



# Vapodest 40

## Instruction manual



Please read this instruction manual with care before you start operating the system! 

Please observe the safety instructions of this manual, marked with  in order to avoid any dangerous handling!

Vap 40  
Order no.: 7640



# ***LAB Online Exhibition***





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## Safety

### Application as directed

With the Vapodest 40 you have purchased an automatic distillation system for the steam distillation of Kjeldahl digestions and associated distillations. Automatic addition of  $H_2O$ ,  $NaOH$  and  $H_3BO_3$  as well as removal of the sample remains after distillation by suction.

### Safety instructions

Make sure that no liquid gets into contact with cable connections or the interior of the electrical parts of the unit!  
Danger of electrical shock!



For repairs on electrical, electronic or mechanical parts always contact your agent's service. Don't do repairs by yourself!



Always switch off the apparatus at the mains and pull out the plug before opening! Danger of electrical shock!



The Vapodest 40 must not be run in damp or hazardous location. The maximum humidity allowed is 80 %, the maximum ambient temperature must not exceed 40 °C!



The apparatus must not be exposed to aggressive vapours of acids, alkalies or solvents.



The apparatus must be used according to this instruction manual. It is not allowed to supply changes to the apparatus in order to modify its application.



# 1 Technical description

## Warranty conditions

The Vapodest 40 is made following the high quality guidelines of *Warranty* DIN EN ISO 9001.

On the basis of the C. Gerhardt conditions of warranty our products are guaranteed for 1 year, as long as the apparatus is used in accordance with the instructions mentioned in this manual.

Please note that the semi-consumable parts are excluded from warranty.

## Technical data

Voltage: .....	230 V AC, 50 Hz	<i>Distillation</i>
Wattage: .....	1600 W	<i>System</i>
Cooling water: .....	about 3 litre per distillation minute	
Cooling wat. pressure	> 1,3 bar	
Pump capacity:		
-Diaphragm pump ...	about 10 ml/s	
-Peristaltic pump .....	about 10 ml/s	
Store tank: .....	any size, recommended: KAN 40	
Micro controller: .....	Single-chip MCU	
Display: .....	2 x 16 LCD	
Programs: .....	10	
Interface: .....	RS 485	
Dimensions: .....	440 x 690 x 340 mm (W x H x D)	
Weight: .....	29kg	
Baud-rate: .....	9600	<i>Interface</i>
Data-bits: .....	8	
Parity .....	No	
Start bit: .....	1	
Stop bit: .....	1	
Mode: .....	Semi-Duplex	
User: .....	Maximum 32	
Connection: .....	D-Sub 9-pin acc. to DIN 41 652	

.....  
Pin-assignment: ..... 1 – shield  
..... 2 – N/C  
..... 3 – B driver-Out/receiver-In  
..... 4 – N/C  
..... 5 – GND  
..... 6 – VCC  
..... 7 – N/C  
..... 8 – A driver-Out/receiver-In  
..... 9 – N/C

*Pin-assignment*

## Operating conditions

Vapodest distillation systems can be run under normal laboratory conditions.

For the connection to the tap (cold water) a fixed connection with 1/2 inch thread is needed.



## 2 Description of the system

### Front view

Structural components and parts:

- 1 .... Quick clamping device with wedge
- 2 .... Kjeldatherm digestion tube, 250/100 ml or flask, 500/750 ml, with enlarged neck or KDD 400/800
- 3 .... Holder for steam inlet tubing
- 4 .... PTFE-inlet tubing, steam
- 5 .... Viton-cone, macro or micro
  
- 6 .... Clamping for glassware
- 7 .... Screw cap GL 18 with silicone seal
- 8 .... PTFE-inlet tubing, NaOH
- 9 .... PP-distributor with PP-threaded joint
- 10 .... Distribution head, glass
  
- 11 .... Screw cap GL 32 with silicone seal
- 12 .... Distillation condenser
- 13 .... Screw cap GL 14 with plastic screw connection
- 14 .... Display
- 15 .... Keyboard, chemical-resistant
  
- 16 .... Mains switch, green, illuminated
- 17 .... Holder PVC
- 18 .... Ventilation valve
- 19 .... Distillate outlet tubing, silicone 8/12 mm
- 20 .... Erlenmeyer flask
  
- 21 .... Platform
- 22 .... Drip tray
- \*\* .... Plexiglass protection door, top (not illustrated)
- \*\* .... Plexiglass protection door, bottom (not illustrated)
- \*\* .... New, plexiglass protection door, single (not illustrated)

