



Cn[®] Cetane Number

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 Cetane Number analyser provides refineries with quick and accurate cetane number measurements without the drawbacks of traditional CFR Engines or the issues associated with model-based chemometrics used in FTIR and Raman spectrometers. The analyser is the first and only online process analyser in the world to measure cetane number and works well with both Diesel and Biodiesel products. The analyser measurements correlate to all other ASTM cetane number methods such as D613, D6890, D7668, and include the effects of Cetane improvers thus enabling real-time control of a diesel blending plant.

The analyser won the coveted ISA Analysis Division Innovation Award in its first year of launch. It is designed to replace the traditional Engine based method and is cheaper, faster, more reliable, and requires a lot less maintenance. It is also designed to be complimentary to lab based Cetane Number measuring instruments thus making bias management more straightforward.

How does it work?

The Icon Cetane Number analyser uses a constant volume combustion chamber with direct fuel injection into heated compressed air. A dynamic pressure wave is produced from the combustion of the sample from which ignition delay (ID) and combustion delay (CD) can be determined. Built-in equations allow for calibration curves of ID, or CD, or both* to calculate a derived cetane number (DCN).

* Using both ID & CD in the United States of America is not permitted due to Patent Restrictions.

Why choose the Icon Scientific Cetane Number Analyser?

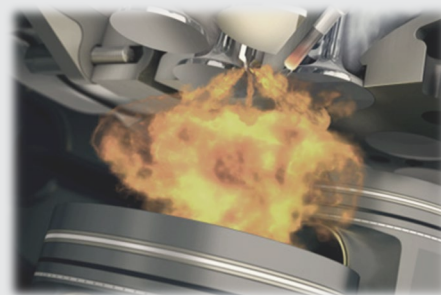
Excellent repeatability: with advanced fast detection, the Icon Cetane Number analyser delivers repeatable real time measurements for tight process control.

Leading the way in design: this is a world-first in online process analysers to address the cost and maintenance issues associated with the use of the CFR Engine or technologies like IQT. Costs are greatly reduced when compared to spectroscopic methods since the Icon analyser is relatively simple to operate and maintain, and there is no need for complex model development and maintenance.

Control cetane improver boost: relying on boost models is finally a thing of the past! With real cetane number measurements, the effects of cetane improver can be reliably measured to avoid expensive wastage or giveaway.

Information at your fingertips: the Cetane Number analyser is fitted with the familiar touch-screen interface, as in other Icon instruments, and is designed for ease of operation whilst giving the operator or technician access to vast amounts of information and diagnostics in an easily digestible format. This information is also available via Modbus with multiple redundant ethernet (TCP/IP) connections.

Sample utilities: the analyser has been specifically designed for the process environment and has the option of a pressure multiplier/scrubber panel to clean and boost the pressure of plant instrument air. Alternatively, synthetic air from cylinders can be used to meet the analyser requirement.



**Analysis Division
Innovation Award**



Sample Requirements

Inlet Temperature	Minimum 10°C (50°F) Maximum 50°C (122°F)
Inlet Pressure	Minimum 3 bar (43.5 psi) Maximum 5 bar (72.5 psi)
Outlet Pressure	Atmospheric, with continuous fall to sample return point.
Sample Flow (non-continuous)	Minimum 10 L/H Recommended 18 L/H N.B: Flow stops during injection. Typical Consumption 15 L/H (based on recommended flow)
Sample Quality	Filtered to 10 microns (µm). Sample should contain no free water.

Utility Requirements

Instrument Air	Not Required (standard)
Pressure	0.2 bar (3 psi) for optional electronics enclosure cooling.
Consumption	Typically 5-10 L/H
Quality	ISO 8573.1 Class 3 ANSI / ISA-7.0.0
Synthetic Air (zero grade)	<i>...or pressure multiplier.</i>
Pressure	Minimum 17.5 bar (254 psi) Maximum 25 bar (363 psi)
Consumption	One 9.7 Nm ³ , 200 bar (2900 psi) cylinder per approx. 24 hours of continuous operation.
Quality	O ₂ content: 20.5 ±0.5% Balance: Nitrogen Hydrocarbons: <0.003% volume Water: <0.025% volume
Instrument Air (to pressure multiplier)	<i>...or synthetic air.</i>
Pressure	Minimum 4 bar (58 psi) Maximum 7 bar (102 psi)
Consumption	Typically 1.4 to 2.0 Nm ³ /min
Quality	ISO 8573.1 Class 3 ANSI / ISA-7.0.0
Coolant	Potable water or antifreeze mixture. (Do not use sea water)
Inlet Temperature	Minimum 10°C (50°F) Maximum 40°C (104°F)
Inlet Pressure	Maximum 10 bar (145 psi)
Outlet Pressure	Can be returned to pressure, provided minimum flow requirement is achieved.
Flow Rate	Minimum 18 L/H Recommended 24 L/H
Filtration	10 microns (µm)
Viscosity	Maximum 10 cSt
Breather	Must be to atmospheric pressure.
Power	230VAC 50-60Hz, Max 1500VA

