

## ***Operating Instructions***

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## ***Display And Operating Unit***

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# 1. Important For Your Safety

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- ☞ Please read and follow all instructions in this manual.
- ☞ Please become familiar with the following:
  - Dangers arising from the unit;
  - Dangers arising from your equipment;
- ☞ Please observe all safety and accident prevention instructions.
- ☞ Regularly monitor for proper observance of all protection measures.
- ☞ Please conform to environmental conditions when using the HPU 001.  
The protection class is IP 20. The HPU 001 is protected from penetration by foreign matter  $\geq \varnothing 12$  mm. Not waterproof.
- ☞ Do not make any unauthorized conversions to the unit on your own.
- ☞ Please observe our shipping instructions when sending in the unit (Chapter 7).

## Pictogram definition



Risk of damaging the unit.



Important information regarding the product, the handling of the product or the respective part of the documentation to which special attention should be paid.

## **2. Getting To Know The HPU 001**

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### **2.1. Orientation**

#### **Abbreviations used**

DCU = Display and operating unit

TC = Electronic drive unit

#### **Instructions in the text**

➔ This indicates an action you must take.

### **Shipment**

- HPU 001
- 3 m cable for connection to the RS 485 serial interface with RJ45 socket.
- 3 m cable for connection to the RS 485 serial interface with M12 socket.
- Operating instructions

### **2.2. Product Description**

The HPU 001 is a display and operating unit for PFEIFFER VACUUM drive units. It allows for monitoring and configuration of all unit parameters.

#### **Connection Options**

The HPU 001 offers connection options for:

- the RS 232 serial interface to connect to a PC
- the RS 485 serial interface to connect to a PFEIFFER VACUUM drive unit
- Battery connection, 9 V (PP3). The battery is not part of the regular shipment; it is not required for normal operation.
- the external power supply. It is available as a PFEIFFER VACUUM accessory (please refer to 9.1.).

The HPU 001 was inspected and approved according to EN 61010 "Safety equipment for electrical devices".

#### **Authorized Use**

- The HPU 001 display and operating unit can be used only for control of PFEIFFER VACUUM drive units and peripheries.
- Installation, commissioning, operation and maintenance requirements must be observed.

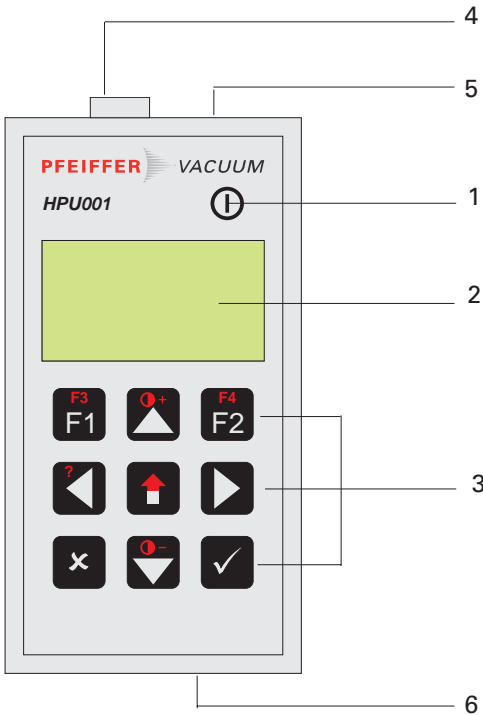
## Unauthorized Use

The following applies as unauthorized use:

- Use for purposes other than from those mentioned above, especially:
  - connection to pumps and devices not unapproved for such use according to their operating instructions;
  - connection to devices with accessible, conductive components.
  - use of power supplies unapproved for such use.

Unauthorized use voids all liability and warranty claims.

