

Distillation at Atmospheric Pressure - DU 4 (manual)

ASTM D 86, ASTM D 850, ASTM D 1078, ISO 3405, DIN 51751 (obs.), IP 123, IP 195, JIS K2254, NF M07-002 (obs.)

Product group(s): Distillation

User group(s): Biodiesel, Diesel, Fuel, Gas Oil, Jet Fuel, Kerosene, Solvent, Turbine Fuel

Scope: For the examination of motor gasolines, aviation gasolines, aviation turbine fuels, special boiling point spirits, naphthas, white spirits, kerosines, gas oils, distillate fuel oils and similar petroleum products.

Due to the rear gold coating the heater rods emit an oriented radiation.

This means a reduction of scattered heat radiation resulting in lower requirements for heating energy.

Moreover, supported by the reflecting effect of stainless steel housing, it is not only possible to omit insulation asbestos but to omit all temperature insulation.

This design also provides a faster cool down of the apparatus after completion of a distillation procedure.

A very important aspect is the encased construction of the heater rods, which ensures protection against contact of live parts.

Thus, in contrast to constructions with exposed heating coils, Petrotest® distillation devices fulfill the VDE-safety requirements.

VDE = German Electro-Engineer's Association

Optional available with:

- Long Life High Efficiency Heater
- Heatable Bath
- built-in Re-Cooling-Fan
- built-in Fire-Extinguisher



DU 4 - Distillation Units

suitable due to the ordered glassware (*not included*) for:

- Petroleum Products at Atmospheric Pressure
- Industrial Aromatic Hydrocarbons
- Volatile Organic Liquids

Distillation Groups 0 ... 3 with a maximum test temperature up to +300 °C

Distillation Groups 0 ... 4 with a maximum test temperature up to +400 °C
(such as diesel, bunkerfuel and solvents)

DU 4 - Distillation Units

available as:

- **Economy Versions** (Eco, EcoPlus, EcoThermo and EcoThermoPlus)
- **Professional Versions** (Pro and ProThermo)

to be composed of:

- **Distillation Unit** (Economy or Professional Version)
- **Glas-Test-Kit**

Technical Data

Distillation Group **0** suitable for **Natural Gasoline**
 Distillation Groups **1+2** suitable for **Automotive Gasoline**
 Distillation Group **3** suitable for **Aviation Gasoline**
 Distillation Group **4** suitable for **Gas Oil**

DU 4 - Distillation Units require counter-cooling for the water-bath.
 For your convenience we offer circulators complete with accessories to connect:

1 DU 4 - Unit at **1 circulator** (11-0925 or 11-0926)
or up to
4 DU 4 - Units at **1 circulator** (11-0240 or 11-0241).

Main Unit

11-0900	<p>DU 4 Eco - Distillation Unit Depending on the ordered accessories suitable for:</p> <p><u>Petroleum Products:</u> ASTM D 86 - JIS K2254 - IP 123 - ISO 3405 (DIN 51 751 - NF M07-002)</p> <p><u>Industrial Aromatic Hydrocarbons:</u> ASTM D 850</p> <p><u>Volatile Organic Liquids:</u> ASTM D 1078 - IP 195</p> <p><i>Distillation group: 0 - 3 (0 - 4 up to 300 °C)</i></p> <p><u>Consisting of:</u> Electric Heating Assembly: made of stainless steel with inspection window, adjustable flask support, incorporated electronic power regulator, electric 800 W or 1200 W heater</p> <p><u>Cooling Bath:</u> made of stainless steel, complete with water in-and out-nozzles, bath cover with thermometer holder, stainless steel condenser tube inclined to the right, cooling by ice or external cooler</p> <p><u>Glassware:</u> on separate order, due to the different available standards</p> <p>Power supply: 230 V, 50/60 Hz, 800 W</p>
11-0901	<p>DU 4 Eco - Distillation Unit <u>Like 11-0900 but:</u> Power supply: 115 V, 50/60 Hz, 800 W</p>
11-0904	<p>DU 4 EcoPlus - Distillation Unit with high efficiency heater</p> <p>Depending on the ordered accessories suitable for:</p> <p><u>Petroleum Products:</u> ASTM D 86 - JIS K2254 - IP 123 - ISO 3405 (DIN 51 751 - NF M07-002)</p> <p><u>Industrial Aromatic Hydrocarbons:</u> ASTM D 850</p> <p><u>Volatile Organic Liquids:</u> ASTM D 1078 - IP 195</p> <p><i>Distillation group: 0 - 4 (up to 400 °C)</i></p> <p><u>Like 11-0900 (DU 4 Eco) but:</u> with 1200 W high efficiency heater and external bath-tempering</p> <p>Power supply: 230 V, 50/60 Hz, 1200 W</p>
11-0905	<p>DU 4 EcoPlus - Distillation Unit with high efficiency heater</p> <p><u>Like 11-0904 but:</u> Power supply: 115 V, 50/60 Hz, 1200 W</p>
11-0902	<p>DU 4 EcoThermo - Distillation-Unit with heatable bath</p> <p>Depending on the ordered accessories suitable for:</p> <p><u>Petroleum Products:</u> ASTM D 86 - JIS K2254 - IP 123 - ISO 3405 (DIN 51 751 - NF M07-002)</p>

