



Technology for Vacuum Systems

**Instructions for use**

**Part II of II**



**Part II:**  
**Readjustment -**  
**Interface parameters -**  
**Accessories - Maintenance**

**PC 3001 VARIO<sup>pro</sup>**  
**PC 3001 VARIO<sup>pro</sup> TE**  
**PC 3001 VARIO<sup>pro</sup> IK**  
**PC 3001 VARIO<sup>pro</sup> EK Peltronic**

**Chemistry pumping unit with speed control**



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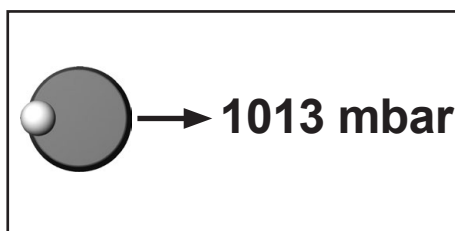
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# Readjustment of CVC 3000

## NOTICE

The vacuum gauge was adjusted using factory standards, which are traceable through regular calibration in an accredited laboratory (DAkkS calibration laboratory) to the German national pressure standard. Depending on the process and/or accuracy requirements, check the adjustment and readjust if necessary. For readjustment, the device has to be adjusted both at atmospheric pressure as well as under vacuum but only if the reference pressures are known with certainty. The adjustment mode can be activated only if the process control is inactive. Press "START/STOP" key, if necessary. In the range between 15 to 525 Torr (20 to 700 mbar) no adjustment is possible; ---- Torr is displayed.

## Adjustment at atmospheric pressure



An adjustment at atmospheric pressure is only possible if the pressure is higher than 525 Torr (700 mbar).

Vent the measurement connection of the CVC 3000 and/or the vacuum system. Make sure that the pressure transducer is at atmospheric pressure.

- ➔ In "Configuration" menu, select program "Adjustment" at the controller.
- ➔ Use the selection knob to adjust the reading to the current atmospheric pressure.
- ➔ Press the selection knob to confirm.

**Note:** To determine the actual atmospheric pressure, use an accurate barometer or get accurate reading from the weather service, or a nearby airport or other reliable source (taking into account the difference in altitude between the source and the laboratory).

## Adjustment under vacuum



0 mbar

An adjustment under vacuum is only possible if the pressure is lower than 15 Torr (20 mbar) absolute.

Evacuate the measurement connection of the CVC 3000 to a pressure  $< 0.1$  Torr (mbar) (e.g. by applying a good two-stage rotary vane pump).

- ➔ In "Configuration" menu, select program "Adjustment" at the controller.
- ☞ The reading is automatically adjusted to "zero".
- ➔ Press the selection knob to confirm.

**Note:** Adjustment under vacuum with an actual pressure higher than 0.1 Torr (mbar) reduces the accuracy of the measurement. If the pressure is significantly higher than 0.1 Torr (mbar), adjustment to a reference pressure is recommended.

## Adjustment at a reference pressure



0...20 mbar

Instead of adjustment under vacuum to a pressure  $< 0.1$  Torr (mbar), adjustment to a precisely known reference pressure within the range of 0..... 15 Torr (20 mbar) is possible. Evacuate the measurement connection of the CVC 3000 to a pressure within 0 ..... 15 Torr (0.....20 mbar).

- ➔ In "Configuration" menu, select program "Adjustment" at the controller.
- ☞ The reading is automatically adjusted to "zero".
- ➔ Use the selection knob to adjust the display to the reference pressure at the vacuum line within the range of 0 ..... 15 Torr (0.....20 mbar).
- ➔ Press the selection knob to confirm.

**Note:** The accuracy of the value of the reference pressure will directly affect the accuracy of the adjustment. If the nominal ultimate vacuum of a diaphragm pump is used as reference vacuum, the accuracy of the controller might be doubtful. The diaphragm pump may not achieve the specified value (due to condensate, poor condition, failure of valves or diaphragm, leaks).

# Calibration in the factory

## Control of measuring equipment

The **VACUUBRAND DAkkS calibration laboratory** is accredited by the Deutsche Akkreditierungsstelle GmbH (national accreditation body of the Federal Republic of Germany) for the measurable variable **pressure in the pressure range from  $7.5 \cdot 10^{-4}$  Torr to 975 Torr ( $10^{-3}$  mbar to 1300 mbar)** in accordance with the general criteria for the operation of testing laboratories defined in the DIN EN ISO/IEC 17025:2000 series of standards (accreditation number D-K-15154-01).

The DAkkS is signatory to the multilateral agreements of the European cooperation for Accreditation (EA) and of the International Laboratory Accreditation Cooperation (ILAC) for the mutual recognition of calibration certificates.

Rely on calibration in the VACUUBRAND calibration laboratory:

- To meet the requirements of the DIN ISO 9000ff and 10012 series of standards regarding the calibration of inspection, measuring and test equipment at specified intervals.
- To document that the vacuum gauges calibrated are traceable to national standards of the PTB (Physikalisch-Technische Bundesanstalt; German national institute for science and technology and the highest technical authority of the Federal Republic of Germany for the field of metrology and certain sectors of safety engineering).

To order **DAkkS calibration** of the CVC 3000 pressure transducer,  
order number: ..... **20900215**

## Cleaning the pressure transducer

- ➔ **Attention: Never use a pointed or sharp-edged tool to clean the pressure transducer.**
- ➔ **Never touch the ceramic diaphragm of the pressure transducer with hard objects.**
- ➔ Fill the measurement chamber with a solvent (e.g., benzene) and allow sufficient cleaning time. Observe all regulations concerning usage and disposal of solvents!
- ➔ Drain the solvent and dispose of in accordance with regulations. Repeat cleaning if necessary.
- ➔ Rinse the measurement chamber several times with alcohol in order to remove all solvent residues.
- ➔ Allow the pressure transducer to dry.
- ➔ Readjust the pressure transducer if necessary.

### **Readjustment of the controller CVC 3000**

See section „Readjustment of CVC 3000“, pg. 84.

# Interface parameters

The CVC 3000 controller is equipped with a serial interface (RS 232C, nine-pin Sub-D-plug).

- ☞ Plug-in or remove the cable (cable RS 232C) from the interface only if the equipment is switched off.
- ☞ The interface is **not** electrically isolated from the measuring circuit.

The controller is fully operable via the serial interface. Measuring results, preselections and the status of the controller can be read at any time.

The factory-set read and write commands are completely compatible with the VACUUBRAND CVC 2000 controller (see sections "Read / Write commands CVC 2000"). An extended instruction set is available using the command "CVC 3" (see sections "Read / Write commands CVC 3000").



## Setting of the interface

Set the interface parameters directly at the controller CVC 3000. The factory set values are underlined.

Edit and confirm the interface parameters in the "Configuration" menu in "RS-232" submenu using the selection knob.

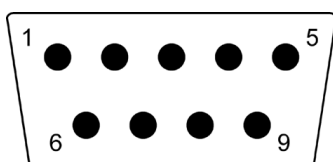
- ➔ Baud: 2400, 4800, 9600 or 19200
- ➔ Parity: 8-N-1, 7-O-1 or 7-E-1
- ➔ Handshake: Off, Xon-Xoff or RTS-CTS
- ➔ Remote: On or Off
- ➔ Timeout: Sending 1s, receiving 10s.

In remote mode (Remote On, with the "PC symbol" in the display) all keys at the controller are inoperable.

**To return to the manual operation of the controller, set the controller to "Remote off" in menu configuration: Switch off the controller. Then switch the controller back on, and press the selection knob within 2s.**

- ➔ A maximum of ten commands per second is possible.
- ➔ Read commands and commands "REMOTE", "CVC", and "STORE" can always be sent. The sending of other write commands is only possible, if "Remote on" is selected.
- ➔ The commands have to be written in capital letters.
- ➔ Command and parameter have to be separated by a blank.
- ➔ The string is terminated with <CR> or <LF> or <CR><LF>.
- ➔ The response of the controller is always terminated with <CR><LF>.
- ➔ Numerical values and parameters can be written without leading zeros.
- ➔ The response of the controller always includes leading zeros.

## Pin assignment RS-232 C



2: RxD  
3: TxD  
4: DTR

5: Mass  
7: RTS  
8: CTS

9: +5V (Bluetooth)

## Read commands "CVC 2000"

Command	Operation	Response	Description
IN_PV_1	current pressure	XXXX mbar/ Torr/hPa	unit according to preselections
IN_PV_2	current frequency	XX.X Hz	pump speed
IN_CFG	device set preselections	0XXXX 1XXXX 2XXXX 3XXXX X0XXX X1XXX XX0XX XX1XX XXX0X XXX1X XXXX0 XXXX1	VACUU•LAN continuous pumping vacuum control without automatic vacuum control with automatic no coolant valve coolant valve no venting valve venting valve no automatic switch off automatic switch off remote operation off remote operation on
IN_ERR	error code	1XXX X1XX XX1X XXX1	fault at pump electronics overpressure maloperation mode pressure transducer last command to interface incorrect
IN_STAT	status of process control	0XXX 1XXX X0XX X1XX XX00 XX01  XX02  XX03 XX10 XX11 XX20 XX21  XX22  XX23  XX30 XX31 XX32 XX33	coolant valve closed coolant valve open venting valve closed venting valve open VACUU•LAN: inactive VACUU•LAN: pumping down, current pressure > selected pressure VACUU•LAN: pumping down, time for automatic switching off is running VACUU•LAN: system is switched off continuous pumping: not active continuous pumping; active vacuum control: not active vacuum control: current pressure above set vacuum vacuum control: current pressure equals set vacuum ( $\pm 1$ Torr/mbar) vacuum control: current pressure below set vacuum automatic: not active automatic: determining boiling point automatic: adjusting boiling point automatic: system is switched off

