# For food analysis


Vitamin A ( Retinol )

Vitamin C
( Ascorbic acid )

Vitamin B6
( Pyridoxine)

BEGER
laboratory equipment

MADE IN EUROPE


# SUPPLY YOUR LABORATORIES SINCE 2014

BEGER laboratory equipment is a company in Slovenia that has been developing and manufacturing laboratory equipment since 2014.

Our goal is to produce world-class products at reasonable prices.

The main directions are manufacturing of equipment for the determination of protein, fat, fibre, other instruments. The area of application includes the most industrial sectors, as well as agrarian, environmental laboratories, research institutes and educational institutions.

Our philosophy is reliability, innovation, the ambitiousness of the tasks facing the company, the greening of our brand.

Meticulous construction, scrupulous selection of parts and components, comprehensive multiple testing and strict control at the assembly stages, continuous contact with users, search and implementation of innovations are the distinguishing features of our equipment.

BEGER is ISO 9001:2015 Certified company and all our products comply with International Standards.

# CONTENTS

# NITROGEN/PROTEIN DETERMINATION

## PROTEIN DETERMINATION

The **Kjeldahl method** is a method for the fast quantitative determination of nitrogen in chemical substances developed by a Danish chemist Johan Kjeldahl in 1883. The Kjeldahl method of nitrogen analysis is the most accurate worldwide standard for calculating the protein content in a wide variety of materials ranging from human and animal food, beverages, grain, wastewater, soil and fossil fuels.

## DISTILLATION UNITS

The **BEGER** assessing the needs and capabilities of the customers has designed a range of apparatus for steam distillation with different functional range and price line.
**BEGER** distillation units SDU series for steam distillation is suitable for many applications such as determining ammoniacal nitrogen, protein nitrogen (using the Kjeldahl method), nitric nitrogen (after reduction), phenols, volatile fatty acids, and also the alcohol content.

Steam distillation apparatus SDU is a reliable assistant in your laboratory. The device is a good investment thanks to the Four Save Process: energy, time, space and money saving.

Ease of the steam distillation unit is confirmed by its functionality. All the necessary functions are available by a single keystroke on an adapted screen. The working process may be observed through the transparent door and all the working information are displayed at a 7 inch LCD. The functionality of the steam distillation unit SDU can satisfy both the experienced and the most demanding users, and those who just acquainted with this type of equipment.
All models guarantee the security, performance, comfort and reliability. The steam distillation unit SDU can work independently and with infrared digestion unit IDU.

- Attractive and practical design
- Delayed start timer
- The simple and intuitive operation via large touch screen.
- Remote control and software updates
- Audio and visual alerts
- Choice of the user's language
- Corrosion resistance and operating life

All models of steam distillation can work independent and in a system with infrared digesters.

## SPECIFIC FEATURES:

### Manual steam distillation unit SDU 100

- Automatic sodium hydroxide dispensing
  1 universal program
- Automatic and manual mode
- Volume batching in ml
- Pump calibration
- Open door sensor
- Steam generator with water control level sensor
- Power control from 0 to 100%
- 7 inch Multi Touch screen
- Screen extension: 1024*600
- WiFi, Bluetooth
- Saving information
- Remote diagnostics
- Distillation time: 5 min. 100 ml
- Electric power: 2100 W
- Frequency: 50/60 Hz
- Easy and rapid change of tubes
- High-quality stainless steel AISI 304
- Corrosion resistance and operating life
- Delayed start time
- Sound notification abound the end of the program
- Reagent containers: canister set recommended
- Sound signaling of the level of reagents in canisters

### Semi-automatic steam distillation unit SDU 200

- Automatic sodium hydroxide dispensing
- Automatic water dispensing
- 1 universal program
- Automatic and manual mode
- Volume batching in ml
- Pump calibration
- Open door sensor
- Steam generator with water control level sensor
- Power control from 0 to 100%
- 7 inch Multi Touch screen
- Screen extension: 1024*600
- WiFi, Bluetooth
- Saving information
- Remote diagnostics
- Distillation time: 5 min. 100 ml
- Electric power: 2100 W
- Frequency: 50/60 Hz
- Easy and rapid change of tubes
- High-quality stainless steel AISI 304
- Corrosion resistance and operating life
- Delayed start time
- Sound notification abound the end of the program
- Reagent containers: canister set recommended
- Sound signaling of the level of reagents in canisters

## Automatic steam distillation unit SDU 300

- Automatic sodium hydroxide dispensing
- Automatic water dispensing
- Automatic boric acid dispensing
- 1 universal program
- Automatic and manual mode
- Volume batching in ml
- Pump calibration
- Open door sensor
- Steam generator with water control level sensor
- Power control from 0 to 100%
- 7 inch Multi Touch screen
- Screen extension: 1024*600
- WiFi, Bluetooth
- Saving information
- Remote diagnostics
- Distillation time: 5 min. 100 ml
- Electric power: 2100 W
- Frequency: 50/60 Hz
- Easy and rapid change of tubes
- High-quality stainless steel AISI 304
- Corrosion resistance and operating life
- Delayed start time
- Sound notification abound the end of the program
- Reagent containers: canister set recommended
- Sound signaling of the level of reagents in canisters