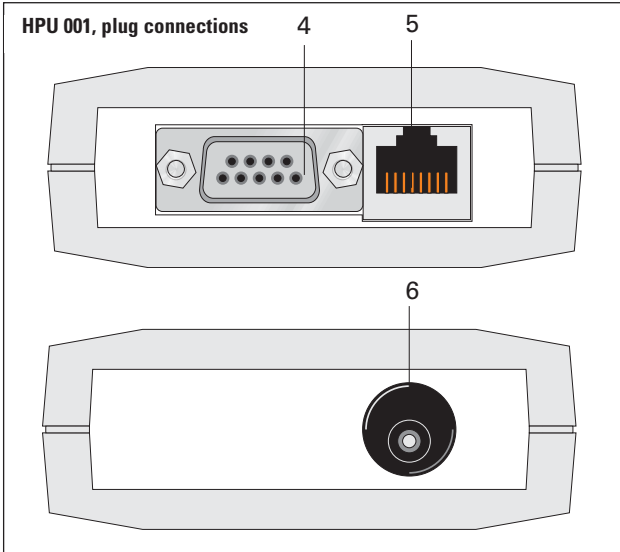
## 2.3. Front Panel



All operating and display elements are located on the front panel.

- 1 On and off switch
- 2 Display
- 3 Operating and function keys
- 4 Serial interface RS 232 connection
- 5 Serial interface RS 485 connection
- 6 External power supply connection

## 2.4. Plug Connections



- 4 RS 232 connection
- 5 RS 485 connection
- 6 External power supply connection

## 2.5. Battery Compartment, Backside

A 9 V block battery (PP3) can be used (not part of the regular HPU 001 shipment).



## 3. Connection

### 3.1. Connection Instructions



Do not make any unauthorized conversions to the display and operating unit.


**Installation site:** protected from the elements.

The following applies to maintenance and operating rooms that are not completely climatized:

**Temperature:** +5 °C – +40 °C.

**Rel. humidity:** 5 – 85 %, dew-free

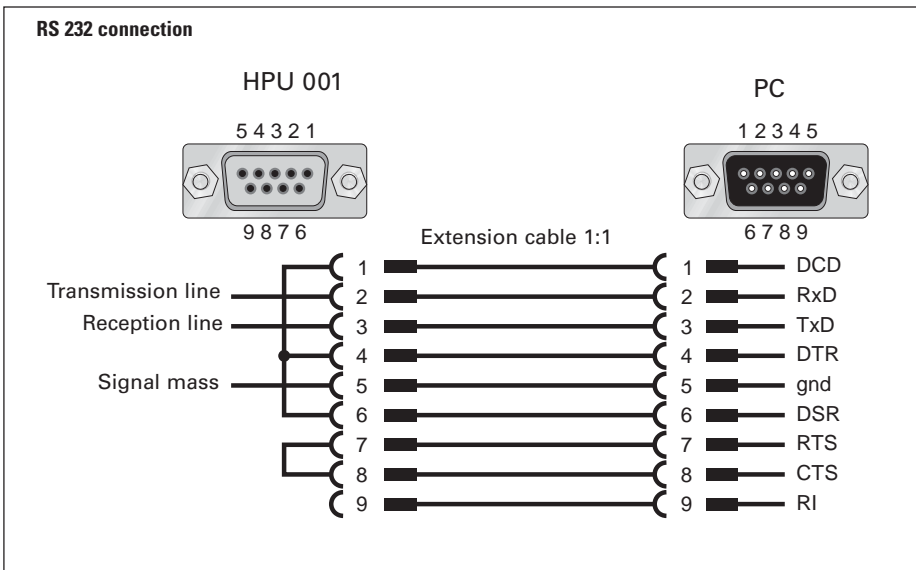
**Air pressure:** 86 kPa – 106 kPa

- ➔ Connect the HPU 001 RS 485 to the RS 485 connection on the PFEIFFER VACUUM drive unit with the enclosed 3 m cable.
- ➔ Turn on the unit by pressing the  key.

