

 Gerhardt



VAPODEST
RAPID DISTILLATION SYSTEMS

VAPODEST

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With the introduction of the Vapodest distillation systems Gerhardt has set new standards in today's worldwide analytical instrument market.



The Vapodest models with improved distillation time range from a simple steam distillation unit, the Vapodest 20, to a fully automated distillation and titration system, the Vapodest 50 carousel with autosampler. All systems have been a tremendous success in all labs that need the highest possible accuracy in their analysis.

USER FRIENDLY

A chemical-resistant touch pad facilitates easy operation (Vapodest 50 has a touch sensitive screen). All program steps as well as error messages are shown on the display.

The analysis is time-controlled.

The steam power can be variably set between 40 – 100 % thus making other determinations possible as well, like e.g. Kjeldahl, alcohol, phenols, etc.

Various standard sizes of tubes can be used:

Either Kjeldatherm digestion tubes with 100 - 800 ml or Kjeldahl flasks KDD 250 - 750 ml with wide neck opening.

The distillation times are programmed. Kjeldahl distillations are typically done in 2 – 4 minutes.



Well arranged key pad keeps the operation simple

ECONOMIC AND ENVIRONMENTALLY FRIENDLY

Energy saving with the help of the stand-by function. The instrument switches automatically to the stand-by mode during non-operation periods. During the stand-by mode the steam power is maintained. This feature ensures full steam power for distillations even after long breaks.

Minimal use of cooling water with the help of the stand-by function. When the equipment is in the stand-by mode the cooling water supply is cut off automatically.

Optimal mixing is achieved by injecting the steam directly into the sample tube. This ensures that crystallized digested solutions are liquefied within seconds.

Chemical resistant plastic housing which can be recycled. Extremely long life span, as corrosion damage is impossible.



Stand-by-function helps to save time and money as well as protecting the environment

SAFE

The plexiglass protection door prevents splashes. All distillation glass parts are mounted in the distillation chamber for easy viewing of the distillation process.

The sample tube is easily inserted via the clamping device which safely supports the tube.

The tube sensing mechanism ensures that the distillation can only be started when the tube is inserted correctly.

The steam generator works automatically by pressure control with overheating protection ensuring complete safety. The steam generator switches off immediately in case of over pressure.



Data can be easily imported or exported using a spread sheet.

COMMUNICATION

All vapodest have two RS 485 interfaces by default. Thus, e.g. a GLP/USO conform protol.

VAPODEST 20/30/40/45

PROGRAMMABLE DISTILLATION SYSTEMS

VAPODEST 20

The basic model for low sample throughput. In order to ensure a distillation process without errors all available functions are continuously monitored by the micro-processor. The digital display shows the program steps as well as eight different error messages.

Programming:

- Addition of NaOH
- Reaction time
- Distillation time can be set
- Programmable steam power, 35 - 100 %

| Order No. | Type | Description |
|-----------|--------|-----------------------|
| 7620 | VAP 20 | Vapodest 20, complete |

Recommended accessory:

| | | |
|------|--------|-----------------------------------------------------|
| 7629 | KAN 20 | Set of storage tanks for VAP 20, 2 storage tanks |
|------|--------|-----------------------------------------------------|



VAPODEST 30

This model fulfils all the parameters for Kjeldahl chemical additions. In order to ensure an error-free distillation process all functions available are continuously monitored by the microprocessor. The digital display shows all program steps as well as nine different error messages. Sample residues are emptied automatically into an optional waste tank.

Programming:

- Addition of H₂O
- Addition of NaOH
- Reaction time
- Distillation time can be set
- Programmable steam power, 35 - 100 %
- Time for suction of sample residue can be set

| Order No. | Type | Description |
|-----------|--------|-----------------------|
| 7630 | VAP 30 | Vapodest 30, complete |

Recommended accessory:

| | | |
|------|--------|-----------------------------------------------------|
| 7639 | KAN 30 | Set of storage tanks for VAP 30, 3 storage tanks |
|------|--------|-----------------------------------------------------|



All distillation systems are especially good in handling distillations of Kjeldahl digestion solutions as well as physical separation methods of water steam soluble materials and volatile acids. For the determination of alcohol it is ideal that the steam power of the steam generator can be reduced to around 70 %.

VAPODEST 40

The deluxe edition is designed to satisfy the highest demands. The entire distillation is automated. In order to ensure an error-free distillation process all functions available are continuously monitored by the microprocessor. The multifunctional display with 32 characters shows all program steps as well as all errors alphanumerically. Sample residues are emptied automatically into an optional waste tank. Up to 10 programs can be stored and recalled which makes this model ideal for laboratories with a wide variety of sample throughput. Four languages are available.

