OptiCPP
Automatic Cloud and Pour Point Analyzer

Operator manual

Revision B

OptiCPP registered patents

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PAC is an international manufacturing and service organization with a portfolio that spans petroleum, petrochemical, biofuels, environmental, food and beverage, pharmaceutical and industrial analysis solutions.
PAC provides advanced scientific apparatus and testing equipment for laboratory process, on-line and field use from small to the largest enterprise businesses. PAC offers analytical solutions for a wide variety of applications, including: chromatographic systems and detectors, elemental, laboratory, and on-line process anlyzers, software applications, and spectroscopy.
Many automatic analyzers bearing the PAC brand are recognized for increasing test precision, boosting laboratory efficiency and reducing costs.

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Revision history

Revision	Date	Description
A	2018-12	First release
B	2019-07	- Redrawn of some paragraphs - 8.1 Modifications on CRM test required after calibration - 10.8 Illustration correction

Table of content

1. General information

1.1. Policy statement

The instructions given herein cover generally the description, installation, operation, and/or maintenance of subject equipment. PAC reserves the right to make engineering refinements that may not be reflected in this manual. Should any questions arise which may not be answered specifically by these instructions, they should be directed to PAC for further detailed information and technical assistance.
Your satisfaction and safety are important to PAC, and a complete understanding of this equipment is necessary to attain these objectives. As the eventual user of this apparatus, it is your responsibility to understand its proper function and operational characteristics.
This manual should be read thoroughly and all users should be given adequate training before attempting to place this analyzer in service. Awareness of the stated cautions and warnings, and compliance with recommended operating and maintenance parameters are important for safe and satisfactory operation.
This apparatus should be used only for its intended operation; alterations will void the warranty.

1.2. Standard limited warranty of PAC

This Standard Limited Warranty applies to products manufactured and sold by Petroleum Analyzer Company, L.P., Walter Herzog GmbH, Instrumentation Scientifique De Laboratoire SAS, A.C. Analytical Controls B.V., A.C. Analytical Controls Asia Pacific Pte Ltd. and Phase Technology (hereafter each or any of them referred to as "PAC").

1.2.1 Limited warranty

1.2.1.1 Warranty

For each product sold, PAC offers to the original owner ("Buyer") a limited warranty against failure to conform to the product specifications or any defects in material and workmanship for a period of

1. twenty-four (24) months from the date of installation of the product or
2. thirty (30) months from date of invoice,

whichever is less (the "Initial Warranty"). If a failure to conform to specifications or a defect in materials or workmanship is discovered within the Initial Warranty period, Buyer must promptly notify PAC in writing, which notification, in any event must be received no later than 14 months from the date of installation of the product. Within a reasonable time after such notification, PAC will correct any failure to conform to specifications or any defect in materials or workmanship, or in lieu of such repair, and at its sole option, shall replace the product, F.O.B. PAC's city of shipment or refund the purchase price, less a reasonable reduction in such purchase price as determined by PAC. In no event shall PAC be liable for consequential or special damages, or for transportation, installation, adjustment or other expenses, which may arise in connection with such products or warranty claim. Products and parts sold by authorized PAC Distributors are covered by the Distributor's terms and conditions.
During the Initial Warranty period, PAC offers a limited warranty on each part or product repaired or replaced by a PAC service person for a period ending the later of

A. the remaining term of the Initial Warranty of the product or
B. ninety (90) days from the date of repair or replacement,

whichever is longer. After expiration of the Initial Warranty period, PAC offers a ninety (90) day limited warranty on each part or product repaired or replaced by a PAC service person. PAC further warrants that the products and parts it sells will conform to PAC's written specifications therefor. The foregoing limited warranties cover parts and labor only and PAC does not warrant and will not reimburse the Buyer for any other costs relating repairing or replacing the product at issue. The foregoing limited warranties apply only to the repair or replacement of defective parts and/or products and such determination will be in the sole discretion of PAC.
The limited warranties of this current section are further subject to those warranty exclusions set forth in *section 1.2.1.3 Limited warranty exclusions*

1.2.1.2 Aftermarket

The use of third party parts in the operation or maintenance of the product or repairs or servicing by unauthorized service personnel immediately voids all further warranty obligations of PAC. PAC genuine consumables are sold on an as-is basis and have no warranty beyond being shipped in good working order.

1.2.1.3 Limited warranty exclusions

Other than the warranties set forth in *section 1.2.1.1 Warranty*, PAC disclaims any and all express or implied warranties, including but not limited to the warranty of merchantability, fitness for a particular purpose and non-infringement of the intellectual property of others. Provided, however, this Intellectual Property Warranty shall apply to the product only so long as Buyer

1. does not modify the product, combine the product with other elements or use the product in a practice or a process, and such modification, combination or practice of which the product forms a part is the subject of such claim or allegation of infringement and
2. uses the product under ordinary conditions and for their intended purposes.

PAC makes no warranty, express or implied, as to the design, sale, installation or use of its products. PAC's warranties will not be enlarged by, nor will any obligation or liability of PAC arise due to PAC providing technical advice, facilities or service in connection with any product. PAC disclaims any and all other warranties and representations and PAC provides no warranty on the oral representations made by its personnel while they are undertaking Services for Buyer.

There is no warranty by PAC with respect to any product's:

1. uninterrupted or error-free operation;
2. actual performance, other than the product's capability to meet PAC's specifications therefore;
3. removal or installation from a worksite or process;
4. electronic components or associated accessories (including without limitation circuit boards and integrated circuits);
5. maintenance (including without limitation gasket and seal replacements, adjustments, minor repairs and other inspection requirements, preventative or otherwise);
6. use under inappropriate conditions or not in accordance with operating instructions; or
7. use in connection with the operation of a nuclear facility.

There is no warranty for products determined to be, in PAC's sole discretion, damaged or impaired as a result of:

A. misuse, neglect or accident;
B. improper application, installation, storage or use;
C. improper or inadequate maintenance or calibration;
D. operation outside of the published environmental specification;
E. improper site preparation or maintenance;
F. unauthorized repairs or replacements;
G. modifications negligently or otherwise improperly made or performed by persons other than PAC;
H. Buyer-supplied software or supplies;
I. use in conjunction with or interfacing with unapproved accessory equipment;

J. use of ABC-style or dry powder fire suppression agents; or
K. leaked sample materials.

To the extent a PAC product is used in connection with the operation of a nuclear power facility, Buyer agrees to indemnify and hold PAC harmless from any and all actions, claims, suits, damages and expenses arising from such use. PAC provides no warranty on the oral representations made by its personnel while they are attempting to assist Buyer in the operation of a product. This Standard Limited Warranty does not apply to items consumed by the products during their ordinary use, including but not limited to fuses, batteries, paper, septa, fittings, screws, fuses, pyrolysis, dryer or scrubber tubes, sample boats, furnaces or lamps.
This warranty is valid only if genuine PAC parts, consumables and standards are used in PAC products.

1.2.1.4 Resale products

Resale products are goods (that are sold with PAC's products) which are not manufactured by PAC and which are supplied as an accommodation to Buyer. PAC MAKES NO WARRANTY FOR RESALE PRODUCTS, EITHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE SOLE WARRANTY SHALL BE THAT OF THE RESALE PRODUCT MANUFACTURER.

1.2.1.5 Expenses on non-warranty work

All repairs or replacements by PAC after the expiration of any applicable limited warranty period will be performed in accordance with PAC's standard rate for parts and labour. Further, if upon PAC's inspection and review, PAC determines the condition of the product for which a warranty claim is submitted is not caused by a defect in PAC's material and workmanship, but is the result of some other condition, including but not limited to damage caused by any of the events or conditions set forth in *section 1.2.1.3 Limited warranty exclusions*. Buyer shall be liable for all expenses incurred by PAC to conduct the inspection and review of the product.

1.2.1.6 Exclusive remedy

The limited warranty contained herein constitutes Buyer's exclusive remedy with respect to products sold by PAC and PAC's liability shall be exclusively limited to the written limited warranty specified herein. No employee, representative or agent of PAC is authorized to either expressly or impliedly modify, extend, alter or change any of the limited warranties expressed herein to Buyer.

1.2.1.7 Procedure and costs

All limited warranty claims must be made in writing promptly following discovery of any failure to conform to specifications or any defect in materials or workmanship. Buyer must hold products for inspection by PAC. If requested by PAC, Buyer must send the product to PAC for inspection. Any such returns by Buyer will be at Buyer's expense and Buyer will remain liable for any loss of or damage to the product during such product's transportation to PAC. No products will be sent to PAC for inspection unless PAC has authorized Buyer to do so.

1.2.1.8 Terms and conditions

PAC's General Terms and Conditions are incorporated herein by reference and Buyer accordingly agrees to be bound by the terms thereof.

1.2.2 Limitations on PAC liability

1.2.2.1 General

Buyer agrees that in no case shall PAC be liable for any special, incidental, consequential, or punitive damages based upon any legal theory whether or not such damages are foreseeable. Such damages include, but are not limited to, loss of profits, loss of savings or revenue, loss of use of the product or any associated equipment, cost of capital, cost of any substitute equipment, facilities or services, downtime, the claims of third parties including customers, injury to property and, unless precluded under applicable state law, bodily and personal injury. PAC's total liability for any and all losses and damages arising out of any and all causes whatsoever including, without limitation, defects in the product (s), services, software, or documentation supplied or breach of this agreement, shall in no event exceed the purchase price of the applicable product(s). Buyer agrees these limitations on PAC's liability are reasonable and reflected in the amounts charged by PAC for its products.

1.2.2.2 Buyer Data

If any data supplied by Buyer, whether in the form of Buyer specifications or pursuant to any purchase order or other documentation, proves to be inaccurate, any warranties or other related obligations of PAC relying thereon will be void.

1.2.2.3 Force majeure

This Standard Limited Warranty does not cover and PAC shall not be liable for either direct or consequential damage caused, either directly or indirectly, as a result of:

1. any act of God, including but not limited to natural disaster, such as floods, earthquakes, or tornadoes;
2. damages resulting from or under the conditions of labor disputes, strikes or riots, insurrection, civil commotion or war;
3. damages or improper operation due to intermittent power line voltage, frequency, electrical spikes or surges, unusual shock or electrical damage;
4. accident, fire or water damage, neglect, corrosive atmosphere or causes other than ordinary use;
5. failure of supplies or transportation, or governmental action; or
6. any other causes beyond Seller's reasonable control.

1.2.2.4 Limitation on warranty claims

Prior to any obligation of PAC to perform any limited warranty service as set forth herein, Buyer must have:

1. paid all invoices to PAC in full, whether or not they are specifically related to the product at issue; and
2. notified PAC of the limited warranty claim within sixty (60) days from the date Buyer knew or had reason to know of the defect.

1.2.3 Compliance

1.2.3.1 General

These Warranty Terms are subject to change without notice. PAC also retains the right to modify these warranty terms in order to comply with policy or laws governing warranty issues in states or countries having specific remedies differing or additional to those described within this document.

1.2.3.2 Severability

If any one or more of the provisions or subjects contained in the Agreement shall for any reason be held invalid, illegal, or unenforceable, it shall not affect the validity and enforceability of any other provisions or subjects.

1.3. Software license

This End-User License Agreement (“EULA”) is a legal agreement between you (either an individual or a single entity) and the manufacturer (“PC Manufacturer”) of the computer system (“COMPUTER”) with which you acquired or installed the Sulfacert software product(s) identified above (“SOFTWARE PRODUCT” or “SOFTWARE”).
If the SOFTWARE PRODUCT is not installed into a new computer system, you may not use or copy the SOFTWARE PRODUCT. The SOFTWARE PRODUCT includes computer software, the associated hardware and media, any printed materials, and any “on-line” or electric documentation. By installing, copying, or otherwise using the SOFTWARE PRODUCT, you agree to be bound by the terms of this EULA.
If you do not agree to the terms of this EULA, PC Manufacturer and PAC are unwilling to license the SOFTWARE PRODUCT to you. In such event, you may not use or copy the SOFTWARE PRODUCT and you should promptly contact your local PAC representatives for return of the unused product(s) for a refund.
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1.3.1 Grant of license

This EULA grants you the following rights:

1.3.1.1 Software

You may install and use one copy of the SOFTWARE PRODUCT on the COMPUTER. A license for the SOFTWARE PRODUCT may not be shared or used concurrently on different computers.

1.3.1.2 Back-up Utility

If PC Manufacturer has not included a back-up copy of the SOFTWARE PRODUCT with the COMPUTER, you may use the back-up utility, if included with the SOFTWARE PRODUCT, to make a single back-up copy of the SOFTWARE PRODUCT. You may use the back-up copy solely for archival purposes. After the single back-up copy is made, the backup utility will be permanently disabled.

1.3.2 Description of other rights and limitations

1.3.2.1 Limitations on Reverse Engineering, Decompilation and Disassembly

You may not reverse engineer, decompile, or disassemble the SOFTWARE PRODUCT, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation.

1.3.2.2 Separation of Components

The SOFTWARE PRODUCT is licensed as a single product. Its component parts may not be separated for use on more than one computer.

1.3.2.3 Single COMPUTER

The SOFTWARE PRODUCT is licensed with the COMPUTER as a single integrated product. The SOFTWARE PRODUCT may only be used with the COMPUTER.

1.3.2.4 Rental

You may not rent or release the SOFTWARE PRODUCT.

1.3.2.5 Software Transfer

You may permanently transfer all of your rights under this EULA only as part of a sale or transfer of the COMPUTER, provided you retain no copies, you transfer all of the SOFTWARE PRODUCT (including all component parts, the media and printed materials, any upgrades, this EULA and, if applicable, the Certificate(s) of Authenticity), and the recipient agrees to the terms of this EULA. If the SOFTWARE PRODUCT is an upgrade, any transfer must include all prior versions of the SOFTWARE PRODUCT.

1.3.2.6 Termination

Without prejudice to any other rights, PAC may terminate this EULA if you fail to comply with the terms and conditions of this EULA. In such event, you must destroy all copies of the SOFTWARE PRODUCT and all of its component parts.

1.3.3 Upgrades

If the SOFTWARE PRODUCT is an upgrade of a component of a package of software programs which you licensed as a single product, the SOFTWARE PRODUCT may be used and transferred only as part of that single product package and may not be separated for use on more than one computer.

1.3.4 Copyright

All title and copyrights in and to the SOFTWARE PRODUCT (including but not limited to any images, photographs, animations, video, audio, music, text and “applets,” incorporated into the SOFTWARE PRODUCT), the accompanying printed materials, and any copies of the SOFTWARE PRODUCT, are owned by PAC or its suppliers. The SOFTWARE PRODUCT is protected by copyright laws and international treaty provisions. You may not copy the printed materials accompanying the SOFTWARE PRODUCT.

1.3.5 Dual-media software

You may receive the SOFTWARE PRODUCT in more than one medium. Regardless of the type or size of medium you receive, you may only use one medium that is appropriate for your single computer. You may not use or install the other medium on another computer. You may not loan, rent, lease, or otherwise transfer the other medium to another user, except as part of the permanent transfer (as provided above) of the SOFTWARE PRODUCT.

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The SOFTWARE PRODUCT and documentation are provided with RESTRICTED RIGHTS. Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 or subparagraphs (c)(1) and (2) of the Commercial Computer Software-Restricted Rights at 48 CFR 52.227-19, as applicable. Manufacturer is PAC, L.P., 8824 Fallbrook Drive Houston, TX 77064, USA.
For the limited warranties and special provisions pertaining to your particular jurisdiction, please refer to the software product printed materials.

1.4. Assumptions

1.4.1 Good Laboratory Practice

Refer to Good Laboratory Practice or GLP as a system of management controls for laboratories and research organizations to ensure the consistency and reliability of results - as outlined in the Organisation for Economic Co-operation and Development (OECD) Principles of GLP and national regulations.
GLP applies to non-clinical studies conducted for the assessment of the safety of chemicals to man, animals and the environment. The internationally accepted definition reads:
Good Laboratory Practice (GLP) embodies a set of principles that provides a framework within which laboratory studies are planned, performed, monitored, recorded, reported and archived. These studies are undertaken to generate data by which the hazards and risks to users, consumers and third parties, including the environment, can be assessed for pharmaceuticals (only preclinical studies), agrochemicals, cosmetics, food additives, feed additives and contaminants, novel foods, biocides, detergents, etc.
GLP helps assure regulatory authorities that the data submitted are a true reflection of the results obtained during the study and can therefore be relied upon when making risk/safety assessments.

1.4.2 The standards of laboratory safety

Refer to the standards of laboratory safety, wearing appropriate gloves, glasses and clothing to handle materials safely.

1.4.3 Electronic device

Refer to the standards of manipulating an electronically / electrical device and electrical current safely.

1.5. Return policy

No product may be returned, whether in warranty or out of warranty, without first obtaining approval from PAC. No replacements will be provided nor repairs be made for products returned without such approval. A return authorization number must accompany any returned product. The buyer will pay for the expense of returning the analyzer to PAC for service. The status of any product returned later than 30 days after the issuance of a return authorization number will be subject to review.
Products may not be returned that are contaminated by radioactive materials, infectious agents, or other materials constituting health hazards to PAC's employees.

1.5.1 Returned product warranty determination

After PAC's examination, warranty or out-of-warranty status will be determined. If a warranted defect exists, the product will be repaired at no charge and shipped pre-paid back to the buyer. Warranty repairs do not extend the original warranty period.
If an out-of-warranty defect exists, the buyer shall be notified of the repair cost. At such time, the buyer must issue a valid purchase order to cover the cost of the repair and freight, or authorize the products to be shipped back as is, at the buyer's expense. Failure to obtain a purchase order number approval within fifteen days of notification will result in the products being returned as is, at the buyer's expense.

1.5.2 On-site repair

If a PAC product cannot be made functional by telephone assistance or by installing replacement parts, and cannot be returned to PAC for repair, the following policy applies.
PAC will provide an on-site field service representative in a reasonable amount of time, provided that the customer issues a valid purchase order to PAC covering all transportation, subsistence, and prevailing labour costs, including travel time, necessary to complete the repair. For warranty field repairs, the customer will not be charged for the cost of transportation, labour, or materials. If service is rendered at times other than normal work periods, then special service rates may apply.

1.5.3 Inspection

This system was thoroughly inspected and carefully packed before leaving our factory. Responsibility for its safe delivery was assumed by the carrier upon acceptance of the shipment. Claims for loss or damage sustained in transit must be made upon the carrier by the recipient as follows.

1.5.3.1 Visible loss or damage

Note any external evidence of loss or damage on the freight bill or express receipt, and have it signed by the carrier's agent. Failure to adequately describe such external evidence of loss or damage may result in the carrier's refusing to honour your damage claim. The form required to file such a claim will be supplied by the carrier.

1.5.3.2 Concealed loss or damage

Concealed loss or damage means loss or damage, which becomes apparent when the merchandise is unpacked and inspected. Should concealed loss or damage occur, make a written request for inspection by the carrier's agent within 15 days of the delivery date, then file a claim with the carrier since the damage is the carrier's responsibility.
By following these instructions carefully, we guarantee our full support of your claim to be compensated for loss from shipping damage.

CAUTION
DO NOT - for any reason - return the analyzer without first obtaining authorization.

1.5.4 Information

In any correspondence to PAC, please supply the data from the nameplate, including catalogue number and serial number.

Catalog number: _____
Serial number: _____
Purchase date: _____

1.6. Disposal

Correct disposal of Waste Electrical and Electronic Equipment in the end-of life

Applicable in the European Union and other European countries with separate collection systems.

This product is designed for exclusive professional use by commercial companies. This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life.

To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Business users should contact the producer or the importer and check the terms and conditions of the purchase contract. If you have a separate agreement with your producer or your importer on the end-of-life disposal in a way that you will care for disposal by your own, would you please ensure an environmentally sound disposal according to the legal regulations for electric and electronic waste equipment in your country.

This product should not be mixed with other commercial wastes for disposal.

The above WEEE-symbol is the official marking for equipment under the WEEE-scope. In some EC-Member states "pure B2B equipment" is not necessarily marked with the waste bin-symbol. To provide a homogenous EC-wide procedure, PAC however uses the marking in all EC-Member states.

1.7. Documentation

1.7.1 Document validity

This manual has been prepared with great care, in compliance with the relevant regulations, and based on PAC's experience and latest knowledge.

The information in this document is therefore valid and correct at the moment of release of this version. (The version number is indicated on the front page of this manual). However, changes and improvements may be made to this document at any time and without prior notice.

This document is only complete in conjunction with all other system-related documents.

1.7.2 Document storage

This document is part of the apparatus that is described in it, and must be kept in a safe place near the apparatus.

This document must be accessible at all times.

1.7.3 Language

The source language of this manual is English.
As a translation may be inaccurate or imprecise, the original source text will be legally binding and shall prevail in the case of any difference between the source text and any translation.

1.7.4 Typographical and authoring conventions

- Hardware buttons that can be pushed, software buttons that can be clicked in the Human Machine Interface (HMI) of software applications, menu commands that can be selected, and data that can be entered via a keyboard, are indicated in the font as shown in the following example:
  Click ***OK***.
- Combined menu selections in the HMI are indicated by the '>' symbol, e.g.
  Select File > Save As.
- File names and texts in the HMI are indicated in the font as shown here:
  The menu ***Temperature*** of the ***Weather*** screen appears.
- E-mail and internet addresses are indicated as in the following example:
  sales@paclp.com
- Lists and enumerations without prescribed order are always preceded by bullets (like this list).
- Procedure steps, which must be performed in consecutive order, are always numbered.
- Throughout this manual, PAC L.P. and its subsidiaries are referred to as 'PAC'.
- Throughout this manual, PAC automatic laboratory equipment (or device, unit, or apparatus) is referred to as the 'analyzer'.
- Throughout this manual, the complete analysis system is referred to as 'the system'.

2. Safety

2.1. Certification

The system and its components have been designed with safety in mind. The design applies to the use, the conditions and the instructions described in the documentation. The system

- Has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules.
- Meets the requirements of the European Directives concerning health, hygiene and safety. The standards applied are listed in the "UE Declaration of Conformity"

For a copy of the corresponding declarations, please contact your PAC representative.
If the user makes changes or modifications that are not expressly approved by PAC, PAC reserves the right to void the user's authority to operate the equipment.
During performance or routine maintenance, the system operator may be exposed to potentially dangerous chemicals, temperatures, electrical voltages and/or other hazards. In order to reduce the personal risk involved, the following guidelines are established. These requirements are within accepted standards for general analytical laboratory operation.

WARNING
Failure to follow the instructions and procedures contained in this manual could result in death or serious injury. The instructions and procedures must be performed by qualified and trained personnel only. Do not perform installation or maintenance operations or procedures outside the scope of this manual.

Please refer to the corresponding Material Safety Data Sheet (MSDS) for each PAC-supplied product and also reference the corresponding MSDS that is vendor-supplied for each sample and standard utilized with the product for the established safety requirements and government safety and disposal standards.

2.2. Warning pictograms

A warning pictogram denotes a dangerous situation that, if not avoided, will result in serious injury or death. The following warning pictograms can be found in the manuals and on the analyzer.

WARNING
General Warning

WARNING
Danger of high voltages: shock hazard, electrocution hazard

WARNING
Dangerous fluids and gases

TIP
Read and fully understand the Operator Manual before using the analyzer

2.3. Caution pictograms

A caution pictogram denotes a situation that, may result in injury or damage. The following caution pictograms can be found in the manuals and on the apparatus.

WARNING
General caution

WARNING
Wear protective gloves

WARNING
Wear safety glasses!

2.4. Note pictograms

A note pictogram denotes a recommendation that, if not followed, may result in minor damage. The following note pictogram can be found in the manuals.

NOTE
General note

2.5. Tip pictograms

A tip pictogram denotes a recommendation that can help in understanding how to operate or service the apparatus. The following tip pictograms can be found in the manuals.

TIP
General tip

2.6. Environmental protection

Please observe all local regulations and recommendations for the disposal, recycling or environmentally friendly processing of parts and materials that have been used or replaced during installation, operation, and maintenance tasks.

2.7. Handling of chemicals

Please observe all safety regulations regarding the handling of the samples, cleaning, rinsing and waste liquids (e.g use of safety glasses, gloves, respiratory protection, exhaustion, etc.).
Check the chemical resistance of all materials (see lists below) which come into contact with the samples before starting the measurement.
Prior to starting a measurement or cleaning procedure, make sure that all parts that come into contact with fluids are properly installed and in good condition.
List of the materials in contact with the sample:

- Jacket :
  - Nickel plated Copper.
  - Polyvinyl chloride (PVC)
- Test jar :
  - Glass
- Disk and Ring :
  - Cork
- O-ring :
  - Fluoroelastomer (FKM)
  - Polytetrafluoroethylene (PTFE)
- Measurement head
  - Polyacetal (POM)
  - Polyvinyl chloride (PVC)
  - Glass
- Temperature Probes :
  - Glass
  - Stainless steel

3. Introduction

3.1. Intended use

The OptiCPP Automatic Cloud and Pour Point Analyzer described in this document has been designed and is intended to be used to provide accurate and precise analysis Pour and Cloud Points of fuels and oils.
Any other use or modification of the analyzer without written agreement from PAC will be regarded as noncompliant: PAC will not be liable for any possible resulting damage or injury, and the warranty will be voided.
The analyzer may only be operated and serviced by trained qualified authorized persons.
The operator must avoid any operation that can affect the safety of the system and of persons. The operator is always required to ensure that the analyzer is in proper condition when it is operating.

