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Read these instructions thoroughly before you use the **BÜCHI Vacuum Controller V-800/V-805**. Keep these instructions near the apparatus, so that they are quickly accessible.

Chapter two contains important safety instructions. This information is essential as regards safe operation of the rotary evaporator.

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en, Version H (50 pages)

Order number

V-800/V-805 Operating Instructions

96771

1 Scope of Delivery



Photograph of V-805

Base apparatus	
V-800 Vacuum Controller 230 V / 50-60Hz	40736
V-800 Vacuum Controller 100/120 V / 50-60Hz	40737
V-805 Vacuum Controller 230 V / 50-60Hz	40738
V-805 Vacuum Controller 100/120 V / 50-60Hz	40739

Standard accessories:	Order number
1 Mains cable	
Typ CH	37551
Typ Schuko	37551
Typ GB	37589
Typ AUS	40720
Typ USA	37552
1 Operating instructions	
German	96770
English	96771
French	96772
Italian	96773
Spanish	96774



Remote control

Facultative accessories

1	Valve unit	37968
1	Holder for valve unit on Rotavapor R-200 /205	40810
1	Remote control	40735
1	Communication set to rotary evaporator R-200/205	40235

2 Safety

This apparatus has been built according to state-of-the-art and recognised safety rules. Still, it can be associated with risks and hazards:

- If the apparatus is operated by insufficiently trained personnel;
- If the apparatus is not used properly.

2.1 Symbols



Stop

Information on hazards, which can lead to heavy material damages, to severe or life-threatening injuries.



Warning

Information on hazards, which can lead to health damages or to material damages.



Please note

Information, pointing to technical requirements. If these are not complied with, disturbances, reduced economic efficiency and product losses can result.

2.2 Requirements placed on operators

This apparatus can only be used by expert personnel or other persons, who, because of their education or profession are familiar with hazards, which can arise when this apparatus is operated.

Personnel lacking this kind of training or persons, still being trained, require thorough instructions. These operating instructions are the basis for such training measures.

2.3 Proper use

This apparatus has been designed and built for laboratory uses. Its proper uses include regulating and displaying vacuum in working range 0mbar to atmospheric pressure.

The Vacuum Controller is used for:

- Distillation apparatuses, especially rotary evaporators
- Vacuum drying cabinet

2.4 Improper use

Applications not mentioned above are improper. Also, applications, which do not comply with the technical data are considered improper. The operator assumes sole risk for any damages, attributed to such improper use.

Especially the following uses are not permitted:

- Use of the apparatus in rooms, which require protected apparatuses
- Calibration apparatus for other apparatuses
- Work in excess pressure

2.5 Fundamental hazards

Fundamental hazards are associated with:

- Evacuated apparatuses
- Damaged glassware, which is evacuated

Covers can only be removed with conventional tools by authorised repair personnel.



| Contact with live parts is life threatening!

2.6 Safety measures



You must respect regional and local laws and regulations.

Basically, personal protective equipment such as **protective eye goggles**, and **protective clothing** are to be worn.

These operating instructions must be available for operating personnel at the point of use of the apparatus as component of the Vacuum Controller V-800/V-805. This also applies to additional language versions of these instructions. These language versions can be ordered separately.

2.7 Modifications



Modifications to the apparatus or to spare parts and accessories as well as use of other spare parts and accessories than those mentioned in these operating instructions are only permitted with the written consent of Büchi Labortechnik AG.

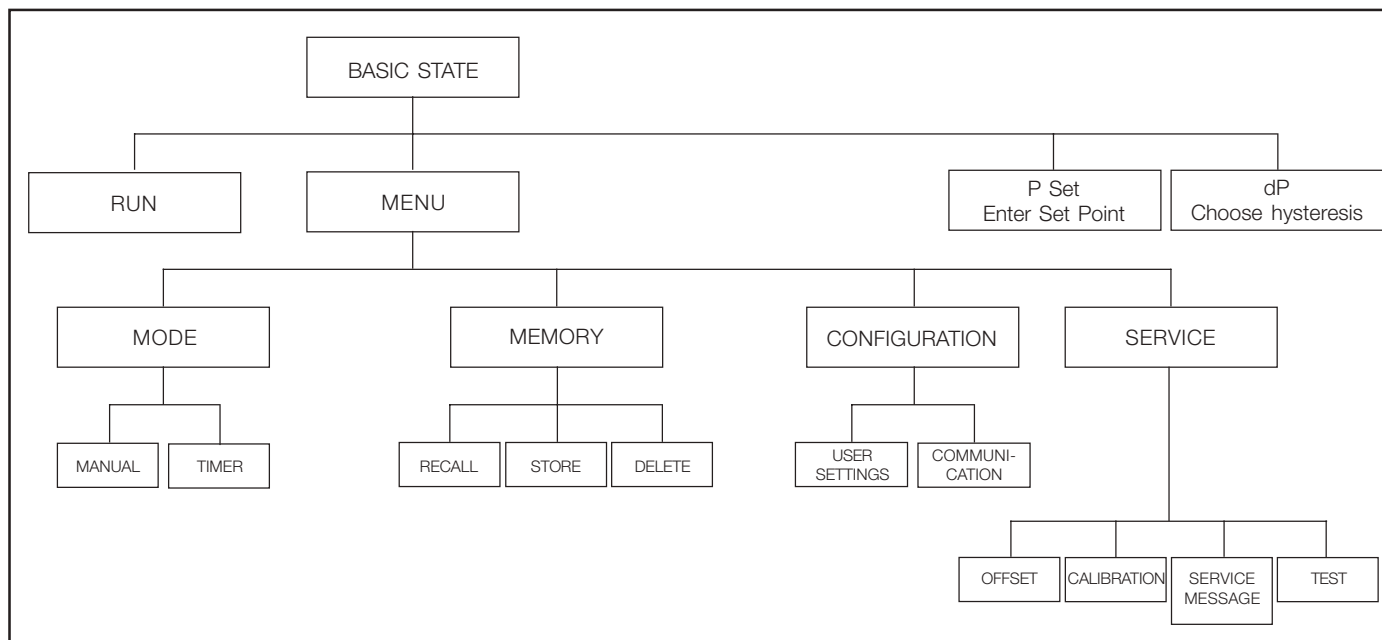
2.8 Operator's responsibilities

The operator is responsible for training its personnel. For this purpose, you can be order these operating instructions in other languages.

The operator shall inform the manufacturer immediately about any safety relevant events, occurring during use of the apparatus.

3 Functions V-800

3.1 Overview program structure V-800



Overview program structure V-800

3.2 General functions

3.2.1 Manual distillation

The set point of system pressure is input. When the distillation starts, the system pressure is reduced to the input value and kept constant. An input value stays in the memory even when the apparatus is turned off. Distillation must be stopped manually.

3.2.2 Distillation with timer function

The set point of system pressure and distillation duration are input. When the distillation starts, the system pressure is reduced to the input value and kept constant during the selected period. At the end of the input distillation period, the distillation is stopped. If configured accordingly, rotation of the evaporating flask is stopped and the flask is lifted from the bath (see 5.6 Configuration).

3.2.3 Working memory

The last module used and associated values remain in the working memory after the apparatus is turned off and are automatically recalled when the apparatus is turned on again.

3.2.4 Configuration - Communication

In this menu, you defined whether:

- Whether rotation of the evaporating flask is to start automatically when the controller starts (only in connection with Rotavapor R-200/R-205)
- Whether the evaporating flask is to be lowered into the bath automatically when the controller starts
- Whether the evaporating flask is to be automatically lifted from the bath when the controller stops
- Whether the apparatus is to be automatically ventilated when the controller stops.

All of these functions can be turned on and off.

3.2.5 Set point (P Set)

Defines the value, at which the system pressure is kept constant. An input value stays in the working memory after the apparatus is turned off and is automatically recalled when you start the apparatus again.

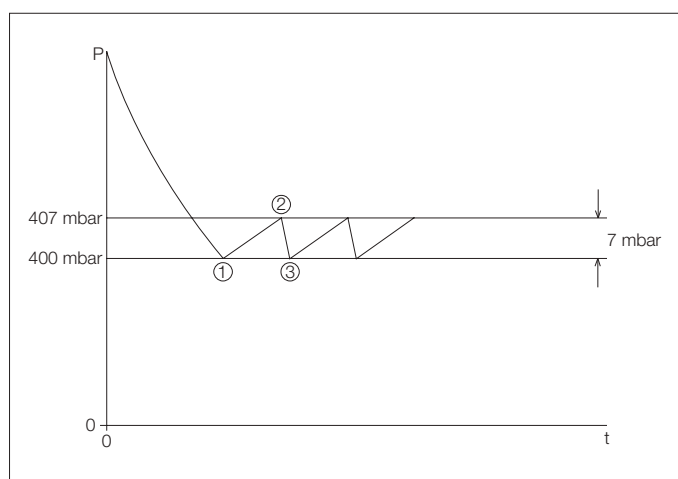
3.2.6 Hysteresis (dP)

Defines the band width, within which a chosen set point is kept constant.

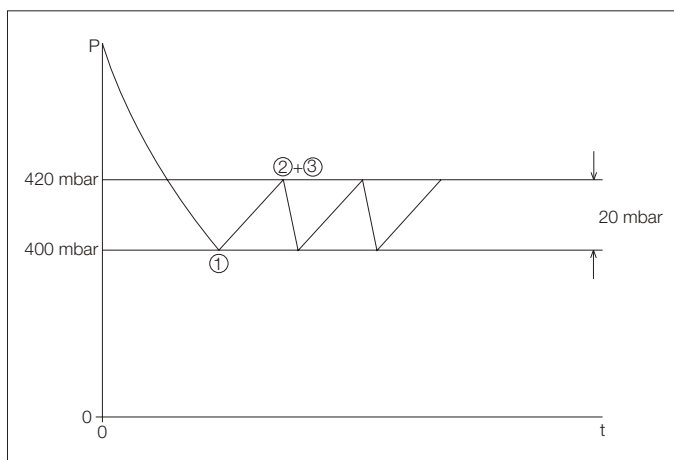
3.2.6.1 Manual hysteresis (dP = 500... 1 mbar, A)

Example: set point 400 mbar, hysteresis 7 mbar

- ① System pressure is reduced to 400 mbar, the vacuum source is turned off
- ② The system pressure increases to 7 mbar
- ③ The vacuum source is turned on and the system pressure is evacuated again to 400 mbar



Manual hysteresis



Automatic hysteresis

3.2.6.2 Automatic hysteresis (dP = A)

The hysteresis is automatically adjusted to the input set point and is 5 % of the set point, but a minimum of 2 mbar.
Example: set point is 400 mbar, automatic hysteresis

- ① The system pressure is reduced to 400 mbar, the vacuum source is turned off
- ② The system pressure increases by 20 mbar
- ③ The vacuum source is turned on and the system pressure is evacuated again to 400 mbar

4 Putting into operation of V-800



Look for damages when you unpack the unit. It is important that you detect any transport damages when you unpack. If necessary, you must prepare a status report immediately (informing postal company, railway company or transportation company).

Keep the original packaging in case the unit needs to be transported later.

4.1 Point of use

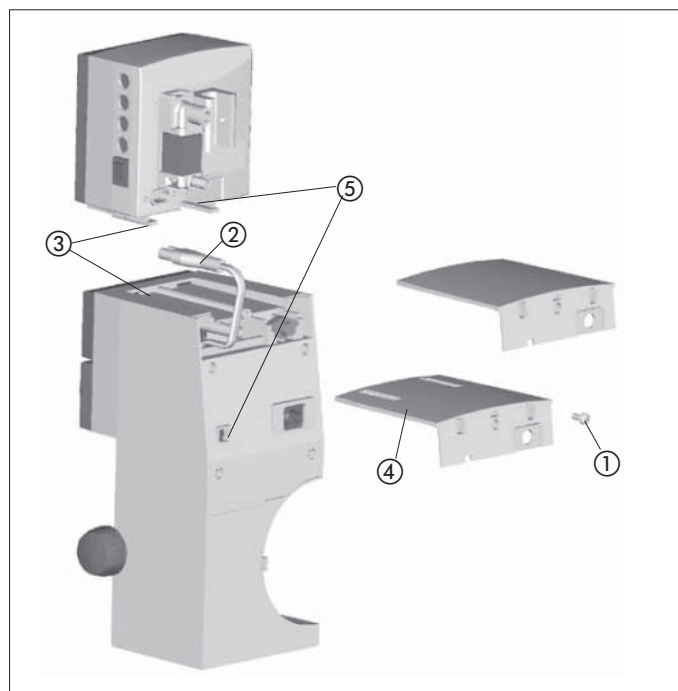
The apparatus is installed directly onto the rotary evaporator R-200/R-205. If the controller is operated on another rotary evaporator or apparatus, it is mounted onto a rod.

4.2 Electrical connections

Determine whether the voltage on the socket corresponds to the voltage given on the apparatus plate.

If the Vacuum Controller is operated in connection with a Rotavapor R-200/R-205, the controller is connected to the rotary evaporator. The connection cable is under the cover plate of the evaporator (see 4.3). In all other cases, connection is done via the supplied mains cable.

