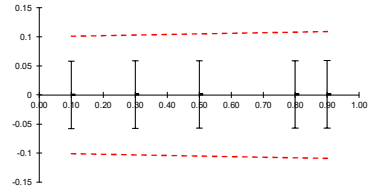


**Resultados de la calibración:**  
(Calibration Results)

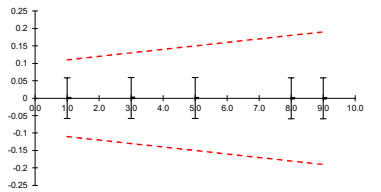
| Magnitud: | Resistencia   | Tipo:                              | Directa | Unidad: | Ω      | Medición | OUT         | Resol. IBC: | 0.1     |                       |          |
|-----------|---------------|------------------------------------|---------|---------|--------|----------|-------------|-------------|---------|-----------------------|----------|
| Patrón:   | Fluke 8845A   | Intervalo:                         | Desde:  | 0.1     | Hasta: | 1        | Frec ( Hz ) | 0           |         |                       |          |
| Punto     | Valor del IBC | Lecturas del Patrón 4 W RESISTENCE |         |         |        |          | Error       | k (95%)     | U (95%) | Tolerancia Fabricante | D.C.     |
|           |               | 1                                  | 2       | 3       | 4      | 5        |             |             |         |                       |          |
| 1         | 0.10          | 0.0999                             | 0.0999  | 0.0999  | 0.0999 | 0.0999   | 0.0001      | 2.00        | 0.06    | 0.101                 | Conforme |
| 2         | 0.30          | 0.2994                             | 0.2994  | 0.2994  | 0.2994 | 0.2994   | 0.0006      | 2.00        | 0.06    | 0.103                 | Conforme |
| 3         | 0.50          | 0.4992                             | 0.4992  | 0.4992  | 0.4992 | 0.4992   | 0.0008      | 2.00        | 0.06    | 0.105                 | Conforme |
| 4         | 0.80          | 0.7989                             | 0.7989  | 0.7989  | 0.7989 | 0.7989   | 0.0011      | 2.00        | 0.06    | 0.108                 | Conforme |
| 5         | 0.90          | 0.8989                             | 0.8989  | 0.8989  | 0.8989 | 0.8989   | 0.0011      | 2.00        | 0.06    | 0.109                 | Conforme |

Tolerancia de fabricante:  $\pm(0.01\% \text{ Valor medido}) + 2 \text{ m}\Omega$



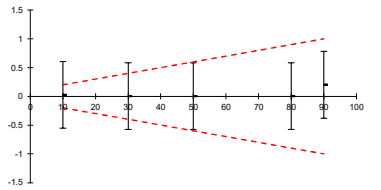
|           |               |                                    |            |         |        |          |        |             |         |                       |          |
|-----------|---------------|------------------------------------|------------|---------|--------|----------|--------|-------------|---------|-----------------------|----------|
| Magnitud: | Resistencia   | Tipo:                              | Directa    | Unidad: | Ω      | Medición | OUT    | Resol. IBC: | 0.1     |                       |          |
| Patrón:   | Fluke 8845A   |                                    | Intervalo: | Desde:  | 1      | Hasta:   | 10     | Frec ( Hz ) | 0       |                       |          |
| Punto     | Valor del IBC | Lecturas del Patrón 4 W RESISTENCE |            |         |        |          | Error  | k (95%)     | U (95%) | Tolerancia Fabricante | D.C.     |
|           |               | 1                                  | 2          | 3       | 4      | 5        |        |             |         |                       |          |
| 1         | 1.0           | 0.9997                             | 0.9997     | 0.9997  | 0.9997 | 0.9997   | 0.0003 | 2.00        | 0.06    | 0.11                  | Conforme |
| 2         | 3.0           | 2.9994                             | 2.9994     | 2.9994  | 2.9994 | 2.9994   | 0.0006 | 2.00        | 0.06    | 0.13                  | Conforme |
| 3         | 5.0           | 4.9997                             | 4.9997     | 4.9997  | 4.9997 | 4.9997   | 0.0003 | 2.00        | 0.06    | 0.15                  | Conforme |
| 4         | 8.0           | 8.0000                             | 8.0000     | 8.0000  | 8.0000 | 8.0000   | 0      | 2.00        | 0.06    | 0.18                  | Conforme |
| 5         | 9.0           | 9.0000                             | 9.0000     | 9.0000  | 9.0000 | 9.0000   | 0      | 2.00        | 0.06    | 0.19                  | Conforme |

Tolerancia de fabricante:  $\pm(0.01\% \text{ Valor medido} + 2 \text{ m}\Omega)$