VAPODEST 45 - WITH TITRATION

This model offers the same functions as the Vapodest 40. Furthermore, it will accept an external titrator which is connected through an additional interface RS 232. It is mandatory however, to order the following accessory: titration cell with suction (Order no.:7686). Thus, the Vapodest 45 offers all the benefits of a complete analysis system.



Programming Vapodest 40/45:

- Addition for H_3BO_3
- Addition for H_2O
- Addition for NaOH
- Reaction time
- Distillation time can be set
- Programmable steam power, 40 - 100 %
- Time for suction of sample residue can be set

| Order No. | Type | Description |
|-----------|----------|---------------------------------|
| 7640 | VAP 40 | Vapodest 40, complete |
| 7645 | VAP 45 | Vapodest 45, (without Titrator) |
| 7689 | Titrator | TitroLine Easy |

Recommended accessory:

| | | |
|------|--------|---------------------------------------------------------|
| 7649 | KAN 40 | Set of storage tanks for VAP 40/45 4 x storage tanks |
|------|--------|---------------------------------------------------------|

TECHNICAL DATA

| Type | Vapodest 20 | Vapodest 30 | Vapodest 40 / 45 |
|--------------------------|--------------------|--------------------|--------------------|
| Order No. | 7620 | 7630 | 7640 7645 |
| Nominal Voltage | 230 V AC | 230 V AC | 230 V AC |
| Frequency | 50 Hz | 50 Hz | 50 Hz |
| Nominal Wattage | 1600 W | 1600 W | 1600 W |
| Weight | 25 kg | 27 kg | 29 kg |
| Dimensions (W x D x H) | 440 x 340 x 690 mm | 440 x 340 x 690 mm | 440 x 340 x 690 mm |
| Programs | 1 | 1 | 10 |
| Interface | 2 x RS 485 | 2 x RS 485 | 2 x RS 485 |
| Language selection | - | - | Yes |
| Storage tanks (optional) | KAN 20 | KAN 30 | KAN 40 |

VAPODEST 50

DISTILLATION SYSTEMS WITH INTEGRATED TITRATION



The highlight of the Vapodest product line is the fully automatic Vapodest 50. This system uses an integrated titration system for precise analysis for the sophisticated, fully automated laboratory. A further asset for laboratories with a high sample through put is the Vapodest 50 carousel with the autosampler.

INNOVATION

User friendliness and safety have been top priorities in the development of this system. Profiting from the experiences of our agencies and clients around the world Gerhardt has collected information and suggestions. The outcome of this vast project was a fully automated distillation and titration system that combines the technology of the 21st century with the experience of such an old and prestigious company as Gerhardt. Vapodest 50 offers state-of-the-art developments for laboratories who value complete automation.

TOUCH-SENSITIVE-SCREEN

The recommended functions can be activated by gently pressing the corresponding sections of the panel. The program then switches automatically to the next stage.



USER

INTERFACE

The chemically resistant user interface displays all available functions at a glance. The program guides the user and is self-explanatory (the operator only sees those keys that are of significance for the actual operating state).

CONTROL

There are 20 main programs for Kjeldahl determinations as well as for a number of other determinations.

Up to 1000 calibration data and up to 10.000 sample results can be stored and recalled; statistics and data can be recalled and printed at any time.

COMMUNICATION

The systems have a very innovative control by PC (an update is possible at any given time) and are ISO/GLP conform. All functions are controlled by a Card-PC.

TITRATION

The highly sensitive micro dosing pump provides the user with unsurpassed precision and has a virtually unlimited life expectancy. The pump works with an accuracy of less than 0.2% deviation which guarantees precise results even in case of small nitrogen quantities. The determination of the endpoint is done potentiometrically with a combined electrode. This improved titration system delivers reproducible results.

PRINT OUT OF RESULT

After the termination of the analysis, all results can be printed out immediately and/or shown on the display. The operator decides what the print out should look like: either all results are shown one after the other after the termination of an entire series or each sample result can be shown on a single sheet. Furthermore, all data relevant for the analysis can be stored for monitoring or documentation purposes as well as printed out later on. The high quality printer is included in the delivery.



ROUTINE ANALYSIS MADE EASY

Many laboratories have to work on a big number of different samples or methods during a day. The Vapodest 50 can be of great help with those routine tasks, as e.g. the sample weight can be imported directly from the balance using the interface for data transfer. For the various sample types, up to 20 different programs can be pre-defined and processed directly. The alpha numerical sample recognition can be input using the touch sensitive screen and sample names can also be imported directly using a spreadsheet. Equipped with the most modern and well-tested components, the Vapodest 50 is ready to be used for continuous operation in any lab.

VAPODEST 50

SOFTWARE

MAIN FUNCTIONS

The main menu displays all available main functions. They can be activated by gently pressing the corresponding sections of the panel.

- Analysis
- Sample Input
- Programming
- Calibration
- Statistics/ Data
- Special Functions

- ANALYSIS

Here the distillation and titration are performed automatically. After completing the analysis the results are presented on the display and/or printed.

