

*Operating Instructions*

# HPU 001

---

## *Display And Operating Unit*



# Contents

Page

<b>1. Important For Your Safety</b> .....	<b>3</b>
<b>2. Getting To Know The HPU 001 Display And Operating Unit</b> .....	<b>4</b>
2.1. Orientation.....	4
2.2. Product Description.....	4
Connection Options .....	4
Authorized Use .....	4
Unauthorized Use.....	5
2.3. Front Panel .....	5
2.4. Plug Connections .....	6
2.5. Battery Compartment, Backside .....	6
<b>3. Installation</b> .....	<b>7</b>
3.1. Installation Instructions .....	7
3.2. Connection Diagram.....	7
3.2.1. Serial Interface RS 232 Connection .....	7
3.2.2. Serial Interface RS 485 Connection .....	8
<b>4. Operation</b> .....	<b>8</b>
4.1. Switching The HPU 001 On And Off.....	8
4.2. Key Allocation.....	9
4.3. Display.....	10
4.4. Setting The Contrast Of The Display .....	11
4.5. Help Function.....	11
<b>5. Menu Structure</b> .....	<b>12</b>
5.1. Parameters.....	12
5.1.1. Show Parameters .....	12
5.1.2. Options .....	14
5.2. Parameter Sets.....	15
5.3. Unit Options (HPU 001) .....	16
5.3.1. Options .....	16
5.3.2. Factory Defaults .....	16
5.3.3. About .....	16
5.3.4. Object List.....	16
<b>6. Troubleshooting</b> .....	<b>17</b>
<b>7. Maintenance, Service</b> .....	<b>17</b>
<b>8. Technical Data</b> .....	<b>18</b>
8.1. Data List.....	18
8.2. Dimensions.....	18
<b>9. Accessories</b> .....	<b>19</b>
<b>10. Additional Information</b> .....	<b>19</b>
<b>Declaration Of Conformity</b> .....	<b>Appendix</b>

## Note!

Current operating instructions can be accessed via [www.pfeiffer-vacuum.de](http://www.pfeiffer-vacuum.de) under "Infoservice".

# 1. Important For Your Safety

---

- ☞ 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.

Subject to change!

## **2. Getting To Know The HPU 001 Display And Operating Unit**

---

### **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
- Operating instructions

### **2.2. Product Description**

The HPU 001 is a display and operating unit for PFEIFFER 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 drive unit
- Battery connection, 9 V (PP3). The battery is not part of the regular shipment; it is not required for normal operation.

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 drive units and peripheries.
- Installation, commissioning, operation and maintenance requirements must be observed.

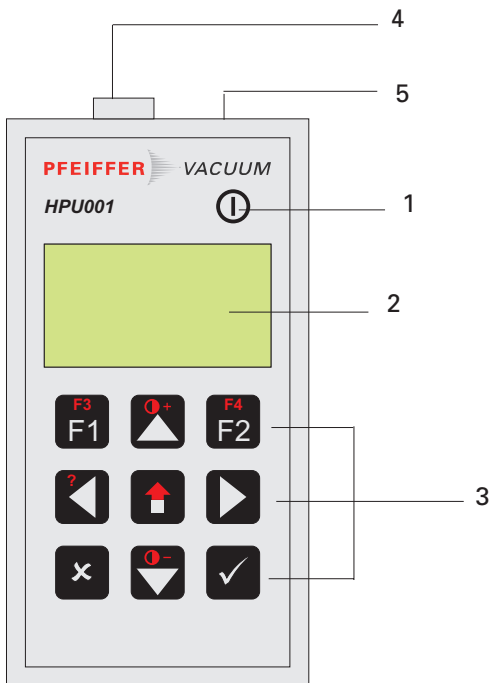
## Unauthorized use

The following applies as unauthorized use:

- Use for purposes deviating from those mentioned above, especially:
  - connection to pumps and devices not designated for such use according to their operating instructions;
  - connection to devices with accessible, conductive components.

Unauthorized use voids all liability and guarantee claims.