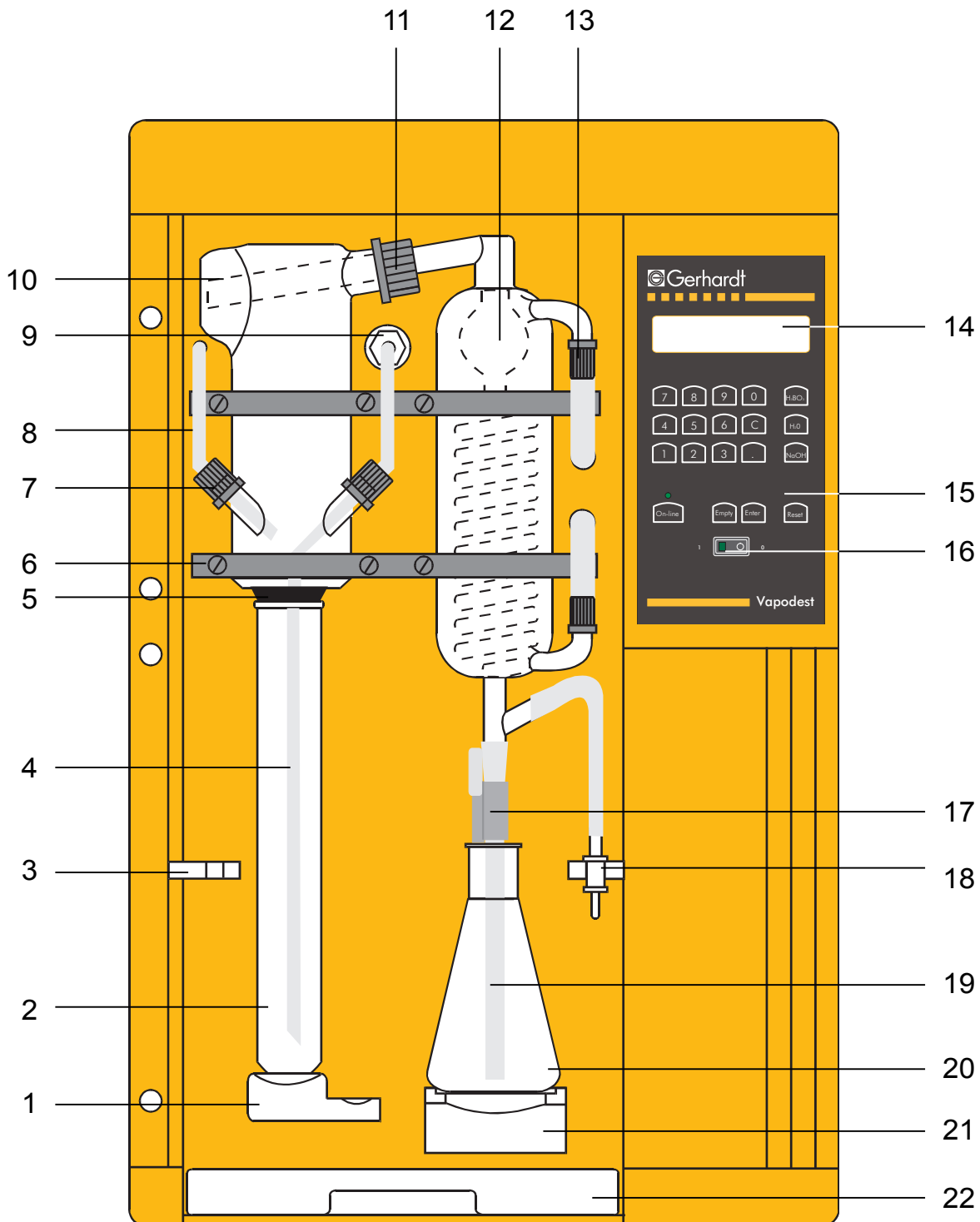


Fig.2.1: Front view Vapodest 40



## Rear view

Description of the connections:

- 1 .... Diaphragm pump for  $\text{H}_3\text{BO}_3$   
Connection pipe for PVC-tubing 4/7 mm
- 2 .... Diaphragm pump for  $\text{H}_2\text{O}$  sample  
Connection pipe for PVC-tubing 4/7 mm
- 3 .... Diaphragm pump for  $\text{H}_2\text{O}$  steam generator:  
Connection pipe for PVC-tubing 4/7 mm
- 4 .... Level detector:  
Connection socket for diode plug, 3-pin  
(level detector for set of tanks KAN 40)
- 5 .... Mains cable with appliance plug
  
- 6 .... Excess current switch, 10A  
Cuts off in case of excessive current consumption
- 7 .... RS 485 interface
  
- 8 .... Outlet ventilation tubing
  
- 9 .... Excess pressure - steam outlet
  
- 10 .... Excess temperature fuse
  
- 11 .... Cooling water inlet with sieve:  
Connection thread 3/4 inch for water inlet tubing 10/17 mm
- 12 .... Water outlet:  
Connection pipe for PVC-tubing 8/12 mm
- 13 .... Peristaltic pump for sample suction  
Connection pipe for Verprene-tubing 8/12 mm
- 14 .... Diaphragm pump for NaOH:  
Connection pipe for PVC-tubing 8/12 mm

