



CERTIFICADO DE CALIBRACIÓN / CALIBRATION CERTIFICATE

**INNOVATECIS CIA LTDA**  
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**Certificado No. (Certificate #):** 64498-A  
**Fecha de Recepción (Reception Date):** 2025-12-18  
**Fecha de Calibración (Calibration Date):** 2025-12-18  
**Próxima Fecha de Calibración (Calibration Due):** -  
**Fecha de Emisión (Emission Date):** 2025-12-18

**Cliente (Client):** TECNOVA S.A.  
Parque Industrial Pascuales km 16.5 vía Daule. Guayaquil, Guayas

| Información del Instrumento (Instrument Information) |                         |                                              |                 |                                                      |                                   |
|------------------------------------------------------|-------------------------|----------------------------------------------|-----------------|------------------------------------------------------|-----------------------------------|
| <b>Equipo (Instrument):</b>                          | Módulo de Ciclo de Vida | <b>Int. de Medición: (Measurement Range)</b> | 18 VDC; 25 ADC  | <b>Ubicación: (Location)</b>                         | Laboratorio de Ensayos Eléctricos |
| <b>Marca (Brand):</b>                                | Bitrode                 |                                              |                 |                                                      |                                   |
| <b>Modelo (Model):</b>                               | CV12-25-12              | <b>División de escala: (Resolution)</b>      | 0.001 V; 0.01 A | <b>Lugar de Calibración: (Place of Calibration):</b> | In Situ<br>On Site                |
| <b>Serie (Serial #):</b>                             | 114086                  |                                              |                 |                                                      |                                   |

| Datos de Calibración (Calibration Info)     |  | Condiciones Ambientales (Environmental Conditions) |                                                  |
|---------------------------------------------|--|----------------------------------------------------|--------------------------------------------------|
| <b>Procedimiento (Procedure):</b> INN-PC-08 |  | <b>Temperatura (Temp):</b> (24.1 °C a 23.4 °C)     | <b>Humedad (Humidity):</b> (56.9 %HR a 58.3 %HR) |

| Trazabilidad (Traceability Info) |               |          |                                |                  |
|----------------------------------|---------------|----------|--------------------------------|------------------|
| Patrón (Standard)                | Marca (Brand) | Cert. #  | Última Calibración (Last Cal.) | Período (Period) |
| Multicalibrador Patrón           | Transmille    | AC-31826 | 2025-06-24                     | 2 años           |
| Multímetro Patrón                | Transmille    | 51065    | 2024-03-26                     | 2 años           |
| Pinza Amperimétrica              | FLUKE         | 54318    | 2025-02-25                     | 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 (Comments):** Código: CV004. Certificado corresponde a la calibración de las líneas 1 al 16 (16 líneas). Este certificado reemplaza al certificado número 64498, versión única corregida.

**Calibrado por: (Calibrated by):** Ing. Mauricio Landívar

**Aprobado por: (Approved by):** 

Fin de Certificado (End of Certificate)

Certificado No.: 64498-A      Equipo (Instrument): Módulo de Ciclo de Vida  
Fecha de Calibración: 2025-12-18      Marca (Brand): Bitrode

