FreezePoint

Powered by icon

icon

intelligent scientific analysis

icon scientific limited

t +44 (0) 1225 667050
e info@iconscientific.com
w www.iconscientific.com

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 and manufactured under an ISO9001:2008 certified Quality Management System.

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, 4-20mA and alarm contact outputs.

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 D2386, D5972 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.

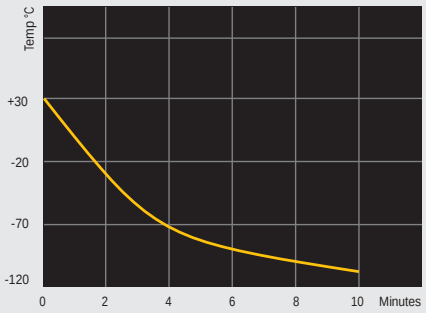
Why choose the icon scientific FreezePoint Analyser?

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



Specification

Measuring range	Adjustable for any range down to -80°C
Repeatability	Equal to or better than the repeatability criteria of the relevant test
Cycle Time	5-15 minutes depending on sample.

Sample Requirements

Filtration	Sample should be free from non-dissolved water and filtered to 10 microns
Sample Pressure at Inlet	Between 1–5 Barg
Sample Pressure at Outlet	At least 1.0 bar below the sample inlet pressure and not exceeding 4 bar.
Sample Temperature at Inlet	At least 20°C above the expected Freeze point and not exceeding 60°C.
Sample Consumption	6-30L/h.

Utility Requirements

Instrument Air	Required at 1.0 bar pressure consumption 5-10L/min for air circulation around cryocooler.
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).
Power	115VAC 50Hz, 230VAC 50Hz 115VAC 60Hz, 230VAC 60Hz, Max 1000VA

Installation Requirements

Location	Unit must be located out of direct wind sun and rain
Ambient Temperature	+5 to +40 deg.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 multi-language.

Inputs/Outputs

Analog Output	2 x 4-20mA active isolated outputs are provided as standard (1 for process, 1 for calibration/validation).
Communications	Modbus RTU over RS485, Ethernet (TCP/IP) or optional fiber optics. Optional OPC c/w server software over RS485.
Analog Inputs (optional)	The analyser can read in up to 3 active 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 (contacts) Inputs (optional)	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.
Digital (contacts) Outputs	In addition to the above Alarm contacts, the analyser also provides the following contact outputs; **New Result**: a 10 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. **Calibration/Validation**: indicates that the analyser is in calibration/validation. **Spill Alarm**: This contact will operate in the case of a leak being detected in the Freezepoint cell or analyser enclosure. All contact ratings are 24VDC 0.5A, 230VAC, 1A

Certification

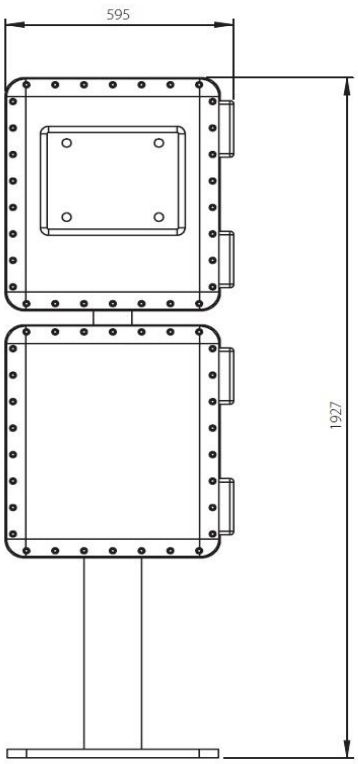
Hazardous Area Certification	The icon Freezepoint analyser is Exd certified to ATEX, IECEx, TIIS and EAC-EX standards, for zone 1 or zone 2 use in gas groups IIA, IIB or IIB+H2 with a variable T-rating depending upon application. It is also ETL listed for Canada and the USA Class 1, Div 1, groups B,C,D.
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

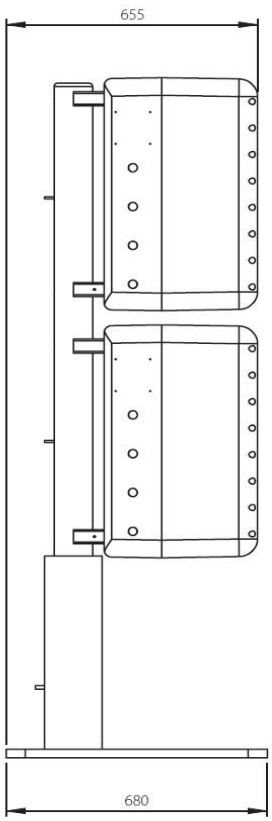
Notes:

All dimensions in mm
Unpacked weight approx. 420kg
Packed weight approx. 527kg

Front view



Side view



__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. V01 (02/2016)