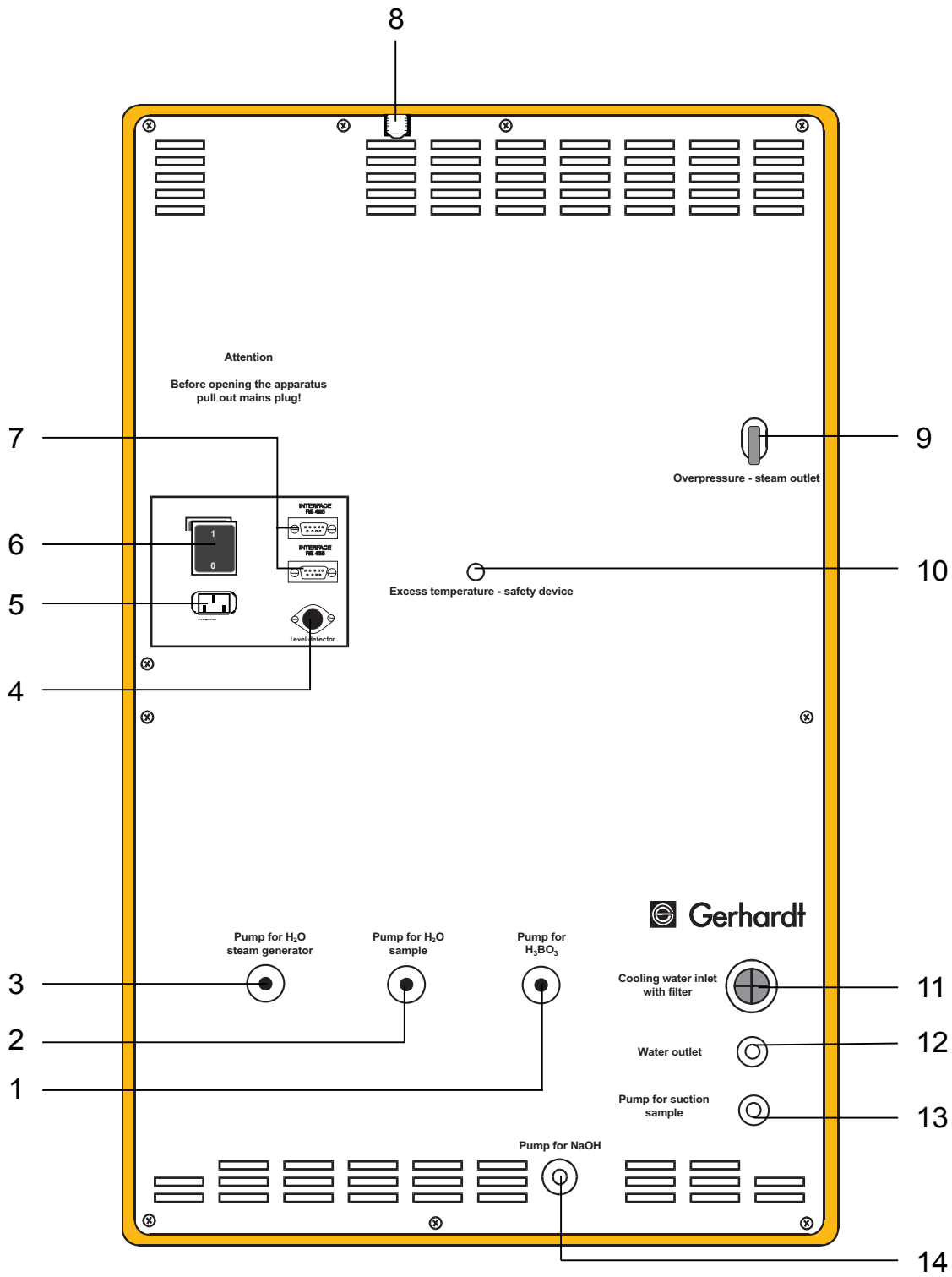


Fig.2.2: Rear view Vapodest 40

## 3 Delivery

### Check for transport damage

Before assembling the instrument please check if the contents of the box is complete and intact!

In case of any damage, please notify your carrier (post, rail, road) and obtain an expert's report!

The exact contents of the delivery can be checked by the following list.

### Parts list

- Distillation system Vapodest 40, complete
  
- Tubing set:
  - 1 x Water inlet tube 10/17 mm with connections of 1/2 inch and 3/4 inch, 2m
  - 1 x Verprene tube 8/12 mm, 2 m
  - 3 x PVC tube 4/7 mm, 2 m
  - 2 x PVC tube 8/12 mm, 2m
  - 3 x PVC pipe 6 x 1 mm, 420 mm
  - 1 x PVC pipe 10 x 1 mm, 420 mm
  
- 1 Mains cable
  
- 1 Kjeldatherm digestion tube 250 ml or 100 ml

## 4 Assembly and installation

### Setup

Please observe the local water and waste regulations and those of your public water supply enterprise!



Please note that the length of the inlet and outlet tubing is restricted to 2 metres.

The appliance should be located on a fixed laboratory bench, close to the cold water connection and a drain.

There should be sufficient space for the set of tanks below the work bench.

Connect the water inlet tubing to a dedicated cold water tap.

The water pressure must be at least 1,3 bar in order to operate the integrated pressure controller.

The Vapodest 40 distillation system comes completely preassembled. Please unpack the instrument with care!

1. Place instrument on work bench
2. Unpack accessories.
3. Place set of tanks for distilled water, sodium hydroxide,  $H_3BO_3$  and sample waste below the bench.

*Installation*

Make sure that the set of tanks are not placed any higher than the distillation unit!

4. Connect the pump tubes (connections are marked at the rear of the apparatus) to the PVC-pipes of the chemical tanks:
  - Inlet tubing sodium hydroxide (PVC-tubing 8/12 mm)
  - Inlet tubing for distilled water steam generator (PVC-tubing 4/7 mm)
  - Inlet tubing distilled water sample (PVC-tubing 4/7 mm)
  - Inlet tubing distilled  $H_3BO_3$  (PVC-tubing 4/7 mm)

*Tubing connections*



5. Connect the water inlet tubing
  - Connect water inlet tubing (pressure-proof tissue tubing 10/17 mm) to cooling water inlet and laboratory water supply
6. Connect the outlet tubing:
  - Connect water outlet tubing (PVC-tubing 8/12 mm) to connection pipe at the rear and place in the drain.
  - Connect sample waste outlet (Verprene-tubing 8/12 mm) to pipe at the rear and direct to sample waste tank/drain.



Please check the nominal voltage on the type plate before connecting to the mains.