Industrial Aromatic Hydrocarbons: ASTM D 850

Volatile Organic Liquids: ASTM D 1078 - IP 195

Distillation group: 0 - 3 (0 - 4 up to 300 °C)

Like 11-0900 (DU 4 Eco) but:
with **800 W** heater and built-in **bath-heater** but
external bath-cooling

Power supply: 230 V, 50/60 Hz, 800 W

**11-0903 DU 4 EcoThermo - Distillation Unit
with heatable bath**

Like 11-0902 but:
Power supply: 115 V, 50/60 Hz, 800 W

**11-0906 DU 4 EcoThermoPlus - Distillation Unit
with heatable bath & high efficiency heater**

Depending on the ordered accessories suitable for:

Petroleum Products:
ASTM D 86 - JIS K2254 - IP 123 - ISO 3405
(DIN 51 751 - NF M07-002)

Industrial Aromatic Hydrocarbons: ASTM D 850

Volatile Organic Liquids: ASTM D 1078 - IP 195

Distillation group: 0 - 4 (up to 400 °C)

Like 11-0900 (DU 4 Eco) but:
1200 W high efficiency heater and built-in **bath-heater** but external bath-cooling

Power supply: 230 V, 50/60 Hz, 1200 W

**11-0907 DU 4 EcoThermoPlus - Distillation Unit
with heatable bath & high efficiency heater**

Like 11-0906 but:
Power supply: 115 V, 50/60 Hz, 1200 W

**11-0910 DU 4 Pro - Distillation Unit
with high efficiency heater & fire-extinguisher**

Depending on the ordered accessories suitable for:

Petroleum Products:
ASTM D 86 - JIS K2254 - IP 123 - ISO 3405
(DIN 51 751 - NF M07-002)

Industrial Aromatic Hydrocarbons: ASTM D 850

Volatile Organic Liquids: ASTM D 1078 - IP 195

Distillation group: 0 - 4 (up to 400 °C)

Consisting of:

Electric Heating Assembly: made of stainless steel with inspection window, adjustable flask support, incorporated electronic power regulator, **high-efficiency 1200 W heater** for boiling temperatures up to 400°C, built-in **re-cooling fan** and manual released **fire-extinguisher**

Cooling Bath:
made of stainless steel, complete with water in-and out-nozzles, bath cover with thermometer holder & **liquid level indicator**, stainless steel condenser tube inclined to the right, cooling by ice or external cooler

Glassware:

on separate order, due to the different available standards

Power supply: 230 V, 50/60 Hz, 1200 W

**11-0911 DU 4 Pro - Distillation Unit
with high efficiency heater & fire-extinguisher**

Like 11-0910 but:

Power supply: 115 V, 50/60 Hz, 1200 W

**11-0912 DU 4 ProThermo - Distillation Unit
with high efficiency heater, fire-extinguisher & heatable bath**

Depending on the ordered accessories suitable for:

Petroleum Products: ASTM D 86 - JIS K2254

IP 123 - ISO 3405 (DIN 51751 - NF M07-002)

Industrial Aromatic Hydrocarbons: ASTM D 850

Volatile Organic Liquids: ASTM D 1078 - IP 195

Distillation group: 0 - 4 (up to 400 °C)

Like 11-0910 (DU 4 Pro) but:

with **1200 W** high efficiency heater, **fire-extinguisher** and built-in **bath-heater** but external bath-cooling

Power supply: 230 V, 50/60 Hz, 1200 W

**11-0913 DU 4 ProThermo - Distillation Unit
with high efficiency heater, fire-extinguisher & heatable bath**

Like 11-0912 but:

Power supply: 115 V, 50/60 Hz, 1200 W

11-0051 Test Kit - ASTM D 86

ASTM D 86 - IP 123 - ISO 3405

Consisting of:

- 1 distillation flask 100 ml, flanged rim
- 1 distillation flask 125 ml, flanged rim
- 1 measuring cylinder 100 ml, graduated
- 1 heater support board, center hole Ø 32 mm (1 ¼")
- 1 heater support board, center hole Ø 38 mm (1 ½")
- 1 heater support board, center hole Ø 50 mm (2")
- 1 thermometer ASTM 7C / IP 5C (range -2 to +300 °C)
- 1 thermometer ASTM 8C / IP 6C (range -2 to +400 °C)
- 2 stoppers, silicone, for thermometer
(Ø22/25 mm, bored Ø 6 mm)
- 1 stopper, silicone (Ø14.5/20 mm, bored Ø 7 mm)



11-0097 Test Kit - ASTM D 86 Pro

ASTM D 86 - IP 123 - ISO 3405

Like 11-0051 but:

distillation flask 100 ml & 125 ml with ground socket (NS 19/26) and 1 stopper, PTFE, for thermometer (NS 19/26, bored Ø 6 mm), instead of 2 stoppers, silicone (Ø22/25 mm, bored Ø 6 mm)

11-0058 Test Kit - ASTM D 850

ASTM D 850 - JIS K2254

Consisting of:

- 1 distillation flask 200 ml, flanged rim
- 1 measuring cylinder 100 ml, graduated
- 1 heater support board, center hole Ø 25 mm (1")
- 1 heater support board, center hole Ø 38 mm (1 ½")
- 1 heater support board, center hole Ø 50 mm (2")
- 1 thermometer ASTM 39C / IP 79C (range +48 to +102 °C)

- 1 thermometer ASTM 40C / IP 80C (range +72 to +126 °C)
- 1 thermometer ASTM 41C / IP 81C (range +98 to +152 °C)
- 1 thermometer ASTM 42C / IP 82C (range +95 to +255 °C)
- 1 stopper, silicone, for thermometer (Ø24/30 mm, bored Ø 6 mm)
- 1 stopper, silicone (Ø14.5/20 mm, bored Ø 7 mm)

11-0099

Test Kit - ASTM D 850 Pro

ASTM D 850 - JIS K2254



Like 11-0058 but:

- distillation flask 200 ml with ground socket (NS 19/26) and
- 1 stopper, PTFE, for thermometer (NS 19/26, bored Ø 6 mm), instead of 1 stopper, silicone (Ø 24/30 mm, bored Ø 6 mm)

11-0059

Test Kit - ASTM D 1078

ASTM D 1078 - IP 195

Consisting of:

- 1 distillation flask 200 ml, flanged rim
- 1 graduated cylinder 100 ml, flanged rim
- 1 heater support board, center hole Ø 32 mm (1 ¼")
- 1 heater support board, center hole Ø 38 mm (1 ½")
- 1 thermometer ASTM 2C / IP 62C (range -5 to +300 °C)
- 1 thermometer ASTM 37C / IP 77C (range -2 to +52 °C)
- 1 thermometer ASTM 38C / IP 78C (range +24 to +78 °C)
- 1 stopper, silicone, for thermometer (Ø24/30 mm, bored Ø 6 mm)
- 1 stopper, silicone (Ø14.5/20 mm, bored Ø 7 mm)

11-0100

Test Kit - ASTM D 1078 Pro

ASTM D 1078 - IP 195



Like 11-0059 but:

- distillation flask 200 ml with ground socket (NS 19/26) and
- 1 stopper, PTFE, for thermometer (NS 19/26, bored Ø 6 mm), instead of 1 stopper, silicone (Ø 24/30 mm, bored Ø 6 mm)

Options & Accessories

11-0925

Circulator (external & internal heating & cooling)

with accessories

For heating & cooling of instruments without circulation pump and / or for tempering applications directly in the bath.

Consisting of:

Cooler with stainless steel bath. Thermostat with analog display, integrated heater, pump, over-temperature protection and pump-pressure control.

Supplied with:

1 bath cover, 1 thermometer (0 to +100 : 0.5 °C), 1 insulated hose-set (Ø 10 mm) (25-0229), 1 adapter

Technical Data:

Working range: -28 to +100 °C (at +5 to +40 °C ambient temp.)
 Display / Resolution: analog / 1 °C
 Heater capacity: 1500 W
 Cooling capacity: 320 W at +20 °C
 Pump-Pressure capacity: 12.5 l/min, 300 mbar
 Bath opening: 13 x 10 x 15 cm (WxDxH)
 Safety class / Bath fluid: 1 / NFL (Non Flammable Liquids only)
 Volume: 4.5 l
 Dimensions / Weight: 23 x 46 x 58 cm (WxDxH), 30 kg
 Power supply: 230 V, 50/60 Hz, 1900 W, EU-plug

11-0926

Circulator (external & internal heating & cooling)

with accessories

Like 11-0925 but:

Heater capacity: 1000 W
 Power supply: 115 V, 60 Hz, 1400 W, EU-plug

11-0240

Circulator (external & internal heating & cooling)

with accessories for 4 instruments

For heating & cooling of instruments without circulation pump (e. g. DU 4) and / or for tempering applications directly in the bath.