3.2. Intended audience

This document is intended for customer personnel that operates the system in order to perform analysis.
The user must have a working knowledge of computers and associated equipment (keyboard, mouse, monitor, etc.).
The content of this document must be read, understood and observed in all points and by each person responsible for the preparation, the transport, the storage, the installation, the operation, the preventive maintenance, checks and calibrations of the analyzer, before starting to work with and on the analyzer.

3.3. Introduction to OptiCPP

The OptiCPP is a fully automated Cloud and Pour Points analyzer that uses innovative features to ensure reliable and accurate cloud or pour points determination in accordance with international Standard Methods. Its powerful embedded smart software allows non-assisted operation during the entire test cycle: the system controls the test progress, records the temperatures and reports the results data in real-time.
The OptiCPP complies with ASTM D97, ASTM D5950, ASTM D5853, IP 15, ISO 3016, JIS K2269 standard methods for pour point determination, and with ASTM D2500, ASTM D5771, IP 219, IP 444, ISO 3015, JIS K2269 Standard Methods for cloud point determination.
The newly designed analyzer includes a color touchscreen and advanced electronics that permits network printing and electronic data transfer to a PC.

3.3.1 Principle

Cloud Point

The OptiCPP Cloud Point test allows determining the temperature at which the paraffin-base constituents of the product may precipitate, a reaction which may cause pipework or filter clogging, or the downgrading of performance in the case of oils.
Sample is cooled down and an optical sensor determines Cloud Point. When Cloud Point is found, sample can be heated up back to the ambient temperature.

Pour Point

The OptiCPP Pour Point test allows determining the lowest temperature at which the product continues to flow. That information is particularly relevant to the storage of products which must be pumped out afterwards.
Pour point is generally 4.5°C to 5.5°C below cloud point, although the difference between those two points may be as much as 8 to 11°C.
Sample is cooled down and tilted at each defined step temperatures according to the chosen Standard Method to determine Pour Point. When sample does not flow after 5 seconds at 90° tilt, Pour Point is found and it can be heated up back to the ambient temperature.

3.3.2 Ease of use and fully automated process

The OptiCPP high level of automation - powered by embedded smart software - allows non-assisted operation during the whole test cycle, therefore a significant reduction of operator's workload. 100% configurable, the OptiCPP accommodates your unique testing requirements, yet also provides strict compliance to international Standard Test Methods.
Automation enables unattended operation with excellent reproducibility and repeatability. The new ergonomic and cordless cloud and pour point measurement heads ensure comfort and freedom of movement when handling test equipment.

3.3.3 Excellent Quality and HSE Management

Special functions guarantee complete operation traceability together with extra quality assurance in data management.

3.4. Applicable standard methods

Cloud Point

Standard method	Description
ASTM D5771	Standard Test Method for Cloud Point of Petroleum Products (Optical Detection Stepped Cooling Method)
IP 444	Determination of the cloud point of petroleum products - Automatic stepped cooling method
ASTM D2500	Standard Test Method for Cloud Point of Petroleum Products and Liquid Fuels
IP 219	Petroleum products - Determination of cloud point
ISO 3015	Petroleum products -- Determination of cloud point
JIS K2269	Testing methods for pour point and cloud point of crude oil and petroleum products

Pour Point

Standard method	Description
ASTM D5950	Standard Test Method for Pour Point of Petroleum Products (Automatic Tilt Method)
ASTM D97	Standard Test Method for Pour Point of Petroleum Products
ASTM D5853	Standard Test Method for Pour Point of Crude Oils
IP 15	Area Classification Code for Petroleum Installations
ISO 3016	Petroleum products — Determination of pour point
JIS K2269	Testing methods for pour point and cloud point of crude oil and petroleum products

3.5. Options

The OptiCPP can be equipped with the following options:

1. IRIS® Network,
2. Barcode reader,
3. Keyboard and mouse,

3.5.1 IRIS® Network

The OptiCPP has been designed to run either has a stand-alone unit or under IRIS® management software developed by PAC.
The IRIS® software is an advanced multitasking software running under Windows that is designed to meet the requirements of the modem analytical laboratories. It allows multiple analytical analyzers to be connected, locally or worldwide, and controlled from a single workstation, therefore simplifying knowledge sharing and key decision-making processes.
Besides its advanced networking capabilities, the PAC IRIS® software provides efficient database management with results, direct and easy transfer to a LIMS (or other information system).

NOTE
The IRIS® kit is optional hardware and software package. Refer to IRIS® Installation and Getting Started User Manual for additional information.

3.5.2 Barcode reader

A barcode reader is available as an optional accessory. The barcode reader allows automatic entry of the sample name during test configuration without spelling mistakes. When connected, the barcode reader can be activated after selecting the sample name/number field.
The analyzer is compatible with 2.4GHz wireless barcode reader bundled with a driverless USB dongle.

3.5.3 Keyboard and mouse

This option avoids the use of the touch screen.
It is possible to connect a keyboard and a mouse via the USB ports of the analyzer.
One USB port is located on the front of the analyzer and the second one is located on the back panel.
The analyzer is compatible with 2.4GHz wireless keyboard or mouse bundled with a driverless USB dongle.

3.6. Precautions

Specifically for the OptiCPP, comply with the following warnings.

3.6.1 Electrical Hazards

WARNING
Dangerous electrical hazard.
The power button on the front does NOT disconnect the electrical power supply. Most components are still electrically charged.

On the rear panel, switch off the main power switch. Disconnect the power supply cable before conducting any maintenance or service.

- Only replace the power cord with a cord having the same characteristics.
- Only replace fuses of the mains socket with fuses having the same characteristics.

CAUTION
The mains plug is the means of disconnection of the analyzer and must be easily accessible.

3.6.2 Hazardous Reaction Products

WARNING
Dangerous liquids

WARNING
Wear protective gloves!

WARNING
Wear safety glasses!

3.6.3 Extreme Temperature

The OptiCPP measures samples in a temperature range down to -95°C (-139°F).
Before conducting any maintenance or service, make sure that the system is warmed up to room temperature.

3.7. Technical Specifications

The OptiCPP has the following general and technical specifications and communication interfaces.

3.7.1 Application range

Operation	Unit - remark
Analytical principle	Cloud Point: Optical detection Pour Point: Tilting detection LED light source emitter; photoelectric cell receptor
Cooling system	Internal cryocooler Stepped or linear cooling profiles according to method or user defined (sample or jacket adjustable from 1°C/h to 120°C/h) Customizable up to 20 steps
Test interval	Pour Point: programmable tilting of the jacket from 1.0 to 5.0°C in step of 0.1°C. Cloud Point: automatic 0.1°C or according to the method

Temperature range	Unit - remark
Sample	- 95°C to +51°C (-139°F to 123°F); Samples having EPP higher than +35°C have to be preheated externally but not above 70°C °C or °F configurable
Jacket	-105°C to + 55°C (-157°F to +131°F); Automatic control of programmable cooling steps °C or °F configurable

Measurements	Unit - remark
Sample temperature	Accuracy: 0.1°C Metal/Glass Pt100 probe Automatic calibration of measurement circuit and probe (10 points) correction table
Cooling temperature	Accuracy: 0.5°C Metal Pt100 probe Automatic calibration procedure
Calibration	Automatic temperature calibration routine 2 to 10 points temperature probe correction table Programmable calibration frequency

3.7.2 Dimensions

Physical specs	Unit - remark
Manufacturer	ISL by PAC
Width	254 mm (10 in) / 300 mm (11.8 in) with second head holder
Length	600 mm (23.6 in)
Height	350 mm (13.4 in)
Weight	30,2 kg (67 lbs)
Overall dimensions (for ventilation) WLH	454 x 700 x 350 mm (17.8 x 27.6 x 13.8 in)
Overall dimensions (for ventilation) with second head holder WLH	500 x 700 x 350 mm (19.7 x 27.6 x 13.8 in)

3.7.3 Electrical data

Power requirements	Unit - remark
Input power voltage	90 to 240 VAC (+/- 10 %) - automatic adaptation INDOOR USE ONLY
Frequency	50 to 60 Hz
Wattage	300 W

3.7.4 Environmental conditions

Environmental conditions	Unit - remark
Operating temperature	10 to 35 °C (50 to 95 °F)
Storage temperature	-20 to 50 °C (-4 to 122 °F)
Humidity	20 to 85 % - non-condensing
Pollution	Degree 2
Installation	Category II
Degree of protection against ingress of solid and water	IPX0

3.7.5 Sample conditions

Sample conditions	Unit - remark
Volume	Around 41 ml
Preparation	Following standards: preheating at 45°C; free from any moisture or bubbles; threated for thermal history
Test equipment	Cork disk and ring; test jar: • Pour Point according to ASTM D5950 and analogs: test jar M004243 (with lower level mark to ASTM D97 level mark and upper level mark for low temperature tests with expected point < -60°C) • Pour Point according to ASTM D97: test jar M00428 (optional) • Cloud Point according to ASTM D5771 and analogs: test jar M00430 (mirror bottom)

3.7.6 Data management

Data Management	Unit - remark
Documentation	Real-time display on screen of test progress & graphics (PP: tilting angles and time before movement; CP: crystals detection signal; jacket/sample temperature graphics); Quality Control Database; Self diagnosis tools Results instant reports in °C or °F Note field available (still accessible)
Internal Memory	200 test runs with graphic result and cooling curve Up to 40 cooling curves (customizable up to 20 steps)
Quality Control Database	Control of measuring devices following up to 30 Quality Control products with automatic acceptance criteria; deviations and statistical quality reports Each quality control chart can store up to 40 points Devices calibration history and printable ticket
PC Networking	IRIS software connection for multi-instrument networking
Printing	Personal/Network printer; 40/80 columns/PCL5 or above USB: USB Flash Drive/ Citizen / Seiko / Axiohm / PCL 5.0 or above RS232: PC / Citizen / Seiko / Axiohm TCPIP: PCL only

Interface Specifications	Unit - remark
Display	7” resistive color touch-screen 16/9; Resolution: 800x480; Real time graphic display; Solvent-proof
Data input/output	USB: 2; for printer connection, barcode reader or keyboard/mouse operation Ethernet port: 1; for IRIS connection & LIMS Serial: 1 RS232C serial link for direct connection to LIMS or external PC

Safety and Error Prevention	Unit - remark
Password security	Multi-level password protection. Customer configurable

4. Description

4.1. Configuration information

4.1.1 Description

The newly designed OptiCPP includes a color touchscreen and advanced electronics that allows network printing and electronic data transfer from the analyzer to a PC.

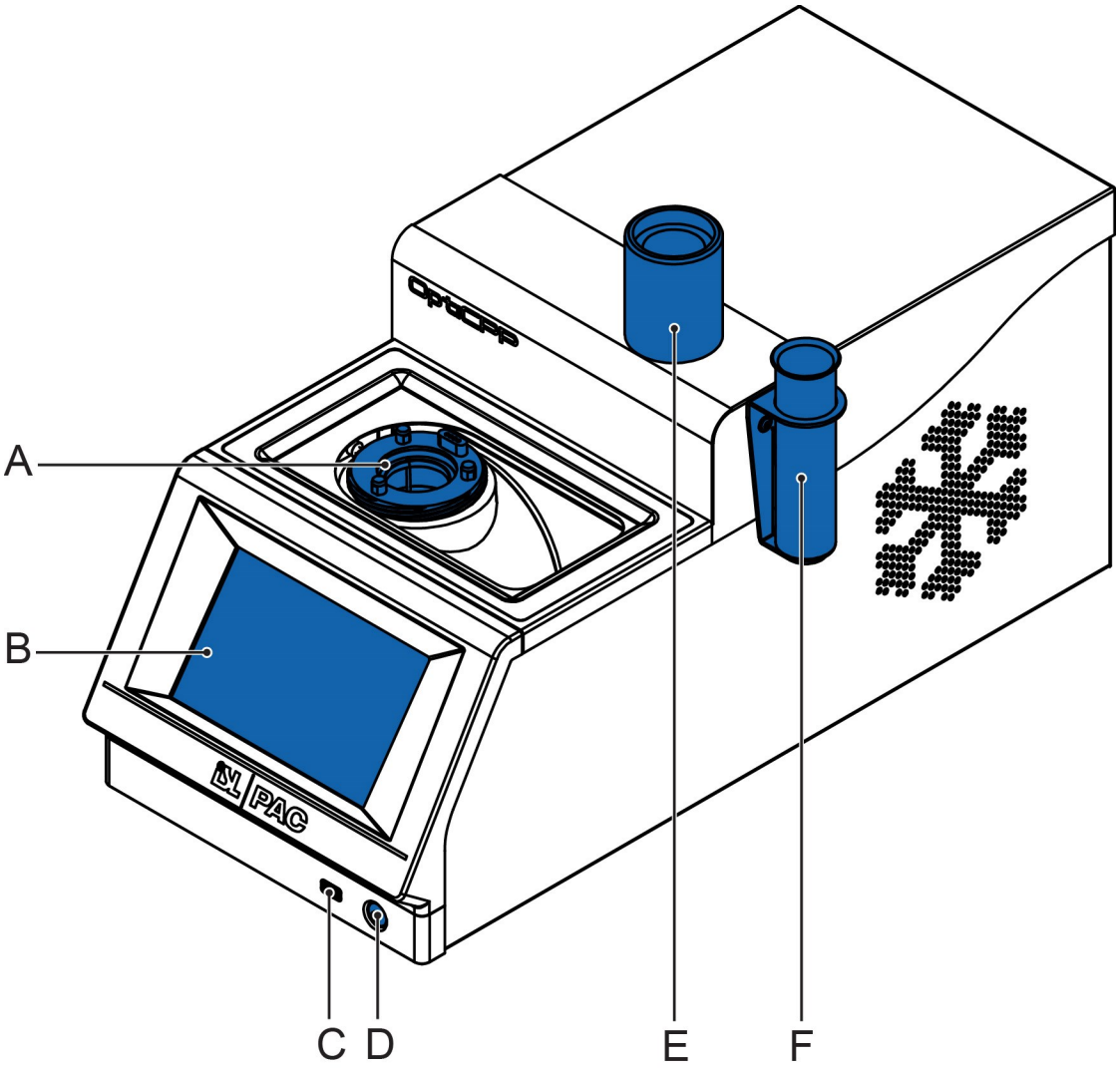
The OptiCPP consists of two main parts:

- The user interface.
- The measuring unit and associated electronic and mechanical components.

The equipment required for cloud and pour point tests (in direct contact with the sample) strictly complies with the applicable Standard Methods.
The OptiCPP includes:

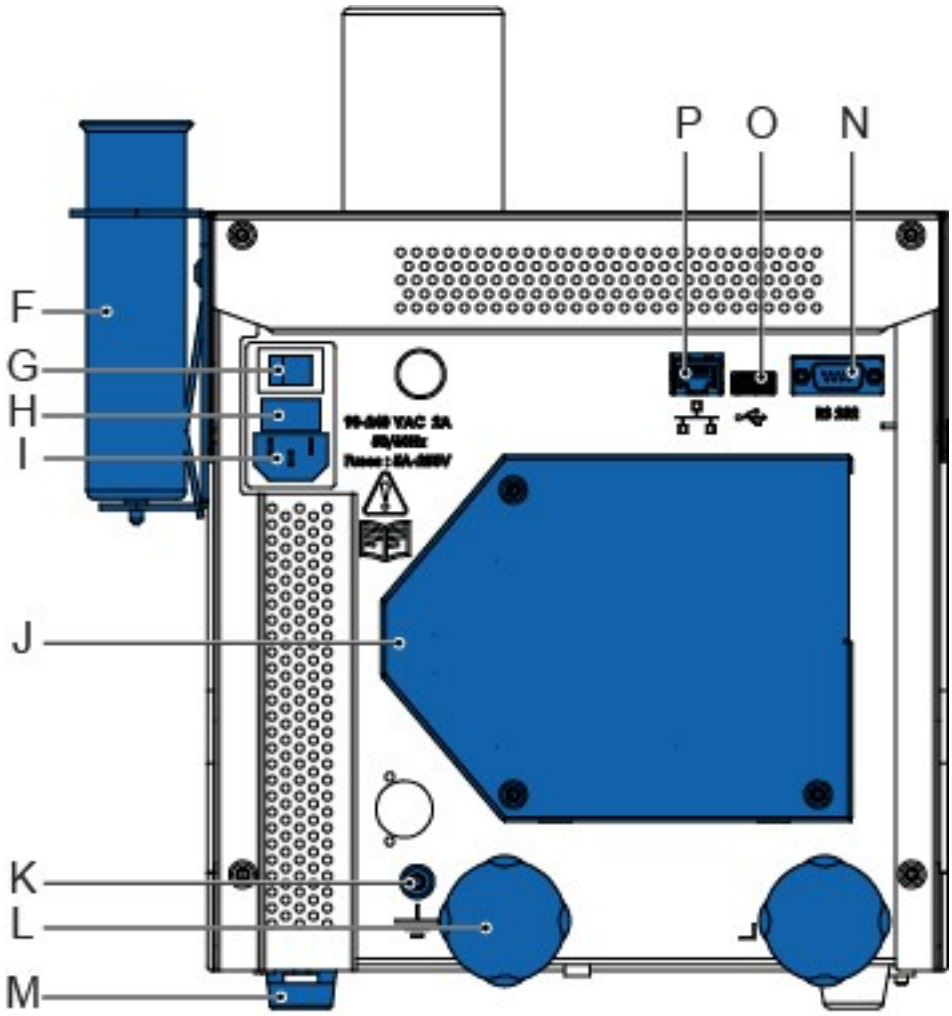
- A transparent, cylindrical, flat-bottomed glass test jar with a permanent marking for standard required volume, which contains the sample. For cloud point testing, use the test jar with a reflecting bottom.
- A flat-bottomed brass cylinder providing a leak-tight air bath, known (in compliance with the standard) as the Jacket, designed to hold the test jar for heating or cooling purposes.
- An insulating assembly consisting of a cork gasket and a cork disc, providing heat insulation between the test jar and jacket so that the heat transfer takes place through the air bath, rather than by contact. Two wireless measurement heads including a sample probe which measures sample temperature, a light source and a detection cell for determining cloud or pour points. The arrangement of the above three components depends on the type of measurement head.
- A Temperature Control System consisting of a heating resistor, a cooling system and a temperature sensor which measures jacket temperature.
- A tilting mechanism (consisting of a motor and drive) for tilting the jacket during the pour point test.

4.1.2 Front overview



A. Jacket
B. Touch screen
C. USB Port
D. Power button
E. Gasket positioning gauge / Measurement head support
F. Measurement head support

4.1.3 Rear panel view



F. Measurement head support
G. Main power switch
H. Fuse drawer (2xF5A; 250V)
I. Electrical socket (90/240 VAC, 50/60Hz)
J. Cooling unit ventilator
K. Earth connection
L. Locking screws (storage position)
M. Level adjusting foot
N. RS-232 connection
O. USB Port
P. Ethernet connection

5. Installation

5.1. Unpacking

1. Unwrap the analyzer.

CAUTION
Use a suitable lifting means supporting 40 kg at minimum (88.2 lbs) to remove the analyzer from its packaging.
The analyzer must be lifted so that the chassis supports the load: grab it by its lower side.

2. Refer to the packing list to verify that all consumables and accessories are included.
3. In case of missing items, contact your local PAC representative.
4. Keep the packaging for future storage.

5.2. Remove locking screws

1. Remove the two locking screws (A) from underneath the unit.

2. Screw them into the special storage panel (B) at the back of the unit.

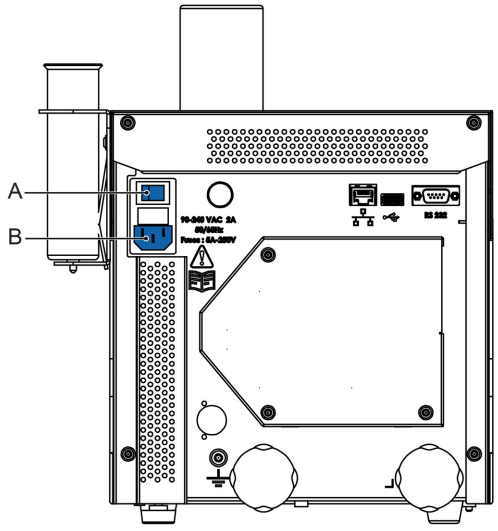
5.3. Positioning

The OptiCPP is designed to operate under laboratory conditions: weather protected and stable temperatures.

1. Position the OptiCPP on a leveled surface to avoid vibration during measurement.
2. If necessary, level out the analyzer with its level adjusting foot (L).
3. Leave sufficient space around it to allow ventilation, cooling airflow and access to rear cable connections.

- Minimum 10 cm at the left and right side
- Minimum 10 cm at the rear side
- At least 50 cm at the top side to ensure good handling conditions.

5.4. Connections



A. Power switch
B. Electrical socket

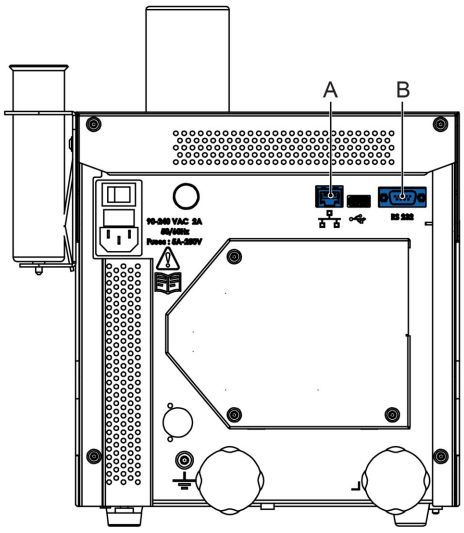
5.4.1 Power supply

1. Make sure the main power switch (A) is set to the off position.
2. Connect the power supply cable suitable to your mains to the electrical socket (B): the analyzer power supply adapts automatically to the appropriate voltage.

WARNING
Leave sufficient space behind the analyzer to connect the various rear cables.
The power supply cable must remain accessible in order to unplug it from the wall socket if needed.

NOTE
If the power supply cable needs to be replaced, contact the PAC customer service. The new cable must have the same electric characteristics.

5.4.2 Connecting to a PC



A. Ethernet connection
B. RS-232 connection

5.4.2.1 Optional external PC control

The OptiCPP can be connected to the IRIS® network on a PC server via a router through the RJ45 Ethernet connection (A), located at the rear of the analyzer.
The connection to the router is plug and play and the OptiCPP is automatically detected.
For more information on the IRIS® software, see *section 3.5.1 IRIS® Network*.

5.4.2.2 Communication with LIMS

Connect the LIMS to the analyzer through the Ethernet (A) or RS-232 (B) communication port located at the rear of the analyzer.
After installation, set up the communication of the OptiCPP to a LIMS system as follows:

1. From the ***Advanced*** menu, select Instrument ***setup > Parameters > Output settings > Output: LIMS RS232 or LIMS Ethernet***.
2. Identify the OptiCPP with a number between 0 and 99 to the LIMS system in ***Instrument ID*** (Only for RS232).
3. Check the communication link parameters between the OptiCPP and the LIMS system through the menu :
   Instrument setup > Parameters > RS232 settings or Ethernet settings.

NOTE
Supervisor level is required to perform these actions.

Refer to *section 11. Appendix* for the description on the fields and formats of the LIMS communication line.

6. Manipulation

6.1. Manipulation

The OptiCPP is manipulated with the power button on the front and the touch screen commands (Refer to *section 6.2. Touch screen*).

6.1.1 Switch on the analyzer

To make sure the OptiCPP is ready to start up, check the following points (refer to pictures of *section 4. Description*):

- the analyzer is installed on a stable horizontal table or bench
- the power cable is connected to the electrical socket

Start up the OptiCPP as follows:

1. On the rear panel, switch on the main power switch (C).
2. On the front, press on the blue backlighted power button to power up the OptiCPP. The analyzer initializes and the blue backlight switches off (it flicks in stand-by mode).

NOTE
Depending on the pre-configured parameters, the touch screen may require selecting the language before displaying the ***Run*** menu.

3. The analyzer displays the ***Run*** menu.
4. If desired connect the USB Flash Drive to the port (C) at the front or (O) at the back to store results and update files.

To start a test, refer to *section 7. Operation*.

6.1.2 Switch off

If the front power button is pressed when the OptiCPP is testing a sample, the analyzer reheats the sample to 25°C before switching off, allowing the cell draining if needed.

WARNING
The power button on the front does NOT disconnect the electrical power supply

Set the rear power switch to off position to disconnect the main electric power.

6.1.3 Emergency

In case of emergency use the main power switch located at the rear to disconnect the main electrical power. The OptiCPP stops immediately at any cycle step.

6.2. Touch screen

6.2.1 Main screens

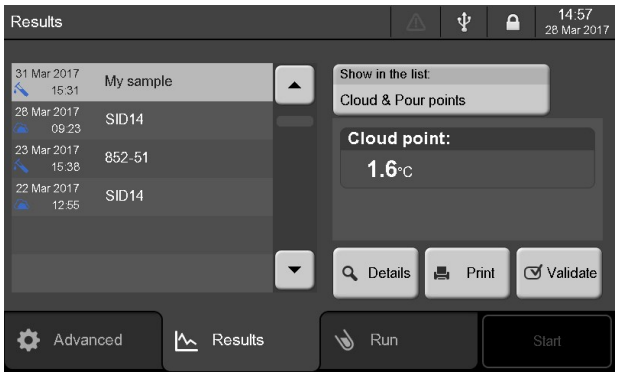
The user interface is based on three main screens.