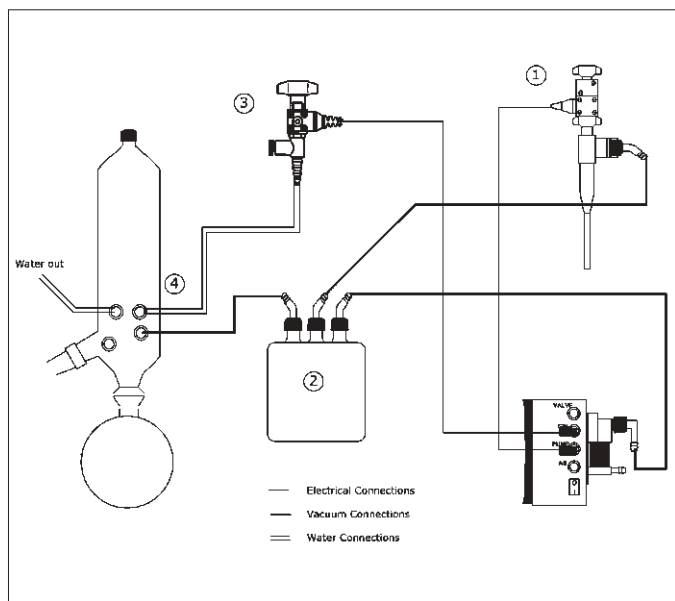
4.3 Fixation of the Vacuum Controller to Rotavapor R-200/R-205



- ① Screw out screw ① and pull the cover plate to the back.
- ② Lift the lower spring-loaded catch of the front plate and remove the front plate.
- ③ Connect the display module with the flat belt cable in the apparatus.
- ④ Connect the 2 pole cable with the display module.
Latch display module from the front to the Rotavapor and insert it on the rear of the plug socket into the foreseen holder as shown in the picture.
- ⑤ Screw the tower cover back on.

The holder for the valve unit is fastened to the side of the tower and valve unit is pushed into it.

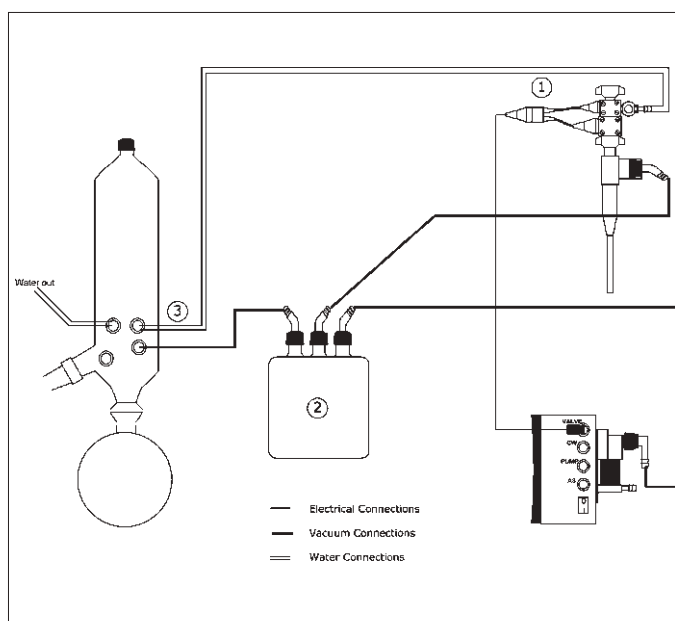
V-800/V-805 with Rotavapor R-200/R-220



V-800/V-805 with Water jet pump B-764

4.4 Installation with water jet pump B-764

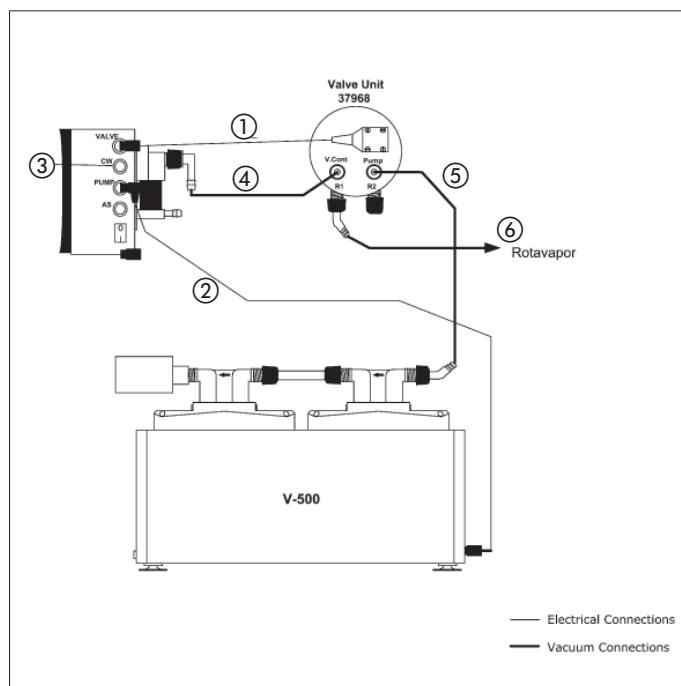
- ① Screw on water jet pump together with inserted sealing to the water tap. Plug cable to **valve** socket of the controller.
- ② Connect the water jet pump with the rotary evaporator via the Wouff bottle.
- ③ Screw on cooling water valve with sieve and seal to the water tap. Plug cable to the CW socket of the controller.
- ④ Connect cooling water tubing.



V-800/V-805 with water jet pump B-767

4.5 Installation with water jet pump B-767 with integrated cooling water valve

- ① Screw on water jet pump with seal to the water tap. Plug cable to **valve** socket of the controller.
- ② Connect water jet pump to the rotary evaporator via Wouff bottle.
- ③ Connect cooling water tubing.



V-800/V-805 with valve unit

4.6 Installation with vacuum pump and valve unit

- ① Connect cable of valve unit with **valve** socket of the controller
- ② Connect control cable of the pump with **pump** socket of the controller
- ③ Connect cable cooling water valve (optional) with **CW** socket of the controller
- ④ Connect vacuum cover **V.Contr.** of the valve unit to the controller
- ⑤ Connect vacuum cover **pump** of the valve unit to the air intake fitting of the pump
- ⑥ Connect vacuum cover **R1** of the valve unit to the rotary evaporator

5 Operation V-800

Note that the apparatus must be properly put into operation in accordance with the instructions in Chapter 4, Putting into operation.

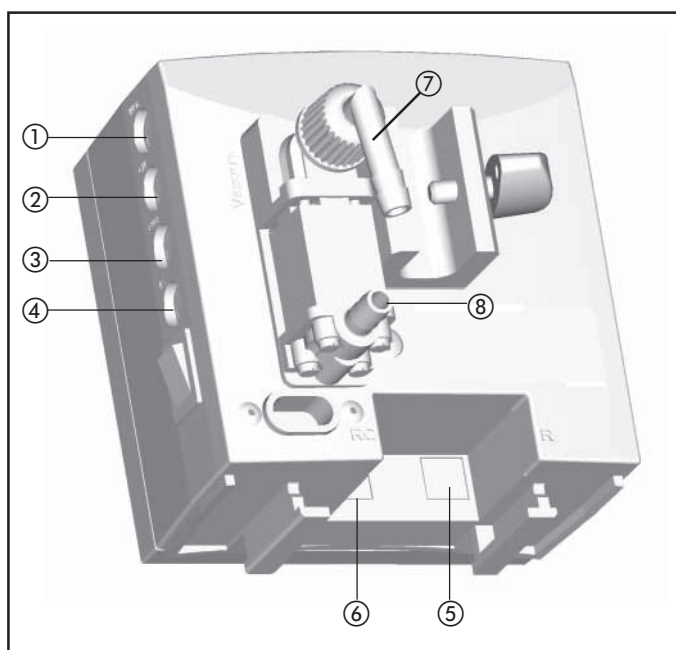
5.1 Controls V-800



Controls V-800

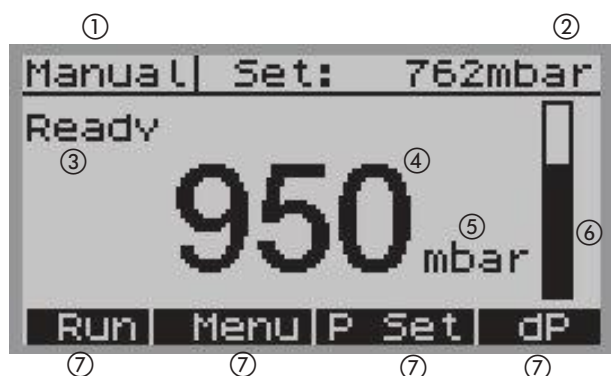
- ① Main switch
- ② Function button, activates the respectively assigned function
- ③ Button for permanent vacuum turns pump 100 % on
- ④ Stop button

5.2 Connections V-800



Connections V-800

- ① Valve unit or vacuum valve **Valve**
- ② Cooling water valve **CW**
- ③ Pump **Pump**
- ④ No function
- ⑤ Connection **R** for Rotavapor R-200/R-205, controls the function "Rotation on/off and lowering/raising" of rotary evaporator
- ⑥ Connection **RC** for remote control
- ⑦ Vacuum connection
- ⑧ Ventilation valve



5.3 Fundamental arrangement of the display

- ① Information on active mode
- ② Set point
- ③ Operating state
- ④ Actual pressure
- ⑤ Selected unit
- ⑥ Graphical pressure display
- ⑦ Illustration of functional buttons



5.4 General information on control keys

- ① The **[OK]** key closes an input and puts the new value into the working memory.
- ② **[ESC]** (Escape) always put you one step backward. Inputs, that have already been changed, but not yet confirmed with **[OK]** are ignored.



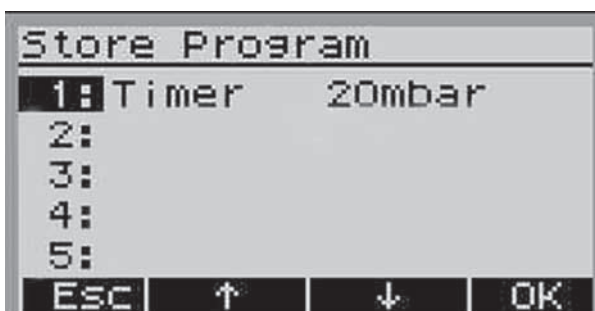
5.5 Manual distillation

5.5.1 Setting the set point and start

- ① Choose manual mode (if it is not already active) **[MENU]⇒[MODE]⇒[MANUAL]**
- ② Define set point ⇒ **[P Set]**. You can always use the **[↑]** key to increase the actual value and **[↓]** to decrease the actual value. Press **[OK]** to confirm value.
- ③ Define hysteresis ⇒ **[dP]**. You can always use the **[↑]** key to increase the actual value and **[↓]** to decrease the actual value. A = Automatic hysteresis. Press **[OK]** to confirm value.

Now, the controller is ready. Use **RUN** to start the controller.

STOP ends the distillation and ventilates the apparatus (unless you have configured otherwise).



5.5.2 Possible interventions into the regulation process

- ① **[P↑]**
Increase the system pressure or interrupt pressure drop in the start phase. The apparatus goes into the hold mode and regulates further to the actual value. If necessary, the apparatus is partially ventilated. **[ESC]** puts the apparatus back into the **RUN** mode with the original set point. **[OK]** puts it back into the **RUN** mode with the new set point.
- ② **[P↓]**
Reduce system pressure.
The apparatus goes into the hold mode and regulates further to the actual value. **[ESC]** puts it back into the RUN mode with the original set point. **[OK]** puts it into the RUN mode with the new set point.
- ③ **[Set] ⇒ [dP]**
Change hysteresis.
You can increase the actual value with **[↑]** and reduce it with **[↓]**. A = Automatic hysteresis. Confirm desired value with **[OK]**. **[ESC]** puts it back into RUN mode with the original value.

5.5.3 Choose program [MENU]⇒[MODUS]⇒[TIMER]

[PROG]

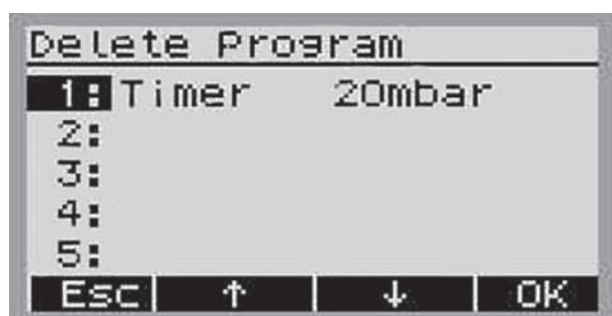
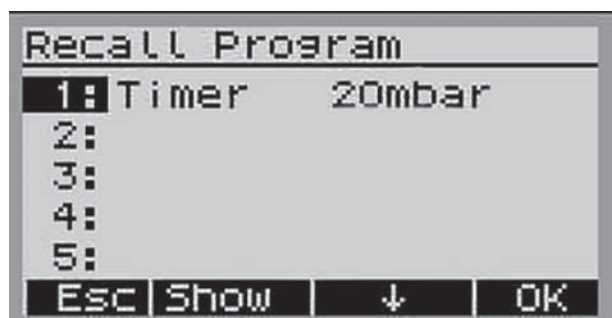
Define distillation time with the buttons **[↑]** and **[↓]** confirm the value with **[OK]**.

