



Technology for Vacuum Systems

Instructions for use



DCP 3000

Vacuum gauge

Dear customer,

Your VACUUBRAND vacuum gauges should support you for many years without trouble and with optimal performance. Thanks to our long practical experience we have much information and advice on how you can achieve powerful application usage and personal safety through our products. Please read these instructions for use before the initial operation of your device. VACUUBRAND vacuum gauges are the result of many years of experience in design and construction and practical operation of these gauges combined with the latest developments in material and manufacturing technology.

Our quality maxim is the „zero fault principle“: Every vacuum gauge leaving our company, is tested intensively including an endurance run. Therefore faults, even those which occur rarely, are identified and can be eliminated immediately. The achievement of the specifications after the endurance run is tested for every device.

Every VACUUBRAND device achieves the specifications.

We are committed to providing our customers with this high quality standard.

We know that the device cannot replace all of your real work and hope that our products contribute to an effective and trouble-free realisation of your work.

Yours VACUUBRAND GMBH + CO KG

After sales service: Contact your local dealer or call +49 9342 808-193.



➡ DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



⚠ WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



• CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to personal injury.



Disconnect equipment from AC power.

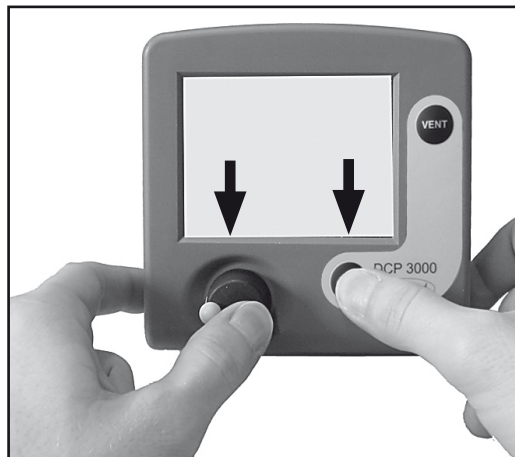


Reset / Language selection

1 switch off



2 press both ↓ ↓



3 turn ↺ ↻



4 press ↓



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Trademark index:

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Safety information

General information

To operate the vacuum gauge DCP 3000, at least one external pressure transducer VSK 3000 or VSP 3000 or MPT 100 is required!

NOTICE

Read and comply with this manual before installing or operating the equipment.

Remove all packing material, remove the product from its packing-box, remove the protective covers and keep, inspect the equipment.

If the equipment is damaged, notify the supplier and the carrier in writing within three days; state the item number of the product together with the order number and the supplier's invoice number. Retain all packing material for inspection.

Do not use the equipment if it is damaged.

If the equipment is not used immediately, replace the protective covers. Store the equipment in suitable conditions.

Intended use

! WARNING

☞ Operate the device only in combination with VACUUBRAND genuine accessories. Make sure that the individual components are only connected, combined and operated according to their design and as indicated in the instructions for use.

☞ Comply with notes on correct vacuum and electrical connections, see section "Use and operation".

! CAUTION

- The device is designed for **ambient and gas temperatures** at the pressure transducer connection of +10°C to +40°C at continuous operation, up to +80°C for short periods (< 5 minutes) at the pressure transducer. If installing the device into a cabinet or a housing check maximum temperature. Ensure that the maximum permitted gas temperature at the pressure transducer (see "Technical data") is not exceeded.

NOTICE

Use the equipment for the intended use only, i.e. for measurement of vacuum in vessels designed for that purpose.

Connecting the device

! WARNING

☞ **Avoid uncontrolled overpressure** (e.g., when connecting to a locked or blocked tubing system). **Risk of bursting.**

! CAUTION

- **Comply with max. permitted pressure** at the pressure transducer, see section "Technical data".
- Connect hoses at the pressure transducer gas tight.
- The device is equipped with a **short circuit proof wide range power supply** with an integrated overload protection.
- Check that mains voltage and current conform with the equipment (see rating plate).
- Prior to using the wall power supply, assemble and lock the suitable mains plug (included in delivery) to the power supply.

- Comply with **max. permitted ambient and gas temperature** (see "Technical data") and make sure ventilation is adequate if the equipment is installed in a housing or if ambient temperature is elevated.
- Avoid high heat supply (e.g., due to hot process gases).
- In case of residues or aggressive or condensable media install a gas washing bottle if necessary.

NOTICE

Position the pressure transducer and its vacuum connection lines so that condensate cannot flow towards the pressure transducer.

Ensure stability of the hose connection. Comply with all relevant **safety requirements**.

When the device is brought from cold environment into a warm room for operation **bedewing** may occur. Allow the device to acclimatise.

Comply with **national safety regulations and safety requirements** concerning the use of vacuum and electrical equipment. Comply with all **applicable and relevant safety requirements** (regulations and guidelines), **implement the required actions and adopt suitable safety measures**.

Ambient conditions

NOTICE

To the best of our knowledge the equipment is in compliance with the requirements of the applicable **EC-directives** and harmonized standards with regard to design, type and model, especially directive EN 61010-1. This directive gives in detail conditions under which the equipment can be operated safely (see also IP degree of protection).

Adopt suitable measures in case of differences, like using the equipment outdoors, installation in altitudes of more than 1000 m above mean sea level, conductive pollution or dewiness.

Operating conditions

DANGER

- The devices are **not suitable** for applications which involve **dangerous or explosive gases or explosive or flammable mixtures**.

NOTICE

Ensure that the materials of the wetted parts are compatible with the substances processed in the vacuum system, see section "Technical data".

Safety during operation

DANGER

- Adopt suitable measures to prevent the release of dangerous, toxic, explosive, corrosive, noxious or polluting fluids, vapours and gases.
- Prevent any part of the human body from coming in contact with the vacuum.

Operation with pressure transducer **VSK 3000**:

WARNING

- ⚠ **Attention:** If the pressure is higher than approximately 1060 mbar the pressure reading becomes incorrect (saturation of the pressure transducer). The display flashes. **Immediate pressure relief necessary! Risk of bursting!**

Operation with pressure transducer **VSP 3000**:

- ☞ **Attention:** Maximum pressure reading: $1 \cdot 10^3$ mbar. Pressure values above 1000 mbar can not be displayed. **Danger of unnoticed overpressure! Risk of bursting!**

Operation with pressure transducer **MPT 100**:

- ☞ See instructions for use of MPT 100.

⚠ CAUTION

- Use only **genuine spare parts and accessories**. Otherwise safety and performance of the equipment as well as the electromagnetic compatibility of the equipment might be reduced.
Possibly the CE mark or the cTÜVus mark become void if not using OEM spare parts.

NOTICE

Electronic equipment is never 100% fail-safe. This may lead to an ill-defined status of the equipment or of other connected devices. Provide protective measures against malfunction and failure. Ensure that in case of failure the device and the vacuum system always will turn into a safe status.



Maintenance and repair

- ➡ Before starting maintenance unplug the power supply (wall plug).
- ➡ **Wait two minutes** after isolating the equipment from mains to allow the capacitors to discharge.

⚠ CAUTION

- **Attention:** Due to the operation the equipment might be contaminated by harmful or dangerous substances, clean or decontaminate prior to maintenance.

NOTICE

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

Interior components of the device can only be repaired at the factory.

Return the pressure transducer to the factory for repair. Opening the housing of a pressure transducer will void any warranty.

Returned products will not be repaired or calibrated until the completed health and safety clearance form has been received. In order to comply with law (occupational, health and safety regulations, safety at work law and regulations for environmental protection) vacuum pumps, components and measuring instruments returned to the manufacturer can be repaired only when certain procedures (see section "**Notes on return to the factory**") are followed.

Technical data

Technical data of display unit

Display unit	DCP 3000
Display	illuminated LCD graphic display
Pressure units / scale (selectable)	mbar, Torr or hPa
Ambient temperature range (operation)	10°C to +40°C
Ambient temperature range (storage)	-10°C to +70°C
Permitted relative atmospheric moisture during operation (no condensation)	30% to 85%
Maximum permissible range of supply voltage	24 V= (±6V)
Maximum permissible current of connected valves (connected components)	4A (with sufficiently powerful power supply)
Maximum power draw (internal)	3.4 W (140 mA at 24 V=)
Degree of protection according to IEC 529 (front side)	IP 42
Interface	RS 232 C
Cable length of power supply	approx. 2 m
Weight (without power supply)	0.44 kg
Dimensions L x W x H (incl. foot, without mains adapter)	144 mm x 124 mm x 114 mm

Technical data of power supply

Power supply (wall plug)	
Input voltage (±10%)	100-240 V~, 47-63 Hz
Max. current draw	0.8 A
Ambient temperature range (operation)	0°C to +40°C
Ambient temperature range (storage)	-20°C to +85°C
Output voltage	24 V=, short-circuit proof
Max. output current	1.25 A
Mains connection	exchangeable plug Europe / UK / US / AUS
Weight	0.24 kg
Dimensions L x W x H	108 mm x 58 mm x 34 mm

We reserve the right for technical modification without prior notice!

