



Cert. #:4038.01

CERTIFICADO DE CALIBRACIÓN / CALIBRATION CERTIFICATE

**INNOVATECIS CIA LTDA**

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**Certificado No. (Certificate #):** 54665

**Fecha de Recepción (Reception Date):** 2025-02-28

**Fecha de Calibración (Calibration Date):** 2025-02-28

**Próxima Fecha de Calibración (Calibration Due):**

**Fecha de Emisión (Emission Date):** 2025-02-28

**Cliente (Client):** LETERAGO DEL ECUADOR S.A.

Av. Manuel Cordova Galarza Km 7 1/2 Frente al Colegio Frances, QUITO, PICHINCHA

| Información del Instrumento (Instrument Information) |                                      |                                                     |                    |                             |               |
|------------------------------------------------------|--------------------------------------|-----------------------------------------------------|--------------------|-----------------------------|---------------|
| <b>Equipo (Instrument):</b>                          | Registrador de Temperatura y Humedad | <b>Código (Code):</b>                               | *****              | <b>Int. de Medición:</b>    | (-10 a 70) °C |
| <b>Marca (Brand):</b>                                | FULL GAUGE                           | <b>Ubicación (Location):</b>                        | BODEGA CONTROLADOS | <b>(Measurement Range):</b> | (10 a 85) %HR |
| <b>Modelo (Model):</b>                               | MT-530 Super                         | <b>Lugar de Calibración (Place of Calibration):</b> | In Situ            | <b>División de escala:</b>  | 0.1 °C        |
| <b>Serie (Serial #):</b>                             | 4607003681339                        |                                                     | On Site            | <b>(Resolution):</b>        | 0.1 %HR       |

| Datos de Calibración (Calibration Info) |           | Condiciones Ambientales (Environmental Conditions) |                  |
|-----------------------------------------|-----------|----------------------------------------------------|------------------|
| <b>Procedimiento (Procedure):</b>       | INN-PC-24 | <b>Temperatura (Temp):</b>                         | (21.6 a 21.8) °C |
|                                         |           | <b>Humedad (Humidity):</b>                         | (50.6 a 50.2)%HR |

| Trazabilidad (Traceability Info) |                      |                |                                       |                         |
|----------------------------------|----------------------|----------------|---------------------------------------|-------------------------|
| <b>Patrón (Standard)</b>         | <b>Marca (Brand)</b> | <b>Cert. #</b> | <b>Ultima Calibración (Last Cal.)</b> | <b>Período (Period)</b> |
| Termohigrómetro                  | ELITECH              | 47506          | 2024-06-28                            | 1 año                   |

| Resultados (Results) |                   |           |               |                   |                             |
|----------------------|-------------------|-----------|---------------|-------------------|-----------------------------|
| Nominal (Nominal)    | Patrón (Standard) | UBP (UUT) | Error (Error) | E.M.P (Tolerance) | Incertidumbre (Uncertainty) |
| 21 °C                | 21.87 °C          | 21.38 °C  | -0.49 °C      | ± 1 °C            | ± 0.34 °C                   |
| 57 %HR               | 57.39 %HR         | 57.44 %HR | 0.05 %HR      | ± 5 %HR           | ± 3.0 %HR                   |
| -                    | -                 | -         | -             | -                 | -                           |
| -                    | -                 | -         | -             | -                 | -                           |
| -                    | -                 | -         | -             | -                 | -                           |
| -                    | -                 | -         | -             | -                 | -                           |
| -                    | -                 | -         | -             | -                 | -                           |
| -                    | -                 | -         | -             | -                 | -                           |
| -                    | -                 | -         | -             | -                 | -                           |
| -                    | -                 | -         | -             | -                 | -                           |
| -                    | -                 | -         | -             | -                 | -                           |

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, o 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:** E.M.P. = Error Máximo Permitido; El Equipo CUMPLE con los E.M.P. Establecidos por la Empresa LETERAGO DEL ECUADOR S.A. de 1 °C para Temperatura y 5% para Humedad Relativa

**Comments**

**Calibrado por:** Ing. Patricio Llerena

**Calibrated by:**

**Aprobado por:**

**Approved by:**

Certificado No.:

54665

Registrador de Temperatura y Humedad

Fecha de Calibración:

2025-02-28

FULL GAUGE

Tabla 1.0: Lecturas de la TEMPERATURA en el área de trabajo (°C)