Define working pressure with the buttons **[↑]** and **[↓]** confirm the value with **[OK]**.

5.5.4 Saving a program

Save program (if desired). **[OK]** is saving the program to the recommended number, **[ESC]** is ignores the saving of the program. In both cases the display changes into the basic state of the timer function.

Now, the controller is ready. Use **[RUN]** to start the controller.



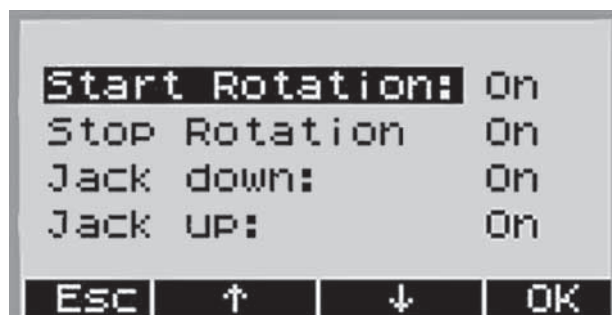
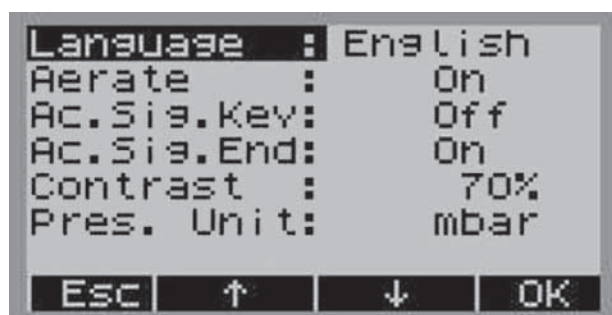
5.5.5 Recall a program from the memory

- ① Recall the program from the memory:
[MENU] ⇒ [MEMORY] ⇒ [RECALL] ⇒ [OK].
- ② Choose the desired program number and confirm with **[OK]**.
- ③ The display is changing into the basic state automatically..

Now, the desired program is in the working memory. Use **[RUN]** to start the controller..

5.5.6 Delete a program

- ① Recall the program from the memory:
[MENU] ⇒ [MEMORY] ⇒ [DELETE] ⇒ [OK].
- ② Choose the desired program number and confirm with **[OK]**.
- ③ Back into the basic state ⇒ **[ESC]** or delete further programs according ① and ②.



5.6 Configuration

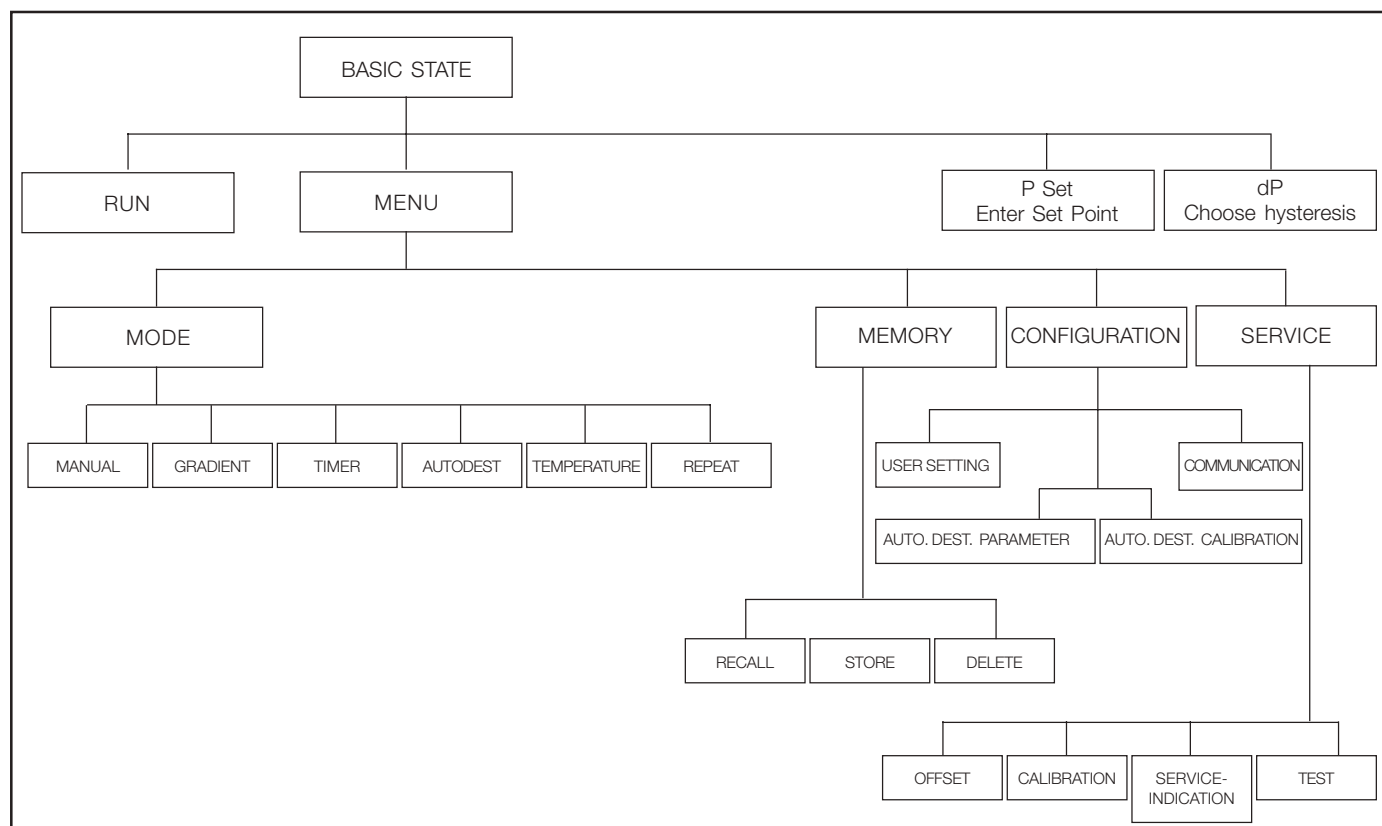
- ① Choose configuration mode **[MENU] ⇒ [CONFIGURATION] ⇒ [USER SETTING]**
- ② Use **[↑]** and **[↓]** to define the parameters. Confirm desired setting with **[OK]**.
 - Language
 - Ventilation ON = automatic ventilation in case of Stop
Ventilation OFF = apparatus remains evacuated in case of stop
 - Sound BUTTON ON/OFF
 - Sound END ON/OFF
 - Contrast: contrast of displays (30 ... 100 %)
 - Unit = mbar/hPa/Torr

[COMMUNICATION]

- Start rotation ON/OFF: Autostart rotation of evaporating flask when Controller starts On/Off (only R-200/R-205)
- Stop rotation ON/OFF: Autostop of rotation of evaporating flask when Controller stops (only R-200/R-205)
- Lowering ON/OFF: automatic lowering of the evaporating flask when the Controller starts (only R-200/R-205)
- Raising ON/OFF: automatic raising of the evaporating flask from the bath when the controller stops (only R=200/R-205)

6 Functions V-805

6.1 Overview of program structure V-805



Overview program structure V-805

6.2 General functions

6.2.1 Manual distillation

The set point of system pressure is input. When the distillation starts, the system pressure is reduced to the input value and kept constant. An input value stays in the memory even when the apparatus is turned off. Distillation must be stopped manually.

6.2.2 Distillation with pressure gradients

Programming of a pressure profile from up to 20 segments. Each segment is defined by start pressure, end pressure and its duration. At the end of the entire pressure profile, the distillation is stopped. If so configured, rotation of the evaporating flask is stopped and the flask is lifted from the bath.

6.2.3 Distillation with timer function

The set point of system pressure and distillation duration are input. When the distillation starts, the system pressure is reduced to the input value and kept constant during the selected period. At the end of the input distillation time, the distillation is stopped. If so configured, rotation of the rotary evaporator is stopped and the flask is lifted from the bath.

6.2.4 AUTODEST function (only with automatic dual temperature sensor)

Allows full automatic distillation without input of parameters until dryness, if physically possible. As soon as the evaporating flask is dry, distillation is stopped. If so configured, rotation of the evaporating flask is stopped and the flask is lifted from the bath.

6.2.5 The TEMPERATURE function (only with automatic dual temperature sensor)

Distillation is carried out on the automatically found pressure. As soon as the vapour temperature drops, distillation is stopped. If so configured, rotation of the evaporating flask is stopped and the flask is lifted from the bath.

6.2.6 The REPEAT function

The last, for example, manually performed distillation can be repeated and stored for later use (learning by doing). This is a valuable function for difficult distillations, which must be performed repeatedly, in which the parameters must be experimentally determined and optimised.

6.2.7 Working memory

The last mode used and associated values are kept in the working memory after the apparatus is turned off and are automatically recalled when the apparatus is turned back on.

6.2.8 Memory of methods

Memory for 5 complete distillation programs. Memory management with the help of conventional functions, **Storing, Retrieving, and Deleting.**

6.2.9 Configuration

In this menu, you define:

- Whether the rotation of the evaporator is to automatically start when the controller starts (only in connection with Rotavapor R-200/R-205)
- Whether the evaporating flask is to be lowered into the bath automatically when the controller starts
- Whether the evaporating flask is to be automatically lifted from the bath when the controller stops
- Whether the apparatus is to be automatically ventilated when the controller stops.

Further:

- Language
- Sound (Beep)
- Contrast
- Pressure Unit

All of these functions can be turned on and off. Moreover, all apparatus specific parameters and process parameters can be defined for the automatic distillations.

6.2.10 Set point (P Set))

Defines the value, at which the system pressure is kept constant. An input value stays in the working memory after the apparatus is turned off and is automatically called when you start the apparatus again.

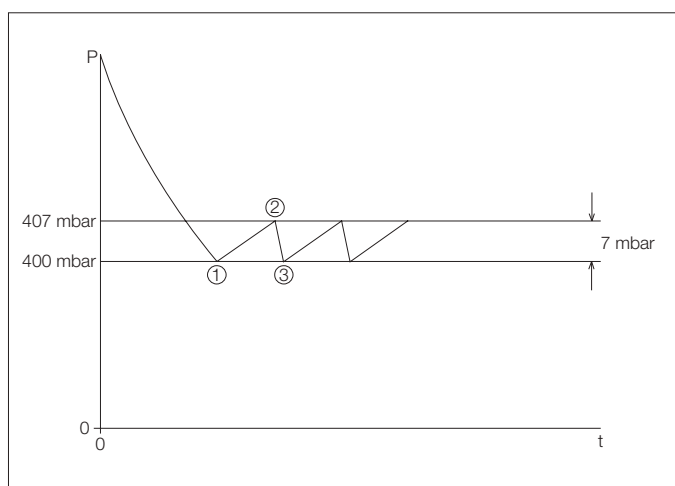
6.2.11 Hysteresis (dP)

Defines the band width, within which a chosen set point is kept constant.

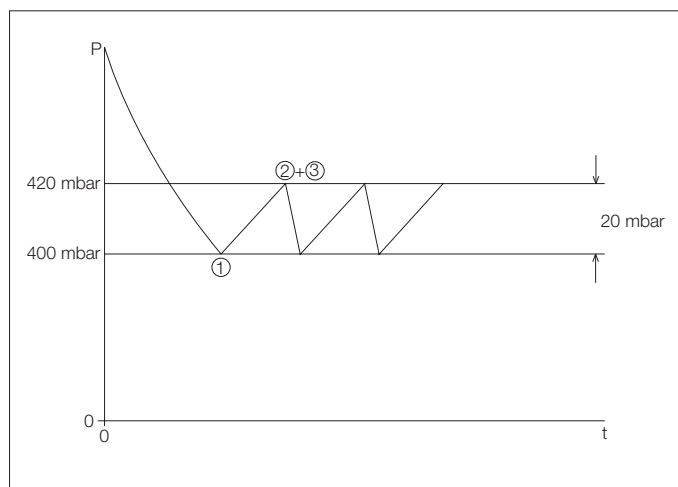
6.2.11.1 Manual hysteresis (dP = 500...1 mbar, A)

Example: set point 400 mbar, hysteresis 7 mbar

- ① System pressure is reduced to 400 mbar, the vacuum source is turned off
- ② The system pressure increases to 7 mbar
- ③ The vacuum source is turned on and the system pressure is evacuated again to 400 mbar



Manual hysteresis



Automatic hysteresis

6.2.11.2 Automatic hysteresis (dP = A)

The hysteresis is automatically adjusted to the input set point and is 5 % of the set point, but a minimum of 2 mbar. Example: set point is 400 mbar, automatic hysteresis

- ① The system pressure is reduced to 400 mbar, the vacuum source is turned off
- ② The system pressure increases by 20 mbar
- ③ The vacuum source is turned on and the system pressure is evacuated again to 400 mbar

7 Putting into operation V-805

Look for damages when you unpack the unit. It is important that you detect any transport damages when you unpack. If necessary, you must prepare a status report immediately (informing postal company, railway company or transportation company).