Technical data of pressure transducers VSK 3000 and VSP 3000

Type	VSK 3000	VSP 3000
Measuring principle	ceramic diaphragm (alumina), capacitive, absolute pressure, gas type independent	thermal conductivity according to Pirani, dependent on gas type
Measuring range (absolute)	1060 mbar - 0.1 mbar (795 Torr - 0.1 Torr)	$1 \cdot 10^3$ mbar - $1 \cdot 10^{-3}$ mbar ($7.5 \cdot 10^2$ Torr - $7.5 \cdot 10^{-4}$ Torr)
Resolution	0.1 mbar	10% of displayed decade
Measurement uncertainty (absolute) after careful adjustment and at constant temperature	$< \pm 1$ mbar (0.75 Torr) / ± 1 digit	$1 \cdot 10^2$ mbar - $1 \cdot 10^{-2}$ mbar ($7.5 \cdot 10^1$ Torr - $7.5 \cdot 10^{-3}$ Torr): $\pm 15\%$ of displayed value
Maximum permissible pressure at pressure transducer	1.5 bar (1125 Torr) absolute	
Maximum permissible temperature of gaseous media at measurement connection	continuous operation: 40°C, for short periods (< 5 minutes): up to 80°C	
Temperature coefficient	$< \pm 0.07$ mbar/K (0.05 Torr/K)	not specified
Ambient temperature range (operation)	10°C to +40°C	
Ambient temperature range (storage)	-10°C to +60°C	
Permitted relative atmospheric moisture during operation (no condensation)	30% to 85%	
Range of supply voltage (via VACUU•BUS)	6-30 VDC / 5 mA	18-30 VDC / 65 mA
Degree of protection IEC 529	IP 54	
Communication	VACUU•BUS	
Weight with small flange with hose nozzle with tubing connection	185 g 180 g 178 g	180 g 185 g -
Housing dimensions diameter length with vacuum connection	60 mm 60 mm (small flange) 95 mm (hose nozzle) 63 mm (tubing connection)	60 mm 58 mm 97 mm -
Vacuum connection	small flange DN 16 or hose nozzle 6/10 mm or connection for PTFE tubing DN 8/10 mm	small flange DN 16 and screw-in hose nozzle 6/10 mm
Internal volume of measurement chamber	with small flange: 4.1 cm ³ with hose nozzle: 4.4 cm ³ with tubing connection: 3.5 cm ³	2.9 cm ³ with hose nozzle: 2.5 cm ³
Cable length	approximately 2.0 m	

Technical data MPT 100: See instructions for use of MPT 100**We reserve the right for technical modification without prior notice!**

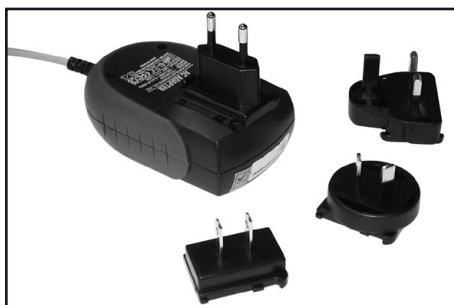
Wetted parts

Components	Wetted materials
VSK 3000	
Sensor	aluminium oxide ceramics
Sensor housing, measurement chamber	PPS, glass fibre
Seal at sensor	chemically resistant fluoroelastomer
Hose nozzle	PP
Clamping ring	PA
Small flange	stainless steel
VSP 3000	
Sensor	aluminium oxide ceramics
Sensor housing, measurement chamber, small flange	PBT, glass fibre / PUR
Hose nozzle / O-ring	PPS, glass fibre / FPM

We reserve the right for technical modification without prior notice!

Use and operation

Assembling the country specific mains plug



- ☞ The wall power supply is delivered with mains plugs for Europe, UK, USA and Australia.
- ☞ To replace the mains plug press the locking key and remove mains plug.
- ☞ Assemble the suitable mains plug to the power supply and lock.

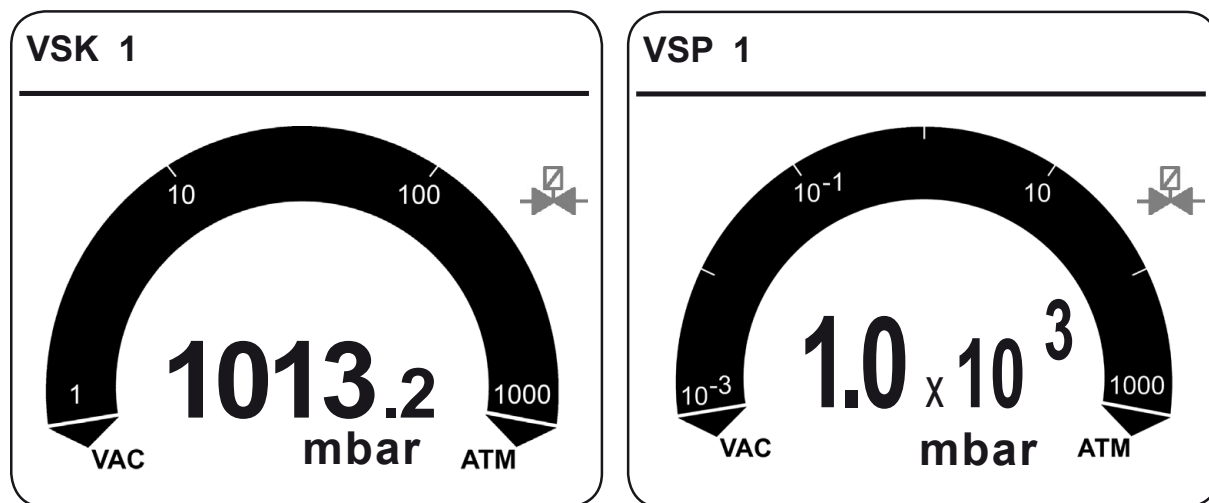
Display and symbols

When switching on the DCP 3000 for the very first time, a menu to select the language of the device is displayed. Select the desired language (e.g. "English") by turning the selection knob and press to confirm. Then select the pressure unit ("mbar", "Torr" or "hPa") in the same way.

It is possible to access the language selection menu at any time by switching on the device while keeping the selection knob pressed.

After switching on, the **version number of the software** is displayed.

The connected components (valves, external sensor) are identified and configured automatically.



VSK 1 / VSP 1 active pressure transducer (status line)



venting valve switched on (if connected)