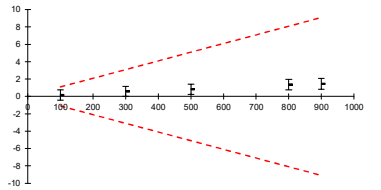
|           |               |                                    |         |         |         |          |       |             |         |                       |          |
|-----------|---------------|------------------------------------|---------|---------|---------|----------|-------|-------------|---------|-----------------------|----------|
| Magnitud: | Resistencia   | Tipo:                              | Directa | Unidad: | Ω       | Medición | OUT   | Resol. IBC: | 0.1     |                       |          |
| Patron:   | Fluke 8845A   | Intervalo:                         |         | Desde:  | 10      | Hasta:   | 100   | Frec ( Hz ) | 0       |                       |          |
| Punto     | Valor del IBC | Lecturas del Patrón 4 W RESISTENCE |         |         |         |          | Error | k (95%)     | U (95%) | Tolerancia Fabricante | D.C.     |
|           |               | 1                                  | 2       | 3       | 4       | 5        |       |             |         |                       |          |
| 1         | 10            | 9.9750                             | 9.9750  | 9.9750  | 9.9750  | 9.9750   | 0.025 | 2.00        | 0.58    | 0.20                  | Conforme |
| 2         | 30            | 29.9970                            | 29.9970 | 29.9970 | 29.9970 | 29.9970  | 0.003 | 2.00        | 0.58    | 0.40                  | Conforme |
| 3         | 50            | 49.8870                            | 49.8870 | 49.8870 | 49.8870 | 49.8870  | 0.003 | 2.00        | 0.58    | 0.60                  | Conforme |
| 4         | 80            | 79.8363                            | 79.8363 | 79.8363 | 79.8363 | 79.8363  | 0.003 | 2.00        | 0.58    | 0.90                  | Conforme |
| 5         | 90            | 89.7990                            | 89.7990 | 89.7990 | 89.7990 | 89.7990  | 0.201 | 2.00        | 0.58    | 1.00                  | Conforme |

Tolerancia de fabricante:  $\pm(0.01\% \text{ Valor medido} + 2 \text{ m}\Omega)$



|           |               |                                    |            |          |          |          |        |             |         |                       |          |
|-----------|---------------|------------------------------------|------------|----------|----------|----------|--------|-------------|---------|-----------------------|----------|
| Magnitud: | Resistencia   | Tipo:                              | Directa    | Unidad:  | Ω        | Medición | OUT    | Resol. IBC: | 0.1     |                       |          |
| Patron:   | Fluke 8845A   |                                    | Intervalo: | Desde:   | 100      | Hasta:   | 1000   | Frec ( Hz ) | 0       |                       |          |
| Punto     | Valor del IBC | Lecturas del Patrón 4 W RESISTENCE |            |          |          |          | Error  | k (95%)     | U (95%) | Tolerancia Fabricante | D.C.     |
|           |               | 1                                  | 2          | 3        | 4        | 5        |        |             |         |                       |          |
| 1         | 100           | 99.8392                            | 99.8392    | 99.8392  | 99.8392  | 99.8392  | 0.1608 | 2.00        | 0.58    | 1.1                   | Conforme |
| 2         | 300           | 299.4090                           | 299.4090   | 299.4090 | 299.4090 | 299.4090 | 0.591  | 2.00        | 0.58    | 3.1                   | Conforme |
| 3         | 500           | 499.1730                           | 499.1730   | 499.1730 | 499.1730 | 499.1730 | 0.827  | 2.00        | 0.59    | 5.1                   | Conforme |
| 4         | 800           | 798.6430                           | 798.6430   | 798.6430 | 798.6430 | 798.6430 | 1.357  | 2.00        | 0.61    | 8.1                   | Conforme |
| 5         | 900           | 898.5440                           | 898.5440   | 898.5440 | 898.5440 | 898.5440 | 1.456  | 2.00        | 0.61    | 9.1                   | Conforme |

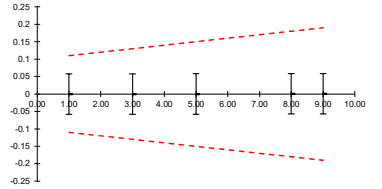
Tolerancia de fabricante:  $\pm((0.01\% \text{ Valor medido} + 2 \text{ m}\Omega))$



Resultados de la calibración:  
(Calibration Results)