## Fully automatic steam distillation unit SDU 400

- Automatic sodium hydroxide dispensing
- Automatic water dispensing
- Automatic boric acid dispensing
- Automatic residues removal
- 1 universal program
- Automatic and manual mode
- Volume batching in ml
- Pump calibration
- Open door sensor
- Steam generator with water control level sensor
- Power control from 0 to 100%
- 7 inch color Multi Touch screen
- Screen extension: 1024*600
- WiFi, Bluetooth
- Saving information
- Remote diagnostics
- Distillation time: 5 min. 100 ml
- Electric power: 2100 W
- Frequency: 50/60 Hz
- Easy and rapid change of tubes
- High-quality stainless steel AISI 304
- Corrosion resistance and operating life
- Delayed start time
- Sound notification abound the end of the program
- Reagent containers: canister set recommended
- Sound signaling of the level of reagents in canisters

## TECHNICAL DATA:

| | |
|---|---|
| Power: | 2100 W |
| Mains supply: | 230 V/50 Hz |
| Distillation: | 5 min. 100 ml |
| Steam generation adjustment: | 0 – 100% |
| Dimensions (L x H x W): | 420 x 700 x 350 mm |

## FEATURES OF STEAM DISTILLATION UNITS:

| | SDU 100 | SDU 200 | SDU 300 | SDU 400 |
|---|---|---|---|---|
| Automatic sodium hydroxide dispensing | + | + | + | + |
| Automatic water dispensing | - | + | + | + |
| Automatic boric acid dispensing | - | - | + | + |
| Automatic residues removal | - | - | - | + |
| Power control | + | + | + | + |
| Remote control | + | + | + | + |
| Internet access: WiFi, Bluetooth | + | + | + | + |
| Weight, kg | **31,5** | **31,7** | **31,9** | **34,8** |

## ORDER INFORMATION:

| TYPE | PU | ORDER NO. |
|---|---|---|
| Steam Distillation Unit SDU 100 | 1 | 114 104 00 |
| Steam Distillation Unit SDU 200 | 1 | 114 204 00 |
| Steam Distillation Unit SDU 300 | 1 | 114 304 00 |
| Steam Distillation Unit SDU 400 | 1 | 114 404 00 |
| Gasket | 1 | 114 002 01 |
| Canister with level sensor | 1 | 114 003 01 |

**ITEMS SUPPLIED:**

All steam distillation units are delivered as complete systems including glassware.

## INFRARED DIGESTION UNITS IDU



The infrared digesters of the IDU series for the "wet" combustion of samples are designed and suitable for a variety of applications where carrying out the process of digestion is required, including the extraction of nitrogen by the Kjeldahl method. Thanks to infrared heating, it is possible to significantly speed up the analysis process.
The digestion unit is controlled by a new generation microprocessor-based controller with a 5-inch color display and Touchscreen function.
The user has the ability to independently set an almost unlimited number of programs with different power and heating time. The memory function of the last actions allows to return to the last stage and continue working regardless of power failures. Bluetooth is used to configure the sending and receiving data parameters. Wireless Internet connection (Wi-Fi) enables a remote service diagnostic, software updates and obtaining information of an educational and advisory nature.
The devices are equipped with an exhaust system and a set of flasks corresponding to the selected model. SWP scrubber – optional.
In basic versions the heating power is adjusted. Models of the IDUt series are equipped with temperature sensors and can be controlled to set temperature values.

- Universal
- Easy in use
- Rapid heating
- Saving of working time
- Memory of the last action
- Unlimited number of steps in program
- Freely configurable programs for block temperature and digestion time

| | IDU4 | IDU6 | IDU8 | IDU10 | IDU12 |
|---|---|---|---|---|---|
| Number of samples | 4x500 ml | 6x250 ml | 8x250 ml | 10x250 ml | 12x250 ml |
| Number of programs | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Number of steps in the program | unlimited | unlimited | unlimited | unlimited | unlimited |
| Time range for one phase | 0 … 999 min in 1 min steps | 0 … 999 min in 1 min steps | 0 … 999 min in 1 min steps | 0 … 999 min in 1 min steps | 0 … 999 min in 1 min steps |
| Digestion time | 1 to 990 min | 1 to 990 min | 1 to 990 min | 1 to 990 min | 1 to 990 min |
| Power setting range | 0 … 100% in 1% steps | 0 … 100% in 1% steps | 0 … 100% in 1% steps | 0 … 100% in 1% steps | 0 … 100% in 1% steps |
| Power | 1600 W | 1600 W | 1600 W | 1600 W | 1600 W |
| Rated voltage | 230 V, 50/60 Hz | 230 V, 50/60 Hz | 230 V, 50/60 Hz | 230 V, 50/60 Hz | 230 V, 50/60 Hz |
| Dimensions (W x D x H) | 430 x 600 x 700 mm | 430 x 600 x 700 mm | 430 x 600 x 700 mm | 430 x 600 x 700 mm | 430 x 600 x 700 mm |
| Temperature range | up to 450° C ± 10% | up to 450° C ± 10% | up to 450° C ± 10% | up to 450° C ± 10% | up to 450° C ± 10% |
| Weight | 20 kg | 23,4 kg | 24 kg | 24,4 kg | 24,6 kg |

