# ORBIS BV
*Innovation in distillation*

# STARDist

## Automatic Distillation testing
by Orbis BV

# STARDIST - NEW FEATURES

## PreScan

The sample temperature and exact percentage of volume are measured by the Volume Scan before the start of each test. Receiving chamber temperature is then automatically set to sample temperature to eliminate incorrect volume measurement due to thermal expansion. Subsequently, the actual measured volume is corrected to 100% volume.

## Flask Installer

The simple and elegant flask holder design ensures easy and correct positioning of the distillation flask for both 125 ml and 200 ml flasks. Moreover it ensures that the probe's height in relation to the flask's side arm is always correct.

## Optical Dry Sense

This unique built-in feature for Dry Point Detection eliminates the need for an external dry point sensor. It ensures higher accuracy and easier handling while keeping operating costs low. Especially suitable for tests in which dry point detection is required (tests according to ASTM D850 & D1078, but also D86 and other related methods).

## Voc Cold Trap

Designed to minimize evaporation loss of volatile organic compounds, this unique built-in feature ensures safer surroundings while improving the accuracy and repeatability of distillation results.

## Automatic Heater Lift

The new automatic heater lift applies the correct upward pressure to the flask and shortens the after-test cooling period by automatically lowering the heater when the test is finished.

## HD Volume Scan

The second generation Volume Scan is equipped with a HD CCD camera that provides two times the precision and accuracy of its predecessor in the former PAMv2 distillation unit. Includes Peltier controlled temperature regulation.

Accurate

Advanced

Intuitive

# ... MORE NEW FEATURES

## Advanced Heat Control

Early-on detection of the distillation behavior and smart internal algorithms enable real-time accurate heater control. This results in increased IBP/FBP repeatability, "right-in-time" IBP detection and a distillation rate kept smoothly between 4 - 5 ml per min., even with complicated blends such as 20% ethanol-in-gasoline. Automatic final heat is automatically optimized for any type of sample, even for "heavy tail" samples.

## Condenser Cooling

Liquid-free condenser cooling equipped with peltier elements and heat-pipe assisted heat sinks ensures powerful and maintenance friendly operation.

## Software app

Simple screens and logical navigation structure give users quick access to basic functions such as "choose program", "start test", "monitor distillation" and "view results". Custom distillation points, such as **volume at 250°C**, can be added to the test results even after the test is finished. Password protected access allows experienced users to customize program settings and manage menus for connection to LIMS and Windows PC, printing, calibration and more. Storage on built-in iPad: 20.000 results, 1.000 programs and 100 users.

## Fast Heater Cooling

2 adjustable and powerful fans ensure quick heater and flask cooling after the test is finished.

## Fire Detection

Sensitive UV fire detection sensor and connection to N / CO2 for built-in fire extinguisher.
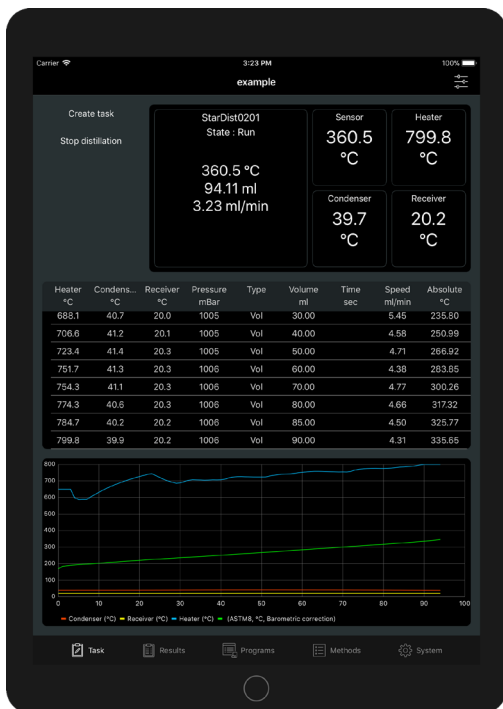
## Built-in Drop Deflector

Increases ease of use and reduces operator mistakes from misplacing or forgetting to insert drop deflector.
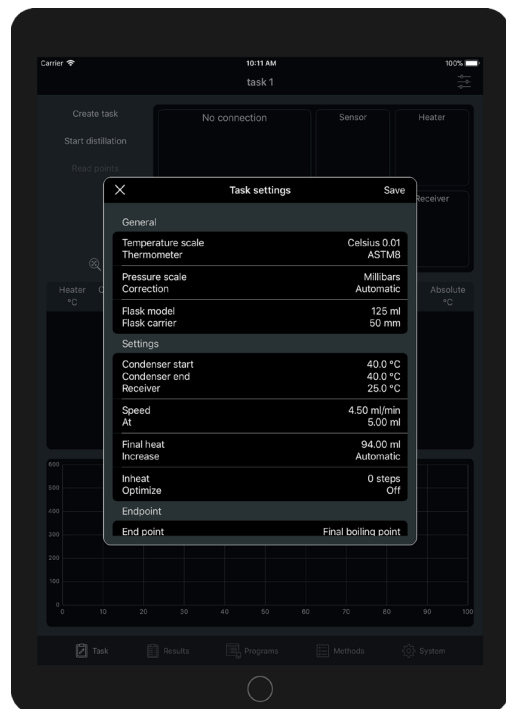
Safe
Precise
Reliable

Intuitive and easy to use interface helps operators to start and run distillation tests without making mistakes.
Quick real-time overview of test data in the task screen, with more details just one click away.

