

CERTIFICADO DE CALIBRACIÓN / CALIBRATION CERTIFICATE

INNOVATECIS CIA LTDA

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Certificado No. (Certificate #): 61953

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): 2025-10-13

Cliente (Client): QUIMPAC ECUADOR S.A QUIMPACSA
PASCUALES / ROSAVIN LOTE 1 Y COBRE, GUAYAQUIL (GUAYAS), ECUADOR

Información del Instrumento (Instrument Information)

Equipo (Instrument):	Microbaño	Int. de Medición:	(-20 a 100) °C	Ubicación:	*****
Marca (Brand):	AMETEK	(Measurement Range)		(Location):	
Modelo (Model):	CTC155C115BM01R21F	División de escala:	0.01 °C	Lugar de Calibración:	In Situ
		(Resolution)		(Place of Calibration):	On Site
Serie/Código:	710980-01616 / 00097				

Datos de Calibración (Calibration Info)

Procedimiento (Procedure): INN-PC-29

Condiciones Ambientales (Environmental Conditions)

Temp. Inicial (Initial Temp.): 21.5 °C	Hum. Inicial (Initial Hum.): 54.6 %HR
Temp. Final (Final Temp.): 22.3 °C	Hum. Final (Final Hum.): 55.1 %HR

Trazabilidad (Traceability Info)

Patrón (Standard)	Marca (Brand)	Cert. #	Última Calibración (Last Cal.)	Período (Period)
PRT	ISOTECH	AC-31859	2025-06-30	2
Advanced Multimeter	Transmille	51065	2024-03-26	2
Termocupla	-	51731 / 51732	2024-11-26	1
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

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 son un promedio de los datos tomados durante la calibración.
Comments

Calibrado por: Jonathan Fonseca
Calibrated by:

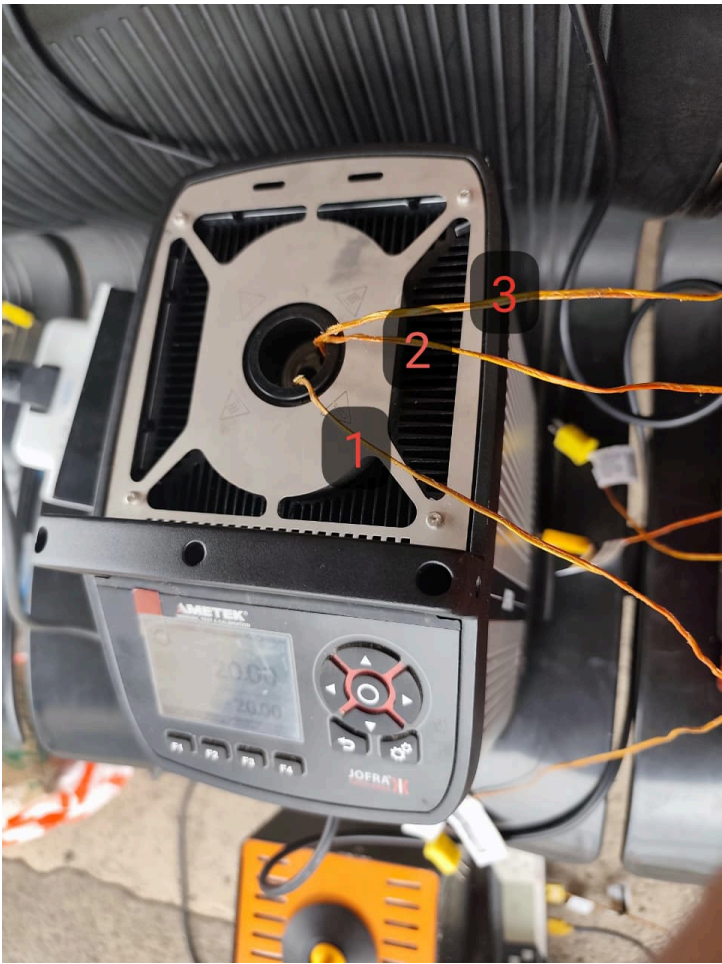
Aprobado por:
Approved by:



Fin de Certificado (End of Certificate)