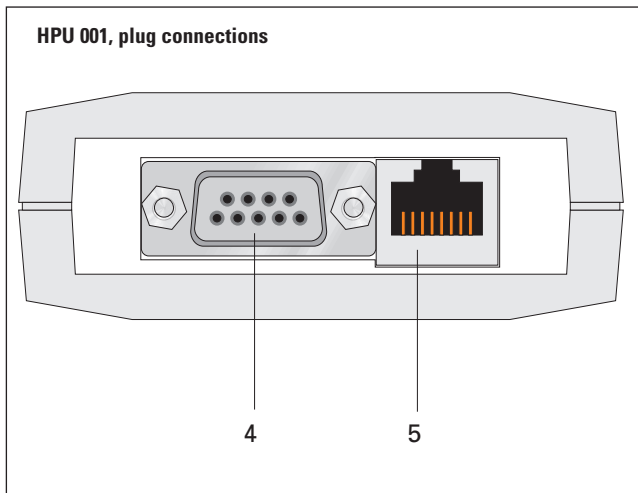
## 2.3. Front Panel



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

- 1 Switching on and off
- 2 Display
- 3 Operating and function keys
- 4 Serial interface RS 232 connection
- 5 Serial interface RS 485 connection

## 2.4. Plug Connections



- 4 RS 232 connection
- 5 RS 485 connection

## 2.5. Battery Compartment, Backside

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



## 3. Installation

### 3.1. Installation Instructions



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

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

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

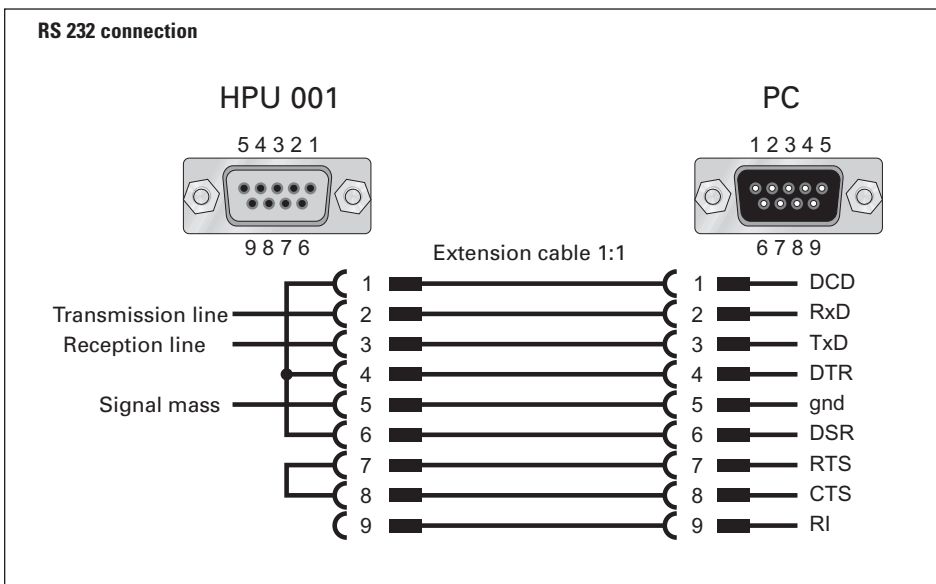
The following applies to maintenance and operating rooms that are not completely climatized:

**Temperature:** +5 °C – +40 °C.  
**Rel. humidity:** 5 – 85 %, dew-free  
**Air pressure:** 86 kPa – 106 kPa

### 3.2. Connection Diagram

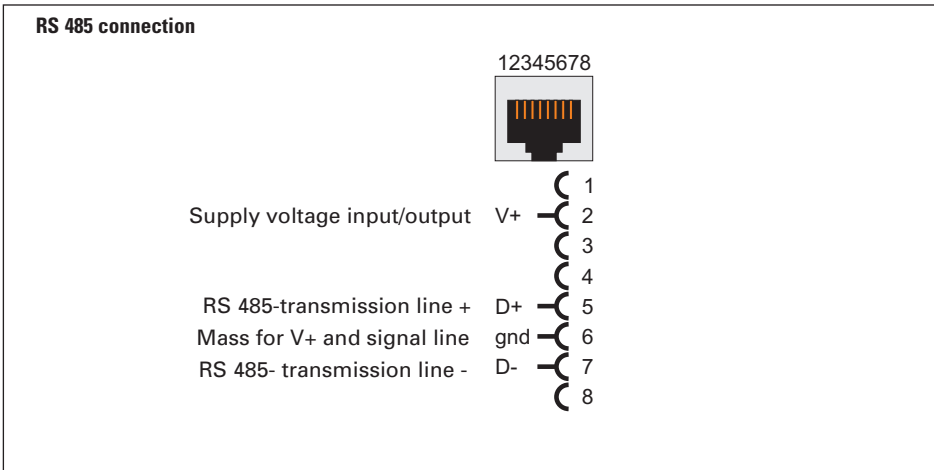
#### 3.2.1. Serial Interface RS 232 Connection

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 drive unit with the included cable as per the connection diagram.