7. Mains connection
  - Make sure that the mains switch at the front of the instrument is in position „0“
  - Connect the mains cable to the rear appliance plug first
  - Connect the mains cable to a shockproof socket
8. Use of the set of tanks KAN 40 (optional)
  - Connect the diode plugs of the level detectors to the distribution box and connect to the socket level detection (at rear)
9. Excess current switch
  - Before you first take the Vapodest into operation make sure that the excess current switch at the rear is in position 1.

## Setting into operation



Attention when working with acids and alkalies! Make sure you observe the safety instructions concerning work with hazardous materials!



Always close the plexiglass doors of the distillation unit before operating!

1. Fill the set of tanks with chemicals:
  - H<sub>2</sub>O distilled or demineralized
  - NaOH 32 %
  - H<sub>3</sub>BO<sub>3</sub> 2-4 %
2. Turn on the water tap
3. Initial filling of steam generator

- After switching the unit on the pump that fills the steam generator starts immediately, and the display shows the error message:

Low water  
Press Enter

press 

Filling  
Steam generator

The steam is filled with water up to a preset level, which then causes the pump to switch off.

4. Monitoring the status notice on the display:

Distillation = 1  
Programming = 2

The Vapodest 40 is now ready for operation.

# 5 Programming the system

## Keyboard

The Vapodest 40 can be programmed and controlled via the keyboard of the control panel.

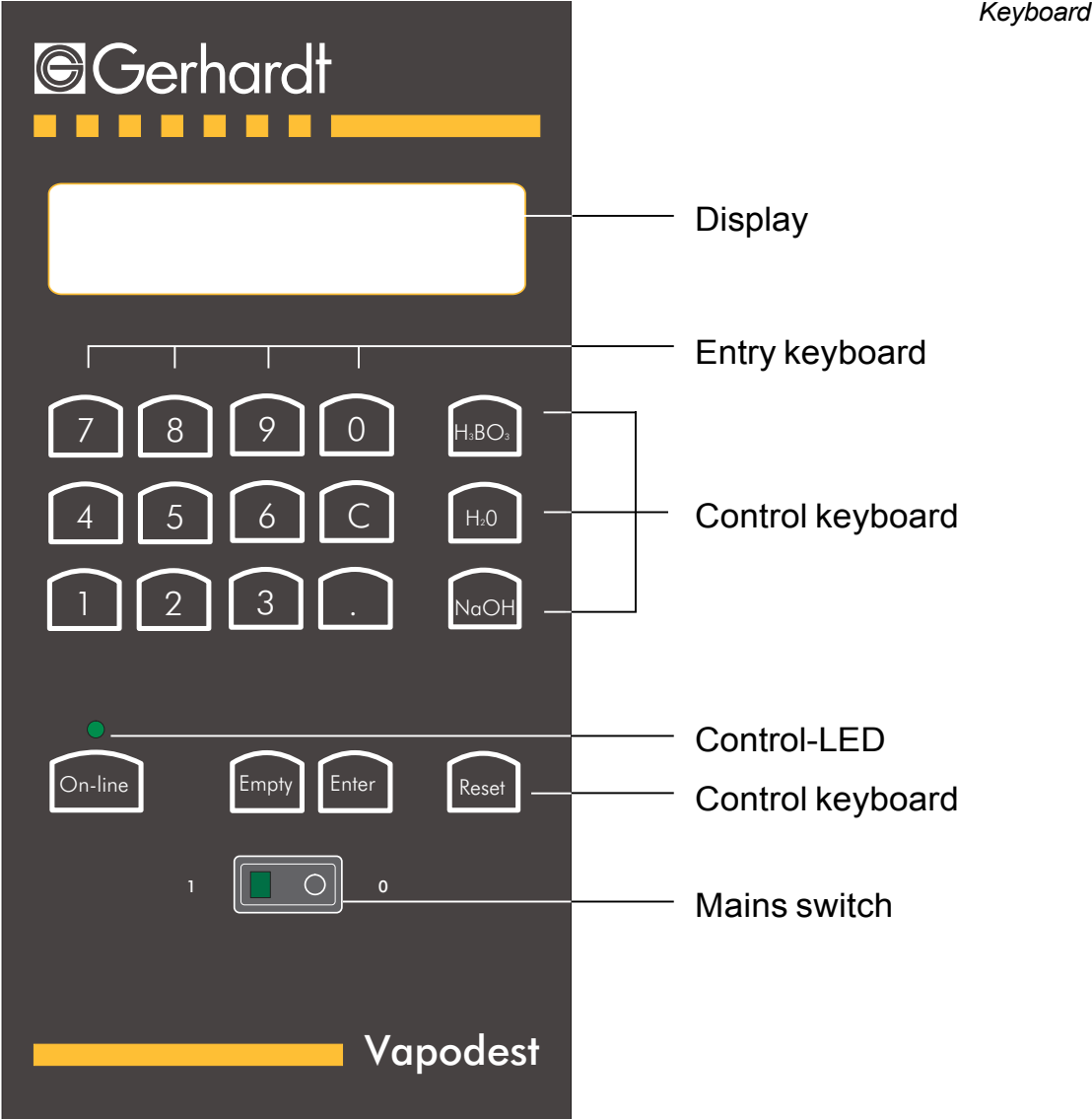


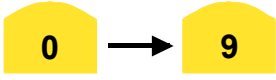










Fig. 5.1: Control panel keyboard

Display/keys	Description
	Display of actual state or step
	Confirm or store programs or specific settings
	Numeric keys to set the desired values
	Interrupt a program, return to starting position
	Go to previous step
	Press to light „On-line“: Control-LED illuminated, Interface is activated
	Press combined with key „On-line“ to enter synchro mode
	Manual adding of H <sub>3</sub> BO <sub>3</sub>
	Manual adding of H <sub>2</sub> O
	Manual adding of NaOH
	Manual suction of sample

## Programming the Vapodest 40

Each Vapodest undergoes a pre-delivery performance test in the quality assurance department before leaving C.Gerhardt. On arrival the machine is supplied with the test program.