## Write commands "CVC 2000"

Command	Operation	Parameter	Description
OUT_MODE	function	1 2 3 30 31 32	continuous pumping vacuum control without automatic vacuum control with automatic <i>optional: sensitivity: low</i> <i>optional: sensitivity: normal</i> <i>optional: sensitivity: high</i>
OUT_SP_1	set vacuum	XXXX	unit (mbar/Torr/hPa) according to pre-selection; see respective function for parameter range
OUT_SP_V	set vacuum with venting*	XXXX	unit (mbar/Torr/hPa) according to pre-selection; see respective function for parameter range
OUT_SP_2	set frequency	XX.X	motor speed in Hz (99.9 for "HI"; 99.8 for 3000 rpm)
OUT_SP_3	vacuum for switch on (VACUU•LAN)	XXXX	unit (mbar/Torr/hPa) according to pre-selection; see respective function for parameter range
OUT_SP_4	delay	XX:XX	hh:mm (hours:minutes)
OUT_SP_5	vacuum for automatic switching off	XXXX	unit (mbar/Torr/hPa) according to pre-selection; see respective function for parameter range
OUT_SP_6	time for automatic switching off (VACUU•LAN)	XX:XX	hh:mm (hours:minutes)
START	starting process control		
STOP	stopping process control	1 2	termination of process control termination of process control and storage of the current pressure as new set point
REMOTE	remote operation**	0 1	set controller to local operation set controller to remote operation
OUT_VENT	driving venting valve	0 1	close venting valve (not automatically) open venting valve (process control stopped)

\* Pressure setting with venting is only possible in "Vac control" function if a venting valve is connected and configured, and vacuum control is started. The venting valve opens automatically if the actual pressure is at least 7.5 Torr (10 mbar) below the preset pressure. Automatic venting becomes inactive if vacuum control is stopped (by pressing "START/STOP" or "VENT"), a pressure value is set using the command OUT\_SP\_1, or if the function is changed. Activate the command OUT\_SP\_V again if necessary.

- \*\* If remote operation is selected or deselected, the user has to ensure that no dangerous status of the system can occur due to the change of the mode of operation, and must take appropriate safety precautions, especially if selecting remote operation interferes with a locally operated active process.

## Read commands "CVC 3000"

Command	Operation	Response	Description
IN_PV_1	current pressure	XXXX.X mbar/Torr/hPa	unit according to preselections
IN_PV_2	current speed	XXX%	1-100% or "HI"
IN_PV_3	time	XX:XX h:m	process runtime (hours:minutes)
IN_PV_X	pressure	XXXX.X XXXX.X ...	pressure of all connected sensors, unit (mbar/Torr/hPa) according to preselections
IN_PV_T	operation time of the controller	XXXXdXXh	operation time in days and hours
IN_CFG	device set preselections  + Language: 0: German 1: English 2: French 3: Italian 4: Spanish 5: Turkish 6: Korean 7: Chinese 8: Portuguese 9: Russian A: Polish B: Dutch C: Japanese D: Finnish	0XXXXXXXXXXXXXXXXX VACUU•LAN 1XXXXXXXXXXXXXXXXX Pump down 2XXXXXXXXXXXXXXXXX Vac control 3XXXXXXXXXXXXXXXXX Auto mode 4XXXXXXXXXXXXXXXXX Program 5XXXXXXXXXXXXXXXXX measuring device XyXXXXXXXXXXXXXXXXX y: 0.....D: language+ (hexadecimal) XX0XXXXXXXXXXXXXXXXX pressure unit mbar XX1XXXXXXXXXXXXXXXXX pressure unit Torr XX2XXXXXXXXXXXXXXXXX pressure unit hPa XXX0XXXXXXXXXXXXXXXXX autostart off XXX1XXXXXXXXXXXXXXXXX autostart on XXXX0XXXXXXXXXXXXXXXXX acoustic signal off XXXX1XXXXXXXXXXXXXXXXX acoustic signal on XXXXX0XXXXXXXXXXXXXXXXX VARIO pump not connected XXXXX1XXXXXXXXXXXXXXXXX VARIO pump connected XXXXXX0XXXXXXXXXXXXXXXXX VMS not connected XXXXXX1XXXXXXXXXXXXXXXXX VMS connected XXXXXXX0XXXXXXXXXXXXXXXXX in-line valve not connected XXXXXXX1XXXXXXXXXXXXXXXXX in-line valve connected XXXXXXXX0XXXXXXXXXXXXXXXXX coolant valve not connected XXXXXXXX1XXXXXXXXXXXXXXXXX coolant valve connected XXXXXXXXXX0XXXXXXXXXXXXXXXXX venting valve not connected XXXXXXXXXX1XXXXXXXXXXXXXXXXX venting valve connected XXXXXXXXXX0XXXXXXXXXXXXXXXXX fault indicator not connected XXXXXXXXXX1XXXXXXXXXXXXXXXXX fault indicator connected XXXXXXXXXX0XXXXXXXXXXXXXXXXX level sensor not connected XXXXXXXXXX1XXXXXXXXXXXXXXXXX level sensor connected XXXXXXXXXX0XXXXXXXXXXXXXXXXX remote module not connected XXXXXXXXXX1XXXXXXXXXXXXXXXXX remote module connected XXXXXXXXXX0XXXXXXXXXXXXXXXXXyXX y: 1.....9: sensor number XXXXXXXXXX0XXXXXXXXXXXXXXXXXyX y: 1.....9: sensor quantity XXXXXXXXXX0XXXXXXXXXXXXXXXXX remote operation off XXXXXXXXXX1XXXXXXXXXXXXXXXXX remote operation on	

Command	Operation	Response	Description
IN_STAT	status process control	0XXXXXX 1XXXXXX X0XXXXX X1XXXXX XX0XXX XX1XXX XXX0XX XXX1XX XXXX0X XXXX1X XXXX2X XXXX3X XXXX4X XXXX5X XXXXX0 XXXXX1  XXXXX2  XXXXX3	pump off pump on in-line valve closed in-line valve open coolant valve closed coolant valve open venting valve closed venting valve open VACUU•LAN Pump down Vac control Auto mode Program measuring device control off pump down - determining boiling point set vacuum reached - boiling pressure found current pressure below set vacuum - automatic switch-off
IN_ERR	fault status	0XXXXXXXX 1XXXXXXXX X0XXXXXXXX X1XXXXXXXX XX0XXXXXXXX XX1XXXXXXXX XXX0XXXXX XXX1XXXXX XXXX0XXXX XXXX1XXXX XXXXX0XXX XXXXX1XXX XXXXXX0XX XXXXXX1XX XXXXXX0X XXXXXX1X XXXXXX0 XXXXXX1	no fault at pump fault at pump no fault at in-line valve fault at in-line valve no fault at coolant valve fault at coolant valve no fault at venting valve fault at venting valve no overpressure overpressure no fault at pressure transducer fault at pressure transducer catchpot not full catchpot full no external fault external fault last interface command correct last interface command incorrect
IN_SP_1	set vacuum	XXXX mbar/Torr/hPa	unit according to preselections
IN_SP_2	maximum speed	XXX%	speed in % (1-100% or "HI")
IN_SP_3	switching pressure	XXXX mbar/Torr/hPa	switching pressure for VACUU•LAN or two point control; unit according to preselections

Command	Operation	Response	Description
IN_SP_4	delay	XX:XX h:m	hours:minutes (00:00 = Off)
IN_SP_5	switch off pressure	XXXX mbar/Torr/hPa	"Maximum" for "Vac control", "Minimum" for "Pump down") unit according to preselections
IN_SP_6	runtime	XX:XX h:m	process runtime (hours:minutes)
IN_SP_P1y	time	XX:XX:XX h:m:s	time in program step y (0.....9) (hours:minutes:seconds)
IN_SP_P2y	pressure	XXXX mbar/Torr/hPa	pressure in program step y (0.....9) unit according to preselections
IN_SP_P3y	venting valve	0 1	no venting valve in program step y (0.....9) venting valve in program step y (0.....9)
IN_SP_P4y	Step	0 1	no "Step" in program step y (0.....9) "Step" in program step y (0.....9)
IN_SP_P5y	Auto	0 1	no "Auto" in program step y (0.....9) "Auto" in program step y (0.....9)
IN_PV_Sx	current pressure of pressure transducer x	XXXX mbar/hPa/Torr	pressure of pressure transducer x (order of numbering according to display in "Sensors" menu)
IN_VER	version	CVC 3000 VX.XX	software version

## Write commands "CVC 3000"

Command	Operation	Parameter	Description
OUT_MODE	function	0 1 2 3 30 31 32 4	VACUU•LAN Pump down Vac control Auto mode <i>optional: sensitivity: low</i> <i>optional: sensitivity: normal</i> <i>optional: sensitivity: high</i> Program
OUT_CFG	configuration (bus monitoring)	yXXX X0XX X1XX X2XX XX0X XX1X XXX0 XXX1	y: 0.....D: language+ (hexadecimal), see "Read commands CVC 3000" pressure unit mbar pressure unit Torr pressure unit hPa Autostart off Autostart on acoustic signal off acoustic signal on

**Attention (OUT\_MODE):** If control is running, it is only possible to switch either from 1 to 2, or from 2 to 3, or from 3 to 2. The set vacuum is adopted in each case.

