ResTest 8134

Sole system able of accurately measuring copper conductors directly on the stranding machine

DESCRIPTION

Cables are usually supplied with unnecessary and expensive excess material (at least 2 - 5% safety margin). A reliable and non-destructive measurement directly on the stranding machine allows reducing the safety margin, thus generating significant savings.

ResTest 8134 avoids cutting samples for the laboratory. It allows rapid results, even at high temperature and of extremely compacted strands. AESA's dry heating system drastically reduces the temperature stabilisation time. The patented measuring method of ResTest 8134 doesn't require insulating from ground potential the pull-off capstan and the winding spool (costly and dangerous modification).

KEY FEATURES

- **Important savings in production**
  - raw material savings enable pay-back in less than one year
  - testing without generation of any scrap
  - rapid check of production adjustment effects thanks to a short feedback loop

- **Directly on the stranding machine**
  - our patented measuring method allows reliable measurements directly on the line
  - unlike other solutions on the market, it is not needed to insulate the production line

- **Dry temperature stabilization system**
  - fast heating system and stabilisation at the conductor's temperature
  - no use of coolant or water

- **Overall accuracy**
  - our specification relates to the overall measurement, not only to the micro-ohmmeter

AESA Cortaillod

TECHNICAL SPECIFICATIONS

Measuring range	9 µΩ - 7000 µΩ					
Measuring length	1000 mm					
Mechanical capability	Max Ø 60 mm / 2.36"					
Sections	**Copper**			**Aluminium**		
	2.5 – 1'800 mm² 13 AWG – 3'200 MCM			6 – 1'800 mm² 9 AWG – 3'200 MCM		
Accuracy (± 3 digits)	Class 1 (solid)	< 1'000 mm² < 1'800 mm²	< 2'000 MCM < 3'200 MCM	± 0.1% ± 0.2%	< 1'000 mm² < 2'000 MCM < 1'800 mm² < 3'200 MCM	± 0.1% ± 0.2%
	Class 2 (stranded)	< 1'000 mm² < 1'800 mm²	< 2'000 MCM < 3'200 MCM	± 0.1% ± 0.2%	< 150 mm² < 300 MCM	± 0.2%
	Sectors	<800 mm²	< 1'600 MCM	± 0.1%	< 150 mm² < 300 MCM	± 0.2%
	± 0.4% with microprocessor heating facility *Note: The accuracy may depend on the corrosion level and construction characteristics of the tested strand*					
Measuring method	Kelvin (4 points) performs the measurement responding to the norms IEC 60468 and IEC 60228					
Resolution	5 digits					
Operating modes	• Operator mode for production use (Start-Stop button) • Advanced mode for supervisor use (touchscreen with password locked screens)					
Display	State-of-the-art interface thanks to a 10" touchscreen					
Conductor temperature	5 - 65°C					
Stabilization time	Depends on the temperature of the conductor (usually 3 to 20 minutes)					
Supply voltage	Total consumption: 6 KW (230 W without controlled heating) • European version: 3 x 400V (340-440V) 50Hz • US & Japanese version: 3 x 205V (175-225V) 50-60Hz					
Components	• Measuring ruler with all integrated components (temperature probes, voltage and current knives) • Movable and adjustable trolley (height & inclination) • Control unit (with embedded touchscreen, PC, metrology,…) • ISO 17025 Certificate					
Interfaces	2 x USB (e.g. for printer) 1 x Display Port connector for external monitor 2 x RJ45 for LAN connection					
Dimensions	2060 x 800 x 1230 mm (81.1" x 31.5" x 48.4")					
Weight	≈148 kg (326 lb)					
Article No	31.8134.0001.0					

OPTIONS

- ISO 17025 certified control box
- ISO 17025 certified copper rod
- Printer (for labels or full page)
- Protective cover
- Maintenance contract

ALTERNATIVES

- on-the-line   ResTest 8135 for copper and aluminium (hydraulic jaws)
  ResTest 8136 for copper when space is limited (short version)
- for samples   Several models for production and laboratory (see specific ResTest family brochure)

KEY BENEFITS

αCU= 0.393 %/°C	ID	AESA_1					Start
pCU= 17.6 nΩm	Date	25/08/2016		Time	09:21:23		
θn1 = 20 °C	Duration	00:02:02		Range	44		
Measurer		**39.645**			µΩ/m		Print
Rn = 40 µΩ/m		-0.88 %		26.32 °C			
Delta = 3 %							
Heating = OFF	Probes [°C]	Tl Tu Tc Td Tr					
	Ts 26.2	26.2 26.0 26.5 26.2 25.8					
	Epsilon	0.0 -0.2 0.3 0.0 -0.4					
Measurement Parameters	Current			0 %			Return
Epsilon i [°C] 4.0							
Variat. Des [%/min] 0.5							
Average Points 2							
Range = Auto							