## 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.

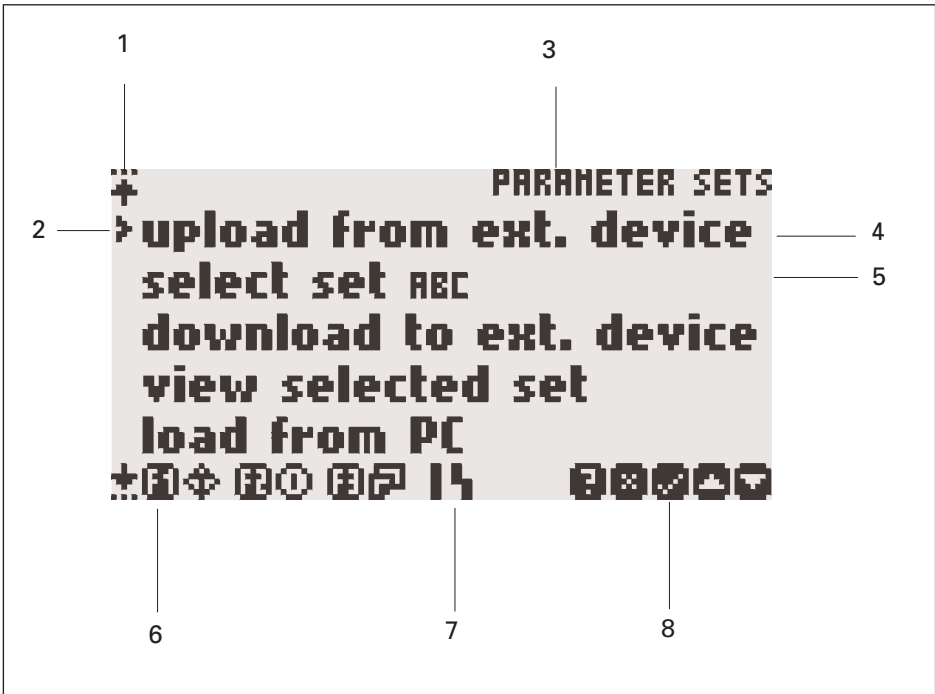
## 4.2. Key Allocation

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 , for , for + and for + ) 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 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).
 	When parameters are displayed in groups, <b>F3</b> switches between the various defined groups.
	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 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).

**in groups:** 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 "In Groups" under "Parameters/Settings/Display".  
Now the display shows only the parameters in the same group.

You can switch between the two groups with  and . The groups are preset with some parameters at delivery.

## 5.2. Parameter Sets

A parameter set is the entirety of all changeable parameters and their values or also the configuration of a unit. 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 (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.

**send to PC:** The selected parameter set can be sent to the PC and saved as a file.

## **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 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
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

