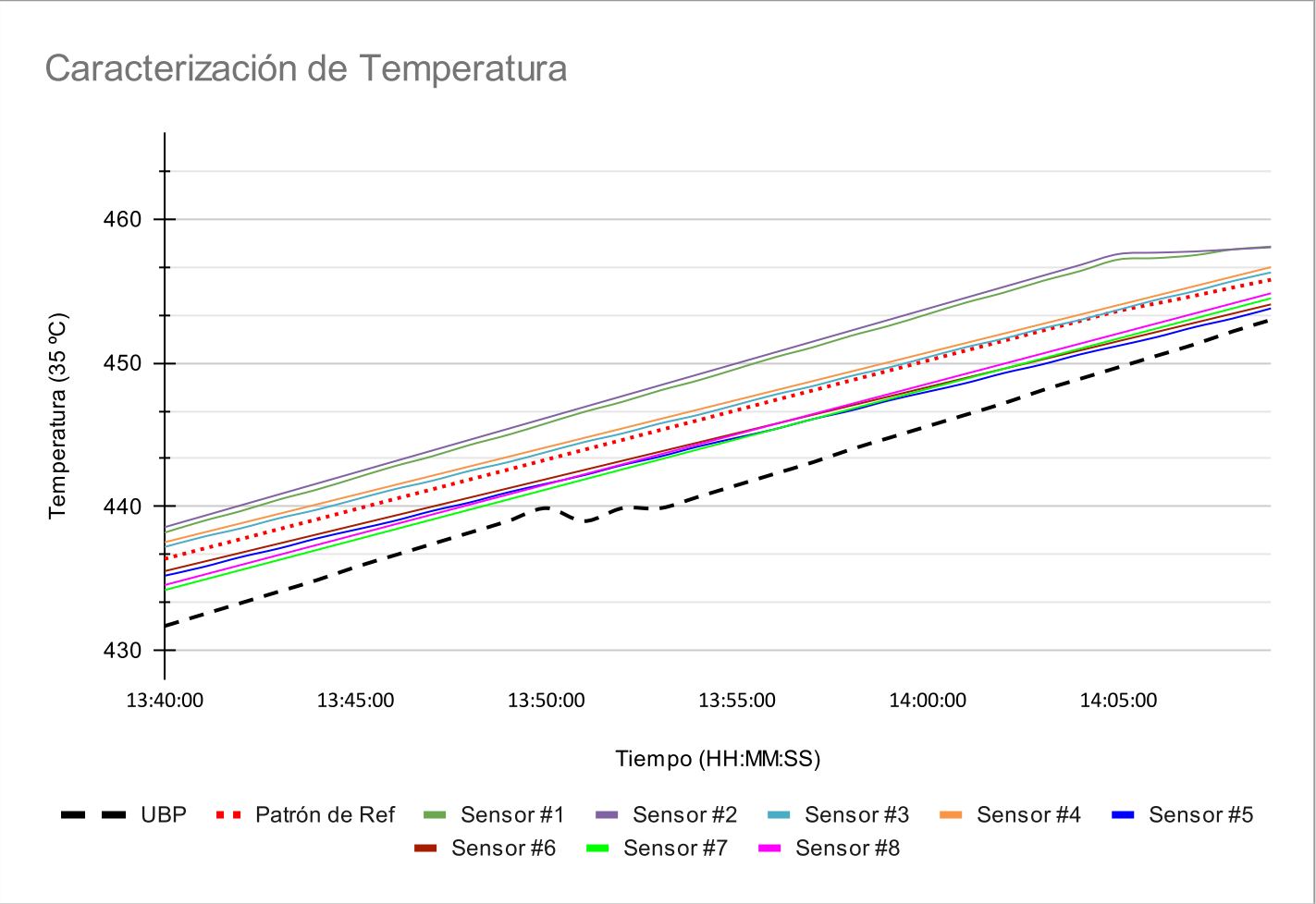
Las imagenes utilizadas solo son un ejemplo de lo puntos de medida empleados y posición de los sensores.