### 3.2. Connection Diagram

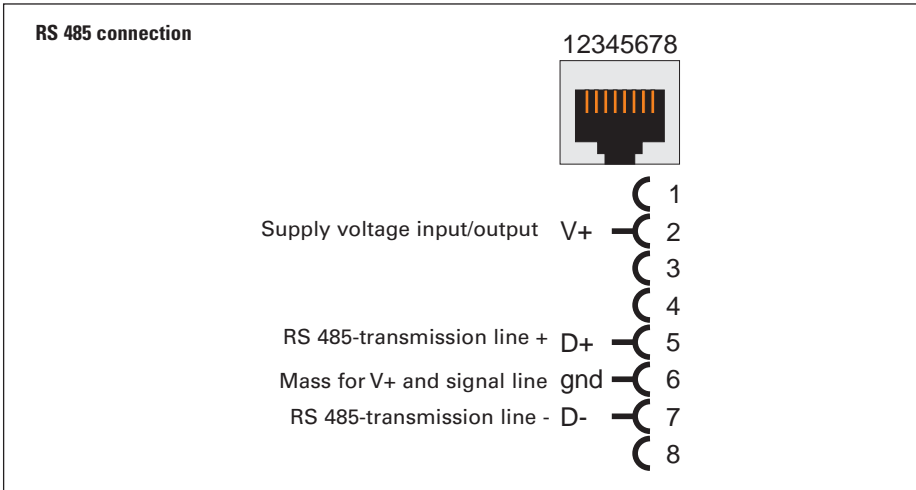
#### 3.2.1. Serial Interface RS 232 Connection

Connect RS 232 (4) serial interface on the HPU 001 to the PC as per connection diagram.



### 3.2.2. Serial Interface RS 485 Connection

The RS 485 serial interface on the HPU 001 can be connected to a PFEIFFER VACUUM drive unit with the included cable as per the connection diagram.



### 3.2.3. External Power Supply Connection

Only use the external power supply available from PFEIFFER VACUUM as accessory (please refer to 9.1.).

## 4. Operation

### 4.1. Switching The HPU 001 On and Off



The HPU 001 can be switched on and off by holding the  key at least 0.5 seconds.


The main menu appears on the display, followed by the three menu items:

- Parameters
- Parameter sets
- HPU 001.

Menu items can be selected with  and  and activated with .

Please note:

If you hold down the  and  keys, you can scroll through or edit the data more quickly.




















Use  to cancel the current menu item or to go back one menu level.

The active keys are displayed at the bottom right of the display.

Press the desired key and scroll through the menu.