## 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 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.

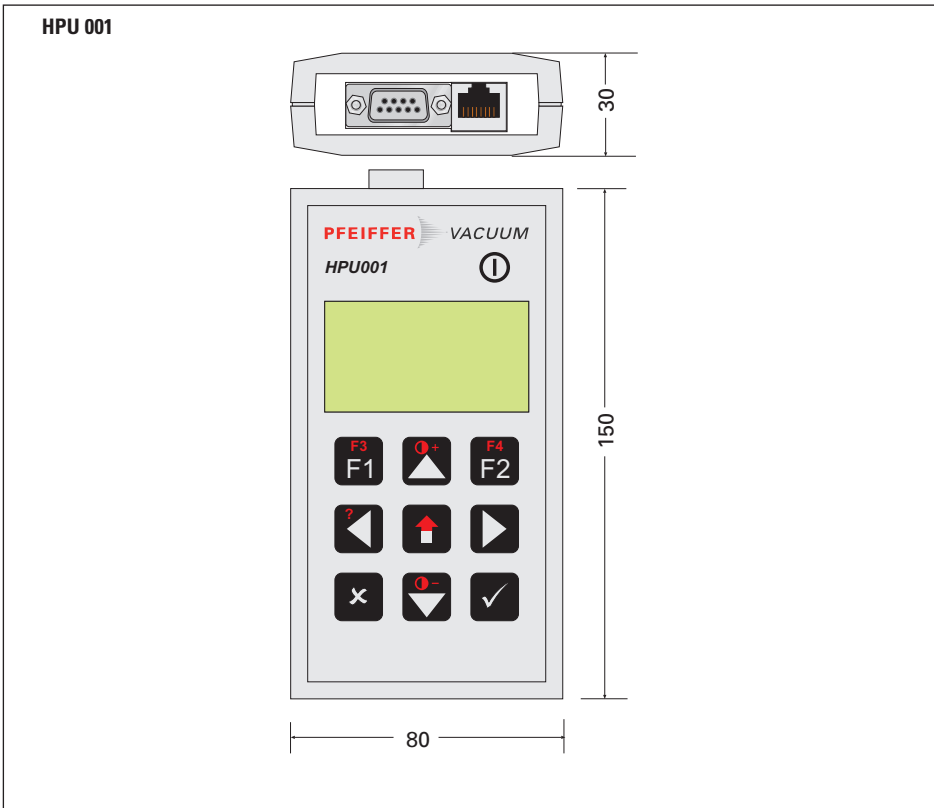
## 8. Technical Data

### 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

1) dew-free at 5-40°C

### 8.2. Dimensions



## 9. Accessories

Description	Size	Part	Number	Note
Cable	3 m	1	P 0993 595	
	5 m	1	P 0993 596	
	10 m	1	P 0993 597	
	15 m	1	P 0993 598	
	20 m	1	P 0993 599	

## 10. Additional Information

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 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:

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

**CE** **Konformitätserklärung** **CE**  
**Declaration of Conformity**

im Sinne folgender EU-Richtlinien:  
*pursuant to the following EU directives:*

- **Elektromagnetische Verträglichkeit/***Electromagnetic Compatibility* **89/336/EWG**
- **Niederspannung/***Low Voltage* **73/23/EWG**

Wir bestätigen Konformität mit der EU-Richtlinie über elektromagnetische Verträglichkeit 89/336/EWG und der EU-Niederspannungsrichtlinie 73/23/EWG.

*We hereby certify that the product specified below is in accordance with the provision of EU Electromagnetic Compatibility Directive 89/336/EEC and EU Low Voltage Directive 73/23/EEC.*

Produkt/*Product:*  
**HPU 001**

Angewendete Richtlinien, harmonisierte Normen und angewendete, nationale Normen:  
*Guidelines, harmonised standards, national standards in which have been applied:*

**EN 61010, EN 61000-4-2-6, EN 50081-2, EN 55022**

Unterschrift/*Signature:*



Pfeiffer-Vacuum GmbH  
Emmeliusstrasse 33  
35614 Asslar  
Germany

(W. Dondorf)  
Geschäftsführer  
*Managing Director*

Konf.II/2000

## Zentrale/Headquarters

Pfeiffer Vacuum GmbH

Berliner Strasse 43  
D-35614 Asslar

Telefon 06441/802-0

Telefax 06441/802-202

Hotline 06441/802-333

http://www.pfeiffer-vacuum.de

### Argentina

ARO S.A., Av. Belgrano 369,  
1092 Buenos Aires, Phone: +54 / 11 4331 5766,  
Fax: +54 / 11 4331 3572, Email: info@aroline.com.ar

### Australia

Scitek Australia Pty. Ltd., Suite 1B,  
10-18 Cliff Street, Milsons Point, NSW 2061,  
Phone: +61 / 2 9954 1925, Fax: +61 / 2 9954 1939,  
Email: contact@scitek.com.au

### Austria

Pfeiffer Vacuum Austria GmbH  
Diefenbachgasse 35, A-1150 Wien,  
Phone: +43 / 1 8941 704, Fax: +43 / 1 8941 707  
Email: office@pfeiffer-vacuum.at

### Branch Office, Czech Republic

Pfeiffer Vacuum Austria GmbH, Branch Prague  
Zvonarska 885, CZ-156 00 Praha 5  
Phone: +420/2 900 42981, Fax: +420/2 579 23014  
Email: office@pfeiffer-vacuum.cz

### Belgium / Luxemburg

Pfeiffer Vacuum Belgium N.V./S.A.  
Luxemburgstraat 5, B-9140 Temse  
Phone: +32 / 3 710 5920, Fax: +32 / 3 710 5929  
Email: Sales@pfeiffer-vacuum.be

