

Color Measurement System ERX31

Laboratory instrument for the automotive industry. 45°c:0° geometry, DIN 5033, spectral measurement with high resolution, excellent inter-instrument agreement and high long-term stability.

Advantages of color measurement

- ✓ Good correlation with average visual color difference perception (45°c:0° geometry)
- ✓ Documentation of the production (ISO 9000)

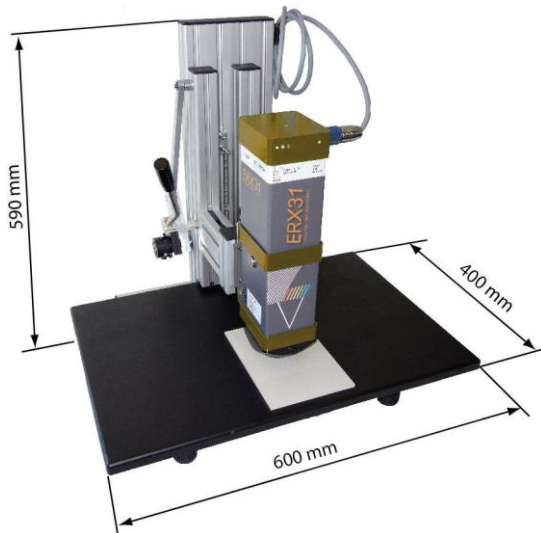
Special advantages ERX31

- ✓ Excellent measurement results with real spectral resolution of 1 nm
- ✓ Good correlation of measurement results with the visual perception under all illuminants.
- ✓ Measurement area with 10 mm diameter
- ✓ Positioning aided by illuminating the target space, in particular for small samples
- ✓ Can also be used independent of the laboratory stand (portable)
- ✓ Excellent inter-instrument agreement with the proven ER 50 model (no longer produced)
- ✓ A little shorter and lighter than the ER 50 model



Functional description ERX31

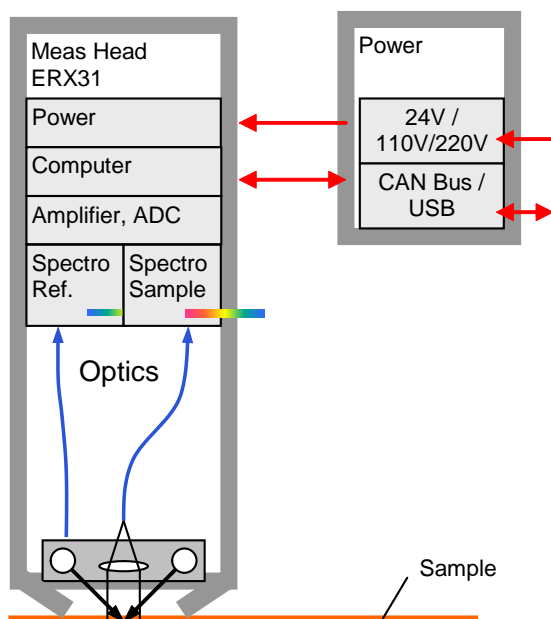
The ERX31 is a compact, exact spectrophotometer for spectral measurement with the standardized geometry 45° circular / 0°.



Picture 1: ERX31 Dimensions

For a measurement the sample will be illuminated with white light (Xenon flash lamp, close to daylight) 45° circular for approx. 1 / 1000 sec. Perpendicular to the sample surface (under 0°) the reflected light will be collected and guided to a high resolution spectrometer (figure 2).

Simultaneously with the sample measurement a reference measurement of the lamp will be made with a second high resolution spectrometer (full dual beam design).



Picture 2: Function blocks of ERX31

In both spectrometers the optical measurement signals will be separated into 401 different wavelength signals via corrected concave gratings and measured via photoelectric sensors (dispersed). Measurements are taken by an integrated photodiode line. The result is a true 1 nm spectral measurement resolution.

The measurement signals will be amplified and digitized with high resolution. A fast processor calculates corrected spectral reflectance data. These 401 reflectance results (from 330 nm to 730 nm) are the basis for all further colorimetric calculations for any possible illuminant and observer (e.g. CIE Lab data for illuminant D65 / 10° observer).

The calibration of the system also includes automatic wavelength calibration for excellent measurement accuracy and long-term stability

The spectrophotometer is controlled by a computer, where all measurement results will be collected as well. The interface between the two is a USB port. The built-in optical isolation guarantees stable operation in a real world production environment.