Hora (Time)	UBP (UUT)	Patrón de Ref (Ref. Standard)	Sensor #1 (Sensor #1)	Sensor #2 (Sensor #2)	Sensor #3 (Sensor #3)	Sensor #4 (Sensor #4)	Sensor #5 (Sensor #5)	Sensor #6 (Sensor #6)	Sensor #7 (Sensor #7)	Sensor #8 (Sensor #8)	Error (Error)
11:05:00	243 °C	245.898 °C	248.00 °C	248.31 °C	247.00 °C	247.28 °C	245.00 °C	245.31 °C	243.00 °C	243.28 °C	-2.897 °C
11:06:00	243.4 °C	246.493 °C	248.60 °C	248.93 °C	247.60 °C	247.84 °C	245.60 °C	245.93 °C	243.60 °C	243.84 °C	-3.092 °C
11:07:00	243.9 °C	247.063 °C	249.20 °C	249.55 °C	248.10 °C	248.40 °C	246.20 °C	246.55 °C	244.10 °C	244.40 °C	-3.162 °C
11:08:00	244.3 °C	247.683 °C	249.90 °C	250.17 °C	248.70 °C	248.96 °C	246.90 °C	247.17 °C	244.70 °C	244.96 °C	-3.383 °C
11:09:00	244.8 °C	248.253 °C	250.50 °C	250.79 °C	249.20 °C	249.52 °C	247.50 °C	247.79 °C	245.20 °C	245.52 °C	-3.452 °C
11:10:00	245.2 °C	248.848 °C	251.10 °C	251.41 °C	249.80 °C	250.08 °C	248.10 °C	248.41 °C	245.80 °C	246.08 °C	-3.648 °C
11:11:00	245.6 °C	249.443 °C	251.70 °C	252.03 °C	250.40 °C	250.64 °C	248.70 °C	249.03 °C	246.40 °C	246.64 °C	-3.843 °C
11:12:00	246.1 °C	250.013 °C	252.30 °C	252.65 °C	250.90 °C	251.20 °C	249.30 °C	249.65 °C	246.90 °C	247.20 °C	-3.913 °C
11:13:00	246.5 °C	250.633 °C	253.00 °C	253.27 °C	251.50 °C	251.76 °C	250.00 °C	250.27 °C	247.50 °C	247.76 °C	-4.132 °C
11:14:00	247 °C	251.203 °C	253.60 °C	253.89 °C	252.00 °C	252.32 °C	250.60 °C	250.89 °C	248.00 °C	248.32 °C	-4.202 °C
11:15:00	247.4 °C	251.798 °C	254.20 °C	254.51 °C	252.60 °C	252.88 °C	251.20 °C	251.51 °C	248.60 °C	248.88 °C	-4.397 °C
11:16:00	247.8 °C	252.393 °C	254.80 °C	255.13 °C	253.20 °C	253.44 °C	251.80 °C	252.13 °C	249.20 °C	249.44 °C	-4.593 °C
11:17:00	248.3 °C	252.963 °C	255.40 °C	255.75 °C	253.70 °C	254.00 °C	252.40 °C	252.75 °C	249.70 °C	250.00 °C	-4.662 °C
11:18:00	248.7 °C	253.583 °C	256.10 °C	256.37 °C	254.30 °C	254.56 °C	253.10 °C	253.37 °C	250.30 °C	250.56 °C	-4.882 °C
11:19:00	249.2 °C	254.153 °C	256.70 °C	256.99 °C	254.80 °C	255.12 °C	253.70 °C	253.99 °C	250.80 °C	251.12 °C	-4.952 °C
11:20:00	249.6 °C	254.748 °C	257.30 °C	257.61 °C	255.40 °C	255.68 °C	254.30 °C	254.61 °C	251.40 °C	251.68 °C	-5.148 °C
11:21:00	250 °C	255.343 °C	257.90 °C	258.23 °C	256.00 °C	256.24 °C	254.90 °C	255.23 °C	252.00 °C	252.24 °C	-5.343 °C