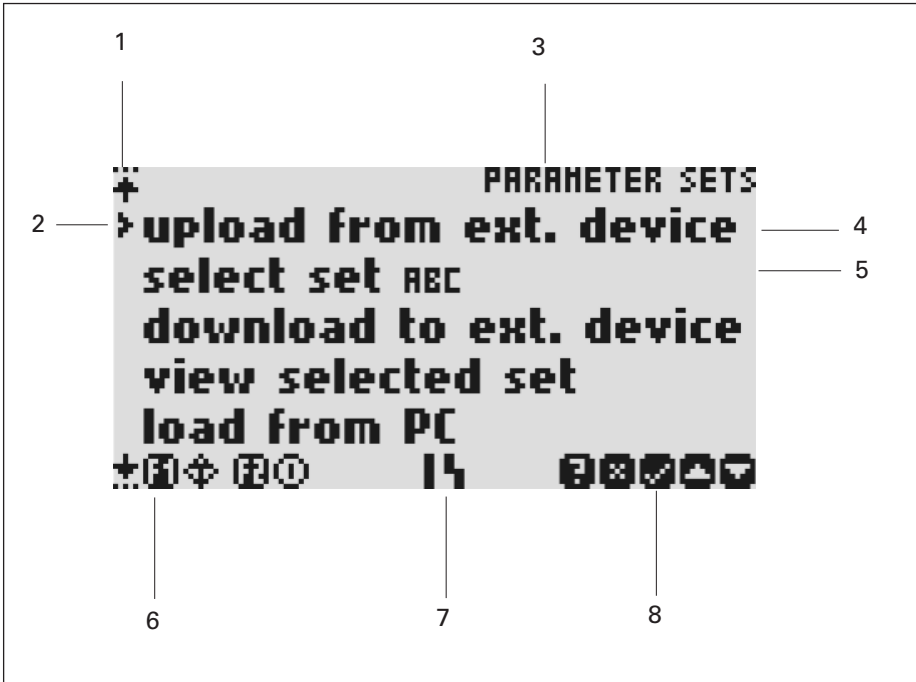
## 4.2. Key Allocation

Keys	Explanation
	<b>Switching the HPU 001 on and off</b>
	<b>Select function F1*</b>
hold  and press 	<b>Select function F3*</b>
	<b>Cursor key up</b> (e.g. scroll menu item)
hold  and press 	<b>Contrast setting</b> Increase the display contrast
	<b>Select function F2*</b>
hold  and press 	<b>Select function F4*</b>
	<b>Cursor key left</b>
hold  and press 	<b>Help function</b>
	<b>Cursor key right</b>
	<b>Canceling menu items</b> Go back to preceding menu item or cancel entry
	<b>Cursor key down</b> (e.g. scroll menu item)
hold  and press 	<b>Contrast setting</b> Reduce the display contrast
	<b>Confirmation</b> Move to next menu item or confirm entry

\* The assignment of the function keys depends on the corresponding menu item and is shown in the display.

### 4.3. Display

Accounts can appear in the display as shown in the figure below:







#### Display HPU 001

- 1 If the or symbol appears, the current listing is scrolled up or down.
- 2 The selection indicator points to the current menu item or table entry. It can be moved up with and down with . The current entry is selected with .
- 3 Display of the preceding menu level or the current operation.
- 4 Selectable menu item.
- 5 Selectable menu item, which shows a selected option.
- 6 If the function keys F1 - F4 ( for F1, for F2, for + F1 and for + F2) are assigned a function, they are shown as text or a symbol (symbol definition, see 5.1.1).
- 7 When displaying parameters, symbols can appear as representations of individual parameters or of their values.
- 8 Symbolic display of keys that are assigned a function under this menu item.

#### ***4.4. Setting The Contrast Of The Display***




After the HPU 001 is turned on, the contrast of the display can be changed with the following key combinations:

Increasing the contrast: hold  and press 

Reducing the contrast: hold  and press 

The contrast may change when the RS 232 is connected. In this case, readjust the contrast.

#### ***4.5. Help Function***

Help for the current action can be accessed via  +  , as long as the symbol  is showing in the bottom right corner of the display.

## 5. Menu Structure








<b>Main menu</b>	
<b>parameters</b> <b>show parameters</b> <b>options</b>  <b>symbols</b> <b>display</b> <b>group 1</b> <b>group 2</b>	Parameter display Display parameters according to options  Symbols for specific parameters Type of display for parameters Definition of parameter group 1 Definition of parameter group 2
<b>parameter sets</b> <b>upload from ext. device</b>  <b>select set</b> <b>download to ext. device</b>  <b>view selected set</b> <b>load from PC</b> <b>send to PC</b>	Sets of parameter values for a unit Load from PFEIFFER VACUUM electronic unit (e.g. TC 600) Select internally saved sets Save selected set in the electronic unit (e.g. TC 600)  Load set from PC Send selected set to PC
<b>HPU 001</b> <b>options</b>  <b>language</b> <b>auto power off</b> <b>backlight</b>  <b>factory defaults</b> <b>about...</b>  <b>object list</b>	Language of the menu items (German/English) "auto power off" Display lighting Return HPU 001 to shipment condition Information about the HPU 001, e. g. software version Internally saved information



### 5.1. Parameters

With the HPU 001, the parameters of a connected unit can be displayed and processed. Information for the connected unit is saved internally so that the run up to load information occurs only once for unknown units.

#### 5.1.1. Show Parameters

You can display parameters via the "Parameter menu" and the item "Show parameters". In addition to the regularly used symbols, the following ones can be shown in the bottom row of the display:

Symbol	Meaning
	Errors can be reversed by pressing the <b>F1</b> key (corresponds to p009 -> 1 or pressing the key  on the DCU).
	The pump can be switched on and off with the <b>F2</b> key (corresponds to p010-> 0 or 1 or pressing the key  on the DCU).
	Appears when p010=1 (pumping station on, corresponds to illuminated green LED on the DCU) and disappears when p010=0 (pumping station off).
	Blinks when there is a warning on the connected unit (p303="WrnXXX"), remains steadily on for errors (p303="ErrXXX") and disappears when there is no error. In addition, the number of the error or the warning is displayed.
	Blinks when there is a disturbance in the communication with the connected unit. In this case, no parameter values can be displayed and no commands can be executed.

You can access additional information in the help function for each parameter by pressing the  and  keys, e.g.