### Brazil

Elmi Tec,  
Assistencia Técnica e Representação S/C Ltda.  
Rua Bernardino de Campos, 551-Brooklin  
CEP 04620-002 São Paulo, SP - Brasil  
Phone: +55 / 11 5532 0740, Fax: +55 / 11 5535 3598,  
Email: elmi-tec@gdv.com.br

### Chile

BERMAT S.A., Coyancura 2283, Oficina 601  
Providencia, P.O. Box 9781, Santiago  
Phone: +56 / 2 231 8877, Fax: +56 / 2 231 4294,  
Email: bermat@bermat.cl

### Colombia

Arotec Colombiana S.A., Carrera 16 No. 36-89  
P.O. Box 050 862, Santafé de Bogotá / D.C.  
Phone: +57 / 1 288 7799, Fax: +57 / 1 285 3604,  
Email: ventarot@unete.com

### Denmark

Pfeiffer Vacuum Scandinavia AB, Vesterengen 2,  
DK-2650 Taastrup, Phone: +45 / 43 52 38 00,  
Fax: +45 / 43 52 38 50, Email: sales@pfeiffer-vacuum.dk

### France

Pfeiffer Vacuum France SAS 45, rue Senouque, BP 139  
F-78531 BUC Cedex, Phone: +33 / (0)1 30 83 04 00,  
Fax: +33 / (0)1 30 83 04 04, Email: info@pfeiffer-vacu-  
um.fr

### Germany

Pfeiffer Vacuum GmbH,  
Berliner Strasse 43, D-35614 Asslar  
Phone: +49 / 6441 802 400, Fax: +49 / 6441 802 399  
Service Hotline: +49 / 6441 802 333,  
Email: Info@pfeiffer-vacuum.de

### Great Britain

Pfeiffer Vacuum Ltd.  
2-4 Cromwell Business Centre  
Howard Way, Interchange Park  
Newport Pagnell, MK16 9QS, United Kingdom  
Phone: +44 / 1 908 500615, Fax: +44 / 1 908 500616,  
Email: sales@pfeiffer-vacuum.co.uk

### Greece

Analytical Instruments S.A., 1 Mantzarou St.,  
GR-15451 Athens, Phone: +30 / 10 674 8973-7,  
Fax: +30 / 10 674 8978, Email: contact@analytical.gr

### Hong Kong

Pfeiffer Vacuum Asia Ltd., Units 06-07, 17/F,  
Workingfield Commercial Building,  
408-412 Jaffe Road, Hong Kong  
Phone: +852 2575 6688, Fax: +852 2575 6993,  
Email: sales@pfeiffer-vacuum.com.hk

### India

Pfeiffer Vacuum India Ltd., 25-E Nicholson Road,  
Tarbunde, Secunderabad 500 009,  
Phone: +91 / 40 775 0014, Fax: +91 / 40 775 7774,  
Email: pfeiffer@hd1.vsnl.net.in

### Israel

ODEM Scientific Applications Ltd.  
9 Hamazmera St., P.O. B. 2001 Nes Ziona  
Phone: +972 8 938 0333, Fax: +972 8 938 0334,  
Email: odemtd@idsn.net.il

### Italy

Pfeiffer Vacuum Italia S.p.a.  
Via San Martino, 44 I-20017 RHO (Milano)  
Phone: +39 / 2 93 99 051, Fax: +39 / 2 93 99 05 33,  
Email: contact@pfeiffer-vacuum.it

### Japan

Hakuto Co. Ltd., C.P.O. Box 25,  
Vacuum Scientific Instruments Division  
C.P.O. Box 25, Tokyo 100-91, Phone: +81 / 3 32 258 910,  
Fax: +81 / 3 32 259 011, Email: pfeiffer@hakuto.co.jp

### Korea

Pfeiffer Vacuum Korea Ltd.,  
703 Ho, 843-1, Hankuk Mulru, Dongchonri, Suzi-Eup,  
449-843 Yong-in City, Kyungkido,  
Phone: +82 / 31 266 0741, Fax: +82 / 31 266 0747,  
Email: sales@pfeiffer-vacuum.co.kr

### Netherlands

Pfeiffer Vacuum Nederland BV  
Veldzigt 30a, NL-3454 PW De Meern,  
Phone: +31 / 30 6666050, Fax: +31 / 30 6662794,  
Email: Sales@pfeiffer-vacuum.nl