Run menu
Displayed at power on, allows to run a test, watch progression and completion.
Refer to *section 6.3. The Run menu: Test starting and monitoring.*

Results menu
Allows to display the list of results to consult, print and validate results.
If not configured for automatic sending, the ***Validate*** button allows to send selected result:

- to a LIMS through the RS232 or Ethernet link;
- to IRIS software through the Ethernet link

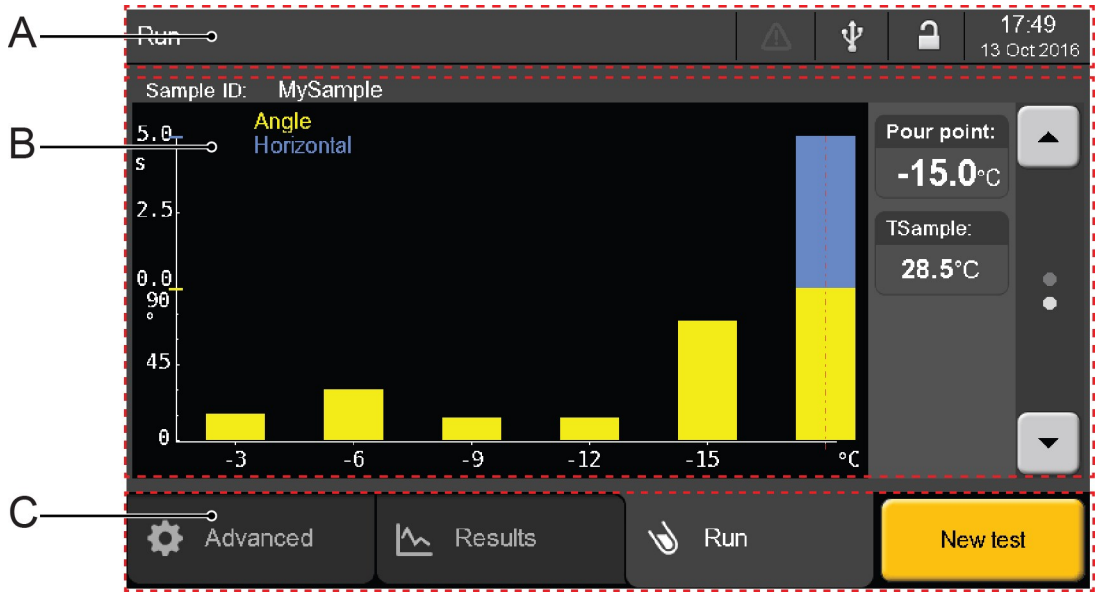
Refer to *section 6.4. Results menu*



Advanced menu
Allows to navigate within the whole menu tree.
Refer to *section 6.5. Advanced menu*

6.2.2 Areas

User interface is a touch screen mainly split into 3 areas.



A. Status Bar: Displays currently active menu/submenu on the left and icon bar on the right shows status icons (active alarms, warnings, USB device, access level status) and date and time.
B. Center area: Shows level related information.
C. Bottom area: Main menu tabs (***Run***, ***Results***, ***Advanced***) and available actions.

6.2.3 Access levels

Password security

NOTE
Analyzer configuration, calibration and maintenance functions can be password protected in the analyzer setup database (from the ***Advanced*** menu, select ***Instrument setup > Parameters >Accessibility***).

Active access level indicator

N°	Name	Symbol	Description
1	Operator		Operator functions, necessary for test runs, cannot be password protected.
2	Supervisor		If a password is set, only the supervisor has access to important and/or sensitive operating parameters and functions.
3	Maintenance		If a password is set, only qualified technicians have access to the service parameters, diagnostics and calibration menus.

When the analyzer is switched on, it goes to the configured start up access level.

NOTE
When the analyzer is shipped, there is no password protection for the Supervisor and Maintenance levels.

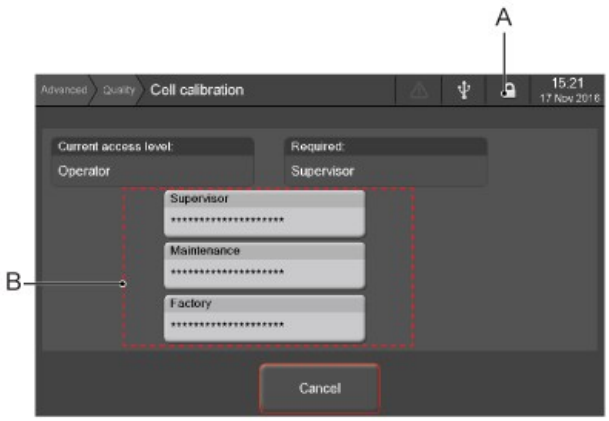
TIP
The system administrator should set-up these passwords during installation to prevent unauthorized persons from changing the settings of the instrument. In this way, access to important operations can be restricted to a limited number of persons.

In case passwords are lost, unlock any level with the Master password (contact the Design Center Technical Service).

Gain access level

Access level change is requested to gain access to specific functions and properties.

A. Lock symbol indicating current active access level.
B. Access level password input fields.



1. Type the password in the field below the level name (B).

Access level remains available until another level is explicitly requested or during a predefined time set in the analyzer internal parameters.

This duration countdown starts when the touch screen does not detect any contact. At the end of this time, the access level is reset to the default level configured in the analyzer setup database. Countdown is reset at each touch screen contact.

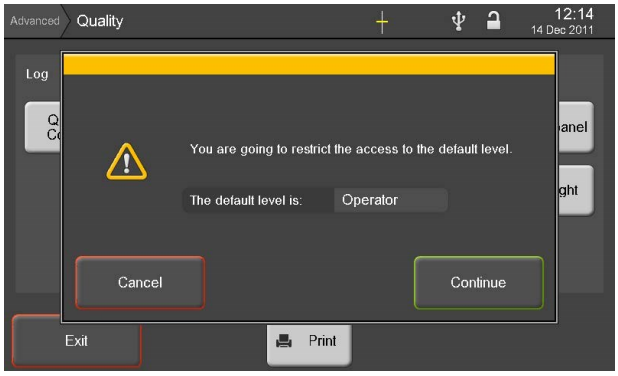
Example

If the Operator level is configured as default access level at power on and Maintenance level is currently active, the analyzer will change automatically to the Operator level after the access reset time has elapsed.

Reset access level

It is not necessary to wait until access level reset time has elapsed to reset access level:

1. ***Press*** the lock symbol in the status bar of the screen (A).
2. An access level reset message displays.
3. ***Press*** the ***Continue*** button to confirm the access level reset or the ***Cancel*** button to cancel the action.

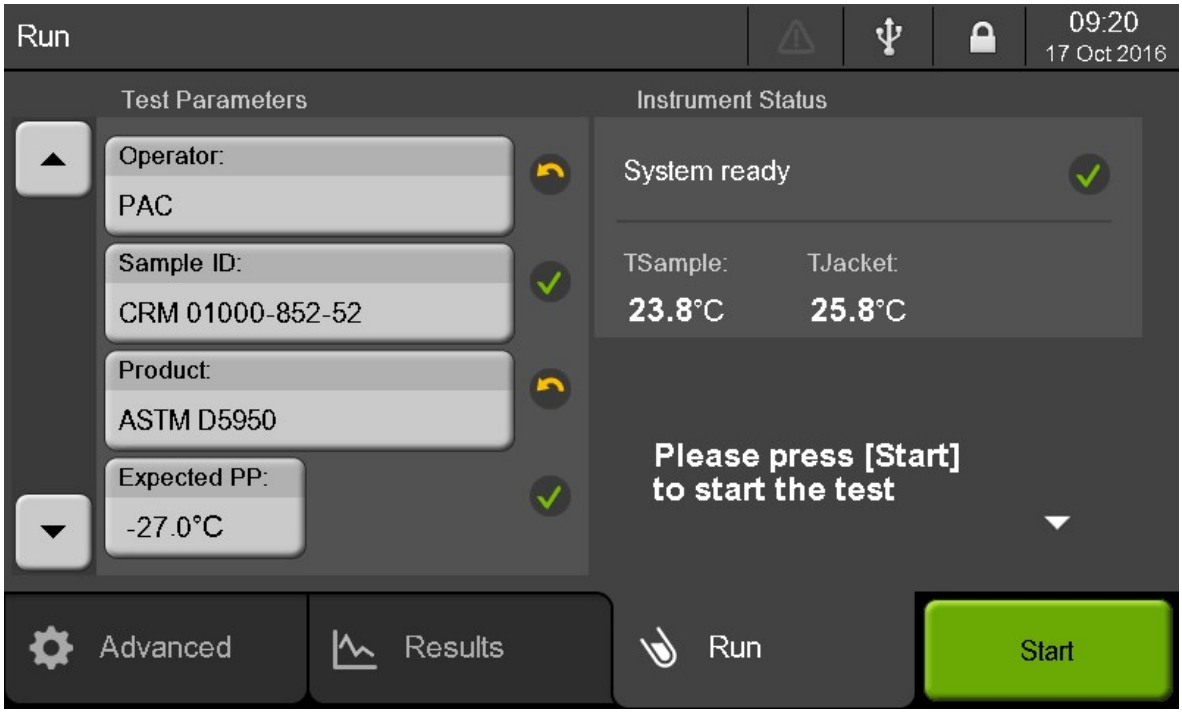


6.2.4 Menu tree

Level 1	Level 2	Level 3	Level 4	Access permission
Advanced	Environment	Products		Supervisor
		Operators		Supervisor
		More	Products	Supervisor
			Operators	Supervisor
			Cooling profiles	Supervisor
	Quality	Quality Control		Operator
		More	Log > Quality control	Operator
			Sensors > Cloud probe / Pour probe / Jacket probe	Supervisor
			Probe circuits > Cloud probe circuit / Pour probe circuit / Jacket probe circuit	Supervisor
			Interface > Touch panel / backlight	Operator
	Instrument setup	Parameters		Supervisor
		Date & Time		Operator
		More	Parameters	Supervisor
			Date & Time	Operator
			Backup Restore	Maintenance
			Reset	Maintenance
	Service	Measures Diagnostic		Maintenance
		Functions		Maintenance
		More	Measures Diagnostic	Maintenance
			Functions	Maintenance
			Service parameters	Factory level
			Cooler parameters	Factory level
	Information	Event log		Operator
		About		Operator
		More	Event log	Operator
			About	Operator
			Spare parts	Operator
			Contact	Operator
			Counters	Operator
Results				Operator
Run				Operator
Start-stop				Operator

6.3. The Run menu: Test starting and monitoring

The ***Run*** menu allows to parameter a test through only three fields: ***Operator***, ***Sample ID***, ***Product*** and to monitor a test running.



6.3.1 Test parameters

In the left part of the ***Run*** screen, the ***Test Parameters*** area allows to input values. An icon is displayed on the right of each field:

Icon	Description
	Parameter must be entered.
	Parameter is provided from the previous test.
	Parameter entered/selected by the operator or proposed by default following setting of internal parameters.

Depending on preconfigured internal parameters, the analyzer:

- provides parameters by default
- provides the same parameters as the previous test
- provides incremented parameters from the previous test
- requires the user to enter the parameters for each test

To set pre-configured internal parameters, refer to *section 6.5.2.1 Analyzer Internal parameters*.
Enter the test parameters fields according to the following details:

Operator setting
If the field is empty or if the name proposed by default is not suitable:

1. Click on the ***Operator*** field to access to the ***Operator selection*** screen. Then :
   - Select an operator name in a scrolling list;
   - Add an operator name : click on ***Operator*** button to access to a virtual keyboard, type the name and validate with ***Enter***,
   - Delete an operator: select a name in the scrolling list and press ***Delete***.
2. Validate or cancel your selection using the ***Select*** or ***Exit*** buttons.

For detailed information, refer to *section 6.5.1.3 Operators*

Sample ID setting
If the field is empty or if the name proposed by default is not suitable:

1. Click on the ***Sample ID*** field to access to the virtual keyboard
2. Enter a name/number
3. Click on ***Enter*** to validate the Sample ID or ***Cancel*** to go back to the ***Run*** screen.

TIP
To auto increment the next sample ID when pressing the ***New Test*** button: Go to ***Instrument Setup> Parameters>Test start settings*** screen and select ***Auto increment the ID*** under the ***Sample ID at start*** tab.

For detailed information, refer to *section 6.5.2.1 Analyzer Internal parameters*.

Product setting
If the product proposed by default is not suitable or if there is no default product:

1. Click on the ***Product*** field to access to the ***Product selection*** screen.
2. Click on the suitable product in the list of prestored products.
3. Click on ***OK*** to validate your selection or ***Cancel*** to go back to the ***Run*** screen.

NOTE
Supervisor level is required to add or delete products.
For procedure and detailed information, refer to *section 6.5.1.1 Products*.

NOTE
Press the left sided arrows of test parameters fields to access to / go back to the note entry screen allowing to enter a comment regarding the test. This text will be stored with the result and printed on the result ticket.

6.3.2 Instrument status

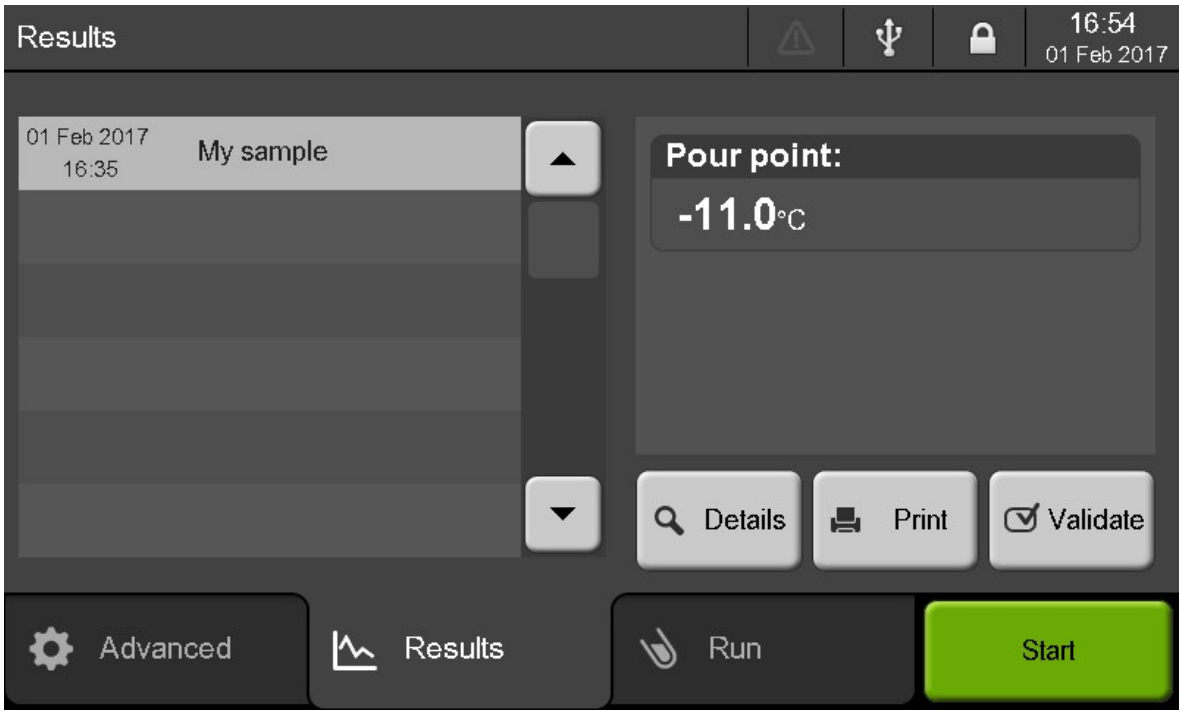
In the right part of the ***Run*** screen, the ***Instrument Status*** area displays status data and instructions messages.

- Instrument status or current test step
- TSample: Temperature of the sample
- TJacket: Temperature of the jacket
- Instructions to monitor the test (when necessary)

NOTE
When the test is programmed and the system is ready, the ***Start*** button turns green.

6.4. Results menu

The ***Results*** menu displays the list of results (up to 200 results).



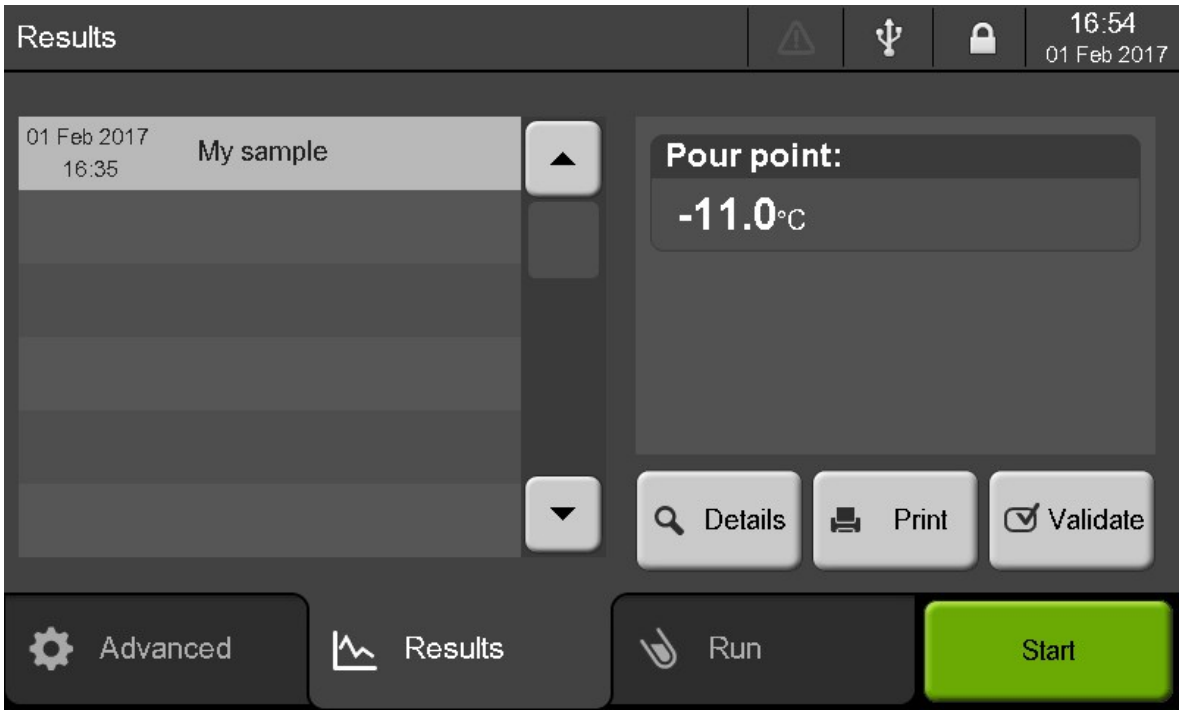
In the left part of the screen, results are listed displaying the sample ID and the date and time of the end of the test.
The right part of the screen shows the Cloud or Pour point result and available operations.
Details button opens the complete results screen.
Print button prints the results.

Validate button confirms the selected result can be sent to a LIMS if not configured to be sent automatically at the end of test.

NOTE
Make sure a printer is connected and configured in the analyzer internal parameters.

NOTE
LIMS must be connected and configured in the analyzer parameters.

6.4.1 Results list



The right part of the screen shows the Cloud or Pour point result and available operations.
Details button opens the complete results screen. Result ticket, volume and temperature specifications if selected, distillation curve and test parameters.
Print button prints the results.
Validate button confirms the selected result can be sent to the external device configured in internal parameters. According to the analyzer's configuration, results can be sent automatically. If they are, the ***Validate*** button becomes ***Validate again***, allowing to send the selected result again.

NOTE
Make sure a printer is connected and configured in the analyzer internal parameters.

NOTE
LIMS must be connected and configured in the analyzer parameters.

6.4.2 Results details

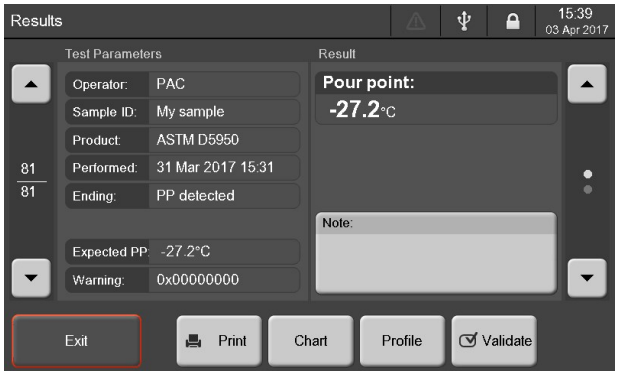
The left part of the ***Results*** details screen shows ***Tests parameters*** fields, left sided arrow buttons allow to navigate between tests.

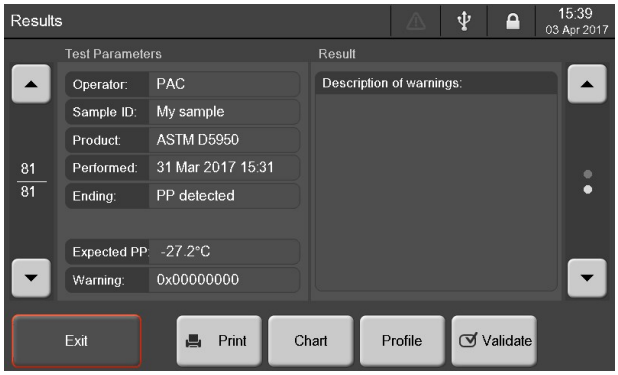
The right part of the ***Results*** details screen shows ***Result*** fields, right sided arrow buttons allow to scroll between values subscreens.

Exit button closes this screen and goes back to the list of results.
Profile button displays the cooling profile of jacket and sample measured during the test (refer to *section 7. Operation*).
Print button allows to print the results.
Chart button displays the real time measured values during the test (refer to *section 7. Operation*).
Validate button (if not configured for automatic sending) allows to send selected result:

- to a LIMS through the RS232 link;
- to IRIS software through the Ethernet link.

The ***Note*** field allows to add comments.





Test conditions are detailed as follows:

Test parameters fields

Field	Description
Operator	Operator name
Sample ID	Sample identification
Product	Product identification
Performed	Date and time of the end of the test

Ending	Type of end of test
	• Cloud point
	  • CP detected
	  • Stop temperature
	  • End of profile
	• Pour point
	  • PP not detected
	  • PP detected
	  • PP at first tilt
	  • Stop temperature
	  • End of profile

Warning:	Bit code of events that eventually occurred during the test and that could influence the result. Displayed in details in page 2 of the Result Details menu: List of possible message: "148-4 Calibration to do" : this refers to the Cloud point temperature circuit. "148-5 Calibration to do" : this refers to the Pour point temperature circuit. "148-6 Calibration to do" : this refers to the Jacket temperature circuit. "148-7 Calibration to do" : this refers to the Cloud point temperature probe Table "148-8 Calibration to do" : this refers to the Pour point temperature probe Table "148-9 Calibration to do" : this refers to the Jacket temperature probe Table This means: The date of the calibration was elapsed and the test was allowed. Please, renew the calibration.

Results fields

Field	Description
Pour point	Lowest temperature at which the product continues to flow
Cloud point	Temperature at which smallest observable cluster of hydrocarbons crystals first appears
Note	Field used to add comments. Click on it to access a virtual keyboard and enter text
Description of warnings	Detailed description of the events displayed under the Warning field (for more information, refer to *section 10. Troubleshooting*)

6.5. Advanced menu

Allows to navigate within all menu tree. The screen is split into the five first level categories.

The first two buttons of each category show the most frequently used functions.
Use the ***More*** buttons to access all available functions for each subscreen.
Refer to:

Environment

All functions accessible from this screen.
More details in *section 6.5.1 Defining a new test environment*

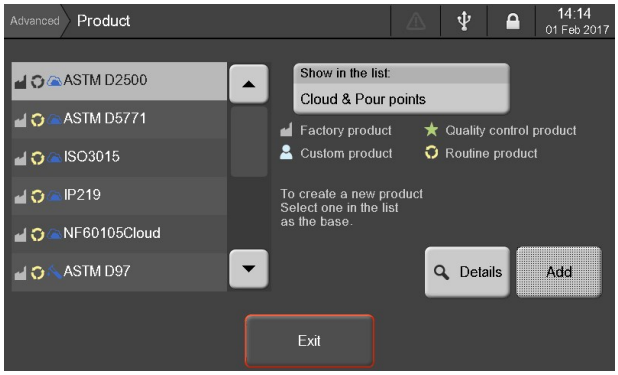
Quality	*section 8.3. Quality Menu*
Instrument setup	*section 6.5.2 Instrument Setup*
Service	*section 6.5.3 Service Menu*
Information	*section 6.5.4 Information Menu*

6.5.1 Defining a new test environment

From the ***Advanced*** menu, access to the ***Environment*** menu.
Test environment allows to define ***Products***, , ***Cooling profiles*** and ***Operators***.

