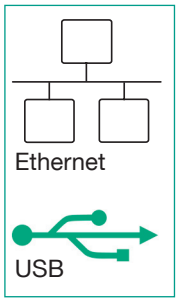
Micro Ohmmeter RESISTOMAT®

For the cable industry

Model 2317

Code:	2317 EN
Delivery:	ex stock/6 weeks
Warranty:	24 months

2317 EN



- **Measuring ranges from 200 µΩ to 20 kΩ**
- **Resolution up to 0.01 µΩ**
- **Accuracy 0.03 % Rdg.**
- **Autorange**
- **Temperature compensation for all materials**
- **Thermal e.m.f. compensation**
- **Input voltage protection up to 400 V_{rms}**
- **Ethernet-, USB-, RS232 - as well as PLC interface**

Application

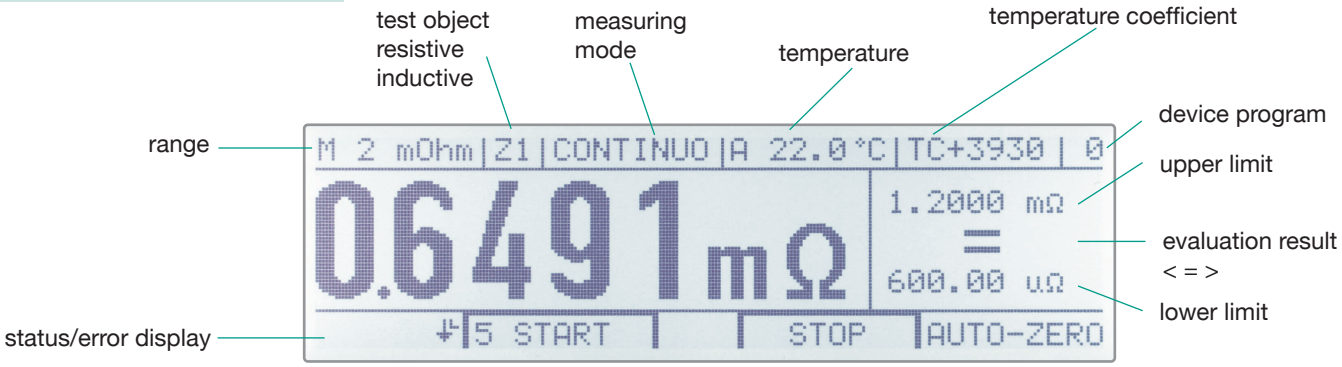
Fast and accurate measurements of the smallest resistance values at conductor samples with high cross sections or cables on the drum is possible with the micro-ohmmeter RESISTOMAT® model 2317. Due to the rugged aluminium injection moulding desktop housing with membrane keypad it is suitable for use in laboratory and industrial environment likewise.
Wires and coils can be measured with temperature compensation. The temperature of the sample is measured with a Pt100 or pyrometer and the resistance is then corrected to the equivalent at e.g. 20 °C (adjustable) in the instrument.
The complete control via Ethernet, USB or RS232 interface enables the setup of fully automatic test stations.

Description

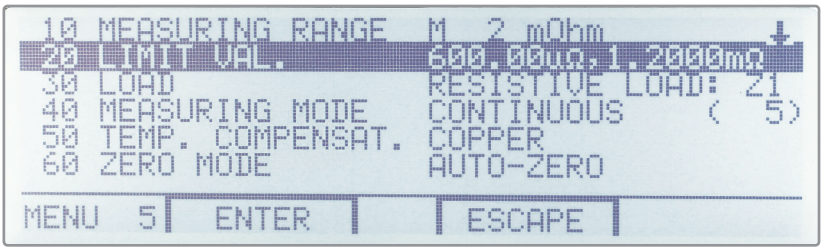
The device works according to the proven 4-wire measuring method which eliminates errors caused by test lead and contact resistances. Thermo voltages that might be in the measurement circle would be compensated automatically by this measurement method. The control of the measurement leads is done with integrated cable fraction detection.
The measurement value indication can be changed in Ω, Ω/km, Ω/ft or Ω/kft.
16 device settings such as the measurement range, limit values, temperature coefficient etc. can be saved in order to test samples with different parameters in an automatic measurement system. All device specific settings are shown to the user via display.
The high-contrast LCD display with backlight assures very good reading of the measurement value in dark as well as bright spaces.