After switching on the Vapodest 40, the display shows the actual version of software,

After that the display shows the standby-mode:

```

Distillation = 1
Programming  = 2
    
```


From this mode all programming and operation is performed, which is explained in the following.

## Special functions

### Selecting language

1. Enter the language selection menu by pressing the key „C“.

*Selecting language*

 → 

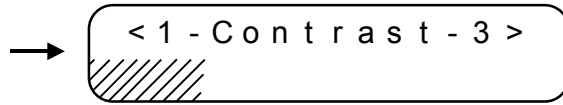
```

Select language
D=1 GB=2 F=3 E=4
    
```

D= German GB= English  
F= French E= Spanish

2. Select your desired language by pressing the keys „1“, „2“, „3“ or „4“
3. The display changes to the „contrast adjustment“-menu.

### Setting the contrast



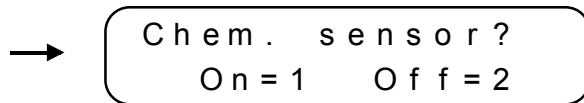
1. Pressing the key „1” decreases, pressing the key „3” increases the contrast of the display, according to the surrounding light conditions. *Setting the contrast*

Note:

The adjustment range can be further increased by pressing the keys „1” or „3” at the end of each scale.

2. Confirm the set value by pressing the key „Enter”.
3. The display changes to the „chemical sensor“- menu.

### Setting the chemical sensor



The chemical sensor is used in conjunction with the „KAN 40“ *Chemical sensor* set of tanks to monitor the chemical level inside the tanks.

- Press key „1”, if KAN 40 is used.
- Press key „2”, if other tanks are used.
- The display changes to the initial „Standby“-mode.

## Programming the distillation system

### General remarks

The Vapodest 40 is provided with 10 programs (0-9) where the programs 0-8 are intended for the distillation of KJELDAHL digestions, free ammonia and the nitrogen determination acc. to Devarda. The chemicals to be added in program 9 are not specified.

### Setting up a program

Example:

The example used assumes a sulphuric acid digestion leaving approx. 10 ml of free unbound concentrated sulphuric acid.

The display shows the standby-mode:

*Programming the  
distillation system*

```

  D e s t i l l a t i o n   = 1
  P r o g r a m m i n g   = 2
  
```

- Press key „2” to enter the program mode

```

  2 → P r o g r a m   N o . 0
  
```

- The apparatus always comes up with program 0. For another program enter the desired program number.
- Press the key "Enter" to confirm the desired program

```

  Enter → P r o g r a m   N o . 0
          A d d   H 3 B O 3       0 6 s
  
```

- The time varies acc. to the chosen program. Enter 6 seconds for a 300 ml Erlenmeyer flask.  
When you change this value, remember that the distillate outlet tubing must always dip into the receiver solution.
- Adjustment range 0-99 s →

**Enter** → 

Program No . 0
Add H <sub>2</sub> O        0 7 s

- It is necessary to have a 6 fold dilution of the residual acid after digestion in this case 60 ml = about 6-7 sec. of H<sub>2</sub>O.
- Adjustment range 0-99 s

**Enter** → 

Program No . 0
Add NaOH        0 8 s

- Again, It is necessary to have a 6-7\* fold dilution of the residual acid after digestion in this case 60-70 ml = about 7-8 sec. of NaOH
- \* There must always be an excess of NaOH.
- Adjustment range 0-99 s

**Enter** → 

Program No . 0
Reac . time 00m00 s

- This allows the beginning of distillation to be delayed so that a cold reaction can occur, e.g. for Devardas. For KJELDAHL this is not relevant, so a time of 0 is entered.
- Adjustment range 0-99 min

**Enter**

- Adjustment range 0-59 s

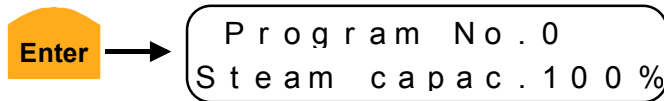
**Enter** → 

Program No . 0
Dist . time 03m30 s

- The distillation time must be chosen so that approx. 90 ml of distillate is collected. On setting 100 % for the steam power 3 minutes, 30 seconds is sufficient.
- Adjustment range 0-99 min

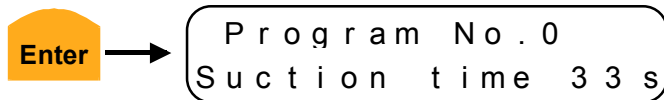
**Enter**

- Adjustment range 0-59 s

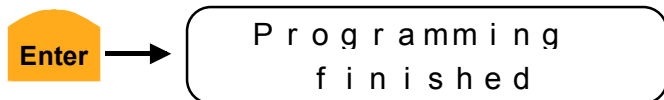


- Adjustment range 40-100%  
*Each 10 % interval is equivalent to 150 watts of heating power.*  
e.g.: 40 % = 600 W, 50 % = 750 W, 100 % = 1500 W

- **Note:** with micro tubes 100 ml the maximum capacity that can be used is 80 %



- The suction time for a 10 ml solution is 1 s
- Adjustment range 0-99 s



- Press the key „Enter“ to return to the „standby“-mode.
- Now you can start programmed distillations or write more programs.
- The set values remain stored in memory until they are changed again.