11:22:00	250.5 °C	255.913 °C	258.50 °C	258.85 °C	256.50 °C	256.80 °C	255.50 °C	255.85 °C	252.50 °C	252.80 °C	-5.412 °C
11:23:00	250.9 °C	256.533 °C	259.20 °C	259.47 °C	257.10 °C	257.36 °C	256.20 °C	256.47 °C	253.10 °C	253.36 °C	-5.633 °C
11:24:00	251.4 °C	257.103 °C	259.80 °C	260.09 °C	257.60 °C	257.92 °C	256.80 °C	257.09 °C	253.60 °C	253.92 °C	-5.702 °C
11:25:00	251.8 °C	257.698 °C	260.40 °C	260.71 °C	258.20 °C	258.48 °C	257.40 °C	257.71 °C	254.20 °C	254.48 °C	-5.897 °C
11:26:00	252.2 °C	258.293 °C	261.00 °C	261.33 °C	258.80 °C	259.04 °C	258.00 °C	258.33 °C	254.80 °C	255.04 °C	-6.092 °C
11:27:00	252.7 °C	258.863 °C	261.60 °C	261.95 °C	259.30 °C	259.60 °C	258.60 °C	258.95 °C	255.30 °C	255.60 °C	-6.162 °C
11:28:00	253.1 °C	259.483 °C	262.30 °C	262.57 °C	259.90 °C	260.16 °C	259.30 °C	259.57 °C	255.90 °C	256.16 °C	-6.383 °C
11:29:00	253.6 °C	260.053 °C	262.90 °C	263.19 °C	260.40 °C	260.72 °C	259.90 °C	260.19 °C	256.40 °C	256.72 °C	-6.453 °C
11:30:00	254 °C	260.648 °C	263.50 °C	263.81 °C	261.00 °C	261.28 °C	260.50 °C	260.81 °C	257.00 °C	257.28 °C	-6.647 °C
11:31:00	254.4 °C	261.243 °C	264.10 °C	264.43 °C	261.60 °C	261.84 °C	261.10 °C	261.43 °C	257.60 °C	257.84 °C	-6.843 °C
11:32:00	254.9 °C	261.813 °C	264.70 °C	265.05 °C	262.10 °C	262.40 °C	261.70 °C	262.05 °C	258.10 °C	258.40 °C	-6.912 °C
11:33:00	255.3 °C	262.433 °C	265.40 °C	265.67 °C	262.70 °C	262.96 °C	262.40 °C	262.67 °C	258.70 °C	258.96 °C	-7.132 °C
11:34:00	255.8 °C	263.003 °C	266.00 °C	266.29 °C	263.20 °C	263.52 °C	263.00 °C	263.29 °C	259.20 °C	259.52 °C	-7.202 °C



Hora (Time)	UBP (UUT)	Patrón de Ref (Ref. Standard)	Sensor #1 (Sensor #1)	Sensor #2 (Sensor #2)	Sensor #3 (Sensor #3)	Sensor #4 (Sensor #4)	Sensor #5 (Sensor #5)	Sensor #6 (Sensor #6)	Sensor #7 (Sensor #7)	Sensor #8 (Sensor #8)	Error (Error)
13:40:00	431.7 °C	436.373 °C	438.20 °C	438.58 °C	437.20 °C	437.53 °C	435.20 °C	435.52 °C	434.20 °C	434.55 °C	-4.673 °C
13:41:00	432.5 °C	437.068 °C	439.00 °C	439.34 °C	437.90 °C	438.19 °C	435.80 °C	436.16 °C	434.90 °C	435.25 °C	-4.568 °C
13:42:00	433.3 °C	437.750 °C	439.70 °C	440.10 °C	438.50 °C	438.85 °C	436.50 °C	436.80 °C	435.60 °C	435.95 °C	-4.450 °C
13:43:00	434.1 °C	438.445 °C	440.50 °C	440.86 °C	439.20 °C	439.51 °C	437.10 °C	437.44 °C	436.30 °C	436.65 °C	-4.345 °C
13:44:00	434.9 °C	439.128 °C	441.20 °C	441.62 °C	439.80 °C	440.17 °C	437.80 °C	438.08 °C	437.00 °C	437.35 °C	-4.228 °C