ISO 17025 ACCREDITED

ilac-MRA

SWISS ACCREDITATION
sas.admin.ch SCS 0050

AESA SA
AESA ResTest Resistance Bridge

ID	AESA310	Sn :	1#05659
Date	4/15/2011	Time	8:49:00 AM
α_CU	0.393 %/°C	θN1	20 °C
Rmes	+3.8109 Ω/km	Duration	00:00:14 / 2
Tmes	+20.70 °C		

ROI < 1 year

thus rapidly generating
significant savings

Testing ON-THE-LINE generates profits

USERFRIENDLY

- ResTest is multilingual
- Facilitated data interpretation
  (direct results without post calculation)
- Simple Start/Stop button for use in production
- Advanced mode for supervisor use

ACCURATE

- The equipment is certified ISO 17025
- Specifications apply to the overall measurement
- All uncertainties are mastered, the risk of human error is reduced to its minimum

EFFICIENT

- Measurement directly on the stranding machine
- Intermediate measurement can be performed during the production
- Elimination of destructive sample cutting
- Usable on several production lines (robust trolley)
- Short measuring time (integrated heating system)
- No need for water for temperature stabilisation
- No need for earth/ground insulation

SMART

- All data (results and conditions) are saved in the internal PC
- Labels can be printed directly on site
- Data can be exported through the LAN
- Traceability is easily managed

COST EFFECTIVE

- High accuracy allows raw material savings
- Simplicity of use reduces operational costs
- Reliable information allows process improvement
- On-the-line measurement allows raw material savings. Example of financial benefits:

  - *Annual consumption*   *5'000 tons*
  - *Copper price (May 2021) USD 9'960.-/ton*
  - *Decrease in margin*   *50 tons (1%)*
  - *Savings*   *USD 498'000 / year*

The purchase of ResTest 8134 is not a cost but a rewarding investment

DESCRIPTION

Temporary stop the production line, position and adjust the equipment towards the rope (height and slope). Tighten the jaws and close the cover. Set the basic data and start the measurement.

The equipment measures the rope temperature and the heating elements enable the whole area surrounding the measurement setup to quickly be brought up to the temperature of the conductor. All the heating elements are electronically regulated and controlled by microprocessor. After a few minutes only, the temperature is stabilized.

The equipment induces a regulated alternative current in the conductor and measures the difference of potential over a predetermined length. The resistance is calculated from the voltage to current ratio. The built-in probe measures the temperature of the conductor under test in order to display the corrected resistance value as function of the chosen nominal temperature.

A signal notifies the operator when the displayed measuring value is valid. The value can be read or printed. At the end of the measurement, the operator may remove the equipment to continue the production.

Of course, ResTest 813x can also measure samples (use of a tensioner is recommended).

INTERFACE

ResTest 8134 measurer is supplied with a 10'' lighted screen PCT-sensor covered with a protection glass (unbreakable), perfectly suitable for a production use. Interface can be supplied in the language of your choice (English, French, Chinese, Arabic, Russian etc.) and changed directly by the user if needed.

The front panel is made of the screen and an illuminated button giving indication of the measurement status. This button is specially designed for production use, where the operator can easily start/stop the measurement.

On the back panel, 2 USB ports are available to connect a printer, keyboard or mouse. 2 x RJ-45 allow the connection to another computer in your network or during a possible remote maintenance with AESA using Teamviewer. One Display Port connector can be used to connect an external monitor (laboratory use for example).
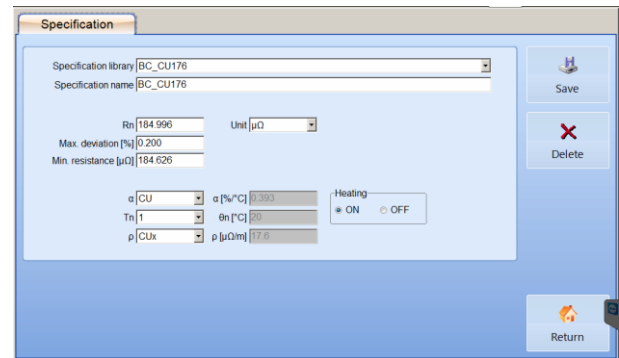
INTEGRATED FUNCTIONS

Creation of a library of strand specifications

Each specification includes:
- A specification name
- The nominal resistance
- The maximum allowed deviation
- The nominal temperature
- The material being used and its physical constants α (temperature coefficient) and ρ (resistivity)

Starting a measurement

The users can access to two different menus:

1. **Direct measurement**: All parameters can be modified (as α: Temperature coefficient, ρ Resistivity, allowing to show the section of the conductor in [mm²], Ɵn: Nominal temperature at which the resistance value is given (generally 20 [°C] etc.) Libraries of these coefficients are available in a dedicated Menu. They can be completed depending on your needs.
2. **Specification measurement**: The operator preselects a specification (created previously by a supervisor). Graphical information is also available. It is possible to select previous measurement and to print the last value measured.

All measurements are stored thanks to an internal PC.
The data can be used for post-analysis, measurement verifications or printing if needed.