burster praezisionsmesstechnik gmbh & co kg Germany
Talstr. 1-5 · Gernsbach 76593 · Phone +49-7224-6450
www.burster.com
info@burster.com

Measurement Display

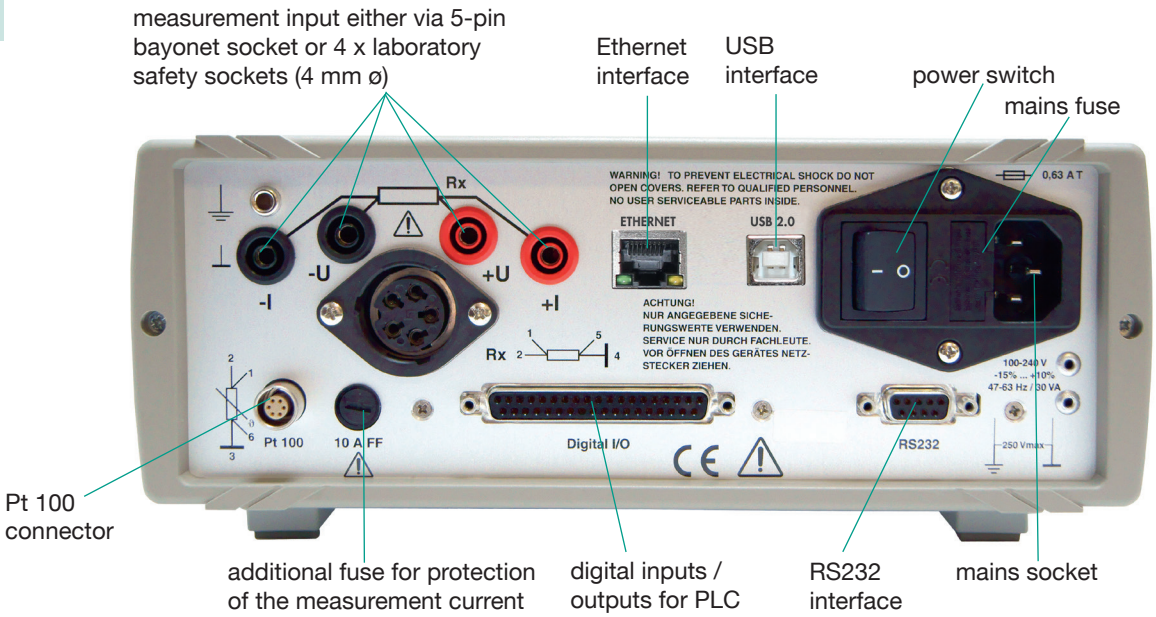


Menu



Measurement at a cable drum with measurement value indication Ω/m, Ω/ km as well as Ω/ft and Ω/kft. Entry of the cable length 0.01 meter up to 9999 meter is possible.

Rear Side



Device and Documentation Software

The software model 2316-P001 is especially developed for the device setting, measurement value evaluation as well as the printout of measurement reports.
A demo version is available at **www.burster.com** in the section Instruments & PC software.

Following features are available:

- Full control of RESISTOMAT® model 2317
- Online display of the measuring values including limits in graphic or tabular mode
- Direct storage of the measuring values with time stamp in ASCII files
- Export of all data in ASCII format to MS-EXCEL
- Printout of a test certificate with your own logo
- Complete cooling curve record and printout of motor and transformer windings with extrapolation in Excel
- Backup of device settings