6.5.1.1 Products

Lists the prestored products defining run parameters which regulate the test and the way to provide the result (s).
Run parameters configured in the Product have an impact on tests conditions, acceptance, storage and LIMS validation.
Products can be:
- Displayed and printed with the Operator level through the ***Details*** button.
- Modifed, created or deleted (excepted factory products) with a Supervisor access level through the ***Add*** button.



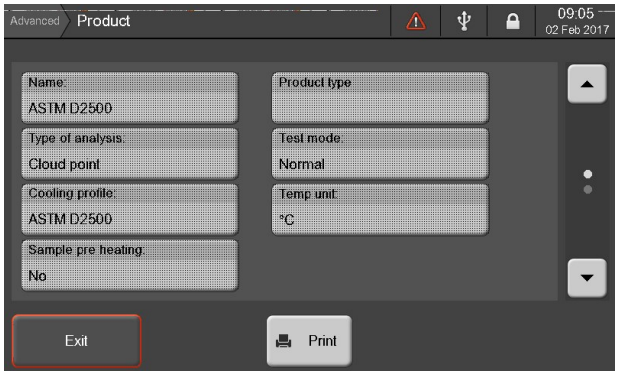
NOTE
Maximum 40 products can be stored.

Show in the list button allows to display pour, cloud or both points products.
Add button: with a Supervisor access level, allows to create new products on the basis of parameters of the product highlighted in the list.
Details button: At Operator level, allows to display and print run parameters of the Product.
Each line shows icons representing the product type, with different properties.

Type	Description
Factory product	Non erasable or modifiable factory-product used as a base to create a new one
Quality control product	To test reference product with minimal and maximal registered values for automatic acceptance (tests monitored in the Quality Control database)
Custom product	Product created by the customer and registered in the list of prestored products with possible acceptance criteria
Routine product	Non quality control product

Product parameters screen

At operator level, use the ***Print*** button to print the product parameters.
Right sided arrow buttons allow to scroll between values subscreens.



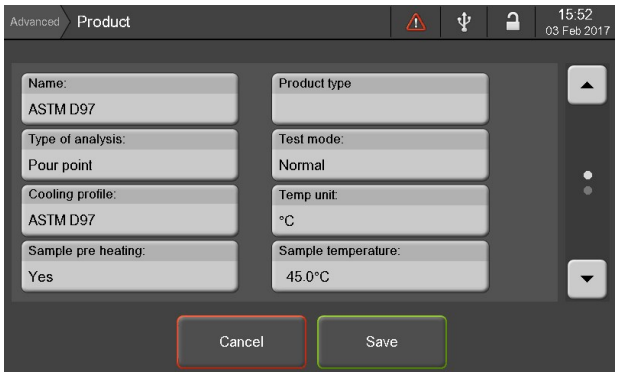
Editing or adding a product

Product details definition has an impact on tests acceptance, storage and LIMS validation.

NOTE

Supervisor level is required to create, delete or modify the product parameters.

1. To create a new product, select one from the existing list and click on the ***Add*** button.
2. Parameters of the selected prestored product are displayed to ease the programming.
3. Click on the corresponding field to modify the required parameter.
4. Confirm your settings with the ***Save*** button, or click on ***Cancel*** to go back to the products list.



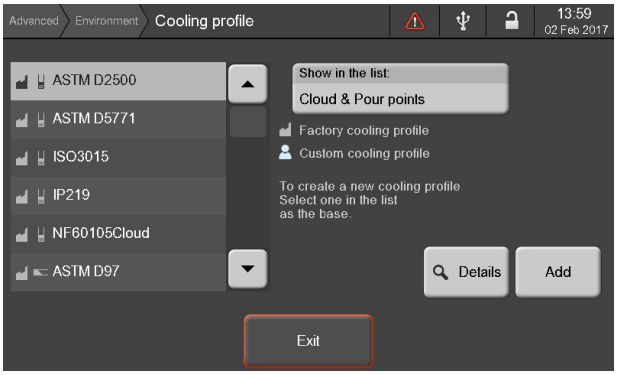
Product detailed parameters are the following:

Parameter	Description
Name	Name of the product corresponding to the associated Standard Method
Type of analysis	Type of test selected
Cooling profile	Cooling profile selection
Sample pre heating	Select "Yes" to heat the sample up to the configured temperature according to applicable Standard Method (or use it to check the sample starting temperature). To optimize test duration, it is recommended to preheat sample outside the analyzer in an appropriate oven for the sample type. Do not start a test with a sample temperature above 70°C.

Parameter	Description
Product type	If the field is empty: Routine product with possible automatic acceptance if minimum and maximum values are entered. If QC product is displayed: Tests saved in the Quality monitoring database. Set minimum and maximum values to define limits for automatic acceptance.
Test mode	Select "normal" or "RCM: Rapid Cooling Method" (non standard cooling: rapid cooling of the jacket up to the step before the expected pour point)
Temp unit	°C or °F
Sample temperature	Actual temperature of the sample
Expected PP (Pour Point only)	Inform the analyzer when to start tilting the test jar if known
Stop 3 tests after EP (Pour Point only)	If this option is selected, testing will stop after the third unsuccessful tilting following the Expected Point
Minimum - Maximum	Limit values defined for automatic acceptance
Stop temperature	Minimal sample temperature for the test
Start at EP + (Pour point only)	Temperature above Expected Point to start the test
Detection level CP / PP	The change (in number of points) required at the optical receiver to detect cloud or pour point. A value of 350 will detect most products.

6.5.1.2 Cooling profile

This screen displays a list of available cooling profiles.



NOTE
Maximum 40 cooling profiles can be stored.

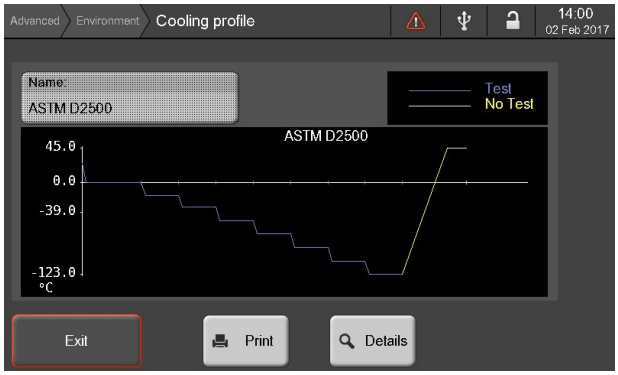
Show in the list button allows to display pour, cloud or both points cooling profiles.
Add button allows to create a new cooling profile. Supervisor level is required.
Details button displays the cooling profile chart screen.

Each line shows icons representing the product type, with different properties.

Type	Description
Factory cooling profile	Non erasable or modifiable factory cooling profile
Custom cooling profile	Cooling profile created by the customer and registered in the list of prestored cooling profiles

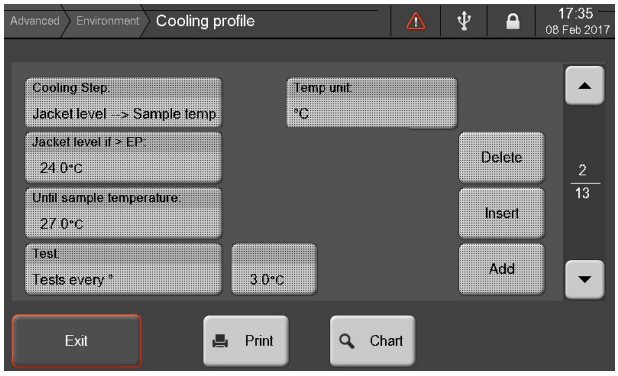
Cooling profile chart screen

At operator level, use the ***Print*** button to print the cooling profile parameters or the ***Details*** button to edit cooling profile.



Cooling profile parameters screen

At operator level, use the ***Print*** button to print the cooling profile parameters or the ***Chart*** button to display cooling profile chart.
Right sided arrow buttons allow to scroll between values subscreens.

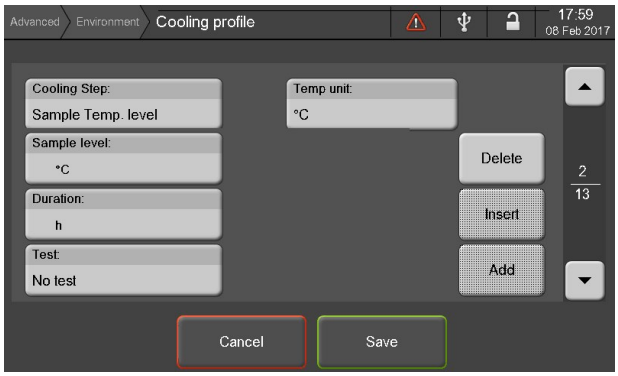


Editing or adding a cooling profile

Cooling profile details definition has an impact on tests acceptance, storage and LIMS validation.

NOTE
Supervisor level is required to create, delete or modify the cooling profile parameters.

1. On the right part of the screen, between the arrows, the step number of the cooling profile is displayed. Use the arrows to navigate from one step to another.
2. Parameters of the selected pre stored cooling profile are displayed to ease the programming.
3. Click on the corresponding field to modify the required parameter.
4. Click on ***Add*** to add a step after the current step, or click on ***Insert*** to add a step before the current step. Click on ***Delete*** to remove the current step.
5. Confirm your settings with the ***Save*** button, or click on ***Cancel*** to go back to the cooling profile list.



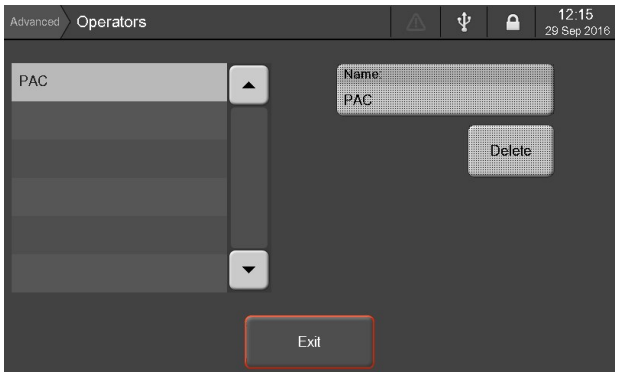
Step parameters:

<table>
<tr><th>Cooling Step choice</th><th>Description</th></tr>
<tr><td>Jacket level --> Sample temp.</td><td>Jacket level In °C|°F to sample temp in °C|°F</td></tr>
<tr><td>Jacket level --> Time</td><td>Jacket level in °C|°F during a time in hours</td></tr>
<tr><td>Jacket heating</td><td>Jacket heating speed in (°C|°F)/h to a jacket temp. in °C|°F</td></tr>
<tr><td>Cooling jacket</td><td>Jacket cooling speed in (°C|°F)/h to a jacket temp. in°C|°F</td></tr>
<tr><td>Sample Temp. level</td><td>Sample level in°C|°F during a time in hours</td></tr>
<tr><td>Sample heating</td><td>Sample heating speed in (°C|°F)/h to a sample temp. in °C|°F</td></tr>
<tr><td>Sample cooling</td><td>Sample cooling speed in (°C|°F)/h to a sample temp. in°C|°F</td></tr>
<tr><td>Differential cool-ing</td><td>Differential cooling sets a temperature difference between the jacket and the sample until a sample temp is reached</td></tr>
<tr><td></td><td>
<table>
<tr><td>Step name</td><td>Step type</td><td>Description</td></tr>
<tr><td>PCH_ECH</td><td>Sample waming</td><td>To sample temp and dur-ation</td></tr>
<tr><td>PAL_JAQ</td><td>Jacket level</td><td>To sample temp</td></tr>
<tr><td>PAL1_JAQ</td><td>Jacket level</td><td>To time</td></tr>
<tr><td>MON_JAQ</td><td>Jacket heating</td><td>Jacket heating speed</td></tr>
<tr><td>DES_JAQ</td><td>Jacket cooling</td><td>Jacket cooling speed</td></tr>
<tr><td>PAL_ECH</td><td>Sample temp</td><td>To time</td></tr>
<tr><td>MON_ECH</td><td>Sample heating</td><td>Sample heating speed</td></tr>
<tr><td>DES_ECH</td><td>Sample cooling</td><td>Sample cooling speed</td></tr>
<tr><td>DES_DIF</td><td>Differential cooling</td><td>Jacket temp. sample temp delta</td></tr>
<tr><td>FES_PRJ</td><td>End of test jacket preparation</td><td></td></tr>
<tr><td>FES_RCH</td><td>End of test controlled heating</td><td></td></tr>
<tr><td>PAL_JAQ_CHX</td><td>Jacket level temp depending on EP</td><td></td></tr>
<tr><td>PAL_JAQ_SUP</td><td>Jacket level if > EP</td><td>To sample temp</td></tr>
<tr><td>PAL_JAQ_INF</td><td>Jacket level if <= EP</td><td>To sample temp</td></tr>
</table>
</td></tr>
<tr><td>Final heating</td><td>End of test controlled heating</td></tr>
<tr><td rowspan="3">Jacket level depending on EP</td><td>Jacket level temperature depending on EP, adds two more as following step when possible.</td></tr>
<tr><td>Jacket level --> Sample temperature if Jacket level if > EP</td></tr>
<tr><td>Jacket level --> Sample temperature if Jacket level if <= EP</td></tr>
</table>

6.5.1.3 Operators

Operator deletion

1. Select operator in the list.
2. Click on the ***Delete*** button.



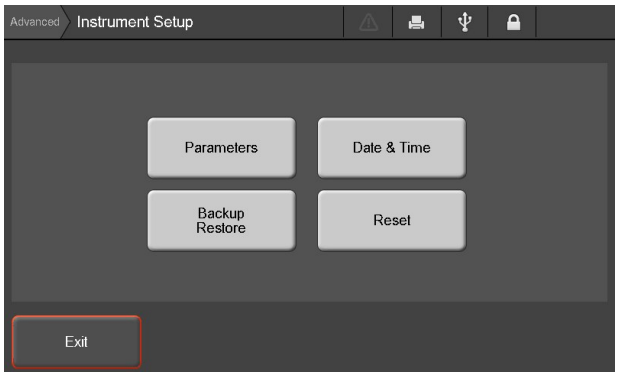
Operator creation

1. Click on the ***Name*** tab.
   A virtual keyboard is displayed
2. Input operator name.
3. Click on ***Enter*** to validate.

6.5.2 Instrument Setup

Allows to set internal parameters and core functions.

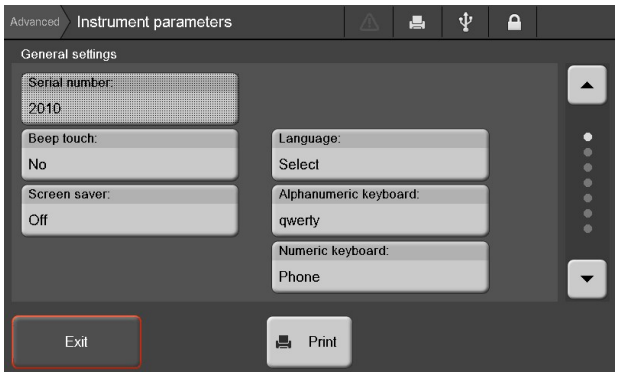
- ***Parameters***: to adjust the analyzer internal parameters
- ***Date & Time***: to adjust the current date and format
- ***Backup Restore***: to update firm-ware and backup or restore data with a USB Flash Drive
- ***Reset***: to reset values to factory default settings



6.5.2.1 Analyzer Internal parameters

At the operator level, allows to display and print internal parameters (see parameters list on next page). Needs the Supervisor Level to modify the settings.

- Switch between screens using the right sided arrow buttons.
- ***Print*** button prints the parameters.



NOTE
Supervisor or Maintenance level is required to change the parameters.

NOTE
It is recommended to regularly backup analyzer internal parameters.
See *section 6.5.2.3 Backup Restore*

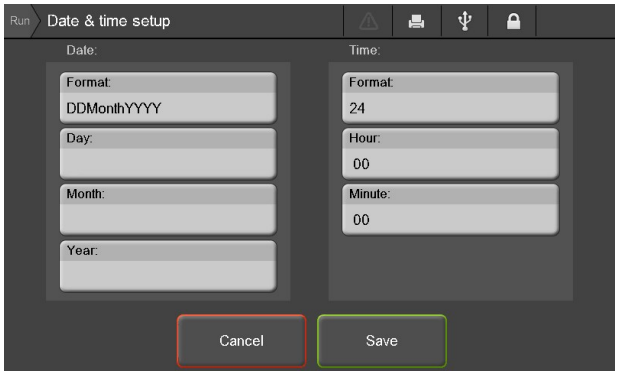
Analyzer Internal parameters list

Parameter Name	Field	Required Access level
General Settings		
Serial number	12 characters	Factory
Beep touch	Yes / No	Supervisor
Screen saver	On / Off	Supervisor
Delay	2 minutes to 300 minutes	Supervisor
Language	Select (at switching on) / English / other language installed Access to the language installation menu	Supervisor
Alphanumeric keyboard	qwerty / azerty / qwertz	Supervisor
Numeric Keyboard	Phone / PC	Supervisor
Test start settings		
Temp unit	°C / °F	Supervisor
Operator at start	Erased, keying mandatory / Preserve the previous name /Use the default name	Supervisor
Sample ID at start	Erased, keying mandatory / Preserve the previous /Auto increment the ID	Supervisor
Product field at start	Erased, keying mandatory / Preserve the previous product /Use the default product	Supervisor
Default operator name	Selection of the operator in the list of prestored operator's names	Supervisor
Default product	Selection in the list of product	Supervisor
Accessibility		
Access at power on	Operator / Supervisor / Maintenance	Supervisor
Supervisor password	20 characters	Supervisor
Alarm buzzer beep	0 to x seconds beep	Supervisor
Access level reset time	0 to 900 minutes	Supervisor
Maintenance password	20 characters	Maintenance
Warning buzzer beep	0 to x seconds beep	Supervisor
Printer settings		
Printer	None/ USB/ RS232	Supervisor
Auto. result print	Yes / No	Supervisor
Type (USB)	USB Flash Drive / Citizen / Seiko / Axiohm / PCL	Supervisor
Type (RS232)	PC / Citizen / Seiko / Axiohm	Supervisor
LIMS settings		
Instrument ID	0 to 99	Supervisor

Parameter Name	Field	Required Access level
Automatic validation	Yes / No	Supervisor
RS232 settings		
Interface	Off / On-line / Test / Service	Supervisor
Data bit	8	Not modifiable
Stop bit	1	Not modifiable
Baud rate	115200 bit/s - 57600 bit/s - 38400 bit/s - 19200 bit/s - 9600 bit/s - 4800 bit/s - 2400 bit/s	Supervisor
Parity bit	none	Not modifiable
Protocol	Xon-xoff / Hardware / none	Supervisor
Ethernet settings		
Interface	Off / On-line	Supervisor
Instrument ID	20 characters	Supervisor
Instrument IP address	192.168.0.1	Supervisor
Subnet mask	255.255.255.0	Supervisor
Dynamic IP	On / Off	Supervisor

6.5.2.2 Date and time

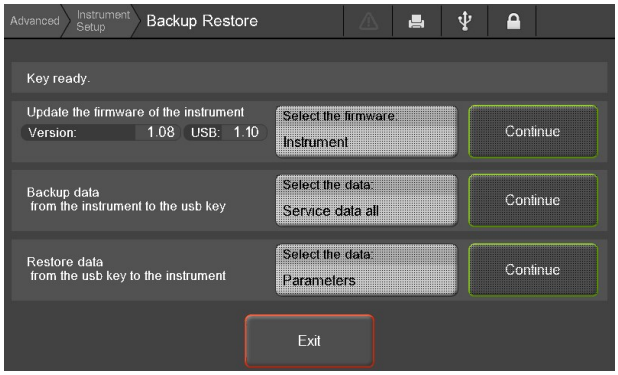
1. Click a field to change its value.
2. Click ***Save*** button to validate
   or
   Click ***Cancel*** to go back to the previous screen



Parameter Name	Field	
Date		
Format	DDMonthYYYY MonthDDYYYY YYYYMonthDD YYYYDDMonth	DD.MM.YYYY MM/DD/YYYY YYYY-MM-DD YYYY DD MM
Day	1 to 31	
Month	Jan, Feb…..	
Year		
Time		
Format	12 hour 24 hour	
Hour Minute	AM/PM	

6.5.2.3 Backup Restore

Allows to update the instrument firmware, backup data to a USB Flash Drive and restore data from a USB Flash Drive.



NOTE
Maintenance level is required to perform the following actions.

Instrument firmware update

1. USB Flash Drive preparation: On the USB Flash Drive, you should get an OptiXXX folder which contains the new release firmware:
   - OptiCPP/OptiCPP.024 (firmware image)
   - /OptiCPP.pac (Information file to download the firmware)
   - /OptiCPP/language/francais.bin (language files)
   - /OptiCPP/XXXHEAD.108 (optional and related to the measurement head of the OptiCPP & OptiFPP instruments)
2. Connect the USB Flash Drive.
   The analyzer automatically detects the firmware version available on it.
3. Press on button ***Select the firmware***, choose between: ***Instrument***, ***Cooling Unit Board***, ***Measuring head***.
4. Click on the ***Continue*** button to upload the corresponding firmware.
   At the end of the process, the analyzer is re-initialized.

Data backup

1. Click on the ***Select the data*** area of the Backup data row.
2. Select the memory part to backup from the list:

- ***Service data today:*** Today's Service data.
- ***Service data t-2:*** Today's Service data and day before.
- ***Service data t-7:*** 7 days before.
- ***Service data all:*** all days.
- ***Instrument data:*** All user's data in memory (parameters, calibration, results, …).

Service data: Each primary data recorded during a test are saved on the SD Card. This feature allows you to export them to a USB Flash Drive.
USB Flash Drive architecture after the Backup ***Service data*** will be as follow:

- ***OptiCPP/SNXXXX/YYYYMMDD:*** Data is recorded by Date.
- ***RESULT:*** All results under a readable form.
- ***CONTROL:*** Primary data under a readable form
- ***Cxxxxxxxx.txt:*** Data for the corresponding Rxxxxxxxx.txt result.
- ***CChhmmss.txt:*** Calibration data.
- ***CEhhmmss.txt:*** Diagnostic function data.
- ***OptiCPP/SNXXXX/ARCHIVE:*** Resume of the results and constant calibration.

Instrument data: All the user's data contained in the Flash memory such as the 200 last results, the calibration, the products or the parameters. Before starting the backup, the USB BACKUP directory is erased.
USB Flash Drive architecture after the backup ***Instrument data*** will be as follow:

- ***OptiCPP/SNXXXX/BACKUP/Calibration:*** Parameters are saved under readable form.
- ***BACKUP/RESULTS:*** All the results present in the flash memory in a readable form.
- ***BACKUP/BINARY:*** Files in binary format for the Restore operation.
- ***PARAM.PRM:*** Parameters file.
- ***OPERATOR.PRM:*** Operators name's list.
- ***OptiCPP.PRM:*** Section of the flash memory.
- ***PRDxx.PRM:*** Special way of naming the product (different from usual product's name).
- ***Several files xxxxxxxx.PRM:*** Calibrations files.

3. Click on the ***Continue*** button to start transfer data to USB Flash Drive.

NOTE
If there is no pac file, the backup is performed excepted the OPTIXXX.PRM and will end with a “No pac file” error message.

Restore data

1. Click on the ***Select the data*** area of the ***Restore data*** row.
2. ***Select the data*** to restore from the list. User can choose between ***Parameters***, ***Calibrations*** or ***Environment*** ("***All memory*** is factory restricted"). The firmware will look on the USB Flash Drive under OptiCPP\SNxxxxxx\BACKUP\BINARY. These binary files are created by a previous backup “***Instrument data***” and are not readable by an editor.
   Parameters: The binary parameter file “PARAM.PRM” must be present on the analyzer under OptiCPP\SNxxxx\BACKUP\BINARY. This file will be copied in the instrument memory.

   It is advised to restart the analyzer and go to ***Adjust the instrument*** from the parameters.
   Calibrations: The calibrations are in separated files. Theses binary calibration files must be present on the USB Flash Drive under OptiCPP\SNxxxx\BACKUP\BINARY. It is advised to restart the analyzer and to adjust measurement instruments through the ***Advanced / Quality*** menu.
   Environment: All the names of the operators are gathered in 1 file named “OPERATORS.PRM”. The “OPERATORS.PRM” file will be copied in the instrument's memory. Each product file present under OptiCPP\SNxxxx\BACKUP\BINARY named PRDxx.PRM will be copied in the instrument's memory. The maximum number of products being 40, if there isn't sufficient space, the restore will stop without notice.
3. Click on the ***Continue*** button to start transfer data from USB Flash Drive.

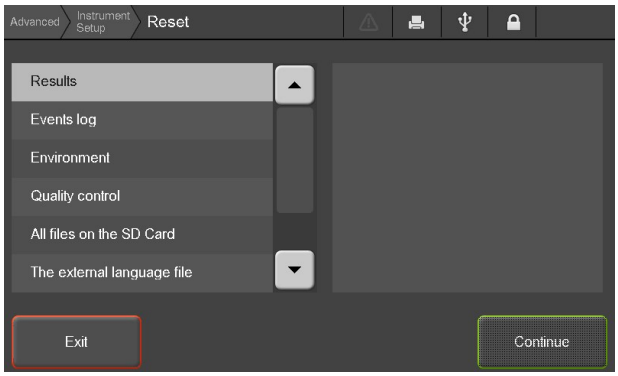
CAUTION
Restore data can override existing. If you are not sure all your data are already treated or backed-up, make a backup first.