7.1 Point of use

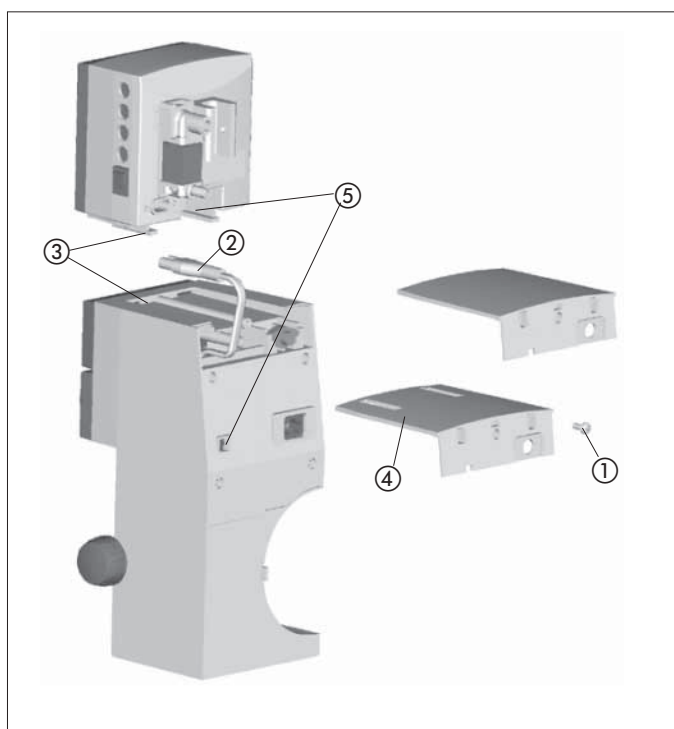
The apparatus is installed directly onto the rotary evaporator R-200/R-205. If the controller is operated in connections with other apparatuses, it is mounted onto a rod.

7.2 Electrical connections

Determine whether the voltage on the socket corresponds to the voltage given on the apparatus plate.

If the Vacuum Controller is operated in connection with a Rotavapor R-200/R-205, the controller is connected to the rotary evaporator. The connection cable is under the cover plate of the evaporator (see 7.3). In all other cases, connection is done via the supplied mains cable.

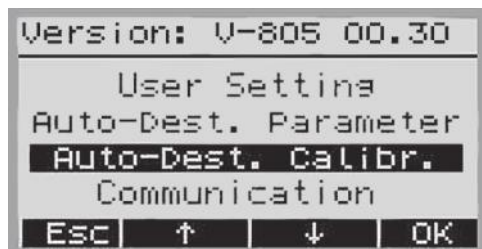
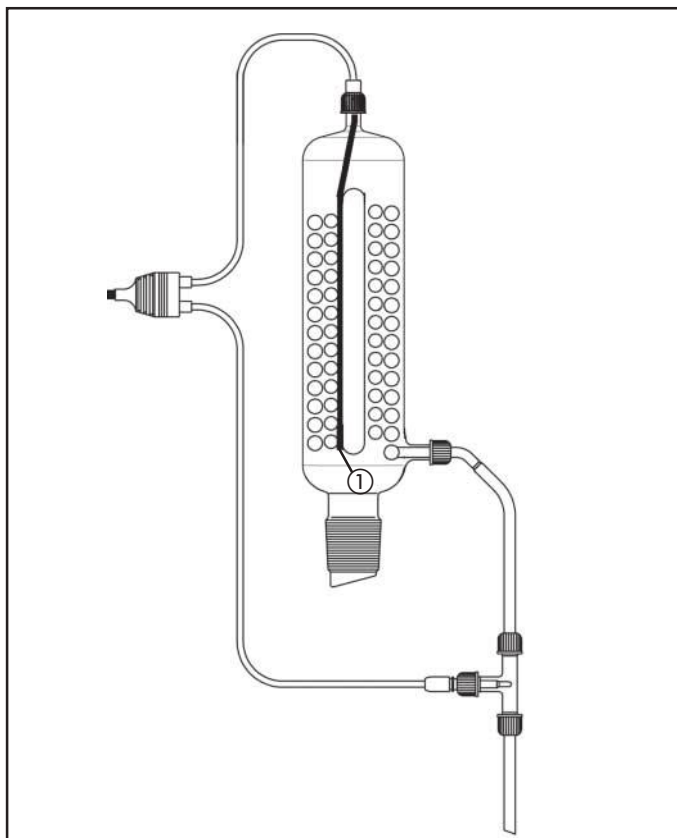
7.3 Fixation of the Vacuum Controller to Rotavapor R-200/R-205



Fixation of the Vacuum Controller to Rotavapor R-200/R-205

- ① Screw out screw ① and pull the cover plate to the back.
- ② Lift the lower spring-loaded catch of the front plate and remove the front plate
- ③ Connect the display module with the flat belt cable in the apparatus
- ④ Connect the 2 pole cable with the display module.
Latch display module from the front to the Rotavapor and insert it on the rear of the plug socket into the foreseen holder as shown in the picture.
- ⑤ Screw the tower cover back on.

The holder for the valve unit is fastened to the side of the tower and valve unit is pushed into it.



7.4 Installation and adjusting of automatic dual temperature sensor

Insert the long end of the temperature sensor into the condenser, through the screw neck melted to the top of the condenser between the inner condenser coil and centrally melted vacuum tube in the condenser. Position the sensor, so that it is in the front part of the condenser. The tip of the sensor is located about at the height of the highest condenser coil ①. Tightened screw cap.

Install the short end of the temperature sensor to the cooling water outlet with the help of the supplied T piece.

Plug temperature sensor into the AS socket of the controller.

Connect cooling water tubing.

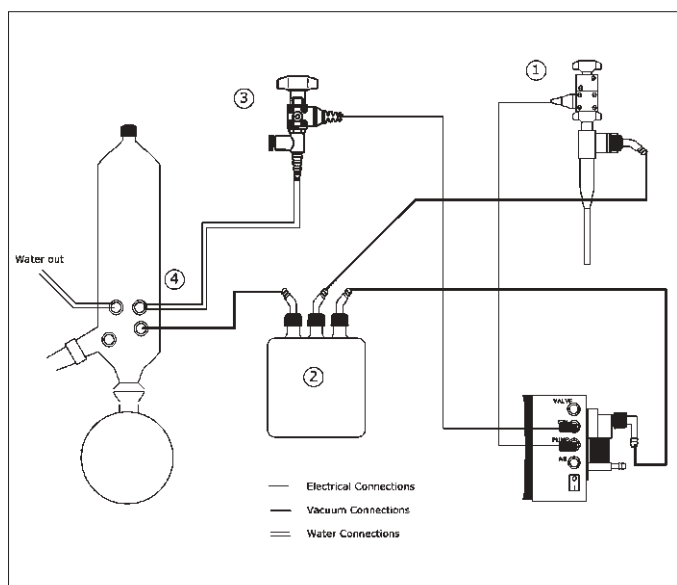
Adjusting (before putting into operation for the first time):

Submerge both sensor tips as far as possible into water of approximately 30 °C, until all of 3 measuring points are covered by water.

Wait 2 to 3 minutes, and occasionally stir the water.

Adjust the apparatus:

[MENU] ⇒ [CONFIGURATION] ⇒ [ADJUST CALIBR.] ⇒ [OK]

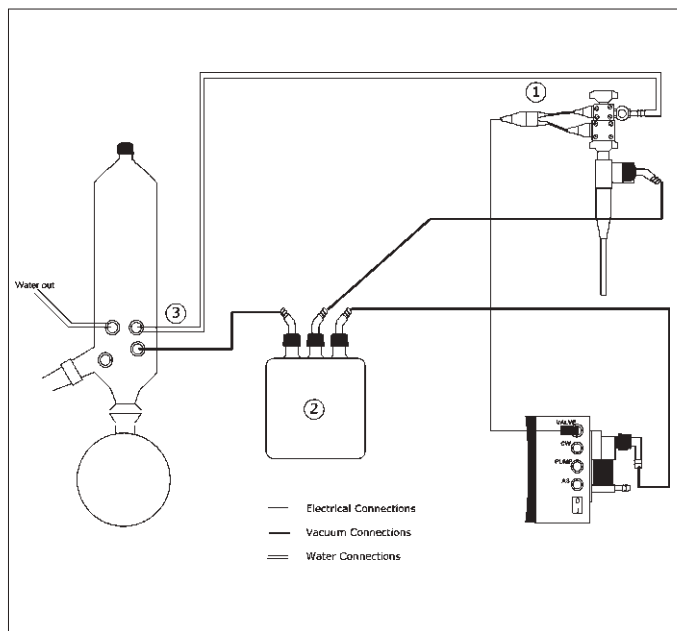


Installation with water jet pump B-764

7.5 Installation with water jet pump B-764

- ① Screw water jet pump together with the seal onto the water tap. Plug cable to **valve** socket of the controller.
- ② Connect water jet pump with the rotary evaporator via the Wouff bottle.
- ③ Screw on cooling water valve together with sieve and seal. Plug cable to **CW** socket of the controller.
- ④ Connect cooling water tubing.

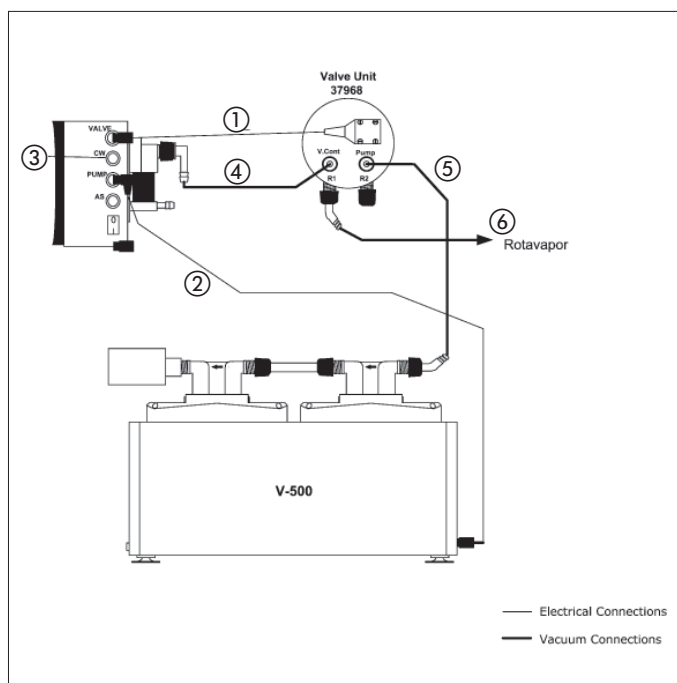
7.6 Installation with water jet pump B-767 (with integrated cooling water valve)



Installation with water jet pump B-767 (with integrated cooling water valve)

- ① Screw on water jet pump together with seal to the water tap. Plug cable to **valve** socket of the controller.
- ② Connect water jet pump to the rotary evaporator via Woulff bottle.
- ③ Connect cooling water tubing.

7.7 Installation with vacuum pump and valve unit



Installation with vacuum pump and valve unit

- ① Connect cable of valve unit with **valve** socket of the controller
- ② Connect control cable of the pump with **pump** socket of the controller
- ③ Connect cable cooling water valve (optional) with **CW** socket of the controller
- ④ Connect vacuum cover **V.Contr.** of the valve unit to the controller
- ⑤ Connect vacuum cover **pump** of the valve unit to the air intake fitting of the pump
- ⑥ Connect vacuum cover **R1** of the valve unit to the rotary evaporator

8 Operation V-805

Note that the apparatus must be properly put into operation in accordance with the instructions in Chapter 7, Putting into operation.

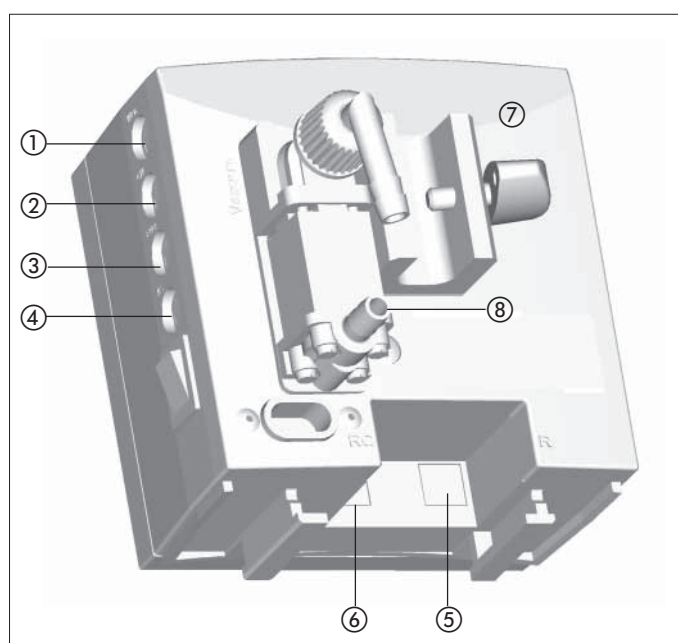
8.1 Controls V-805



Controls V-805

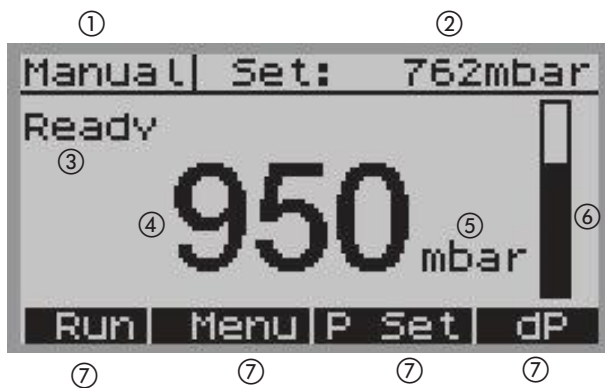
- ① Main switch
- ② Control keys, activating assigned function
- ③ Key for permanent vacuum, turns the pump 100 % on
- ④ Stop key

8.2 Connections V-805



Connections V-805

- ① Valve unit or vacuum valve **Valve**
- ② Cooling water valve **CW**
- ③ Pump **Pump**
- ④ Automatic dual temperature sensor **AS**
- ⑤ Connection **R** for Rotavapor R-200/R-205, controls the function "Turn on rotation and lower flask" of the rotary evaporator
- ⑥ Connection **RC** for remote control
- ⑦ Vacuum connection
- ⑧ Ventilation valve



8.3 Fundamental arrangement of the display

- ① Information on active mode
- ② Set point
- ③ Operating state
- ④ Actual pressure
- ⑤ Selected unit
- ⑥ Graphical pressure display
- ⑦ Illustration of control keys



8.4 General information on the control keys

- ① The key **[OK]** closes an input and puts the new value into the working memory.
- ② The key **[ESC]** (Escape) always take you one step backward. Inputs that have already been changed, but not yet confirmed with **[OK]** are ignored.



