FreezePoint

Powered by icon

intelligent scientific analysis

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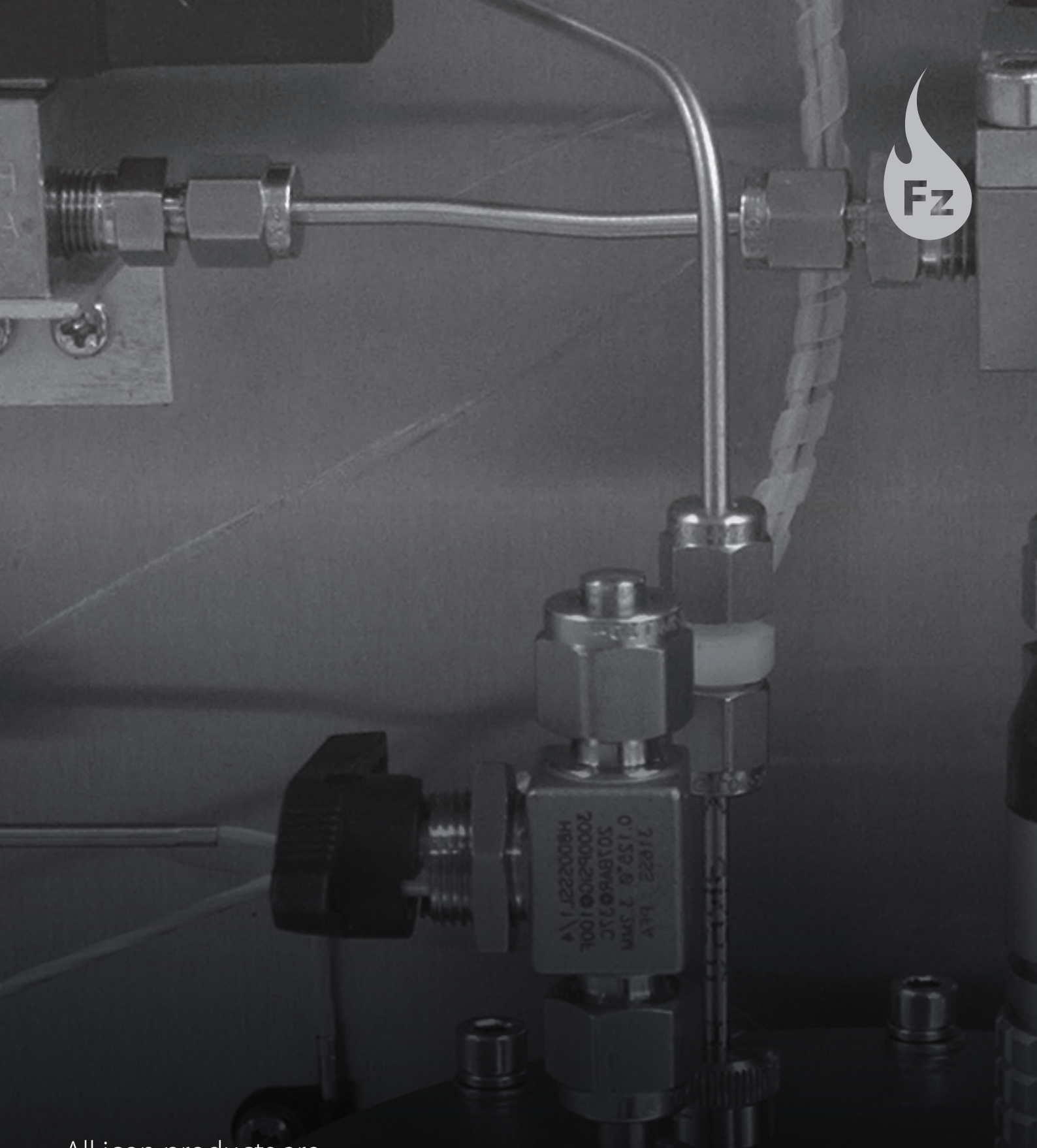


All icon products are…

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.

