# Digital Megohmmeter RESISTOMAT®

## Model 2408

| | |
|---|---|
| Code: | 2408 EN |
| Delivery: | ex stock |
| Warranty: | 24 months |

2408 EN


- **Resistance range from 1 kΩ ... 100 TΩ**
- **Current range from 0.1 pA ... 1 mA**
- **Automatic ranging**
- **Test voltage selectable from 1 V ... 1000 V**
- **Limit indicator**
- **Result memory at ext. USB flash drive**
- **RS232 interface (IEEE488 optional)**

### Application

RESISTOMAT® model 2408 digital megohmmeter has been specially developed to measure extremely high resistance values with a high degree of accuracy. This instrument has a specification that makes it suitable for all common applications. The measurement voltages equal those given in the DIN test regulations (e.g. DIN 51953, DIN 53482, DIN 54345, DIN 57281 and DIN 57411) for measuring the electrical resistance value across films, floor coverings, test equipment, cables, moldable materials, rubber, plastics, insulating oils and the like.
Fast serial measurements can be performed using the integral limit indicator. If the reading lies below an adjustable limit, the pass/fail limit indicator trips and enables an output. All functions can be PC-controlled via the built-in RS232 interface provided as standard.
The guard circuit in shield technology can be used to measure individual resistances in a delta connection. This means, for instance, it is possible to measure the insulation resistance between wire and shield on a 2-core cable with common shield without the result being distorted by the two guard resistances lying in parallel (see diagram overleaf). The meter can also be used to measure the leakage currents flowing through the test specimen; in “current measurement “ mode, it measures currents from 0.1 pA to 1mA.

### Description

RESISTOMAT® model 2408 digital megohmmeter is a microprocessor-controlled instrument for measuring high resistances and small currents. Measurements can be made in the range 1 kΩ to 100 TΩ, with the user able to select a test voltage between 1 V and 1000 V. All instrument functions can be configured manually and via RS232 interface (standard) or IEEE488 interface (option).
On-screen information guides the user efficiently through the meter’s range of application-oriented configuration options, clearly displayed on the backlit graphical display with adjustable contrast level.
With its rugged case, this instrument is designed for both laboratory use and harsh industrial environments.
For automated system applications the model 2408 includes an I/O interface connection with remote start and pass/fail outputs.
Test setup conditions and measured results can be stored in CSV format at an external USB flash drive for easy use with Microsoft Excel.


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## Technical Data

| | | |
|---|---|---|
| Resistance range: | 1 x $10^3$ ...100 x $10^{12}$ Ω | |
| Accuracy: | < 1 x $10^{12}$ Ω | 0.5 % |
| | 1 x $10^{12}$ ... 1 x $10^{13}$ Ω | 1 % |
| | 1 x $10^{13}$ ... 1 x $10^{14}$ Ω | 10 % |
| | > 1 x $10^{14}$ Ω | less accuracy |

The accuracy depends on the Rx and test voltage.
± {0.45 % +[(Rx/$U_{Test}$) · (0.0005 · FS + 2 pA) + 30 Ω/Rx] · 100 %}

| | | |
|---|---|---|
| Voltage range (DC): | 1 V ... 1000 V, freely selectable | |
| Voltage accuracy: | 1 V - 100 V | 1 % rdg. + 1 V |
| | 100 V - 1000 V | 1 % rdg. + 2 V |
| Current limited: | | < 2 mA |
| Input impedance: | | 5 kΩ ± 5 % |
| Output voltage impedance: | | 1 kΩ ± 5 % |
| Current measure: | 1 x $10^{-13}$ ... 1 x $10^{-3}$ A | |
| Range selection: | manual, autorange, via interface | |
| Test cycle | manually: | charge, measure, discharge |
| | automatically: charge | 0 - 300 s |
| | dwell | 0 - 300 s |
| | measure | 0 - 999 s |
| | discharge | 0 - 300 s |
| Input terminals: | four sheated 4 mm⌀ banana jacks | |
| | red + | black - |
| | blue - guard | green - ground |
| Display: | LCD graphics display with contrast setting and back ground illumination | |
| Limit indicator: | pass - fail - output | |
| | open collector | max. +15 V |
| | | max. 24 mA |
| Interface: | standard | RS232, I/O-port (safety interlock) |
| | option | IEEE488 (upgradable) |
| Internal memory: | for storing up to 25 test conditions | |
| USB connection: | to store test set up conditions and measurement results on a USB flash drive | |
| Operating temperature: | | 0 ... 50 °C |
| Storage temperature: | | - 40 ... 70 °C |
| Power: | | 90 V ... 250 V<br>47 Hz ... 63 Hz |
| Power consumption: | | ca. 40 VA |
| Housing: | | 19"-3HU metal panel mount housing with tilt back bail |
| Dimensions (H x W x D): | | 134 x 445 x 407 [mm] |
| Weight: | | 8.5 kg |

