



# Cp<sup>o</sup> Cloud Point

Powered by Icon

## All Icon products are...

**Easy to use:** with an intuitive multilingual graphic user interface on a large armoured-glass wipe-clean touch-screen display.

**Certified to global standards:** ATEX, IECEx, UKEx, TIIS, EACEx, and ETL approved to give absolute confidence and peace of mind in hazardous areas and manufactured under an ISO9001:2015 certified Quality Management System.

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

**Highly efficient:** with low sample consumption, sample flow monitoring, and minimal or no utility requirements.

**Safety assured:** with configurable general fault alarms, and a dedicated alarm for internal sample leakage.

**Flexible:** with auto validation or calibration options and standard Modbus, 4-20mA, and digital contact outputs.



## What does it do?

The Icon Cloud Point analyser provides an indicator of the lowest ambient temperature at which typically a diesel fuel may be used. The analyser uses advanced thermoelectric cooling and optical detection to provide exceptional results between  $-40^{\circ}\text{C}$  to  $+30^{\circ}\text{C}$ , in most cases without the need for chilled water.

To improve reliability and cooling performance, and to eliminate condensation and ice formation, the whole system is housed in a patented sealed containment vessel held under vacuum. The vessel features detection systems to monitor the vacuum and to alert on any internal sample leakage. The optical detector arrangement also provides excellent immunity to dissolved water in the sample and to any changes in sample opacity and colour, giving outstanding repeatability. The obtained results are compatible with those of standard cloud point test methods such as ASTM D2500 and ASTM D5771/2/3.

## How does it work?

The low mass measuring cell traps a small amount of the sample that is then cooled at a controlled rate by the peltier-based thermoelectric cooler using a pulse width modulated control signal. The cooling process continues until the optical detector picks up sufficient light-scatter from precipitating wax crystals to trigger the cloud point detection. The old sample is then flushed away, and the cycle is repeated. If the sample enters the unit at too low a temperature, the peltier control can be reversed to warm the sample before continuing with the analysis.

## Why choose the Icon Scientific Cloud Point Analyser?

**Excellent repeatability:** with advanced detection algorithms, high signal-to-noise ratios, pulse width modulated variable-rate peltier cooler control, and a thermally insulated measuring cell, the analyser achieves better repeatability than the standard test methods.

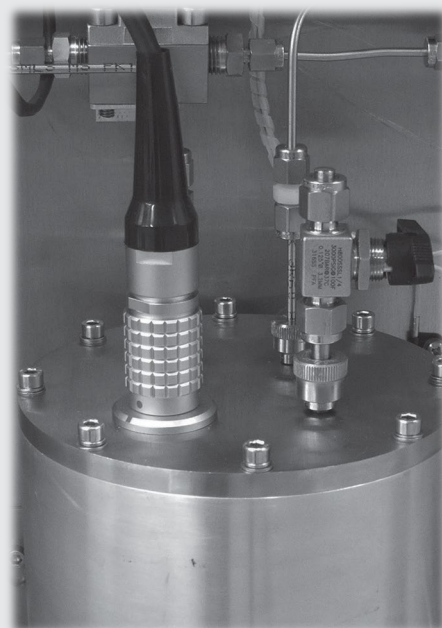
**High signal-to-noise ratio:** the specific optical detector arrangement provides excellent immunity to dissolved water in the sample and ensures that the measurement is unaffected by changes in sample opacity and colour.

**Minimised thermal losses:** the cell's LED light source and photodiode detector are equipped with air-gapped light guides to eliminate physical and thermal contact between the light source, detector and the cell, thereby reducing thermal losses.

**Best in class cooling performance:** with reduced thermal losses thanks to the low-mass measuring cell, patented vacuum insulation system, and non-contacting light source and detector, the analyser provides the highest differential between cooling water temperature and the lowest measurable cloud point.

**Long-life and low maintenance:** as well as giving improved cooling performance, the vacuum insulation effectively eliminates premature failure of the measuring cell caused by condensation, and overcomes cooling errors due to ice formation. This results in a low-maintenance or even maintenance-free analyser for years at a time.

**Cell service exchange plan:** to aid planned maintenance and reduce downtime in the unlikely event of a problem, Icon operates a Cloud Point cell service exchange plan. The complete vacuum chamber is sent to Icon or their local representative, and a fully refurbished chamber is delivered by return. This process enables considerable savings on the individual cost of parts, and can also save you time and money by reducing the risks associated with carrying out your own cell repairs.



## Sample Requirements

Inlet Temperature	Maximum 50°C (122°F)
Inlet Pressure	Maximum 5 bar (72.5 psi)
Outlet Pressure	Can be returned to pressure, provided minimum flow requirement is achieved. Typically requires a minimum 1-bar differential across the analyser.
Sample Flow (continuous)	Minimum 6 L/H Recommended 12 L/H
Sample Quality	Filtered to 10 microns (µm). Sample should be 'clear and bright' at room temperature and contain no free water.

## Utility Requirements

Instrument Air	Not Required (standard)
Pressure	0.2 bar (3 psi) for optional cell and/or electronics enclosure cooling.
Consumption	Typically 5-10 L/H
Quality	ISO 8573.1 Class 3 ANSI / ISA-7.0.0
Coolant	Potable water, or antifreeze mixture. (Do not use sea water)
Inlet Temperature	Not more than 50°C (90°F) above the lowest expected measurement point.
Inlet Pressure	Maximum 10 bar (145 psi)
Outlet Pressure	Can be returned to pressure, provided minimum flow requirement is achieved.
Flow Rate	Minimum 10 L/H Recommended 18 L/H
Filtration	100 microns (µm)
Viscosity	Maximum 10 cSt
Power	115-230VAC 50-60Hz, Max 500VA

## Installation Requirements

Location	Unit must be located out of direct wind sun and rain.
Ambient Temperature	+5 to +40 °C
Ambient Humidity	0-95% RH, non-condensing.