- Serial or single determination is possible
- Calculation of average value

- SAMPLE INPUT

Up to 20 samples (Weights/Volumes) can be input per series. 99 series are available.

- Alphanumeric sample recognition
- Input manually or directly from the balance
- And many more features...

- PROGRAMMING

All requirements that are relevant for the control of the distillation/titration can be entered.

- Up to 20 programs can be entered as required
- Input of the endpoint (automatic or predetermined)
- Input of the desired calculation factor (% N, % Protein, % NH_4 , % NH_3 etc.)
- On-line titration and many more features...

- CALIBRATION

A two point calibration is carried out automatically for calibration of the pH-electrode.

- STATISTICS / DATA

In order to achieve maximum control of all steps relevant for the analysis all data are stored on the integrated hard disk. These can be recalled at any time for control or documentation purposes and then altered on or printed.

- SPECIAL FUNCTIONS

- Selection of language (English, German, French, Dutch)
- Level sensor to check on level of chemicals in the tanks
- Data Communication
- Service

The user can process even the most complex analysis easily with the help of the interactive menu.



The serial analysis



VAPODEST 50 CAROUSEL

VAPODEST 50 WITH AUTOSAMPLER

AUTOSAMPLER

This model is Gerhardt's solution for the most sophisticated lab requirements: the distillation system with automated sample feed for fully automated analysis. The sample tubes are taken from the carousel and fed directly into the Vapodest 50 for further processing. This robust system, based on a pneumatic drive ensures very reliable running. Furthermore, all functions are checked continuously by an error diagnosis system.

ROUTINE ANALYSIS

This model was developed for continuous operation with high sample throughput. The operator time is reduced to loading the tubes and filling the storage tanks with chemicals. Data transfer supports the input of all data relevant for the samples.



TYPES OF CAROUSEL

Different sizes of carousel allow the processing of various sizes of sample tubes, e.g.:

- 20 x 250 ml-tubes
- 16 x 400ml-tubes
- 12 x 800ml-tubes

The handling of the carousels is very easy, thus making exchanging or cleaning them is no problem.



SERVICE DISPLAY

The service display shows the error message and a diagnosis can be given quickly.



STORAGE TANKS

The level of the tanks is monitored constantly and they are stored conveniently in a drawer, saving valuable bench space.



PROTECTION HOOD

For safety reasons a transparent hood covers the carousel.

VAPODEST 50

ORDER INFORMATION

VAPODEST 50

This instrument is ideal for all laboratories with a high sample throughput which want to automate their daily routine tasks.

| Order No. | Type | Description |
|-----------|--------|----------------------------------------------------------------------------------------------------------------------------|
| 7650 | VAP 50 | Vapodest 50, complete with: printer, digestion tube, buffer-solution, KCL-solution, tubing set, operating pen, mains cable |

Recommended accessory:

| | | |
|------|--------|---------------------------------------------------|
| 7659 | KAN 50 | Storage tanks VAP 50, 4 x 20 litre 1 x 5 litre |
|------|--------|---------------------------------------------------|



VAPODEST 50 CAROUSEL

Same as Vapodest 50 plus autosampler which feeds sample tubes automatically from the carousel into the Vapodest 50. Included in the standard configuration:

- 1 x Distillation system Vapodest 50 carousel, complete mounted with compressor and carousel
- 1 x Set of storage tanks consists of: 1 x H₂O-tank, 1 x H₃BO₃-tank, 1 x NaOH-tank, 1 x Sample waste tank, 1 x titration tank
- 1 x Printer incl. printer cable
- 1 x Set digestion tubes

Also:

buffer solution, KCL-solution, tubing set, operating pen and mains cable

| Order No. | Type | Description |
|-----------|---------|-----------------------------------------------------------|
| 7655 | VAP 50c | Vapodest 50 carousel, with carousel for 20 x 250 ml tubes |
| 7655/1 | VAP 50c | Vapodest 50 carousel, with carousel for 16 x 400 ml tubes |
| 7655/2 | VAP 50c | Vapodest 50 carousel, with carousel for 12 x 800 ml tubes |

SPECIAL FEATURE

You can't make up your mind yet what system you should get? No problem! You can order the upper and lower part separately. Thus, should your sample throughput increase dramatically, you can easily upgrade the Vapodest 50 upper part to a Vapodest 50 carousel later on.

| Order No. | Type | Description |
|-----------|-----------|---------------------------------------------------------------------------------------------------|
| 7658 | VAP 50 OT | Vapodest 50 Upper part, prepared for a possible upgrade to a Vapodest 50 carousel at a later time |