| Tipo (Type)     | Rango (Range) | Patrón (Standard) | UBP (UUT) | Error (Error) | Incertidumbre (Uncertainty) |
|-----------------|---------------|-------------------|-----------|---------------|-----------------------------|
| LINEA 1 - CV004 | 18 V          | 10.500 V          | 10.498 V  | -0.002 V      | ± 7.8 mV                    |
| LINEA 1 - CV004 | 18 V          | 12.700 V          | 12.706 V  | 0.006 V       | ± 7.8 mV                    |
| LINEA 1 - CV004 | 18 V          | 16.000 V          | 16.016 V  | 0.016 V       | ± 7.8 mV                    |
| LINEA 1 - CV004 | 18 V          | 18.000 V          | 18.001 V  | 0.001 V       | ± 7.8 mV                    |
| LINEA 1 - CV004 | 25 A          | 2.489 A           | 2.50 A    | 0.011 A       | ± 8.5 mA                    |
| LINEA 1 - CV004 | 25 A          | 12.445 A          | 12.50 A   | 0.056 A       | ± 8.5 mA                    |
| LINEA 1 - CV004 | 25 A          | 22.413 A          | 22.50 A   | 0.087 A       | ± 8.5 mA                    |
| LINEA 2 - CV004 | 18 V          | 10.500 V          | 10.485 V  | -0.015 V      | ± 7.8 mV                    |
| LINEA 2 - CV004 | 18 V          | 12.700 V          | 12.697 V  | -0.003 V      | ± 7.8 mV                    |
| LINEA 2 - CV004 | 18 V          | 16.000 V          | 16.006 V  | 0.006 V       | ± 7.8 mV                    |
| LINEA 2 - CV004 | 18 V          | 18.000 V          | 17.970 V  | -0.030 V      | ± 7.8 mV                    |
| LINEA 2 - CV004 | 25 A          | 2.502 A           | 2.50 A    | -0.002 A      | ± 8.5 mA                    |
| LINEA 2 - CV004 | 25 A          | 12.500 A          | 12.50 A   | 0.000 A       | ± 8.5 mA                    |
| LINEA 2 - CV004 | 25 A          | 22.503 A          | 22.50 A   | -0.003 A      | ± 8.5 mA                    |
| LINEA 3 - CV004 | 18 V          | 10.500 V          | 10.508 V  | 0.008 V       | ± 7.8 mV                    |
| LINEA 3 - CV004 | 18 V          | 12.700 V          | 12.713 V  | 0.013 V       | ± 7.8 mV                    |
| LINEA 3 - CV004 | 18 V          | 16.000 V          | 15.992 V  | -0.008 V      | ± 7.8 mV                    |
| LINEA 3 - CV004 | 18 V          | 18.000 V          | 18.011 V  | 0.011 V       | ± 7.8 mV                    |
| LINEA 3 - CV004 | 25 A          | 2.521 A           | 2.50 A    | -0.021 A      | ± 8.5 mA                    |
| LINEA 3 - CV004 | 25 A          | 12.509 A          | 12.50 A   | -0.009 A      | ± 8.5 mA                    |
| LINEA 3 - CV004 | 25 A          | 22.503 A          | 22.50 A   | -0.003 A      | ± 8.5 mA                    |
| LINEA 4 - CV004 | 18 V          | 10.500 V          | 10.499 V  | -0.001 V      | ± 7.8 mV                    |
| LINEA 4 - CV004 | 18 V          | 12.700 V          | 12.718 V  | 0.018 V       | ± 7.8 mV                    |
| LINEA 4 - CV004 | 18 V          | 16.000 V          | 16.008 V  | 0.008 V       | ± 7.8 mV                    |
| LINEA 4 - CV004 | 18 V          | 18.000 V          | 18.005 V  | 0.005 V       | ± 7.8 mV                    |
| LINEA 4 - CV004 | 25 A          | 2.496 A           | 2.50 A    | 0.004 A       | ± 8.5 mA                    |
| LINEA 4 - CV004 | 25 A          | 12.499 A          | 12.50 A   | 0.001 A       | ± 8.5 mA                    |
| LINEA 4 - CV004 | 25 A          | 22.499 A          | 22.50 A   | 0.001 A       | ± 8.5 mA                    |
| LINEA 5 - CV004 | 18 V          | 10.500 V          | 10.511 V  | 0.011 V       | ± 7.8 mV                    |
| LINEA 5 - CV004 | 18 V          | 12.700 V          | 12.707 V  | 0.007 V       | ± 7.8 mV                    |
| LINEA 5 - CV004 | 18 V          | 16.000 V          | 16.009 V  | 0.009 V       | ± 7.8 mV                    |
| LINEA 5 - CV004 | 18 V          | 18.000 V          | 18.034 V  | 0.034 V       | ± 7.8 mV                    |
| LINEA 5 - CV004 | 25 A          | 2.507 A           | 2.50 A    | -0.007 A      | ± 8.5 mA                    |
| LINEA 5 - CV004 | 25 A          | 12.504 A          | 12.50 A   | -0.004 A      | ± 8.5 mA                    |
| LINEA 5 - CV004 | 25 A          | 22.501 A          | 22.50 A   | -0.001 A      | ± 8.5 mA                    |
| LINEA 6 - CV004 | 18 V          | 10.500 V          | 10.500 V  | 0.000 V       | ± 7.8 mV                    |
| LINEA 6 - CV004 | 18 V          | 12.700 V          | 12.719 V  | 0.019 V       | ± 7.8 mV                    |
| LINEA 6 - CV004 | 18 V          | 16.000 V          | 16.024 V  | 0.024 V       | ± 7.8 mV                    |
| LINEA 6 - CV004 | 18 V          | 18.000 V          | 18.002 V  | 0.002 V       | ± 7.8 mV                    |
| LINEA 6 - CV004 | 25 A          | 2.484 A           | 2.50 A    | 0.017 A       | ± 8.5 mA                    |
| LINEA 6 - CV004 | 25 A          | 12.466 A          | 12.50 A   | 0.034 A       | ± 8.5 mA                    |
| LINEA 6 - CV004 | 25 A          | 22.452 A          | 22.50 A   | 0.048 A       | ± 8.5 mA                    |
| LINEA 7 - CV004 | 18 V          | 10.500 V          | 10.507 V  | 0.007 V       | ± 7.8 mV                    |
| LINEA 7 - CV004 | 18 V          | 12.700 V          | 12.704 V  | 0.004 V       | ± 7.8 mV                    |
| LINEA 7 - CV004 | 18 V          | 16.000 V          | 15.996 V  | -0.004 V      | ± 7.8 mV                    |
| LINEA 7 - CV004 | 18 V          | 18.000 V          | 17.988 V  | -0.012 V      | ± 7.8 mV                    |
| LINEA 7 - CV004 | 25 A          | 2.483 A           | 2.50 A    | 0.017 A       | ± 8.5 mA                    |

