

# ORBIS BV

*Innovation in distillation*



# STARDist

Automatic Distillation testing  
by Orbis BV

# STARDIST - UNIQUE FEATURES

## Optical Dry Point

This unique feature for Dry Point Detection eliminates the need for an external dry point sensor. It ensures high accuracy and easier handling while keeping operating costs low. Especially suitable for ASTM D850 & D1078 and D86 + dry point tests.

## Flask Installer

The new flask holder design ensures easy and correct positioning of the distillation flask for both 125 ml and 200 ml flasks. It ensures always-correct probe positioning in relation to the flask's side arm.

## PreScan

The sample temperature and exact volume are measured by the Volume Scan before 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.

## Prepare Guide

Every detail counts. Whether it is a clean condenser or a correct heater plate size, many small details will influence the test behavior and results. The Prepare Guide helps the operator to strictly follow all the essential steps to performing a method-compliant distillation test and achieve excellent and repeatable test results. For experienced operators, the Prepare Guide can be switched off in the administrator access screen.

## Advanced Heat Control

Early-on detection of the distillation behavior and smart internal algorithms ensure 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.

## Built-in Drop Deflector

Reduces operator mistakes from misplacing or forgetting to insert drop deflector.

## Fast Heater Cooling

2 powerful fans ensure quick heater and flask cooling after the test is finished (or if the operator chooses to abort the test prematurely, too).

## Automatic Heater Lift

The new automatic heater lift applies the correct upward pressure to the flask and automatically lowers the heater after each test.

## 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.

## 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.



## Condenser Cooling

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

## Fire Detection

UV fire detection sensor and connection to N / CO2 for built-in fire extinguisher. Built-in pressure sensor detects whether N/CO2 is connected properly.

Accurate

Advanced

Intuitive

## Technical specifications

Methods	ASTM D86, D1078, D850, E123, IP195, DIN51751, ISO 3405, GOST 2177, JIS K2254.
User interface	iPad with STARDist app software. <i>Available in App Store. App &amp; updates are free of charge.</i>
Operator support features	<u>PreScan</u> : 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 within the method-prescribed limits. <u>Prepare guide</u> : guides operator through entire start procedure, from sample storage temperature to heater plate size. <u>Results validation</u> : real-time pass / fail test validation against method-prescribed limits such as "time to IBP", "FBP temp.", etc. <u>Optimization</u> : automatically optimizes program settings with fixed InHeat and Final Heat settings after first distillation test. <u>Flask Installer</u> : 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	Multiparameter-based algorithm calculates and applies the required heater settings for IBP, FBP and distillation rate 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. 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. 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. <i>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.</i> 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). Range: 0 – 450 °C ASTM / 0 – 500 °C absolute. Temperature units: °C, °F.
Dry point detection	Optical Dry Point: built-in IR sensor for automatic detection of the dry point. No dry point probe required. <i>(Conventional dry point probe is still available as option)</i>
Pressure	Built-in pressure sensor. Automatic correction of temperature results to atmospheric pressure. 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	Built-in fire extinguisher with UV sensor. Connection (pressure) automatically detected). 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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## STARDist ordering information

### Basic Consumable Kit

"ASTM D86"

#### Part No. 913030. 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
- Distillation side arm stopper cap
- 38 mm ceran heater plate
- 50 mm ceran heater plate
- Boiling stones 25 gr.
- Condenser cleaning tool

### STARDist Automatic Distillation Unit

Part No. 913021. (Consumable kit PN913030 required for operation)

### ASTM D1078 / D850 pack

(Add-on pack for basic kit PN913030)

#### 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
- (No dry point probe required: Optical Dry Point sensor built-in)

### Accessories and consumables:

Part No. 919103 - Kiosk printer  
Part No. 919061 - Heater element for STARDist  
Part No. 919123 - PT-100 vapor probe  
Part No. 919120 - Centering device 125 ml flask  
Part No. 919121 - 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. #11003 - Condenser 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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