Create and customize program settings for specific products, or simply "Optimize" the program based on automatic suggestions from the previous test. Easy 1-step program creation based on pre-defined method settings. Requires authorized user and password.
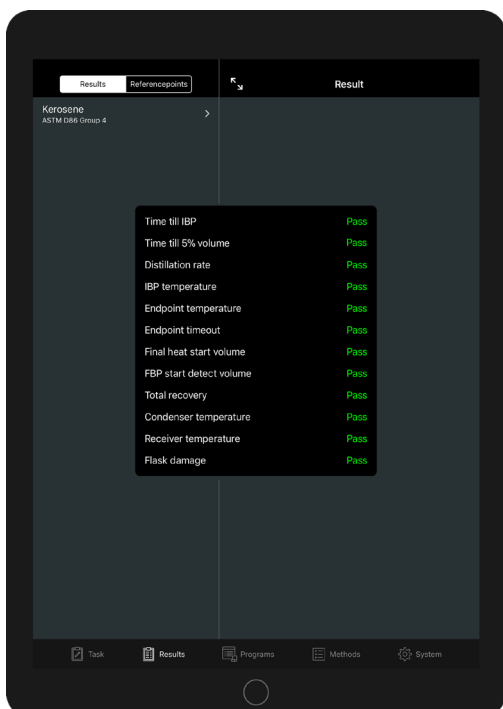




"Pass / Fail" test validation helps operators process only those results that are obtained from correctly executed tests. The validation is based on pre-defined method limits such as "Time to IBP", "IBP/FBP temperature", "Condenser/receiver temperature", distillation rate, etc.
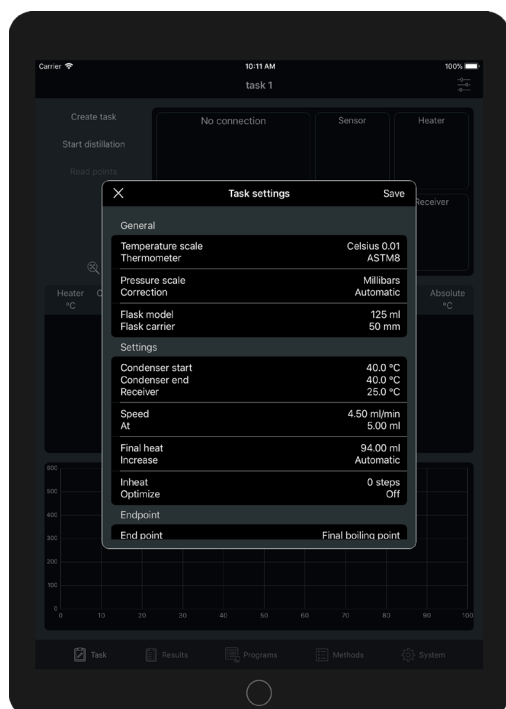
Test reports are printed on a wired kiosk printer or on any AirPrint device.
RJ45 port and setup menu available for FTP connection to LIMS or Windows PC.
Local storage capacity: 20,000 samples, 1,000 programs, 100 users.