Certificado No.: 64498-A      Equipo (Instrument): Módulo de Ciclo de Vida  
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| Tipo (Type)      | Rango (Range) | Patrón (Standard) | UBP (UUT) | Error (Error) | Incertidumbre (Uncertainty) |
|------------------|---------------|-------------------|-----------|---------------|-----------------------------|
| LINEA 7 - CV004  | 25 A          | 12.410 A          | 12.50 A   | 0.090 A       | ± 8.5 mA                    |
| LINEA 7 - CV004  | 25 A          | 22.341 A          | 22.50 A   | 0.159 A       | ± 8.5 mA                    |
| LINEA 8 - CV004  | 18 V          | 10.500 V          | 10.495 V  | -0.005 V      | ± 7.8 mV                    |
| LINEA 8 - CV004  | 18 V          | 12.700 V          | 12.685 V  | -0.015 V      | ± 7.8 mV                    |
| LINEA 8 - CV004  | 18 V          | 16.000 V          | 15.984 V  | -0.016 V      | ± 7.8 mV                    |
| LINEA 8 - CV004  | 18 V          | 18.000 V          | 17.970 V  | -0.030 V      | ± 7.8 mV                    |
| LINEA 8 - CV004  | 25 A          | 2.530 A           | 2.50 A    | -0.030 A      | ± 8.5 mA                    |
| LINEA 8 - CV004  | 25 A          | 12.555 A          | 12.50 A   | -0.055 A      | ± 8.5 mA                    |
| LINEA 8 - CV004  | 25 A          | 22.589 A          | 22.50 A   | -0.089 A      | ± 8.5 mA                    |
| LINEA 9 - CV004  | 18 V          | 10.500 V          | 10.525 V  | 0.025 V       | ± 7.8 mV                    |
| LINEA 9 - CV004  | 18 V          | 12.700 V          | 12.710 V  | 0.010 V       | ± 7.8 mV                    |
| LINEA 9 - CV004  | 18 V          | 16.000 V          | 16.026 V  | 0.026 V       | ± 7.8 mV                    |
| LINEA 9 - CV004  | 18 V          | 18.000 V          | 17.998 V  | -0.002 V      | ± 7.8 mV                    |
| LINEA 9 - CV004  | 25 A          | 2.487 A           | 2.50 A    | 0.013 A       | ± 8.5 mA                    |
| LINEA 9 - CV004  | 25 A          | 12.443 A          | 12.50 A   | 0.057 A       | ± 8.5 mA                    |
| LINEA 9 - CV004  | 25 A          | 22.392 A          | 22.50 A   | 0.108 A       | ± 8.5 mA                    |
| LINEA 10 - CV004 | 18 V          | 10.500 V          | 10.479 V  | -0.021 V      | ± 7.8 mV                    |
| LINEA 10 - CV004 | 18 V          | 12.700 V          | 12.677 V  | -0.023 V      | ± 7.8 mV                    |
| LINEA 10 - CV004 | 18 V          | 16.000 V          | 16.001 V  | 0.001 V       | ± 7.8 mV                    |
| LINEA 10 - CV004 | 18 V          | 18.000 V          | 17.994 V  | -0.006 V      | ± 7.8 mV                    |
| LINEA 10 - CV004 | 25 A          | 2.499 A           | 2.50 A    | 0.001 A       | ± 8.5 mA                    |
| LINEA 10 - CV004 | 25 A          | 12.508 A          | 12.50 A   | -0.008 A      | ± 8.5 mA                    |