### Peru

Ing. E. Brammertz s.r.l., José Pardo 182, Apartado 173,  
PE-18 Miraflores, Phone: +51 / 1 445 8178,  
Fax: +51 / 1 445-1931, Email: braming@terra.com.pe

### Poland

Softrade Sp.z.o.o. ul. Grunwaldzka 391,  
PL-60-173 Poznan, Phone: +48 / 61 8677 168,  
Fax: +48 / 61 8677 111, Email: softrade@softrade.com.pl

### Portugal

Unilaser Lda, Taguspark, Núcleo Central, sala n.º 268,  
Estrada Cacém Porto Salvo, P-2780 Oeiras  
Phone: +351 / 1 421 7733, Fax: +351 / 1 421 7744,  
Email: unilaser@taguspark.pt

### Singapore

APP Systems Services Pte Ltd, 11, Toh Guan Road  
East,  
#03-01 APP Enterprise Building, Singapore 608603,  
Phone: +65 / 6452 6611, Fax: +65 / 6560 6616,  
Email: sales@appsystems.com.sg

### Spain

Tecnovac, Tecnología de Vacío S.L., Sector Literatos,  
38 - Local 1, ES-28760 Tres Cantos (Madrid),  
Phone: +34 / 91 804 11 34, Fax: +34 / 91 804 30 91,  
Email: tecnovac@tecnovac.es

### Sweden

Pfeiffer Vacuum Scandinavia AB  
Johanneslundsvägen 3  
SE-194 61 Upplands Väsby, Phone: +46 / 8 590 748 10,  
Fax: +46 / 8 590 748 88, Email: sales@pfeiffer-vacuum.se

### Switzerland

Pfeiffer Vacuum Schweiz S.A.  
Föhrliwegstrasse 30, CH-8005 Zürich  
Phone: +41 / 1 444 2255, Fax: +41 / 1 444 2266  
Email: info@pfeiffer-vacuum.ch

### South Africa

Labotec Pty Ltd., P.O. Box 6553,  
Halfway House, 1685 Midrand  
Phone: +27 / 11 315 5434, Fax: +27 / 11 315 5882,  
Email: sales@labotec.co.za

### Taiwan

HAKUTO Taiwan Ltd. Hsinchu office No. 103,  
Hsien Chen 11th Street, Chupei,  
HsinChu County, Taiwan, R.O.C. (zip/postal code: 320)  
Phone: +886 / 3 554 1020, Fax: +886 / 3 554 0867,  
Email: leo-shih@hakuto.com.tw

### Thailand

Hakuto (Thailand) Ltd.  
18th Floor, Chokchai Int'l Bldg.  
690 Sukhumvit Road, Klongton, Klongtoey, Bangkok  
10110  
Phone: +662 / 259 6244, Fax: +662 / 259 6243,  
Email: tmgroup@hakutothailand.com

### U.S.A.

Pfeiffer Vacuum, Inc.  
24 Trafalgar Square  
Nashua, NH 03063-1988, USA  
Phone: +1 / 603 578 6500, Fax: +1 / 603 578 6500,  
Email: contact@pfeiffer-vacuum.com

### Venezuela

Secotec S.A., Apartado 3452, Caracas 1010-A,  
Phone: +58 / 212 573 8687, Fax: +58 / 212 573 1932,  
Email: secotec@cantv.net

### Other countries

AVI - Applied Vacuum Industries GmbH  
Legienstrasse 17A; CH-7320 Sargans  
Switzerland  
Phone: +41 / 81 710 03 80  
Fax: +41 / 81 710 03 81  
Email: avi@gbuewien.ch

### Scope of represented countries

Armenia, Azerbaijan, Bangladesh, Belarus, Bulgaria,  
Cambodia, Estonia, Georgia, Kazakhstan, Kingdom of  
Nepal, Kirghizia, Latvia, Lithuania, Maldiva,  
Philippines, P.R. China, Rumania, Russia, Tajikistan,  
Turkmenistan, Ukraine, Uzbekistan, Vietnam

### A.E.M.S.

Advanced Equipment Materials and Systems  
P.O. Box 25  
Föhrenweg 18  
FL-9496 Balzers  
Phone: +423 / 380 0550  
Fax: +423 / 380 0551  
Email: aems@adon.li

### Scope of represented countries

Bahrain, Egypt, Iraq, Iran, Jordan, Kuwait, Lebanon,  
Lybia, Oman, Pakistan, Saudi-Arabia, Sudan, Syria,  
Turkey, United Arab Emirates, Yemen