700:TMP RUTime (min)

Type: 1\_u\_integer

Operation: Symbols for read, write

Min: 1

Max: 120

Line 1: Parameter no., name and physical unit

Line 2: Data type, for explanation, see PFEIFFER VACUUM Protocol  
Operating Instructions PM 800 488 BN

Line 3: read-only, write-only or both

Line 4: Minimum value (1 min. in example)









Line 5: Maximum value (120 min. in example).

## 5.1.2. Options

There are various options and display modes for display of parameters:

### Symbols

When you set this menu item to “on”, symbols for several parameters will be shown at the bottom of the display, as with the DCU. The display of the remaining parameters will be reduced, i.e. depending on the display option, either fewer parameters will be shown simultaneously or a smaller font will be used.

Symbol	Status	Explanation
	off on	Pump does not accelerate (p307=0) Pump accelerates (p307=1)
	off blinking on	Heating off (p001=0) Heating pre-selected, switchpoint not attained (p001=1, p302=0) Heating on (p001=1, p302=1)
	off on	Standby not selected (p002=0) Standby selected (p002=1)
	off on	Unit not remote controlled (p300=0) Unit remote controlled (p300=1)
	off on	Rotation speed switchpoint not attained (p302=0) Rotation speed switchpoint attained (p302=1)
	off on	No excess temperature pump (p305=0) Excess temperature pump (p305=1)
	off on	No excess temperature electronic drive unit (p304=0) Excess temperature electronic drive unit (p304=1)
	off on	Pump not at set rotation speed (p306=0) Pump at set rotation speed (p306=1)

## **Display**

The parameters can be displayed in various ways:

**as a list:** Parameters are displayed one below the other in ascending order. Either five or three parameters are visible simultaneously, depending on whether the symbol display is selected.

**Single parameter:** Only one parameter is displayed in the largest possible font (best suited for reading from a distance).

**Group 1/group 2:** Various parameters can be compiled in one group. This is useful if you want to view several parameters simultaneously although they are far apart in the list. Two groups can be defined with up to eight parameters each.

Procedure for creating the parameter groups:

1. Under "Parameters/Settings/Group 1 (or Group 2)" assign the number of desired parameters from Parameter 1 to Parameter 8.
2. You can assign a name to the group under the same menu item.
3. Select the item "group 1" or "group 2" under "Parameters/Settings/Display".

Now the display shows only the parameters in the same group.

## **5.2. Parameter Sets**

A parameter set consists of all changeable parameters and their values. The HPU 001 can load the parameter sets from a unit (e.g. TC 600) and save it internally with any desired name (up to 15 characters). A set can be viewed and copied to other units as often as you like. With a PC program, the parameter sets can be read by the PC or transferred to the PC and saved as a file (for archival or service purposes).

**Upload from ext. device:** The HPU 001 must be connected to the unit with a standard DCU cable (e.g. TC 600). The HPU loads all read/write parameters and saves them internally. The currently loaded parameter set can be assigned any desired name (up to 15 characters).





**Select set:** For some applications, the parameter set to be used must be selected from the list of internally saved parameter sets.

**Download to ext. device:** The selected parameter set is transferred to a connected unit via a standard DCU cable. The unit will have the same configuration as the original unit that generated the parameter set. For monitoring purposes, you can access which parameters were changed and whether errors occurred. Please note: The same principle applies to saving a parameter set in a unit as for setting parameters via the DCU: The parameters must be adjustable; there should be no restrictions due to external control (e.g. remote control).

**View selected set:** The parameter values of the currently selected set can be viewed but not changed!

**Load from PC:** You can request a PC program from PFEIFFER VACUUM (Win95, 98, NT) that allows you to load parameter sets from a PC. These sets must be on the PC as a file. The D-sub-socket is used for connection to the PC. It is connected to the COM-Port (RS 232) via a 1:1 interface extension cable (please refer to 9.1.).

**Send to PC:** The selected parameter set can be sent to the PC and saved as a file (please refer to 9.1.).

**Delete parameter set:** Select parameter set with  or  under "HPU001/object list" and delete with  .

## 5.3. Unit Options (HPU 001)

### 5.3.1. Options

**language:** Either English or German can be selected as the language for the unit.

**auto power off:** When this function is activated, the unit turns off automatically 5 minutes after keys have been used (energy-saving function for battery operation).