13:45:00	435.8 °C	439.823 °C	442.00 °C	442.38 °C	440.50 °C	440.83 °C	438.40 °C	438.72 °C	437.70 °C	438.05 °C	-4.022 °C
13:46:00	436.6 °C	440.518 °C	442.80 °C	443.14 °C	441.20 °C	441.49 °C	439.00 °C	439.36 °C	438.40 °C	438.75 °C	-3.918 °C
13:47:00	437.4 °C	441.200 °C	443.50 °C	443.90 °C	441.80 °C	442.15 °C	439.70 °C	440.00 °C	439.10 °C	439.45 °C	-3.800 °C
13:48:00	438.2 °C	441.895 °C	444.30 °C	444.66 °C	442.50 °C	442.81 °C	440.30 °C	440.64 °C	439.80 °C	440.15 °C	-3.695 °C
13:49:00	439 °C	442.578 °C	445.00 °C	445.42 °C	443.10 °C	443.47 °C	441.00 °C	441.28 °C	440.50 °C	440.85 °C	-3.577 °C
13:50:00	439.9 °C	443.273 °C	445.80 °C	446.18 °C	443.80 °C	444.13 °C	441.60 °C	441.92 °C	441.20 °C	441.55 °C	-3.373 °C
13:51:00	439 °C	443.968 °C	446.60 °C	446.94 °C	444.50 °C	444.79 °C	442.20 °C	442.56 °C	441.90 °C	442.25 °C	-4.967 °C
13:52:00	439.9 °C	444.650 °C	447.30 °C	447.70 °C	445.10 °C	445.45 °C	442.90 °C	443.20 °C	442.60 °C	442.95 °C	-4.750 °C
13:53:00	439.9 °C	445.345 °C	448.10 °C	448.46 °C	445.80 °C	446.11 °C	443.50 °C	443.84 °C	443.30 °C	443.65 °C	-5.445 °C
13:54:00	440.7 °C	446.028 °C	448.80 °C	449.22 °C	446.40 °C	446.77 °C	444.20 °C	444.48 °C	444.00 °C	444.35 °C	-5.327 °C
13:55:00	441.5 °C	446.723 °C	449.60 °C	449.98 °C	447.10 °C	447.43 °C	444.80 °C	445.12 °C	444.70 °C	445.05 °C	-5.222 °C
13:56:00	442.3 °C	447.418 °C	450.40 °C	450.74 °C	447.80 °C	448.09 °C	445.40 °C	445.76 °C	445.40 °C	445.75 °C	-5.117 °C
13:57:00	443.1 °C	448.100 °C	451.10 °C	451.50 °C	448.40 °C	448.75 °C	446.10 °C	446.40 °C	446.10 °C	446.45 °C	-5.000 °C
13:58:00	444 °C	448.795 °C	451.90 °C	452.26 °C	449.10 °C	449.41 °C	446.70 °C	447.04 °C	446.80 °C	447.15 °C	-4.795 °C
13:59:00	444.8 °C	449.478 °C	452.60 °C	453.02 °C	449.70 °C	450.07 °C	447.40 °C	447.68 °C	447.50 °C	447.85 °C	-4.677 °C
14:00:00	445.6 °C	450.173 °C	453.40 °C	453.78 °C	450.40 °C	450.73 °C	448.00 °C	448.32 °C	448.20 °C	448.55 °C	-4.572 °C
14:01:00	446.4 °C	450.868 °C	454.20 °C	454.54 °C	451.10 °C	451.39 °C	448.60 °C	448.96 °C	448.90 °C	449.25 °C	-4.468 °C
14:02:00	447.2 °C	451.550 °C	454.90 °C	455.30 °C	451.70 °C	452.05 °C	449.30 °C	449.60 °C	449.60 °C	449.95 °C	-4.350 °C
14:03:00	448.1 °C	452.245 °C	455.70 °C	456.06 °C	452.40 °C	452.71 °C	449.90 °C	450.24 °C	450.30 °C	450.65 °C	-4.145 °C
