



- Calibration of temperature controllers
- Resistance range 16.0000  $\Omega$  – 400 k $\Omega$
- Resistance accuracy +/- 30 ppm
- Temperature coefficient < 1ppm/°C
- Operating voltage 200 V
- Simulation of RTD temperature sensors accuracy  $\pm 0.01$  °C
- User defined curves (conversion tables)
- RS232 (optionally USB, IEEE488)

Model MC631 is a precise RTD simulator with range from 16  $\Omega$  to 400 k $\Omega$ . Basic accuracy is 0.003 %. Best resolution at the lowest range is 100  $\Omega\mu$ . Decade contains stable foil resistors with low temperature coefficient switched by low thermal voltage relays. Built-in software contains function of RTD temperature sensor simulation with parameters according to IEC (DIN) or US standards, temperature setting in degree of Celsius or Fahrenheit. Instrument can be controlled via RS232, USB, LAN or GPIB interface.

MC631 is sophisticated instrument with its own recalibration procedure. The procedure enables to correct any deviation in resistance without any mechanical adjusting.

Decade box is designed for checking parameters of resistance meters, regulators and process meters that use external resistance sensors for non-electric quantity measuring.

#### MC631 Resistance accuracy

| Range / Resolution                    | Accuracy               |
|---------------------------------------|------------------------|
| 16.000 0 $\Omega$ - 20.000 0 $\Omega$ | 0.002 % + 2 m $\Omega$ |
| 20.001 $\Omega$ - 200.000 $\Omega$    |                        |
| 200.01 $\Omega$ - 1000.00 $\Omega$    | 0.003 %                |
| 1000.1 $\Omega$ - 3000.0 $\Omega$     | 0.005 %                |
| 3001 $\Omega$ - 10000 $\Omega$        | 0.015 %                |
| 10.01 k $\Omega$ - 30.00 k $\Omega$   | 0.03 %                 |
| 30.1 k $\Omega$ - 100.0 k $\Omega$    | 0.1 %                  |
| 101 k $\Omega$ - 400 k $\Omega$       | 0.4 %                  |

#### MC631 Pt simulation accuracy

| Temperature          | Accuracy Pt100 ... Pt500 | Accuracy Pt501 ... Pt1000 |
|----------------------|--------------------------|---------------------------|
| -200.000...0.000 °C  | 0.01 °C                  | 0.01 °C                   |
| 0.001...200.000 °C   | 0.015 °C                 | 0.02 °C                   |
| 200.001...500.000 °C | 0.03 °C                  | 0.04 °C                   |
| 500.001...850.000 °C | 0.04 °C                  | 0.1 °C                    |

#### MC631 Ni simulation accuracy

| Temperature        | Accuracy Ni100 ... Ni500 | Accuracy Ni501 ... Ni1000 |
|--------------------|--------------------------|---------------------------|
| -60.000...0.000 °C | 0.01 °C                  | 0.01 °C                   |
| 0.001...300.000 °C | 0.01 °C                  | 0.02 °C                   |

#### MC631 Frequency response

| R              | AC/DC difference |        |        |
|----------------|------------------|--------|--------|
|                | 100 Hz           | 1 kHz  | 10 kHz |
| 16 $\Omega$    | 0.01 %           | 0.01 % | 0.04 % |
| 100 $\Omega$   | 0.01 %           | 0.03 % | 0.30 % |
| 1 k $\Omega$   | 0.03 %           | 0.30 % | 3.00 % |
| 10 k $\Omega$  | 0.30 %           | 3.00 % |        |
| 100 k $\Omega$ | 3.00 %           |        |        |

## General specification

|                                 |  |
|---------------------------------|--|
| <b>Maximal voltage:</b>         | 200 V pk   |
| <b>Maximal current:</b>         | 500 mA   |
| <b>Total power dissipation:</b> | 0.25 W   |
| <b>TC of used resistors:</b>    | < 1 ppm/ °C (16 Ω ... 2 kΩ)<br>< 5 ppm/ °C (2 kΩ ... 10 kΩ)<br>< 50 ppm/ °C (10 kΩ ... 400 kΩ) |
| <b>Reaction time:</b>           | 6 ms   |
| <b>Switching method:</b>        | Fast / Smooth / Via short / Via open   |
| <b>Terminals:</b>               | gold plated terminals 4mm  |
| <b>Remote control:</b>          | RS232 interface (optionally USB, LAN, IEEE488)   |
| <b>Power supply:</b>            | 115/230 Vac, 50/60 Hz  |
| <b>Reference temperatures:</b>  | +20 °C ... +26 °C  |
| <b>Working temperatures:</b>    | +5 °C ... +40 °C   |
| <b>Storage temperatures:</b>    | -10 °C ... +50 °C  |
| <b>Dimensions:</b>              | W 390 mm, H 128 mm, D 310 mm   |
| <b>Weight:</b>                  | 5.2 kg   |

### Content of delivery

M631 Precision RTD Simulator  
Cable RS 232  
Application software  
User's manual

### Ordering information – options

|                |  |
|----------------|--|
| <i>Bus</i>     | MC631-V1xxx - RS232<br>MC631-V2xxx - RS232, USB, LAN, GPIB   |
| <i>Housing</i> | MC631-Vxx0x - table version<br>MC631-Vxx1x - module 19", 3HE |

#### Resistance

| RESISTANCE       |           | 14:33:45 | Function |
|------------------|-----------|----------|----------|
| FAST             |           |          |          |
| <b>100.000 Ω</b> |           |          |          |
| Output           | 100.000 Ω |          |          |
| Specification    | 0.0040 %  |          |          |
| Max. Voltage     | 5.00 V    |          |          |
| Max. Current     | 50.0 mA   |          | Menu     |

#### Temperature

| PLATINUM          |                        | 10:18:59 | Function |
|-------------------|------------------------|----------|----------|
| PT385 (90)        |                        |          |          |
| FAST              |                        |          |          |
| <b>100.000 °C</b> |                        |          |          |
| Output            | 138.505 Ω RO 100.000 Ω |          |          |
| Specification     | 0.015 °C               |          |          |
| Max. Voltage      | 5.88 V                 |          |          |
| Max. Current      | 42.5 mA                |          | Menu     |

#### Recalibration

| CALIBRATION          |            | Previous |
|----------------------|------------|----------|
| Resistance           | 1 / 37     |          |
| Nominal resistance   | 1.95 Ω     | Next     |
| Requested accuracy   | 1 mΩ       |          |
| Last calibrated      | 07/02/2012 | Save     |
| <b>↑ 1.9443810 Ω</b> |            | Close    |

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