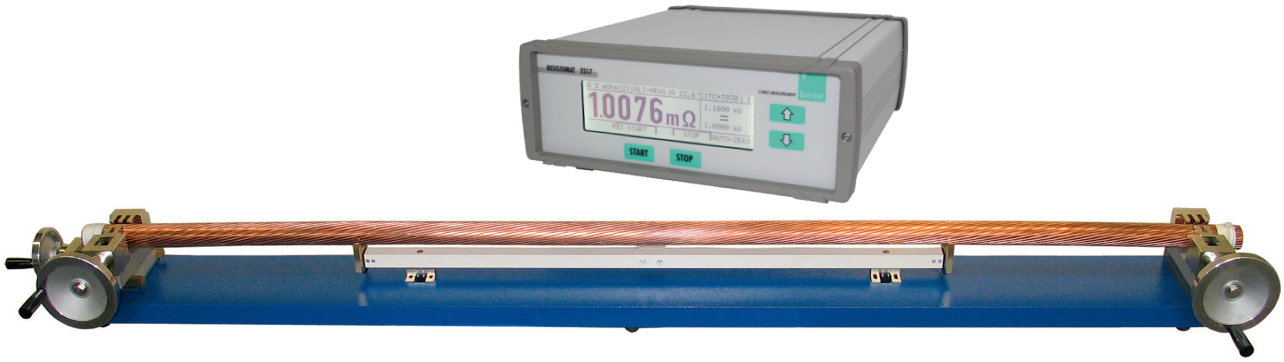
System requirements:

Processor:	Pentium 500 MHz (at least)
Graphic:	VAG 800 x 600 (at least) 256 colours (at least)
Memory:	128 MB RAM (at least) (WIN7, WIN8, WIN10)
Hard Disk:	approx. 200 MB free memory
Interface:	RS232, USB or Ethernet

Application Examples

Quality control on cable

- Resistance measurement at cables up to 1500 sqmm (max. 44 mm Ø)
- Measurement length fix 1000 mm
- Temperature compensation of the test sample calculated to 20 °C with ambient temperature measurement



... in combination RESISTOMAT® 2317 with clamping device 2381-V001 and temperature sensor 2392-V001

Quality control on wires

- Testing of variable wire lengths from 100 mm ... 1000 mm measurement length, max. cross section 100 mm²
- The integrated temperature compensation allows a standardized resistance value in correspondence to the reference temperature (Germany e.g. 20 °C)
- Individual selection of material specific temperature coefficient

... in combination RESISTOMAT® 2317 and clamping device 2381

Quality control of cable drums

- Testing of the ready cable length at the cable drum
- Indication in Ohm per km or Ohm per ft
- Measurement with respect of the temperature

... in combination RESISTOMAT® 2317 with KELVIN test tongs 2386-V001 and temperature sensor 2392-V001

burster praezisionsmesstechnik gmbh & co kg Germany
Talstr. 1-5 · Gernsbach 76593 · Phone +49-7224-6450
www.burster.com
info@burster.com

Technical Data

Construction

The device has a service-friendly construction in a sturdy aluminium die casting housing which enables good access to the various components. The operation is done via the membrane keypad. The connections for the sample, the in- and outputs of the RS232/PLC interface as well as the Pt100-sensors are located at the backside of the device. The device features a diagnosis function for current source, amplifier, display, internal operation voltage and PLC I/O.

Measuring range		Resolution		Measuring current low**		Measuring current high**	
200	µΩ*	0.01	µΩ	7	A	7	A
2	mΩ*	0.0001	mΩ	7	A	7	A
20	mΩ	0.001	mΩ	1	A	1	A
200	mΩ	0.01	mΩ	100	mA	1	A
2	Ω	0.0001	Ω	10	mA	1	A
20	Ω	0.001	Ω	10	mA	100	mA
200	Ω	0.01	Ω	1	mA	10	mA
2	kΩ	0.1	Ω	1	mA	1	mA
20	kΩ	1	Ω	100	µA	100	µA

*only ohmic probes, **adjustable at the device

Accuracy (with temp. comp. off):
Range 20 mΩ ... 20 kΩ ±0.03 % Rdg. ±3 counts
Range 200 µΩ and 2 mΩ ±0.03 % Rdg. ±5 counts
(valid for 10% ... 100% of the range)

