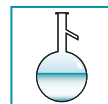




# Distillation at Atmospheric Pressure - ADU 4+ (automatic)



Petroleum Products:  
**ASTM D 86 - ISO 3405 - IP 123 - JIS K2254**

Solvents:  
**ASTM D 850 - ASTM D 1078 - IP 195**

## ADU 4+ Automatic Distillation Unit

With the included accessories suitable for:

- **Petroleum Products at Atmospheric Pressure**

With further accessories suitable for:

- **Industrial Aromatic Hydrocarbons**
- **Volatile Organic Liquids**

### Consisting of:

Distillation Unit (with or without Dry-Point Detection)  
 integrated are: - **Fire-Extinguisher** (for CO<sub>2</sub> or N<sub>2</sub>)

- **Cooling system**
- **ADUpro-software**
- **Computer with external flat screen monitor**
- **Glassware set according ASTM D 86 (Group 1-4)**

### Further available:

- **Glassware Set (Group 0)** acc. ASTM D 86
- **Glassware Set (Solvents)** acc. ASTM D 850 - ASTM D 1078 - IP 195
- **Dry-point sensor** (depending on the flask size)
- **Spare Part Set (ASTM D 86)** for approx. 12 months operation

### Recommendable Extensions:

- **Ink-Jet Color Printer** (25-0807)  
 Recommended for using ADUPro to print result lists and graphics

## Main Unit

### ADU 4+ Automatic Distillation Unit

Petroleum Products: ASTM D 86 - IP 123 - ISO 3405 - JIS K2254

#### Features:

- Volume detection by solid state light barrier system
- High grade steel cabinet, two color powder coated
- Temperature controlled swing-out receiver chamber
- Chamber tempering can be switched-over automatically during a test from group 1 to 4.
- Integrated computer (with Windows & ADUpro Software)
- LIMS, impact or ink-jet printer are connectable

#### Consisting of:

##### Coolant-compressor:

Integrated PID-Temping-System with 350 W max. cooling capacity.

##### Fire extinguishing system:

Automatic detection & release or manual release via push-button on the front of the unit. Requires external CO<sub>2</sub> or N<sub>2</sub> supply, 6 - 12 bar.

##### Software ADUPro with following functions:

- *Heat-Parameter Optimizer:*  
 This software automatically recommends adequate heat parameters for the next test run.
- *Pre-selectable Temperature-Spread-Sheet:*  
 In addition to the Volume-Spread-Sheet this software-module allows to select the required temperature values (corrected temp.) and the corresponding volumes recovered.

##### Internal Computer:

built-in PC (details upon request) with Windows 7 (32 bit) software, attached color flat screen monitor, keyboard & mouse included.

##### Mechanical device features:

High-grade stainless steel housing with two-color powder coating, digital display, membran keys. Heating cabinet with built-in fire-extinguisher, microprocessor controlled electric heater (1200 W), temperature probe and jack for height adjustment of flask. Condenser tube with water jacket (tempering by internal circulator). Recovery cabinet with light barrier detection.

##### Supplied with:

- 1 glassware set according ASTM D 86 (group 1-4)  
 (1 flask 125 ml, 2 glass-ceramic plates with hole 1x Ø 38 & 1x Ø 50 mm)
- 1 stopper PTFE 19/26 to hold the temperature probe
- 1 cylinder 100 ml graduated, with metal base
- 1 drip tongue
- 1 cooler anti-freezing agent (1.5 l)
- 1 stopper to connect flask condenser tube
- 1 cleaning coil for the condenser tube
- 1 Diesel test sample (300 ml bottle) with boiling stones (1 g)
- 1 measuring cylinder 5 ml
- 1 glass tube with O-ring, to store the temperature probe
- 1 connection set (0-modem cable, RS232-adaptor (9 - 25 pin), USB-converter (USB - 9 pin))

##### Note:

- For ASTM D 86 Group 0 further accessories are required.
- For solvents (ASTM D 850, ASTM D 1078, IP 195) see 11-5583 with built-in dry-point detection

##### Technical Data:

Working range : 0 to +450°C (sample temperature), 0 to +80°C (cooler)  
 Distillation groups : 1 to 4, (0 and solvents with further accessories)  
 Heating capacity : 1200 W  
 Cooling capacity : 350 W max.  
 Interfaces : 6 x USB 2.0, 1 x each PS/2, eSATA, HDMI, SPDIF, DVI, VGA, Audio, LAN  
 Dimensions : 409 x 595 x 968 mm (WxDxH), Weight: 54 kg