warning notice (if necessary in combination with other symbols), flashing

1013.2

actual absolute pressure at the pressure transducer

mbar

Torr

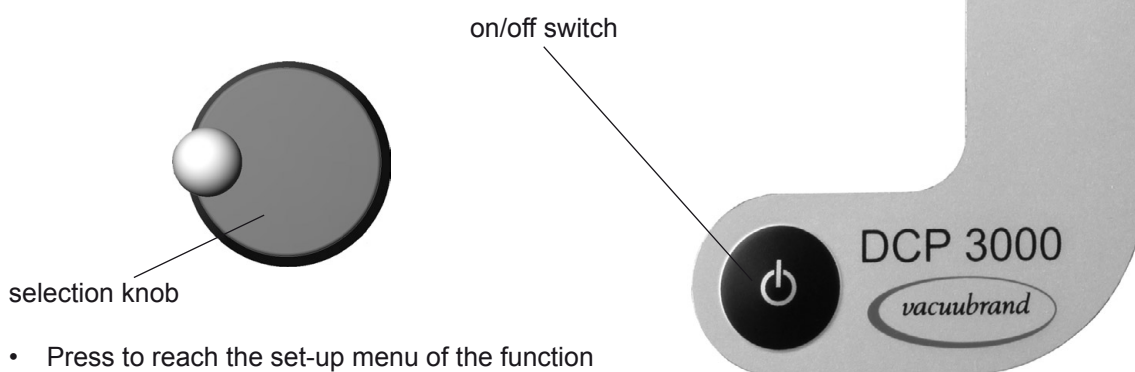
hPa

preselected pressure unit

Keys

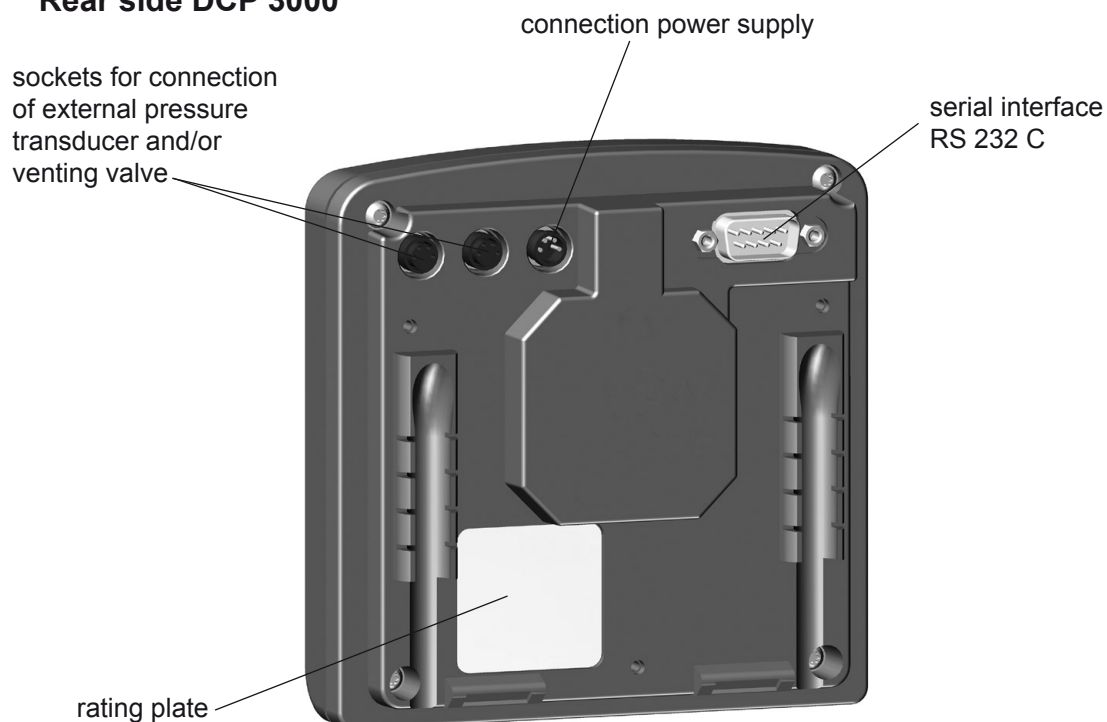
Venting: Only after connection of an external venting valve

- Short pressing vents short-time, control runs on.
- Pressing longer than 2 seconds vents the system to atmospheric pressure.



- Press to reach the set-up menu of the function
- Turn to reach the parameter set-up
- Press to reach the set value
- Turn to change the set value
- Press to confirm and to reach further parameters or to exit the set-up menu

Rear side DCP 3000



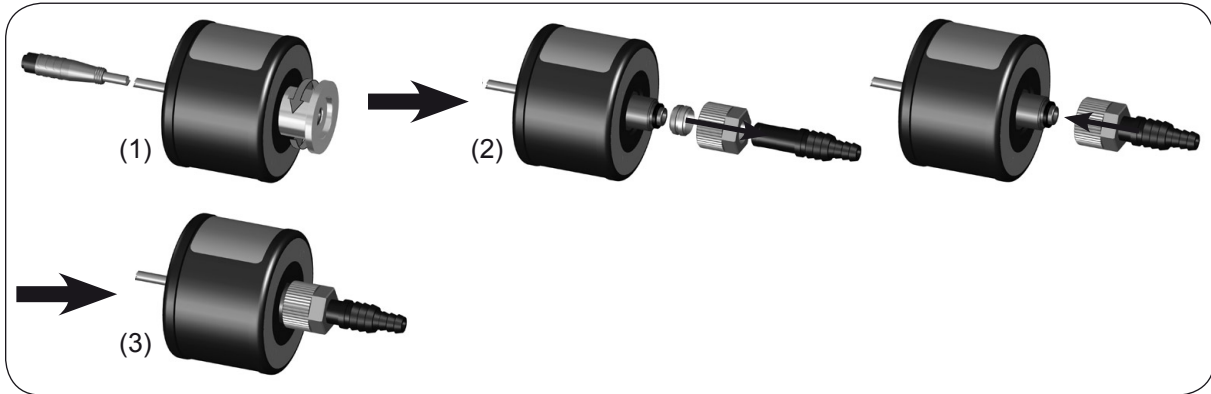
Attention: Do not cant when assembling or removing plug connections! Comply with correct positioning of the plug. To connect further components use Y-adapters and extension cables VACUU-BUS.

Further information on how to use several sensors or valves on request.

Changing the vacuum connector at pressure transducer VSK 3000

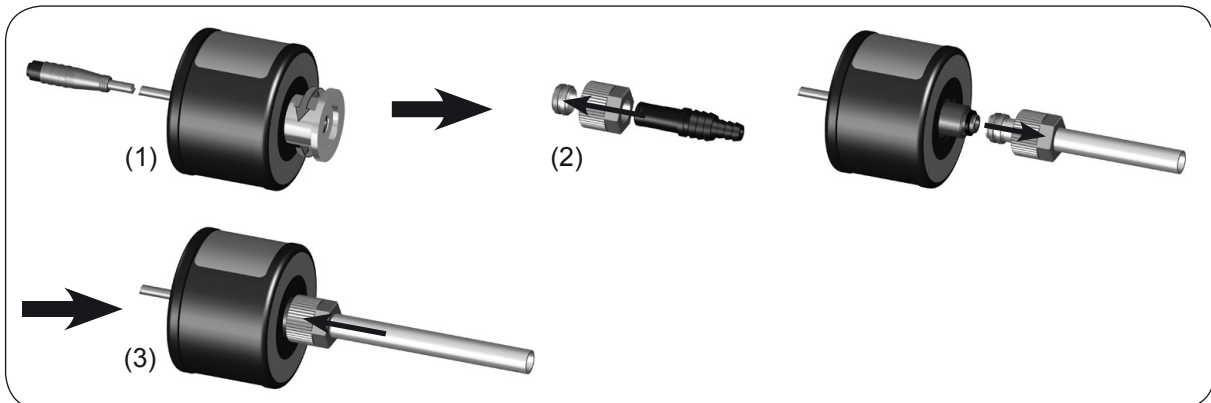
Installing the hose nozzle:

Unscrew the flange (using a 17 mm open-end wrench, if necessary) to expose the compression fitting (1). Slip the compression nut, and then the ferrule, onto the smooth end of the supplied hose nozzle (2). Slide the smooth end of the hose nozzle onto the compression fitting on the VSK 3000 gauge head, and tighten the compression nut firmly finger-tight (3).



Installing the PTFE-tubing connection (PTFE-tubing ID: 8mm, OD: 19mm):

Unscrew the flange (using a 17 mm open-end wrench, if necessary) to expose the compression fitting (1). Slip the compression nut, and then the ferrule, onto the PTFE-tubing (2). Slide the PTFE-tubing onto the compression fitting on the VSK 3000 gauge head, and tighten the compression nut firmly finger-tight (3).



Notes on operation

Operation principle of the VSK 3000

The VSK 3000 is equipped with a capacitive pressure transducer with ceramic diaphragm to measure the actual pressure **independent of the gas type** and depending on the vacuum, i. e. **absolute**.

The pressure value is displayed with a resolution of 0.1 mbar in the pressure range from 0.1 mbar to 1060 mbar.

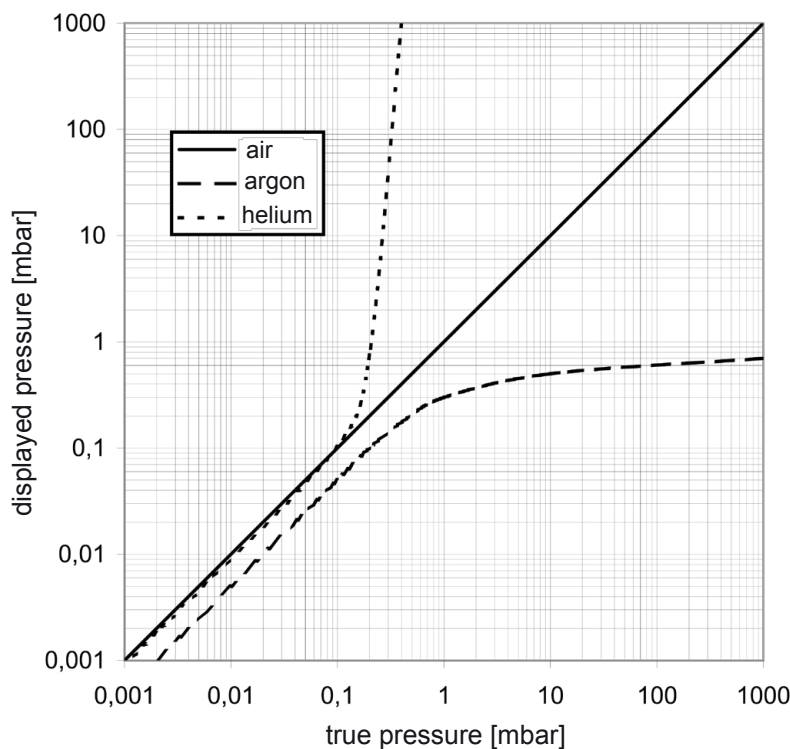
Operation principle VSP 3000

The pressure transducer VSP 3000 relies on the fact that the thermal conductivity of the residual gas in the vacuum chamber is a measure for the gas pressure. The thermal conductivity of gases is proportional to the pressure within a certain range and is related to the molecular mass.

The thermal conductivity of gases and vapours varies with their molecular mass. Therefore the pressure measurement is dependent on the gas type. The pressure transducer has been adjusted for air at the factory.

- ☞ Pressure of gases with similar mass, such as O_2 or CO , can be read off directly within the uncertainty of the measurement.
- ☞ With gases of lower or higher mass (H_2 , He, Ar, CO_2) it is recommended to readjust the VSP 3000 using the gas to be measured.