Command	Operation	Parameter	Description
OUT-SP_1	set vacuum	XXXX	unit according to preselection; see respective function for parameter range
OUT_SP_V	set vacuum with venting	XXXX	unit according to preselection; see respective function for parameter range
OUT_SP_2	speed	XXX	speed in % or "HI"
OUT_SP_3	start-up pressure	XXXX	unit according to preselection; see respective function for parameter range
OUT_SP_4	delay	XX:XX	hh:mm (hours:minutes)
OUT_SP_5	switch-off pressure	XXXX	unit according to preselection; see respective function for parameter range
OUT_SP_6	switch-off time	XX:XX	hh:mm (hours:minutes)
OUT_SP_PL	open program	X	program 0.....9
OUT_SP_PS	store program	X	program 0.....9
OUT_SP_P1y	time	XX:XX:XX +XX:XX:XX	total runtime until program step y (0.....9) or time for program step y (0.....9) (additive)
OUT_SP_P2y	pressure	XXXX	pressure at program step y (0.....9) unit according to preselection
OUT_SP_P3y	venting valve	0 1	no venting valve in program step y (0...9) venting valve in program step y (0.....9)
OUT_SP_P4y	Step	0 1	no "Step" in program step y (0.....9) "Step" in program step y (0.....9)
OUT_SP_P5y	Auto	0 1 2	no "Auto" in program step y (0.....9) "Auto↓" in program step y (0.....9) "Auto←" in program step y (0.....9)
START			started
STOP		0 1 2	Stop and delete fault Stop Stop and adopt the set vacuum
REMOTE*		0 1	Remote off Remote on
ECHO**		0 1	Echo off Echo on, write command with return value
CVC		2 3	CVC 2000 commands CVC 3000 commands***
OUT_VENT		0 1 2	venting valve closed venting valve open venting until atmospheric pressure (788 Torr (1050 mbar) at maximum)
STORE			store settings permanently, if "ECHO = 1" after realization



Command	Operation	Parameter	Description
OUT_SENSOR		1 2...9	internal sensor external sensors (if connected)

- \* If remote operation is selected or deselected, the user has to ensure that no dangerous status of the system can occur due to the change of the mode of operation, and must also take appropriate safety precautions, especially if selecting remote operation interferes with a locally operated active process.
- \*\* With command "ECHO 1" a return value can be activated at write commands. A return value is only given if the command is performed correctly.
- \*\*\* After being switched on, the controller is in "CVC 2" mode by default. Send "CVC 3" and "STORE" to permanently set the controller RS 232C commands to the extended set "CVC 3000".

# Accessories

External pressure transducer VSK 3000, ..... capacitive, ceramic diaphragm sensor 1080-0.1 mbar	<b>20636657</b>
Small flange connection KF DN 16.....	<b>20699939</b>
Coolant valve VKW-B, 24 V= .....	<b>20674220</b>
Venting valve VBM-B / KF 16, 24 V= .....	<b>20674217</b>
Level sensor .....	<b>20699908</b>
VACUU•BUS Y-type adapter .....	<b>20636656</b>
VACUU•BUS extension cable, 6.6ft (2m) .....	<b>20612552</b>
VACUU•BUS wall jack.....	<b>20636153</b>
Serial cable RS 232C, 9-pin, Sub-D .....	<b>20637837</b>
Upgrade kit emission condenser .....	<b>20699922</b>
(for PC 3001 VARIO <sup>pro</sup> without emission condenser)	
Silencer (with connection hose).....	<b>20636588</b>


**Attention:** Dust-laden gases, deposits and condensed solvent vapor can restrict air flow out the silencer. The resultant back pressure can lead to damage of pump bearings, diaphragms, and valves. Under those conditions, a silencer must not be used.

## Spare parts:

Catchpot 0.52 qt (500 ml), coated .....	<b>20638497</b>
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# Troubleshooting

Fault	Possible cause	Remedy
<input type="checkbox"/> No display.	<ul style="list-style-type: none"> <li>➔ Electrical power cord not plugged in, electrical supply failure?</li> <li>➔ Controller CVC 3000 or pumping unit switched off?</li> <li>➔ VACUU • BUS cable between pump and controller not plugged in at controller?</li> <li>➔ Other than above mentioned causes?</li> </ul>	<ul style="list-style-type: none"> <li>✓ Plug in power cord. Check fuse.</li> <li>✓ Switch on controller and/or pumping unit.</li> <li>✓ Plug in VACUU • BUS cable at CVC 3000 controller.</li> <li>✓ Contact local distributor.</li> </ul>
<input type="checkbox"/> Display disappears.	<ul style="list-style-type: none"> <li>➔ Too much load (e.g., valves) connected?</li> <li>➔ Short circuit at connected valves?</li> <li>➔ Short circuit at the RS 232 plug?</li> <li>➔ Other than above mentioned causes?</li> </ul>	<ul style="list-style-type: none"> <li>✓ Check current draw of the connected devices.</li> <li>✓ Replace valves.</li> <li>✓ Check plug and cable.</li> <li>✓ Contact local distributor.</li> </ul>
<input type="checkbox"/> Pressure reading incorrect.	<ul style="list-style-type: none"> <li>➔ Pressure transducer decalibrated?</li> <li>➔ Humidity in the measurement chamber?</li> <li>➔ Pressure transducer contaminated?</li> <li>➔ Other than above mentioned causes?</li> </ul>	<ul style="list-style-type: none"> <li>✓ Readjust CVC 3000.</li> <li>✓ Let the pressure transducer dry, e.g., by pumping. Readjust if necessary. Determine and eliminate the cause for humidity.</li> <li>✓ See "Cleaning the pressure transducer".</li> <li>✓ Contact local distributor.</li> </ul>
<input type="checkbox"/> Digital pressure reading is flashing, display shows "0.0".	<ul style="list-style-type: none"> <li>➔ Pressure transducer not correctly adjusted under vacuum?</li> </ul>	<ul style="list-style-type: none"> <li>✓ Adjust CVC 3000 correctly.</li> </ul>
<input type="checkbox"/> No digital pressure reading.	<ul style="list-style-type: none"> <li>➔ Pressure transducer defective?</li> </ul>	<ul style="list-style-type: none"> <li>✓ Contact local distributor.</li> </ul>

Fault	Possible cause	Remedy
<input type="checkbox"/> Digital pressure reading is flashing, one blip*.	➔ Overpressure at the pressure transducer, pressure > 795 Torr (1060 mbar)? 	✓ Release pressure immediately (risk of bursting).
<input type="checkbox"/> Warning triangle and black valve symbol are flashing, two blips*.	➔ External venting valve removed or defective?	✓ Connect valve or replace with a new one or reconfigure without valve.
<input type="checkbox"/> Warning triangle and valve symbol are flashing, three blips*.	➔ Pump and in-line valve connected?	✓ Disconnect in-line valve; switch controller off/on to reconfigure.
<input type="checkbox"/> Warning triangle and coolant valve symbol are flashing, four blips*.	➔ Coolant valve removed or defective?	✓ Check connection cable of the valve; or use new valve or reconfigure without valve.
<input type="checkbox"/> No digital pressure reading. Warning triangle is flashing, five or seven blips*.	➔ Five blips: External pressure transducer defective or removed? ➔ Seven blips: Internal pressure transducer defective?	✓ Connect pressure transducer or replace with a new one or reconfigure without pressure transducer. ✓ Contact local distributor.
<input type="checkbox"/> Warning triangle and pump symbol are flashing, six blips*.	➔ Pump and VMS** (Vacuum Management System) connected? ➔ Fault at the VARIO pump or at the VMS? ➔ Connecting cable from pump or VMS removed?	✓ Remove VMS. Restart controller. ✓ Check pump and/or VMS, restart controller. ✓ Check cable connections.
<input type="checkbox"/> Clock symbol is flashing.	➔ Preselected process time is over?	✓ Confirm by pressing START/STOP key.
<input type="checkbox"/> Internal venting valve does not respond, valve symbol is not displayed.	➔ External pressure transducer connected and active?	✓ Select internal pressure transducer or connect external venting valve.
<input type="checkbox"/> Venting valve does not respond, valve symbol is displayed.	➔ Venting valve contaminated?	✓ Clean valve.

Fault	Possible cause	Remedy
<input type="checkbox"/> "Vac control" function: Control stops, "arrow up" is flashing.	➔ Preset maximum pressure exceeded?	✓ Confirm by pressing START/STOP key. Change maximum pressure value if necessary.
<input type="checkbox"/> "Pump down" function: Control stops, "arrow down" is flashing.	➔ Pressure below preset minimum pressure?	✓ Confirm by pressing START/STOP key. Change minimum pressure value if necessary.
<input type="checkbox"/> No function is displayed. No menu.	➔ No controllable device (valve, VARIO pump, VMS) connected?	✓ Connect devices or use controller as measuring device.
<input type="checkbox"/> Controller does not respond when pressing keys (except ON/OFF). PC symbol is displayed.	➔ Controller in remote mode?	✓ Control CVC 3000 via interface or switch off remote mode.
<input type="checkbox"/> Controller does not respond when operating any keys. No change after switching off/on.		✓ Contact local distributor.
<input type="checkbox"/> Pump does not start or stops immediately. Warning triangle and pump symbol are flashing.	➔ Pump has been exposed to condensate?  ➔ Overpressure in outlet line?	✓ Allow pump to run for some minutes at maximum speed with atmospheric pressure at the inlet.  ✓ Remove blockage in line, open valve.
<input type="checkbox"/> Pump does not achieve its ultimate vacuum or usual pumping speed.	➔ Centring ring at small flange connection not correctly positioned, or leak in the pipeline or vacuum system?  ➔ Wrong setting at controller?  ➔ Long, narrow vacuum line?  ➔ Pump has been exposed to condensate?	✓ Check pump directly, then check connection, pipeline and vacuum system if necessary.  ✓ Select function "Pump down" with speed set to "HI" and check again.  ✓ Use lines with larger diameter, length as short as possible.  ✓ Allow pump to run for some minutes with atmospheric pressure at the inlet to purge.