## ORDER INFORMATION:

| TYPE | PU | ORDER NO. |
|---|---|---|
| Infrared Digestion Unit IDU4 with power control | 1 | 224 104 00 |
| Infrared Digestion Unit IDUt 4 with temperature control | 1 | 234 104 00 |
| Infrared Digestion Unit IDU6 with power control | 1 | 224 106 00 |
| Infrared Digestion Unit IDUt 6 with temperature control | 1 | 234 106 00 |
| Infrared Digestion Unit IDU8 with power control | 1 | 224 108 00 |
| Infrared Digestion Unit IDUt8 with temperature control | 1 | 234 108 00 |
| Infrared Digestion Unit IDU10 with power control | 1 | 224 110 00 |
| Infrared Digestion Unit IDUt 10 with temperature control | 1 | 234 110 00 |
| Infrared Digestion Unit IDU12 with power control | 1 | 224 112 00 |
| Infrared Digestion Unit IDUt12 with temperature control | 1 | 234 112 00 |
| Kjeldahl flask, Ø42x300mm, 250 ml | 1 | 214 004 01 |
| Kjeldahl flask, Ø64x295mm, 500 ml | 1 | 214 004 05 |
| Rack for IDU 4 | 1 | 214 104 05 |
| Rack for IDU 6 | 1 | 214 106 05 |
| Rack for IDU 8 | 1 | 214 108 05 |
| Rack for IDU 10 | 1 | 214 110 05 |
| Rack for IDU 12 | 1 | 214 112 05 |

**ITEMS SUPPLIED:**

IDU / IDUt digester, a rack, a lid with fume removal for the rack, a water jet pump and a gas exhaust hose, a set of flasks, user manual, brief installation instructions.

## SCRUBBERS


- Double neutralization of aggressive vapours
- Effective cleaning
- Water saving
- Compact size
- Environmental security

Scrubber SWP is designed for removal and further neutralization of toxic vapours and gases generated during digestion process. The acid vapors pass through a two-stage neutralization (NaOH and H2O).
Vapours are removed using a vacuum pump built into the scrubber, which extracts the gas and directs it to the alkali, where the steam/gas is neutralized, then it undergoes additional cleaning with water.

**Water saving – no requirement for a connection to the water supply when using SWP!**

## TECHNICAL DATA:

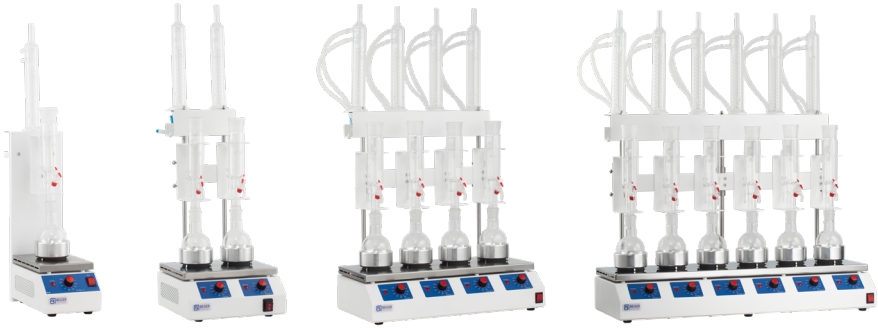
| | |
|---|---|
| Housing material | Stainless Steel coated with acid-resistant powder paint |
| Airflow rate (max.) | 28 L/min |
| Airflow adjustment | yes |
| Max. power | 100 W |
| Dimensions (W x H x D) | 395 x 410 x 345 mm |
| Weight | 16,4 kg |

## ORDER INFORMATION:

| TYPE | PU | ORDER NO. |
|---|---|---|
| Scrubber SWP | 1 | 204 202 00 |
| Screw-top bottle 2000 ml | 1 | 204 004 07 |

**ITEMS SUPPLIED:** The SWP scrubber is supplied as complete unit, including glassware.

# SOLVENT EXTRACTION



- Meat and meat products
- Cereals and feed
- Confectionery and other
- Milk and dairy products

## FAT DETERMINATION
## Soxhlet extraction

The **Soxhlet extraction** method corresponds to the reference methods for the determination of total fat in samples. The essence of the method is to extract fat by repeated washing with a solvent, to determine the difference in masses before and after extraction.