| LINEA 10 - CV004 | 25 A          | 22.511 A          | 22.50 A   | -0.011 A      | ± 8.5 mA                    |
| LINEA 11 - CV004 | 18 V          | 10.500 V          | 10.472 V  | -0.028 V      | ± 7.8 mV                    |
| LINEA 11 - CV004 | 18 V          | 12.700 V          | 12.677 V  | -0.023 V      | ± 7.8 mV                    |
| LINEA 11 - CV004 | 18 V          | 16.000 V          | 15.973 V  | -0.027 V      | ± 7.8 mV                    |
| LINEA 11 - CV004 | 18 V          | 18.000 V          | 17.994 V  | -0.006 V      | ± 7.8 mV                    |
| LINEA 11 - CV004 | 25 A          | 2.502 A           | 2.50 A    | -0.002 A      | ± 8.5 mA                    |
| LINEA 11 - CV004 | 25 A          | 12.518 A          | 12.50 A   | -0.018 A      | ± 8.5 mA                    |
| LINEA 11 - CV004 | 25 A          | 22.526 A          | 22.50 A   | -0.026 A      | ± 8.5 mA                    |
| LINEA 12 - CV004 | 18 V          | 10.500 V          | 10.520 V  | 0.020 V       | ± 7.8 mV                    |
| LINEA 12 - CV004 | 18 V          | 12.700 V          | 12.697 V  | -0.003 V      | ± 7.8 mV                    |
| LINEA 12 - CV004 | 18 V          | 16.000 V          | 15.995 V  | -0.005 V      | ± 7.8 mV                    |
| LINEA 12 - CV004 | 18 V          | 18.000 V          | 17.992 V  | -0.008 V      | ± 7.8 mV                    |
| LINEA 12 - CV004 | 25 A          | 2.505 A           | 2.50 A    | -0.005 A      | ± 8.5 mA                    |
| LINEA 12 - CV004 | 25 A          | 12.510 A          | 12.50 A   | -0.010 A      | ± 8.5 mA                    |
| LINEA 12 - CV004 | 25 A          | 22.509 A          | 22.50 A   | -0.009 A      | ± 8.5 mA                    |
| LINEA 13 - CV004 | 18 V          | 10.500 V          | 10.511 V  | 0.011 V       | ± 7.8 mV                    |
| LINEA 13 - CV004 | 18 V          | 12.700 V          | 12.712 V  | 0.012 V       | ± 7.8 mV                    |
| LINEA 13 - CV004 | 18 V          | 16.000 V          | 15.984 V  | -0.016 V      | ± 7.8 mV                    |
| LINEA 13 - CV004 | 18 V          | 18.000 V          | 18.006 V  | 0.006 V       | ± 7.8 mV                    |
| LINEA 13 - CV004 | 25 A          | 2.506 A           | 2.50 A    | -0.006 A      | ± 8.5 mA                    |
| LINEA 13 - CV004 | 25 A          | 12.507 A          | 12.50 A   | -0.007 A      | ± 8.5 mA                    |
| LINEA 13 - CV004 | 25 A          | 22.499 A          | 22.50 A   | 0.001 A       | ± 8.5 mA                    |
| LINEA 14 - CV004 | 18 V          | 10.500 V          | 10.492 V  | -0.008 V      | ± 7.8 mV                    |
| LINEA 14 - CV004 | 18 V          | 12.700 V          | 12.710 V  | 0.010 V       | ± 7.8 mV                    |
| LINEA 14 - CV004 | 18 V          | 16.000 V          | 15.992 V  | -0.008 V      | ± 7.8 mV                    |