6.5.2.4 Reset

Displays a list of the factory default settings and allows to reset them.

- Results
- Event log
- Environment
- Quality control
- All files on the SD Card
- The external language file
- Sensors calibrations (Factory)
- Instrument parameters (Factory)

1. Select value to reset from the list.
2. Click on the ***Continue*** button to return to factory default settings.

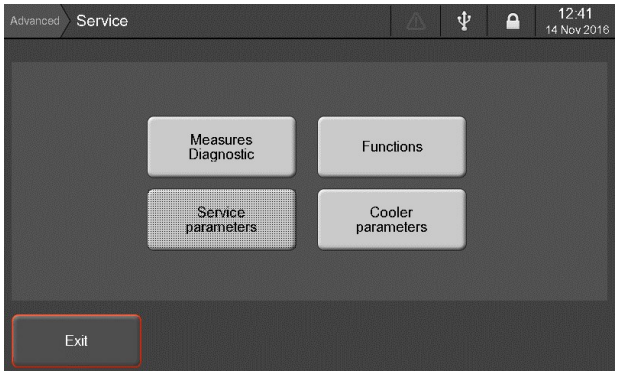


CAUTION
Resetting analyzer settings is a non reversible process.
Make a backup first.

NOTE
Maintenance level is required to reset selected data to factory default settings or to delete any memory area.

6.5.3 Service Menu

- ***Measures Diagnostic*** displays sensors measurements and with Maintenance Level, allows activation of command of individual components.
- ***Functions*** allows command of smart functions (Maintenance Level).
- ***Service parameters*** (Factory Level).
- ***Cooler parameters*** (Maintenance Level).



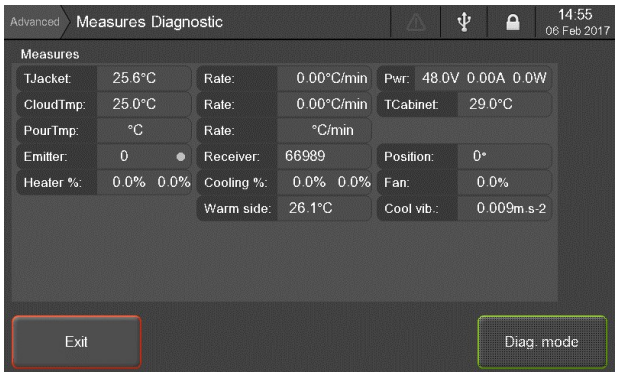
NOTE
Maintenance level is required to perform any action. Operator and Supervisor levels can only display the measurements available under the ***Measures diagnostic*** menu.

6.5.3.1 Measures screen

Shows the measurements of various sensors and the status of analyzer parts.

- Measures
- Sample Tempering
- Optical sensors

The ***Exit*** button allows to go back to the ***Advanced*** menu.
The ***Diag.mode*** opens the ***Measures Diagnostic commands*** screen.



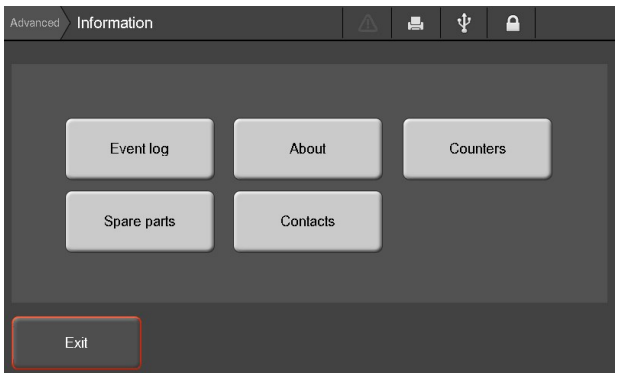
NOTE
Maintenance level is required to access to the diagnostic mode.

Measures data description

6.5.4 Information Menu

The following functions are available:

- ***Event log***
- ***About***
- ***Counters***
- ***Spare parts***
- ***Contact***

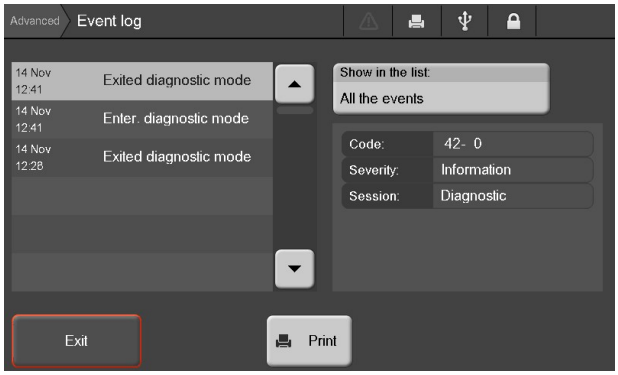


6.5.4.1 Event log Menu

Any incident or unusual event occurring while the analyzer is operating, whether in analysis or diagnostic mode, is recorded in the Event log (messages and recommended actions are detailed in *section 10. Troubleshooting*).
Categories of events by severity:

- Failure Alarms
- Warning Messages
- Information Messages

1. Test: Press the ***Test*** button to test the buzzer operation.
2. Exit the screen to turn the buzzer off.



Failure Alarms
The analyzer triggers a failure alarm if it detects any system malfunction, whether the analyzer be idle, in analysis or in diagnostic mode.
Triggering a failure alarm has the following consequences:

- An immediate halt to a current analysis.
- No new analysis can be started until the failure has been corrected.

Warning Messages

A warning is an abnormal event that involves no risk for analyzer operation or its environment.

The warning messages inform the user of an abnormal event during the analysis or in diagnostic mode. They are stored with the result if occurred during a test as this could influence the result. These messages are also displayed when maintenance is needed on the analyzer (calibration, preventive maintenance due…).

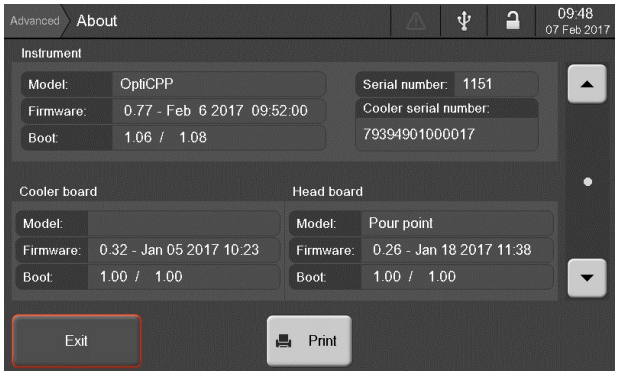
Information Messages

The information messages relate to normal analyzer operation or standard preventive maintenance. They are saved in the events log only.

6.5.4.2 About Menu

This menu gives information about the analyzer firmware version and the common board and control board version.

1. Use the ***Print*** button to print the detailed information.



Information

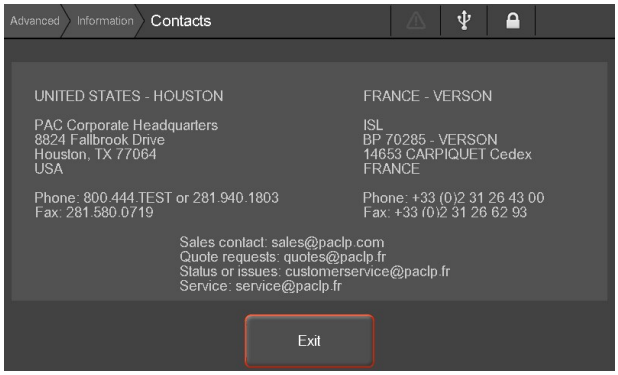
Information	Description
Instrument	
Model	Model of the unit
Serial number	Unit serial number
Firmware	Firmware version and date of the version
Cooler serial number	Cooling unit serial number
Boot	Bootstrap software
Cooler board	
Model	Model of the cooling unit control board
Firmware	Firmware version installed on the cooling unit control board, date of the version
Boot	Bootstrap software of the cooling unit control board
Head board (displayed only if head is connected)	
Model	Model of the head board
Firmware	Firmware version installed on the head board, date of the version
Boot	Bootstrap software of the head board

6.5.4.3 Counters Menu

The ***Counters*** menu displays the analyzer elements operating times.

6.5.4.4 Contacts Menu

The ***Contacts*** menu contains contact information :



7. Operation

7.1. Measurement setup

Check the OptiCPP is ready for operation:

- The analyzer is powered on. Refer to *section 6.1.1 Switch on the analyzer*
- The ***Run*** menu is displayed and test parameters suits to the test. If needed, refer to *section 6.3. The Run menu: Test starting and monitoring.*
- All test parameters are suitable. If needed, refer to *section 6.3. The Run menu: Test starting and monitoring.*

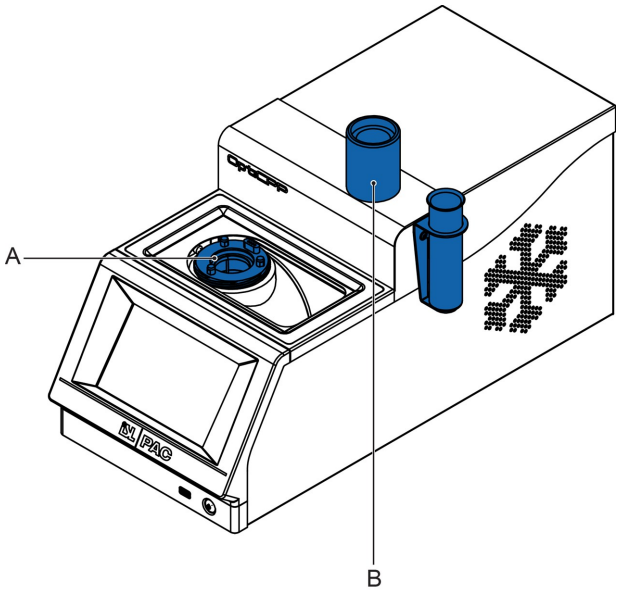
NOTE
The measurement heads and test jars are different for the Cloud and Pour point tests. Use the appropriate cleaned and dry measurement head and test jar according to the type of test desired. The system automatically detects which test to perform and imports the sample probe calibration values once the measurement head is connected to the jacket.

WARNING
Do not immerse the measurement head when cleaning it: use a cloth. Never use acetone or other highly polar solvents, to avoid altering appearance of the plastic parts. Use non-polar solvents such as heptane, petroleum naphta, petroleum ether.

NOTE
To store results in the USB Flash Drive, plug it in the front USB port BEFORE starting the test. In case of forgetfulness, results as other data can be registered on the USB Flash Drive through the backup menu (see *section 6.5.2.3 Backup Restore*)

7.2. Sample preparing

1. Prepare a sample in accordance with practices detailed in the applicable Standard Method relative to thermal history, preheating temperature, filtering or bubble suppression.
2. Fill the cleaned and dry test jar with the sample up to the level mark (with the bottom of the meniscus):
   - Pour Point: M004243 test jar with 2 level marks:
     - Lower level mark corresponds to ASTM D97 standard level of sample
     - Upper level mark corresponds to level required for low temperature tests with expected point < -60°C (ASTM D5950 only)
   - Cloud Point: M00430 test jar (mirrored bottom)
3. Position the cork gasket in the positioning gauge (B).
4. Insert the test jar filled with the sample fully to the bottom of the positioning gauge (B) to adjust the gasket to the position defined in standards.
5. Place the cork disc in good condition at the bottom of the jacket (A) and put the test jar together with the cork gasket in the jacket (A).



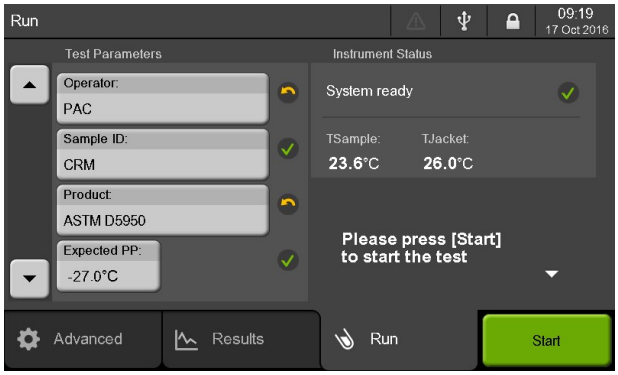
7.3. Operation - Pour Test

7.3.1 Start a test

1. Clean measurement head and sample probe with hydrocarboned solvent (such as heptane, petroleum naphta or petroleum ether) and rinse with light hydrocarboned solvent (such as isopentane or pentane). Dry with a cloth or in a stream of dry and filtered air.

WARNING
Do not immerse the measurement head when cleaning it: use a cloth. Never use acetone or other highly polar solvents, to avoid altering appearance of the plastic parts. Use non-polar solvents such as heptane, petroleum naphta, petroleum ether.

2. Position the pour point measurement head  on the jacket so that the arrow drawn on the label points to the rear of the analyzer. Lock the head by screwing it on the jacket: the sample temperature is displayed.
3. Press the ***New test*** key or activate the ***Run*** menu to enter test parameters (***Operator*** and ***Product*** from a list; ***Sample ID*** entry) by pressing the field (refer to *section 6.3. The Run menu: Test starting and monitoring* for more details on the ***Run*** menu and *section 6.5. Advanced menu* for more details on test parameters).



4. Press on the ***Expected PP*** field to enter or modify the expected pour point temperature to inform the analyzer when to start tilting the test jar (refer to *section 6.5.1.1 Products* for more details on the test product parameters).
5. When all fields are filled and if the analyzer status indicates “System ready”, the ***Start*** button turns green. Press it to run the test.

NOTE
The test product can be proposed by default (set in internal parameters). Press on the ***Product*** field to select another one if needed.

7.3.2 Test in progress

The analyzer manages the entire test cycle following tests parameters of the selected product and the cooling profile attached.

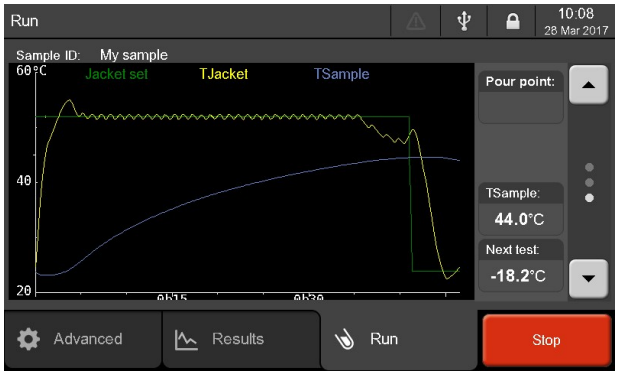
7.3.2.1 Preheating phase

Depending on the product, sample preheating can be activated in the product parameters.

During the test, the ***Run*** screen displays the ***Test parameters*** on the left : ***Operator***, ***Sample ID***, ***Product*** and ***Expected PP***.
On the right, the Instrument Status area displays the current test phase with a test progress bar, the temperature of the sample (***TSample***) and the setpoint temperature of the jacket (***TJacket***).
To interrupt the ongoing test, press the ***Stop*** button.

NOTE
To optimize test duration, it is recommended that the user preheats the sample outside the analyzer in an oven appropriate for the sample type. Do not start a test with a sample temperature above 70°C.

Use the right sided arrow buttons to switch to the screen showing a graph with real-time values.
The analyzer will heat the sample to the preheating setpoint temperature, up to a maximum 45°C.

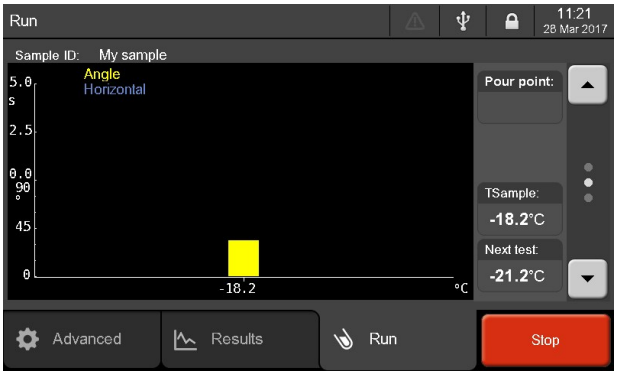


7.3.2.2 Detection phase

For each step, jacket is cooled to “Jacket level to sample Temp”. When the sample temperature reaches the sample temperature set point, the analyzer goes to next cooling step.

NOTE
It is possible to override first cooling steps by configuring a “jacket level depending on EP” step if EP is lower than a preset temperature.

The jar starts to be tilted from the temperature set in product parameters ***Start at EP+*** (point 3 from *section 7.3.1 Start a test*) and every x°C decrease of sample temperature following cooling profile parameter attached to the product ***Tests every*** up to detection of no movement of the sample surface for 5 seconds.

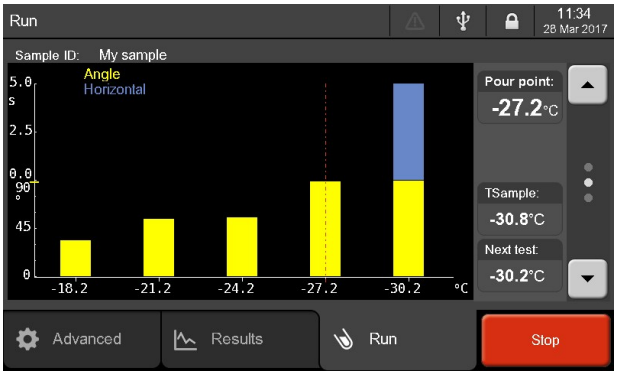


Displayed values

Value	Description
Run Screen	
Test parameters	Operator, Sample ID, Product
Instrument status	Current test phase with progress bar
TSample	Real-time temperature of the sample
TJacket (Cloud Point only)	Temperature of the jacket
Chart Screen	
Blue bars (Pour Point only) (page 2)	Time (s) before detection of a movement (value on the upper part of the left scale)
Yellow bars (Pour Point only) (page 2)	Tilting angle (°) until detection of a movement (value on the lower part of the left scale)
Pour point	Lowest temperature at which the product continues to flow. When no movement happens in 5 seconds, the no flow point is found. The Pour Point temperature corresponds to the previous test temperature.
Profile Screen	
Yellow curve (page 3)	Real-time temperature of the jacket
Blue curve (page 3)	Real-time temperature of the sample
Green curve (page 3)	Real-time temperature of the jacket set

7.3.3 End of test

When no movement happens in 5 seconds, the no flow point is found and the analyzer beeps one time. The Pour Point temperature corresponds to the previous step temperature.



At the end of the test or when the ***Stop*** button is pressed and confirmed, the sample is heated to the final heating configured (25°C by default). When test is finished, the analyzer beeps three times.
Yellow ***New test*** button is displayed and a new test can be prepared.
Click on the ***Results*** tab to display the results list.

NOTE
Current result is now available in the ***Results*** menu.

For results details, refer to section *section 6.4. Results menu*

Type of end of test messages

These messages are stored with the results in the analyzer internal memory. They are also displayed in the ***Results***, under the ***Ending*** field.

Pour point

Message	Description
PP not detected	Pour Point not detected after Expected point + 3 tilts (verification of the no-flow at expected temperature).
PP detected	Normal Pour point end.
PP at first tilt	Pour point at 1st tilt (error in the expected temperature).
Stop temperature	Programmed stop temperature reached (by default: the lowest the analyzer can reach)
End of profile	End of cooling profile reached (another standard is advised)

Refer to *section 6.4.2 Results details*.

7.4. Operation - Cloud Test

7.4.1 Start a test

1. Clean measurement head, sample probe and detectors with hydrocarboned solvent (such as heptane, petroleum naphta or petroleum ether) and rinse with light hydrocarboned solvent (such as isopentane or pentane). Dry with a cloth or in a stream of dry and filtered air.

WARNING
Do not immerse the measurement head when cleaning it: use a cloth. Never use acetone or other highly polar solvents, to avoid altering appearance of the plastic parts. Use non-polar solvents such as heptane, petroleum naphta, petroleum ether.

2. Position the cloud point measurement head on the jacket so that the arrow drawn on the label points to the rear of the analyzer. Lock the head by screwing it on the jacket: the sample temperature is displayed.
3. Press the ***New test*** key or activate the ***Run*** menu to enter test parameters (***Operator*** and ***Product*** from a list; ***Sample ID*** entry) by pressing the field (refer to *section 6.3. The Run menu: Test starting and monitoring* for more details on the ***Run*** menu and *section 6.5. Advanced menu* for more details on test parameters).
4. When all fields are filled and if the analyzer status indicates “System ready”, the ***Start*** button turns green. Press it to run the test.

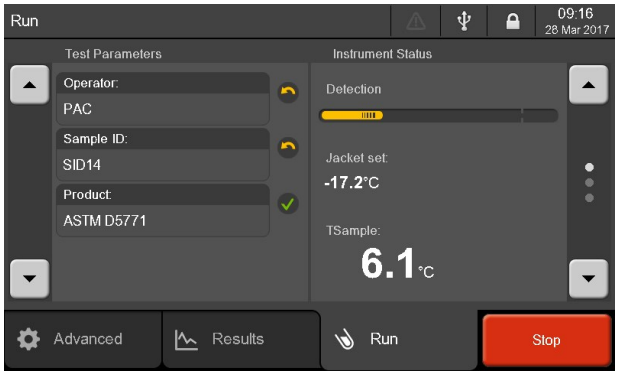
NOTE
The test product can be proposed by default (set in internal parameters). Press on the ***Product*** field to select another one if needed.

7.4.2 Test in progress

The analyzer manages the entire test cycle following tests parameters of the selected product and the cooling profile attached.

7.4.2.1 Detection phase

During the test, the ***Run*** screen displays the ***Test parameters*** on the left : ***Operator***, ***Sample ID***, ***Product***.
On the right, the Instrument Status area displays the current test phase with a test progress bar, the temperature of the sample (***TSample***) and the setpoint temperature of the jacket (***TJacket***).
To interrupt the ongoing test, press the ***Stop*** button.



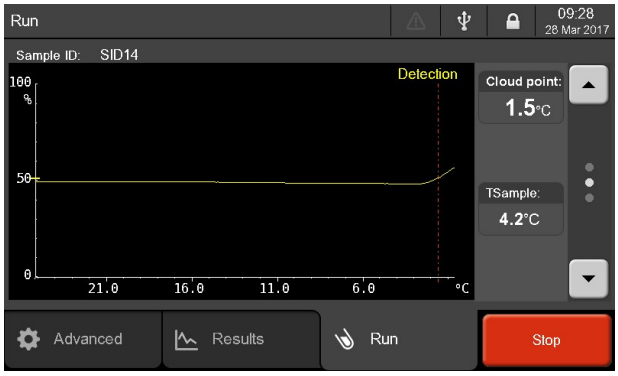
Use the right sided arrow buttons to switch to the screen showing a graph with real-time values.

Displayed values

Value	Description
Run Screen	
Test parameters	Operator, Sample ID, Product
Instrument status	Current test phase with progress bar
TSample	Real-time temperature of the sample
TJacket	Temperature of the jacket
Chart Screen	
Yellow curve (Cloud Point only) (page 2)	Percentage of the detection signal against sample temperature
Profile Screen	
Yellow curve (page 3)	Real-time temperature of the jacket
Blue curve (page 3)	Real-time temperature of the sample
Green curve (page 3)	Real-time temperature of the jacket set
Cloud point	Temperature at which the smallest observable cluster of hydrocarbons crystals first appears

7.4.3 End of test

When the Cloud Point is found, the analyzer beeps one time.



At the end of the test or when the ***Stop*** button is pressed and confirmed, the sample is heated to the final heating configured (25°C by default). The test is then finished and the analyzer beeps three times. Yellow ***New test*** button is displayed and a new test can be prepared. Click on the ***Results*** tab to display the results list.

NOTE
Current result is now available in the ***Results*** menu.

For results details, refer to section *section 6.4. Results menu*

Type of end of test messages

These messages are stored with the results in the analyzer internal memory. They are also displayed in the ***Results***, under the ***Ending*** field.

Cloud point

Message	Description
CP detected	Normal Cloud point end.
Stop temperature	Programmed stop temperature reached (by default: the lowest the analyzer can reach).
End of profile	End of cooling profile reached (another standard is advised).

Refer to *section 6.4.2 Results details*.

8. Calibration

8.1. General

NOTE
It is recommended to regularly test a CRM or a reference sample with a Quality Product to verify the analyzer operation and calibration in the Quality Control database. Intervals should not exceed 1 month.

CAUTION
Regular verification of the temperature measuring device is imperative for accurate measurement. Intervals should not exceed 12 months.

After calibration of the analyzer or any service intervention, perform a verification test with a CRM or a referent sample preferably through the Quality Control Database for calibration traceability.
The client schedules the calibration intervals according to his Quality Assurance Program. ISL by PAC, PAC or any of its employees can NOT be held responsible for fault measurements with the OptiCPP.

8.2. Required access and permissions

Operations allowed by access level.