Graphical display

The measurement window allows following, second after second, the evolution of the resistance and temperature values as the automatic temperature stabilization process moves on. All possible data are given in this window, including:

- The measurement status versus the specification at the end of the process,
- The deviation to the specification,
- The margin in percentage to the limit (the raw material given away)
- The measurement duration
- Cross-section in mm^2
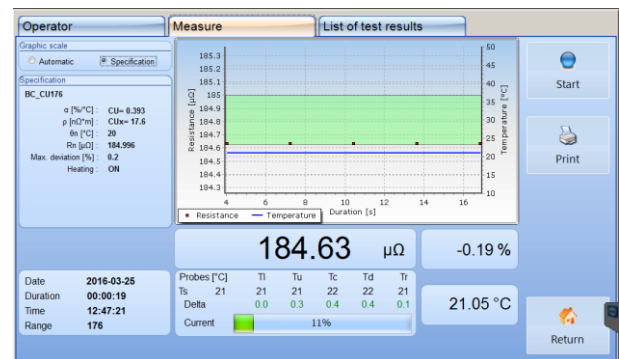
Reporting

The user has the possibility to create its own report, with a title and the company logo, a set of freely definable fields and all available information related to the measurement itself.
The report can be generated as a printed page or, in a condensed format, on a sticker.
AESA offers a dedicated sticker printer as an option.
The size of the stickers can be defined in the AESA software.
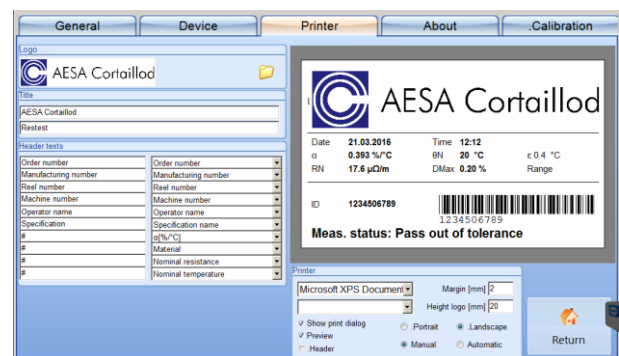
Maintenance

The "AESA support" button allows launching Teamviewer for a remote connection.
A button give you access to the user manual in PDF file.

ACCESSORIES AND OPTIONS

1.   *ISO 17025 certified control box type 7394*   Article No: 45.7394.0001.0

This option is required to check the accuracy of each range of the ohmmeter.
This option also allows to simulate various test conditions in order to check the device.

ISO 17025 ACCREDITED

Delivered with ISO 17025 certificate

2.   *ISO 17025 copper rod 11mm length 2 m*   Article No: 45.0030.0007.0

This option is required to verify the overall accuracy of the equipment (including the ruler).

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3. *Label printer type Brother QL-700*   Article No: 51.0500.0012.0

This printer is directly connected to the USB port and prints the measured data and test conditions on labels (example here below).

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ID	AESA310	Sn :	1#05659
Date	4/15/2011	Time	8:49:00 AM
α_CU	0.393 %/°C	θN1	20 °C
Rmes	+3.8109 Ω/km	Duration	00:00:14 / 2
Tmes	+20.70 °C		

4.   *Full page printer*

This printer is directly connected to the USB port and prints the measured data and test conditions on full pages. It takes place on a specially adapted support (option) fixed on the ResTest 8134 trolley.


LaserJet printer   Article No: 51.0500.0021.0
Adapted support for printer   Article No: 51.0001.0031.0

5. *Cable tensioner for sample measurement (off-the-line)*   Article No: 51.0030.0043.0

Specially designed for laboratory purposes (sample testing), this tool allows a very accurate copper and aluminium measurement by straightening the sample and twisting it if need be (note: the pulling force is not measured.
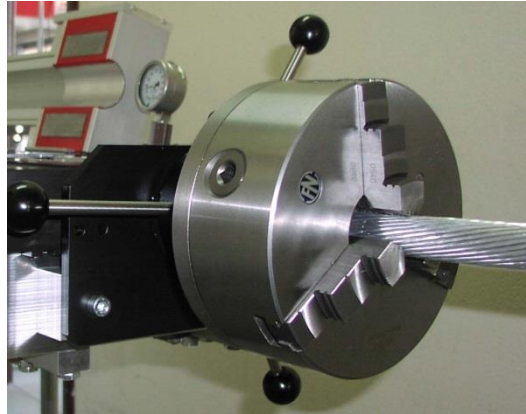
6. *Protective cover*   Article No: 51.0030.0077.0

This option covers the complete system in order to protect it when not in use.

7. *Commissioning*   Article No: 61.0001.0001.0

The commissioning will be performed on site. It will be organised as soon as the equipment is arrived at the end-user plant. The commissioning includes the installation of the equipment as well as the training of the operators.

8. *Services*

AESA offers also several additional services like:

- Warranty extension (standard = 24 months)   Article No: 61.0100.0001.0
- Maintenance contract   Article No: 61.0100.0011.0
- Upgrade, calibration, remote assistance, expertise, specific training, …