Fault	Possible cause	Remedy
<input type="checkbox"/> Pump does not achieve its ultimate vacuum or usual pumping speed.	<ul style="list-style-type: none"> <li>➔ Deposits have been formed inside the pump?</li> <li>➔ Diaphragms or valves damaged?</li> <li>➔ Outgassing substances or vapor generated in the process?</li> <li>➔ Pressure below "Minimum" in Auto mode?</li> <li>➔ Pump too hot?</li> </ul>	<ul style="list-style-type: none"> <li>✓ Clean and inspect the pump heads.</li> <li>✓ Replace diaphragms and/or valves.</li> <li>✓ Check process parameters.</li> <li>✓ Change switch off pressure ("Minimum") if necessary.</li> <li>✓ Allow pump to cool down. Determine and eliminate the cause of overheating.</li> </ul>
<input type="checkbox"/> Pump too noisy.	<ul style="list-style-type: none"> <li>➔ Atmospheric or high pressure at the pump inlet?</li> <li>➔ Diaphragm crack or diaphragm clamping disc loose?</li> <li>➔ Other than above mentioned causes?</li> </ul>	<ul style="list-style-type: none"> <li>✓ Connect hose or silencer to pump outlet. Be careful not to cause outlet overpressure, especially with condensable vapors.</li> <li>✓ Perform maintenance.</li> <li>✓ Contact local distributor.</li> </ul>
<input type="checkbox"/> Pump seized.		<ul style="list-style-type: none"> <li>✓ Contact local distributor.</li> </ul>

\* only if "Sound" "On" is selected

\*\* VMS: Vacuum management system to switch non-VARIO pumps

Note: All error messages comprising a flashing warning triangle have to be confirmed (deleted) by pressing the START/STOP key.

Solve the problem (see "Remedy"), then press the START/STOP key to delete the error message.

➔ A service manual with exploded view drawings, spare parts list and directions for repair is available on request.

👉 The service manual is intended for trained service people only.

# Replacing diaphragms and valves

☞ Please read section "Replacing diaphragms and valves" completely before starting maintenance.

The pictures may show other versions of pumps. This does not change the method of replacing diaphragms and valves.

## DANGER

➔ Never operate the pump if covers or other parts of the pump are disassembled.



➔ Before starting maintenance, **disconnect the electrical power cord. Wait two minutes** after isolating the equipment from AC power to allow the capacitors to discharge.

➔ Ensure that the pump cannot be operated accidentally.

➔ **Note:** The pump might be contaminated with the process chemicals that have been pumped during operation. Ensure that the pump is decontaminated before maintenance.

➔ Avoid the release of pollutants.

## WARNING

☞ Never operate a defective or damaged pump.

☞ Take adequate precautions to protect people from the effects of dangerous substances that may have contaminated the pump and may be released upon disassembly. Ensure that the maintenance technician is familiar with the safety procedures which relate to the products processed by the pumping system.

Use appropriate protective clothing, safety goggles and protective gloves.

☞ Allow sufficient cooling of the pump before starting maintenance.

☞ **Vent the pump and isolate it from the vacuum system before you start maintenance.**

**NOTICE**

**Ensure that maintenance is done only by suitably trained and supervised technicians.**

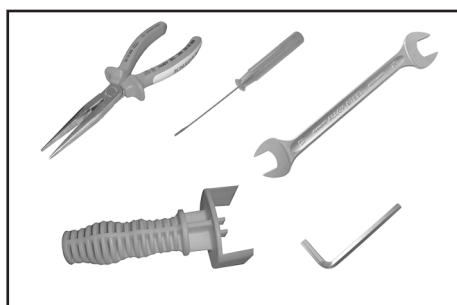
The valves and diaphragms are wear parts. If the rated ultimate vacuum is no longer achieved or in case of increased noise level, the pump interior, the diaphragms and the valves must be cleaned and the diaphragms and valves must be checked for cracks or other damage.

All bearings are encapsulated and are filled with long-life lubricant. Under normal operating conditions, the drive system is maintenance free.

In demanding circumstances, it may be efficient to check and clean the pump heads on a regular basis. In normal use, the lifetime of the diaphragms and valves is typically 15,000 operating hours.

- Prevent internal condensation, transfer of liquids or dust. The diaphragms and valves will be damaged if liquid is pumped in significant amount.
- Carry out maintenance frequently if the pump is exposed to corrosive media or in case of deposits.
- Regular maintenance will improve the lifetime of the pump and also protect both users and the environment.

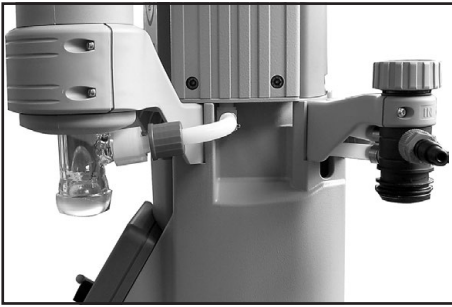
Service kit MD 1C (diaphragms, valves, diaphragm key) .....**20696828**

**Tools required (metric):**

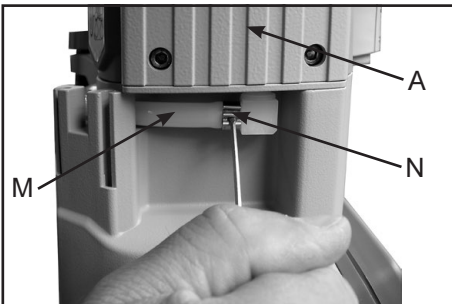
- Diaphragm key width 46 mm
- Open end wrench width 14 / 17 mm
- 4 / 5 mm wide Allen key
- 2.5 mm wide slotted screwdriver
- Phillips screwdriver size 2
- Torx driver T10
- Flat pliers



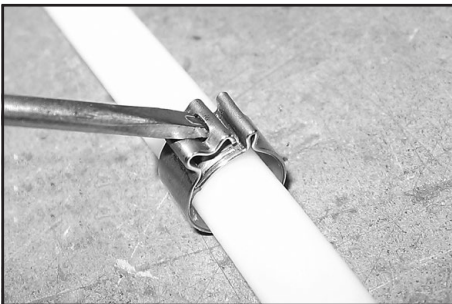
## Cleaning and inspecting the pump heads



- Remove catchpots (10) at inlet and outlet (see „Use and operation“, pg. 39).

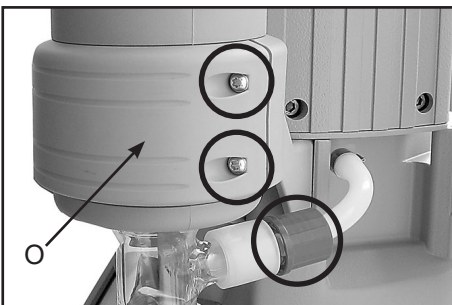


- Detach the coupling of the hose connection (M) below the housing cover (A).
- Open the hose clip (N) with a slotted screwdriver.
- Pull the tubing off the hose connector.



Opening the hose clip:

- Apply slotted screwdriver as shown and turn.



### PC 3001 VARIO<sup>pro</sup> / PC 3001 VARIO<sup>pro</sup> IK

Disassemble the exhaust vapor condenser.

- Loosen the union nut at the inlet of the exhaust vapor condenser.
- Remove the 4 screws affixing the counter holder (O) of the exhaust vapor condenser with a Torx driver T10.
- Remove the exhaust vapor condenser. In doing so pull the PTFE hose out of the inlet of the exhaust vapor condenser.



### PC 3001 VARIO<sup>pro</sup> IK

Disassemble the inlet condenser.

- Loosen the union nut at the inlet of the pump.
- Remove the 4 screws affixing the counter holder of the exhaust vapor condenser with a Torx driver T10.
- Remove the inlet condenser. In doing so pull the PTFE hose out of the inlet of the inlet condenser.



### PC 3001 VARIO<sup>pro</sup> TE

Disassemble the emission condenser TE.

- Loosen the union nut at the inlet of the emission condenser TE.
- Remove the 2 screws affixing the mounting plate of the emission condenser TE with a Phillips screw driver size 2.
- Remove the emission condenser TE. In doing so pull the PTFE hose out of the inlet of the emission condenser TE.

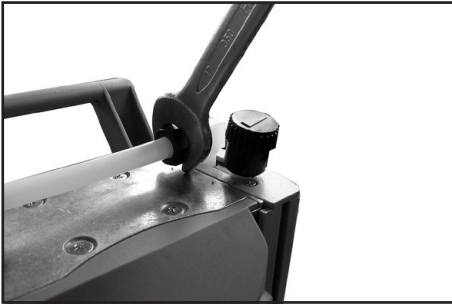


### PC 3001 VARIO<sup>pro</sup> EK Peltronic

Disassemble the Peltronic emission condenser. Detach the coupling of the hose connection at the Peltronic emission condenser.

- Open the hose clip with a slotted screwdriver.
- Pull the tubing off the hose connector.
- Remove the 2 screws affixing the mounting plate of the Peltronic emission condenser with a Phillips screw driver size 2.
- Remove the Peltronic emission condenser. In doing so pull the PTFE hose out of the inlet of the Peltronic emission condenser.