## On-line mode

The RS 485 interface allows quality assurance conforming to ISO/GLP. It enables up to 32 different instruments (including other makes) to be connected between each other.

The on-line mode provides the following possibilities:

1. Connection of personal computer for controlling and monitoring in conjunction with the GerLab® user program. *Control via PC*

2. Connection of PC for controlling and monitoring in conjunction with a customerised terminal program, i.e., Telix (MS-DOS), Terminal (for Windows). With the assistance of the interface a program, based on the customers' needs, can be written, too.

*Synchronous mode*

3. Synchronous working of various equipment. The programming and controlling is effected via a system, which has been appointed semi master.  
The working instructions for the synchronous mode are as follows:

- Connect all instruments with the interface cables RS 485
- Provide the last unit connected with the terminator AST
- Activate the On-line key of each instrument (control LED illuminated)



- Determine the semi master by pressing the keys „.“ (keep pressed) and „On-line“ (control LED flashes)



By pressing this key-combination once more you can return to the simple On-line position (Control LED illuminated).

- Programme the semi master as described in the previous paragraph →

After having confirmed program step 5 the following is shown on the display:

Data transfer  
= Enter

- Press the key „Enter“ to initiate the data transfer from the semi master to the connected instruments
- After the termination of the data transfer the programming mode automatically ends, and the display shows the standby mode.

Further information about GerBus® and GerLab® can either be obtained from C. Gerhardt GmbH & Co. KG or our appointed dealer.

## 6 Operation

### Safety instructions

Attention when handling acids and alkalies! Please observe your national safety regulations!



Use gloves when removing the glass digestion tube as this will be very hot, and there is danger of burning!



Take care when handling glass parts and follow the national safety regulations concerning the handling of glass parts!



### Priming the system

Please make sure that the system is fully primed. This must be performed before for the initial start, after longer working intermissions (holidays etc.) and each time after the inlet and outlet tubes have been removed.

1. Check the chemical tanks
2. Turn on the tap
3. Insert the inlet tube into an empty digestion tube
4. Lower the quick clamping device and insert the digestion tube
5. Ensure there is a tight fit between the tube and the Viton cone
6. Insert the distillate outlet tube into an empty Erlenmeyer flask, and place the flask into position
7. Close the protection door, and switch on the distillation system
8. Keep the key „H<sub>2</sub>O“ pressed until the water runs into the digestion tube
9. Keep the key „NaOH“ pressed until the sodium hydroxide solution runs into the digestion tube.
10. Keep the key „H<sub>3</sub>BO<sub>3</sub>“ pressed until the boric acid runs into

*Priming*

the receiver

11. To empty the contents in the digestion tube press the key „Empty“

12. Remove the digestion tube and the Erlenmeyer flask

The distillation system Vapodest 40 is now primed.

## Test run

**Each day before starting to distill samples you should do a distillation without sample.**



Don't be disturbed by noises deriving from the approx. 106 °C hot steam being led into the digestion tube.

## Distilling a sample

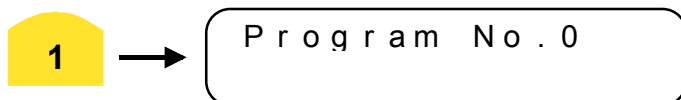
This program can be interrupted any time by pressing the key „Reset“.

1. Place an Erlenmeyer flask into position
2. Place the steam inlet tube into the sample tube filled with sulphuric acid digestion
3. Place the quick clamping device and place the digestion tube into position
4. Check the tight fit of the tube against the Viton cone.
5. Close the protection door and switch the instrument on.
6. The display shows the standby mode

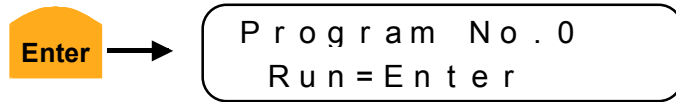
*Sample distillation*

Distillation	= 1
Programming	= 2

7. Press key „1“ to access the program mode



8. Enter the desired program number (key 0...9)



9. On running a sample the display shows the distillation sequence of chemical additions, distillation time and suction sample.  
During the reaction time (if used) and distillation period both the programmed time and countdown time are displayed. With the chemical additions only the countdown time is displayed.
10. Once the program has finished the program remove the digestion tube by lowering the quick clamping device.
11. Place the steam inlet tube into the holder.
12. Clean the  $H_3BO_3$  distillate outlet tubing with  $H_2O$ -distilled, then remove the Erlenmeyer flask with the distillate and continue the determination.

If you wish to keep this program and distill further samples, please press the key „Enter“. If you wish to change the program, reprogramme the system. If you have finished all distillations, switch the unit off or start the cleaning program.



## Cleaning

Glass parts and suction pump should be cleaned before long periods of non-usage (i.e. holidays). This way blockages caused by crystalline deposits are avoided.

The following program should be run:

Addition $\text{H}_3\text{BO}_3$	0	s
Addition $\text{H}_2\text{O}$ :	13	s
Addition NaOH:	0	s
Reaction time:	0	s
Distillation time:	7	min.
Steam capacity:	100	%
Suction time:	20	s

Place an empty digestion tube and an Erlenmeyer flask into position, and start the program.

In case of extreme deposits in the glassware you can clean the system by putting about 10 ml of sulphuric acid into the digestion tube.