Certificado No.:		61953	Equipo (Instrument): Microbaño				
Fecha de Calibración:		2025-10-02	Marca (Brand): AMETEK				
Nominal (Nominal)	Patrón (Standard)	UBP (UUT)	Error (Error)	Precisión (Accuracy)	Estabilidad (Stability)	Uniformidad (Uniformity)	Incertidumbre (Uncertainty)
-20 °C	-20.277 °C	-20.0 °C	0.277 °C	± 0.3 °C	0.767 °C	0.777 °C	± 0.13 °C
-10 °C	-10.338 °C	-10.0 °C	0.338 °C	± 0.3 °C	0.712 °C	0.650 °C	± 0.12 °C
0 °C	-0.021 °C	0.0 °C	0.021 °C	± 0.3 °C	0.431 °C	0.430 °C	± 0.12 °C
50 °C	50.267 °C	50.0 °C	-0.267 °C	± 0.3 °C	0.507 °C	0.463 °C	± 0.29 °C
100 °C	101.253 °C	100.0 °C	-1.253 °C	± 0.3 °C	0.317 °C	0.307 °C	± 0.29 °C

Diagram de Posición de Sensores (Sensor Position Diagram)

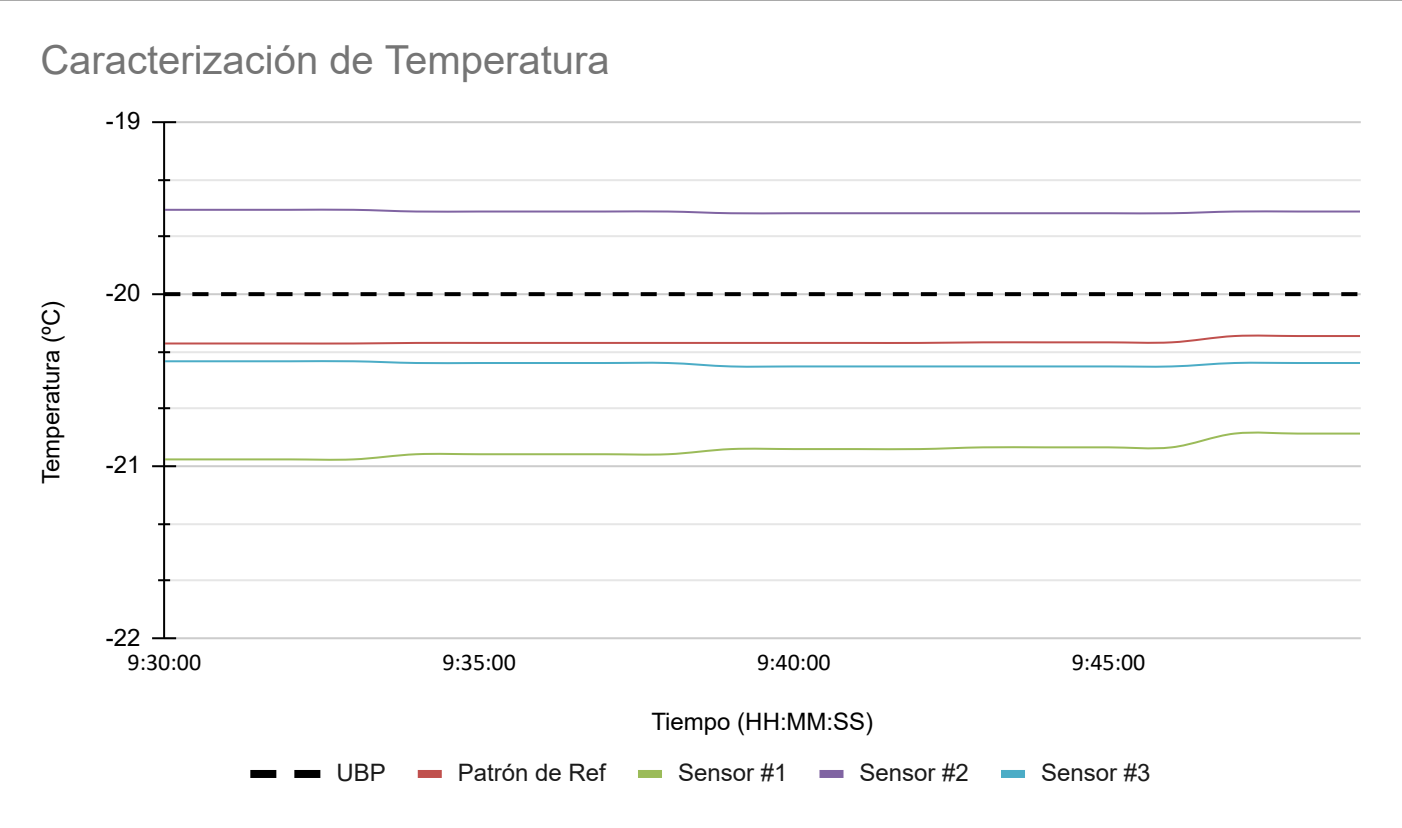


- Leyenda:**
- 1: Patrón de Referencia
 - 2: Sensor #1
 - 3: Sensor #2

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

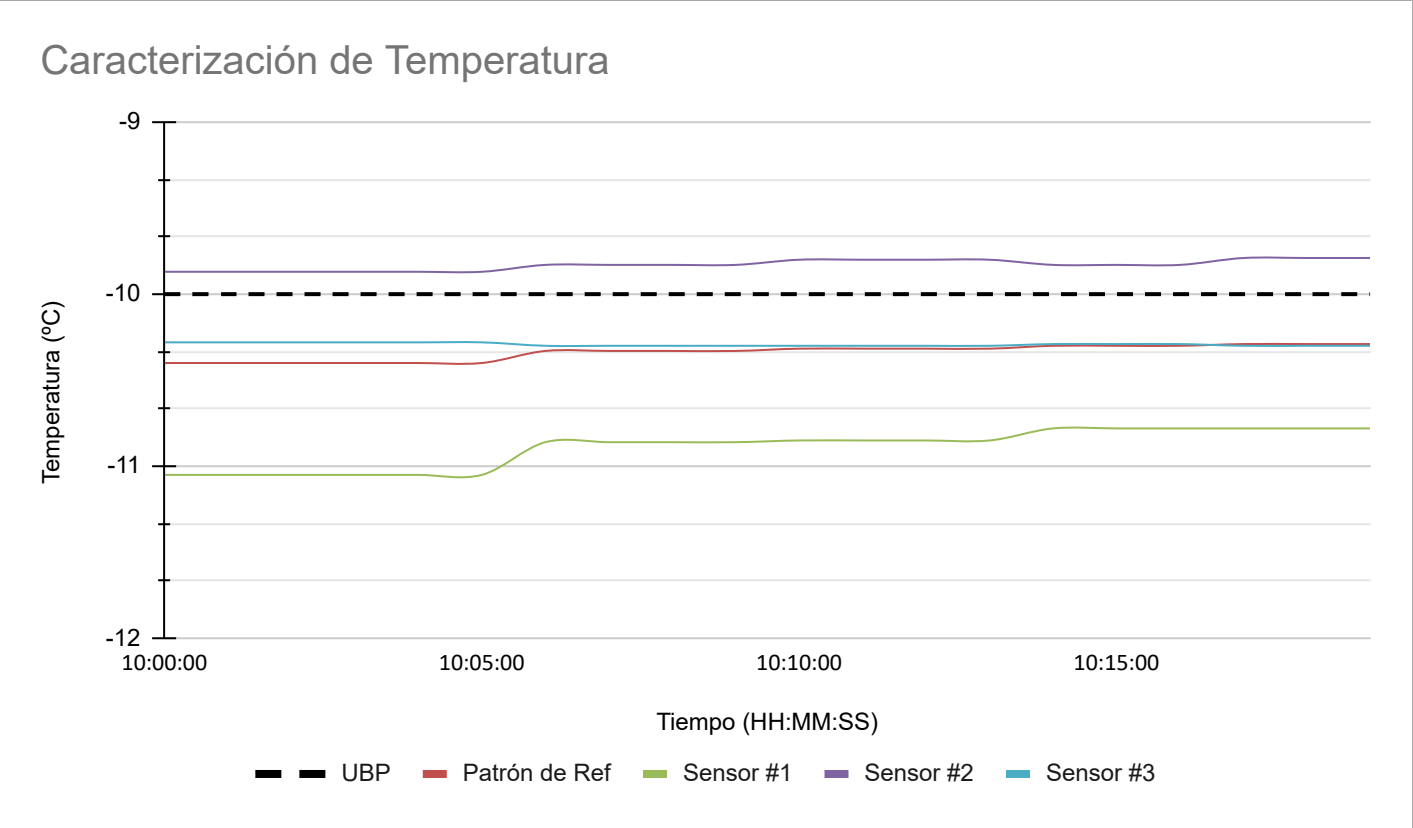