Diagram: Gas dependence of a VSP 3000



General information on handling the VSP 3000

The pressure transducer VSP 3000 which has been developed particularly for use in chemical laboratories is a pressure sensor working in the fine vacuum range. Over the whole measuring range the pressure reading is indicated in exponential notation.

Allow the VSP 3000 a period of approx. 20 minutes to preheat and to meet its specifications. Even in case of the controller or vacuum gauge being switched off, the VSP 3000 stays ready for operation. To de-energize the pressure transducer, unplug either its VACUU•BUS line or the power supply of the controller or vacuum gauge.

NOTICE

The interior of the pressure transducer is highly sensitive! Do not insert fingers or tools into the measuring chamber.

VACUU•BUS

Readout of the pressure transducer via VACUU•BUS line by the vacuum gauge DCP 3000 using VACUU•BUS protocol. Maximum cable length inside buildings: 30m (extension cable VACUU•BUS 2m: order-no. 612552 / extension cable VACUU•BUS 10m: order-no. 2618493).

Don't use more than one DCP 3000 within a VACUU•BUS system. More than one DCP 3000 within the same VACUU•BUS system will interfere with each other and cause error messages of the connected components.

Prior to use

- ➔ Connect the gauge head VSK 3000 or VSP 3000 with connecting cable (VACUU•BUS line) to a socket at the rear side of the DCP 3000.
- ➔ Connect the gauge head to the vacuum chamber via the small flange connection, the hose nozzle or PTFE tubing. Avoid contamination (oil/oil mist) of the gauge head when generating the vacuum with an oil-filled vacuum pump.
- ⚠ Do not mount the gauge head directly at the oil-sealed pump. The diameter of the pipelines should be as large as possible.
- ⚠ Inside a vacuum system where evaporation occurs (e.g. rotary evaporator) the vacuum is not uniform (e.g., a condenser acts as pump or the vacuum in the pipeline is lower than in the system). Therefore choose carefully the position where to connect the gauge head.
- ⚠ Condensate and deposits at the gauge head falsify the measurement result.
- ⚠ If residues occur or when working with aggressive or condensable substances, install a gas washing bottle in front of the pressure gauge head.
- ⚠ **Mount the gauge head in such a position that condensate can not flow into it.**

VSP 3000:

Recommended orientation: Vertically with vacuum connection pointing downwards. If mounting the VSP 3000 in any other orientation, a readjustment is recommended (see section "Readjustment of VSP 3000").

- ⚠ If necessary, clean the gauge head.

- ➔ Switch the equipment on.

Automatic detection of connected components

When switching on the device the actual configuration of the connected components is checked.

Connected components (valves, sensors, etc.) are **automatically detected**, used and monitored until the device is switched off. Reconfiguration is possible by switching the DCP 3000 off/on. Identical components must be configured beforehand to different VACUU•BUS addresses (e.g., VSK 1 and VSK 2), see section "Connecting several pressure transducers".

- ➔ **Further information on how to use several sensors or valves on request.**

The configuration menu is stored in the device, see "Configuration" with specific settings adapted **automatically** to the connected components.

Depending on the connected components (valves, sensors) some menu items are not active!



Max. permitted pressure at the pressure transducer: 1.5 bar (absolute).

VSK 3000:

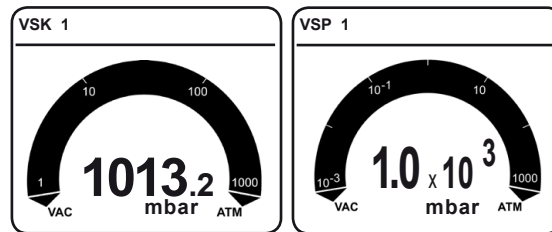
- ⚠ The display flashes at a pressure higher than approximately 1060 mbar. **Immediate pressure release. Risk of bursting!**

VSP 3000:

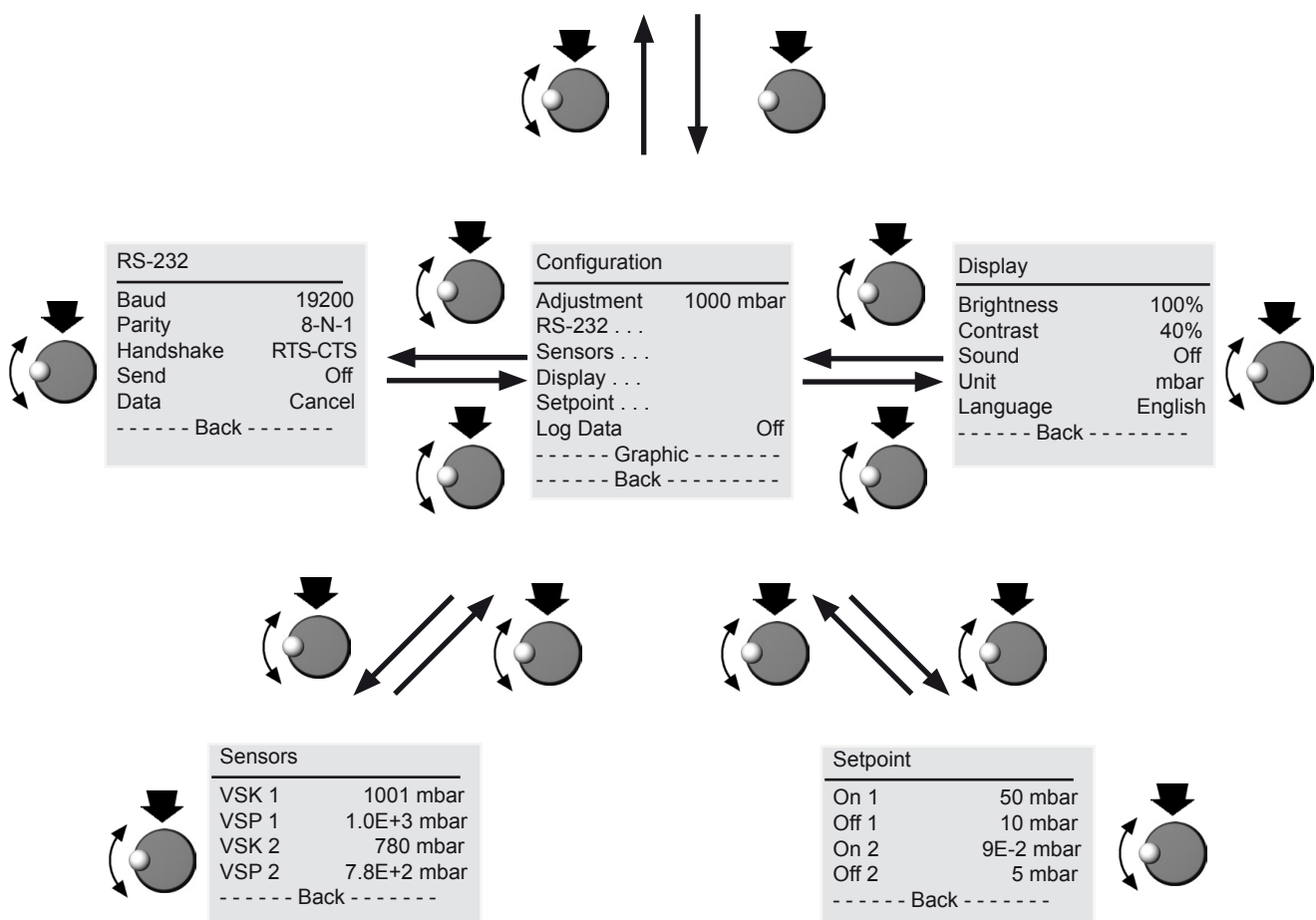
- ⚠ **Attention:** Maximum pressure reading: $1 \cdot 10^3$ mbar. Pressure values above 1000 mbar are not displayed. **Risk of unnoticed overpressure. Risk of bursting!**

Menu

pressure indication
with VSK 3000



pressure indication
with VSP 3000



Switching between pressure transducers while the pressure indication or graphic are displayed:

- ➔ Press the selection knob and keep it pressed. Then turn the still pressed selection knob until the desired pressure transducer is displayed. Release selection knob.

Configuration

In the menu "Configuration" the device parameters are set.

Settings

☞ Select the parameters via the selection knob.

- ➡ Switch the DCP 3000 on.
- ➡ Press the selection knob.
- ➡ Turn the selection knob to choose a menu and confirm by pressing the selection knob.

"Configuration"

Settings for

- Adjustment (of the pressure transducer)
- RS-232 (serial interface)
- Sensors (configuration and switching between several pressure transducers)
- Display (brightness and contrast of the display, language, sound,.....)
- Setpoint (valves, digital I/O interface)
- Log Data (Off, 1 . . . 3600 seconds)
- Graphic

☞ **Adjustment:** Adjustment of the pressure transducer under vacuum and/or at atmospheric pressure, see section "Adjustment of pressure transducer VSK 3000 / VSP 3000".

Adjustment is carried out at two adjustment points: at atmospheric pressure and under vacuum.