14:04:00	448.9 °C	452.928 °C	456.40 °C	456.82 °C	453.00 °C	453.37 °C	450.60 °C	450.88 °C	451.00 °C	451.35 °C	-4.028 °C
14:05:00	449.7 °C	453.623 °C	457.20 °C	457.58 °C	453.70 °C	454.03 °C	451.20 °C	451.52 °C	451.70 °C	452.05 °C	-3.923 °C
14:06:00	450.5 °C	454.148 °C	457.30 °C	457.68 °C	454.40 °C	454.69 °C	451.80 °C	452.16 °C	452.40 °C	452.75 °C	-3.648 °C
14:07:00	451.3 °C	454.683 °C	457.50 °C	457.76 °C	455.00 °C	455.35 °C	452.50 °C	452.80 °C	453.10 °C	453.45 °C	-3.382 °C
14:08:00	452.2 °C	455.251 °C	457.90 °C	457.91 °C	455.70 °C	456.01 °C	453.10 °C	453.44 °C	453.80 °C	454.15 °C	-3.051 °C
14:09:00	453 °C	455.794 °C	458.10 °C	458.05 °C	456.30 °C	456.67 °C	453.80 °C	454.08 °C	454.50 °C	454.85 °C	-2.794 °C

Caracterización de Temperatura



Hora (Time)	UBP (UUT)	Patrón de Ref (Ref. Standard)	Sensor #1 (Sensor #1)	Sensor #2 (Sensor #2)	Sensor #3 (Sensor #3)	Sensor #4 (Sensor #4)	Sensor #5 (Sensor #5)	Sensor #6 (Sensor #6)	Sensor #7 (Sensor #7)	Sensor #8 (Sensor #8)	Error (Error)
14:15:00	650.5 °C	659.674 °C	661.98 °C	661.00 °C	660.68 °C	659.79 °C	659.13 °C	658.75 °C	658.51 °C	657.55 °C	-9.174 °C
14:16:00	650.8 °C	659.588 °C	662.14 °C	660.84 °C	660.50 °C	659.76 °C	659.04 °C	658.53 °C	658.32 °C	657.57 °C	-8.787 °C
14:17:00	651.2 °C	659.626 °C	661.67 °C	660.99 °C	660.46 °C	659.96 °C	659.39 °C	658.50 °C	658.15 °C	657.89 °C	-8.426 °C
14:18:00	651.3 °C	659.564 °C	661.43 °C	660.94 °C	660.62 °C	659.84 °C	659.10 °C	658.79 °C	658.27 °C	657.52 °C	-8.264 °C
14:19:00	651.9 °C	659.548 °C	661.46 °C	660.91 °C	660.41 °C	659.64 °C	659.34 °C	658.52 °C	658.18 °C	657.92 °C	-7.648 °C
14:20:00	652.2 °C	659.588 °C	661.36 °C	661.00 °C	660.63 °C	659.67 °C	659.17 °C	658.80 °C	658.26 °C	657.81 °C	-7.388 °C
14:21:00	652.7 °C	659.661 °C	661.78 °C	660.87 °C	660.67 °C	659.95 °C	659.20 °C	658.84 °C	658.21 °C	657.77 °C	-6.961 °C
14:22:00	653.3 °C	659.636 °C	661.55 °C	661.02 °C	660.68 °C	659.79 °C	659.41 °C	658.64 °C	658.10 °C	657.90 °C	-6.336 °C
14:23:00	653.8 °C	659.630 °C	661.86 °C	660.91 °C	660.59 °C	659.77 °C	659.16 °C	658.75 °C	658.35 °C	657.65 °C	-5.830 °C
14:24:00	655.1 °C	659.684 °C	662.28 °C	660.91 °C	660.40 °C	659.72 °C	659.05 °C	658.89 °C	658.33 °C	657.89 °C	-4.584 °C
14:25:00	655.6 °C	659.630 °C	661.83 °C	660.84 °C	660.30 °C	659.54 °C	659.58 °C	658.89 °C	658.31 °C	657.75 °C	-4.030 °C
