ICON

Di⁹ Distillation

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 Distillation analyser is used to directly measure individual boiling points or full boiling ranges of petroleum products from the light to middle distillate ranges.

The results obtained may be directly correlated to standard test methods such as ASTM D86, IP123 and ISO3405.

How does it work?

The analyser carries out a precise small-scale distillation on 20ml of sample under controlled conditions. Our proven laser level measurement technology is used to accurately control the volume of sample in the distillation flask and to monitor the volume recovered; using the same piston setup for both measurements ensures any cross-system errors are negated. All results can be corrected for barometric pressure, as this is monitored throughout the distillation cycle. The temperature of the receiver block can be controlled to allow distillations covering all ASTM sample groups, and the distillations may also be stopped at any point along the curve.

Why choose the Icon Scientific Distillation Analyser?

Rapid cycle time: a complete distillation is achieved in 10-15 minutes.

Full distillation curve: available as raw data points for every 1% volume.

Auto validation/calibration: the analyser can be programmed to perform automatic validation or calibration on demand or on a timed basis.

Auto de-coke: the analyser can be programmed to perform an automatic de-coke cycle to remove potential coke build-up on the flask walls, to reduce or eliminate any manual cleaning requirement.

Multiple configurations: saved in the analyser software for a wide variety of samples, and individually selectable for each process stream.

Precision laser level measurement: provides superior repeatability.

Atmospheric pressure compensation: analyser results can be adjusted according to atmospheric pressure as defined in the standard test method.

Programmable outputs: gives the user greater control over the analyser's analog outputs, Modbus, and OPC data points. Multiple fixed and configurable data points available, including IBP, FBP, temperatures at percent recovered/evaporated, and volumes recovered/evaporated at temperature.
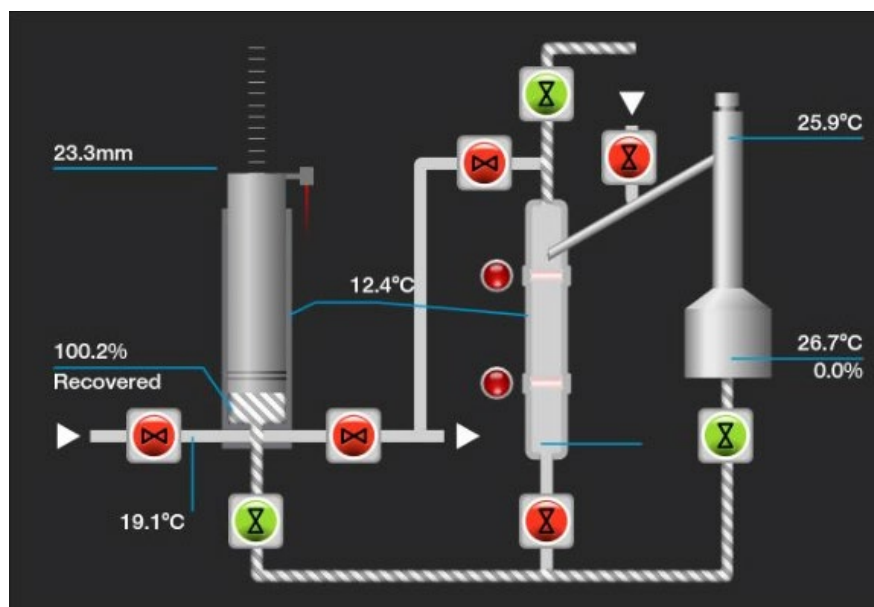
Sample Requirements

Inlet Temperature	At least 15°C (27°F) below the expected initial boiling point. Ideally no more than 60°C (140°F). Contact Icon for details.
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 only during Flush/Cool Typical Consumption 3-5 L/H
Sample Quality	Filtered to 10 microns (µm). Sample should contain no free water.
Vent	Atmospheric, with continuous fall to vent point.

Utility Requirements

Instrument Air	
Pressure	Minimum 4 bar (58 psi) Maximum 6 bar (87 psi)
Consumption	Typically 20-30 L/H
Quality	ISO 8573.1 Class 3 ANSI / ISA-7.0.0
Optional extra	If optional electronics enclosure cooling is selected, then a supply of instrument air is also required at 0.2 bar (3 psi), typically 5-10 L/H.
Coolant	Potable water, or antifreeze mixture. (Do not use sea water)
Inlet Temperature	ASTM Group 1 samples ≤ 20°C (68°F) All other ASTM Groups ≤ 40°C (104°F)
Inlet Pressure	Maximum 5 bar (72.5 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
Breather	Must be to atmospheric pressure.
Power	115VAC 50-60Hz, 230VAC 50-60Hz Max 1000VA

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, 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	0-430 °C (32-806°F)
Repeatability	Within the repeatability criteria of the ASTM D86 test for the measuring range and type of product under test.
Cycle Time	Typically 10-20 minutes, dependent on method and sample type.

Inputs/Outputs

Analog Outputs	4 x 4-20mA (active) isolated outputs and 4 x non-isolated outputs provided as standard. User-configurable to be for any volume recovered/evaporated at temperature, or temperature at percent recovered/evaporated, including IBP and FPB.
Digital (Contact) Inputs	**Run / Standby**: reads a customer supplied latching switch to toggle between run and standby modes. **Remote Cal**: reads a customer supplied momentary switch to remotely initiate a calibration cycle. **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 in Cal. or Val. modes. **Cal/Val** (NO)**:** indicates that the analyser is currently in Cal/Val 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.
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.

Stream Switching (optional)

Control Modes	Stream switching control can be assigned to any of the following selectable modes: - Digital Input (up to 2 streams) - Modbus (up to 3 streams) - OPC (up to 3 streams) - Internal Stream Switching Table (up to 3 streams) Each stream can be individually named and can have their own ASTM method assigned from the internal stream switching table or over Modbus. A single validation stream is also available as standard, and is controlled independently of the process stream switching modes selected above.
Digital (Contact) Outputs (additional)	**Current Stream:** this contact indicates the current stream, applicable when stream control is by digital input.
External Device Signals	24VDC signals provided for external stream selection solenoid valves.
Modbus / OPC	Full distillation curve of last completed distillation (raw data in 1% steps). Multiple fixed and configurable data points available for each stream, including IBP, FBP, temperature at percent recovered/evaporated, and volume recovered/evaporated at temperature. The current stream number is also available over Modbus and OPC Contact Icon for more information about available data.

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.