Hora (Time)	UBP (UUT)	Patrón de Ref (Ref. Standard)	Sensor #1 (Sensor #1)	Sensor #2 (Sensor #2)	Sensor #3 (Sensor #3)	Sensor #4 (Sensor #4)	Sensor #5 (Sensor #5)	Sensor #6 (Sensor #6)	Sensor #7 (Sensor #7)	Sensor #8 (Sensor #8)	Error (Error)
9:30:00	-20 °C	-20.287 °C	-20.960 °C	-19.510 °C	-20.390 °C	-	-	-	-	-	0.287 °C
9:31:00	-20 °C	-20.287 °C	-20.960 °C	-19.510 °C	-20.390 °C	-	-	-	-	-	0.287 °C
9:32:00	-20 °C	-20.287 °C	-20.960 °C	-19.510 °C	-20.390 °C	-	-	-	-	-	0.287 °C
9:33:00	-20 °C	-20.287 °C	-20.960 °C	-19.510 °C	-20.390 °C	-	-	-	-	-	0.287 °C
9:34:00	-20 °C	-20.287 °C	-20.930 °C	-19.520 °C	-20.40 °C	-	-	-	-	-	0.283 °C
9:35:00	-20 °C	-20.287 °C	-20.930 °C	-19.520 °C	-20.40 °C	-	-	-	-	-	0.283 °C
9:36:00	-20 °C	-20.287 °C	-20.930 °C	-19.520 °C	-20.40 °C	-	-	-	-	-	0.283 °C
9:37:00	-20 °C	-20.287 °C	-20.930 °C	-19.520 °C	-20.40 °C	-	-	-	-	-	0.283 °C