Temperature drift: < 50 ppm/K
Burden voltage: approx. 5 V max.
Measuring time (for ohmic probes): approx. 500 ms
Warm-up time to attain the error tolerance range: < 15 min
Measurement connection: 4-wire technology for current and voltage measurement (KELVIN), ground-free circuit design
FE-PE max. 250 V
Input protected: against induction voltages and external voltages up to 400 V_{rms}
Measurement mode: continuous, single and alternated measurement
Measurement display: Ω, Ω/m, Ω/km, Ω/ft, Ω/kft at variable measurement length 0.1 m ... 10 km
Limit values: Hi/Lo limits programmable via keypad or interface
Range selection: manually or automatically
Automatic temperature compensation: 7 different temperature coefficients can be chosen and additional 8 TCs are adjustable
Temperature measurement: 0 ... 100 °C, resolution 0.1 °C, accuracy 0.1 °C
with ext. Pt100 sensor or temperature transmitter (pyrometer) with a voltage output of 0 ... 10 V
Display: high-contrast graphic LCD with adjustable contrast and LED background illumination 264*64 Dots, 127 x 34 mm
Measurement display: max. 21 000 counts
Device setting memory: for 16 different device settings
Operator language: German, English, French, Italian, Spanish
Mains supply: 85 ... 264 V AC 50/60 Hz
Power consumption: approx. 30 VA
Operation temperature: 0 ... +23 ... +50 °C
Humidity non-condensing: 80 % rel. hum. (up to 31 °C), thereover linearity decreasing to 50 % at 50 °C
Storage temperature: 0 ... +70 °C
Weight: 3.5 kg
Dimensions (W x H x D): 247 x 106 x 275 [mm]
19"-3HU rack mount set optionally
Device protection: EN 61010-1 protection class1
Protection class: IP 40

Connections

Measuring input: alternatively via 4 terminals (ø 4 mm) or 5-pin socket with bayonet lock
Pt 100 sensor: 6-pin, LEMO socket EGG.1B.306
Digital I/O: 37-pin subminiature D-socket
PLC interface with positive logic (negative logic optionally)
additional comparator output with relay (disconnectible) 24 V / 1A
RS232 interface: 9-pin subminiature D-socket
Baud rate: 300 ... 57 600
Protocol: ANSI X3.28 1976 Subc.2.1,A3
SCPI commands: Vers. 1995.0
direct data recording to a printer with RS232 interface is possible
USB interface: Slaveport type B
Baud rate: 57600
Ethernet: Western socket RJ45 10/100 MBit

Calibrations Sets:

1. The **calibration set model 2317-Z010** consists of 5 calibration resistors series 1240 with the values 100 µΩ, 1 mΩ, 10 mΩ, 100 mΩ and 1 Ω as well as adapter model 2394, including one DAkkS certificate for each resistor. The added adapter model 2394 allows a direct contacting with the RESISTOMAT®.
This calibration certificate documents the traceability to national standards. Full description see data sheet 1240 EN

Order Information

RESISTOMAT®

Range 200 µΩ ... 20 kΩ **Model 2317-V0000**

Accessories

Measurement leads, 4-pin, 1.5 m long shielded cable with banana plugs and bayonet socket	**Model 2329-K001**
Temperature sensor with 2.5 m shielded connection line and 6-pin connection plug	**Model 2392-V001**
RS232 data transmission lead	**Model 9900-K333**
USB connection cable	**Model 9900-K349**
37-pin plug for digital I/O interface	**Model 9900-V165**
5-pin bayonet plug for measuring input	**Model 9900-V172**
19"rack mount kit (3U)	**Model 2316-Z001**
External device program selecting switch with cable 2 m length and power supply	**Model 2316-Z002**
External foot switch for measuring start/stop with cable 2 m length	**Model 2316-Z003**
Device and documentation software incl. data transmission lead model 9900-K333	**Model 2316-P001**
Calibration set	**Model 2317-Z010**
DAkkS Calibration Certificate Model 2317-V0000	**Model 23DKD-2317-V0000**
WKS Calibration Certificate Model 2317-V0000	**Model 23WKS-2317-V0000**

For DAkkS (Deutscher Kalibrierdienst) calibrations we use PTB-calibrated standards (national institute).

For WKS (manufacturer calibration) calibrations we use DKD-calibrated resistors.

Kelvin measuring tongs and probes	**see data sheet 2385 EN**
Wire holding devices for wires up to 2500 mm^2	**see data sheet 2381 EN**
Calibration resistors	**see data sheet 1240 EN**

burster praezisionsmesstechnik gmbh & co kg Germany
Talstr. 1-5 · Gernsbach 76593 · Phone +49-7224-6450
www.burster.com
info@burster.com

2962-002317EN-5099-111530