Safety assured: with an alarm for internal sample leakage.

Highly efficient: with low sample consumption and a sample flow monitor.

Flexible: with auto validation calibration options and 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 FreezePoint Analyser provides an indicator of the lowest ambient temperature at which an aviation jet fuel can be used. Using advanced cryo-cooling, it can measure freeze points down to -80°C.

Like the CloudPoint Analyser, it features the icon scientific low mass measuring cell and a vacuum-insulated cell housing. This patented system helps improve cooling performance and eliminate condensation, ice formation and the effect of stray light. The vessel features detection systems to monitor the vacuum and alert you to any sample leakage. The results are compatible with those of any standard freeze-point test methods such as ASTM D2387, D5972, ASTM D7153 and ASTM D7153. Additionally, the analyser can perform very low cloud point measurements without the external chiller units required by Peltier-based CloudPoint analysers for these applications.

How does it work?

The low-mass measuring cell traps a small amount of the sample. This is then cooled at a controlled rate by the cryo-cooler using a phase-angle control signal. The cooling process continues until the optical detector picks up sufficient light-scatter from precipitating wax crystals, indicating that a cloud is forming. At this point, the cell is allowed to warm up; the temperature at which the cloud disappears is taken as the freeze point. The sample cell is then flushed with a new sample and the cycle is repeated.

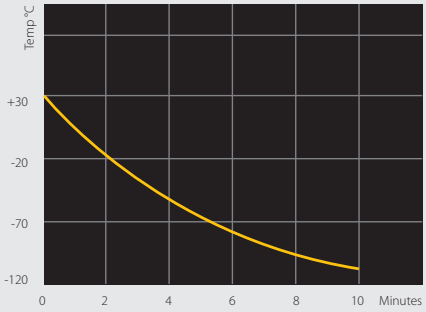
Why choose the icon scientific FreezePoint Analyser?

Excellent repeatability: with advanced detection algorithms and phase angle cryo-cooler control it generally achieves better repeatability than the standard test methods.

Reduced thermal losses: the cell is equipped with LED light source and photodiode detector; air-gapped light guides eliminate physical and thermal contact between the light source, detector and the cell, reducing thermal losses.

Best-in-class cooling performance: reduced thermal losses, coupled with the low-mass measuring cell and vacuum insulation, enable the maintenance-free cryo-cooler to cool down to -100°C within 10 minutes using normal plant-cooling water.

FreezePoint last cycle screen



FreezePoint cooler performance graph

Additional information

Measuring range	Adjustable for any range between -80°C to 0°C.
Repeatability	Equal to or better than repeatability criteria of the relevant test method.
Reproducibility	Equal to or better than the reproducibility criteria of the relevant test method.
Cycle time	4-10 minutes depending on sample.

Sample requirements

Filtration	Sample should be free from non-dissolved water and filtered to 70 microns or better.
Sample pressure at inlet	To be maintained between 1 and 5.0 bar(g).
Sample pressure at outlet	At least 0.5 bar(g) below the sample inlet pressure.
Sample temperature at inlet	At least 20°C above the expected freeze point, and not exceeding 60°C.
Sample flow	Typically 20-60L/hr.

Utility requirements

Instrument air	Not required.
Power	115-220V (±15%) AC 50/60Hz Maximum Consumption 1000VA.
Coolant	Plant cooling water (max temp 45°C) is required for the removal of extracted heat from the cryo-cooler. The typical flow rate is 50-100L/hr. Maximum pressure is 10 bar(g). Minimum differential pressure is 0.5 bar(g).

Installation Requirements

Location	Unit should be located out of direct wind sun and rain.
Ambient temperature	Should be maintained. Between + 5 to +50 °C.
Ambient humidity	0 to 95% relative humidity, non-condensing.