| Tiempo<br>(hh:mm:ss) | Temperatura Patrón<br>(°C) | Temperatura<br>Calibrando (°C) | Error (°C) |
|----------------------|----------------------------|--------------------------------|------------|
| 2:02:00 PM           | 21.90                      | 21.30                          | -0.60      |
| 2:03:00 PM           | 21.80                      | 21.40                          | -0.40      |
| 2:04:00 PM           | 21.80                      | 21.40                          | -0.40      |
| 2:05:00 PM           | 21.70                      | 21.30                          | -0.40      |
| 2:06:00 PM           | 21.70                      | 21.30                          | -0.40      |
| 2:07:00 PM           | 21.60                      | 21.30                          | -0.30      |
| 2:08:00 PM           | 21.60                      | 21.30                          | -0.30      |
| 2:09:00 PM           | 21.60                      | 21.40                          | -0.20      |
| 2:10:00 PM           | 21.50                      | 21.40                          | -0.10      |
| 2:11:00 PM           | 21.50                      | 21.30                          | -0.20      |
| 2:12:00 PM           | 21.50                      | 21.40                          | -0.10      |
| 2:13:00 PM           | 21.50                      | 21.40                          | -0.10      |
| 2:14:00 PM           | 21.50                      | 21.40                          | -0.10      |
| 2:15:00 PM           | 21.50                      | 21.40                          | -0.10      |
| 2:16:00 PM           | 21.40                      | 21.40                          | 0.00       |
| 2:17:00 PM           | 21.40                      | 21.40                          | 0.00       |
| 2:18:00 PM           | 21.40                      | 21.40                          | 0.00       |
| 2:19:00 PM           | 21.40                      | 21.40                          | 0.00       |
| 2:20:00 PM           | 21.40                      | 21.40                          | 0.00       |
| 2:21:00 PM           | 21.40                      | 21.40                          | 0.00       |
| 2:22:00 PM           | 21.40                      | 21.40                          | 0.00       |
| 2:23:00 PM           | 21.40                      | 21.40                          | 0.00       |
| 2:24:00 PM           | 21.60                      | 21.40                          | -0.20      |
| 2:25:00 PM           | 22.10                      | 21.40                          | -0.70      |
| 2:26:00 PM           | 22.50                      | 21.40                          | -1.10      |
| 2:27:00 PM           | 22.70                      | 21.40                          | -1.30      |
| 2:28:00 PM           | 22.90                      | 21.40                          | -1.50      |
| 2:29:00 PM           | 23.20                      | 21.40                          | -1.80      |
| 2:30:00 PM           | 23.50                      | 21.40                          | -2.10      |
| 2:31:00 PM           | 23.70                      | 21.40                          | -2.30      |
| <b>Promedio</b>      | <b>21.87</b>               | <b>21.38</b>                   |            |
| <b>Desviación</b>    | <b>0.668</b>               | <b>0.041</b>                   |            |
| <b>Max</b>           | <b>23.70</b>               | <b>21.40</b>                   |            |
| <b>Min</b>           | <b>21.40</b>               | <b>21.30</b>                   |            |

Certificado No.:

54665

Registrador de Temperatura y Humedad

Fecha de Calibración:

2025-02-28

FULL GAUGE

Tabla 2.0: Lecturas de la HUMEDAD RELATIVA en el área de trabajo (%HR)

| Tiempo<br>(hh:mm:ss) | Humedad Relativa<br>Patrón (%HR) | Humedad Relativa<br>Calibrando (%HR) | Error (%HR) |
|----------------------|----------------------------------|--------------------------------------|-------------|
| 2:02:00 PM           | 55.80                            | 57.60                                | 1.80        |
| 2:03:00 PM           | 55.90                            | 57.70                                | 1.80        |
| 2:04:00 PM           | 56.00                            | 57.60                                | 1.60        |
| 2:05:00 PM           | 56.10                            | 57.50                                | 1.40        |
| 2:06:00 PM           | 56.30                            | 57.50                                | 1.20        |
| 2:07:00 PM           | 56.40                            | 57.50                                | 1.10        |
| 2:08:00 PM           | 56.50                            | 57.50                                | 1.00        |
| 2:09:00 PM           | 56.60                            | 57.40                                | 0.80        |
| 2:10:00 PM           | 56.80                            | 57.60                                | 0.80        |
| 2:11:00 PM           | 56.80                            | 57.50                                | 0.70        |
| 2:12:00 PM           | 56.90                            | 57.50                                | 0.60        |
| 2:13:00 PM           | 57.00                            | 57.50                                | 0.50        |
| 2:14:00 PM           | 57.00                            | 57.50                                | 0.50        |
| 2:15:00 PM           | 57.00                            | 57.50                                | 0.50        |
| 2:16:00 PM           | 57.10                            | 57.40                                | 0.30        |
| 2:17:00 PM           | 57.10                            | 57.40                                | 0.30        |
| 2:18:00 PM           | 57.10                            | 57.40                                | 0.30        |
| 2:19:00 PM           | 57.10                            | 57.40                                | 0.30        |
| 2:20:00 PM           | 57.10                            | 57.20                                | 0.10        |
| 2:21:00 PM           | 57.20                            | 57.40                                | 0.20        |
| 2:22:00 PM           | 57.10                            | 57.40                                | 0.30        |
| 2:23:00 PM           | 57.10                            | 57.40                                | 0.30        |
| 2:24:00 PM           | 61.00                            | 57.40                                | -3.60       |
| 2:25:00 PM           | 59.40                            | 57.40                                | -2.00       |
| 2:26:00 PM           | 57.70                            | 57.30                                | -0.40       |
| 2:27:00 PM           | 57.90                            | 57.40                                | -0.50       |
| 2:28:00 PM           | 60.00                            | 57.30                                | -2.70       |
| 2:29:00 PM           | 59.80                            | 57.30                                | -2.50       |
| 2:30:00 PM           | 58.00                            | 57.40                                | -0.60       |
| 2:31:00 PM           | 59.80                            | 57.40                                | -2.40       |
| <b>Promedio</b>      | <b>57.39</b>                     | <b>57.44</b>                         |             |
| <b>Desviación</b>    | <b>1.315</b>                     | <b>0.104</b>                         |             |
| <b>Max</b>           | <b>61.00</b>                     | <b>57.70</b>                         |             |
| <b>Min</b>           | <b>55.80</b>                     | <b>57.20</b>                         |             |