8.5 Manual distillation

8.5.1 Setting set values and start

- ① Choose manual mode (if it is not already active)
[MENU] ⇒ [MODE] ⇒ [MANUAL]
- ② Define set point ⇒ **[P Set]**. You can always use the key **[↑]** to increase the actual value and **[↓]** to decrease the value. Confirm the desired value with **OK**.
- ③ Define hysteresis ⇒ **[dP]**. You can always use the key **[↑]** to increase the actual value and **[↓]** to decrease the value. A = Automatic hysteresis. Confirm the desired value with **OK**.

Now, the controller is ready. Press **RUN** to start the controller.

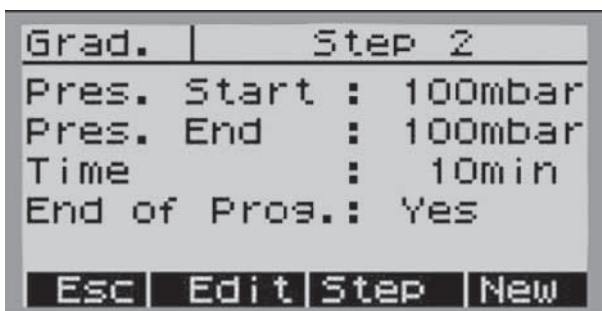
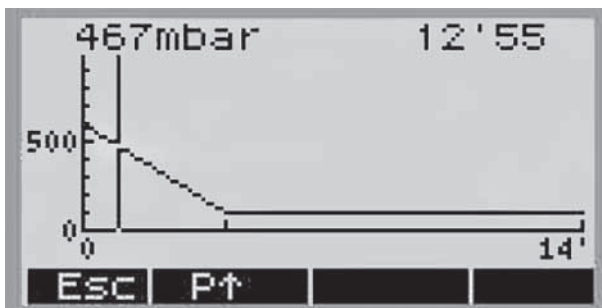
STOP ends the distillation and ventilates the apparatus (if it has not already been configured).



Installation of the automatic dual temperature sensor (Version V)

8.5.2 Possible interventions into the regulating process

- ① **[P↑]**
Increase the system pressure or interrupt pressure drop in the start phase. The apparatus goes into the hold mode and regulates further to the actual value. If necessary, the apparatus is partially ventilated. **[ESC]** the apparatus puts back into the RUN mode with the original set point. **[OK]** it puts back into the RUN mode with the new set point.
- ② **[P↓]**
Reduce system pressure.
The apparatus goes into the hold mode and regulates further to the actual value. **[ESC]** puts it back into the RUN mode with the original set point. **[OK]** puts it into the RUN mode with the new set point.
- ③ **[Set] ⇒ [dP]**
Change hysteresis.
You can increase the actual value with **[↑]** and reduce it with **[↓]** A = Automatic hysteresis. Confirm desired value with **[OK]**. **[ESC]** puts it back into RUN mode with the original value.
- ④ Transfer manually started distillation to automatic mode. The distillation is continuously optimised by the automatism, and, if physically possible, is carried out to dryness. At the end of distillation, if so configured, rotation of evaporating flask is stopped and the evaporating flask is lifted from the bath.



8.6 Distillation with pressure gradient

8.6.1 Setting of the set point and Start, preparing a new program

- ① Choose gradient mode (if it is not already active) **[MENU]⇒[MODE]⇒[GRADIENT]⇒[PROG]⇒[NEW]**. The first segment can now be programmed. Each segment is defined by a start pressure, its end pressure and the duration.
- ② Define start pressure. Use the **[↑]** key to increase the value and the **[↓]** to decrease the value. Confirm desired value with **[OK]**.
- ③ Defines end pressure. Use the **[↑]** key to increase the value and the **[↓]** to decrease the value. Confirm desired value with **[OK]**.
- ④ Define duration of segment. Use the **[↑]** key to increase the value and the **[↓]** to decrease the value. Confirm desired value with **[OK]**.
- ⑤ Answer question about program end (Yes/No). Yes ends the program, No pushes it to the next segment. Use **[OK]** to confirm answer..
- ⑥ Store segment, Yes/No. Use **[OK]** to confirm selection. Yes stores the values and leads program to next segment (or ends program), if you answer No, the segment stays in the display and the values can be corrected by over writing.
- ⑦ Store program (if desired). **[OK]**, the program is stored under suggested number, **[ESC]**, saving is ignored. In both cases, the display changes in the basic state for the gradient course.

Now, the controller is ready and can be started with **[RUN]**.

[SHOW] displays the start width or current program in graphical representation.

[PROG] shows the start width or current program in graphical representation.

[STOP] ends distillation and ventilates the apparatus (unless you have configured otherwise).



8.6.2 Possible interventions in the regulating process (gradient mode)

- ① Increase the system pressure or interrupt pressure drop in the start phase ⇒ **[P↑]**. The apparatus goes into the hold mode and regulates further to the actual value. If necessary, the apparatus is partially ventilated. **[ESC]** it puts back into the RUN mode with the original set point. **[OK]** puts it back into the **RUN** mode with the new set point.
- ② Holds program course ⇒ **[HOLD]**. The apparatus changes into the hold mode and regulates further to the actual value.
- ③ **[GO]** sends the apparatus back into the RUN mode and continues the program.
- ④ **[SHOW]** displays the hold program and the actual time graphically.
- ⑤ **[MAN]** changes the apparatus into the manual mode.



8.6.3 Changing an existing program (gradient mode)

- ① Request the program to be changed from the memory (if it is not already active) **[MENU]** ⇒ **[MEMORY]** ⇒ **[RECALL]**. Use **[OK]** to confirm desired program number.
- ② Choose editing mode **[PROG]** ⇒ **[EDIT]**
- ③ Change desired value by overwriting as described in preparing a new program (see 8.6.1).
- ④ After you have modified the program, store the program (see 8.6.1).



8.7 Distillation with timer

8.7.1 Setting the set point and start

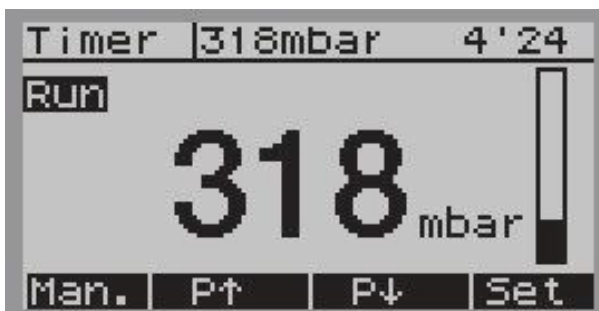
- ① Choose timer mode (if it is not already active)
[MENU] ⇒ **[MODE]** ⇒ **[TIMER]** ⇒ **[PROG]**
- ② Define distillation time. Use **[↑]** to increase the actual value and **[↓]** to decrease the actual value. Use **[OK]** to confirm the desired value.
- ③ Define set point. Use **[↑]** to increase the actual value and **[↓]** to decrease the actual value. Use **[OK]** to confirm the desired value.
- ④ Store Program (if desired) **[OK]**

Now, the controller is ready. Use **[RUN]** to start the controller.

[STOP] ends the distillation and ventilates the apparatus (unless you have configured otherwise).

8.7.2 Possible interventions into the regulating process

- ① Increase the system pressure or interrupt pressure drop in the start phase ⇒ **[P↑]**. The apparatus goes into the hold mode and regulates back to the actual value. If necessary, the apparatus is partially ventilated. **[ESC]** it puts back into the **RUN** mode with the original set point. **[OK]** puts its back into the **RUN** mode with the new set point.
- ② Reduce system pressure ⇒ **[P Set]** ⇒ **[P↓]**. The apparatus goes into the hold mode and regulates further to the actual value. If necessary, the apparatus is partly ventilated. **[ESC]** it puts back into the **RUN** mode with the original set point. **[OK]** puts its back into the **RUN** mode with the new set point.
- ③ Change hysteresis ⇒ **[dP]**. Use **[↑]** to increase the actual value and **[↓]** to decrease the actual value. A = Automatic hysteresis. Confirm desired value with **[OK]**. **[ESC]** puts it back into **RUN** mode with the original value.
- ④ Changes into the manual mode ⇒ **[Man.]**. The timer function is turned off.



8.8 Automatic distillation (only with connected auto sensor)

8.8.1 Preconditions for an automatic distillation

The automatic dual temperature sensor is based on a balance adjustment of the temperature in the condenser with consideration of the cooling material temperature. For trouble-free distillation until dryness, the following conditions must exist:

- minimum solvent quantity 50 ... 100 ml.
- Boiling point differences in the case of solvent mixtures is not greater than 45...50°C. Greater differences lead to back evaporation from the receiving flask and stopping of the apparatus.
- Temperature difference between heating bath and cooling 35...45°C.

It is difficult to evaporate solvent mixtures with very large boiling point and/or evaporation heat difference in automatic mode. This includes many aqueous solvent mixtures.

You cannot add anything to the evaporating flask in the automatic mode. To do this, the controller must be changed into the manual mode, the material added to the evaporating flask and then the apparatus must be changed back into the automatic mode.

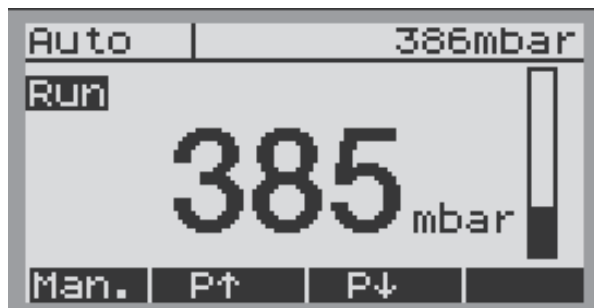
8.8.2 Performing automatic distillation

Choose the autodist function **[MENU]** ⇒ **[MODE]** ⇒ **[AUTODEST.]** (if it is not already active). The display changes to the READY state. You do not have to input any other parameters.

Now, the controller is ready. Use **[RUN]** to start it.

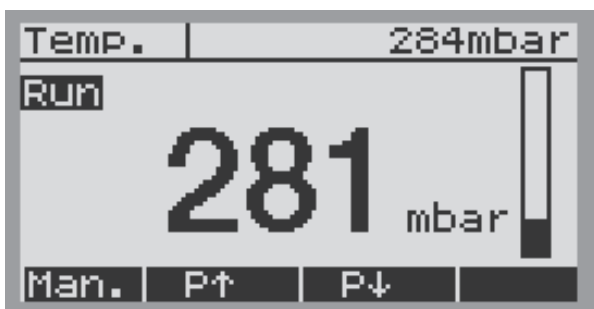
[STOP] ends the distillation and ventilates the apparatus (unless configured otherwise).





8.8.3 Possible interventions into the regulating process

- ① Increase the system pressure or interrupt pressure drop in the start phase ⇒ **[P↑]**. The apparatus goes into the hold mode and regulates further to the actual value. If necessary, the apparatus is partially ventilated. **[ESC]** puts back into the **RUN** mode with the original set point. **[OK]** puts back into the **RUN** mode with the new set point. Use **[AUTO]** to put distillation back into the automatic mode.
- ② Change into the manual mode ⇒ **[MAN]**. Now, distillation can be continued manually (for example, if the distillation is too slow). You can change back to the automatic mode at any time.