If no adjustment is possible in the actual pressure range, "---- mbar" is displayed.

☞ **RS-232:** Configuration of the interface, setting of parameters and commands, see section "Interface parameters".

Baud rate is selectable on 19200, 9600, 4800 or 2400, parity on "8-N-1", "7-O-1" or "7-E-1", Handshake on "no", "Xon-Xoff" or "RTS-CTS" and remote on "On" or "Off".

Automatic sending of pressure values "off" (only on demand) or in a time interval of 1 360 seconds. To switch off automatic sending select "off" or stop via serial interface.

Send data of the recording.

☞ **Sensors:** Selection of the gauge head to be controlled (maximum 4 sensors of each type VSK 3000 or VSP 3000 (alternatively max. 4 x MPT 100 instead of VSP 3000) or reference sensors VSK 3000).

☞ **Display:** Selection of the device parameters

"Brightness" between 0 - 100% and "Contrast" between 0 - 100% of the display

"Sound" "On" or "Off" in case of faults

"Units" (pressure units) "mbar", "hPa" or "Torr"

"Language" of the display "German", "English", "French", "Italian", "Spanish", "Turkish", "Korean", "Chinese", "Portuguese", "Russian", "Polish", "Dutch", "Japanese", "Finnish",

☞ **Setpoint:** Maximum four setpoints "On" and four setpoints "Off" can be preset after appropriate configuration of valves and / or digital I/O interfaces (see section "Setpoints").

☞ **Log data:** Recording and internal storage of time and pressure data of up to 4 sensors (Log Data "Off" or interval 1 . . . 3600 seconds)

The screen-shot shows the factory-set values.

Configuration	
Adjustment	1000 mbar
RS-232 . . .	
Sensors . . .	
Display . . .	
Setpoint . . .	
Log data	Off
----- Graphic -----	
----- Back -----	

Connecting several pressure transducers

It is possible to connect several external pressure transducers simultaneously to the DCP 3000. Maximum number of pressure transducers of the same type (VSK 3000 or VSP 3000) connected to one DCP 3000: four. Alternatively connect 1 x MPT 100 instead of one VSP 1000 from DCP 3000 software version 2.03 or 4 x MPT 100 instead of VSP 1000 from DCP 3000 software version 2.22. That is a total of eight external pressure transducers at maximum. Up to four additional pressure transducers VSK 3000 may be connected as reference if configured accordingly (see "Measuring differential pressure"). Only the reading of one pressure transducer is displayed at a time.

- ☞ The VACUU•BUS address of the active and displayed pressure transducer is shown in the upper left corner (status line). The readings of all pressure transducers are shown in the menu "Sensors". If in the menu "Sensors" the display of a sensor is flashing, this indicates a fault at the sensor.
- ☞ Each pressure transducer needs an individual address (VSK 1 to VSK 4 / VSP 1 to VSP 4 / MPT 1 to MPT 4) to communicate with the DCP 3000 via VACUU•BUS. All pressure transducers are shipped with their VACUU•BUS address factory-set to VSK 1 or VSP 1 or MPT 1.
- ☞ Use the DCP 3000 to reconfigure the pressure transducers VSK 3000 or VSP 3000 (e.g., changing the VACUU•BUS address from VSK 1 to VSK 2), see section "Reconfiguring the pressure transducer".

Configuration of the MPT 100: See instructions for use of the MPT 100.

Manual switching between pressure transducers

1st possibility:

- ➔ Select the menu item "Sensors" in the menu "Configuration".
- ☞ Connected pressure transducers are displayed in the order of their VACUU•BUS address: VSK 1 - VSP 1 - VSK 2 - VSP 2 - ... - VSP 4.
- ➔ Select the desired pressure transducer by turning and pressing the selection knob.
- ➔ Press the selection knob again to exit the configuration menu.
- ☞ The selected pressure transducer is displayed in the status line as active pressure transducer.

2nd possibility:

- ☞ Switching during pressure indication or in graphic display
- ➔ Press the selection knob and keep it pressed.
- ➔ Turn the selection knob until the desired pressure transducer is indicated (see VACUU•BUS address in the status line).
- ➔ Release the selection knob.
- ☞ The selected pressure transducer is displayed in the status line as active pressure transducer.

Automatic switching between pressure transducers VSK 3000 and VSP 3000

If both a pressure transducer VSK 3000 and a VSP 3000 are connected to the vacuum gauge DCP 3000 the DCP 3000 automatically displays the readings of the pressure transducer more suitable in the current pressure range.

This requires both pressure transducers to be configured to corresponding VACUU•BUS addresses (i.e. VSK x and VSP x). If the two VACUU•BUS addresses do not correspond (i.e. VSK x and VSP y), an automatic switching between pressure transducers is not possible. It then is necessary to reconfigure the address of one pressure transducer in order to enable automatic switching (see section "Reconfiguring the pressure transducer".)

Switchover points between pressure transducers VSK 3000 and VSP 3000:

In case of decreasing pressure: Switching from VSK 3000 to VSP 3000 at a pressure of 1 mbar

In case of increasing pressure: Switching from VSP 3000 to VSK 3000 at a pressure of 5 mbar

The active pressure transducer is shown in the status line. Furthermore, a VSK 3000 is always displayed in decimal notation, a VSP 3000 in exponential notation.

Measuring differential pressure

A differential pressure between two pressure transducers can only be determined and indicated between two pressure transducers VSK 3000 connected to the DCP 3000.

- ☞ This requires one of the two pressure transducers to be defined as reference (e.g., VACUU•BUS address "Ref. 1").
- ☞ In addition, both pressure transducers have to be configured to corresponding VACUU•BUS addresses (VSK x and Ref. x). If the two addresses do not correspond (VSK x and Ref. y), no differential pressure will be determined or displayed. Then it is necessary to reconfigure the address of one pressure transducer to enable differential pressure measurement (see section "Reconfiguring the pressure transducer".)

➡ The displayed pressure value is: ("pressure value of Ref. x" minus "pressure value of VSK x") mbar

Reconfiguring the pressure transducer VSP 3000 or VSK 3000

Configuration of the MPT 100: See instructions for use of MPT 100.

Reconfiguring the VACUU•BUS address of a pressure transducer:

1. Switch the vacuum gauge DCP 3000 off.
2. Preferably connect only the pressure transducer to be reconfigured to the DCP 3000.
3. Keep key "VENT" pressed and switch the DCP 3000 on (key "ON/OFF").
4. Select the menu item "Vacuubus" by turning and pressing the selection knob.
5. The first component detected by the VACUU•BUS is displayed (e.g., VSK 1). If necessary, select the pressure transducer to be reconfigured by turning and pressing the selection knob.
6. Keep key "VENT" pressed and press selection knob additionally. The inverse display of the component is replaced by a frame.
7. Turn the selection knob until the address, to which you want to reconfigure the pressure transducer (e.g., VSK 2 or Ref.1), is displayed.
8. Press the selection knob. If the configuration was successful, the menu is quit and the DCP 3000 restarts.

A configuration of more than one pressure transducer to the same VACUU•BUS address will result in error conditions at the DCP 3000 and must therefore be avoided!

Do not configure a VSK 3000 as VSP 3000.

Do not configure a VSP 3000 as VSK 3000.

Further information concerning the configuration of other components (e.g., valves) on demand.

Setpoints

Valves (see accessories) can be used after appropriate configuration to set setpoints to open or close a valve.

The digital I/O interface can be used as interface for existing (provided by the customer) isolation, coolant or venting valves or a VACUUBRAND VMS module, if these components are not equipped with a VACUU•BUS™ connection. The component has to be connected to the output of the module (an additional voltage supply is necessary).

Each valve / digital I/O interface can be used to set a setpoint "On" and a setpoint "Off". The setting range depends on the measuring range of the pressure transducer.

Set points with designation „1“ (e. g. „On 1“) always relate to pressure transducers (VSK 3000, VSP 3000, MPT 100) with address „1“ and valves or digital I/O interfaces with address „1“ (analogously for addresses „2“, „3“, „4“).

Example:

If a setpoint „On 1“ is set to 500 mbar and a pressure less than or exactly 500 mbar is measured by the corresponding pressure transducer 1 then a connected valve „1“ opens. If the pressure exceeds 500 mbar the valve closes.

If the setpoint „Off 1“ is set to 70 mbar the valve closes at a pressure less than or exactly 70 mbar, the valve opens if the pressure exceeds 70 mbar.

A setpoint can be used e. g. to open a valve assembled between a backing pump and a turbomolecular or diffusion pump first if a specified backing pressure is reached.

Configuring the valves or digital I/O interfaces to set setpoints

Reconfiguring the VACUU•BUS address of valves or digital I/O interfaces

1. Switch the vacuum gauge DCP 3000 off.
2. Preferably connect only the pressure transducer to be reconfigured to the DCP 3000.
3. Keep key "VENT" pressed and switch the DCP 3000 on (key "ON/OFF").
4. Select the menu item "Vacuubus" by turning and pressing the selection knob.
5. The first component detected by the VACUU•BUS is displayed (e.g., SP 1). If necessary, select the pressure transducer to be reconfigured by turning and pressing the selection knob.
6. Keep key "VENT" pressed and press selection knob additionally. The inverse display of the component is replaced by a frame.
7. Turn the selection knob until the address, to which you want to reconfigure the pressure transducer (e.g., SP 2 or SP 1), is displayed.
8. Press the selection knob. If the configuration was successful, the menu is quit and the DCP 3000 restarts.