Consisting of:

Cooler with stainless steel bath. Thermostat with digital display, splash-proof keypad, integrated heater, pump, over/under-temperature & low-level protection.

Supplied with:

1 bath cover, 1 insulated hose-set to supply 4 instruments (incl. hoses, connectors, fittings, 2 stop-cocks) (25-0235)

Technical Data:

Working range: -40 to +200 °C (at +20 °C ambient temp.)
 Display / Resolution: LED / 0.1 & 0.01 °C
 Heater capacity: 2000 W
 Cooling capacity: 700 W at +20 °C
 Pump-Pressure capacity: 15 l/min
 Bath opening: 18 x 15 x 17 cm (WxDxH)
 Safety class / Bath fluid: 1 / NFL (Non-Flammable Liquids only)
 Volume: 7 l
 Dimensions / Weight: 30 x 48 x 68 cm (WxDxH), 41 kg
 Power supply: 230 V, 50 Hz, 12 A, EU-plug

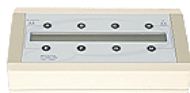
11-0241 Circulator (external & internal heating & cooling)

with accessories for 4 instruments

Like 11-0240 but:

Heater capacity: 800 W
 Power supply: 115 V, 60 Hz, 16 A, US-plug

21-0695 Stop Watch, 8-Channel, battery operated



Containing 8 individual stop watches.
 Each operated by a single button to run, stop or reset.

- Auto-Power-Off when no stop watches are running.
- After Power-Off individual values are kept in memory.
- All values can be reset together or per channel.
- 9 V-Battery-block included. Expected life time approx. 6 months.
- The stop watch can be supplied with a calibration certificate.

Dimensions (L x W x H): 195 x 112 x 46 mm

11-0822 Full-View Tempering-Jacket for measuring cylinder

with hose connection (for Distillation Group 0)

11-0575 Anti-Dazzle Screen

(for dazzling-free dry-point observations)

11-0549 Cleaning Coil for condenser tube

11-0567 Drip Tongue

11-0524 Distillation Flask, 125 ml, ground socket (NS 19/26)

with thermometer immersion-mark, side pipe Ø 7 mm, quartz glass (for temperatures above 370 °C) (ASTM E133/B, Engler-shape)

11-0955 Liquid Level Indicator

11-0151 Thermometer ASTM 7C / IP 5C

Range: -2 to +300 : 1 °C
 Length: 385 mm, Immersion: total, Ø 7 mm

11-0152 Thermometer ASTM 7C / IP 5C

Range: -2 to +300 : 1 °C (officially certified)

11-0155 Thermometer ASTM 8C / IP 6C

Range: -2 to +400 : 1 °C

Length: 385 mm, Immersion: total, Ø 7 mm

11-0156	Thermometer ASTM 8C / IP 6C Range: -2 to +400 : 1 °C (officially certified)
11-0956	Thermometer ASTM 8C / IP 6C (similar) Range: -2 to +450 : 1 °C
11-0157	Thermometer ASTM 8F Range: +30 to +760 : 2 °F Length: 385 mm, Immersion: total, Ø 7 mm
11-0158	Thermometer ASTM 8F Range: +30 to +760 : 2 °F (officially certified)
11-0089	Thermometer ASTM 39C / IP 79C Range: +48 to +102 : 0.2 °C Length: 395 mm, Immersion: 100 mm, Ø 7 mm
11-0090	Thermometer ASTM 39C / IP 79C Range: +48 to +102 : 0.2 °C (officially certified)
11-0085	Thermometer ASTM 37C / IP 77C Range: -2 to +52 : 0.2 °C Length: 395 mm, Immersion: 100 mm, Ø 7 mm
11-0086	Thermometer ASTM 37C / IP 77C Range: -2 to +52 : 0.2 °C (officially certified)
11-0087	Thermometer ASTM 38C / IP 78C Range: +24 to +78 : 0.2 °C Length: 395 mm, Immersion: 100 mm, Ø 7 mm
11-0088	Thermometer ASTM 38C / IP 78C Range: +24 to +78 : 0.2 °C (officially certified)
11-0091	Thermometer ASTM 40C / IP 80C Range: +72 to +126 : 0.2 °C Length: 395 mm, Immersion: 100 mm, Ø 7 mm
11-0092	Thermometer ASTM 40C / IP 80C Range: +72 to +126 : 0.2 °C (officially certified)
11-0093	Thermometer ASTM 41C / IP 81C Range: +98 to +152 : 0.2 °C Length: 395 mm, Immersion: 100 mm, Ø 7 mm
11-0094	Thermometer ASTM 41C / IP 81C Range: +98 to +152 : 0.2 °C (officially certified)
11-0095	Thermometer ASTM 42C / IP 82C Range: +95 to +255 : 0.5 °C Length: 395 mm, Immersion: 100 mm, Ø 7 mm
11-0096	Thermometer ASTM 42C / IP 82C Range: +95 to +255 : 0.5 °C (officially certified)
11-0590	Reference Liquid for Distillation of Mineral Oil Products (Boiling Characteristics) ASTM D 86 - ISO 3405 Initial Boiling Point: approx. 160°C, Final Boiling Point: approx. 360°C Data evaluated by International Industrial Round Robin Test. Aluminum bottle / content 255 ml.

