



ColourOpacity

Powered by icon



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All icon products are...

Easy to use: with an intuitive glass touch-screen, wipe-clean graphic user interface with multi-language options.

Certified to the latest global standards: ATEX and IECex approved to give absolute confidence and peace of mind in hazardous areas.

Robust and fully explosion proof: no air or inert gas purging required for safe operation in explosion hazard areas.

Flexible: with standard modbus, 2x4-20mA and alarm contact outputs.

Guaranteed: with a two-year warranty if commissioned by icon scientific Ltd.

What does it do?

The icon scientific Process ColourOpacity Analyser uses a dispersive spectrometer module to carry out colour, opacity and concentration measurement. It is designed to overcome the shortcomings of optical filter-based instruments, such as sensitivity losses due to bandpass width and the low transmission characteristics of fixed optical filters. The analyser can measure colour and opacity simultaneously, and can perform concentration measurements based on light absorption at single or multiple wavelengths.

A unique measuring instrument, the analyser is extremely versatile and can be readily re-programmed in the field. It provides accurate measurement on the many petroleum products that have colour as part of their specification. It can be used to duplicate a range of standard visual colour comparison tests dealing with light and dark samples. Delivering exceptional results, the analyser can enable you to measure contamination, purity or the clarity of a liquid. It is particularly good at detecting dye colour and product contamination in pipeline applications.

How does it work?

The analyser uses visible light produced by a 12V 10W tungsten lamp running under reduced voltage to increase its life. Light passes out of the analyser enclosure through an optical window and moves along a fibre-optic cable to an external measuring cell. The light enters the cell through another window fitted with a focusing lens. It then passes through the test sample and out via a further window and fibre-optic cable. It travels back into the enclosure to the dispersive spectrometer module, where the optical transmission or absorbance measurements are carried out. These measurements are fed into a control computer which calculates the final results.

Why choose the icon scientific Process ColourOpacity Analyser?

Fibre optic cables: cables allow separation of the measuring cell and controller if required.

Standard SMA connectors: a range of third-party transmittance and reflectance-measuring cells can be used in addition to one of the standard icon transmittance cells.

Stability: to compensate for drift and dirt build-up on the cell windows, all measurements are carried out using one or more reference wavelengths.

Dual method analysis: The analyser can perform two simultaneous measurements as standard. These could be colour, opacity or concentration measurements.



Colour Opacity status screen



“The icon scientific ColourOpacity Analyser is extremely versatile and may be readily re-application engineered by the user in the field. The use of a solid state spectrometer module avoids the band pass and transmission loss problems associated with optical filters and moving parts such as filter wheels and chopper motor assemblies”.

Additional information

Standard operating range	Between 360-1100nm.
Typical measuring ranges	ASTM D1500, 0-8ASTM, ASTM D156 (Saybolt) -10 to +25. Opacity ranges between 0-100% based on transmission or absorbance. Custom colour ranges are also available for dyed products and concentration measurements.
Repeatability	Equal to or better than $\pm 1.0\%$ of fsd (non cumulative) over a 24hr period.
Reproducibility	Equal to or better than the reproducibility criteria of the relevant test method.
Cycle time	Continuous measurement.
Number of methods	Two (methods may be based on linear interpolation of calibration curves or user-entered calculations based on absorbance or transmittance at single or multiple wavelengths.)
Light Source	Standard light source G4 10W Tungsten Halogen lamp (Lifetime >7000hr).
Spectrometer (std.)	Visible range 2048 pixel CCD array spectrometer.
Resolution	Typically 2 nm with standard 200 micron entrance slit.

Sample requirements

Filtration	Generally not required.
Sample pressure at inlet	Vacuum to 50 bar(g) with standard icon measuring cell.
Sample temperature at inlet	-10°C to 150°C with standard icon measuring cell.
Sample flow	0.1 to 0.5L/min (standard cell).

Utility requirements

Power	115-220V ($\pm 15\%$) AC 50/60Hz Maximum Consumption 60VA. DC operation is also available as an option.
Instrument air	Not required.
Safety	Available in an ATEX/IECEx (EExd IIB+H2 T5 (Tamb.-20°C to +60°C)) certified version, or in general purpose versions in stainless steel or painted steel cabinets.
IP rating	IP 66/67 depending on version.

Installation Requirements

Location	Unit should be located out of direct wind sun and rain.
Ambient operating temperature range	0°C to +55 °C.
Ambient humidity	0 to 95% relative humidity (non-condensing).

Control System

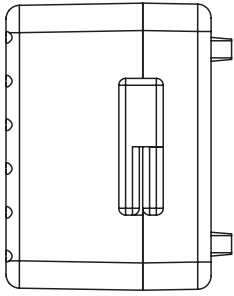
Control system	Based on fan-less industrial SBC with solid state hard drive.
Graphical User Interface (GUI)	10" dual-touch touch-screen panel that can be wiped clean and operated with gloved hands. The GUI is used to programme the unit and display current and historical analyser results and alarm status.
Language	Screen language selectable between English, French, and Spanish (others on request).

Outputs

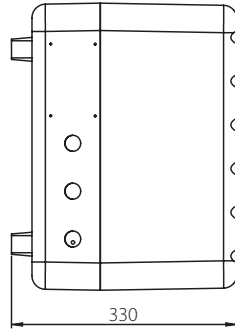
Output ranges	Fully user adjustable.
Analog outputs	One 4-20ma isolated output is provided as standard. Optional additional 4-20Ma output available.
Modbus output	Wired Modbus RTU (RS485) and Modbus RTU over Ethernet available as standard.
Alarms	The analyser has two measured level alarm contacts. These may be set to operate on rising or falling colour or concentration anywhere within the measuring ranges. Additionally, there is a general fault alarm contact. All contact ratings are 24VDC 0.5A

Dimensions & Weights

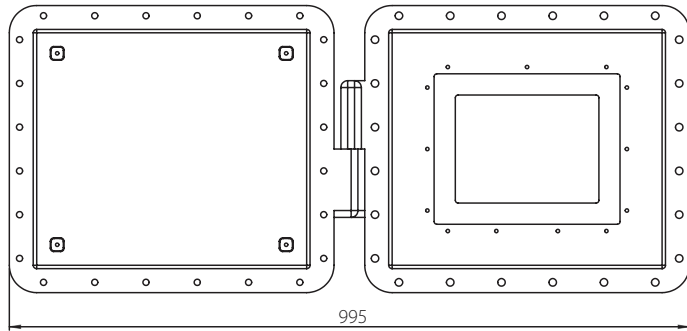
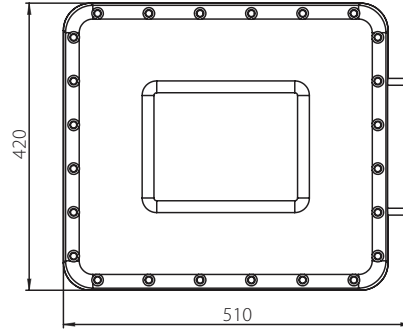
Side view



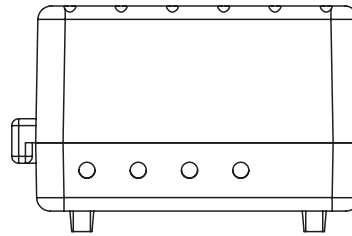
Side view



Front view



Top view



Notes:

All dimensions in mm

Unpacked weight approx 65kg

Packed weight approx 75kg

Note: icon scientific products are subject to a program of continuous development and improvement and specifications are liable to change without notice. Please check that you have the latest information available before relying on any specification.