## 7 Error messages


The micro-processor continually surveys all the functions of the distillation system. As soon as an error arises it is shown on the display and accompanied by an acoustic signal.

Error message	Measures	
No tap water	Check cooling water inlet for blockages. Ensure the tap is turned on	→ Enter
No sample tube	Insert tube	→ Enter
Check chemicals	Check set of tanks	→ Enter
Low water Press Enter  ↓ Filling Steam generator	Check the water inlet distilled H <sub>2</sub> O  This message disappears as soon as steam generator is filled	→ Enter

After the above mentioned errors are corrected, the following message is displayed.

Error message	Measures
Stop Prog.No. x continue=Enter	Enter = continue of interrupted program Reset = Standby-mode

Other error messages

Error message	Measures
<div style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;">                     W a i t f o r s t e a m                 </div>	Message disappears as soon as stand-by is reached
<div style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;">                     A d d s o l . &gt; 1 m i n                      C o n t i n u e = E n t e r                 </div>	Check programming  Enter=continue of interrupted program Reset=Standby-mode
<div style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;">                     P r o g r a m                      u n d e f i n e d                 </div>	Check programming  <div style="text-align: center;">  </div>
<div style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;">                     E x c e s s s t e a m                      p r e s s u r e                 </div>	Switch the system off and call service
<div style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center;">                     S e n s o r e r r o r                 </div>	Switch the system off and call service

## 8 Maintenance

In case of necessary replacements, please make sure that only original C. Gerhardt spare parts are used!



### Service and cleaning

Condensate that might escape is collected in the drip tray. Please clean the drip tray regularly.

Regularly check the consistence of the tubing and tubing connections.

To minimize malfunctions of the Vapodest 40, we recommend to have it checked by authorized service personnel regularly.

### Trouble shooting

The excess current switch cuts off in case of excessive current consumption. Switch on the excess current switch again. If this problem reoccurs, call service!

*Excess current switch*

In case of breakdown or failure of your extraction unit, please contact your local dealer or:

*Service*

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## Tubing diagram

The pumps and the valves of the instrument are marked with reference numbers.

Descriptions of the structural components:

- 1 .... PVC-pipe 6x1 mm, 400 mm
- 2 .... PVC-pipe 10x1 mm, 400 mm
- 3 .... PVC-tubing 4/7 mm
- 4 .... Verprene-tubing 4/8 mm
- 5 .... Peristaltic pump suction (pos. 4)
- 6 .... Diaphragm pump NaOH (pos. 6)
- 7 .... Diaphragm pump H<sub>2</sub>O sample (pos. 2)
- 8 .... Diaphragm pump H<sub>2</sub>O steam generator (pos.5)
- 9 .... Tubing reduction PP 51x10x5 mm
- 10 .... Silicone tubing 4/7 mm
- 11 .... Verprene-tubing 8/12 mm
- 12 .... Inlet condenser, Silicone tubing 8/16
- 13 .... Outlet condenser, Silicone tubing 8/16
- 14 .... Ventilation glass
- 15 .... Pinch-solenoid valve, shut-off (pos. 3)
- 16 .... Pinch-solenoid valve, steam (pos. 7)
- 17 .... Novoprene-tubing 4,8x1,6 mm
- 18 .... PP-distributor with PP-thread
- 19 .... PTFE-inlet tubing NaOH
- 20 .... Steam generator
- 21 .... Water inlet tubing 10/17 mm
- 22 .... Magnetic valve cooling water (Pos. 8)
- 23 .... Outlet tubing, PVC 8/12 mm
- 24 .... Diaphragm pump H<sub>3</sub>BO<sub>3</sub>, receiver (Pos.1)
- 25 .... PVC-tubing 8/12 mm
- 26 .... Verprene-tubing 8/12 mm
- 27 .... Level detector for sample waste tank
- 28 .... Knurled knob with socket
- 29 .... Level detector for chemical tanks