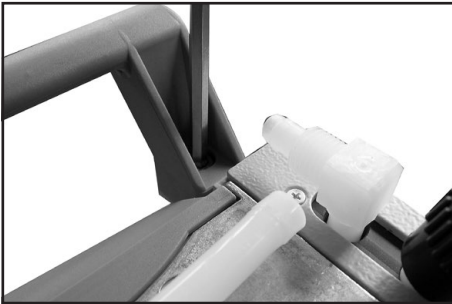
☞ Service only one side of the pump at a time to avoid the mixing of parts.



- Loosen the union nut (K) of the hose connection next to the gas ballast valve with an open-ended wrench (w/f 17).



- Turn the fitting (L) with an open-ended wrench (w/f 14) to detach the hose from the pump head (1/4 of a turn at maximum).
- ⚠ Do not remove the elbow fitting from the pump head; during reassembly a leak may result.



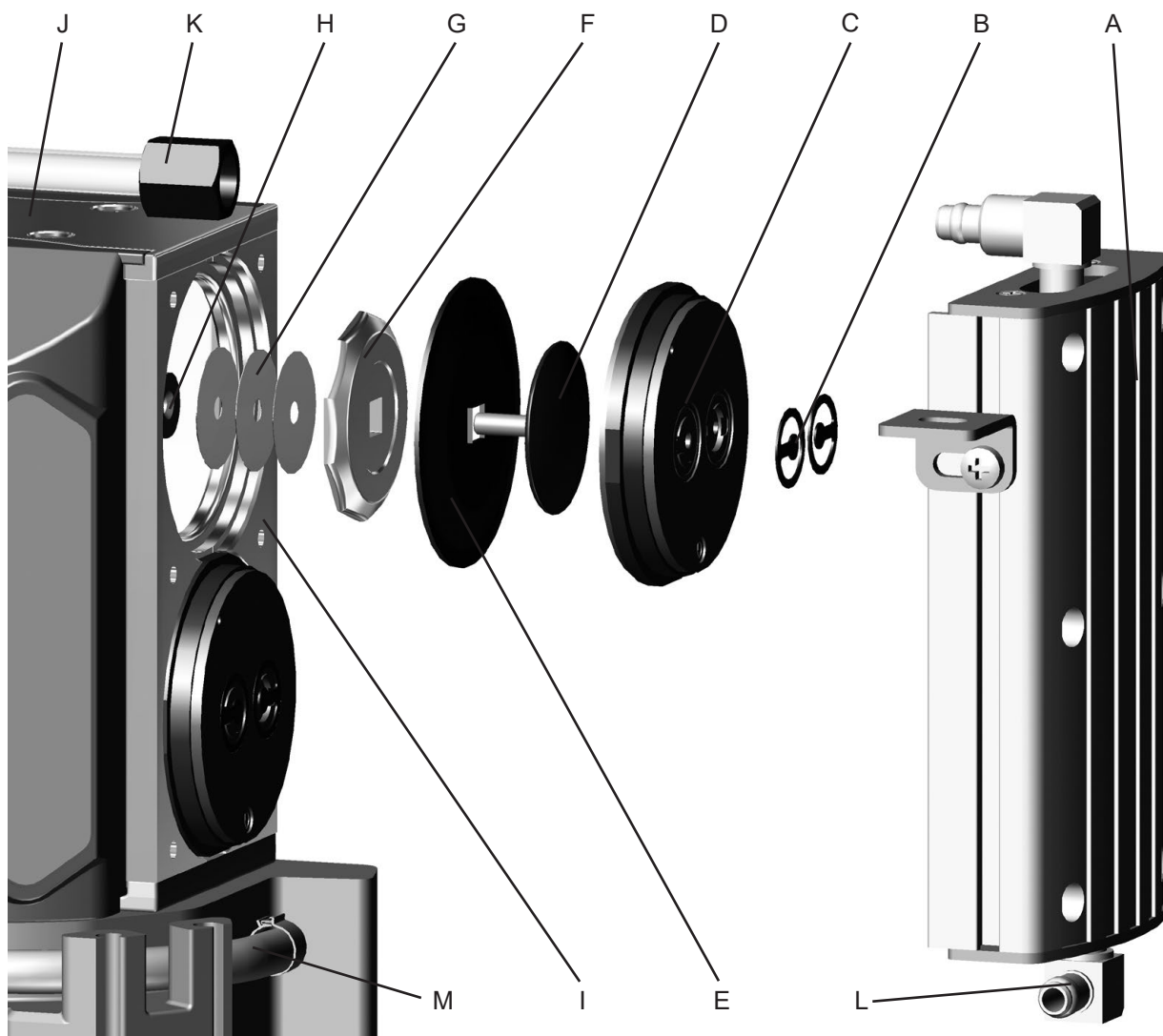
- Loosen the screw affixing the handle (use 5 mm wide Allen key) at one housing cover.

## ***Disassembling the housing cover at the side of the emission condenser***



- Lay the pumping unit on its side with the pump heads to be maintained at the top. Support the pumping unit appropriately.
- Disassemble the housing cover (A) to check the valves (B).
- Unscrew six Allen screws with a 4mm wide Allen key. Remove the housing cover with housing cover insert (A) together with head covers (C) and valves (B).
- ⚠ Never use a pointed or sharp-edged tool to remove parts (e.g., screwdriver). We recommend using a rubber mallet or compressed air (to be blown carefully into port).

## View of the disassembled pump head parts



### Pump head parts:

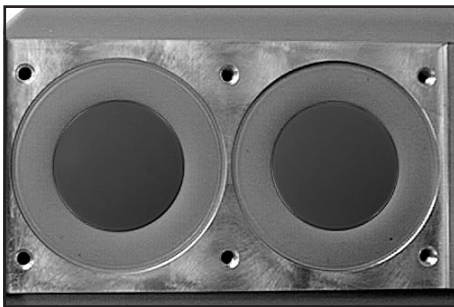
A: Housing cover with insert  
 B: Valves  
 C: Head cover  
 D: Diaphragm clamping disc  
 with square head screw  
 E: Diaphragm  
 F: Diaphragm support disc

G: Washer(s)  
 H: Connecting rod  
 I: Housing  
 J: Housing bearing flange  
 K: Union nut  
 L: Fitting  
 M: Hose connection

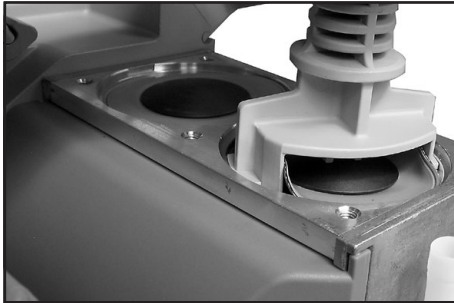


- Remove the head cover (C) carefully from the housing cover (A). Note position and alignment of valves (B). Remove the valves.
- ☞ Replace valves if necessary.
- ☞ Use petroleum ether or other industrial solvent to remove deposits. Do not inhale vapors.

## Replacing the diaphragm



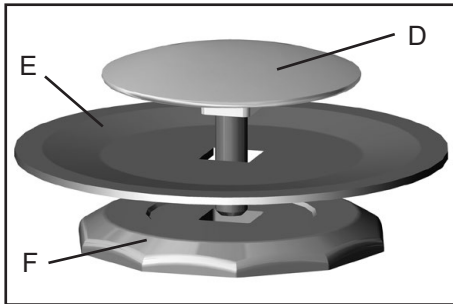
- ☞ Check diaphragms (E) for damage and replace if necessary.



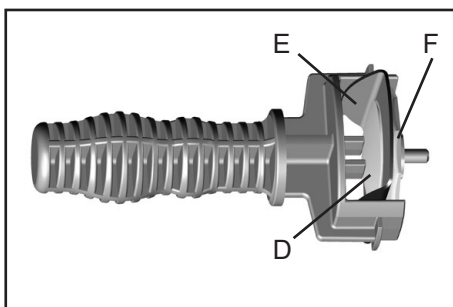
- Lift diaphragm carefully sidewise.
- ☞ Never use a pointed or sharp-edged tool to lift the diaphragm. If necessary, press down the diaphragm clamping disc of the adjacent pump head to raise the diaphragm into its uppermost turning point position.
- Use the diaphragm key to grip the diaphragm support disc (F) below the diaphragm.
- Press down the diaphragm clamping disc to bring the diaphragm into its lower turning point position. Unscrew diaphragm support disc (F) with diaphragm (E) and diaphragm clamping disc (D).
- Check for washers (G) between the diaphragm support disc (F) and the connecting rod (H). Do not mix the washers from the different pump heads, since these are set at the factory to ensure proper pump performance. Make sure that the original number is reassembled at the individual pump head.
- ☞ Too few washers: The pump will not attain vacuum specification. Too many washers: Diaphragm clamping disc will hit head cover, causing noisy operation and possibly causing the pump to seize up.



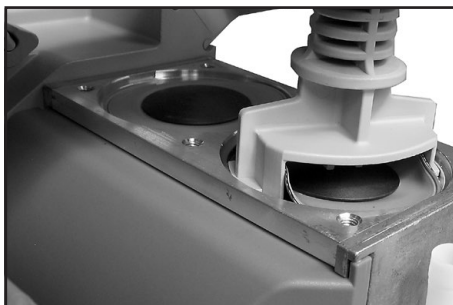
- ☞ If the old diaphragm is difficult to separate from the diaphragm support disc, immerse assembly in naphtha or petroleum ether. Do not inhale vapors!



- ➔ Position new diaphragm (E) between diaphragm clamping disc with square head screw (D) and diaphragm support disc (F).
- ☞ **Note:** Position diaphragm with pale side towards diaphragm clamping disc (facing pump chamber).

