



# ColourOpacity

Powered by icon



## All icon products are...

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

**Certified to global standards:** ATEX, IECEx, TIIS, EAC-EX, ETL 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, 4-20mA and alarm contact outputs.



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## 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.



*“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”.*

## Specification

Measurement	Unit measures colour according to any visual comparison scale (typically ASTM D1500, D156 Saybolt). Also opacity and concentration of coloured substances in solution.
Repeatability	Equal to or better than $\pm 2.0\%$ of full scale reading (8hrs).
Reproducibility	Equal to or better than the reproducibility criteria of the relevant test.
Cycle Time	Continuous Output.
Number of Methods	1 or 2 (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	10W Tungsten Halogen lamp (Lifetime >7000hr)
Spectrometer	360-1100nm Spectrometer

## Sample Requirements

Filtration	Generally not required.
Water	Free water must be removed from the sample.
Sample Pressure at Inlet	100 barg
Measuring Cell Pathlength	Application dependent.
Sample Temperature at Inlet	Maximum 150°C
Sample Flow	0.5l/min (standard cell)

## Utility Requirements

Instrument Air	Not Required.
Power	100-240VAC 50-60Hz, Max 75VA

## Installation Requirements

Location	Unit must be located out of direct wind sun and rain
Ambient Temperature	+5 to +45 Deg.C
Ambient Humidity	0-95% RH, non-condensing.
Remote Flowcell	Optionally can be supplied with loose flowcell and extended fibers for installation in 3 <sup>rd</sup> party sampling system

## Control System

Control System	Based on fan-less industrial PC with solid state hard drive.
Graphical User Interface(GUI)	10.5" armoured glass touch-screen panel capable of being wiped clean and operated with gloved hands. The GUI is used to program the unit and display current and historical analyser results and alarm status.
Language	Screen language selectable between English, French, Spanish Russian German and Chinese (others on request).

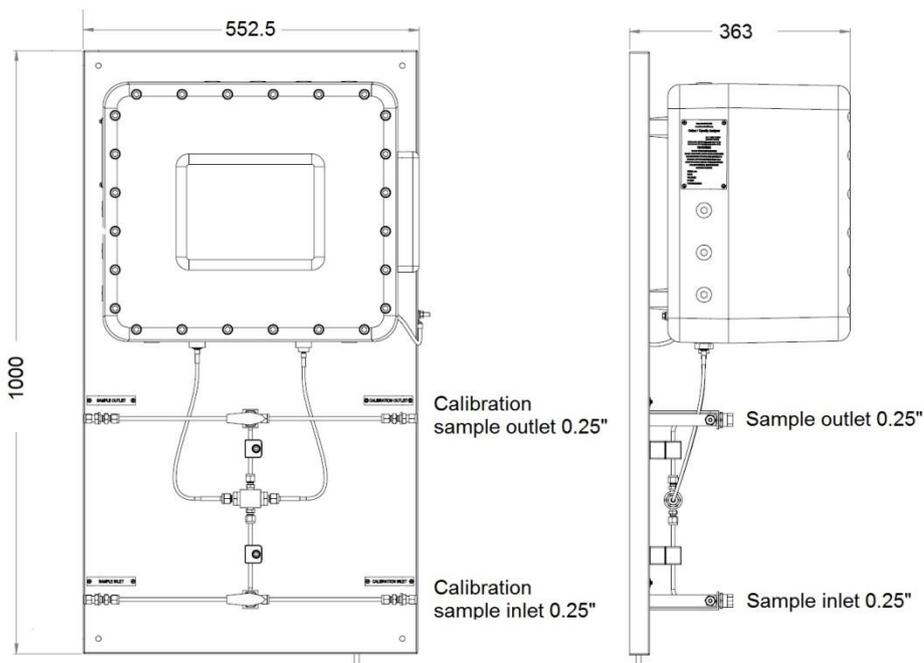
## Inputs/Outputs

Analog Output	1 x 4-20ma isolated output (active or passive) is provided as standard (additional output available)
Communications	Modbus RTU over RS485, Ethernet (TCP/IP) or optional fiber optics.  Optional OPC c/w server software over RS485.
Alarms	The analyser provides changeover alarm contacts for the following conditions:- <ul style="list-style-type: none"><li>Result 1 high or low level alarm</li><li>Result 2 high or low level alarm</li><li>Spectrometer Fault</li><li>Analyser offline (Standby mode)</li><li>Bulb fail/low light transmission</li></ul>
Contact Ratings	24V at 0.5amps DC and 230V AC 1.0 amps

## Certification

Hazardous Area Certification	The icon Colour analyser is Exd certified to ATEX, IECEx, TIIS and EAC-EX standards, for zone 1 or zone 2 use in gas groups IIA, IIB or IIB+H2 with a variable T-rating depending upon application. It is also ETL listed for Canada and the USA Class 1, Div 1, groups B,C,D.
IP Ratings	Tested and certified to IP67 (dust tight and protected from temporary total immersion in water). Classification broadly equivalent to NEMA 6

# Dimensions & Weights



## Notes:

- All dimensions in mm
- Unpacked weight approx. 98kg
- Packed weight approx. 154kg

*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.*