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.

Specification

Measuring Range	35 to 65 Cetane Number
Repeatability	≤0.38 (CN40) ≤0.59 (CN51)
Cycle Time	< 2 minutes per cycle. Typically uses 5 to 8 cycles to give results from averaged combustion curves.

Inputs/Outputs

Analog Outputs	3 x 4-20mA (active) isolated outputs provided as standard for ignition delay (ID), combustion delay (CD), and cetane number.
Digital (Contact) Inputs	Run / Standby: reads a customer supplied latching switch to toggle between run and standby modes. Remote Val: 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	Fatal Alarm (NC): a general fault alarm that causes the analyser to suspend its operation when triggered. Warning Alarm (NC): a general fault alarm for notification only. New Result (NO): a variable-length momentary contact to notify that a new analyser result is available. Data Valid (NO): indicates that the analyser is currently running on a process stream, and that data is valid. As opposed to when in standby, or when running validations. Validation (NO): indicates that the analyser is currently in validation mode. Spill Alarm (NC): 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	Validation Valve: provides a 24VDC signal to an external solenoid valve to switch between process and validation samples. Shutoff Valve: provides a 24VDC signal to an external shutoff valve to isolate the sample in error or standby.
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Analog Inputs Set of 2x inputs (optional)	The analyser can optionally read up to two 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.
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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.
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Communications	Modbus RTU or OPC over RS485 or Ethernet (TCP/IP), with optional fiber optics. Optional OPC server software.
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Certification

Hazardous Area Certification	Exd certified to ATEX, IECEx & UKEx 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).

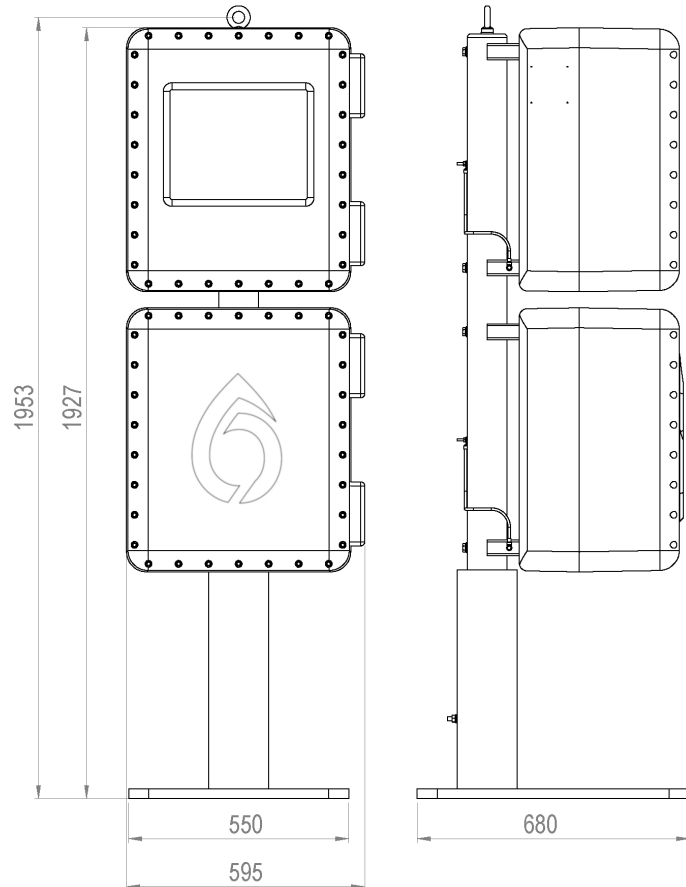
Dimensions & Weights

Notes:

All dimensions in mm

Unpacked weight approx. 420kg

Packed weight approx. 527kg



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.