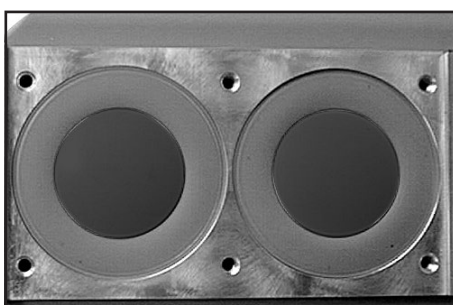


- ☞ Make sure that the square head screw of the diaphragm clamping disc is correctly seated in the guide hole of the diaphragm support disc.
- ➔ Lift the diaphragm at the side. Place the diaphragm carefully together with diaphragm clamping disc and diaphragm support disc in the diaphragm key.
- ☞ Avoid damage of the diaphragm: Do not excessively bend or crease the diaphragm.

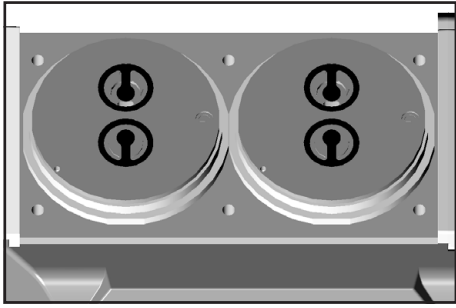


- ☞ Assemble the original number of washers (G) between diaphragm support disc (F) and connecting rod (H).
- ➔ Screw diaphragm clamping disc (D), diaphragm (E), diaphragm support disc (F), and washers (G) to connecting rod (H).

- ➔ Optimum torque for the diaphragm support disc: 3 ft·lb<sub>f</sub> (4 Nm).
- ☞ If necessary, put the pumping unit in its upright position to screw the diaphragm clamping disc to the connecting rod. Subsequently lay the pumping unit again on its side.



- ➔ Bring the diaphragms (E) into a position, in which they are in contact with the housing (I) and centered with respect to the bore.



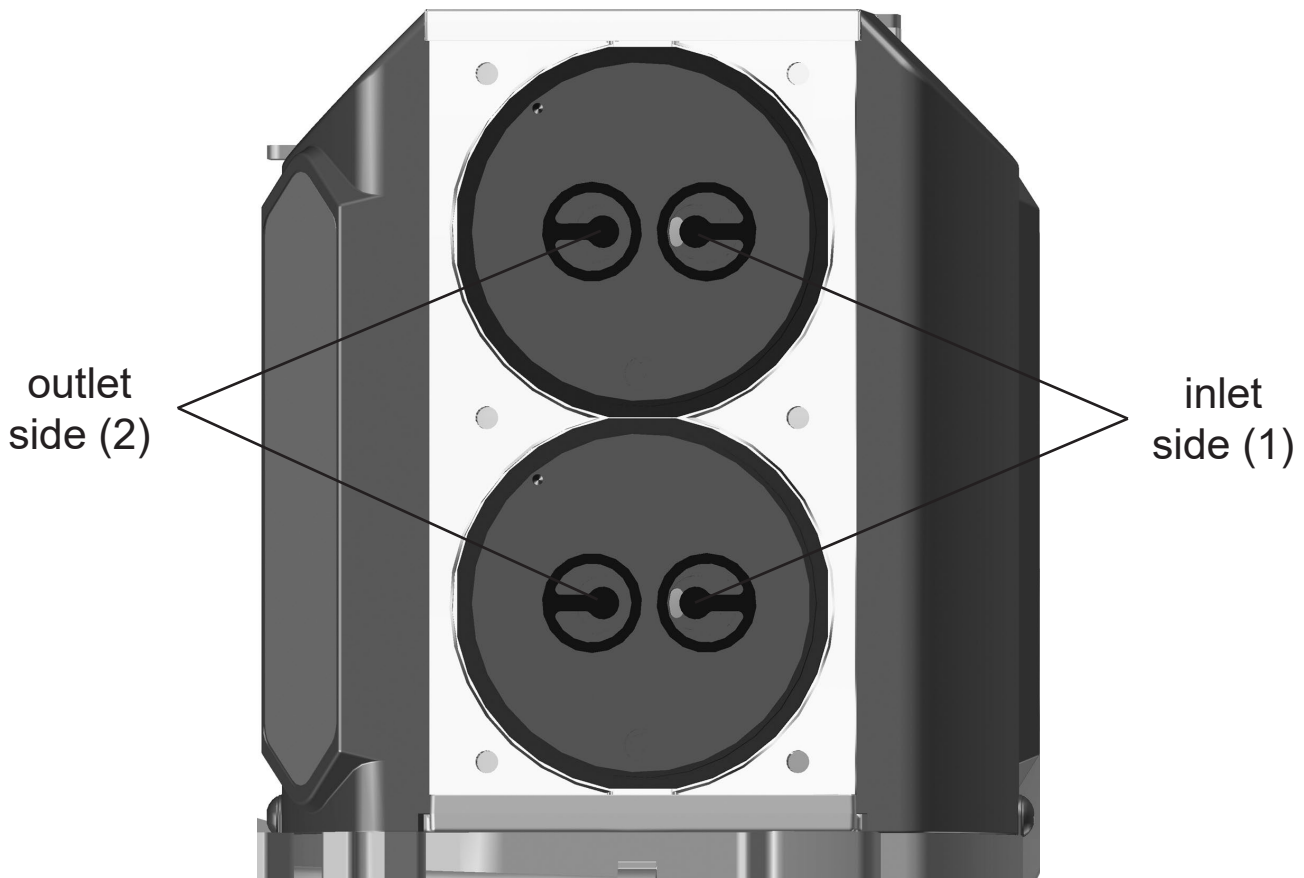
- Put on head covers (C).
- ☞ Pay attention to the correct orientation of the head covers (see figure below).
- ☞ Make sure that the diaphragms stay centered with respect to the bores so that they will become clamped uniformly between housing (I) and head covers (C).

- Put the valves (B) in place. See figure below for the correct position of the valves:

**Inlet side** of pump head: The valve tongue points at the kidney-shaped orifice in the valve seat (1).

**Outlet side** of pump head: The valve is oriented the opposite direction as the valve at the inlet side. Round orifice under the valve tongue (2).

### Scheme of pump heads with head covers and valves



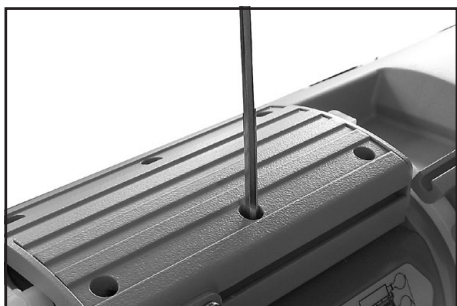
## Assembling the housing cover at the side of the emission condenser

- ➔ Put on housing cover (A).
- ☞ Move housing cover slightly to ensure that the head covers are correctly positioned.



- ➔ Screw in the Allen head screws at the head cover in a diagonal pattern with a 4 mm wide Allen key, loosely at first, to align, then tighten.
- ☞ Maximum torque: 4.4 ft·lb<sub>f</sub> (6 Nm).

## Disassembling the housing cover at the side of the ON/OFF switch



- ➔ Lay the pumping unit on its side with the pump heads to be maintained at the top. Support the pumping unit appropriately.
  - ➔ Disassemble the housing cover (A) to check the valves (B).
  - ➔ Unscrew six Allen screws with a 4mm wide Allen key. Remove the housing cover with housing cover insert (A) together with head covers (C) and valves (B).
- ☞ Never use a pointed or sharp-edged tool to remove parts (e.g., screwdriver). We recommend using a rubber mallet or compressed air (to be blown carefully into port).



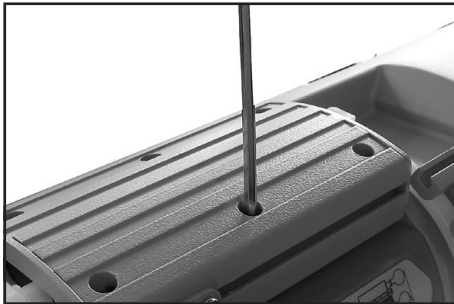
- ➔ Remove the head cover (C) carefully from the housing cover (A). Note position and alignment of valves (B). Remove the valves.
- ☞ Replace valves if necessary.
- ☞ Use petroleum ether or other industrial solvent to remove deposits. Do not inhale vapors.



**For replacing the diaphragm refer to the section "Replacing the diaphragm" above.**

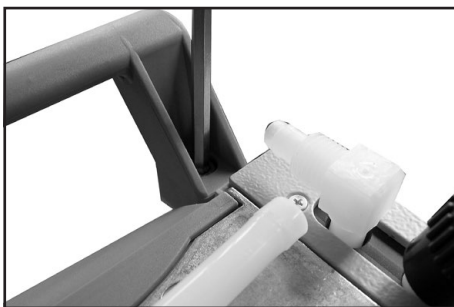
## ***Assembling the housing cover at the side of the ON/OFF switch***

- ➔ Put on housing cover (A).  
Pay attention to a correct guidance of the connection hose towards the inlet.
- ☞ Move housing cover slightly to ensure that the head covers are correctly positioned.



- ➔ Screw in the Allen head screws at the head cover in a diagonal pattern with a 4 mm wide Allen key, loosely at first, to align, then tighten.
- ☞ Maximum torque: 4.4 ft·lb<sub>f</sub> (6 Nm).

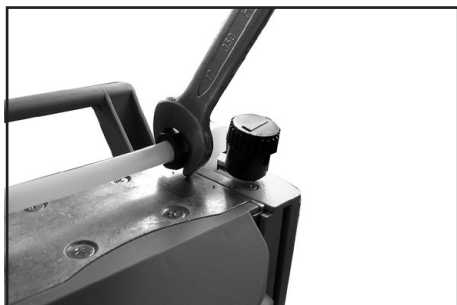
## ***Assembling the fittings***



- ➔ Attach the handle at the housing cover (use 5 mm wide Allen key)



- ➔ Slip the hose onto the hose connector by turning the fitting (L) with an open-ended wrench w/f 14.