9:38:00	-20 °C	-20.283 °C	-20.930 °C	-19.520 °C	-20.40 °C	-	-	-	-	-	0.283 °C
9:39:00	-20 °C	-20.283 °C	-20.90 °C	-19.530 °C	-20.420 °C	-	-	-	-	-	0.283 °C
9:40:00	-20 °C	-20.283 °C	-20.90 °C	-19.530 °C	-20.420 °C	-	-	-	-	-	0.283 °C
9:41:00	-20 °C	-20.283 °C	-20.90 °C	-19.530 °C	-20.420 °C	-	-	-	-	-	0.283 °C
9:42:00	-20 °C	-20.283 °C	-20.90 °C	-19.530 °C	-20.420 °C	-	-	-	-	-	0.283 °C
9:43:00	-20 °C	-20.283 °C	-20.890 °C	-19.530 °C	-20.420 °C	-	-	-	-	-	0.28 °C
9:44:00	-20 °C	-20.28 °C	-20.890 °C	-19.530 °C	-20.420 °C	-	-	-	-	-	0.28 °C
9:45:00	-20 °C	-20.28 °C	-20.890 °C	-19.530 °C	-20.420 °C	-	-	-	-	-	0.28 °C
9:46:00	-20 °C	-20.28 °C	-20.890 °C	-19.530 °C	-20.420 °C	-	-	-	-	-	0.28 °C
9:47:00	-20 °C	-20.28 °C	-20.810 °C	-19.520 °C	-20.40 °C	-	-	-	-	-	0.243 °C
9:48:00	-20 °C	-20.28 °C	-20.810 °C	-19.520 °C	-20.40 °C	-	-	-	-	-	0.243 °C
9:49:00	-20 °C	-20.28 °C	-20.810 °C	-19.520 °C	-20.40 °C	-	-	-	-	-	0.243 °C

