Delivery: 3 weeks | Warranty: 24 months

RESISTOMAT® for universal high-resistance measurement in automation, laboratories, and R&D

MODEL 2411 NEW

Preliminary data sheet



Protected against EM interference

USB

Ethernet

EtherNet/IP PROFINET EtherCAT





Rear view

Highlights

- Measuring ranges from 100 kΩ to 100 TΩ
- Measurement accuracy from ±0.1 % of reading*
- Test voltage up to 1000 V
- High-speed measurements from 50 ms/measurement, including evaluation
- 32 adjustable measuring programs
- Individually configurable measurement phases
- Cable break detection, short-circuit detection function
- Mains-synchronous measurement
- Humidity measurement for documentation purposes

Options

- Flexible fieldbus integration with EtherCAT, PROFINET, or Ethernet/IP
- TOhm version up to 100 TΩ

Areas of application

- Insulation testing in motor production
- Insulation testing in cable manufacturing
- Evaluation of cathode-to-case insulation resistance in battery cells
- Testing of ignition coil Case resistance in airbags

Product description

The RESISTOMAT® Model 2411 is designed and optimized for high-impedance, high-speed applications in automation. It can perform up to 20 measurements per second. The measurement leads are monitored via the integrated cable break detection and contact monitoring.

For classification and sorting, a single- or multi-comparator is available, with evaluation output via a fieldbus, switching outputs, or the integrated display. Relative humidity can also be recorded for documentation purposes.

All device settings can be individually saved in up to 32 measurement programs. Of course, all device settings can also be configured via the Ethernet, USB, or fieldbus interfaces (optional). With the integrated data logger, up to 500 measured values per measurement program can be saved.

Technical data

Resistance measurement, including measurement times									**Available only in the TOhm version**	
Measuring range from 0 …		100 kΩ-1 MΩ	1 MΩ-10 MΩ	10 MΩ-100 MΩ	100 MΩ-1 GΩ	1 GΩ-10 GΩ	10 GΩ-100 GΩ	100 GΩ-1 TΩ	1 TΩ-10 TΩ	10 TΩ-100 TΩ
Max. Resolution		10 Ω	100 Ω	1 kΩ	10 kΩ	100 kΩ	1 MΩ	10 MΩ	100 MΩ	1 GΩ
Min. measuring time in ms		50	50	50	50	50	50	50	50	50
Accuracy from		±0.1 % of reading* ±2 digit	±0.1 % of reading* ±2 digit	±0.1 % of reading* ±2 digit	±0.1 % of reading* ±2 digit	±0.1 % of reading* ±2 digit	±0.1 % of reading* ±2 digit	±0.1 % of reading* ±2 digit	TBD	TBD
Current measurement range **		100 µA	10 µA 100 µA	1 µA 10 µA 100 µA	100 nA 1 µA 10 µA	10 nA 100 nA 1 µA	1 nA 10 nA 100 nA	100 pA 1 nA 10 nA	10 pA 100 pA 1 nA	10 pA 100 pA
Measurement voltage		10 V	10 … 100 V	10 … 1000 V	10 … 1000 V	10 … 1000 V	10 … 1000 V	10 … 1000 V	10 … 1000 V	11 … 1000 V
Measurement recording		Internal data logger, USB stick, interfaces								
Housing										
Material		Aluminium								
Size		165 x 110 x 176 (W x H x D / mm)								
Weight		Approx. 2 kg								
Protection Class		IP40 / panel mounting IP65								
Connections		Fieldbus, PLC I/O, wire break, measurement input, test voltage input, test voltage output, external devices, Ethernet, USB (Micro-B)								
Environmental Conditions										
Operating temperature		+5 … +23 … +40 °C								
Storage temperature range		-10 °C … +60 °C								
Humidity		20 … 80 %, non-condensing								
General data										
Supply voltage		85 … 264 VAC, 47 … 63 Hz								
Power consumption		< 20 VA								
Communication		USB, Ethernet (default)								
Fieldbus interfaces										
EtherCAT										
Connection		2 x RJ45, 10/100 Mbit/s								
Communication		**PDO - Process Data Objects** Transmission of PLC data such as measured values or the current program number from the device to an EtherCAT controller as well as control of the device such as program selection or measurement start/stop by an EtherCAT controller. **SDO - Service Data Objects** Device configuration, e.g. setting of comparator limits or modification of the assignment of PLC inputs and outputs.								