Traditional extraction systems for the fat determination according to Soxhlet of the BEGER company are presented in 4 versions: FAT 1, FAT 2, FAT 4, FAT 6.

Depending on model, the unit consist of either 1, 2, 4, 6 individually adjustable heating positions for 250 ml round bottom flasks which are used with extractors of 100 ml and condenser of your choice.

The apparatus is equipped with a Soxhlet extractor and a Dimroth or Allihn condensers.

| | FAT1 | FAT2 | FAT4 | FAT6 |
|---|---|---|---|---|
| Hosing material | Stainless Steel or metal coated with chemically resistant powder paint | Stainless Steel or metal coated with chemically resistant powder paint | Stainless Steel or metal coated with chemically resistant powder paint | Stainless Steel or metal coated with chemically resistant powder paint |
| Number of samples | 1 | 2 | 4 | 6 |
| Flask volume | 250 ml | 250 ml | 250 ml | 250 ml |
| Power consumption | 0,5 kW | 1 kW | 2 kW | 3 kW |
| Max. heating temperature | 350 °C ± 10 % | 350 °C ± 10 % | 350 °C ± 10 % | 350 °C ± 10 % |
| Rated voltage | 230 V, 50 Hz | 230 V, 50 Hz | 230 V, 50 Hz | 230 V, 50 Hz |
| Dimensions with rack, without glass parts (W x D x H) | 290 x 165 x 500 mm | 295 x 280 x 600 mm | 556 x 350 x 600 mm | 810 x 350 x 600 mm |
| Weight | 5,8 kg | 8,6 kg | 13,8 kg | 23,6 kg |

## ORDER INFORMATION:

| TYPE | PU | ORDER NO. |
|---|---|---|
| Extraction system FAT1 with Dimroth condenser | 1 | 414 101 00 |
| Extraction system FAT2 with Dimroth condenser | 1 | 414 102 00 |
| Extraction system FAT4 with Dimroth condenser | 1 | 414 104 00 |
| Extraction system FAT4 with Allihn condenser | 1 | 414 204 00 |
| Extraction system FAT6 with Dimroth condenser | 1 | 414 106 00 |
| Extraction system FAT6 with Allihn condenser | 1 | 414 206 00 |
| Cellulose extraction thimbles, 25 pcs | 1 | 414 011 01 |
| Dimroth condenser | 1 | 414 004 01 |
| Allihn condenser | 1 | 414 004 02 |
| Soxhlet extractor, 100 ml | 1 | 414 004 03 |
| Round bottom flask, 250 ml | 1 | 414 014 01 |

**ITEMS SUPPLIED:** The FAT extraction system is supplied complete, including glassware.

# DETERMINATION OF FIBRE

## DETERMINATION OF FIBRE
## FIBRE 6 system for fibre determination


**FIBRE 6** apparatus is used in the determination of crude fibre in cereals, feed, food and other agricultural products. Thanks to its versatility, accessibility and the ability to analyze up to 6 samples simultaneously, **FIBER 6** becomes an indispensable apparatus in the laboratory.

Thanks to the thoughtfulness of the details, **FIBER 6** has acquired a compact size. Glassware is made of heat-resistant borosilicate glass. The **BEGER** heating platform guarantees the uniform boiling temperature. Thanks to the power adjustment the heating rate and the maximum temperature are reached in the shortest possible time.

The rack is equipped with a comfortable detachable haft for extracting samples from a hot solution.

The essence of the method is extracting soluble compounds from a sample with subsequent ashing. The ash-free residue is taken as crude fibre.

- Fodder production
- Grain processing

## TECHNICAL DATA:

| | |
|---|---|
| **Model** | Fibre 6 |
| **Number of samples** | 6 |
| **Number of heaters** | 1 |
| **Rated voltage** | 230 V/50 Hz |
| **Power consumption** | 500 W |
| **Heat control** | Power gain |
| **Dimensions** | 165x275x580 mm |
| **Weight** | 5 kg |

## ORDER INFORMATION:

| TYPE | PU | ORDER NO. |
|---|---|---|
| Fibre 6 system | 1 | 314 106 00 |
| Filter gauze, 30 pcs. | 1 | 314 002 01 |

**ITEMS SUPPLIED:** Heating block, PTFE rack for 6 positions, detachable haft for 6 place rack, 1000 ml beaker, 6x spacers, silicone hoses, stainless steel rack with clamp, spherical condenser, 30 x filter gauze, instruction manual.

BEGER
laboratory equipment

For food analysis

## MAIN OFFICE

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