Graficos (Graphs):



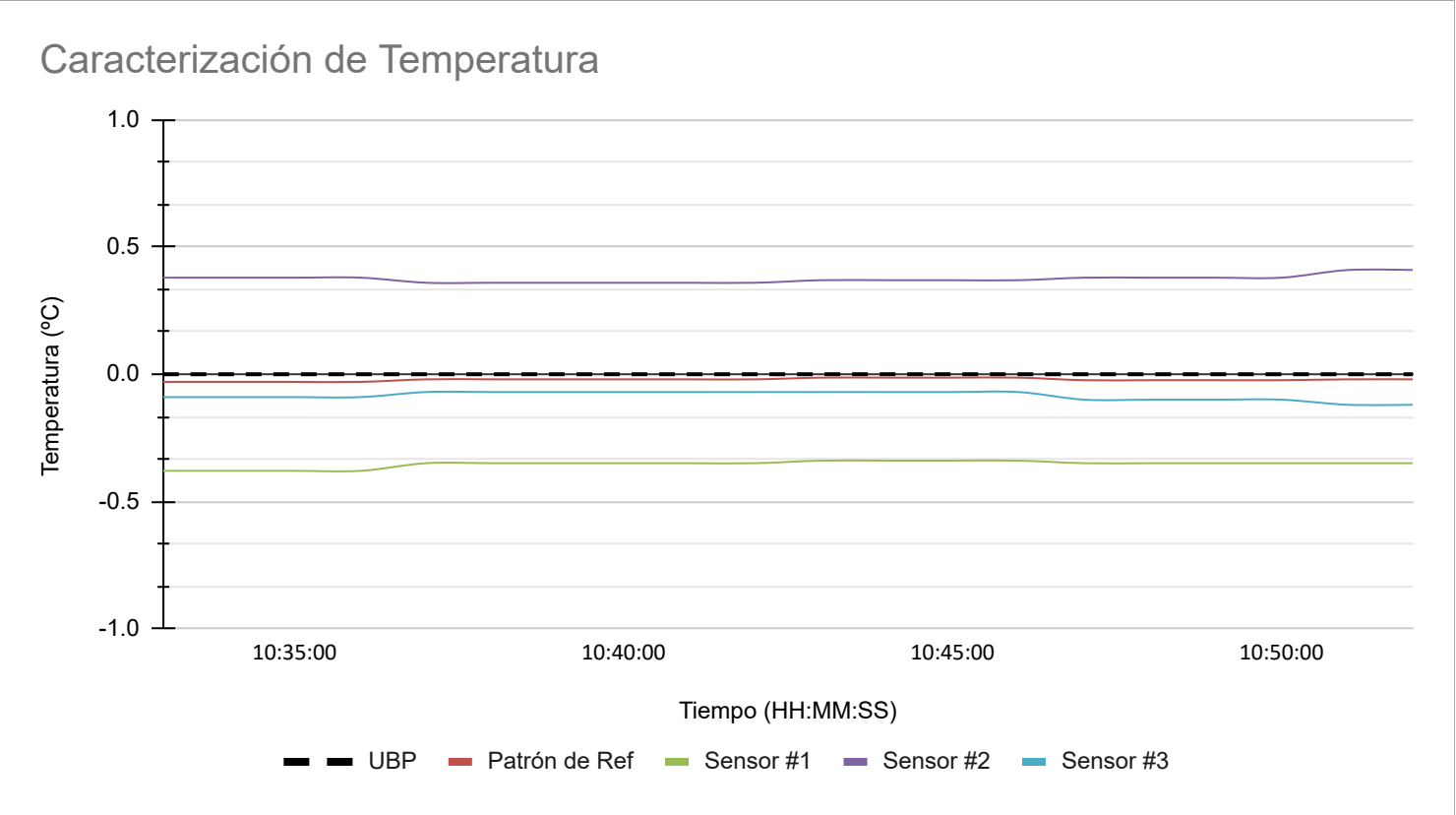
Hora (Time)	UBP (UUT)	Patr3n de Ref. Standard	Sensor #1 (Sensor #1)	Sensor #2 (Sensor #2)	Sensor #3 (Sensor #3)	Sensor #4 (Sensor #4)	Sensor #5 (Sensor #5)	Sensor #6 (Sensor #6)	Sensor #7 (Sensor #7)	Sensor #8 (Sensor #8)	Error (Error)
10:00:00	-10 3C	-10.4 3C	-11.050 3C	-9.870 3C	-10.280 3C	-	-	-	-	-	0.4 3C
10:01:00	-10 3C	-10.4 3C	-11.050 3C	-9.870 3C	-10.280 3C	-	-	-	-	-	0.4 3C
10:02:00	-10 3C	-10.4 3C	-11.050 3C	-9.870 3C	-10.280 3C	-	-	-	-	-	0.4 3C
10:03:00	-10 3C	-10.4 3C	-11.050 3C	-9.870 3C	-10.280 3C	-	-	-	-	-	0.4 3C
10:04:00	-10 3C	-10.4 3C	-11.050 3C	-9.870 3C	-10.280 3C	-	-	-	-	-	0.4 3C
10:05:00	-10 3C	-10.4 3C	-11.050 3C	-9.870 3C	-10.280 3C	-	-	-	-	-	0.4 3C
10:06:00	-10 3C	-10.33 3C	-10.860 3C	-9.830 3C	-10.30 3C	-	-	-	-	-	0.33 3C
10:07:00	-10 3C	-10.33 3C	-10.860 3C	-9.830 3C	-10.30 3C	-	-	-	-	-	0.33 3C