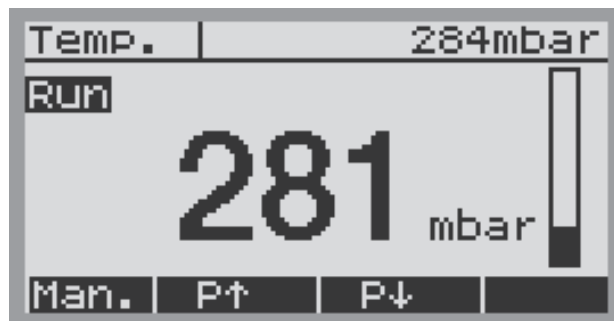
8.9 Distillation at constant vapour temperature (Mode TEMPERATURE)

8.9.1 Performing temperature distillation

- ① Choose the temperature mode (if it is not already active) **[MENU] ⇒ [MODE] ⇒ [TEMPERATURE]**

Now, the controller is ready and you can use **[RUN]** to start it.

[STOP] ends the distillation and ventilates the apparatus (unless configured otherwise).



8.9.2 Possible interventions into the regulating process

- ① Increase the system pressure or interrupt pressure drop in the start phase ⇒ **[P↑]**. The apparatus goes into the hold mode and regulates further to the actual value. If necessary, the apparatus is partially ventilated. **[ESC]** puts back into the manual RUN mode with the original set point. **[OK]** puts back into the manual RUN mode with the new set point. Use **[AUTO]** to put distillation back into the automatic mode.
- ② Change into the manual mode ⇒ **[MAN]**. Now, distillation can be continued manually.



8.10 Repeating the last distillation performed

The last manual distillation performed is automatically saved in active working memory.

8.10.1 Performing the distillation

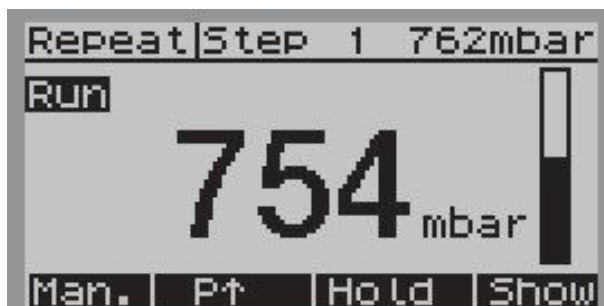
- ① Choose repeat mode **[MENU]** ⇒ **[MODE]** ⇒ **[REPEAT]** ⇒ **[OK]**.
- ② The display automatically goes into the basic state of the repeat function.

Now, the controller is ready and you can use **[RUN]** to start it.

[SHOW] displays the pressure course graphically.

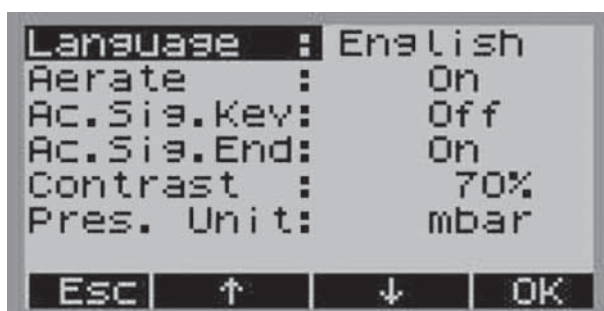
[STOP] ends the distillation and ventilates the apparatus (unless configured otherwise).

The program can be saved from the basic state for applications later: **[MENU]** ⇒ **[MEMORY]** ⇒ **[STORE]** ⇒ **[OK]** (program is saved as gradient).



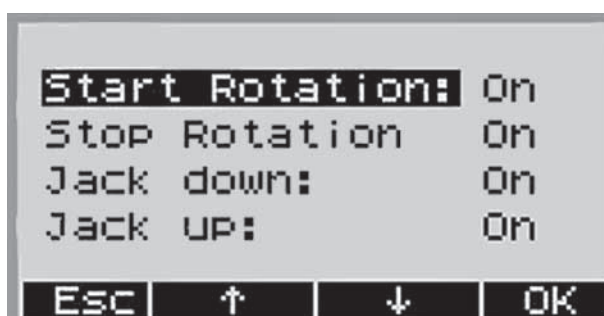
8.10.2 Possible interventions into the regulating process

- ① Increase the system pressure or interrupt pressure drop in the start phase ⇒ **[P↑]**. The apparatus goes into the hold mode and regulates further to the actual value. If necessary, the apparatus is partially ventilated. **[ESC]** puts back into the **RUN** mode with the original set point. **[OK]** puts back into the **RUN** mode with the new set point. Use **[AUTO]** to put distillation back into the automatic mode.
- ② Change into the manual mode ⇒ **[MAN]**. Now, distillation can be continued manually
- ③ **[SHOW]** displays the pressure profile and the momentary time graphically. **[ESC]** puts the system back into the normal RUN display.



8.11 Configuration

- ① Choose configuration mode **[MENU]** ⇒ **[CONFIGURATION]** ⇒ **[USER SETTING]**
- ② Use **[↑]** and **[↓]** to define the parameters. Confirm desired setting with **[OK]**.
 - Language
 - Ventilation ON = automatic ventilation in case of Stop
 - Ventilation OFF = apparatus remains evacuated in case of stop
 - Sound BUTTON ON/OFF = Buzzer On/Off
 - Sound END ON/OFF = Buzzer On/Off
 - Contrast: contrast of displays (30 ... 100 %)



[COMMUNICATION]

- Start rotation ON/OFF: Autostart rotation of evaporating flask when Controller starts On/Off (only R-200/R-205)
- Stop rotation ON/OFF: Autostop of rotation of evaporating flask when Controller stops (only R-200/R-205)
- Lowering ON/OFF: automatic lowering of the evaporating flask when the Controller starts (only R-200/R-205)
- Raising ON/OFF: automatic raising of the evaporating flask from the bath when the controller stops (only R-200/R-205)
- Unit = mbar/hPa/Torr

8.12 Method memory

8.12.1 General information

Gradient programs and time programs can be saved in the methods memory. Manual distillation can only be saved via the repeat function. The save function . The save function includes conventional functions like saving, opening and deleting.

8.12.2 Saving programs

Normally, you save gradient, time and temperature programs immediately after you have prepared them. You are prompted to do so automatically. However, you can also save a program from the working memory into the methods memory later. Proceed as follows:

- ① Program is in the working memory (basic state in the display)
- ② Call up save function
[MENU] ⇒ [MEMORY] ⇒ [STORE] ⇒ [OK].
- ③ Confirm save ⇒ **[OK]**
- ④ Back to the basis state ⇒ **[ESC]**

8.12.3 Retrieving a program from the memory

- ① Retrieve save function
[MENU] ⇒ [MEMORY] ⇒ [RECALL] ⇒ [OK].
- ② Choose desired program number and use **[OK]** to confirm.
- ③ The display automatically changes to the basis state.

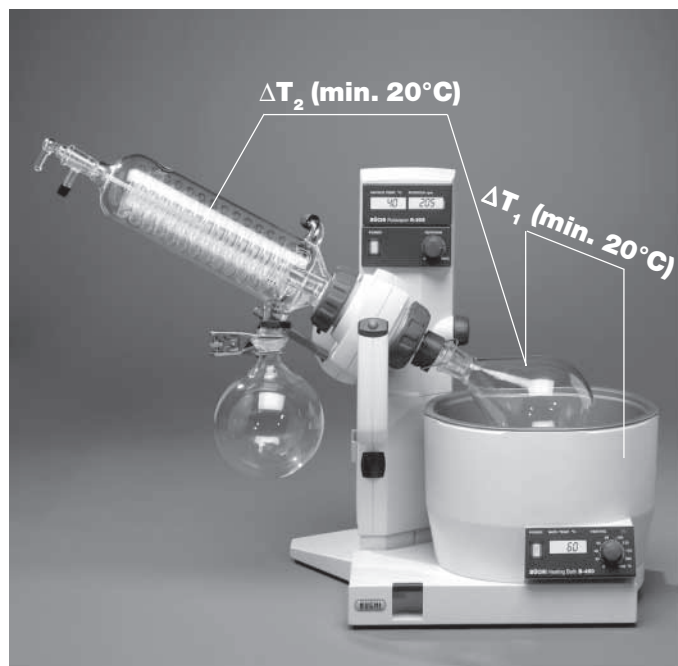
Now, the desired program is in the working memory and you can use **[RUN]** to start it.





8.12.4 Deleting a program from the memory

- ① Call up memory function
[MENU] ⇒ [MEMORY] ⇒ [DELETE] ⇒ [OK].
- ② Choose desired program number and confirm with **[OK]**.
- ③ Back to basis state ⇒ **[ESC]** or other program according to ① or ② delete.



45: "20-40-60"



Condensation range

9 Information on choosing distillation conditions

To achieve optimum distillation conditions when rotary evaporators are used, the energy, supplied for distillation from the heating bath, must be removed via the condenser. To guarantee this, operations should be performed according to this rule of thumb.

Cooling water	Vapour	Bath
max. 20°C	40°C	60°C

How can you achieve these conditions?

- Set the bath temperature to 60 °C
- Set cooling water, temperature no higher than 20°C
- Allow cooling water to flow through the condenser at approximately 40 – 50 l/h
- The working vacuum is to be chosen, so that the boiling point of the solvent is 40 °C. You can get the corresponding pressure from the Solvent Table (next page).

Advantages associated with 60 °C bath temperature:

- The evaporating flask can be replaced without risk of scalding.
- The evaporation rate of the water from the heating bath is not very high (energy loss).
- The heating bath energy is employed at a good degree of efficiency.

This rule can also be applied to lower bath temperatures, for example:

Cooling water	Vapour	Bath
max. 0°C	20°C	40°C

Optimising distillation:

Depending on distilled solvent, distillation may have to be optimised again. However, before you optimise distillation again, the heating bath must have reached 60 °C.

The following applies: condensation of solvent should be 2/3 to 3/4 of the existing condenser coil.

There are basically two possibilities for optimising distillation:

1. Slowly reduce pressure again

Bath must have reached 60 °C (Boiling point is reduced, increase of ΔT_1 , resulting in increase of distillation capacity) or

2. increasing bath temperature

(Increase of ΔT_1 , resulting in increase of distillation capacity).

By increasing the bath temperature, not all of the additional energy is supplied to distillation, but more is also discharged into the environment. This is due to the increase temperature difference between bath and environmental temperature.

Solvent table

Solvent	Formula	Molar Mass in g/mol	Evaporation energy in J/g	Boiling point at 1013 mbar	Density in g/cm³	Vacuum in mbar for boiling point at 40°C
Acetone	C ₃ H ₆ O	58.1	553	56	0.790	556
n-amylalcohol, n-pentanol	C ₅ H ₁₂ O	88.1	595	37	0.814	11
Benzene	C ₆ H ₆	78.1	548	80	0.877	236
n-butanol, tert.butanol	C ₄ H ₁₀ O	74.1	620	118	0.810	25
(2-methyl-2-propanol)	C ₄ H ₁₀ O	74.1	590	82	0.789	130
Chlorobenzene	C ₆ H ₅ Cl	112.6	377	132	1.106	36
Chloroform	CHCl ₃	119.4	264	62	1.483	474
Cyclohexane	C ₆ H ₁₂	84.0	389	81	0.779	235
Diethylether	C ₄ H ₁₀ O	74.0	389	35	0.714	Atmospheric
1,2-dichloroethane	C ₂ H ₄ Cl ₂	99.0	335	84	1.235	210
1,2-dichloroethylene (cis)	C ₂ H ₂ Cl ₂	97.0	322	60	1.284	479
1,2-dichloroethylene (trans)	C ₂ H ₂ Cl ₂	97.0	314	48	1.257	751
Diisopropyl ether	C ₆ H ₁₄ O	102.0	318	68	0.724	375
Dioxane	C ₄ H ₈ O ₂	88.1	406	101	1.034	107
DMF (dimethyl-formamide)	C ₃ H ₇ NO	73.1		153	0.949	11
Acetic acid	C ₂ H ₄ O ₂	60.0	695	118	1.049	44
Ethanol	C ₂ H ₆ O	46.0	879	79	0.789	175
Ethylacetate	C ₄ H ₈ O ₂	88.1	394	77	0.900	240
Heptane	C ₇ H ₁₆	100.2	373	98	0.684	120
Hexane	C ₆ H ₁₄	86.2	368	69	0.660	335
Isopropylalcohol	C ₃ H ₈ O	60.1	699	82	0.786	137
Isoamylalcohol,						
3-methyl-1- butanol	C ₅ H ₁₂ O	88.1	595	129	0.809	14
Methylethylketone	C ₄ H ₈ O	72.1	473	80	0.805	243
Methanol	CH ₄ O	32.0	1227	65	0.791	337
Methylene chloride, dichloromethane	CH ₂ Cl ₂	84.9	373	40	1.327	Atmospheric
Pentane	C ₅ H ₁₂	72.1	381	36	0.626	Atmospheric
n-propylalcohol	C ₃ H ₈ O	60.1	787	97	0.804	67
Pentachloroethane	C ₂ HCl ₅	202.3	201	162	1.680	13
1,1,2,2-tetra-chloroethane	C ₂ H ₂ Cl ₄	167.9	247	146	1.595	35
Tetrachlorocarbon	CCl ₄	153.8	226	77	1.594	271
1,1,1-trichloroethane	C ₂ H ₃ Cl ₃	133.4	251	74	1.339	300
Tetra-chloro-ethylene	C ₂ Cl ₄	165.8	234	121	1.623	53
THF (tetrahydrofurane)	C ₄ H ₈ O	72.1		67	0.889	357
Toluene	C ₇ H ₈	92.2	427	111	0.867	77
Trichloroethylene	C ₂ HCl ₃	131.3	264	87	1.464	183
Water	H ₂ O	18.0	2261	100	1.000	72
Xylene (mixture)	C ₈ H ₁₀	106.2	389			25
O-xylene	C ₈ H ₁₀	106.2		144	0.880	
m-xylene	C ₈ H ₁₀	106.2		139	0.864	
p-xylene	C ₈ H ₁₀	106.2		138	0.861	

10 Control function in connection with Rotavapor R-200/R-205

10.1 Start of rotation

The Vacuum Controller V-800/V-805 makes it possible to automatically start rotation of the evaporating flask. This function is activated and deactivated in the configuration menu. The rotation speed corresponds to the respective rotary button setting of the rotary evaporator. In spite of the activated autostart function, you can also rotate the evaporating flask at any time without start of controller. For this purpose, you simply turn slightly on the respective regulating button of the evaporator.