# Technical specifications

| Methods | ASTM D86, D1078, D850, E123, IP195, DIN51751, ISO 3405, GOST 2177, JIS K2254. |
|---|---|
| User interface | iPad with STARDist app software. *Available in App Store. App & updates are free of charge.* |
| Operator support features | PreScan: volume and temperature of sample-filled receiver are measured in the receiving chamber before each test. Actual measured volume is then corrected to 100% volume. Receiving chamber temperature is automatically set to sample temperature, provided it is whitin the method-prescribed limits.<br>START check: 1. Heater plate size. 2. PT-100 probe placed in flask. 3. Heater door closed. (*Must be confirmed before test to start*)<br>Results validation: quick pass / fail test validation against method-prescribed limits such as "time to IBP", "FBP temp.", etc.<br>Optimization: automatically optimizes program settings with fixed InHeat and Final Heat settings after first distillation test.<br>Flask Installer: ensures easy and correct upright flask positioning for both 125 ml and 200 ml flasks. The vapor probe's height position relative to the flask's side arm is always correct thanks to the vapor probe design in combination with the strict flask dimensions. |
| Heating control | Kalman Filter technology: multiparameter-based algorithm calculates and applies the required heater settings for IBP, FBP and (4-5 ml/p min.) speed control in real-time. Suitable for unknown samples and/or complicated blends such as E20. |
| Heating system | Low mass/low voltage heater. 2 user adjustable fans for extra fast cooling after test.<br>Automatic heater lift with correct flask pressure & positioning. Automatic shut-off in case of fire. |
| Condenser cooling | Solid state: based on Peltier elements with heat-pipe assisted heat sinks and silent fans for heat dissipation. No liquids involved. Condenser temperature can be increased during the distillation to deal with "light start / heavy end" products to prevent both evaporation loss and product waxing in the condenser tube. Temperature range: 0 – 65°C. Resolution 0.1°C. |
| Volume detection | Smart HD CCD camera for accurate volume measurement. Detects actual bottom of meniscus. Suitable for "smoke producing" products. Each-test automatic calibration of the camera based on calibrated ring marks on receiver cylinder.<br>Resolution: 0.01 ml, accuracy: 0.01 ml, charge volume: 0-105%. |
| Receiving chamber | Built-in drop deflector. Cooling: similar to condenser cooling. 1 sensor for receiver chamber temperature and 1 sensor for sample temperature. Automatic lift moves receiver cylinder up to be sealed at the top, where a small hole ensures exposure to atmospheric pressure. *A small tube, laid along the condenser tube and connected to this hole, acts as "VOC Cold Trap", preventing vapors from escaping the receiver (loss). At the end of this tube a VOC extractor can be connected dissipate VOC emissions.*<br>Temperature range: 0 – 45°C. Resolution 0.1°C. |
| Residue & Loss | Various options: automatic prediction, automatic measurement, manual measurement and preset value. Loss correction is automatically applied to temperature readings. |
| Vapor temperature measurement | PT-100 class A probe with 10-point calibration data storage and automatic probe ID detection. Calibration certificate standard supplied. True dynamic simulation of ASTM 7 & 8 in-glass thermometer behavior (lag time and emergent stem).<br>Range: 0 – 450°C ASTM / 0 – 500°C absolute. Temperature units: °C, °F. |
| Dry point detection | Optical Dry Sense: IR sensor for automatic detection of the dry point. No dry point probe required. *(Conventional dry point probe is still available as option)* |
| Pressure | Built-in pressure sensor. Automatic correction of temperature results to atmospheric pressure.<br>Range: 70 to 110 kPa, resolution 0.1 kPa. Pressure units: kPa, mmHg, mbar, psi, mWc, hPa. |
| Cetane index | Function for automatic calculation of cetane index included. |
| Fire safety | UV sensor for fire detection. Built-in fire extinguisher. N or CO2 supply required from lab |
| System health | Automatic quick system health check before every distillation run to ensure all components are in excellent state. |
| Connectivity | 1 x RJ45 (LAN) for connection to LIMS, Windows PC, FTP server, Kiosk printer and/or connection between multiple STARDist units. |
| Dimensions | Dimensions: 40cm x 40cm x 63cm (WxDxH), weight: 40 kg |
| Accessories | Kiosk printer |
| Voltage | 100-240 VAC 50/60 Hz |
| Power | 1200 W |
| Lab conditions | Environment temperature 10°C – 30°C. Environment humidity up to 80 % at 30°C. |

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Manufactured in The Netherlands

# STARDist ordering information

## STARDist Automatic Distillation Unit

**Part No. 913000. Includes:**

- PT-100 temp. probe including calibration report
- Distillation flask 125 ml straight neck
- Centering device for 125 ml flask
- 100 ml receiver with brass foot
- 38 mm ceran heater plate
- 50 mm ceran heater plate
- Boiling stones 25 gr.
- Condenser cleaning tool

## ASTM D1078 / D850 pack

**(Add-on pack for main unit 913000)**

**Part No. 919114. Includes:**

- 25 mm ceran heater plate
- 32 mm ceran heater plate
- Distillation flask 200 ml straight neck
- Centering device for 200 ml flask

## Accessories and consumables:

Part No. 919103 - Kiosk printer

Part No. 919061 - Heater element for STARDist

Part No. 919109 - PT-100 vapor probe

Part No. 919107 - Centering device 125 ml flask

Part No. 919108 - Centering device for 200 ml flask

Part No. 919030 - Set of 5: Distillation flask 125 ml

Part No. 919031 - Set of 5: Distillation flask 200 ml

Part No. 919105 - 100 ml receiver with brass foot

Part No. 919106 - Set of 5: 100 ml receiver without foot

Part No. 919071 - Set of 5: Distillation stopper cap

Part No. 919033 - 25 mm ceran heater plate

Part No. 919034 - 32 mm ceran heater plate

Part No. 919035 - 38 mm ceran heater plate

Part No. 919036 - 50 mm ceran heater plate

Part No. 919081 - Boiling stones 25 gr.

Part No. 919039 - Condenser cleaning tool

# OTHER ORBIS BV PRODUCTS:

## AIRSTAR CFPP

Automatic Cold Filter Plugging Point Testing

## AIRSTAR CPPP

Automatic Cloud and Pour Point Testing

Features:

- ColdBlock: AirSTAR's integrated cooling unit ( to -105°C)
- CFPP & CP/PP Heads: easy to use & exchangeable
- Completely according to traditional test methods



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