11-5580 Power supply : 230 V, 50/60 Hz, 3000 W, EU-plug



11-5580



11-5582

### ADU 4+ Automatic Distillation Unit with Dry-Point Detection

Petroleum Products : ASTM D 86 - IP 123 - ISO 3405 - JIS K2254

With further accessories suitable for:

Industrial Aromatic Hydrocarbons : ASTM D 850

Volatile Organic Liquids : ASTM D 1078 - IP 195

Like 11-5580 but:

#### Software ADUPro with the following additional functions:

- Support for distillation of solvents acc. to ASTM D 850 & ASTM D 1078:

A library with preset parameters for different solvents is available to ease test operation.

#### Note:

- For ASTM D 86 group 0 further accessories are required.

- For solvents (ASTM D 850, ASTM D 1078, IP 195) further accessories are required.

11-5582 Power supply : 230 V, 50/60 Hz, 3000 W, EU-plug

### Accessories

#### 11-0546 Glassware Set (Group 0-4) ASTM D 86 - ISO 3405 - IP 123 - JIS K2254

Comprising:

1 flask 100 ml, neck 19/26 (group 0)  
1 glass-ceramic plate with hole Ø 32 mm (group 0)  
1 flask 125 ml, neck 19/26 (group 1-4)  
1 glass-ceramic plate with hole Ø 38 mm (group 1-4)  
1 glass-ceramic plate with hole Ø 50 mm (group 1-4)

11-0524 Distillation flask, 125 ml, quartz glass, ground socket (NS 19/26)  
with thermometer immersion-mark, side pipe Ø 7 mm (for temperatures above 370 °C)

11-0588 Dry-Point Sensor (fits 100/125 ml flask)

#### 11-0547 Glassware Set (Solvents) ASTM D 850 - ASTM D 1078 - IP 195

Comprising:

1 flask 200 ml, neck 19/26  
1 glass-ceramic plate with hole Ø 25 mm  
1 glass-ceramic plate with hole Ø 32 mm  
1 glass-ceramic plate with hole Ø 38 mm  
1 glass-ceramic plate with hole Ø 50 mm

11-0587 Dry-Point Sensor (fits 200 ml flask)

11-0596 Measuring Cylinder "HR", 100 ml, borosilicate glass, graduated  
(complete tube, metal base with solvent resistant KALREZ O-ring)

11-0597 O-Ring Set (Chemraz), solvent resistant (for condenser tube stopper and flask-neck)

11-0575 Anti-Dazzle Screen (for dazzling-free dry-point observations)

11-5571 Volume-Detection Calibration Set ADU4+,  
Comprising: burette (50:0.1 ml) and burette holder set

11-0582 Temperature Calibration Set,  
Comprising: calibration-resistor-set and thermometer IP 39C (officially certified)

11-0590 Reference Liquid for Distillation  
.. of Mineral Oil Products (Boiling Characteristics) ASTM D 86 - ISO 3405, 255 ml  
initial boiling point approx. 160°C / final boiling point approx. 360°C

11-0591 .. of Gasoline (Unleaded) ASTM D 86, 250 ml, certified value approx. 34 °C - 180 °C

11-0593 .. of Diesel ASTM D 86, 250 ml, certified value approx 165 °C - 362 °C

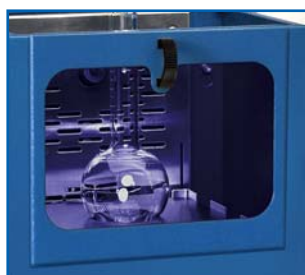
25-0807 Ink-Jet Printer (color) for single sheet paper (instead of a PC), USB-data connecton  
Power supply: 230 V, 50/60 Hz



11-0546



11-0547



11-0575



11-0574

### Spare Parts

11-0574 Spare Parts Set ASTM D 86  
(group 1-4) for approx. 1 year:  
10x 11-0515 (125 ml flask),  
2x 11-0554 (100 ml cylinder),  
1x 11-0558 (5 stoppers),  
1x 11-0559 (temperature probe),  
1x 11-0567 (drip tongue)

11-5540 Anti-Freezing Agent (1.5 l) for cooler

Distillation Flask, ground socket  
(NS 19/26) with thermometer  
immersion-mark, side pipe Ø 7 mm,  
11-0514 100 ml (group 0)  
11-0515 125 ml (group 1-4)  
11-0524 125 ml (group 1-4) (for above 370°C)  
11-0517 200 ml (solvents)