Configuration possibility: start rotation On/Off

10.2 Stop rotation

If the function is activated, when the controller stops, rotation of the evaporating flask is automatically stopped. This function is turned on and off in the configuration menu.

Configuration possibility: Stop rotation On/Off

10.3 Automatic lowering of the evaporating flask

When configured accordingly, when the controller starts, the evaporating flask is automatically lowered into the bath. It is essential that the lower end catch is correctly set in the quick-action jack of the rotary evaporator. Hand operation of the quick-action jack is already priority effective.

Configuration possibility: Lowering ON/OFF

10.4 Automatic raising of the evaporating flask

This function is also only active when configured accordingly. When the controller stops, the evaporating flask is automatically lifted from the heating bath to the upper end catch. Hand operation of the quick-action jack is always priority active.

Configuration possibility: Lifting ON/OFF

11 The ventilation valve

Automatic ventilation

With standard configuration ex factory, when the controller stops, the connected apparatus is ventilated immediately and the valve remains open even after the apparatus has been turned off. As a result, accidental excess pressure situations are avoided.

However, you can also configure the controller so that when the system stops the apparatus is not ventilated. In this case, you must press on the Stop key again to ventilate the apparatus.



Attention: Excess pressure situations can arise when the second operating mode is used. Thus, always remove the evaporating flask immediately and drain receiving flask!
Configuration possibility: ventilation ON/OFF



Remote control (optional accessory)

12 Remote control (optional accessory)

Plug remote control to connection RC. Now, remote control is ready and when the Vacuum Controller is turned on, you can use it to control all controller functions. The function keys F1 to F4 correspond to the menu driven keys (visual contact with Vacuum Controller is precondition).

You can also operate the apparatus even if the remote control is connected to the Vacuum Controller.

13 Maintenance

You must observe all instructions, aimed at keeping the Rotavapor functional. This includes periodically cleaning and checking for damages.



13.1 Cleaning

Attention: Before cleaning, make sure that the apparatus is unplugged from the current mains.

Housing

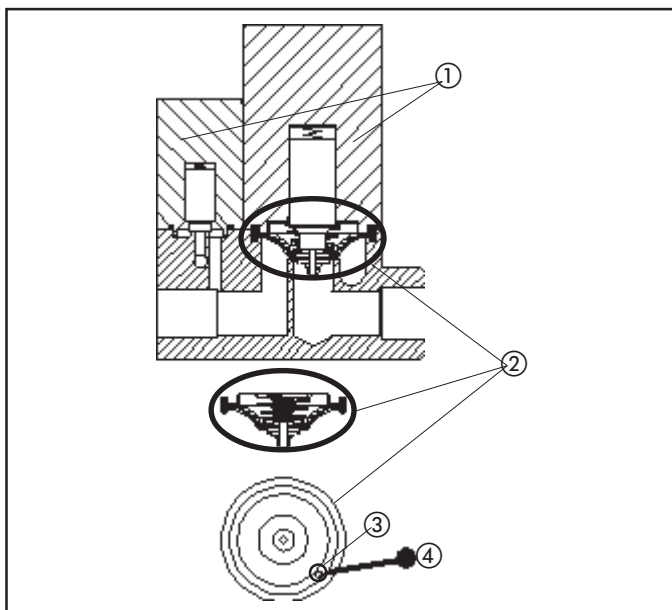
Use a moist cloth to clean the housing. Never use solvents as cleaning agents. Check the housing for defects (controls, plugs).

13.2 Functional test

Test the following functions after each intervention or in regular intervals during the year:

- ① Turn on apparatus: display shows the basis state of the last distillation. If the connected apparatus is ventilated, the device shows the actual atmospheric pressure.
- ② Press RUN: ventilation valve turns on and can be heard, pump runs, vacuum valve opens, display shows RUN mode.
- ③ Stop apparatus: ventilation valve switches in an way that can be heard (if *ventilation OFF* is configured, the valve only switched when you press the STOP key a second time), pump stops, vacuum valve closes, display changes to the basic mode.

13.3 Water jet pump



The water jet pump is equipped with a low-impact valve. Diaphragms built into such valves have a small opening, which, for example, can be clogged by furring or dirt. In such cases, the valve no longer closes completely.

- ① Screw off valve coil
- ② Remove diaphragm
- ③ Push needle through opening 0.5 mm
- ④ Needle

Reassemble the valve.

Water jet pump

13.4 Customer service

Only authorised service personnel can perform work on or in the apparatus. These persons have a comprehensive technical training and knowledge about hazards, resulting when safety stipulations are not complied with. BÜCHI Customer Service Office have apparatus specific Service Manual, which can only be obtained by authorised personnel.

Addresses of official BÜCHI Customer Service Offices are given on the last page of these operating instructions. If your apparatus malfunctions or you have technical questions or application problems, contact one of these offices.

BÜCHI Customer Service offers the following services:

- Spare parts
- Repairs
- Maintenance
- Technical advise.

13.5 Error messages on Vacuum Controller

SW Version 1.02:

Error—1	Pressure sensor not calibrated	
Error—2	RAM (battery suppeorted) not initilized	Call customer service
Error—3	Automatic distillation wrong/leak is too high (only 805)	Call customer service
Error—4	Automatic temperature sensor defective or not connected (only 805)	Call customer service
Error—5	Pressure sensor defective	

13.6 Troubleshooting

Malfunction	Possible cause	Remedy
No display	No current to apparatus	Turn mains switch on Check mains connections
Frequent switching of valve or pump	System is untight Hysteresis is too small	Control all sealing points (tubes and their connections) Choose larger hysteresis (if end vacuum is greater than 700 mbar, set to automatic hysteresis)
Valve does not switch	Valve does not close	Valve coil is dirty Valve cable is not plugged in
No vacuum	Tubing incorrec Incorrectly cabled	See Chapter 4, Installation See 5.1 Controls
Vacuum is not reached	Back evaporation Rotavapor Water pressure to water jet pump is too low	Empty receiving flask Completely open water tap
Auto distillation has "abated"	Manually decrease pressure until the distillation starts again, then, if so desired, return to the automatic function.	
Distillation has ended despite not dried out completely	a) Back evaporation from the receiving flask is too strong (especially solvent mixtures), drain receiving flask and start distillation again b) Malfunction in distillation procedure is not exactly defined (for example, sudden cooling, heat flow is too low, etc.). Decrease pressure manually until the distillation starts again, then return to automatic function (V-805)	
Rest moisture is too high after auto distillation	Control to end dryness by manually decreasing pressure of product	

14 Taking out of operation



You must remove dangerous substances and thoroughly clean the apparatus. As a result, people will not be injured from contact with dangerous substances.

14.1 Storage/transportation

Clean the apparatus thoroughly. Residues of chemicals must be removed completely and glass components must be cleaned.

Keep and transport the apparatus in its original packaging..

14.2 Disposal

So that the apparatus can be disposed of in an environmentally friendly manner, there is a list of materials used in Chapter 13, Annex. This helps to ensure that the components are separated and recycled.

Please observe valid regional and local laws concerning disposal.

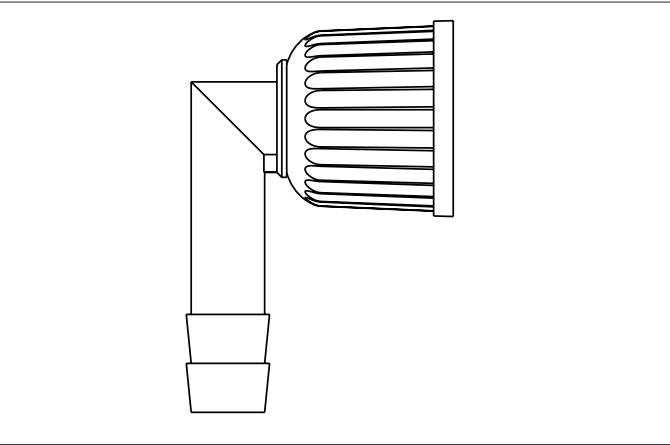
15 Spare parts and accessories

Only BÜCHI original accessories and spare parts guarantee safety and that the apparatus functions correctly. You can only use spare parts and accessories from other companies if BÜCHI consents. During assembling and disassembling the general safety rules and Chapters 4 and 7 are to be respected. Before placing the apparatus into operation, check to make sure that it operates correctly according to Chapter 11.2 Manufacturing according to this Manual is prohibited. Copyright remains at Büchi AG.

15.1 Spare parts

Name	Order number
Hose nipple GL 14 complete, 4 pieces	37287

Table 7: Spare parts hose nipple



Hose nipple GL14 complete

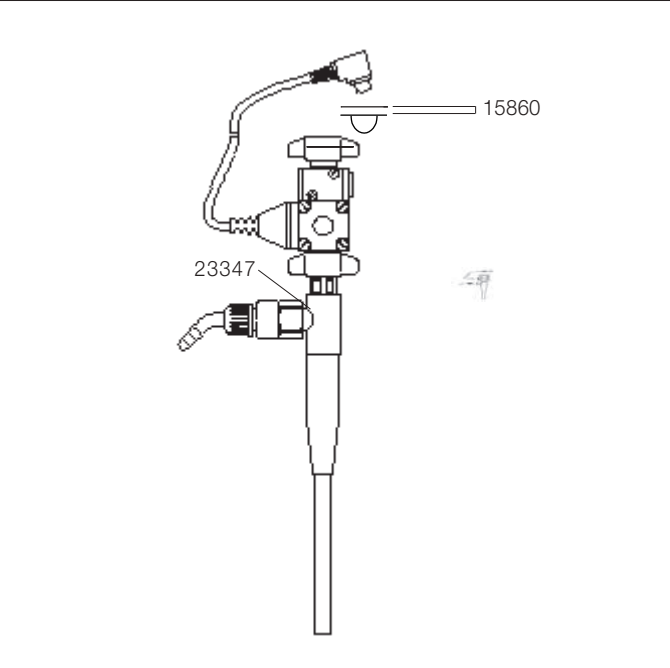
15.2 Accessory

Name	Order number
Water jet pump B-764	31358
Set with 5 sieves and 10 seals	15860
Kalrez PP membrane	23347
Set of four O rings	37607

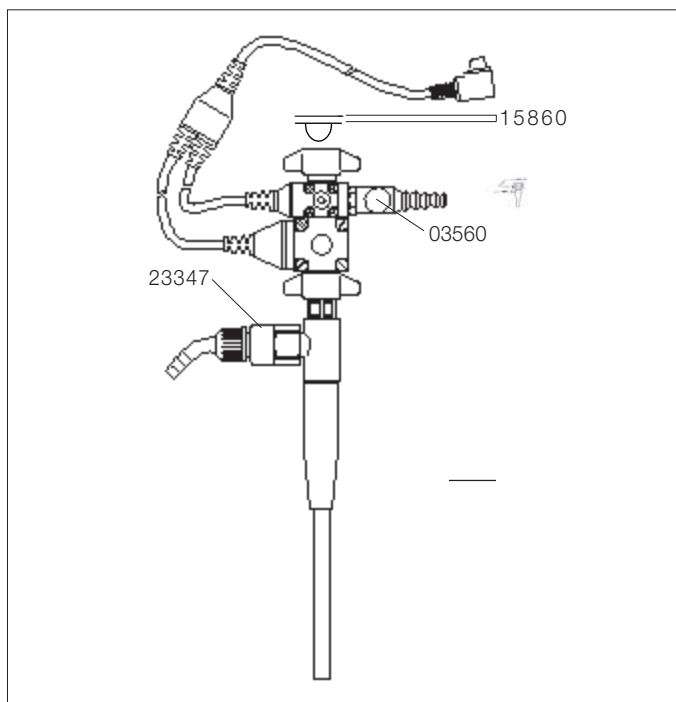
Table 8: Accessory B-764

Water jet pump for creating vacuum.

Is controlled via the V-805. When the set vacuum is reached, this water jet pump turns off and, thus, saves up to 400 l water/h.
The integrated backstroke valve prevents back suction of water into the system.