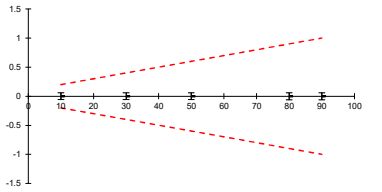
| Magnitud: | Resistencia   | Tipo:                              | Directa    | Unidad: | kΩ      | Medición | OUT     | Resol. IBC: | 0.1     |                       |          |
|-----------|---------------|------------------------------------|------------|---------|---------|----------|---------|-------------|---------|-----------------------|----------|
| Punto:    | Fluke 8845A   |                                    | Intervalo: | Desde:  | 1       | Hasta:   | 10      | Frec ( Hz ) | 0       |                       |          |
| Punto     | Valor del IBC | Lecturas del Patrón 4 W RESISTENCE |            |         |         |          | Error   | k (95%)     | U (95%) | Tolerancia Fabricante | D.C.     |
|           |               | 1                                  | 2          | 3       | 4       | 5        |         |             |         |                       |          |
| 1         | 1.00          | 1.0000                             | 1.0000     | 1.0000  | 1.0000  | 1.0000   | 4E-06   | 2.00        | 0.06    | 0.11                  | Conforme |
| 2         | 3.00          | 2.99995                            | 2.99995    | 2.99995 | 2.99995 | 2.99995  | 5E-05   | 2.00        | 0.06    | 0.13                  | Conforme |
| 3         | 5.00          | 4.99986                            | 4.99986    | 4.99986 | 4.99986 | 4.99986  | 0.00014 | 2.00        | 0.06    | 0.15                  | Conforme |
| 4         | 8.00          | 7.99974                            | 7.99974    | 7.99974 | 7.99974 | 7.99974  | 0.00026 | 2.00        | 0.06    | 0.18                  | Conforme |
| 5         | 9.00          | 8.99972                            | 8.99972    | 8.99972 | 8.99972 | 8.99972  | 0.00028 | 2.00        | 0.06    | 0.19                  | Conforme |

Tolerancia de fabricante:  $\pm(0.01\% \text{ Valor medido} + 2 \text{ m}\Omega)$



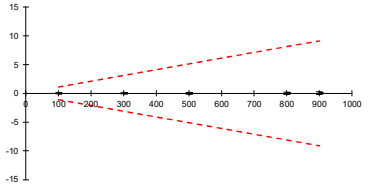
|           |               |                                    |            |         |         |          |          |             |         |                       |          |
|-----------|---------------|------------------------------------|------------|---------|---------|----------|----------|-------------|---------|-----------------------|----------|
| Magnitud: | Resistencia   | Tipo:                              | Directa    | Unidad: | kΩ      | Medición | OUT      | Resol. IBC: | 0.1     |                       |          |
| Patron:   | Fluke 8845A   |                                    | Intervalo: | Desde:  | 10      | Hasta:   | 100      | Frec ( Hz ) | 0       |                       |          |
| Punto     | Valor del IBC | Lecturas del Patrón 4 W RESISTENCE |            |         |         |          | Error    | k (95%)     | U (95%) | Tolerancia Fabricante | D.C.     |
|           |               | 1                                  | 2          | 3       | 4       | 5        |          |             |         |                       |          |
| 1         | 10            | 10.0001                            | 10.0001    | 10.0001 | 10.0001 | 10.0001  | -0.00012 | 2.00        | 0.06    | 0.20                  | Conforme |
| 2         | 30            | 29.9995                            | 29.9995    | 29.9995 | 29.9995 | 29.9995  | 0.0005   | 2.00        | 0.06    | 0.40                  | Conforme |
| 3         | 50            | 49.9998                            | 49.9998    | 49.9998 | 49.9998 | 49.9998  | 0.0002   | 2.00        | 0.06    | 0.60                  | Conforme |
| 4         | 80            | 80.0005                            | 80.0005    | 80.0005 | 80.0005 | 80.0005  | -0.0005  | 2.00        | 0.06    | 0.90                  | Conforme |
| 5         | 90            | 90.0002                            | 90.0002    | 90.0002 | 90.0002 | 90.0002  | -0.0002  | 2.00        | 0.06    | 1.00                  | Conforme |

Tolerancia de fabricante:  $\pm(0.01\% \text{ Valor medido} + 2 \text{ m}\Omega)$