11-0591 Reference Liquid for Distillation of Gasoline (Unleaded)

ASTM D 86

Certified Value: approx. 34 °C - 180 °C, 250 ml

11-0593 Reference Liquid for Distillation of Diesel

ASTM D 86

Certified Value: approx 165 °C - 362 °C, 250 ml

Spare Parts

11-0135 Support Board, center hole Ø 25 mm (1")

glass ceramics (150 x 150 x 4 mm)

11-0136 Support Board, center hole Ø 32 mm (1 ¼")

glass ceramics (150 x 150 x 4 mm)

11-0137 Support Board, center hole Ø 38 mm (1 ½")

glass ceramics (150 x 150 x 4 mm)

11-0138 Support Board, center hole Ø 50 mm (2")

glass ceramics (150 x 150 x 4 mm)

11-0121 Distillation Flask, 100 ml, flanged rim (Ø 17 mm)

with side pipe Ø 7 mm

11-0122 Distillation Flask, 125 ml, flanged rim (Ø 17 mm)

with side pipe Ø 7 mm

11-0124 Distillation Flask, 200 ml, flanged rim (Ø 21 mm)

with side pipe Ø 7 mm

11-0514 Distillation Flask, 100 ml, ground socket (NS 19/26)

with thermometer immersion-mark, side pipe Ø 7 mm,
(ASTM E133/A, Engler-shape)

11-0515 Distillation Flask, 125 ml, ground socket (NS 19/26)

with thermometer immersion-mark, side pipe Ø 7 mm,
(ASTM E133/B, Engler-shape)

11-0524 Distillation Flask, 125 ml, ground socket (NS 19/26)

with thermometer immersion-mark, side pipe Ø 7 mm,
quartz glass (for temperatures above 370 °C)
(ASTM E133/B, Engler-shape)

11-0517 Distillation Flask, 200 ml, ground socket (NS 19/26)

with thermometer immersion-mark, side pipe Ø 7 mm,
(ASTM E133/C, Barret-shape)

11-0130 Measuring Cylinder, 100 : 1 ml

borosilicate glass with plastic stand

11-0585 Measuring Cylinder, 5 : 0.1 ml

glass, with stand, 115 mm high

11-0401 Stopper, Silicone (22/25 / bored Ø 6 mm), pack of 20

11-0403 Stopper, Silicone (24/30 / bored Ø 6 mm), pack of 20

11-0406 Stopper, Silicone (14.5/20 / bored Ø 7 mm), pack of 20

11-0566 Stopper PEEK (Ø 12 / bored Ø 6 mm), pack of 1



with 3 O-rings, high-temperature resistant
(to connect condenser tube with distillation flask side pipe)

11-0521	Stopper, PTFE (NS 19/26 / bored Ø 6 mm) with 2 O-rings as temperature probe support
11-0938	Heater Assembly, 1000 W, 230/115 V (for bath)
11-0939	Heater Assembly, 800 W, 230/115 V (for bath)
11-0040	Twin-Heater Rod, 2x 600 W (1200 W), 230/115 V encased shape with rear gold coating

Order Guideline

Minimum equipment: 1x Distillation-Unit DU 4, 1x required Glass-Test-Kit
 Spares (approx. 1 year): Thermometer, 11-0130, Stopper
 Additional requirements: Bath tempering device