- Tighten the union nut (K) of the hose connection with an open-ended wrench w/f 17.
- ☞ Tighten the union nut first by hand and then tighten one full turn using the open ended wrench.



### PC 3001 VARIO<sup>pro</sup> / PC 3001 VARIO<sup>pro</sup> IK

Assemble the exhaust vapor condenser.

- Feed the PTFE hose from the pump outlet into the inlet of the exhaust vapor condenser.
- Mount the condenser with the counter holder (Torx screws T10) to the pump.
- Fasten union nut.



### PC 3001 VARIO<sup>pro</sup> IK

Assemble the inlet condenser.

- Slip the hose from the inlet of the pump onto the hose connector of the inlet condenser.
- Mount the condenser with the counter holder (Torx screws T10) to the pump.
- Tighten the union nut first by hand and then tighten one full turn using the open ended wrench.



### PC 3001 VARIO<sup>pro</sup> TE

Assemble the emission condenser TE.

- Feed the PTFE hose from the pump outlet into the inlet of the emission condenser TE.
- Attach the mounting plate of the emission condenser TE with 2 screws at the housing cover of the pumping unit; use a Phillips screw driver size 2. Pay attention to the cage nuts in the groove of the housing cover.
- Fasten union nut.



## PC 3001 VARIO<sup>pro</sup> EK Peltronic

Assemble the emission condenser Peltronic.

- Slip the hose from the outlet of the pump onto the hose connector of the emission condenser Peltronic.
- Attach the hose connection with hose clip. Close hose clip with flat pliers.
- Attach the mounting plate of the emission condenser Peltronic with 2 screws at the housing cover of the pumping unit; use a Phillips screw driver size 2. Pay attention to the cage nuts in the groove of the housing cover.



- Slip connecting hose onto hose connection of fitting below the housing cover.
- Close hose clip with flat pliers.



- Assemble catchpots (10) with joint clips.

## Checking the ultimate vacuum

- After any intervention at the equipment (e.g., repair / maintenance) the ultimate vacuum of the pump has to be checked. Only if the pump achieves its specified ultimate vacuum, the pump's leak rate is low enough to ensure that no explosive atmospheres will occur in the interior of the equipment.

After any intervention at the vacuum sensor the leak rate of the equipment has to be checked.

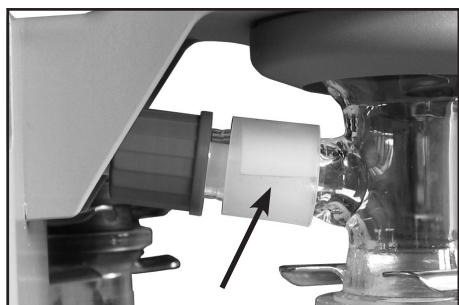
**If the pump does not achieve the ultimate vacuum:**

- Whenever the diaphragms and valves have been replaced, a break-in period of several hours is required before the pump achieves its ultimate vacuum.
- In case of an unusual noise, switch off pump immediately and check clamping disc positions.

If the specified ultimate vacuum is not achieved, and if this does not change after the break-in period:

Check hose connectors at pump heads for leaks. If necessary recheck valve seats and pump chambers.

## Cleaning and replacing components



Overpressure safety relief device .....**20638821**  
(at exhaust waste vapor condenser)

Replacing the overpressure safety relief device:

- Loosen the union nut at the inlet of the exhaust vapor condenser.
- Pull the PTFE hose out of the inlet of the exhaust vapor condenser.
- If necessary, pull off the old pressure relief valve and install the new one. Check for correct position of the PTFE-film under the pressure relief valve.
- Feed the PTFE hose into the inlet of the exhaust vapor condenser. Fasten union nut.

Catchpot 0.52 qt (500 ml), coated .....**20638497**

O-ring 28 x 2.5.....**20635628**  
at the spherical ground joint of the catchpot at the inlet

# Repair - Maintenance - Return - Calibration

## **IMPORTANT**

Every employer (user) is held responsible for the health and safety of his employees. This also applies to service personnel performing repair, maintenance, return or calibration.

The **health and safety clearance form** informs the contractor about any possible contamination of the device and forms the basis for the risk assessment.

**In case of devices which have been in contact with biological substances of risk level 2 contact the VACUUBRAND service absolutely before dispatching the device. These devices have to be completely disassembled and decontaminated by the user prior to shipment. Do not return devices which have been in contact biological substances of risk level 3 or 4. These devices cannot be checked, maintained or repaired. Also decontaminated devices must not returned to VACUUBRAND due to a residual risk.**

The same conditions apply to on-site work.

**No repair, maintenance, return or calibration is possible unless the correctly completed health and safety clearance form is returned. Devices sent are rejected if applicable.** Send a completed copy of the **health and safety clearance form** to us in advance. The declaration must arrive before the equipment. Enclose a second completed copy with the product.

Remove all components from the device that are no original VACUUBRAND components. VACUUBRAND will not be responsible for lost or damaged components that are no original components.

**Drain the device completely of fluids and residues. Decontaminate the device.** Close all openings airtight especially if using substances hazardous to health.

To expedite repair and to reduce costs, please enclose a detailed description of the problem and the product's operating conditions with every product returned.

If you do not wish a repair on the basis of our **quotation**, the device may be returned to you disassembled and at your expense.

In many cases, the components must be cleaned in the factory prior to repair.

For cleaning we use an environmentally friendly water based process. Unfortunately the combined attack of elevated temperature, cleaning agent, ultrasonic treatment and mechanical stress (from pressurised water) may result in damage to the paint. Please mark in the health and safety clearance form if you wish a repaint at your expense just in case such a damage should occur. We will also replace parts for cosmetic reasons at your request and at your expense.

### **Before returning the device**

Pack the device properly, if necessary, please order original packaging materials at your costs.

Mark the package completely

**Enclose the completed health and safety clearance form.**

Notify the carrier of any possible contamination if required.

### **Scrapping and waste disposal**

Dispose of the equipment and any components removed from it safely in accordance with all local and national safety and environmental requirements. Particular care must be taken with components and waste oil which have been contaminated with dangerous substances from your processes. Do not incinerate fluoroelastomer seals and O-rings. You may authorize us to dispose of the equipment **at your expense**. Otherwise we return the device at your expense.



# Warranty

VACUUBRAND shall be liable for insuring that this product, including any agreed installation, has been free of defects at the time of the transfer of risk.

VACUUBRAND shall not be liable for the consequences of improper handling, use, servicing or operation of this product or the consequences of normal wear and tear of wearing parts such as diaphragms, seals, valves, vanes, condensers, oil and the breakage of glass or ceramic parts, for the consequences of chemical, electrochemical or electrical influences or the failure to follow the instructions in this manual.

Claims for defects against VACUUBRAND shall be limited to one year from delivery. The same shall apply to claims for damages irrespective of legal grounds.

For further information on general terms and conditions refer to [www.vacuubrand.com](http://www.vacuubrand.com).

### Health and safety clearance form

1. Device (Model): .....

2. Serial no.: .....

3. Reason for return / malfunction: .....

4. Has the device been used in a copper process step (e.g., semiconductor production):  yes  no

5. Substances (gases, liquids, solids, biological material, e. g. bacteria, viruses) in contact with the device / which have been pumped:

.....  
.....  
.....

6. Risk level of the used biological material:  none  1  2\*  3\*\*  4\*\*

\* Contact the VACUUBRAND service absolutely before dispatching the device.

\*\* Devices which have been in contact with biological substances of risk level 3 or 4 cannot be checked, maintained or repaired. Also decontaminated devices must not returned to VACUUBRAND due to a residual risk.

7. Radioactive contamination:  yes  no

8. Prior to return to the factory the device has been decontaminated:  yes  no

Description of the decontamination method and the test / verification procedure:

.....  
.....

9. All parts of the device are free of hazardous, harmful substances:  yes  no

10. Protective measures required for service staff:

.....

11. If the paint is damaged, we wish a repaint or a replacement of parts for reason of appearance (repaint and replacement at customer's expense):  yes  no

#### 12. Legally binding declaration

We assure for the returned device that all substances, which have been in contact with the device are listed in section 5 and that the information is complete and that we have not withheld any information. We declare that all measures - where applicable - have been taken listed in section "Repair - Maintenance - Return - Calibration". By our signature below, we acknowledge that we accept liability for any damage caused by providing incomplete or incorrect information and that we shall indemnify VACUUBRAND from any claims as regards damages from third parties. We are aware that as expressed in § 823 BGB (Public Law Code of Germany) we are directly liable for injuries or damages suffered by third parties, particularly VACUUBRAND employees occupied with handling/repairing the product. Shipping of the device must take place according to regulations.

Name: ..... Signature: .....

Job title: ..... Company's seal:

Date: .....

Release for repair grant by VACUUBRAND (date / signature):.....