TECHNICAL DATA

| Type | Vapodest 50 / Vapodest 50 OT | Vapodest 50 carousel |
|------------------------|---------------------------------------|---------------------------------------|
| Order No. | 7650 / 7658 | see page 10 |
| Nominal Voltage | 230 V AC | 230 V AC |
| Frequency | 50 Hz | 50 Hz |
| Nominal Wattage | 1700 W | 1830 W |
| Weight | 44 kg | 190 kg |
| Dimensions (W x D x H) | 440 x 340 x 690 mm | 1010 x 830 x 1655 mm |
| Programs | 20 | 20 |
| Cooling water | about 3 litre per distillation minute | about 3 litre per distillation minute |
| Distillation time | 2-4 min / sample | 2-4 min / sample |
| Select of language | Yes | Yes |
| Recovery rate | > 99,5 % | > 99,5 % |
| Reproducibility | +/- 1 % | +/- 1 % |
| Detection limit | 0,1 mg N | 0,1 mg N |

ALL SYSTEMS IN COMPARISON

| STANDARD CONFIGURATION | VAP 20 | VAP 30 | VAP 40 | VAP 45 | VAP 50 | VAP 50c |
|---------------------------------------------------|--------|--------|--------|--------|--------|------------------|
| Automatic addition H ₃ BO ₃ | | | o | o | o | o |
| Automatic addition H ₂ O | | o | o | o | o | o |
| Automatic addition NaOH | o | o | o | o | o | o |
| Programmable reaction time | o | o | o | o | o | o |
| Programmable distillation time | o | o | o | o | o | o |
| Automatic steam generator | o | o | o | o | o | o |
| Programmable steam power 40 - 100 % | o | o | o | o | o | o |
| Automatic suction of sample waste | | o | o | o | o | o |
| Automatic suction of the receiver | | | | | o | o |
| Main programs | 1 | 1 | 10 | 10 | 20 | 20 |
| Selection of language | | | o | o | o | o |
| Automatic check of chemical reservoir | o | o | o | o | o | o |
| Stand-by-function | o | o | o | o | o | o |
| Optical and acoustical error messages | o | o | o | o | o | o |
| Kjeldatherm digestion tube | o | o | o | o | o | o |
| Kjeldahl-flasks can be used | o | o | o | o | o | o ⁽¹⁾ |
| External titrator can be connected | | | | o | | |
| 2 x RS 485 Interface | o | o | o | o | o | o |
| 2 x parallel interface (Centronix) | | | | | o | o |
| 1 x serial interface (RS 232) | | | | o | | o |
| 1 x VGA interface | | | | | o | o |
| 2 x PCMCIA-socket | | | | | o | o |
| Card PC | | | | | o | o |
| Automatic titration | | | | | o | o |
| Printer | | | | | o | o |
| Display of analysis results | | | | | o | o |
| Micro dosing pump | | | | | o | o |
| Calibration data can be stored and recalled | | | | | o | o |
| Sample results can be stored and recalled | | | | | o | o |
| Result print out | | | | | o | o |
| Autosampler (carousel) | | | | | | o |
| Set of storage tanks | | | | | | o |

(1) Only possible for single determination with adapter

OTHER PRODUCTS

On request we will be happy to supply you with further brochures regarding our other products.

HOTPLATES

HOTPLATES HC
SERIAL HEATING UNITS
SERIAL FLASK HEATERS

Heating equipment for all kinds of applications in the modern lab has been a long standing tradition in Gerhardt. This continues with the latest generation of hotplates and sandbaths, as well as serial hotplates and serial flask heaters. For your safety they have all been equipped with an excess current switch off.



DIGESTION SYSTEMS

KJELDATHERM
TURBOTHERM
TRACE METAL SMA

The new generation of the traditional Kjeldatherm product range offers significant improvements in the heating up time, reduction of power consumption as well as a weight reduction of 30 %. Turbotherm is a flexible rapid digestion system for flasks with 100, 250, 400, and 800 ml - with RS 485 Interface.



RAPID EXTRACTION

SOXTERM

Soxtherm simplifies and accelerates the traditional Soxhlet-method in all areas. The patented technology is fully automated and has 5 stages. It is up to 5 times faster than the traditional Soxhlet Method.



SHAKER

LABOSHAKE
THERMOSHAKE

The new generation of shakers is the answer to the growing demand for robust and state-of-the-art instruments. It can be supplied with an RS 485 interface.



All stages from research & development to shipment have undergone a constant quality control under EN ISO 9001:2000, which C. Gerhardt has achieved recently.

EN ISO
9001:2000



FRONTCOVER DESIGN

Gouache „Vapodest“
Douglas Swan 1997

Douglas Swan, born in the USA, raised in Scotland, had his studio at C.Gerhardt in Bonn from 1980 until his death in the year 2000.
Winner of the August Macke Award, Bonn 1997.



 **Gerhardt**

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Technical details correct as from 03/2002
Later modifications possible.