Water jet pump B-764

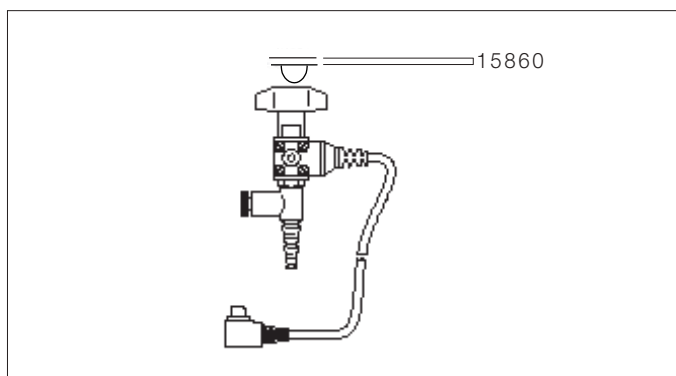


Water jet pump B-767

Name	Order number
Water jet pump B-767	31357
Set with 5 sieves and 10 seals	15860
Kalrez PP membrane	23347
Set of four O rings	37607

Table 9: Accessory B-767

Just like B-764, B-767 is also equipped with a cooling water valve, thus, you need only one water connection for vacuum and cooling water.

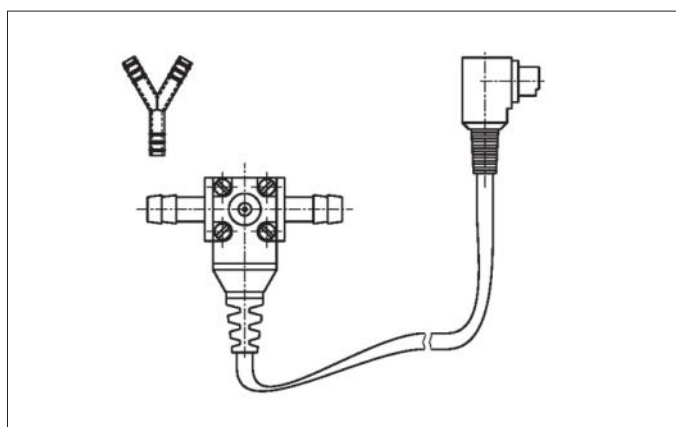


Cooling water valve

Name	Order number
Cooling water valve	31356
Set with five sieves and 10 seals	15860

Table 10: Accessory cooling water valve

The Vacuum Controller controls this cooling water valve. It opens it only when cooling water is needed. This also helps to save water and reduce control efforts.

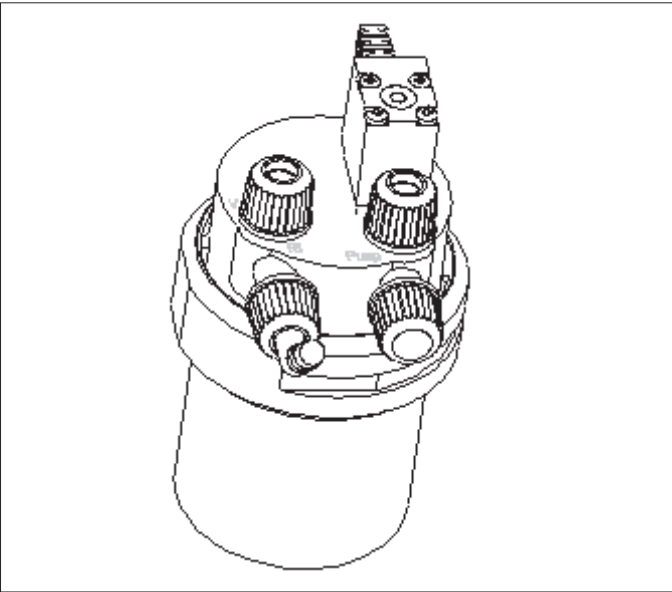


In line valve to 1 litre Rotavapor

Name	Order number
In line valve 24 VDC Ø 2,4 mm to 1 litre Rotavapor (with 00394 Y-piece)	31353
Ø 4 mm to 20 litre Rotavapor	31354
Ø 4 mm to 50 litre Rotavapor	31355

Table 11: Accessory in line valve

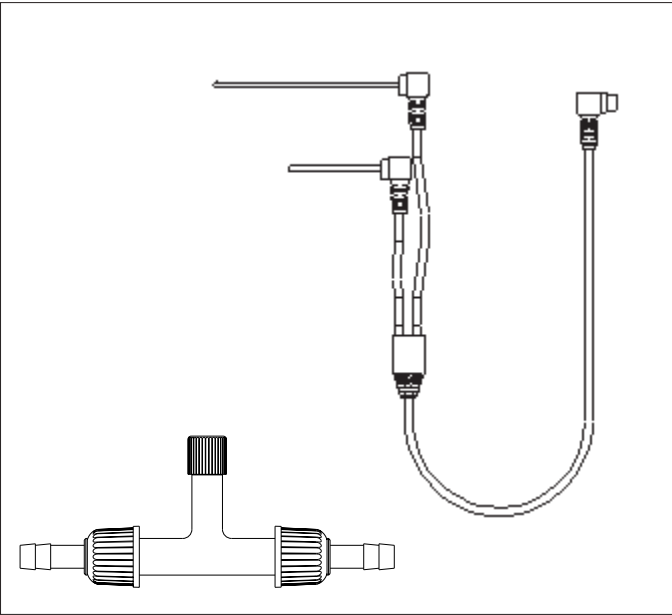
The in line valve is used in connection with in-house vacuum systems or continuous operating vacuum pumps. It controls opening and closing of the vacuum line.



Valve unit, complete

Name	Order number
Valve unit, complete	37968

The valve unit combines the function of the Woulff bottle with that of the vacuum valve.

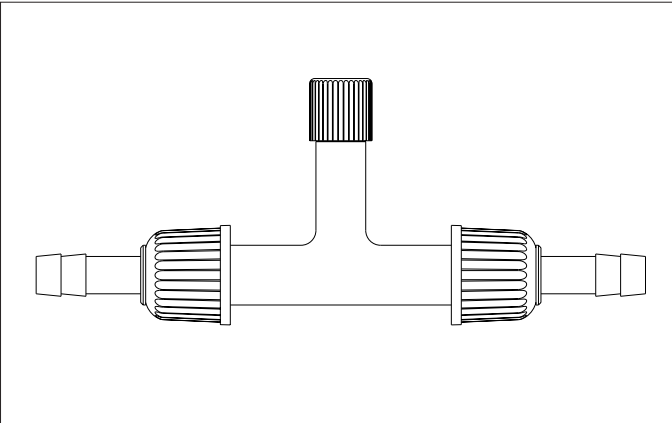


Automatic dual temperature sensors

Name	Order number
Automatic dual temperature sensor Complete for glass assemblies V and S (including T piece, only for V-805)	40741

Table 12: ZAccessory automatic dual temperature sensor

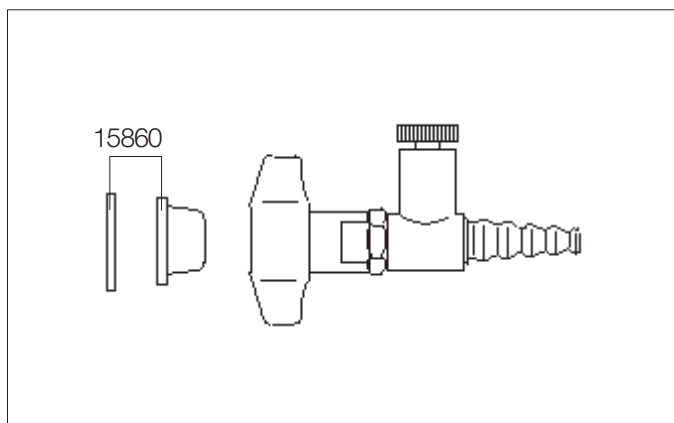
For automatic distillation (only V-805).



T-piece

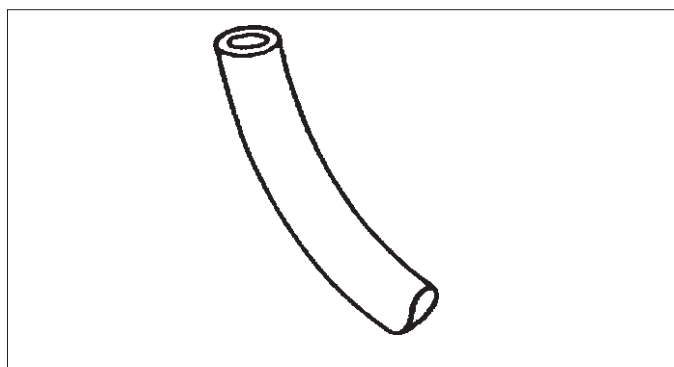
Name	Order number
Glass T piece complete	37751

For automatic distillation (only V-805).



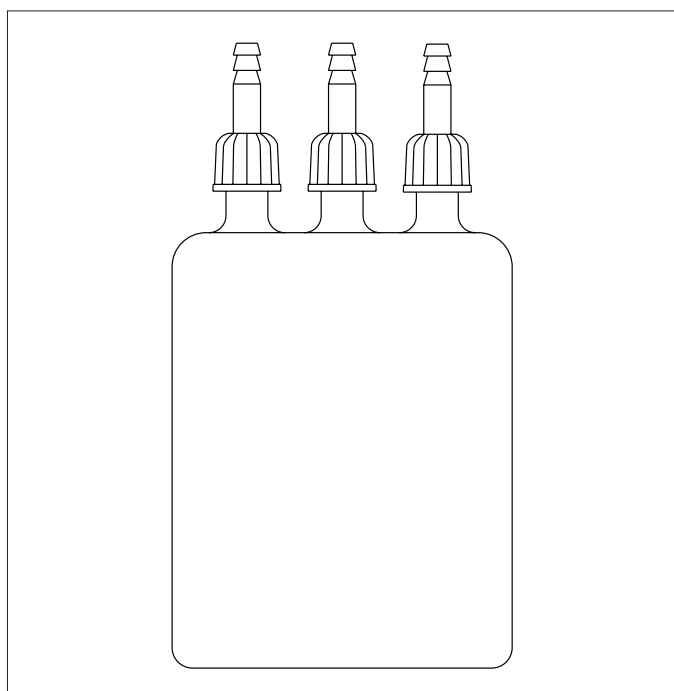
Water control valve, complete

Name	Order number
Water control valve ½" complete (01308 + 03560 + 15860)	11606
Set with 5 sieves and 10 seals	15860



Vacuum tube

Name	Order number
Vacuum tube 16/6 mm	17622
Nylex tube 14 x 8 (alternative to 17622)	04113



Woulff bottle

Name	Order number
Woulff bottle, complete	25519

16 Annex

16.1 Technical data

	V-800 / V-805
Dimensions casing (W x L x D)	110 x 110 x 70 mm
Weight	0.9 kg
Electrical supply	230 V / 50/60 Hz 100 - 120 V / 50/60 Hz
Power consumption	16 W
Ambient conditions	for indoor use only, altitude up to 2000 m, 5 - 40 °C maximum relativ humidity 80% for temperatures up to 30°C
Magnetic valve supply	24V
Regulating range	1 mbar/torr to atmospheric pressure
Max regulating range deviation	+/- 0.5% f.s.
Display range	0 - 1400 mbar
Hysteresis	Automatic or 1 – 500 mbar
Installation category	II
Pollution degree	2

16.2 Materials used

Component	Material	Abbreviation
Pressure foil	Polyester	PES
Casing	Polybutylterephthalate	PBT
Printed board	Glass fibre reinforced epoxi resin	
Cable	Polyvinyl chloride	PVC

16.3 Declaration of conformity

We,

BÜCHI Labortechnik AG
Postfach, CH-9230 Flawil, Switzerland

Declare, solely under our responsibility, that the product:

BÜCHI Vacuum Controller **V-800/V-805**

On which this declaration is based, complies with the following standards:

EN 61326-1: 1997

Electrical equipment for measurement technique, control and laboratory use
EMC requirements

EN 55011:1991/B (~VDE 0875/B, VDE 0871/B)

Limit values and measuring methods for interference of industrial, scientific and medical high frequency instruments

EN 61000-3-2: 1995/1996

Limits for harmonic current emissions

EN 61000-3-3: 1995

Limitation of voltage fluctuations and flicker

In accordance with specifications of the EU Directive:

73/23/EEC (Electrical equipment/low voltage directive)

89/336/EEC (Electromagnetic compatibility)

Flawil, 16.01.2001

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Guido Worch
Qualitymanager



16.4. FCC Deklaration

English:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to both Part 15 of the FCC Rules and the radio interference regulations of the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Français:

Cet appareil a été testé et s'est avéré conforme aux limites prévues pour les appareils numériques de classe A et à la partie 15 des réglementations FCC et à la réglementation des radio-interférences du Canadian Department of Communications. Ces limites sont destinées à fournir une protection adéquate contre les interférences néfastes lorsque l'appareil est utilisé dans un environnement commercial.

Cet appareil génère, utilise et peut radier une énergie à fréquence radioélectrique, il est en outre susceptible d'engendrer des interférences avec les communications radio, s'il n'est pas installé et utilisé conformément aux instructions du mode d'emploi. L'utilisation de cet appareil dans les zones résidentielles peut causer des interférences néfastes, auquel cas l'utilisateur sera amené à prendre les dispositions utiles pour remédier aux interférences à ses propres frais.