Control System

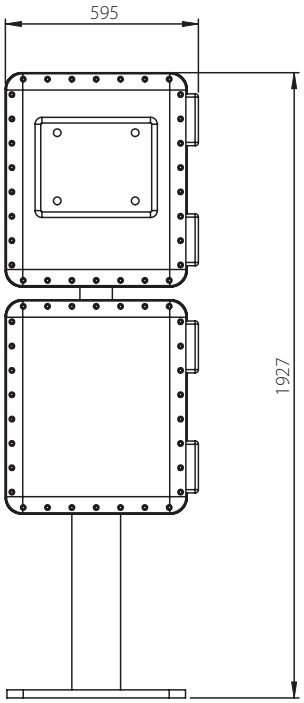
Control system	Based on fan-less industrial PC with solid state hard drive.
Graphical User Interface (GUI)	17" dual-touch, touch-screen panel that can be wiped clean and operated with gloved hands. The GUI is used to programme the unit and display current and historical analyser results and alarm status.
Language	Screen language selectable from English, French, Spanish and Chinese (others on request).

Inputs/Outputs

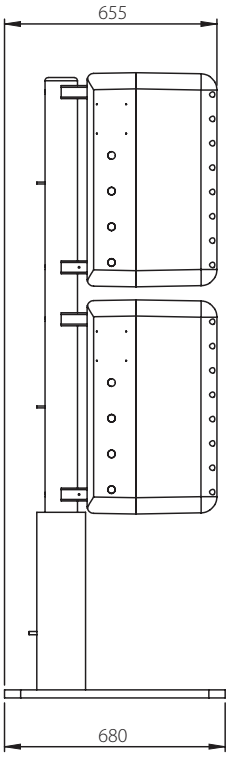
Analog outputs	2 x 4-20ma isolated outputs are provided as standard.
Modbus output	Wired Modbus RTU (RS485) and Modbus RTU over Ethernet available as standard.
Analog inputs	The analyser can read in up to four customer-provided 0-10V or 4-20mA signals. These inputs may be named, scaled and displayed and the values can have alarm levels associated with them.
Digital (contact) inputs	The analyser can monitor up to four volt free external contacts. The contacts can be allocated names for screen display and may be included in the alarm table.
Alarms	Any available alarm condition within the analyser may be allocated as active or inactive. Active alarms are notified on screen and stored in the alarm history table. Active alarms can be set by the user to activate a warning alarm contact or a fatal alarm contact. A warning alarm is for notification only while a fatal alarm causes the analyser to suspend its operation.
Contact outputs	In addition to the above alarm contacts, the analyser and also provides the following contact outputs. New Result: a two second contact to notify that a new analyser result is available. Data Valid: this contact will operate if the analyser is operating but the data is not valid because calibration or validation is in progress or the analyser is being run in manual mode. Service Alarm: the analyser monitors a number of internal functions and will warn the user if key items require service. All contact ratings are 24VDC 0.5A.
Hazardous area certification	The icon FreezePoint Analyser is ATEX and IECex certified Exd (Tamb. -20°C to +60°C) suitable for zone 1 or zone 2 use in gas groupings of IIA, IIB or IIB+H2 with a variable T-rating depending upon application. ATEX cert No.ITS10ATEX17190. IECex certificate no. IECex ITS 10.0059.
IP ratings	Tested and certified to IP66 (dust-tight and protected from powerful water jets) and to IP67 (dust-tight and protected from temporary total immersion in water).

Dimensions & Weights

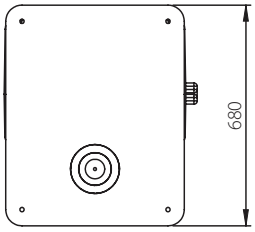
Front view



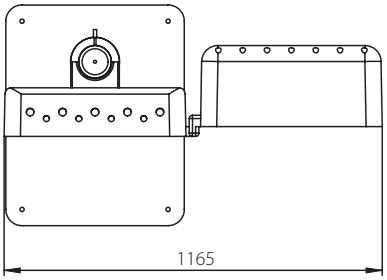
Side view



Top view



Top view with door open



Notes:

All dimensions in mm

Unpacked weight approx 300kg

Packed weight approx 350kg

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.*