Certificado No.: 64498-A

Equipo (Instrument): Módulo de Ciclo de Vida

Fecha de Calibración: 2025-12-18

Marca (Brand): Bitrode

| Tipo (Type)      | Rango (Range) | Patrón (Standard) | UBP (UUT) | Error (Error) | Incertidumbre (Uncertainty) |
|------------------|---------------|-------------------|-----------|---------------|-----------------------------|
| LINEA 14 - CV004 | 18 V          | 18.000 V          | 17.997 V  | -0.003 V      | ± 7.8 mV                    |
| LINEA 14 - CV004 | 25 A          | 2.505 A           | 2.50 A    | -0.005 A      | ± 8.5 mA                    |
| LINEA 14 - CV004 | 25 A          | 12.495 A          | 12.50 A   | 0.005 A       | ± 8.5 mA                    |
| LINEA 14 - CV004 | 25 A          | 22.477 A          | 22.50 A   | 0.023 A       | ± 8.5 mA                    |
| LINEA 15 - CV004 | 18 V          | 10.500 V          | 10.497 V  | -0.003 V      | ± 0.78 mV                   |
| LINEA 15 - CV004 | 18 V          | 12.700 V          | 12.701 V  | 0.001 V       | ± 0.78 mV                   |
| LINEA 15 - CV004 | 18 V          | 16.000 V          | 16.016 V  | 0.016 V       | ± 0.78 mV                   |
| LINEA 15 - CV004 | 18 V          | 18.000 V          | 18.002 V  | 0.002 V       | ± 0.78 mV                   |
| LINEA 15 - CV004 | 25 A          | 2.499 A           | 2.50 A    | 0.001 A       | ± 8.5 mA                    |
| LINEA 15 - CV004 | 25 A          | 12.502 A          | 12.50 A   | -0.002 A      | ± 8.5 mA                    |
| LINEA 15 - CV004 | 25 A          | 22.497 A          | 22.50 A   | 0.003 A       | ± 8.5 mA                    |
| LINEA 16 - CV004 | 18 V          | 10.500 V          | 10.481 V  | -0.019 V      | ± 0.78 mV                   |
| LINEA 16 - CV004 | 18 V          | 12.700 V          | 12.682 V  | -0.018 V      | ± 0.78 mV                   |
| LINEA 16 - CV004 | 18 V          | 16.000 V          | 16.005 V  | 0.005 V       | ± 0.78 mV                   |
| LINEA 16 - CV004 | 18 V          | 18.000 V          | 17.987 V  | -0.013 V      | ± 0.78 mV                   |
| LINEA 16 - CV004 | 25 A          | 2.501 A           | 2.50 A    | -0.001 A      | ± 8.5 mA                    |
| LINEA 16 - CV004 | 25 A          | 12.509 A          | 12.50 A   | -0.008 A      | ± 8.5 mA                    |
| LINEA 16 - CV004 | 25 A          | 22.509 A          | 22.50 A   | -0.009 A      | ± 8.5 mA                    |