10:08:00	-10 3C	-10.33 3C	-10.860 3C	-9.830 3C	-10.30 3C	-	-	-	-	-	0.33 3C
10:09:00	-10 3C	-10.33 3C	-10.860 3C	-9.830 3C	-10.30 3C	-	-	-	-	-	0.33 3C
10:10:00	-10 3C	-10.317 3C	-10.850 3C	-9.80 3C	-10.30 3C	-	-	-	-	-	0.317 3C
10:11:00	-10 3C	-10.317 3C	-10.850 3C	-9.80 3C	-10.30 3C	-	-	-	-	-	0.317 3C
10:12:00	-10 3C	-10.317 3C	-10.850 3C	-9.80 3C	-10.30 3C	-	-	-	-	-	0.317 3C
10:13:00	-10 3C	-10.317 3C	-10.850 3C	-9.80 3C	-10.30 3C	-	-	-	-	-	0.317 3C
10:14:00	-10 3C	-10.3 3C	-10.780 3C	-9.830 3C	-10.290 3C	-	-	-	-	-	0.30 3C
10:15:00	-10 3C	-10.3 3C	-10.780 3C	-9.830 3C	-10.290 3C	-	-	-	-	-	0.30 3C
10:16:00	-10 3C	-10.3 3C	-10.780 3C	-9.830 3C	-10.290 3C	-	-	-	-	-	0.30 3C
10:17:00	-10 3C	-10.29 3C	-10.780 3C	-9.790 3C	-10.30 3C	-	-	-	-	-	0.290 3C
10:18:00	-10 3C	-10.29 3C	-10.780 3C	-9.790 3C	-10.30 3C	-	-	-	-	-	0.290 3C
10:19:00	-10 3C	-10.29 3C	-10.780 3C	-9.790 3C	-10.30 3C	-	-	-	-	-	0.290 3C