## Control System

Control System	Based on fan-less industrial PC with solid state hard drive.
Graphical User Interface (GUI)	17" armoured glass touch-screen. The GUI is used to program the unit and display current and historical analyser results and alarm status.
Language	User-selectable multilingual display.

## Certification

Hazardous Area Certification	Exd certified to ATEX, IECEx, UKEx, TIIS, and EACEx standards, suitable 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 the USA and Canada Class 1, Div 1, groups B,C,D.
IP Ratings	Tested and certified to IP66/IP67 (dust tight and protected from temporary total immersion in water).

## Specification

Measuring Range	-40 to +30 °C (-40 to +86 °F) For extended ranges, contact Icon.
Repeatability	Equal to or better than repeatability criteria of the relevant test method.
Cycle Time	Typically 4-8 minutes.

## Inputs/Outputs

Analog Outputs	2 x 4-20mA (active) isolated outputs provided as standard for process and calibration/validation results.
----------------	---

Digital (Contact) Inputs	<b>Run / Standby:</b> reads a customer supplied latching switch to toggle between run and standby modes. <b>Remote Cal:</b> reads a customer supplied momentary switch to remotely initiate a calibration cycle. <b>Remote Val:</b> reads a customer supplied momentary switch to remotely initiate a validation cycle.
--------------------------	---

General Fault Alarms	Alarm limits can be configured for monitored conditions, and set to be Fatal, Warning, or Inactive. Active alarms are notified on screen and stored in the alarm history table.
----------------------	---

Digital (Contact) Outputs	<b>Fatal Alarm (NC):</b> a general fault alarm that causes the analyser to suspend its operation when triggered. <b>Warning Alarm (NC):</b> a general fault alarm for notification only. <b>New Result (NO):</b> a variable-length momentary contact to notify that a new analyser result is available. <b>Data Valid (NO):</b> indicates that the analyser is currently running on a process stream, and that data is valid. As opposed to when in standby, or when in Cal. or Val. modes.
---------------------------	--

	<b>Cal/Val (NO):</b> indicates that the analyser is currently in Cal/Val mode. <b>Spill Alarm (NC):</b> an alarm contact that triggers if a leak is detected in the analyser enclosure. All contact ratings are 24VDC 0.5A, 230VAC 1A
--	---

Digital (Signal) Outputs	<b>Calibration Valve:</b> provides a 24VDC signal to an external solenoid valve to switch between process and calibration samples.
--------------------------	--

Analog Inputs Set of 4x inputs (optional)	The analyser can optionally read up to four 0-10V or 4-20mA active signals. These input values can each have high/low alarm levels associated with them to trigger either of the analyser's general fault alarms.
--	---

Digital (Contact) Inputs Set of 4x inputs (optional)	The analyser can optionally monitor up to four volt-free external contacts or customer alarms. These contacts may also be included in the analyser alarm table to trigger the general fault alarms.
---	---

Communications	Modbus RTU or OPC over RS485 or Ethernet (TCP/IP), with optional fiber optics. Optional OPC server software.
----------------	--

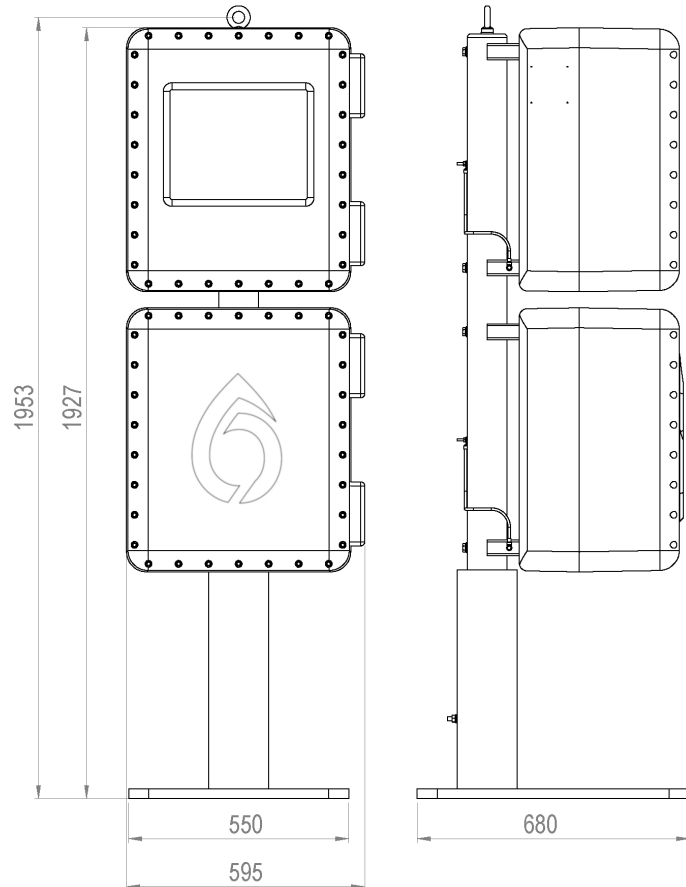
# Dimensions & Weights

## Notes:

All dimensions in mm

Unpacked weight approx. 414kg

Packed weight approx. 521kg



*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.*