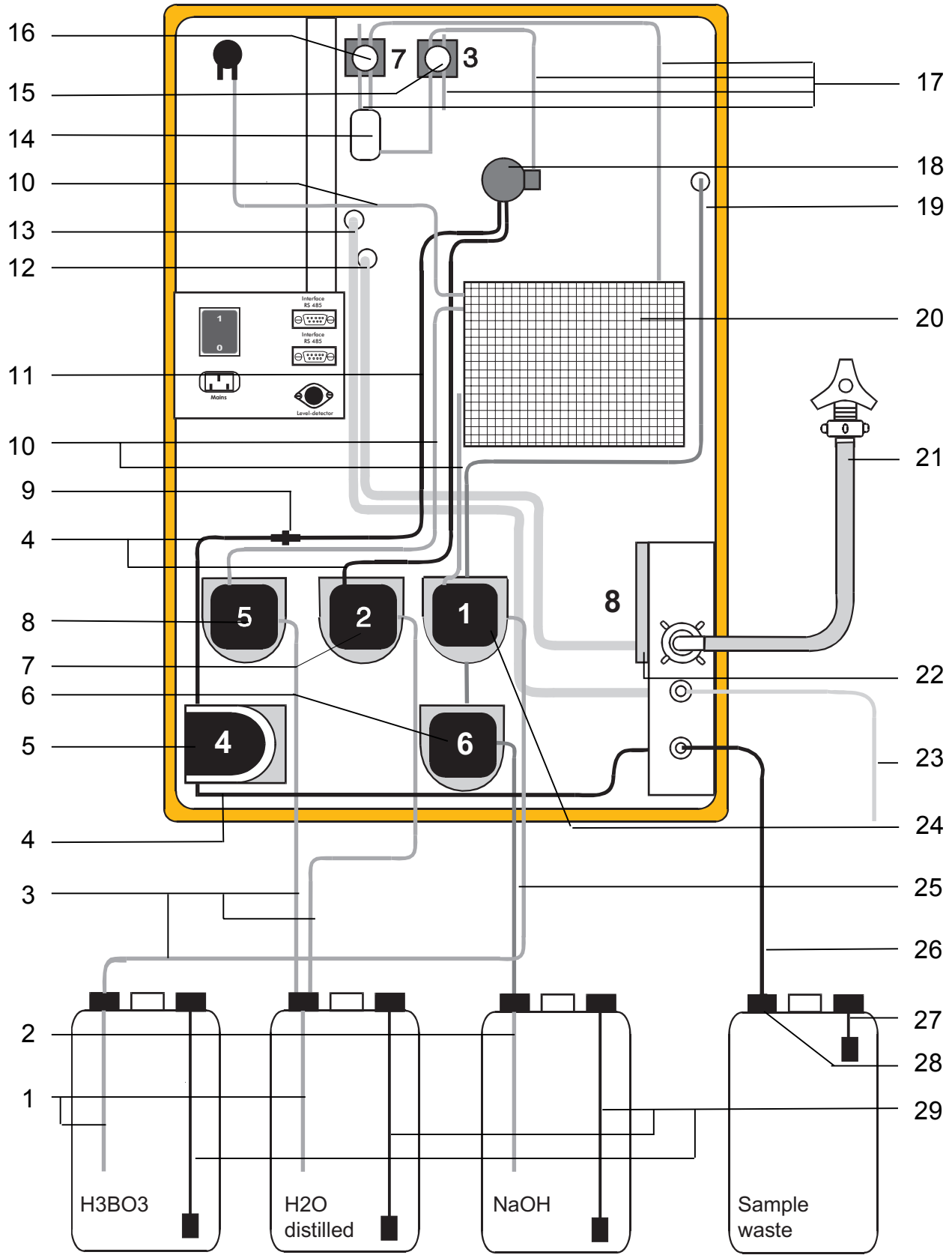


Fig. 8.1: Tubing diagram



## Spare parts and accessories

Parts description	Order no.	
Distillation condenser	7673	<i>Spare parts</i>
Plastic screw connection for distillation condenser	16609	
Ventilation valve	6474	
Distribution head, glass	7472	
Viton cone	6470	
PTFE-inlet tubing, steam	11810	
Teflon sieve for 11810	30698	
PTFE-inlet tubing, NaOH	11811	
PP-distributor	50024	
PP-tube joint	17542	
Screw cap GL 14	16601	
Screw cap GL 18	16602	
Screw cap GL 32	16604	
Silicone seal GL18	16606	
Silicone seal GL 32	16607	
Plexiglass protection door, top	19016	
Plexiglass protection door, bottom	19015	
New, plexiglass protection door, single	19017	
Door handle, brown	18251	
Door hinges, brown, 1 pair	18250	
Rubber foot GF21, self-adhesive	17945	
Drip tray, PP	50015	
Mains switch, green, illuminated	11750	
Keyboard	11215	
Control PCB	11225	
Excess current switch, 10 A	15378	
Heating element	12354	
Steam generator	40850	
Excess pressure valve, steam generator	20604	
Ventilation valve WMF	20620	
Power PCB, 230 V	11223	
Mains cable	1311	
Magnetic valve with pressure control	17109	
Semiconductor relay WG-A5-6D25	15350	

<b>Parts description</b>	<b>Order no.</b>	
Micro switch for quick clamping device	13308	
Pinch-solenoid valve steam and shut-off	10385	
Ventilation glass	40272	
Diaphragm pump PML 1140-ND 100	10310	
Peristaltic pump	10360	
Water inlet tubing 10/17 mm, 2 m	22802	
Silicone tubing 8/12 mm, 2 m	22704	
Novoprene-tubing 4,8x1,6 mm	20919	
Verprene-tubing 4/8 mm	20920	
Verprene-tubing 8/12 mm	20921	
Tubing reduction PP 51x10x10 mm	50022	
Tubing reduction PP 51x10x5 mm	50023	
PVC-tubing 4/7 mm, 2 m	22601	
PVC-tubing 8/12 mm, 2 m	22604	
PVC-pipe 6x1 mm, 400 mm	25450	
PVC-pipe 10x1 mm, 400 mm	25451	
Set of tanks KAN 40	7649	<i>Accessories</i>
Level detector with plug for H <sub>2</sub> O, H <sub>3</sub> BO <sub>3</sub> and NaOH-tank	11320	
Level detector with plug for „Sample waste“ tank	11321	
RS 232/485 ARS	4260	
Data cable DK 42 for RS 485, 2 m	4261	
Data cable DK 45 for RS 485, 5 m	4262	
Data cable DK 22 for RS 232, 2 m	4264	
Terminator AST	4265	
Viton cone VK, micro, for 100 ml tubes KMT	7671	<i>Modification accessory Micro</i>
PP-distribution head Devarda VPD 7, bottom part	7474	<i>Modification kit Devarda</i>
Glass PP-distribution head Devarda VGD 7, top part	7475	
Ventilation valve condenser (glass)	30244	
Condenser, shortened	7676	
PP-adaptor	40213	
PP-distribution head distance piece	50025	
Screw cap GL 32, open version	16604	