Graficos (Graphs):



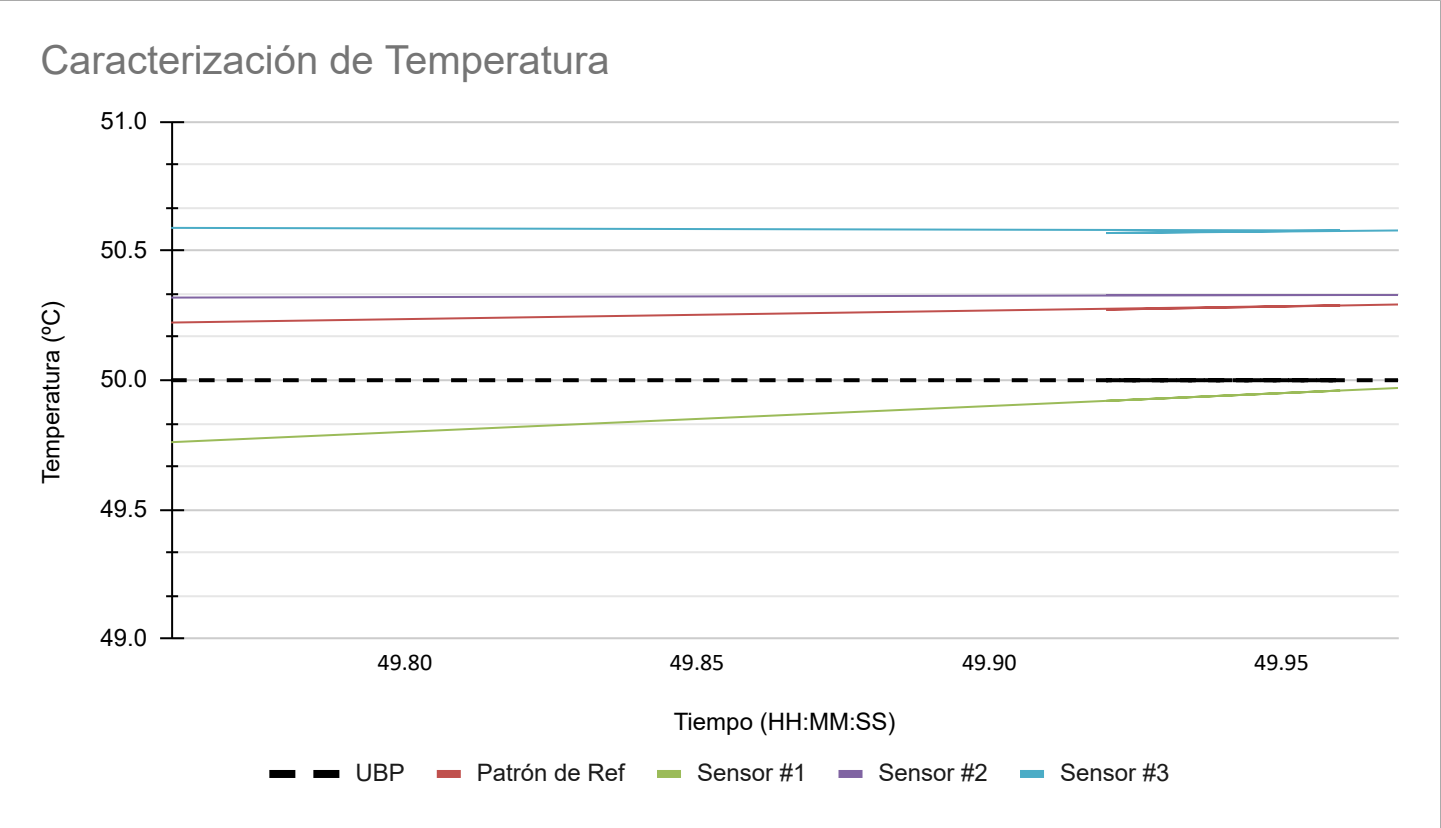
Hora (Time)	UBP (UUT)	Patrón de Ref. Ref. Standard	Sensor #1 (Sensor #1)	Sensor #2 (Sensor #2)	Sensor #3 (Sensor #3)	Sensor #4 (Sensor #4)	Sensor #5 (Sensor #5)	Sensor #6 (Sensor #6)	Sensor #7 (Sensor #7)	Sensor #8 (Sensor #8)	Error (Error)
10:33:00	0 °C	-0.03 °C	-0.380 °C	0.380 °C	-0.090 °C	-	-	-	-	-	0.03 °C
10:34:00	0 °C	-0.03 °C	-0.380 °C	0.380 °C	-0.090 °C	-	-	-	-	-	0.03 °C
10:35:00	0 °C	-0.03 °C	-0.380 °C	0.380 °C	-0.090 °C	-	-	-	-	-	0.03 °C
10:36:00	0 °C	-0.03 °C	-0.380 °C	0.380 °C	-0.090 °C	-	-	-	-	-	0.03 °C
10:37:00	0 °C	-0.02 °C	-0.350 °C	0.360 °C	-0.070 °C	-	-	-	-	-	0.02 °C
10:38:00	0 °C	-0.02 °C	-0.350 °C	0.360 °C	-0.070 °C	-	-	-	-	-	0.02 °C
10:39:00	0 °C	-0.02 °C	-0.350 °C	0.360 °C	-0.070 °C	-	-	-	-	-	0.02 °C
10:40:00	0 °C	-0.02 °C	-0.350 °C	0.360 °C	-0.070 °C	-	-	-	-	-	0.02 °C
10:41:00	0 °C	-0.02 °C	-0.350 °C	0.360 °C	-0.070 °C	-	-	-	-	-	0.02 °C
10:42:00	0 °C	-0.02 °C	-0.350 °C	0.360 °C	-0.070 °C	-	-	-	-	-	0.02 °C
10:43:00	0 °C	-0.013 °C	-0.340 °C	0.370 °C	-0.070 °C	-	-	-	-	-	0.013 °C
10:44:00	0 °C	-0.013 °C	-0.340 °C	0.370 °C	-0.070 °C	-	-	-	-	-	0.013 °C
10:45:00	0 °C	-0.013 °C	-0.340 °C	0.370 °C	-0.070 °C	-	-	-	-	-	0.013 °C
10:46:00	0 °C	-0.013 °C	-0.340 °C	0.370 °C	-0.070 °C	-	-	-	-	-	0.013 °C
10:47:00	0 °C	-0.023 °C	-0.350 °C	0.380 °C	-0.10 °C	-	-	-	-	-	0.023 °C
10:48:00	0 °C	-0.023 °C	-0.350 °C	0.380 °C	-0.10 °C	-	-	-	-	-	0.023 °C
10:49:00	0 °C	-0.023 °C	-0.350 °C	0.380 °C	-0.10 °C	-	-	-	-	-	0.023 °C
10:50:00	0 °C	-0.023 °C	-0.350 °C	0.380 °C	-0.10 °C	-	-	-	-	-	0.023 °C
10:51:00	0 °C	-0.02 °C	-0.350 °C	0.410 °C	-0.120 °C	-	-	-	-	-	0.02 °C
10:52:00	0 °C	-0.02 °C	-0.350 °C	0.410 °C	-0.120 °C	-	-	-	-	-	0.02 °C

Graficos (Graphs):