**backlight:** The display backlight can be switched on or off. You also can set it up so that the backlight only stays on for approximately five seconds after pressing a key.

### 5.3.2. Factory Defaults

The following question appears on the HPU display: Do you really want to reset this device to the factory defaults and erase all objects?

When you press the "yes" key, the unit is reset to the factory default. All objects (e. g. parameter sets, information about units) are deleted.

After turning the unit back on, the display contrast may be so low that the type is not visible. In this case, readjust the contrast (see 4.4.).

### 5.3.3. About ...



Shows information about the HPU 001, such as software and hardware versions.

### 5.3.4. Object List

All information, such as parameter sets and unit descriptions, is saved in the HPU 001 as objects. The maximum number of saved objects is limited to 31 and the available memory (see "HPU 001 – about ..."). The saved objects can be listed here and deleted individually.



## 6. Troubleshooting

Errors	Possible cause	Remedy
The HPU cannot be switched on	Battery empty	Use new battery
	Defective connection cable	Use new cable
	Low display contrast	Hold  and press  for several seconds
	Wrong power supply	Use only the power supply available from PFEIFFER VACUUM as accessory
The HPU switches off automatically during battery operation if it is vibrated	Battery contacts or HPU connection bent (especially with heavily used batteries)	Install new battery or adjust contacts

## 7. Maintenance, Service

The unit is maintenance free. You can clean the front panel with a damp cloth. The unit must first be disconnected.

Please take advantage of our service!

Should damages occur to your HPU 001 contrary to expectation, you have various options for maintaining the availability of your unit:

- Send unit in for repair;
- Replace unit with an as-new substitute unit.

You can get more detailed information from your PFEIFFER VACUUM representative.



Please be aware that units sent in for repair or maintenance work will be handled as per our general delivery conditions.

### Contact addresses and hotline:

Contact addresses and the telephone hotline are on the back page of this manual.