A configuration of more than one pressure transducer to the same VACUU•BUS address will result in error conditions at the DCP 3000 and must therefore be avoided!

Further information concerning the configuration of other components on demand.

Interface parameters

The DCP 3000 is equipped with a serial interface (RS 232C, nine-pole 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.
- ☞ For optimal electromagnetic compatibility assemble an interface filter (cat. no.: 638235).
- ☞ The serial interface is prepared for the connection of a commercial Bluetooth adapter for wireless communication (current supply for Bluetooth adapter on pin 9, see "Connector assignment").
- ☞ Settings via interface are stored.

Setting the interface

Set the interface parameters directly at the DCP 3000.

The factory set values are underlined.

Edit and confirm the interface parameters in the function "Configuration" in the menu "RS-232" 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
- ➔ Send: Off or 1.....360 s
- ➔ Data: Send

- ➔ Maximum 20 commands per second are possible.
- ➔ 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 <CR><LF>.
- ➔ The response of the device is always terminated with <CR><LF>.
- ➔ Numerical values and parameters can be written without leading zeros.
- ➔ The response of the device is always with leading zeros.

Notes concerning the function data logger (recording and sending of data)

- Maximum number of recordable readings is 32765.
- During recording the runtime is displayed.
- The data of all connected pressure transducers are recorded, i.e. for two pressure transducers maximum 16382 readings per pressure transducer are recorded.
- Recording starts, if "Log data" is set to 1 3600 seconds (see menu "Configuration - Log data") and stops if "Log data" is set to "Off" or the device is switched off.
- If the recording interval is changed, stored readings are deleted and recording starts again.
- After power failure the recording interval is set to "Off", the stored readings can be read out further on.
- "Graphic" (with or without function "log data") displays maximum 240 readings of the selected pressure transducer.
- If "Graphic" with function "log data" is selected it is possible to extend the time scale to the next interval if the displayed time scale is reached by turning the selection knob.
- If changing the displayed pressure transducer (without function "log data") the graphic starts anew.
- Read out of the stored readings is possible via RS 232 interface with the selected transfer parameters (see "Configuration of the interface").
- The data output format is ASCII.
- First the time is recorded, then the readings of all pressure transducers, separated by space characters, after the last reading the pressure unit is recorded.

Examples:

1. Data output of one pressure transducer, recording interval 1 second:

```
000.00:00:00 1005.8 mbar
000.00:00:01 1005.8 mbar
000.00:00:02 1005.8 mbar
000.00:00:03 1005.8 mbar
000.00:00:04 1005.8 mbar
000.00:00:05 1005.8 mbar
000.00:00:06 1005.8 mbar
End
```

2. Data output of two pressure transducers (one VSK 3000, one VSP 3000), recording interval 5 seconds:

```
000.00:00:00 1005.8 0112.0 mbar
000.00:00:05 1005.8 0112.0 mbar
000.00:00:10 1005.8 0112.0 mbar
000.00:00:15 1005.8 0112.0 mbar
000.00:00:20 1005.8 0112.0 mbar
000.00:00:25 1005.8 0112.0 mbar
000.00:00:30 1005.8 0112.0 mbar
000.00:00:35 1005.8 0112.0 mbar
End
```

Depending on the amount of data and the transfer rate, the data output may take very long. The output of 32765 readings from one sensor takes up to 8 minutes at 19200 baud, longer than 1 hour at 2400 baud.

Recording of data is possible with any terminal program.

Example: Windows* HyperTerminal: Select "Transfer menu - Capture text". In the file box, type a descriptive name for the file, and then click "Start". Send command "IN_PV_D" or select at the DCP 3000 "RS 232 - Data - Send".

* Windows is a trade mark of Microsoft Corporation in the USA and other countries.

Read commands

Function	Command	Response	Description
actual pressure	IN_PV_1	XXXX.X mbar/Torr/hPa X.XXE±X mbar/Torr/hPa	unit according to preselections
pressure	IN_PV_Sx	XXXX.X mbar/Torr/hPa X.XXE±X mbar/Torr/hPa	pressure of pressure transducer x (order of numbering like display in menu "Sensors")
	IN_PV_X	XXXX.X XXXX.X ...mbar X.XXE±X mbar/Torr/hPa	pressure of all connected pressure transducers
	IN_PV_D	XXX.XX:XX:XX X ...mbar	read out data to memory medium
device set preselections	IN_CFG	XXXXXXXX	<div> <div> <div>** Language:</div> <div> 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 </div> </div> <div> <div>1.....8: quantity of pressure transducers</div> <div>1.....8: number* of active pressure transducer</div> <div> 0: fault indicator not connected 1: fault indicator connected </div> <div> 0: venting valve not connected 1: venting valve connected </div> <div> 0: acoustic signal off 1: acoustic signal on </div> <div> 0: pressure unit mbar 1: pressure unit Torr 2: pressure unit hPa </div> <div>0.....D: language** (hexadecimal)</div> </div> </div>
malfunction	IN_ERR	XXXXXX	<div> <div>0: last command to serial interface correct</div> <div>1: last command to serial interface incorrect</div> <div> 0: no external fault 1: external fault </div> <div> 0: no fault at the pressure transducer 1: fault at the pressure transducer </div> <div> 0: no overpressure 1: overpressure </div> <div> 0: no fault at the venting valve 1: fault at the venting valve </div> </div>
	IN_VER	DCP 3000 Vx.xx	software version
	IN_SP_1	XX:XX	time interval for sending mm:ss
	IN_SP_2	XX:XX	time interval for recording

* numbering corresponds to order of pressure transducers in the configuration menu

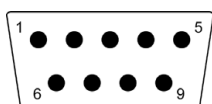
Function	Command	Response	Description
Setpoint	IN_SP_11	XXXX.X mbar/Torr/hPa	setpoint On 1
	12	X.XXE±X mbar/Torr/hPa	setpoint On 2
	13		setpoint On 3
	14		setpoint On 4
	IN_SP_21	XXXX.X mbar/Torr/hPa	setpoint Off 1
	22	X.XXE±X mbar/Torr/hPa	setpoint Off 2
	23		setpoint Off 3
	24		setpoint Off 4

Write commands

Function	Command	Parameter	Description
time	OUT_SP_1	XX:XX	time interval for automatic sending of all pressure values mm:ss sss
alternatively		XXX	
	OUT_SP_2	XX:XX XXX	time interval for recording*
	OUT_VENT	X	{ 0: venting valve closed 1: venting valve open 2: venting until atmospheric pressure
	OUT_SENSOR	X	
	REMOTE	- 1	switch off device switch on device
	OUT_SP_11	XXXX.X mbar/Torr/hPa	setpoint On 1
	12	X.XXE±X mbar/Torr/hPa	setpoint On 2
	13		setpoint On 3
	14		setpoint On 4
	OUT_SP_21	XXXX.X mbar/Torr/hPa	setpoint Off 1
	22	X.XXE±X mbar/Torr/hPa	setpoint Off 2
	23		setpoint Off 3
	24		setpoint Off 4

* When changing the time interval, recording starts anew, existing data are deleted. Time interval "0" stops recording, data are stored.

The single abbreviations of a command are separated by underscores (ASCII 5FH).
The string is terminated with <CR><LF> (ASCII 0DH, ASCII 0AH).

Connector assignment

2: RxD
3: TxD
4: DTR

5: Mass
7: RTS
8: CTS
9: +5V (Bluetooth)

Troubleshooting

Fault	Possible cause	Remedy
<input type="checkbox"/> No display.	<ul style="list-style-type: none"> ➔ Power supply (wall plug) not plugged in, no power available? ➔ DCP 3000 switched off? ➔ Power supply (wall plug) not connected to DCP 3000? ➔ Other causes (device defective)? 	<ul style="list-style-type: none"> ✓ Plug in power supply, connect cable of power supply (wall plug) to DCP 3000. Switch on device. Check mains fuse. ✓ Switch device on. ✓ Connect cable of power supply (wall plug) to DCP 3000. ✓ Contact local distributor.
<input type="checkbox"/> Malfunction of gauge head indicated (warning triangle is flashing) or in menu "Sensors" one of the displayed sensors is flashing.	<ul style="list-style-type: none"> ➔ Pressure transducer not connected? ➔ Pressure transducer or connecting cable defective? 	<ul style="list-style-type: none"> ✓ Plug the pressure transducer into the socket of the DCP 3000. ✓ Replace pressure transducer or connecting cable if necessary.
<input type="checkbox"/> The pressure reading is too high in the low pressure range.	<ul style="list-style-type: none"> ➔ Pressure transducer contaminated? ➔ Pressure transducer not correctly adjusted? 	<ul style="list-style-type: none"> ✓ Clean pressure transducer and readjust. ✓ Readjust pressure transducer correctly.
<input type="checkbox"/> The pressure reading is too low at atmospheric pressure.	<ul style="list-style-type: none"> ➔ Pressure transducer not correctly adjusted? ➔ Pressure measurement with VSP 3000? 	<ul style="list-style-type: none"> ✓ Readjust pressure transducer correctly at atmospheric pressure. ✓ Fluctuations within the range of the measurement uncertainty. Use pressure transducer VSK 3000.
<input type="checkbox"/> Displayed pressure value is fluctuating.	<ul style="list-style-type: none"> ➔ Pressure fluctuations due to the set-up of the vacuum system? ➔ Plug of the cable to the pressure transducer not correctly plugged in? ➔ Position of the pressure transducer VSK 3000 has been changed (e.g. from horizontal to vertical)? Fluctuation of the displayed pressure in the range of 0.2 - 0.4 mbar? ➔ Pressure transducer VSP 3000 is still in the warm-up phase? 	<ul style="list-style-type: none"> ✓ No measuring fault. Check and change set-up of the vacuum system if necessary. ✓ Plug the cable correctly into the socket at the rear of the DCP 3000. ✓ Readjust pressure transducer, if exact pressure indication is required.. ✓ Allow for a warm-up time of 20 minutes.