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)
11:00:00	50 °C	50.223 °C	49.760 °C	50.320 °C	50.590 °C	-	-	-	-	-	-0.223 °C
11:01:00	50 °C	50.223 °C	49.760 °C	50.320 °C	50.590 °C	-	-	-	-	-	-0.223 °C
11:02:00	50 °C	50.223 °C	49.760 °C	50.320 °C	50.590 °C	-	-	-	-	-	-0.223 °C
11:03:00	50 °C	50.223 °C	49.760 °C	50.320 °C	50.590 °C	-	-	-	-	-	-0.223 °C
11:04:00	50 °C	50.223 °C	49.760 °C	50.320 °C	50.590 °C	-	-	-	-	-	-0.223 °C
11:05:00	50 °C	50.223 °C	49.760 °C	50.320 °C	50.590 °C	-	-	-	-	-	-0.223 °C
11:06:00	50 °C	50.29 °C	49.960 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.29 °C
11:07:00	50 °C	50.29 °C	49.960 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.29 °C
11:08:00	50 °C	50.29 °C	49.960 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.29 °C
11:09:00	50 °C	50.29 °C	49.960 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.29 °C
11:10:00	50 °C	50.29 °C	49.960 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.29 °C
11:11:00	50 °C	50.29 °C	49.960 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.29 °C
11:12:00	50 °C	50.273 °C	49.920 °C	50.330 °C	50.570 °C	-	-	-	-	-	-0.273 °C
11:13:00	50 °C	50.273 °C	49.920 °C	50.330 °C	50.570 °C	-	-	-	-	-	-0.273 °C
11:14:00	50 °C	50.273 °C	49.920 °C	50.330 °C	50.570 °C	-	-	-	-	-	-0.273 °C
11:15:00	50 °C	50.273 °C	49.920 °C	50.330 °C	50.570 °C	-	-	-	-	-	-0.273 °C
11:16:00	50 °C	50.293 °C	49.970 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.293 °C
11:17:00	50 °C	50.293 °C	49.970 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.293 °C
11:18:00	50 °C	50.293 °C	49.970 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.293 °C
11:19:00	50 °C	50.293 °C	49.970 °C	50.330 °C	50.580 °C	-	-	-	-	-	-0.293 °C

Graficos (Graphs):



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)
11:33:00	100 °C	101.247 °C	101.276 °C	100.946 °C	101.536 °C						-1.247 °C
11:34:00	100 °C	101.247 °C	101.275 °C	100.946 °C	101.536 °C						-1.247 °C
11:35:00	100 °C	101.247 °C	101.242 °C	100.946 °C	101.536 °C						-1.247 °C
11:36:00	100 °C	101.247 °C	101.245 °C	100.946 °C	101.536 °C						-1.247 °C
11:37:00	100 °C	101.247 °C	101.243 °C	100.946 °C	101.536 °C						-1.247 °C
11:38:00	100 °C	101.247 °C	101.242 °C	100.986 °C	101.526 °C						-1.247 °C
11:39:00	100 °C	101.247 °C	101.241 °C	100.986 °C	101.526 °C						-1.247 °C
11:40:00	100 °C	101.247 °C	101.280 °C	100.986 °C	101.526 °C						-1.247 °C
11:41:00	100 °C	101.247 °C	101.280 °C	100.986 °C	101.526 °C						-1.247 °C
11:42:00	100 °C	101.247 °C	101.280 °C	100.986 °C	101.526 °C						-1.247 °C
11:43:00	100 °C	101.273 °C	101.281 °C	100.976 °C	101.576 °C						-1.273 °C
11:44:00	100 °C	101.273 °C	101.241 °C	100.976 °C	101.576 °C						-1.273 °C
11:45:00	100 °C	101.273 °C	101.242 °C	100.976 °C	101.576 °C						-1.273 °C
11:46:00	100 °C	101.273 °C	101.241 °C	100.976 °C	101.576 °C						-1.273 °C
11:47:00	100 °C	101.247 °C	101.240 °C	100.976 °C	101.536 °C						-1.247 °C
11:48:00	100 °C	101.247 °C	101.240 °C	100.976 °C	101.536 °C						-1.247 °C
11:49:00	100 °C	101.247 °C	101.241 °C	100.976 °C	101.536 °C						-1.247 °C
11:50:00	1000 °C	101.253 °C	101.280 °C	100.976 °C	101.516 °C						-1.253 °C
11:51:00	100 °C	101.253 °C	101.281 °C	100.976 °C	101.516 °C						-1.253 °C
11:52:00	100 °C	101.253 °C	101.282 °C	100.976 °C	101.516 °C						-1.253 °C

Graficos (Graphs):