Level 1 - Operator:
- Reading and printing quality reports and calibration history
- Calibrating the touch panel screen
- Adjusting the backlight of the screen
- Verification of the CPU internal clock

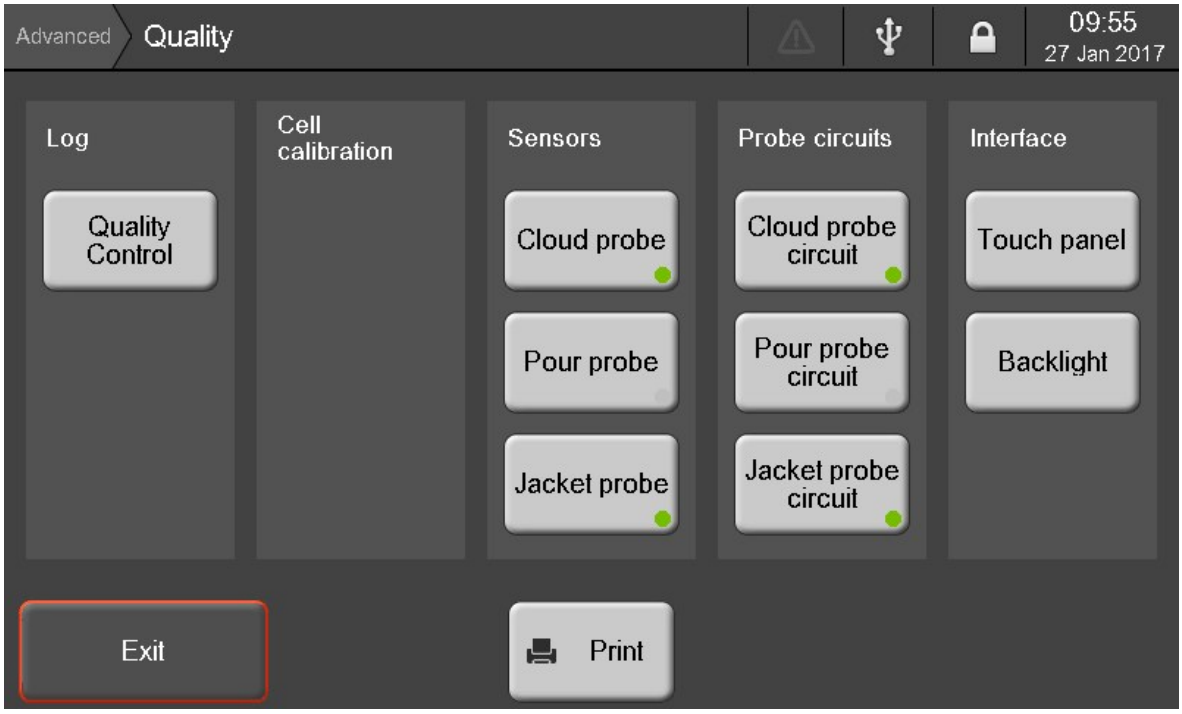
Level 2 - Supervisor:
- Level 1 operations
- Verification / calibration of sample temperature probe through:
  - automatic procedure with pure water and octane samples
  - semi-automatic procedure using an external certified system
- Verification / calibration of jacket probe trough:
  - automatic procedure with measurement head
  - semi-automatic procedure using an external certified reference probe

Level 3 - Maintenance: refer to the Service Manual for procedures
- Level 1 + level 2 operations
- Calibration of electronic circuits of jacket and sample temperature measurement using a certified probe simulator
- Manual calibration of probes

8.3. Quality Menu

This section provides instructions for the verification and calibration of measurement devices, which are critical to ensure measurement accuracy. It also provide tools ensuring the traceability of calibration tests and allowing statistical checks: the Quality-Control Database.

NOTE
Most functions are only accessible with Supervisor or Maintenance levels.
A green dot is displayed when calibration or adjustment is done and still valid.



The ***Quality*** menu is accessible from the ***Advanced*** / ***More*** Menu.
The ***Print*** button allows to send calibration data or status to the printer or to a PC.
The ***Exit*** button allows to go back to the ***Advanced*** menu.

Sub-menus allow accessing to the following functions:

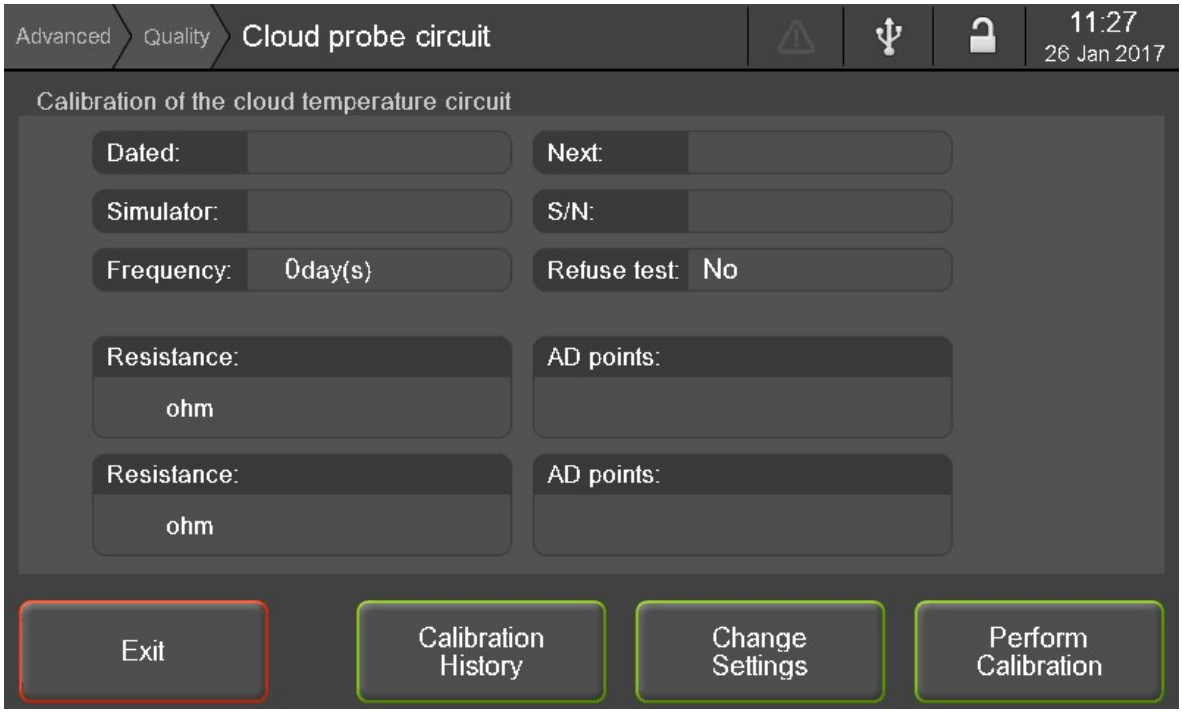
Main function	Sub-menu	Description	Refer to
Log	Quality control	Access to the Quality Control database	*section 8.4.1 Quality Control products*
Sensors	Probes	Verification / calibration of probes	*section 8.5. Sensors verification/calibration*
Probe circuits	Measurement head and jacket temperature measurement	Calibration of electronic circuit of sample temperature measurement	*section 1.*
Interface	Touch panel	Touch panel adjustment	*section 8.6.1 Touch panel calibration*
	Backlight	Backlight adjustment	*section 8.6.2 Backlight adjustment*

To proceed to the whole measurement system calibration, perform in the following order:

1. Electronic circuits calibration. After maintenance operations or every 5 years at least – Maintenance Level (Refer to *section 8.3.1 Probe circuit calibration*).
2. Calibration of sample temperature probes: After calibration of electronic circuits or if verification procedure requires it (refer to *section 8.5.1 Sample probe*).
3. Calibration of jacket probe: After calibration of electronic circuits or after calibration of pour probe (refer to *section 8.5.2 Jacket probe*).

8.3.1 Probe circuit calibration

This calibration is required periodically or in case of maintenance intervention on one of the equipment. Intervals should not exceed 5 years. From the ***Quality*** screen, click on the ***Cloud probe circuit***, ***Pour probe circuit*** or ***Jacket probe circuit*** button to respectively display the ***Cloud probe circuit***, ***Pour probe circuit*** or ***Jacket probe circuit*** screen.
Sample probe is simulated using a PS100 simulation box connected to the control Board.

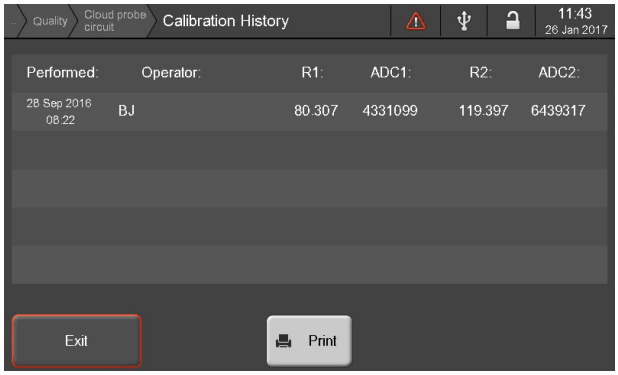


This screen displays calibration data.
Bottom menu gives access to:

- ***Calibration History*** of the sample temperature circuit
- ***Change Settings*** - to change the calibration settings (Factory level only)
- ***Perform Calibration*** - calibration process using the Certified probe Simulator (Maintenance level only - Refer to the Service Manual)

8.3.1.1 Calibration history

Click on ***Calibration history*** button to access the corresponding screen. This screen displays a list of the last 5 calibration procedures. Use the ***Print*** button to print the history of previous calibrations or to send them to a PC, depending on the configuration of the analyzer printing parameters or to send them to a PC, depending on the configuration of the analyzer printing parameters.



8.4. Quality Control database

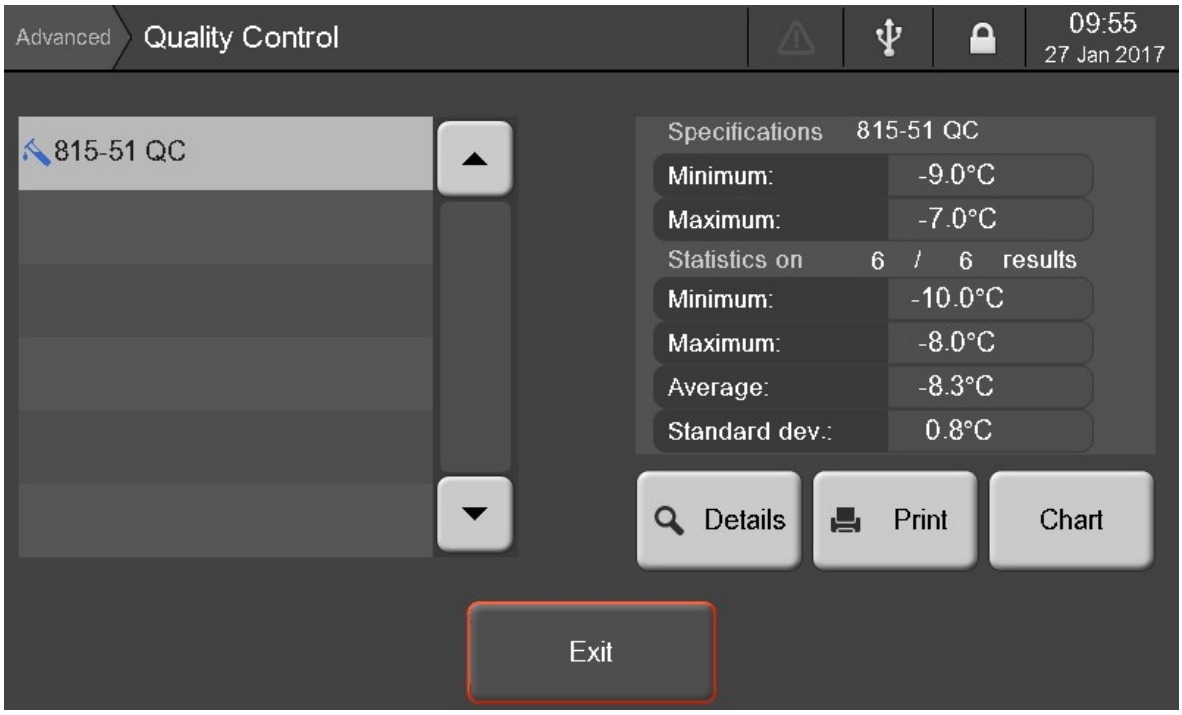
Monthly or according to the customers Quality Assurance Program and after any service interventions, QC-Products allow to carry out quality controls with CRM or a Secondary Working Standard with extended values managed in the Quality Control database to verify analyzer operation and calibration.

QC-Products can also be used to follow the tendency of each value of the product characteristics allowing to adjust process according to deviation if there is. To be noted: Temperature/volume specification can be appointed to a QC-product to check the conformity of the complete test from one single screen.

Each of the tests performed with a QC-Product is recorded in its own QC database, thus ensuring the traceability of the verification tests.

8.4.1 Quality Control products

In addition to automatic acceptance, the ***Quality Control*** menu displays deviations and statistical quality reports about test results based on Quality-Control Products for each point specified in the Quality-Control Database.



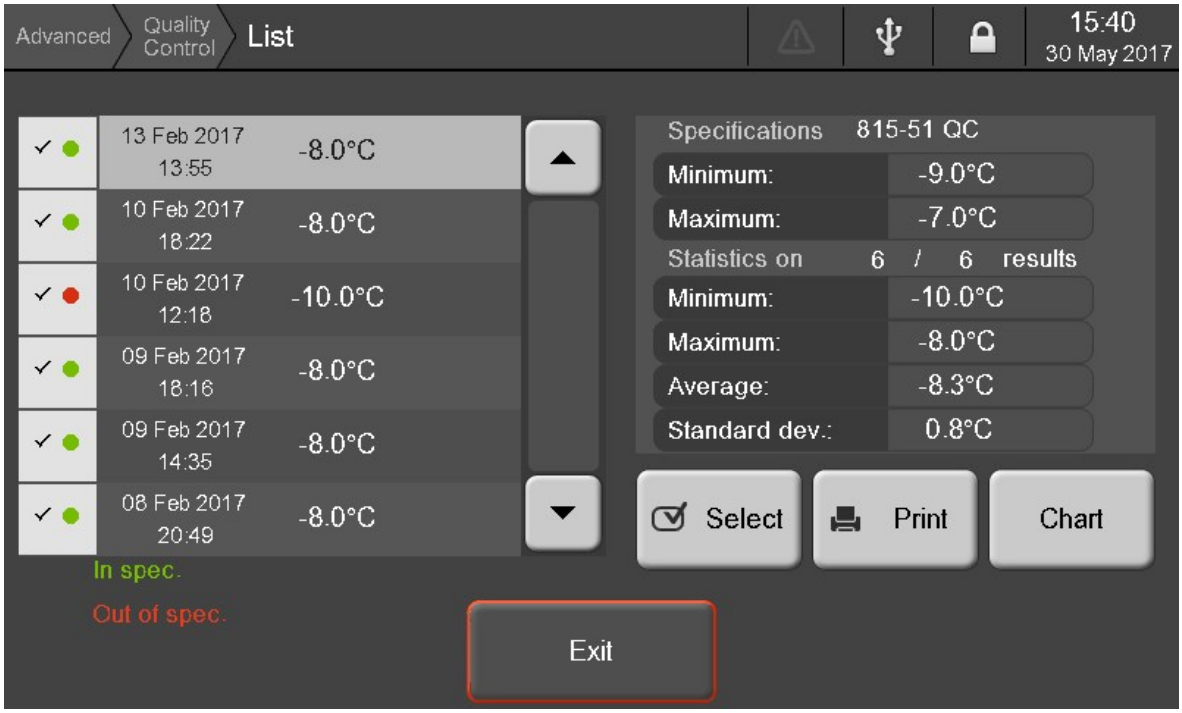
The left part of the screen displays the list of QC-Products used to test reference samples to check there is no deviation of the analyzer measurement devices for example or to tests products for expected values.
On the right part of the screen:

- Under ***Specifications***, minimal and maximal values configured for this QC-product (the Supervisor Level is needed to enter/modify them).
- Under ***Statistics on***, the total number of tests made with this QC-product, minimal and maximal values, the average value and the standard deviation.

1. Use the ***Details*** button to display the list of performed tests with the selected product (***List*** screen *section 8.4.2 Quality Control List*).
2. Use the ***Chart*** button to display the control chart (***Chart*** screen *section 8.4.3 Quality Control chart*).
3. Use the ***Print*** button to print the QC-report selected under text or graphic size specifications and statistic values or to send them to a PC or the the USB Flash Driver, depending on the configuration of the analyzer printing parameters.

8.4.2 Quality Control List

From the ***Quality control*** screen, click on the ***Details*** button to display the ***List*** screen. This screen displays a list of the tests performed with the selected QC-product.



- The green dots correspond to the ***In spec*** results.
- The red dots correspond to the ***Out of spec*** results.
- The left part of the screen displays the data and result for each test.
- The right part of the screen displays the specifications and statistics of the currently selected test.

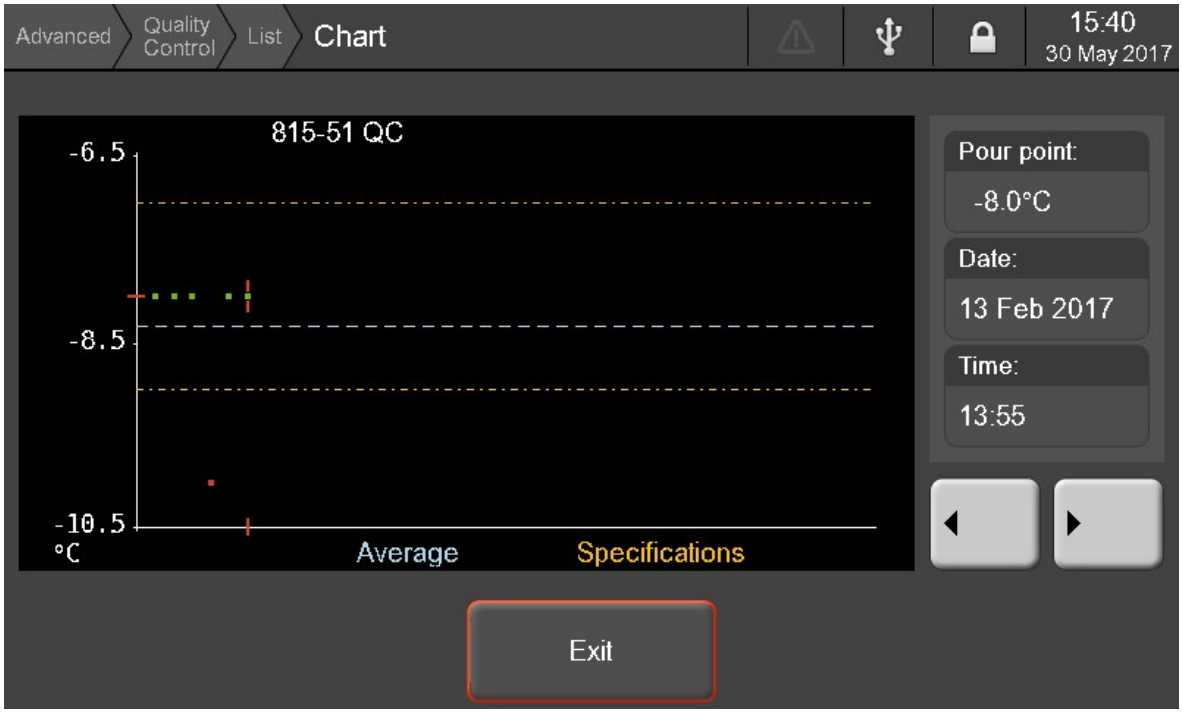
1. Use the ***Print*** button to print the result selected of all tests selected in the list and statistic values or to send them to a PC, depending on the configuration of the analyzer printing parameters.

To perform statistical calculations and to generate the chart, select the tests to display on the graph:

1. Click on a result in the list
2. Press on the ***Select*** button
   The ✓ icon shows that the result is selected. The × icon shows that the result is not selected.
3. Click on the ***Chart*** button to display the control chart.

8.4.3 Quality Control chart

From the ***Quality control*** screen, or from the ***Quality control*** > ***List*** screen, click on the ***Chart*** button to display the ***Chart*** screen.



- The green dots correspond to the In spec results.
- The red dots correspond to the Out of spec results.
- The blue line represents the average value of the selected results.
- The orange lines represent the control limits (if limits have been defined for the product).

1. Use the arrow buttons on the right to switch from a test to another.

NOTE
Only the dots for previously selected results from the list are displayed on the chart.

8.5. Sensors verification/calibration

Calibration of temperature probes must be verified at regular intervals following your Quality Assurance System or at intervals not exceeding 12 months.
Calibration must be done:

- If electronic circuits are recalibrated.
- On deviation of the Pour or Cloud Point values obtained with a CRM or a reference sample with extended values which meets conditions of the respective Standard Method.
- If verification procedure indicates a bias in measurements.
  To check/calibrate the sample temperature probe measurement, the external certified temperature probe for cell calibration must be used (see *section 1. Accelerometer board*). An external acquisition system is needed.

Verification / calibration of temperature probes can be performed following different ways:

Pour/Cloud probe

- Automatic : the calibration is realized in 2 points with as reference temperature the melting point of the water and the octane.
- Manual : the calibration is realized with an external bath provided with a reference probe.

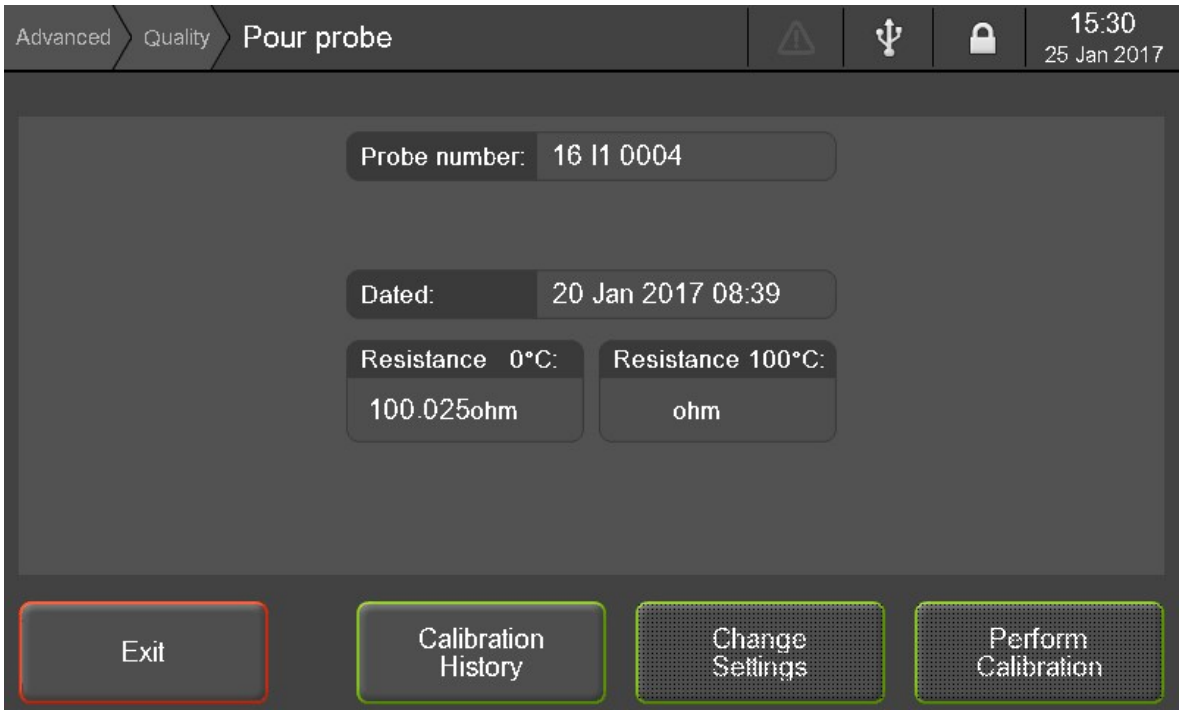
Jacket probe

- Automatic : the calibration is realized in 2 points with as reference temperature the Pour probe.
- Manual : the calibration is realized with a reference probe.

8.5.1 Sample probe

NOTE
Procedure for both Cloud and Pour probes calibration is the same. However, the procedure shown is from the Pour probe calibration.

From the ***Quality*** screen, click on the ***Pour probe*** or ***Cloud probe*** button to respectively display the ***Pour probe*** or ***Cloud probe*** screen.

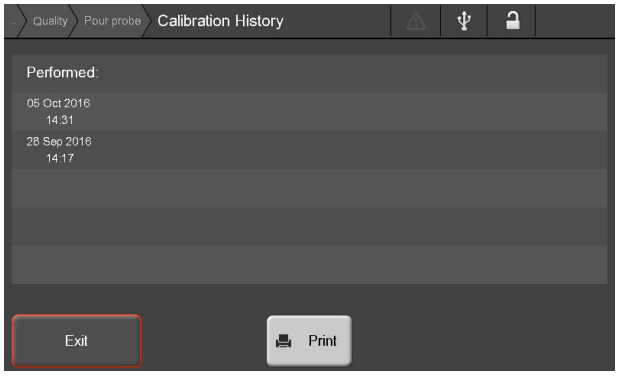


This menu gives access to:

- ***Calibration History*** of the probe
- ***Change Settings*** - to change the calibration values by modifying manually the correction table of probe stored in the measurement head memory (Maintenance level only)
- ***Perform Calibration*** - verification / calibration process using automatic or semi-automatic procedure (Maintenance level only)

8.5.1.1 Calibration history

Click on ***Calibration history*** button to access the corresponding screen.
This screen displays a list of the last 5 calibration procedures.
Use the ***Print*** button to print the history of previous calibrations or to send them to a PC, depending on the configuration of the analyzer printing parameters.