## Order Information

**Megohmmeter RESISTOMAT®**
with RS232 interface **Model 2408**

**Megohmmeter RESISTOMAT®**
with RS232/IEEE488 interfaces **Model 2408 - V001**

## Accessories

19" rack mount kit **Model 2408 - Z001**

Shielded lead set
with measuring tongs **Model 2408 - Z002**

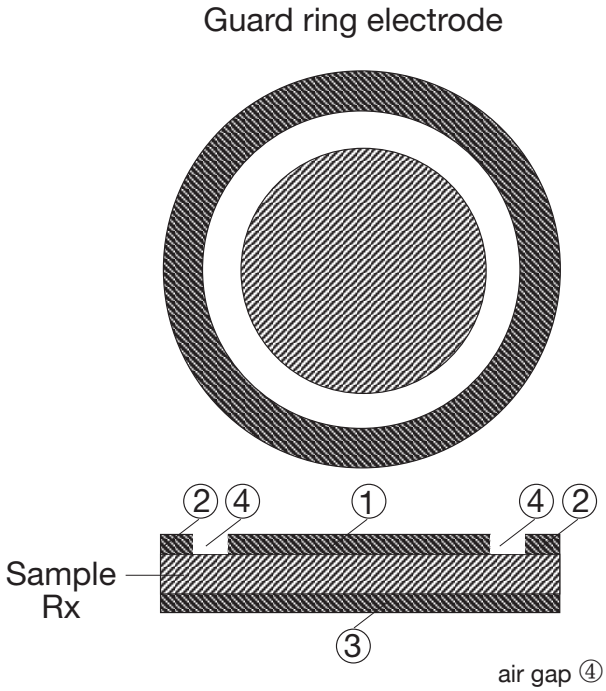
DKD-Calibation Certificate **Model 24DKD-2408**

WKS-Calibration Certificate **Model 24WKS-2408**

Surface and volume resistance measuring electrodes on request

## Guard Circuit

The guard connection is exemplified by a guard ring electrode.




Depending on the connection wiring the RESISTOMAT® 2408 makes it possible to determinate the surface or volume resistance of the test sample.

For the determination of the surface resistance the measuring electrode ① is connected to the "-"input, the guard ring ② is connected with the "+" input and the basic electrode ③ is connected with the guard input.

For the determination of the volume resistance the measuring electrode ① is connected with the "+"input, the guard ring ② with the guard input and the basic electrode ③ is connected with the "-"input.

**Calibration resistors for device check-up and recalibration Series 1270**

| | | |
|---|---|---|
| Operating voltage: | | 20 V ... 1000 V |
| Temperature coefficient: | typically | ± 0.15 %/K |
| | maximum | ± 0.30 %/K |
| Construction: | metal housing with PVC cover | |
| Dimensions: | | 36 x 30 x 90 [mm] |
| Weight: | | ca. 70 g |

| Model | Resistance Value | Accuracy | Voltage Coefficient |
|---|---|---|---|
| 1270 | $10^6$ Ω | 1 % | - 0.005 %/V |
| 1271 | $10^7$ Ω | 1 % | - 0.005 %/V |
| 1272 | $10^8$ Ω | 1 % | - 0.005 %/V |
| 1273 | $10^9$ Ω | 1 % | - 0.02 %/V |
| 1274 | $10^{10}$ Ω | 1 % | - 0.02 %/V |
| 1275 | $10^{11}$ Ω | 1 % | - 0.02 %/V |
| 1276 | $10^{12}$ Ω | 5 % | - 0.02 %/V |
| 1277 | $10^{13}$ Ω | 5 % | - 0.04 %/V |
| 1278 | $10^{14}$ Ω | 10 % | - 0.04 %/V |