Fault	Possible cause	Remedy
<input type="checkbox"/> Displayed pressure value is fluctuating.	<p>➔ Pressure transducer VSP 3000 was exposed to a significant pressure change or a change of position.</p> <p>➔ Pressure measurement with VSP 3000 at pressures above 50 mbar?</p>	<p>✓ Allow the pressure transducer to stabilize.</p> <p>✓ Fluctuations within the range of the measurement uncertainty. Use pressure transducer VSK 3000.</p>
<input type="checkbox"/> Pressure reading incorrect.	➔ Connected pressure transducer configured incorrectly or several pressure transducer with identical VACUU•BUS address connected?	✓ Reconfigure pressure transducer.
<input type="checkbox"/> Second pressure transducer connected but not detected by the DCP 3000.	➔ Second pressure transducer not or incorrectly configured? Both pressure transducers configured to the same address?	✓ Configure second pressure transducer.
<input type="checkbox"/> Display and warning triangle are flashing.	➔ Data storage in function data logger is full.	✓ Read out data and start again if necessary.

NOTICE

Instructions for repair with directions for repair and spare parts list is available on request.

🔧 The instructions are for trained service people.

Accessories

Pressure transducer VSK 3000, capacitive Al_2O_3 sensor 1080-0.1 mbar	636657
Pressure transducer VSP 3000 Pirani, $1 \cdot 10^3 - 1 \cdot 10^{-3}$ mbar	636163
Vacuum gauge head MPT 100 Penning/Pirani, $1 \cdot 10^3 - 5 \cdot 10^{-9}$ mbar	683176
Connection cable SUB-D - VACUU•BUS for MPT 100	636124
Venting valve VBM-B / KF 16 or hose nozzle 6/10mm, 24 V=	674217
Y-type adapter VACUU•BUS	636656
Extension cable VACUU•BUS, 2m	612552
Extension cable VACUU•BUS, 10m	2618493
Wall bushing VACUU•BUS	636153
Cable RS 232C, 9-pole, Sub-D	637837
Digital-I/O-Module VACUU•BUS (fault indicator)	636228
Analog-I/O-Module VACUU•BUS (analog voltage output of vacuum reading)	636229
PC-Software VACUU•CONTROL	692920

Conversion of a VACUUBRAND valve with diode plug to a VACUUBRAND valve with VACUU•BUS plug:

VACUUBRAND valve with diode plug	Conversion kit "valve cable with VACUU•BUS plug"
Venting valve VBM, 24 V= (666817)	612554

Cleaning the pressure transducers

The vacuum gauge itself is maintenance free.

Contamination of the pressure transducer or deposits will influence the accuracy of measurement and/or the adjustment.

NOTICE

Attention: Never use a spiky or sharp-edged tool to clean the pressure transducer.

VSK 3000: Never touch the ceramic diaphragm at the back of the measuring chamber with hard objects!

VSP 3000: The interior of the pressure transducer is highly sensitive! Do not insert fingers or tools into the measuring chamber.

Clean a contaminated pressure transducer as follows:

- ➔ 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 gauge head chamber several times with alcohol in order to remove all solvent residues.
- ➔ Allow the pressure transducer to dry.
- ➔ Readjust the pressure transducer if necessary.

Calibration in the factory

Control of measuring equipment

The **VACUUBRAND DKD calibration laboratory** is accredited by the Physikalisch-Technische Bundesanstalt (PTB; German national institute for science and technology and the highest technical authority of the Federal Republic of Germany for the field of meteorology and certain sectors of safety engineering) for the measurable variable **pressure in the pressure range from 10^{-3} mbar to 1000 mbar** in accordance with the general criteria for the operation of testing laboratories defined in the standard EN ISO/IEC 17025:2000.

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.

DKD calibration

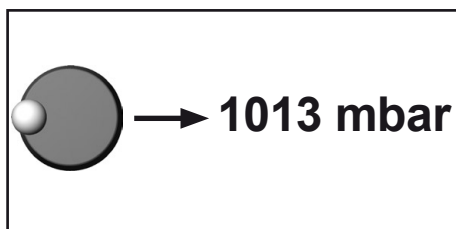
vacuum gauge DCP 3000 with external pressure transducer VSP 3000 / VSK 3000 **900215**

Readjustment of pressure transducer VSK 3000

NOTICE

The pressure transducer VSK 3000 was adjusted using factory standards, which are traceable through regular calibration in an accredited laboratory (German Calibration service) to the German national pressure standard. Depending on the process and/or on 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. For readjustment the reference pressures have to be known precisely. In the range between 20 and 700 mbar no adjustment is possible; ---- mbar is displayed.

Adjustment at atmospheric pressure



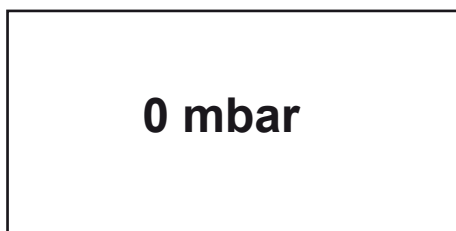
An adjustment at atmospheric pressure is only possible if the pressure is higher than 700 mbar.

Ventilate the pressure transducer VSK 3000 and/or the vacuum system. Make sure that the vacuum connection at the VSK 3000 is at atmospheric pressure.

- ➔ In function "Configuration" select the menu item "Adjustment".
- ➔ Use the selection knob to adjust the reading to the actual 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, the next airport, etc. (take into account the difference in altitude between e. g. airport and laboratory).

Adjustment under vacuum



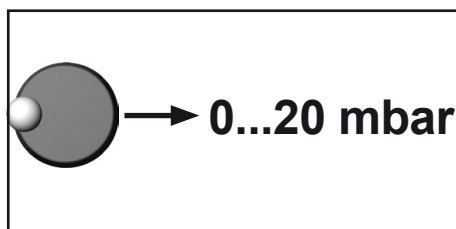
An adjustment under vacuum is only possible if the pressure is lower than 20 mbar.

Evacuate the pressure transducer VSK 3000 to a pressure < 0.1 mbar (e. g. by applying a good two-stage rotary vane pump).

- ➔ In function "Configuration" select the menu item "Adjustment".
- ➔ 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 mbar reduces the accuracy of the measurement. If the pressure is significantly higher than 0.1 mbar, adjustment to a reference pressure is recommended.

Adjustment at a reference pressure



Instead of adjustment under vacuum to a pressure < 0.1 mbar, adjustment to a precisely known reference pressure within the range of 0 20 mbar is possible. Evacuate the pressure transducer VSK 3000 to a pressure within 0 20 mbar

- ➔ In function "Configuration" select the menu item "Adjustment".
- ➔ The reading is automatically adjusted to "zero".
- ➔ Use the selection knob to adjust the reading to the reference pressure at the vacuum connection within the range of 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 device might be doubtful. The diaphragm pump may not achieve the specified value (due to condensate, poor condition, failure of valves or diaphragm, leaks).

Readjustment of pressure transducer VSP 3000

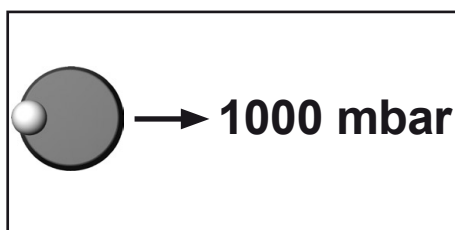
NOTICE

The pressure transducer VSP 3000 was adjusted using factory standards, which are traceable through regular calibration in an accredited laboratory (German Calibration service) to the German national pressure standard. Depending on the process and/or on 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.

- ➡ For readjustment, install the pressure transducer in the same orientation in which it will be operated later on at the application.
- ➡ Allow the pressure transducer a period of minimum 20 minutes to preheat.

If no adjustment is possible in the current pressure range, "---- mbar" is displayed.