Protective measures:  Protective gloves, safety goggles  Hood  External cleaning





**EG-Konformitätserklärung für Maschinen**  
**EC Declaration of Conformity of the Machinery**  
**Déclaration CE de conformité des machines**



Hersteller / Manufacturer / Fabricant:

**VACUUBRAND GMBH + CO KG** · Alfred-Zippe-Str. 4 · 97877 Wertheim · Germany

Hiermit erklärt der Hersteller, dass das Gerät konform ist mit den Bestimmungen der Richtlinien:

Hereby the manufacturer declares that the device is in conformity with the directives:

Par la présente, le fabricant déclare, que le dispositif est conforme aux directives:

- 2006/42/EG
- 2014/30/EU
- 2014/34/EU
- 2011/65/EU, 2015/863

Pumpstand / Pumping unit / Groupe de pompage:

Typ / Type / Type: **PC 3001 VARIOpro / PC 3001 VARIOpro TE / PC 3001 VARIOpro IK / PC 3001 VARIOpro emission condenser Peltronic / PC 3001 VARIOpro without emission condenser**

Artikelnummer / Order number / Numéro d'article: 20696706, 20696735, 20696745, 22615525, 20696700, 20696701, 20696702, 20696703, 20696710, 20696713, 20696753

Seriennummer / Serial number / Numéro de série: Siehe Typenschild / See rating plate / Voir plaque signalétique

Angewandte harmonisierte Normen / Harmonized standards applied / Normes harmonisées utilisées:

DIN EN ISO 12100:2011, DIN EN 61010-1:2020, IEC 61010-1:2010 (Ed. 3), DIN EN 1012-2:2011

DIN EN 61326-1:2013

DIN EN 1127-1:2019, DIN EN ISO 80079-36:2016

DIN EN IEC 63000:2019

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen / Person authorised to compile the technical file / Personne autorisée à constituer le dossier technique:

Dr. Constantin Schöler · VACUUBRAND GMBH + CO KG · Germany

Ort, Datum / place, date / lieu, date: Wertheim, 31.01.2022

(Dr. Constantin Schöler)

*Geschäftsführer / Managing Director /  
Gérant*

ppa.

(Jens Kaibel)

*Technischer Leiter / Technical Director /  
Directeur technique*

**VACUUBRAND GMBH + CO KG**

Alfred-Zippe-Str. 4  
97877 Wertheim

Tel.: +49 9342 808-0

Fax: +49 9342 808-5555

E-Mail: [info@vacuubrand.com](mailto:info@vacuubrand.com)

Web: [www.vacuubrand.com](http://www.vacuubrand.com)



## Declaration of Conformity



Manufacturer:

**VACUUBRAND GMBH + CO KG** · Alfred-Zippe-Str. 4 · 97877 Wertheim · Germany

Hereby the manufacturer declares that the device is in conformity with the directives:

- Supply of Machinery (Safety) Regulations 2008 (S.I. 2008 No. 1597, as amended by S.I. 2019 No. 696)
- Electromagnetic Compatibility Regulations 2016 (S.I. 2016 No. 1091, as amended by S.I. 2019 No. 696)
- The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 (S.I. 2016 No. 1107, as amended by S.I. 2019 No. 696)
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (S.I. 2012 No. 3032)

Pumping unit:

Type: **PC 3001 VARIOpro / PC 3001 VARIOpro TE / PC 3001 VARIOpro IK / PC 3001 VARIOpro emission condenser Peltronic / PC 3001 VARIOpro without emission condenser**

Order number: 20696706, 20696735, 20696745, 22615525, 20696700, 20696701, 20696702, 20696703, 20696710, 20696713, 20696753

Serial number: See rating plate

Harmonized standards applied:

EN ISO 12100:2010, EN 61010-1:2010+A1:2019, EN 1012-2:2010

EN 61326-1:2013

EN 1127-1:2019, EN ISO 80079-36:2016

EN IEC 63000:2018

Person authorised to compile the technical file:

Dr. Constantin Schöler · VACUUBRAND GMBH + CO KG · Germany

Place, date: Wertheim, 31.01.2022

(Dr. Constantin Schöler)

*Managing Director*

ppa.

(Jens Kaibel)

*Technical Director*

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**VACUUBRAND GMBH + CO KG**

Alfred-Zippe-Str. 4  
97877 Wertheim

Tel.: +49 9342 808-0

Fax: +49 9342 808-5555

E-Mail: [info@vacuubrand.com](mailto:info@vacuubrand.com)

Web: [www.vacuubrand.com](http://www.vacuubrand.com)



# Certificate



Certificate no.

CU 72200438 01

**License Holder:**

VACUUBRAND GMBH + Co. KG  
 Alfred-Zippe-Str. 4  
 97877 Wertheim  
 Germany

**Manufacturing Plant:**

VACUUBRAND GMBH + Co. KG  
 Alfred-Zippe-Str. 4  
 97877 Wertheim  
 Germany

Test report no.: USA- 32080512 001

Client Reference: Dr. Wollschläger

Tested to: UL 61010-1:2012 R7.19

CAN/CSA-C22.2 NO. 61010-1-12 + GI1 + GI2 (R2017) + A1

**Certified Product:** Diaphragm vacuum pump system for laboratory use

License Fee -

Units

Model : PC 3001 y zzzzz; VP 2 autovac 7  
 Designation y = basic, VARIOpro, VARIOpro TE,  
 VARIOpro IK, VARIO select,  
 VARIO select TE, or VARIO select IK  
 z = blank, A-Z, +, -

Input voltage: 100 - 230 V AC; 50/60Hz  
 Input current: 1.6 - 0.7 A (max)  
 Protection Class: I

7

Appendix: 1, 1 - 7

Licensed Test mark:



Date of Issue

(day/mo/yr)

28/02/2020

TUV Rheinland of North America, Inc., 12 Commerce Road, Newtown, CT 06470, Tel (203) 426-0888 Fax (203) 426-4009

**This certificate is only valid for pumps with the respective mark (Licensed Test mark) on the pump rating plate.**



## DECLARATION OF CONFORMITY – China RoHS 2

VACUUBRAND GMBH + CO KG has made reasonable efforts to ensure that hazardous materials and substances may not be used in its products.

In order to determine the concentration of hazardous substances in all homogeneous materials of the subassemblies, a “Product Conformity Assessment” (PCA) procedure was performed. As defined in GB/T 26572 the “Maximum Concentration Value” limits (MCV) apply to these restricted substances:

- Lead (Pb): 0.1%
- Mercury (Hg): 0.1%
- Cadmium (Cd): 0.01%
- Hexavalent chromium (Cr(+VI)): 0.1%
- Polybrominated biphenyls (PBB): 0.1%
- Polybrominated diphenyl ether (PBDE): 0.1%

### Environmentally Friendly Use Period (EFUP)



EFUP defines the period in years during which the hazardous substances contained in electrical and electronic products will not leak or mutate under normal operating conditions. During normal use by the user such electrical and electronic products will not result in serious environmental pollution, cause serious bodily injury or damage to the user’s assets.

The Environmentally Friendly Use Period for VACUUBRAND products is 40 years.



此表格是按照SJ/T 11364-2014中规定所制定的。

This table is created according to SJ/T 11364-2014.

MATERIAL CONTENT DECLARATION FOR VACUUBRAND PRODUCTS							
部件名称 Part name	有毒有害物质或元素 Hazardous substances						环保期限标识 EFUP
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr(+VI)	多溴联苯 PBB	多溴二苯醚 PBDE	
包装 Packaging	○	○	○	○	○	○	
塑料外壳 / 组件 Plastic housing / parts	○	○	○	○	○	○	
真空油 Vacuum oil	○	○	○	○	○	○	
电池 Battery	○	○	○	○	○	○	
玻璃 Glass	X	○	○	○	○	○	
电子电气组件 Electrical and electronic parts	X	○	○	○	○	○	
控制器 / 测量设备 Controller / measuring device	X	○	○	○	○	○	
金属外壳 / 组件 Metal housing / parts	X	○	○	○	○	○	
电机 Motor	X	○	○	○	○	○	
配件 Accessories	X	○	○	○	○	○	



**注释:** 此表格适用于所有产品。以上列出的元件或组件不一定都属于所附产品的组成。

**Note:** Table applies to all products. Some of the components or parts listed above may not be part of the enclosed product.

- O: 表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。  
 O: Indicates that the above mentioned hazardous substance contained in all homogeneous materials of the part is below the required limit as defined in GB/T 26572.
- X: 表示该有毒有害物质至少在该部件某一均质材料中的含量超出GB/T 26572规定的限量要求。  
 X: Indicates that the above mentioned hazardous substance contained in at least one of the homogeneous materials of this part is above the required limit as defined in GB/T 26572.

除上表所示信息外，还需声明的是，这些部件并非是有意图用铅（Pb）、汞（Hg）、铬（Cd）、六价铬（Cr(+VI)）、多溴联苯（PBB）或多溴二苯醚（PBDE）来制造的。

Apart from the disclosures in the above table, the subassemblies are not intentionally manufactured or formulated with lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (Cr+VI), polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE).

Products manufactured by VACUUBRAND may enter into further devices (e.g., rotary evaporator) or can be used together with other appliances (e.g., usage as booster pumps).

With these products and appliances in particular, please note the EFUP labeled on these products. VACUUBRAND will not take responsibility for the EFUP of those products and appliances.

Place, date: Wertheim, 06/04/2020

(Dr. F. Gitmans)  
Managing Director

i.A. (Dr. A. Wollschläger)  
Regulatory Affairs Manager

**VACUUBRAND GMBH + CO KG**  
Alfred-Zippe-Str. 4  
97877 Wertheim  
Germany

Tel.: +49 9342 808-0  
Fax: +49 9342 808-5555  
E-Mail: [info@vacuubrand.com](mailto:info@vacuubrand.com)  
Web: [www.vacuubrand.com](http://www.vacuubrand.com)







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Alfred-Zippe-Str. 4 · 97877 Wertheim / Germany  
T +49 9342 808-0 · F +49 9342 808-5555  
info@vacuubrand.com · www.vacuubrand.com

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- Technology for Vacuum Systems -  
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