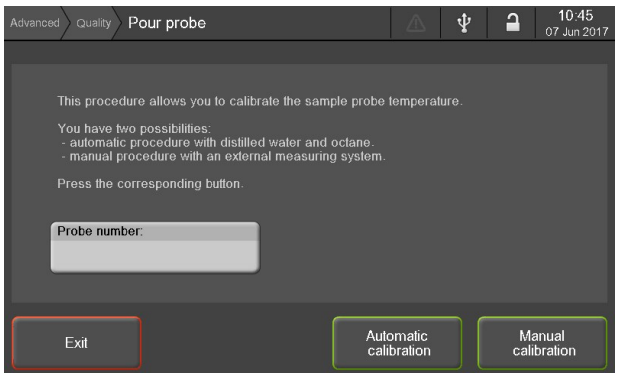
8.5.1.2 Perform calibration

Automatic procedure
This procedure allows to verify or modify the pour and cloud probe correction values with samples of pure water and pure octane.

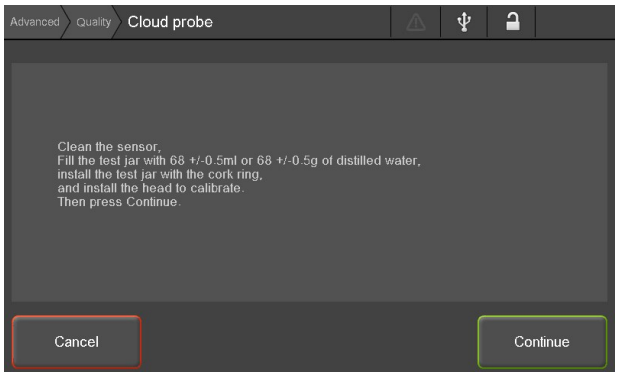
1. Fill the cleaned and dry test jar with 68 ± 0.5 ml of distilled water (pure water).

NOTE
To avoid contamination and temperature influence, it is recommended to fill 68 ± 0.5 g of distilled water weighed with a precision balance.

2. Position the cork gasket in the positioning gauge.
3. Insert the test jar filled with the distilled water fully to the bottom of the positioning gauge.
4. Place the cork disc in good condition at the bottom of the jacket and put the test jar together with the cork gasket in the jacket.
5. Place the measurement head on the test jar.
6. Click on ***Perform calibration*** button of the Pour Probe Quality screen to access the corresponding screen.
7. Enter the Supervisor password if necessary and access to the first screen.
8. ***Probe number***: Number stored in the head's memory. Press the ***Automatic calibration*** button.



9. The following screen displays:
   Cancel: Abort the calibration and go back to the ***Sample Probe*** calibration screen.
   Continue: Start the automatic calibration in two points by searching the freezing point of two pure products: pure water and pure octane.



10. Follow instructions on the screen and click on ***Continue***. The analyzer will cool down until freezing point is reached.
11. When water freezing point has been reached, clean the test jar and fill it with 68 +/- 0.3 ml of octane (purity > 97%).

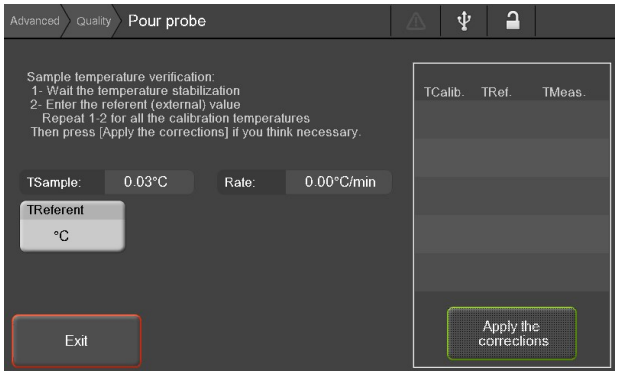
NOTE
To avoid contamination and temperature influence, it is recommended to fill 47.8 ± 0.3 g of octane weighed with a precision balance.

12. Repeat same operations as for distilled water.

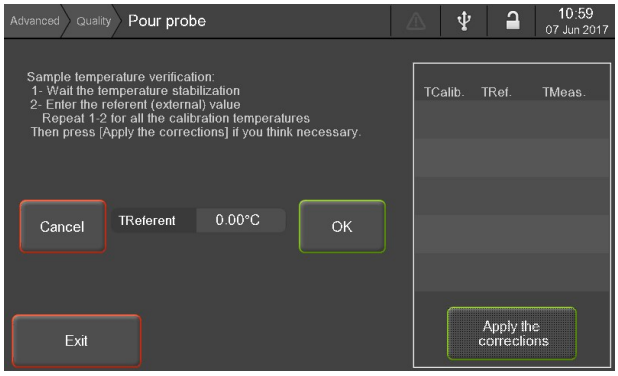
Manual procedure with head calibration set

1. Screw the Head Temperature Calibration Set to the jacket and install the measurement head on the basis at the extremity.
2. Install the measurement head in the external cooling bath. The ***Pour Probe*** must be immersed by 50.8 +/- 2 mm and the ***Cloud Probe*** immersed by 90.2 +/- 5 mm.
3. Adjust the bath temperature to the temperature to which you want calibrate the sample probe.

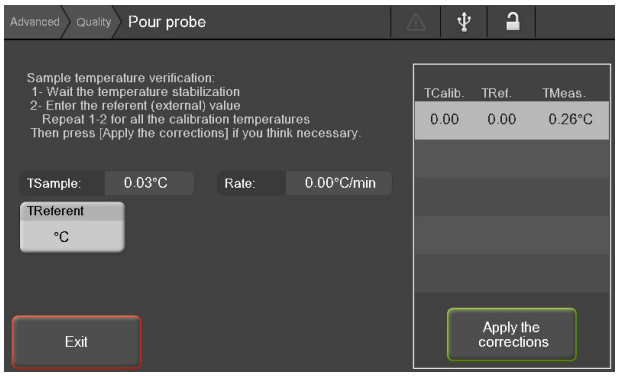
4. Press the ***Manual calibration*** button of the ***Sample Probe*** screen, the following screen appears:
   TSample: bath temperature measured by the probe of the measurement head.
   Rate: cooling rate of the external bath (0.00°C/min indicates the bath is stabilized).
   TReferent: Enter the temperature of the external cooling bath measured by the bath reference probe through the virtual keypad.
   Exit: Go back to the calibration screen.



5. When measurement is stabilized, press the ***TReferent*** button: the virtual keypad appears allowing to enter the real temperature measured by the bath reference probe.
6. Press ***Enter*** to validate the entry.
7. Press ***OK*** to confirm the value entered and store it in the correction table appearing in the left part of the screen or ***Cancel*** to correct the entered value.



8. Adjust the bath to another temperature then press ***TReferent*** button to continue procedure and calibrate the sample temperature probe to another value.
9. Press on button ***Apply the corrections*** to generate correction table following reference value entered and stop calibration procedure.
10. Or press ***Exit*** to stop calibration procedure without applying correction
11. Press ***Exit*** to go back to the calibration screen.



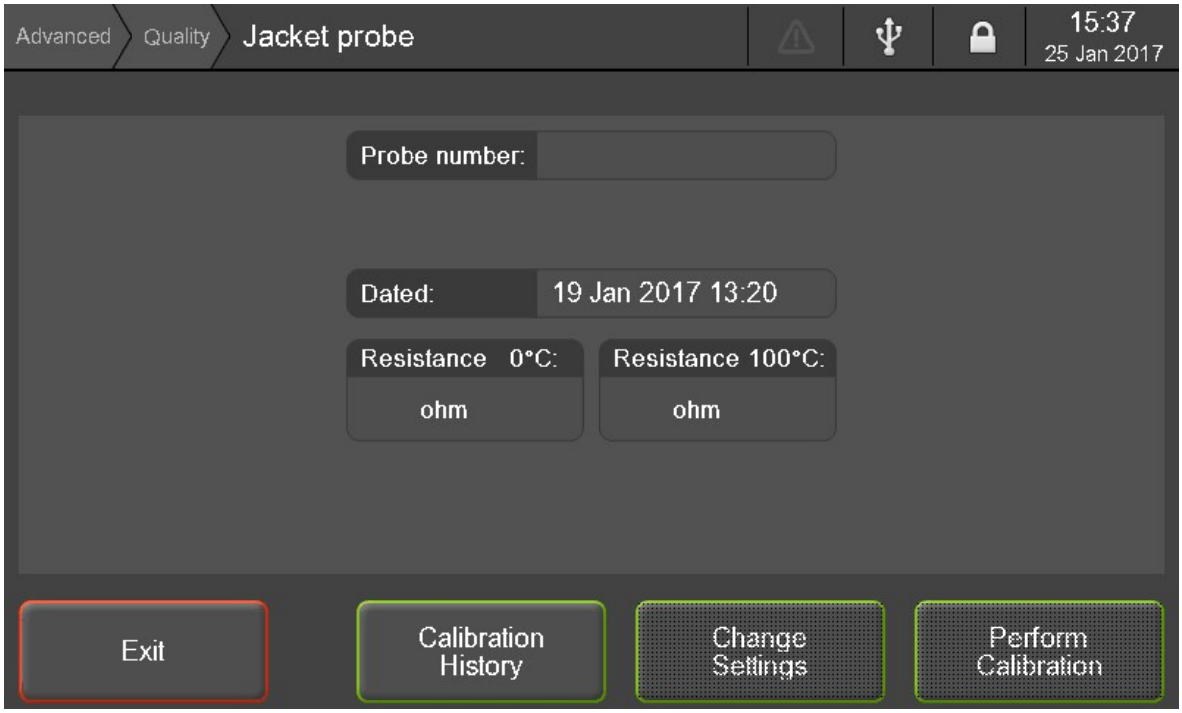
Manual procedure with sensor extension cable set

To install the probe only in the external cooling bath, the Temperature Sensor Extension Cable Set is needed (for cloud and pour probes). This cable allows to link the probe installed in the external cooling bath to the measurement head connected to the jacket for temperature measurement reading, on the analyzer.
For this purpose, the probe must be dismounted:

1. Dismount the head and probe (see *Perform calibration*).
2. Connect the appropriate extension cable to the probe connector (different cable for PP / CP probe).
3. Install the head without its cover on the jacket and screw it.
4. Connect the probe to the extremity of the extension cable: the sample temperature should show up on the analyzer screen.
5. Install the probe in the external cooling bath so that the probe is immersed:
   - by 50.8 +/- 2 mm for the pour probe
   - by 90.2 +/- 5 mm for the cloud probe
6. Install a reference probe beside the measurement head probe respecting the same immersion depth of the probe.
7. Follow the same procedure as previous section from point 3.

8.5.2 Jacket probe

From the ***Quality*** screen, click on the ***Jacket probe*** button to display the ***Jacket probe*** screen.

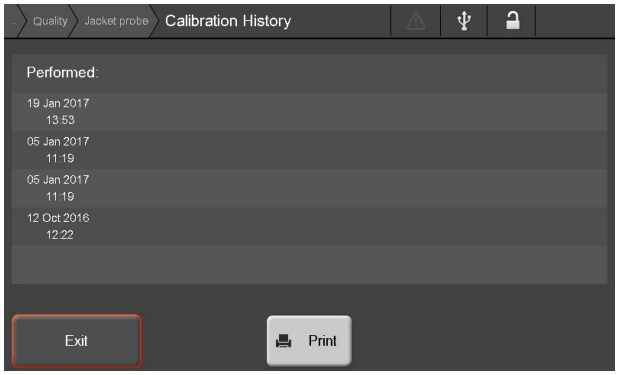


This menu gives access to:

- ***Calibration History*** of the probe
- ***Change Settings*** - to change the calibration settings (Maintenance level only)
- ***Perform Calibration*** - verification / calibration process through automatic or manual procedure (Supervisor level only)

8.5.2.1 Calibration history

Click on ***Calibration history*** button to access the corresponding screen.
This screen displays a list of the last 5 calibration procedures.
Use the ***Print*** button to print the history of previous calibrations or to send them to a PC, depending on the configuration of the analyzer printing parameters or to send them to a PC, depending on the configuration of the analyzer printing parameters.

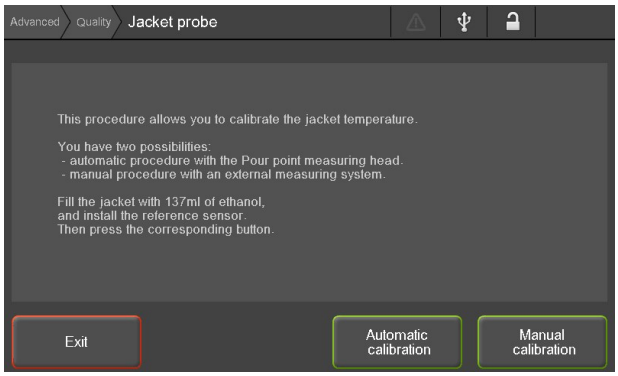


8.5.2.2 Jacket perform calibration

Automatic procedure

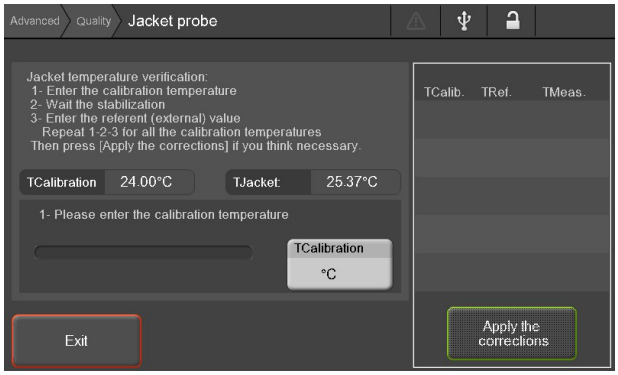
This procedure takes about an hour to complete. It allows to verify or modify the jacket probe correction values in 2 steps.

1. Remove cork disk from the jacket.
2. Fill the jacket with the volume displayed on the screen.
3. Click on ***Perform calibration*** button to access the corresponding screen.
4. Enter the Supervisor password if necessary and access to the first screen.
5. Place the pour point measurement head on the jacket and click on ***Automatic calibration***. The ***Jacket probe*** calibration window displays. The analyzer will reach 2 temperature steps (+10 °C and -51 °C) and save the corrections automatically.



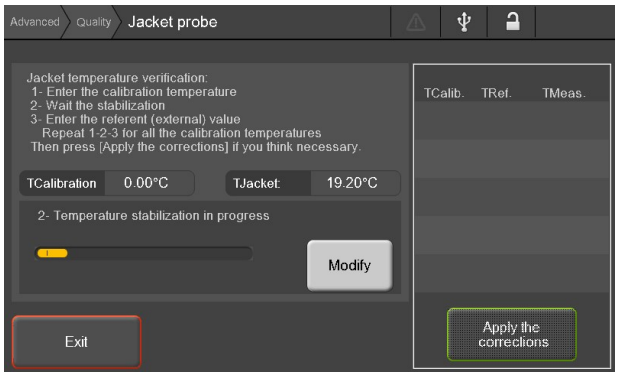
Manual procedure

1. Press the ***Manual calibration*** button of the ***Jacket Probe*** screen, the following screen appears:
   TCalibration: temperature to which the probe is to be calibrated. By default the jacket is regulated at 24°C.
   TJacket: real-time temperature measured by the jacket temperature probe.
   Exit: Go back to the calibration screen.



2. Fill the jacket with 137ml of ethanol
3. Close the jacket with an isolating part (a cork ring for example) with a hole in its center to insert the reference probe.
4. Insert the reference probe so the sensing element is positioned in the middle of the jacket, 55 mm below the ethanol surface.

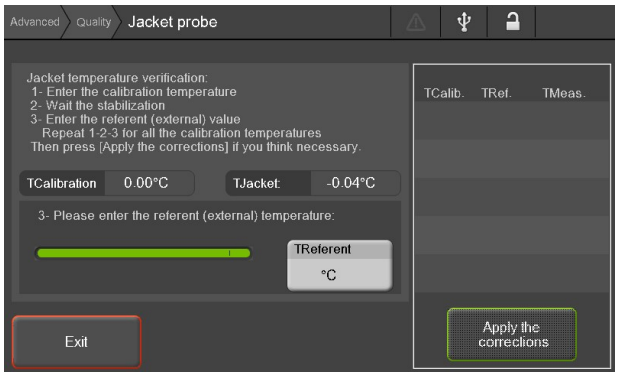
5. Press the ***TCalibration*** button to enter the jacket temperature to be calibrated and to start regulation of the jacket (up to 5 corrections can be stored).



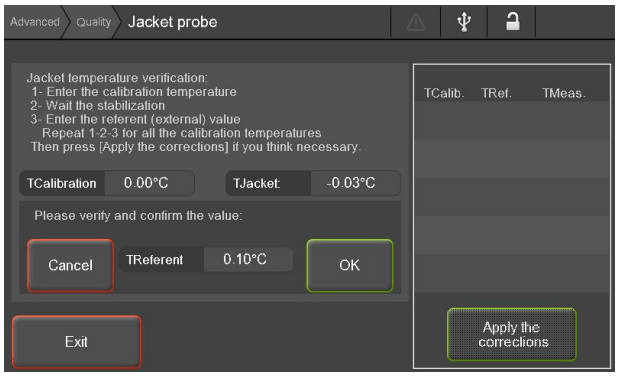
NOTE
The procedure below shows a jacket calibration at a 0°C temperature. The progress bar gives indication on the regulation process and turns to green when the jacket temperature stabilizes.

Modify button allows to modify the jacket temperature to be calibrated.
Exit button allows to go back to the calibration screen.

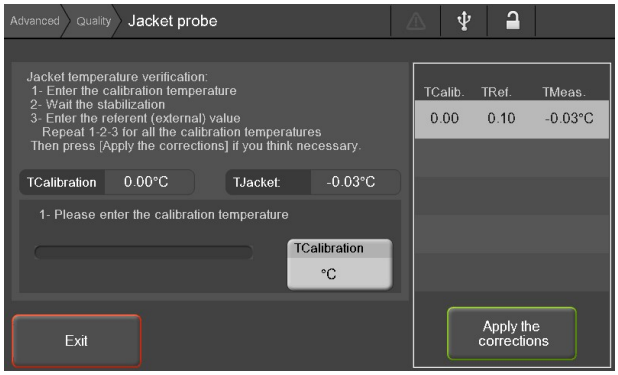
6. The ***TReferent*** button is displayed and the bar turns green once the temperature stabilizes.



7. Press on ***TReferent*** button. The virtual keyboard is displayed, allowing to indicate real temperature measured by reference probe.
8. Press ***Enter*** to validate the entry.
9. Press ***OK*** to confirm the value entered and store it in the correction table appearing in the right part of the screen or ***Cancel*** to correct the entered value.



10. Press on ***TCalibration*** button to calibrate the jacket temperature at another temperature.
    Press ***Apply the corrections*** to generate correction table following reference value entered and stop calibration procedure.
11. Or press ***Exit*** to stop calibration procedure without applying correction.
12. Press ***Exit*** to go back to the calibration screen.



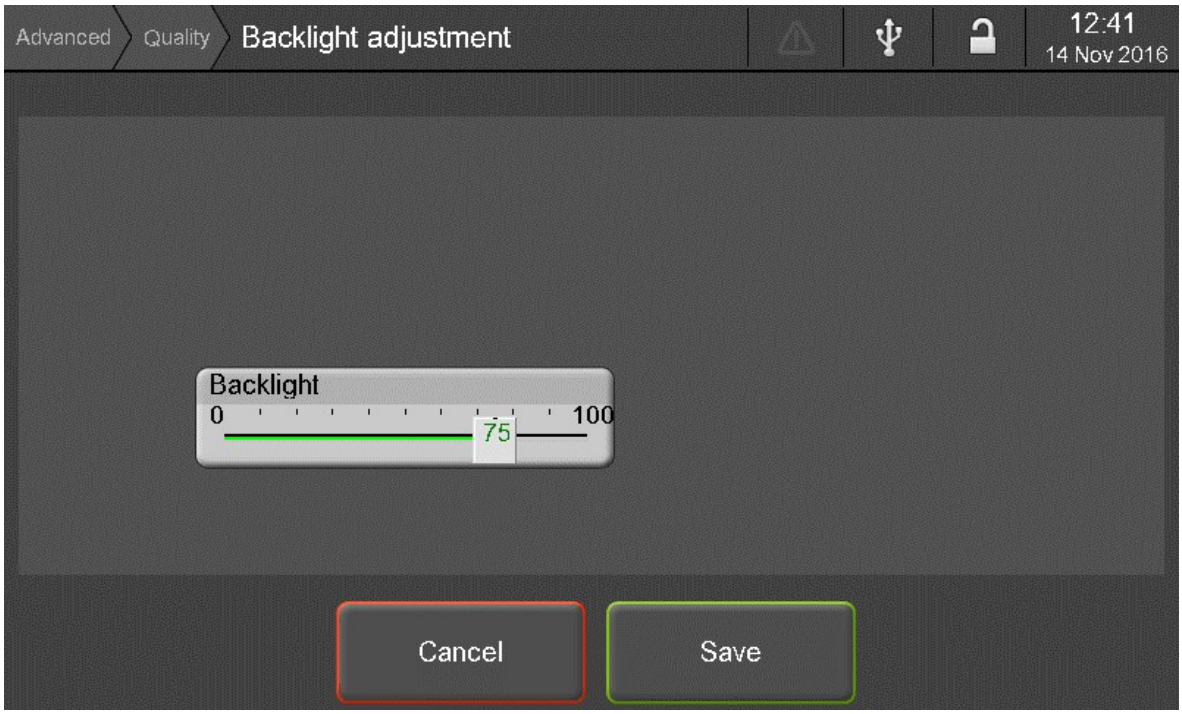
8.6. Interface calibration

8.6.1 Touch panel calibration

From the ***Quality*** screen, click on the ***Touch panel*** button to display the ***Touch panel*** This menu allows to adjust the touch screen with the display by pressing on three different areas. Follow the instructions on the screen.

8.6.2 Backlight adjustment

From the ***Quality*** screen, click on the ***Backlight*** button to display the ***Backlight adjustment*** screen.



This screen allows to adjust the backlight of the touch screen.

1. Manually move the cursor to adjust the screen backlight
2. Click ***Save*** to validate the entered value or ***Cancel*** to go back to the ***Quality*** screen.

9. Maintenance

9.1. Introduction

Regular maintenance is imperative to ensure accurate measurement and proper working of the analyzer.

9.2. General maintenance schedule

Action	Timing
Verification of the analyzer functioning	Using a CRM or a referent sample with extended data sample which meets conditions of the Standard Method at intervals not exceeding one month
Verification of sample probe temperature measurement	- At regular intervals following your Quality Assurance System or at intervals not exceeding 12 months - On deviation of a CRM or a referent sample (which meets conditions of the appropriate standard method tested with a Quality Control product in the QC-Database
Calibration of sample probe temperature measurement	- Must be done if verification procedure indicates a deviation - Must be done after calibration of temperature measurement electronic circuits
Calibration of jacket probe temperature measurement	- At regular intervals following your Quality Assurance System or at intervals not exceeding 12 months (refer to *section 8.3.1 Probe circuit calibration*) - After calibration of measurement electronic circuit of the jacket temperature probe
Airdust all air inlets, outlets and ventilator and radiator of the cryostat	Every year and after any intervention

WARNING
Airdust all air inlets, outlets and ventilator after any intervention on the analyzer.

9.3. Allowed personnel

The preventive maintenance tasks of the OptiCPP can be done by operators or supervisors. They do not require any special training.

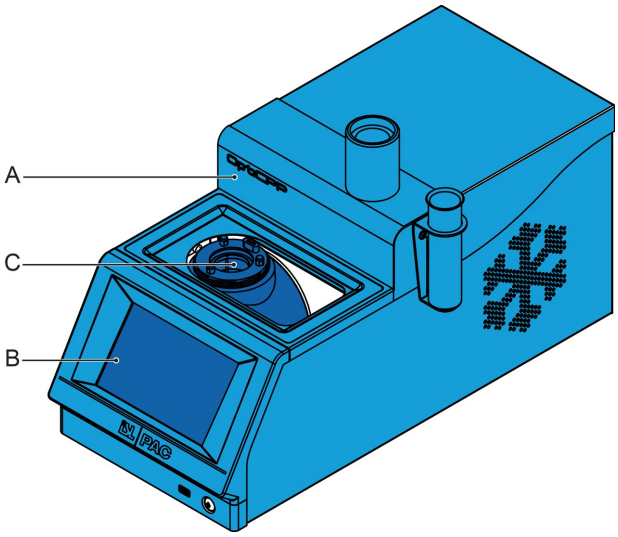
9.4. Clean the OptiCPP

WARNING
Airdust all air inlets, outlets and ventilator after any intervention on the analyzer.