* F.S. = from full scale value

** Current ≤ 1 nA available only in the TOhm version

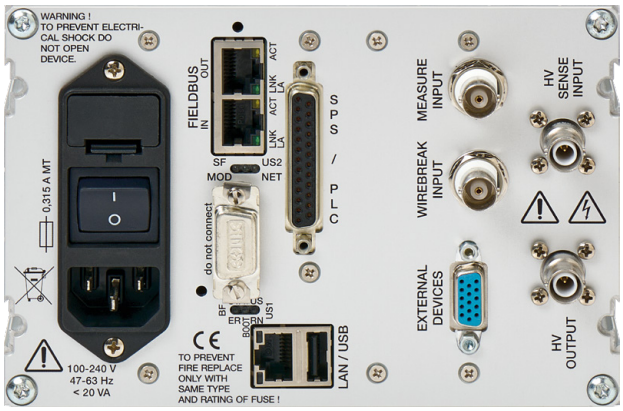
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PROFINET		
Connection		2 x RJ45, 10/100 Mbit/s
Communication		RT Communication **Cyclic data transmission (process data)** Transmission of PLC data such as measured values, evaluation results or the current program number from the device to a PROFINET controller as well as control of the device such as program selection or measurement start/stop by a PROFINET controller. **Acyclic data transmission (configuration data)** Device configuration, e.g. setting of comparator limits or modification of the assignment of PLC inputs and outputs.
EtherNet/IP		
Connection		2 x RJ45, 10/100 Mbit/s
Communication		**Cyclic data transfer (implicit messaging)** Transmission of PLC data such as measured values, evaluation results or the current program number from the device to an EtherNet/IP controller as well as control of the device such as program selection or measurement start/stop by an EtherNet/IP controller. **Acyclic data transmission (explicit messaging)** Device configuration, e.g. setting of comparator limits or modification of the assignment of PLC inputs and outputs.

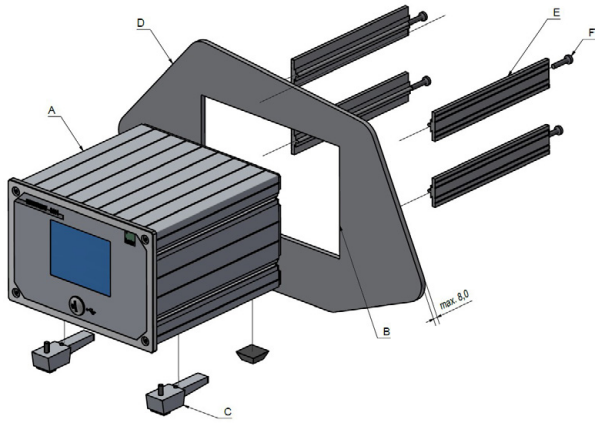
Display – measuring mode



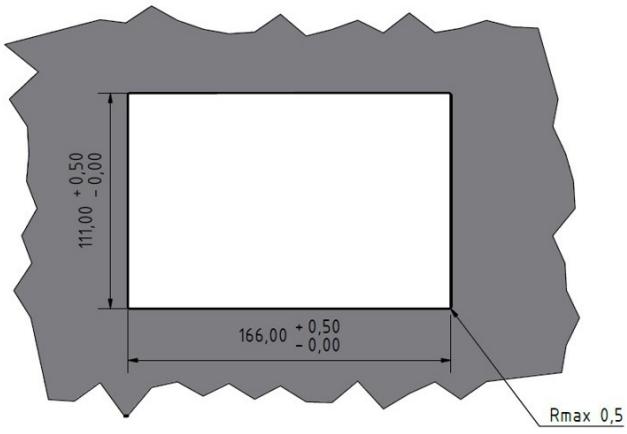
Rear view with connections



Panel mounting



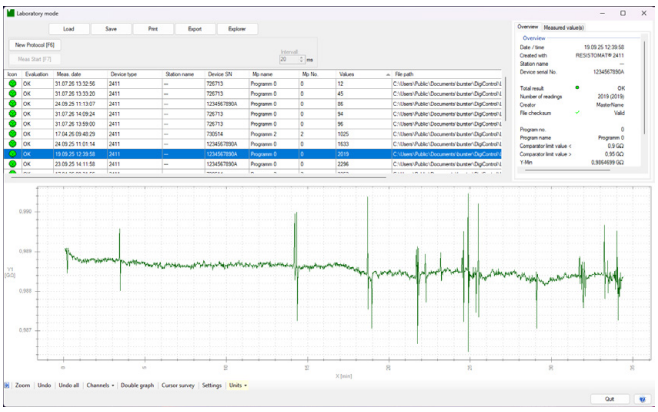
Panel cutout



DigiControl PC software

The full version of the DigiControl software contains the following features for the RESISTOMAT® model 2411:

- Convenient parameterization of the 32 measurement programs
- Copy programs
- Backup of device settings (download)
- Print device settings
- Command line for service purposes
- Measurement export/storage in a Excel file
- Measurement polling (data logging) triggerable under time control and externally via the device
- Printout of a measurement report with flexible design options



Accessories

Order code		
2400-K001-010		Measuring cable set, 1 m length, with 2 BNC connectors and 2 SHV connectors on the device and connection ends
2400-K002-010		Measuring cable set, 1 m length, 2 BNC connectors and 2 SHV connectors on the device side, open end on the connection side
2400-Z001		Pre-assembled interlock connector for enabling high voltage for measurements without protective circuitry
9900-V160		25-pin connector for digital I/O interface
9310-Z001		Fixing kit for front-panel mounting

4839-002411EN-5699-111537

Generate order code

						Standard			
						0	0	0	0
2	**4**	**1**	**1**	**–**	**V**	**0**	**0**		

Housing variant	
■ Desktop device with display 85 ... 240 V/AC	0

Measuring range	
■ Measuring range up to 100 GΩ	0
■ Measuring range up to 100 TΩ	1

Feldbusse	
■ ohne	0
■ EtherCat	1
■ PROFINET	3
■ EtherNet/IP	4