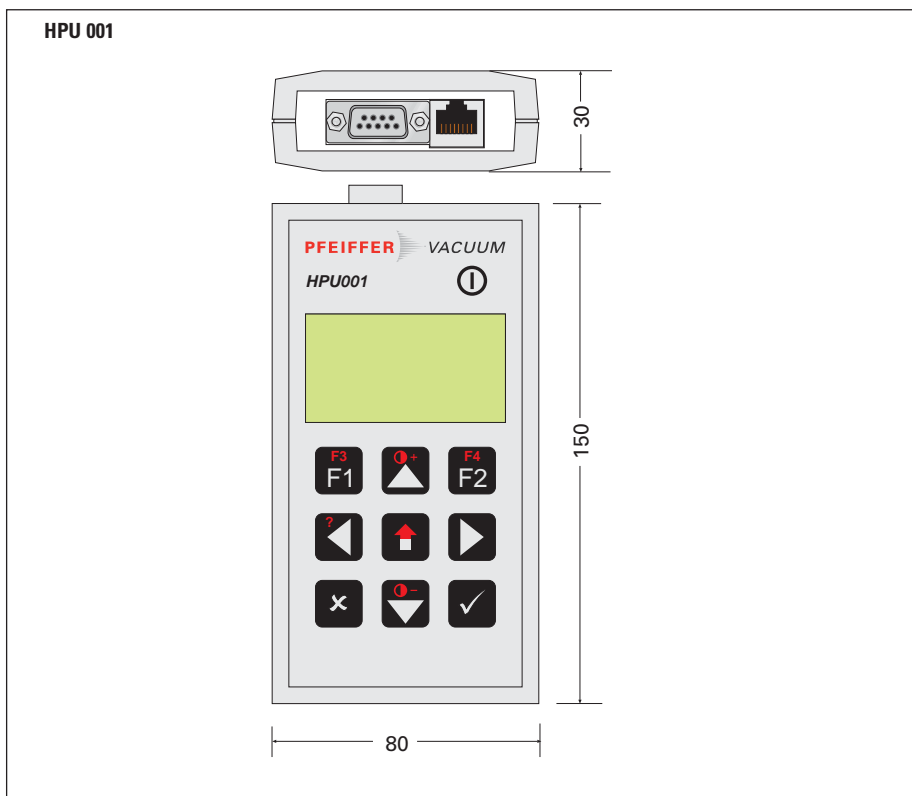
## 8. Technical Data

### 8.1. Data List

Description	Unit	HPU 001
Connection voltage	V DC	9 – 24
Power input, max.:	W	2
Permissible ambient temperature:	°C	5 – 40
Rel. humidity, max. <sup>1)</sup>	%	5 – 85
Air pressure		86 kPa – 106 kPa
Protection class:		IP 20
Weight:	kg	0.25

<sup>1)</sup> dew-free at 5-40°C

### 8.2. Dimensions



## 9. Accessories

Description	Size	Part	Number	Note
Connecting cable RJ 45-RJ 45	1 m	1	P 0998 439	
Connecting cable RJ 45-RJ 45	3 m	1	P 0993 595	
Connecting cable RJ 45-RJ 45	5 m	1	P 0993 596	
Connecting cable RJ 45-RJ 45	10 m	1	P 0993 597	
Connecting cable RJ 45-RJ 45	15 m	1	P 0993 598	
Connecting cable RJ 45-RJ 45	20 m	1	P 0993 599	
Connecting cable RJ 45-RJ 45	30 m	1	P 0998 649	
Connecting cable RJ 45-M12	3 m	1	PM 051 726 -T	
Connecting cable RJ 45-M12	10 m	1	PM 051 728 -T	
Connecting cable RJ 45-M12	20 m	1	PM 051 729 -T	
Accessory package HPU (power supply included)		1	PM 061 005 -T	

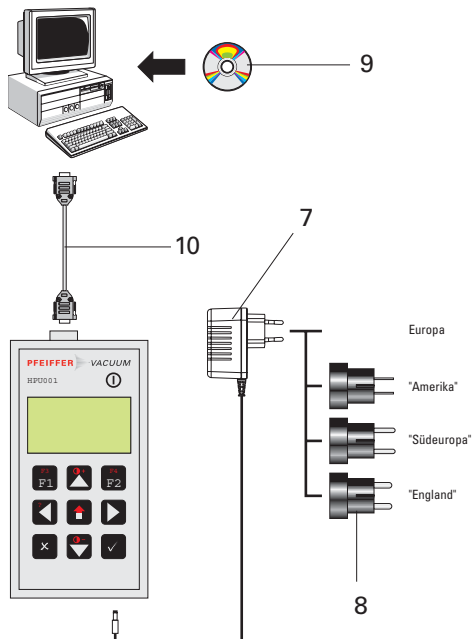
### 9.1. Accessory Package

An accessory package for connecting the external power supply is available from PFEIFFER, VACUUM consisting of:

- one power supply plug (7),
- three power supply adapter (8) : "England", "America", "Southern Europe"
- one CD (9), containing the HPU operating software
- one connecting cable (10) PC - HPU 001.

#### Accessory package HPU

- 7 Power supply plug
- 8 Power supply adapter
- 9 CD
- 10 Connecting cable



- ➔ Install the program "HPU-Communicator" by executing the "setup.exe" program on the CD (additional information please refer to the data on the CD).
- ➔ Connect PC and HPU 001 with cable.
- ➔ Connect the HPU 001 via the external power supply to the mains (if necessary use the appropriate adapter), if no battery is used.

## 10. Additional Information

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Depending on your components, additional operating instructions are included in your shipment (see Table). If any information is missing despite our careful inspection, please contact your PFEIFFER VACUUM representative or call the hotline number on the back. All operating instructions also can be accessed as PDF files.

The following operating instructions are available for the HPU 001:

<b>Product</b>	<b>No. Operating Instructions</b>
PFEIFFER Protocol	PM 800 488 BN
Pump operation with DCU	PM 800 547 BN

# Vacuum is nothing, but everything to us!



**Turbopumps**



**Rotary vane pumps**



**Roots pumps**



**Dry compressing pumps**



**Leak detectors**



**Valves**



**Components and feedthroughs**



**Vacuum measurement**



**Gas analysis**



**System engineering**



**Service**