

## VIPER G2

17SXXXXX0



VIPER measures hyperspectral attenuation and transmission coefficients in the wavelength range of 360 nm and 750 nm, enabling detailed determination of multiple parameters at the same time. The light source is provided by 5 selected, energy-saving LEDs that guarantee a long service life and stable measurement data. VIPER can be used in different media as it is available in multiple path lengths, both in stainless steel or titanium housing.

### Benefits

- Without sampling and preparation of test samples
- Real time sensor
- Without reagents
- Optical window with nano coating
- LED technology

Typical applications for VIPER are water quality monitoring, color measurements of aqueous solutions or quality monitoring of drinking water. Like all TriOS sensors, VIPER is equipped with a nano-coated optical window that protects from fouling. Additional parameters can be installed by means of software if necessary at a later time.

### Applications

- Drinking water monitoring
- Environmental monitoring
- Colorimetry
- Quality assurance
- Petrochemical industry
- Industrial applications
- Food industry



## Color measurement

VIPER is an in-situ VIS photometer to determine the color of liquids. In addition to the hyperspectral recording of spectra (2.2 nm/pixel), various color indexes can be determined. This enables standardized, safe and objective measurements. Time-consuming and expensive sampling is eliminated through in-situ measurements. Additionally variations over a whole day can be recorded.

### SAC<sub>436</sub> (DIN EN ISO 7887-3 (2011))

Spectral absorption coefficients at 436 nm are designated SAC<sub>436</sub>. It represents the light attenuation of an aqueous sample with a layer thickness of 1 m and a wavelength of 436 nm. The yellow to brown color ranges that occur in colored water have the highest light attenuation at 436 nm, which is why for example the coloring is determined according to drinking water regulations at this wavelength.

VIPER compensates any turbidity when determining the SAC<sub>436</sub>.

Depending on the customer's request, SACs in the entire wavelength range (such as SAC<sub>525</sub>, SAC<sub>620</sub>) can be determined, or individual opacity adjustments can be made.

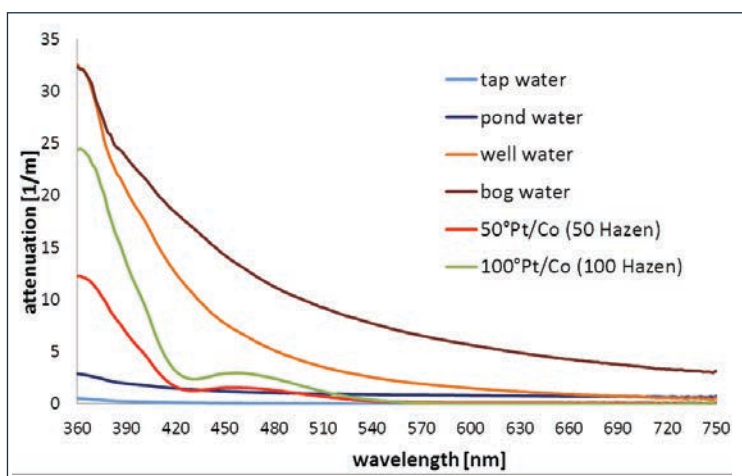
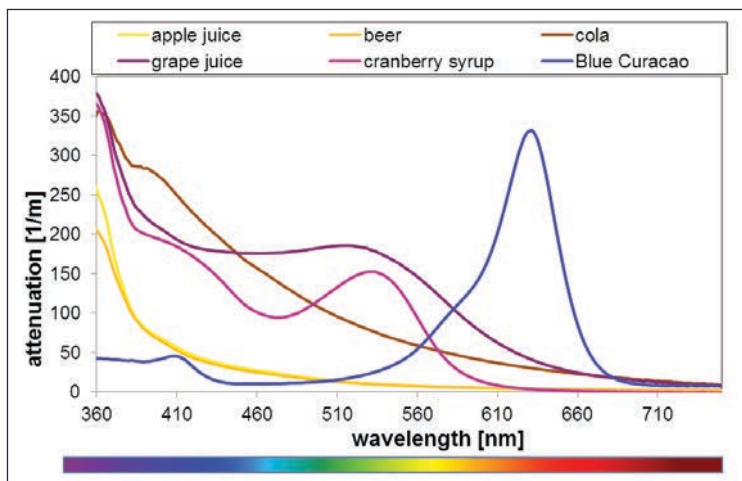


### Pt-Co color scale (Hazen/APHA)

(DIN EN ISO 6271 (2005))

The Pt-Co scale number records the range from colorless (<1) to light yellow-orange (500). The color number is defined via a standard solution of hexachloroplatinate in acidic salt water and specified in mg/L Pt.

The Pt-Co color number is calculated from the turbidity-corrected attenuation at 455 nm or 390 nm.



## Coloring

VIPER enables hyperspectral measurements of color of all liquids.

This also allows the differentiation of colors that are perceived similarly, but consist of different color mixes.

The diagram on the left shows examples from the beverage industry.

## VIPER: Attenuation spectrum

Subsequent calculation of color numbers is also possible thanks to the storage of spectra. Several color numbers can be simultaneously calculated from a spectrum. In addition to the mentioned color numbers, the device can determine the Cr-Co color number (Russian grade) in accordance with GOST 3351-74, which is interesting for the Russian market. Please contact us for any special applications. We will be happy to help.



## Technical Specifications

<b>Measurement technology</b>	light source	5 LED
	detector	High-end miniature spectrometer, 256 channels 360 to 750 nm, 2.2 nm/pixel
<b>Measurement principle</b>		Attenuation
<b>Optical path</b>		10 mm, 50 mm, 100 mm, 150 mm, 250 mm
<b>Parameter</b>		SAC <sub>436</sub> Pt-Co color scale (APHA/Hazen) (390 nm, 455 nm) Colouring based on DIN EN ISO 7887-C (410 nm, 436 nm, 525 nm, 620 nm) Cr-Co color scale (380 nm, 413 nm)
<b>Measuring range</b>		0.01...2.5 AU (absorption units)
<b>Measurement accuracy</b>		< 0.2 %
<b>Turbidity compensation</b>		Yes
<b>Data logger</b>		~ 2 GB
<b>T100 response time</b>		2 min
<b>Measurement interval</b>		≥ 1 min
<b>Housing material</b>		Stainless steel (1.4571/1.4404) or titanium (3.7035)
<b>Dimensions (L x Ø)</b>		495 mm x 48 mm (with 50 mm path)
<b>Weight</b>	stainless steel	~ 2.4 kg (with 50 mm path)
	titanium	~ 1.3 kg (with 50 mm path)
<b>Interface</b>	digital	Ethernet (TCP/IP)
		RS-232 or RS-485 (Modbus RTU)
<b>Power consumption</b>		≤ 3 W
<b>Power supply</b>		12...24 VDC (± 10 %)
<b>Maintenance effort</b>		≤ 0.5 h/month (typical)
<b>Calibration/maintenance interval</b>		24 months
<b>System compatibility</b>		Modbus RTU
<b>Guarantee</b>		1 year (EU: 2 years)
<b>INSTALLATION</b>		
<b>Max. pressure</b>	with SubConn	30 bar
	with fixed cable	3 bar
	in FlowCell	1 bar, 2...4 L/min
<b>Protection type</b>		IP68
<b>Sample temperature</b>		+2...+40 °C
<b>Ambient temperature</b>		+2...+40 °C
<b>Storage temperature</b>		-20...+80 °C
<b>Inflow velocity</b>		0.1...10 m/s