14:26:00	655.9 °C	659.561 °C	661.52 °C	660.96 °C	660.65 °C	659.68 °C	659.05 °C	658.59 °C	658.11 °C	657.93 °C	-3.661 °C
14:27:00	655.2 °C	659.719 °C	662.34 °C	660.84 °C	660.66 °C	659.66 °C	659.52 °C	658.80 °C	658.44 °C	657.49 °C	-4.519 °C
14:28:00	654.8 °C	659.609 °C	661.63 °C	661.05 °C	660.49 °C	659.88 °C	659.46 °C	658.62 °C	658.21 °C	657.53 °C	-4.809 °C
14:29:00	654.5 °C	659.574 °C	661.81 °C	660.84 °C	660.33 °C	659.85 °C	659.10 °C	658.71 °C	658.33 °C	657.62 °C	-5.074 °C
14:30:00	654.1 °C	659.480 °C	661.27 °C	660.85 °C	660.31 °C	659.56 °C	659.52 °C	658.48 °C	658.20 °C	657.65 °C	-5.380 °C
14:31:00	653.6 °C	659.634 °C	661.80 °C	661.01 °C	660.32 °C	659.91 °C	659.15 °C	658.58 °C	658.47 °C	657.83 °C	-6.034 °C
14:32:00	654.2 °C	659.659 °C	661.45 °C	660.85 °C	660.62 °C	659.87 °C	659.52 °C	658.75 °C	658.34 °C	657.87 °C	-5.459 °C
14:33:00	654.9 °C	659.573 °C	661.74 °C	660.87 °C	660.49 °C	659.73 °C	659.10 °C	658.58 °C	658.16 °C	657.91 °C	-4.673 °C
14:34:00	655.5 °C	659.569 °C	661.42 °C	660.88 °C	660.32 °C	659.98 °C	659.15 °C	658.49 °C	658.44 °C	657.87 °C	-4.069 °C
14:35:00	656.1 °C	659.630 °C	661.60 °C	660.96 °C	660.37 °C	659.83 °C	659.37 °C	658.54 °C	658.49 °C	657.88 °C	-3.530 °C
14:36:00	655.8 °C	659.681 °C	661.71 °C	660.83 °C	660.51 °C	659.71 °C	659.51 °C	658.83 °C	658.44 °C	657.91 °C	-3.881 °C
14:37:00	655.3 °C	659.599 °C	661.61 °C	661.05 °C	660.60 °C	659.74 °C	659.01 °C	658.58 °C	658.30 °C	657.90 °C	-4.299 °C
14:38:00	655.1 °C	659.655 °C	662.31 °C	660.98 °C	660.49 °C	659.78 °C	659.14 °C	658.67 °C	658.26 °C	657.61 °C	-4.555 °C
14:39:00	654.8 °C	659.681 °C	661.84 °C	661.01 °C	660.51 °C	659.88 °C	659.52 °C	658.72 °C	658.29 °C	657.68 °C	-4.881 °C
14:40:00	654.6 °C	659.524 °C	661.24 °C	660.83 °C	660.32 °C	659.72 °C	659.05 °C	658.85 °C	658.40 °C	657.78 °C	-4.924 °C
14:41:00	654.1 °C	659.528 °C	661.46 °C	660.96 °C	660.30 °C	659.53 °C	659.37 °C	658.70 °C	658.08 °C	657.82 °C	-5.427 °C
14:42:00	653.9 °C	659.590 °C	661.88 °C	660.86 °C	660.31 °C	659.63 °C	659.59 °C	658.71 °C	658.23 °C	657.51 °C	-5.690 °C
14:43:00	653.5 °C	659.615 °C	662.04 °C	660.84 °C	660.63 °C	659.65 °C	659.17 °C	658.59 °C	658.34 °C	657.66 °C	-6.115 °C
14:44:00	653.4 °C	659.666 °C	661.93 °C	661.00 °C	660.50 °C	659.81 °C	659.28 °C	658.88 °C	658.08 °C	657.85 °C	-6.266 °C

Caracterización de Temperatura