CAUTION
Acetone or other highly polar solvents are to avoid on non metal parts. Prefer petroleum ether or any non-polar solvents.

9.4.1 Clean the analyzer

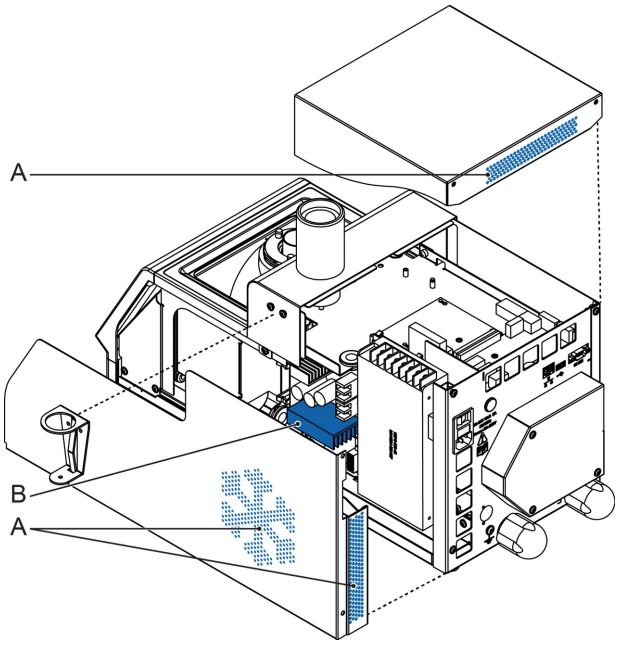
1. Clean the touch screen (B) with a soft lint- free cloth and screen spray.
2. Clean the covers (A) and jacket housing (C) with a soft lint- free cloth, tepid water and a mild detergent.
3. Clean and dry inside of jacket (C) with solvent appropriate for the tested product in case of projection. Dry with a cloth in case of humidity.



9.4.2 Clean the air inlets

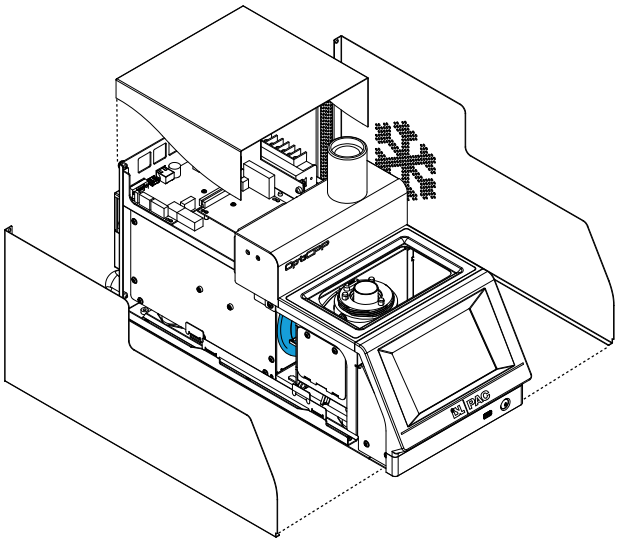
NOTE
Perform the cleaning outside the laboratory, analyzer powered off and disconnected from the mains.

1. Remove the measurement head support to avoid scratching out covers.
2. Remove the top cover.
3. Remove the right side cover.
4. Dust air inlets (A) and the radiator of the electronic board (B) (vacuuming or blowing compressed air).
5. Replace the covers (first the side cover, then the top one).
6. Put back the measurement head support.



9.4.3 Clean the heat-sink of the cooling unit

1. Remove the top cover.
2. Remove the side covers.
3. Dust the heat-sink of the cooling unit (vacuuming or blowing compressed air).
4. Put the covers back in place (first the side covers, then the top one).



10. Troubleshooting

10.1. Troubleshooting by operator

The OptiCPP is programmed to propose an action if it fails to conduct any process.
If the operator or supervisor can not handle the proposed action, please contact ISL-PAC for advice or service.

10.2. Troubleshooting by service engineer

Consult the Service Manual for further analysis of potential malfunctions of the OptiCPP.

10.3. Troubleshooting tables

The sections below contain a FAQ table and tables of events listed according to their definition in the ***Event log*** menu (See *section 6.5.4.1 Event log Menu*).

- Information Messages
- Failure Alarms
- Warning Messages

10.3.1 FAQ

Code	Warning messages / Issue description	Solution / Action
F1	When the analyzer is switched on, the LCD screen does not light up. What should I do?	If the analyzer was stored in a cold or wet place, leave the analyzer in a dry and temperate place for a while before switching on (adapt the time according to the temperatures at which the analyzer has been stored).
		Verify the ambient temperature: operating temperatures: 10°C (50°F) to 35°C (95°F). If the temperature is too low or too high, the text is not visible on the LCD screen even if the supply circuit works.
		Call for a Technical Service to verify the screen and its power supply circuit.
F2	The screen does not react correctly to my finger	Clean the screen then calibrate it if persists
F3	When the principal power supply connector is On, no light on the button on the front side. What should I do?	Verify the good connection of the power supply cable in the analyzer socket and to the mains
		Check the main power switch at the rear of analyzer is set to ON "position"
		Verify/replace general fuses of the power supply connector
		Call for Technical Service to verify the power supply circuit
F4	What is the Ethernet socket for?	Just connect it to the front or rear USB port.
F5	What is the RS232 socket for?	To send the results to a LIMS by the RS232 serial link
F6	Can I use a barecode reader, a mouse or an externalkeyboard?	Just connect it to an USB port
F7	After starting a pout point test, "End of run on the 1st test" occurs	Check sample starting temperature required following the method used.
F8	Test result out of expected value	Check the sample and replace. Take care to use a clean and dry test jar.
		Clean and dry sample probe, optical detectors for cloud point measurement head.
		Perform a test with CRM or other reference sample or check sample temperature probe calibration with automatic calibration procedure with water and octane.
		Calibrate the measurement head electronic circuit and sample temperature probe using automatic procedure with water and octane or using an external certified cooling bath with semi-automatic calibration procedure (for non certified probe).

Code	Warning messages / Issue description	Solution / Action
F9	Within the context of the ISO 9002 Quality Assurance, which controls are recommended on the OptiCPP?	Test a CRM or a reference sample with a Quality Product to verify the analyzer calibration in the Quality Control database
		Perform a calibration of the temperature measurement circuits at least every five years or more following your Quality System Requirements..
		Check or perform calibration of sample temperature probe using automatic procedure with water and octane or using an external certified cooling bath with semi-automatic calibration procedure (for non certified probe) once a year or at period in accordance with your Quality System Requirements or following results obtained on CRM or other reference sample in the Quality Control Database
		Regularly upload analyzer internal data (refer to the section ...): Service data refers to Data in the SD Card; All the memory refers to data in the flash memory
F10	How can I save data stored inmemory?	The instrument preserves its main data in its flash memory. These data are also duplicated in the SD card for Service purpose. To backup these data to an external USB stick navigate to Advanced/Instrument Setup/Backup Restore. Service data refers to Data in the SD Card; All the memory refers to data in the flash memory.
F11	How to connect a printer?	Using the USB port
F12	I low my password. What can I do?	There is no password for the operator functions. See the Service Manual to get the master password for the Laboratory Supervisor Level.

10.3.2 Information messages

Code	Firmware reference	Title	Comment	Solution / action at User Manual Level (involves no dismounting of any parts)
1	Power off		Informative message registered at each power off of the unit with date and time	
7	Reset by soft-ware		Fatal error detected by the soft-ware	Switch off the analyzer then switch on. If failure persists call for Technical Service for further investigation.
11	Power on		Informative message registered at each power on of the unit with date and time	
31	Parameters restored		Analyzer internal parameters restored following file stored in the USB Flash Drive (on request)	
32	Calibration restored		Analyzer calibration values restored from internal parameters stored in the USB Flash Drive (on request)	
33	Environment restored		Run environments (preprogrammed products and operator name list) restored from analyzer internal parameters stored in the USB Flash Drive (on request)	
34	Memory data restored		All structures in memory are restored following files stored in the USB Flash Drive (Factory limited)	
35	Unit setup modified		Analyzer internal parameters mod-ified	
41	Enter. dia-gnostic mode		Activation of the diagnostic mode for a device diagnostic or a function dia-gnostic	
42	Exited dia-gnostic mode		Exit from diagnostic screen	
43-x	Enter. diag. function	X specifies the function X=0 "Cell tempering endurance"	Activation of functions of the dia-gnostic menu	
44-x	Exited diag. Function	X specifies the function	Exit from the diagnostic menu	

Code	Firmware reference	Title	Comment	Solution / action at User Manual Level (involves no dismounting of any parts)
52-x	Firmware updated	X =1 stands for the Instrument firmware X =2 stands for the Cooling Unit Board firmware	Firmware updated from new files in the USB Flash Drive (automatic)	
53	Reset all results		List of results deleted (on request)	
54	Reset event log		Events deleted (on request)	
55	Reset environment		List of products deleted (on request)	
56	Reset quality control		Quality Control Database reset (on request)	
58	Reset sensors calib.		Probe calibration values reset to factory values stored in the USB Flash Drive (on request)	
59	Reset unit parameters		Internal parameters reset to factory values stored in the USB Flash Drive (on request)	
60	Init of the SD Card		Init off all data stored in the SD card excepted calibration values and run Products, stored in the analyzer internal memory (on request)	
61-x	Board change detected	X=0 CPU board X =1 Application/Control board X =2 MMI board X =3 Cooling Unit board	Information message indicating the replacement of a board	

10.3.3 Failure alarms

Code	Firmware reference	Title	Comment	Comment Solution / action at User Manual Level (involves no dismounting of any parts)
67	24Bits ADC error		No dialogue between the CPU and the A/D converter, used to measure the Sample Temperature and the optical signals	This failure is reported upon detection of no dialogue between the CPU and the A/D converter. Switch the analyzer off then on again. If the failure persists, call for Technical Service for further investigation
68	Cooling Unit Board link	Check the connection	No communication with cooling unit board	Switch off then switch on the analyzer. If failure persists, call for Technical Service for further investigation
69-0	No Head communication	Please verify the head connection	This alarm indicates an absence of communication with the Measurement head. Indicate only when a test is in progress.	Unscrew the head and reinstall it correctly. Restart the test
Sample				
71	Sample Temperature		Measure outside -125°C to 55°C range for 5 s	Switch off then switch on the analyzer. If the failure persists, call for Technical Service for further investigation
73	Jacket temperature		Measure outside -125°C to 65°C range for 5 s	Switch off then switch on the analyzer. If the failure persists, call for Technical Service for further investigation
75	Cabinet Temperature		Measure outside -10°C to +50°C range for 60s	Switch off then switch on the analyzer. If the failure persists, call for Technical Service for further investigation
77	Accelerometer sensor	Check the connection	No communication with accelerometer component located inside the cooler block	Switch off then switch on the analyzer. If failure persists, call for Technical Service for further investigation.
78	Cooler thermistor	Check the connection	No communication with the thermistor component located inside the cooler block and connected to the cooling unit board	Switch off then switch on the analyzer. If the failure persists, call for Technical Service for further investigation

Code	Firmware reference	Title	Comment	Comment Solution / action at User Manual Level (involves no dismounting of any parts)
Optics				
80	Optical Sensor		The automatic adjustment of the optical Emission / Reception can't be performed on the Cloud or Pour Point head	Verify and clean the sensors. Verify the sample
85	No sample detected	Please verify the sample in the tube	In Pour point a first tilt is performed at tests starting. If there is no surface motion detected, this alarm is triggered and the test is stopped. There is no result recorded	Verify the presence of the tube and sample
Heating				
90	Low heating temperature rate		Heating rate too low while heater controlled	Switch off then switch on the analyzer. Restart the test, if the failure persists, call for Technical Service for further investigation
95	Jacket rotation default		Tilting time overpassed; The current test is stopped	Switch off then switch on the analyzer. If the failure persists, call for Technical Service for further investigation
Cooling Unit				
100	Low cooling temperature rate		Sample cooling rate too low while cooling unit controlled	Switch off then switch on the analyzer. Restart the test, if the failure persists, call for Technical Service for further investigation
105	High temperature in jacket!		The jacket temperature is too high	Switch off then switch on the analyzer. If the failure persists, call for Technical Service for further investigation

Code	Firmware reference	Title	Comment	Comment Solution / action at User Manual Level (involves no dismounting of any parts)
Parameters				
110-x	Calibration to do	X specifies the calibration type. X= 4 Cloud point temperature circuit calibration. X= 5 Pour point temperature circuit calibration. X= 6 Jacket temperature circuit calibration X= 7 Cloud point temperature probe table. X= 8 Pour point temperature probe. table X= 9 Jacket temperature probe table	A calibration is out of date and the unit when calibrated has been set to refuse test starting, a new test can not be started	Please perform the requested calibration
111	Water quality	The quality of water is insufficient, repeat the test with pure water, carefully cleaned test jar and sensors	The minimal temperature of overcooled water just before freezing warmer than -4°C indicates the lack of purity.	Clean and dry the test jar and the probe, refill with pure water (distilled) then restart the sample probe calibration
112	Octane purity	The purity of octane is insufficient, repeat the test with pure octane, carefully cleaned test jar and sensors	Stabilization time of the octane freezed insufficient for calibration of the sample probe	Clean and dry the test jar, refill with octane with purity > 97% then restart the sample probe calibration
113	Sensor out of tolerance	Error of referent sample or the sensor is out of limits	During sample probe calibration: correction values not valid for 1/3 DIN class B probe	If the defaults persists, perform calibration of the measurement head electronic measurement circuit. Call for a Service Technician to replace the probe

Code	Firmware reference	Title	Comment	Comment Solution / action at User Manual Level (involves no dismounting of any parts)
115-x	Fail writing to the FS	The system fails to record the data	The system fails to record the data in the Flash memory of the analyzer. In some case the SDCard or USB Flash Drive could be the reason. If SDCard or USB Flash Drive are corrupted, the system could try to open a lot of files or directories which will block the operation with the Flash memory.	Switch off the analyzer and unplug USB Flash Drive. Switch the analyzer on again and restart test. If the analyzer operates, check the USB Flash Drive on a computer: format it in FAT if there are corrupted files. Reinstall USB Flash Drive. If failure persists, switch the analyzer off, set main power switch at the rear in off position, disconnect the analyzer from the mains and remove covers. Remove the SD Card memory on Control Board. Check SD Card on a computer: format it in FAT if there are corrupted files. Reinstall SD card. Reinstall covers, power cable and set main power switch to ON position. Switch the analyzer on again and restart test. If failure persists, call Technical Service for further investigation.
116-x	Parameters File	Parameters file is defective. Internal parameters are initialized	Parameters file is defective or cannot be read. Internal parameters are initialized to factory values	Switch off then switch on the analyzer. If failure persists, upload file from USB Flash Drive if a recent back up exists.
117-x	Operators File	The Operators file is defective. The operator's names are initialized	May occur at power on: the Operators list file in the file system of Flash memory does not exist or cannot be read. The operator names are initialized to factory values (deleted).	Switch off then switch on the analyzer. If failure persists, upload file from USB Flash Drive if a recent back up exists or refill.
119-x	Calibration File	Calibration file is defective. Calibrations are initialized	Calibration file is defective or cannot be read.The Calibrations are initialized to factory values.	Switch off then switch on the analyzer. If the failure persists, please verify the Operator list or upload file from USB Flash Drive if a recent back up exists.
120	Product File	The product file is defective. The product is initialized	The Products file is defective or cannot be read. The product list is initialized to factory values.	Switch off then switch on the analyzer. If the failure persists, upload file from USB Flash Drive if a recent back up exists.

Code	Firmware reference	Title	Comment	Comment Solution / action at User Manual Level (involves no dismounting of any parts)
127	Program Flash Memory		Flash test failed	Switch the analyzer off then on again. If the failure persists, call Technical Service for further investigation.
128	Ram Memory		Ram test failed	Switch the analyzer off then on again. If failure persists, call for Technical Service for further investigation.

10.3.4 Warning messages

Events that could eventually occur during the test and that could influence the result. They are bit coded on the result details page. Navigate to the warning page to have them in a clear message.

Code		Firmware reference	Title	Comment
131	End of test		Occurs when the Cloud Point or the Pour Point is found	Wait for reheating of the sample up to 15°C for displaying of the "New test" key allowing to parameterize the next test
132	End of run on the 1st test		With Pour point test, occurs if sample does not flow at the 1rst tilt of the jacket. The result is noted: " No Pour at first tilt: xx°C " with xx=Temperature of the tilt	Restart the test checking the sample and preparation and the expected point entered
148-x	Calibration to do	X specifies the calibration type. X= 4 Cloud point temperature circuit calibration X= 5 Pour point temperature circuit calibration X= 6 Jacket temperature circuit calibration X= 7 Cloud point temperature probe table X= 8 Pour point temperature probe table X= 9 Jacket temperature probe table Please perform the requested calibration.	The date of the calibration is elapsed but the the test can start if unit is set to allow the test. This can influence the result so the message is stored with the result (bit coded). Navigate to the warning page to have them in a clear message.	Renew the calibration requested

Code		Firmware reference	Title	Comment
149	SD Card not detected	Verify the presence of the SD Card on the control board	No communication with the SD memory card connected on the Control Board	Switch the analyzer off then on again. Remove SD Card memory on Control Board. Check SD Card on a computer and format it in FAT if there are corrupted files. Reinstall SD card. Restart test. If failure persists, replace the SD Card on the Common Board

11. Appendix

11.1. LIMS communication

The data that can be transmitted are divided in 3 groups:

- Result (messages R)
- Run context (messages C)
- Test product (messages T)

To be transmitted, a result must be validated:

- Manual validation can be setup in the LIMS setup menu. The transmission is only possible after the validation in the result menu.
- Automatic validation can be set in the LIMS setup menu.

11.1.1 LIMS by Ethernet

Set the OUTPUT settings in the analyzer internal parameters see *section 6.5.2.1 Analyzer Internal parameters*):

From the Advanced menu, in ***the Instrument Setup / Parameters, select Output Setting / LIMS Ethernet***. Enter an instrument ID, the delimiter and choose if data must be sent automatically after each test or if they need to be validated. The instrument sends data through Ethernet to a computer in its network. The computer needs to have LIMS collector, PAC free software, running on. LIMS collector is available on the analyser USB flash drive.

PC needs (refer to the on-line help if needed):

- Select PMD thumbnail
- Choose which data to receive
- Choose in which folder to create the file
- Press the start button

11.1.2 LIMS through RS232 C link

11.1.2.1 Messages format

Messages only use ASCII charset.

- Message lines are enclosed within brackets.
- Strings values are enclosed within double quotes.
- The two last characters is the line checksum; representing the result of the sum of the ASCII value of each preceding characters (including brackets), expressed in hexa-decimal format.

NOTE
The value 999 indicates that the field is reserved for a future use.

Examples:
(0,"R ","2222 "," ",99, 0, , -15.0 , 2," ", 2)BA
(0,"C ","am ","01 Feb 2017", 0,"15:38 ")F1
(0,"T1","ASTM D5950 ", 0, 2, 0,"ASTM D5950 ", 0, 45.0,-120.0 , , , 100, 0, 350, 9.0, 0)91

11.1.2.2 The result message

Message R1

Temperatures are expressed in °C or °F, corrected or not by barometric correction, depending on the product programmed.

Example:
(1,"R1","WS ", 0, 101.9, 0, 1, 1,0x00000000, 1," ")87
(1,"R2", 91.1, 91.6, 92.0, 92.3, 92.6, 92.9, 93.1, 93.4, 93.7, 94.0)90
(1,"R3", 94.3, 94.7, 95.0, 95.5, 95.9, 96.5, 97.2, 98.0, 99.2,101.2)B6
(1,"R4",109.7, 0, 97.3, 0.9)5F

Meaning of result message fields from left to right

Fields	Format	Number of Characters	Comment
Analyzer no.	from 00 to 99	2	
Type of message	string	2	" R1 "
ID-sample	string	20	
Temperature unit	0 or 1	1	0 = °C, 1 = °F
Atmospheric pressure	999.9	5	
Type of sample	0 to 2	2	0= standard, 1=ethanol blend, 2=B100
Barometric correction	0 or 1	1	0 = No, 1 = Yes
Correlation	0 to 4	1	0 = auto ; 3 = 7C/7F ; 4 = 8C/8F
Warning during the test	hexadecimal	7	Hexadecimal value of the warning binary message
Atmospheric pressure unit	2=mmHg	2	
End of test		2	1= normal distillation 2= end on timeout 3= calculation error 4= water detected 5= stop by operator 6= stop by alarm

Message R2

Fields	Format	Number of Characters	Comment
Analyzer no.	from 00 to 99	2	
Type of message	string	2	" R2 "
Temperatures	999.9	5	Temperatures for every 5% evaporated volumes from IBP to 45%

Message R3

Fields	Format	Number of Characters	Comment
Analyzer no.	from 00 to 99	2	
Type of message	string	2	" R3 "
Temperatures	999.9	5	Temperatures for every 5% volumes from 50% to 95%

Message R4

Fields	Format	Number of Characters	Comment
Analyzer no.	from 00 to 99	2	
Type of message	string	2	" R4 "
Temperature for FBP	999.9	5	Final Boiling Point
Heating adjustment	0 or 1	1	Final Boiling Point
Percent recovery %R	999.9	5	
Residue %r	999.9	5	

11.1.2.3 Temperature specification message

When a temperature specification is programmed in the test product, the “Temperature specification” message is systematically transmitted

Example:
(1,"ST", 0.0, 91.1)C8
(1,"ST",128.0,109.7)09

Temperatures are expressed in °C or °F, corrected or not by barometric correction, depending on the product programmed.

Meaning of result message fields from left to right

Fields	Format	Number of Characters	Comment
Analyzer no.	from 00 to 99	2	
Type of message	string	2	" R " = result
Specified volume (%)	999.9	2	0=IBP, 128=FBP
Corresponding temperature	999.9	5	

11.1.2.4 Volume specification message

When a volume specification is programmed in the test product, the “Volume specification” message is systematically transmitted

Example:
(1,"SV", -3.0, 0.9)C8
(1,"SV", -2.0, 97.3)E1
(1,"SV", 80.0,)99
(1,"SV",120.0,)A4

Temperatures are expressed in °C or °F, corrected or not by barometric correction, depending on the product programmed.

Meaning of result message fields from left to right

Fields	Format	Number of Characters	Comment
Analyzer no.	from 00 to 99	2	
Type of message	string	2	" SV "
Specified temperature	999.9	5	-2=%R; -3= %r
Corresponding volume	99.9	5	

11.1.2.5 Message R : The result message

Temperatures are expressed in °C or °F, depending on the programmed product.
Example:
(0,"R ","2222 "," ",99, 0, , -15.0 , 2," ", 2)BA

Meaning of result message fields from left to right

Fields	Format	Number of Characters	Comment
Analyzer no.	from 00 to 99	2	
Type of message	string	2	" R " = result
ID - sample	string	20	
Reserve	string	20	
Reserve	99	2	
Temperature unit	00 to 01	2	0 = °C, 1 = °F
Expected PP	-999.9 to 9999.9	7	
CPP result	-999.9 to 9999.9	7	
Test type	01 to 02	2	01= cloud test, 02= pour test
Reserve	string	1	
Type of end of test	00 to 06	2	

Type of end of test

Value	Signification
1	normal Cloud end of test
2	normal Pour end of test
3	end of test on stop temperature
4	end of test by end of cooling profile reached
5	end of test by number of test reached after EP
6	end of test by detection at the first tiling

11.1.2.6 Message C : The run context message

Example:
(0,"C ","am ","01 Feb 2017", 0,"15:38 ")F1

Meaning of run context message fields from left to right

Field	Format	Numbers of Characters	Comment
Analyzer no.	from 00 to 99	2	
Type of message	string	2	" C "= Context
Operator name	string	20	
Date	string	10	
Date format	from 00 to 07	2	
Time	string	6	

Date format

Value	Signification
0	DDMonthYYYY
1	MonthDDYYYY
2	YYYYMonthDD
3	YYYYDDMonth
4	DD.MM.YYYY
5	MM/DD/YYYY
6	YYYY-MM-DD
7	YYYY DD MM

11.1.2.7 Message T : The test product message

Example:
(0,"T1","ASTM D5950 ", 0, 2, 0,"ASTM D5950 ", 0, 45.0,-120.0 , , , 100, 0, 350, 9.0, 0)91

Meaning of product message fields from left to right

Field	Format	Numbers of Characters	Comment
Analyzer no.	00 to 99	2	
Message type	string	2	“ T1 “ = test product
Product name	string	20	
Temperature unit	00 or 01	2	0 = °C 1 = °F
Test Type	01 to 02	2	01= cloud test, 02= pour test
Type of sample	00	2	0= routine sample, 1=QC sample
Cooling Profile name	string	20	
Preheating	00 to01	2	0=NO, 1=Yes
Preheating temperature	-999.9 to 9999.9	6	
STOP temperature	-999.9 to 9999.9	6	
Spec mini	-999.9 to 9999.9	6	
Spec maxi	-999.9 to 9999.9	6	
CP detection level	99999	5	
Rounding of result	00 or 01	2	0 = No 1 = Yes
PP detection level	99999	5	
Start at EP+ xx°	9999.9	6	
Stop after 3 tests	00 or 01	2	0 = No 1 = Yes

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