|           |               |                                    |            |          |          |          |        |             |         |                       |          |
|-----------|---------------|------------------------------------|------------|----------|----------|----------|--------|-------------|---------|-----------------------|----------|
| Magnitud: | Resistencia   | Tipo:                              | Directa    | Unidad:  | kΩ       | Medición | OUT    | Resol. IBC: | 0.1     |                       |          |
| Patrón:   | Fluke 8845A   |                                    | Intervalo: | Desde:   | 100      | Hasta:   | 1000   | Frec ( Hz ) | 0       |                       |          |
| Punto     | Valor del IBC | Lecturas del Patrón 4 W RESISTENCE |            |          |          |          | Error  | k (95%)     | U (95%) | Tolerancia Fabricante | D.C.     |
|           |               | 1                                  | 2          | 3        | 4        | 5        |        |             |         |                       |          |
| 1         | 100           | 99.9976                            | 99.9976    | 99.9976  | 99.9976  | 99.9976  | 0.0024 | 2.00        | 0.06    | 1.1                   | Conforme |
| 2         | 300           | 299.9960                           | 299.9960   | 299.9960 | 299.9960 | 299.9960 | 0.004  | 2.00        | 0.10    | 3.1                   | Conforme |
| 3         | 500           | 499.9870                           | 499.9870   | 499.9870 | 499.9870 | 499.9870 | 0.013  | 2.00        | 0.14    | 5.1                   | Conforme |
| 4         | 800           | 799.9680                           | 799.9680   | 799.9680 | 799.9680 | 799.9680 | 0.032  | 2.00        | 0.19    | 8.1                   | Conforme |
| 5         | 900           | 899.9540                           | 899.9540   | 899.9540 | 899.9540 | 899.9540 | 0.046  | 2.00        | 0.21    | 9.1                   | Conforme |

Tolerancia de fabricante:  $\pm(0.01\% \text{ Valor medido} + 2 \text{ m}\Omega)$



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## Resultados de la calibración:

(Calibration Results)

### Observaciones generales

- o Es responsabilidad del usuario establecer la fecha de recalibración de su equipo. El tiempo y validez de los resultados informados en este documento depende de las características propias del equipo, de las condiciones de operación y de las buenas prácticas de uso y cuidado.  
It is the responsibility of the user to set the recalibration date of his/her equipment. The time and validity of the results reported in this document depends on the characteristics of the equipment, the operating conditions and good use and care practices..
- o El uso de los resultados de la calibración queda a consideración del usuario.  
The use of calibration results is the responsibility of the user.
- o Los resultados y los niveles de incertidumbres declarados en este certificado corresponden exclusivamente al instrumento descrito en la hoja 1.  
The results and the level of uncertainties declared in this certificate correspond exclusively to the instrument described at the moment of the calibration.
- o Los resultados que se presentan en este certificado tienen trazabilidad a patrones nacionales.  
The results that appear in this certificate have traceability to national standards.
- o La incertidumbre expandida se expresa con un factor de cobertura correspondiente, que asegura un nivel de confianza de al menos el 95% aproximadamente.  
The expanded uncertainty is expressed by a corresponding coverage factor, which assures the confidence level of less than about 95%.
- o La incertidumbre de medida fue estimada según la NMX-CH-140-IMNC-2002 "Guía para la expresión de la incertidumbre en las mediciones".  
The uncertainty of the measurement was estimated according to the NMX-CH-140-IMNC-2002 "Guide for the expression of uncertainty in the measurements"
- o El método empleado en este servicio de calibración se realiza tomando un total de cinco lecturas al instrumento bajo calibración (IBC), de este conjunto se obtiene la media aritmética, tomándolo este valor como el valor medido del IBC en el cálculo del error de medición del instrumento.
- o Applied method for this calibration service was taking five measurements with the Device Under Calibration (DUC), with these measurements the arithmetic mean its obtained, this value was taking as DUC value measurement for the measurement error calculation.
- o La calibración del instrumento descrito en la carátula de este documento, fue realizada con cables propiedad de MESS.
- o Device under calibration described in page 1 of this document, was development with MESS connection wires.
- o Instrumento se encontro dentro de especificaciones de fabricante.
- o The Instrument was found within specifications Manufacturer.
- o A solicitud de cliente se indica próxima fecha de calibración a un año..

### Notas:

(Notes):

A prescripción del cliente, se documenta y aplica la siguiente declaración de conformidad.  
For customer requirement, the following declaration of conformity is documented and applied.  
La tolerancia que el cliente emplea para este equipo, es la indicada en la especificación técnica del fabricante.  
The customer tolerance required for this equipment is indicated in the manufacturer's technical specification.  
La regla de decisión que el cliente pide aplicar es:  $\text{ERROR} \pm U (k=2) \leq \text{TOLERANCIA}$ .  
Customer rule of decision is:  $\text{ERROR} \pm U (k=2) \leq \text{TOLERANCIA}$ .  
La declaración de conformidad se aplica únicamente a los datos indicados en las hojas de resultados del presente certificado.  
The declaration of conformity applies only to the data indicated in the results sheets of this certificate.  
En esta declaración de conformidad; el laboratorio no considera adicionalmente el nivel de riesgo, debido a que la regla es prescrita por el cliente.  
In this declaration of conformity; the laboratory does not additionally consider the level of risk, because the rule is prescribed by the client.  
además que a solicitud del cliente se indica la próxima fecha de calibración  
In addition, at the customer's request, the next calibration date is indicated