Adjustment at atmospheric pressure



An adjustment at atmospheric pressure is only possible in the upper pressure range.

Ventilate the pressure transducer VSP 3000 and/or the vacuum system. Make sure that the vacuum connection at the VSP 3000 is at atmospheric pressure. Allow the pressure transducer a period of minimum 20 minutes to preheat at this pressure.

- ➡ In function "Configuration" select the menu item "*Adjustment*".
- ☞ The reading is automatically adjusted to "1000 mbar". This value is fix and can not be changed.
- ➡ Press the selection knob to confirm.

Adjustment under vacuum



An adjustment under vacuum is only possible in the lower pressure range.

Evacuate the pressure transducer VSP 3000 to a pressure preferably below $1 \cdot 10^{-3}$ mbar (e. g. by applying a high vacuum pump). Allow the pressure transducer a period of minimum 20 minutes to preheat at this pressure.

- ➡ In function "Configuration" select the menu item "*Adjustment*".
- ☞ The reading is automatically adjusted to "zero". This value is fix and can not be changed.
- ➡ Press the selection knob to confirm.

Notes on return to the factory

Repair - return - DKD calibration

NOTICE

Safety and health of our staff, laws and regulations regarding the handling of dangerous goods, occupational health and safety regulations and regulations regarding safe disposal of waste require that for all pumps and other products the **“Health and safety clearance form”** must be sent to our office duly completed and signed before any equipment is dispatched to our premises.

Fax or post 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. If the equipment is contaminated you must notify the carrier.

No repair / DKD calibration is possible unless the correctly completed form is returned. Inevitably, there will be a delay in processing the equipment if information is missing or if this procedure is not obeyed.

! CAUTION

If the product has come in contact with chemicals, radioactive substances or other substances dangerous to health or environment, the product must be decontaminated **prior to sending it back to the factory.**

- Return the product to us **disassembled and cleaned** and accompanied by a certificate verifying decontamination or
- Contact an industrial cleaning and **decontamination service** directly or
- Authorize us to send the product to an industrial cleaning facility **at your expense.**

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 for repair.

We submit **quotations** only on request and always at the customer's expense. If an order is given, the costs incurred are offset from the costs for repair or from the purchase price, if the customer prefers to buy a new product instead of repairing the defective one.

- **If you do not wish a repair on the basis of our quotation, the equipment might be returned to you disassembled and at your charge!**

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

For cleaning we use an environmentally responsible 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 also replace parts due to optical aspects upon your request.

NOTICE

Before returning the equipment ensure that (if applicable):

- Equipment has been cleaned and/or decontaminated.
- All inlet and outlet ports have been sealed.
- Equipment has been properly packed, if necessary, please order an original packaging (costs will be charged), marked as appropriate and the carrier has been notified.
- Ensure that the completed health and safety declaration is enclosed.

We hope for your understanding for these measures, which are beyond our control.

Scraping 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 the process. Do not incinerate fluoroelastomer seals and O-rings.

- You may authorize us to dispose of the equipment **at your expense.**

Health and safety clearance form

Declaration concerning safety, potential hazards and safe disposal of waste, e. g. used oil.

Safety and health of our staff, laws and regulations regarding the handling of dangerous goods, occupational health and safety regulations, safety at work laws and regulations regarding safe disposal of waste, e. g. waste oil, require that for all pumps and other products this form must be sent to our office duly completed and signed before any equipment is dispatched to our premises. **Products will not be accepted for any procedure, and handling and repair / DKD calibration will not start before we have received this declaration.**

- Fax or post a **completed copy of this form** to us in advance. The declaration must arrive before the equipment. **Enclose a second, completed copy with the product.** If the product is contaminated you must notify the carrier (**GGVE, GGVS, RID, ADR**).
- Inevitably, the repair process will be delayed considerably, if this information is missing or this procedure is not obeyed. We hope for your understanding for these measures which are beyond our control and that you will assist us in expediting the repair procedure.
- Make sure that you know all about the substances which have been in contact with the equipment and that all questions have been answered correctly and in detail.**

<p>1. Product (Model):</p> <p>2. Serial No.:</p> <p>3. List of substances in contact with the equipment or reaction products:</p> <p>3.1 Chemical/substance name, chemical symbol:</p> <p>a)</p> <p>b)</p> <p>c)</p> <p>d)</p> <p>3.2 Important information and precautions, e. g. danger classification:</p> <p>a)</p> <p>b)</p> <p>c)</p> <p>d)</p> <p>4. Declaration (please mark as applicable):</p> <p><input type="checkbox"/> 4.1 for non dangerous goods:</p> <p>We assure for the returned product that</p> <ul style="list-style-type: none"> - neither toxic, corrosive, biologically active, explosive, radioactive nor contamination dangerous in any way has occurred. - the product is free of dangerous substances. - the oil or residues of pumped media have been drained. <p><input type="checkbox"/> 4.2 for dangerous goods:</p> <p>We assure for the returned product that</p> <ul style="list-style-type: none"> - all substances, toxic, corrosive, biologically active, explosive, radioactive or dangerous in any way which have been pumped or been in contact with the product are listed in 3.1, that the information is complete and that we have not withheld any information. - the product, in accordance with regulations, has been <p><input type="checkbox"/> cleaned <input type="checkbox"/> decontaminated <input type="checkbox"/> sterilized.</p>	<p>5. Way of transport / carrier:</p> <p>.....</p> <p>Day of dispatch to VACUUBRAND:</p> <p>.....</p> <p>If the paint is damaged, we wish a repaint or a replacement of parts due to optical aspects at our expense (see "Notes on return to the factory"):</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p>We declare that the following measures - where applicable - have been taken:</p> <ul style="list-style-type: none"> - The oil has been drained from the product. Important: Dispose of according to national regulations. - The interior of the product has been cleaned. - All inlet and outlet ports of the product have been sealed. - The product has been properly packed, if necessary, please order an original packaging (costs will be charged), and marked as appropriate. - The carrier has been informed about the hazardous nature of the goods (if applicable). <p>We assure VACUUBRAND 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.</p> <p>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.</p> <p>Signature:</p> <p>Name (print):</p> <p>Job title (print):</p> <p>Company's seal:</p> <p>Date:</p>
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VACUUBRAND GMBH + CO KG
 -Technology for Vacuum Systems-
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vacuubrand



EG-Konformitätserklärung
EC Declaration of Conformity
Déclaration CE de conformité

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 2006/95/EG und 2004/108/EG.

Hereby the manufacturer declares that the device is in conformity with the directives 2006/95/EC and 2004/108/EC.

Par la présente, le fabricant déclare, que le dispositif est conforme aux directives 2006/95/CE et 2004/108/CE.

Vakuum-Controller / Vacuum controller / Régulateur de vide

Typ / Type / Type: DCP 3000 + VSK 3000 / DCP 3000 + VSP 3000

Artikelnummer / Order number / Numéro d'article: 683170 / 683190

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 61326-1, DIN EN 61010-1

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

Dr. J. Dirscherl · VACUUBRAND GMBH + CO KG · Alfred-Zippe-Str. 4 · 97877 Wertheim · Germany

Wertheim, 17.01.2011

Ort, Datum / place, date / lieu, date

(Dr. F. Gitmans)

Geschäftsführer / Managing director / Gérant

ppa.

(Dr. J. Dirscherl)

Technischer Leiter / Technical Director / Directeur technique



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Web: www.vacuubrand.com

 TÜVRheinland®	
<h1>Certificate</h1>	
Certificate no. CU 72091199 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-DS 30981596 001 Tested to: UL 61010-1:2004 R10.08 CAN/CSA-C22.2 61010-1:2004	Client Reference: M. von Przychowski
Certified Product: Measurement and Control Device for Vacuum License Fee - Units	
Model Designation: 7 Main Unit: 1) CVC 3000, CVC 3000E, CVC 3000E ARB C3, DCP 3000, DCP 3000E Valves and Sensors: 2) VKW-B, 3) VB M-B, 4) Liquid level sensor (699908), 5) VV-B 6, 6) VV-B 6C, 7) VV-B 15C, 8) VSK 3000	
Rated Voltage DC: 1-3) 24V; 4) 8-30V; 5-7) 24V; 8) 6-30V Rated Current: 1) 1.25A; 4) 5mA (max.); 8) 5mA Rated Power: 1) 3.4W; 2) 2W; 3) 4W; 5) 8W; 6) 5.5W; 7) 12W Protection Class: III	
Appendix: 1 7	
Licensed Test mark: 	Signature  Dipl.-Ing. M. Glagla QA Certification Officer
Date of Issue (day/mo/yr) 17/06/2009	
<small>TUV Rheinland of North America, Inc., 12 Commerce Road, Newtown, CT 06470, Tel (203) 426-0888 Fax (203) 426-4009</small>	

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

Disclaimer: Our technical literature is only intended to inform our customer. The validity of general empirical values and results obtained under test conditions for specific applications depend on a number of factors beyond our control. It is therefore strictly the users' responsibility to very carefully check the validity of application to their specific requirements. No claims arising from the information provided in this literature will, consequently, be entertained.

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