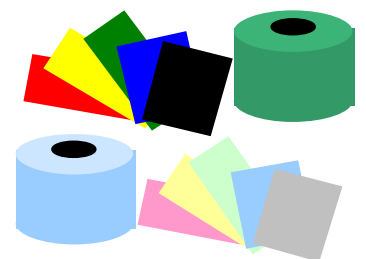
Typical Applications

The spectrophotometer ERX31 is well suited for all applications where high precision and high resolution color measurement of a product are needed. The compact shape makes measuring large samples possible.

References

The color measurement instrument ERX31 is used especially in the automotive industry to measure:

- ✓ Prototypes, panels
- ✓ Leather
- ✓ Plastic foils
- ✓ Buttons, Covers
- ✓ Textiles
- ✓ Carpet
- ✓ ...



Special Advantages of the ERX31

▶ **Precise spectral color measurement**

- ✓ Even critical colors and demanding applications can be measured with high quality based on the excellent spectral resolution of 1 nm.
- ✓ The wide spectral range of the ERX31 from 330 nm to 730 nm gives excellent information.
- ✓ The sample illumination is similar to D65 and delivers very good measurement results in all wavelength ranges.

▶ **Measurement in the laboratory stand**

- ✓ Exact positioning on level samples
- ✓ Triggering the measurement is easy by a measurement button, especially useful in averaging.
- ✓ Power supply and interface converter are integrated into the laboratory stand

▶ **Portable measurement**

- ✓ Upon request there will be a longer cable for the measurement head, so that the head can be placed on a table or
- ✓ To be used portable „on a leash” to measure large components such as instrument panels.

▶ **Automatic wavelength calibration**

- ✓ Absolute automatic wavelength calibration with highest precision
- ✓ Therefore very good long-term stability and repeatability.

▶ **Stable, exact measurement results**

- ✓ Ambient light has no influence on the accurate measurement results
- ✓ The unit is robust and rarely needs service thanks to the compact design and digital data processing and transmission.
- ✓ The longlife Xenon – flash lamp (1 year warranty) is a low price item.

▶ **The ER 50 product family has been successfully installed in hundreds of installations since 1987.**

- ✓ Meaningful internal redesign and improvements have been made over the years. Therefore our customers have a proven system with the latest technology.
- ✓ The ERX31 is the sixth generation and has further improved technical data.

▶ **Development and production of the ERX31 spectrophotometer family in Germany.**

Laboratory color measurement system

The spectrophotometer ERX31 typically will be used in the laboratory with the laboratory stand EHX31 (see picture on front page), but also can be used mobile and hooked up by a 5 m cable.



Picture 3: ERX31 with positioning aid

Typical configurations of ERX31

- ▶ **Software (for PC with Windows)**
 - ✓ Quality control software ESWin
 - ✓ Link to other information systems is possible
- ▶ **Computer (PC)**
- ▶ **Printer**
- ▶ **Laboratory stand EHX31**
 - ▶ Easy removal for portable use of the instrument to measure large samples



- ✓ **Color data products (portable, benchtop, In-Line)**
- ✓ **Software for quality control, color matching and closed loop control**
- ✓ **Light booths for visual inspection**
- ✓ **Densitometers, color management systems**

Technical Data ERX31

Measurement head ERX31

No moving parts, robust construction, high accuracy and precision, built-in diagnostics with service memory (remote diagnostics).

Standardized measurement geometry 45°c:0°

Illumination:	45° circular
Illuminant:	D65 approximated
Measurement:	0°
Measured area:	10 mm
Illuminated area:	12 mm
Spectral measurement area:	330 nm ... 730 nm
Spectral resolution (optical!):	1 nm
Absolute wavelength accuracy: With internal automatic control	better than 0.1 nm
Double beam (sample- and reference channel):	simultaneous
Measurement time:	20 ms
Protection:	IP 65, CE mark
Calibration (traceable to PTB, Germany):	instrument specific white standard
Communication with computer:	USB
Ambient temperature:	max. 40°C
Positioning aid:	illumination of measurement area
Reproducibility CIELAB (standard deviation for repeated difference measurements of the white standard)	$\Delta L^*, \Delta a^*, \Delta b^* \leq 0.03$
Interinstrument agreement between ERX50 systems Based on a white tile Average color difference for measurement of the 12 BCRA standards from production average	$\Delta L^*, \Delta a^*, \Delta b^* \leq 0.1$ $\Delta E^* < 0,3$
Size with measurement head:	approx. 378 mm x 111 mm x 91 mm
Weight with measurement head:	approx. 2,9 kg
Protection:	CE mark

Communication and power supply unit (integral part of laboratory stand)

Input voltage Option 110 V	220V AC, +25% / -15%, 45-440 Hz 110V AC, +25% / -15%, 45-440 Hz
Power consumption	max. 50 VA, typ. 10 VA
Computer interface: USB	max. 2 m
CAN Bus	max. 10 m cables



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