

# OPERATING INSTRUCTIONS

EN

Translation of the Original

## HIPACE

Air cooling

---

## Dear customer,

Thank you for choosing a Pfeiffer Vacuum product. Your new Pfeiffer Vacuum accessory should support you in your individual application with full performance and without malfunctions. The name Pfeiffer Vacuum stands for high-quality vacuum technology, a comprehensive and complete range of top-quality products and first-class service. With this expertise, we have acquired a multitude of skills contributing to an efficient and secure implementation of our product.

Knowing that our product must not interfere with your actual work, we are convinced that our product offers you the solution that supports you in the effective and trouble-free execution of your individual application.

Please read these operating instructions before putting your product into operation for the first time. If you have any questions or suggestions, please feel free to contact [info@pfeiffer-vacuum.de](mailto:info@pfeiffer-vacuum.de).

Further operating instructions from Pfeiffer Vacuum can be found in the [Download Center](#) on our website.

## Disclaimer of liability

These operating instructions describe all models and variants of your product. Note that your product may not be equipped with all features described in this document. Pfeiffer Vacuum constantly adapts its products to the latest state of the art without prior notice. Please take into account that online operating instructions can deviate from the printed operating instructions supplied with your product.

Furthermore, Pfeiffer Vacuum assumes no responsibility or liability for damage resulting from the use of the product that contradicts its proper use or is explicitly defined as foreseeable misuse.

## Copyright

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We reserve the right to make changes to the technical data and information in this document.

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# 1 About this manual



**IMPORTANT**

Read carefully before use.  
Keep the manual for future consultation.

## 1.1 Validity

This operating instructions is a customer document of Pfeiffer Vacuum. The operating instructions describe the functions of the named product and provide the most important information for the safe use of the device. The description is written in accordance with the valid directives. The information in this operating instructions refers to the product's current development status. The document shall remain valid provided that the customer does not make any changes to the product.

### 1.1.1 Applicable documents

Designation	Document
Declaration of conformity	(Component of these instructions)

Tbl. 1: Applicable documents

### 1.1.2 Variants

**24 V DC versions**

- HiPace 30
- HiPace 60 P
- HiPace 80
- SplitFlow 50/80
- HiPace 300
- HiPace 350
- HiPace 400
- HiPace 450
- HiPace 700
- HiPace 800

**115/230 V AC versions**

- HiPace 60 P
- HiPace 80
- SplitFlow 50/80
- HiPace 300
- HiPace 400
- HiPace 700
- HiPace 800
- HiPace 1200
- HiPace 1500
- HiPace 2300

Tbl. 2: Air cooling versions

## 1.2 Target group

This operating instructions is intended for persons who

- install,
- operate,

The work described in this document may be carried out only by people who have completed suitable technical training (experts), or who have received equivalent training from Pfeiffer Vacuum.

## 1.3 Conventions

### 1.3.1 Instructions in the text

Usage instructions in the document follow a general structure that is complete in itself. The required action is indicated by an individual step or multi-part action steps.

**Individual action step**

A horizontal, solid triangle indicates the only step in an action.

- ▶ This is an individual action step.

### Sequence of multi-part action steps

The numerical list indicates an action with multiple necessary steps.

1. Step 1
2. Step 2
3. ...

## 1.3.2 Pictographs

Pictographs used in the document indicate useful information.



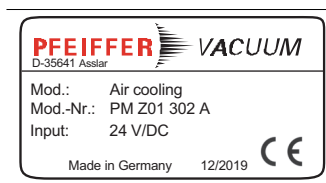

Note



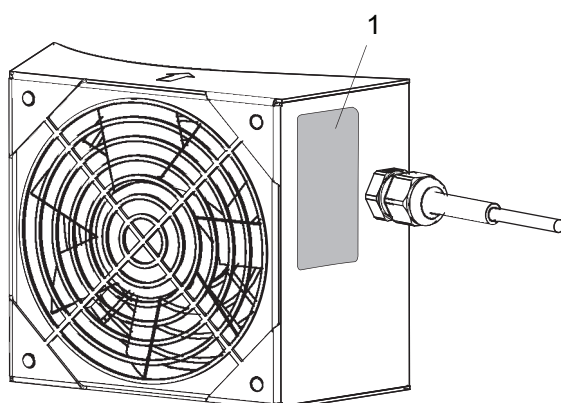
Tip

## 1.3.3 Stickers on the product

This section describes all the stickers on the product along with their meaning.

 <p><b>PFEIFFER</b> <i>VACUUM</i> D-35641 Asslar</p> <p>Mod.: Air cooling Mod.-Nr.: PM Z01 302 A Input: 24 V/DC</p> <p>Made in Germany 12/2019 </p>	<p><b>Rating plate (example)</b> The rating plate is located on the fan housing</p>
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**Tbl. 3:** Stickers on the product



**Fig. 1:** Position of the sticker on the product

- 1 Rating plate

## 2 Safety

### 2.1 General safety information

The following 4 risk levels and 1 information level are taken into account in this document.

<b>⚠ DANGER</b>		
<p><b>Immediately pending danger</b>                  Indicates an immediately pending danger that will result in death or serious injury if not observed.</p> <ul style="list-style-type: none"> <li>▶ Instructions to avoid the danger situation</li> </ul>		
<b>⚠ WARNING</b>		
<p><b>Potential pending danger</b>                  Indicates a pending danger that could result in death or serious injury if not observed.</p> <ul style="list-style-type: none"> <li>▶ Instructions to avoid the danger situation</li> </ul>		
<b>⚠ CAUTION</b>		
<p><b>Potential pending danger</b>                  Indicates a pending danger that could result in minor injuries if not observed.</p> <ul style="list-style-type: none"> <li>▶ Instructions to avoid the danger situation</li> </ul>		
<b>NOTICE</b>		
<p><b>Danger of damage to property</b>                  Is used to highlight actions that are not associated with personal injury.</p> <ul style="list-style-type: none"> <li>▶ Instructions to avoid damage to property</li> </ul>		
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center; vertical-align: middle;"><b>i</b></td> <td>Notes, tips or examples indicate important information about the product or about this document.</td> </tr> </table>	<b>i</b>	Notes, tips or examples indicate important information about the product or about this document.
<b>i</b>	Notes, tips or examples indicate important information about the product or about this document.	

### 2.2 Safety instructions

All safety instructions in this document are based on the results of the risk assessment carried out in accordance with Low Voltage Directive 2014/35/EU. Where applicable, all life cycle phases of the product were taken into account.

#### Risks during installation

<b>⚠ DANGER</b>
<p><b>Danger to life from electric shock</b>                  Contact with exposed and live elements generate an electric shock. Incorrect connection of the mains supply leads to the risk of live housing parts that can be touched. There is a risk to life.</p> <ul style="list-style-type: none"> <li>▶ Before the installation, check that the connection leads are voltage-free.</li> <li>▶ Make sure that electrical installations are only carried out by qualified electricians.</li> <li>▶ Provide adequate grounding for the device.</li> <li>▶ After connection work, do a PE conductor check.</li> </ul>
<b>⚠ WARNING</b>
<p><b>Risk of fatal injury due to electric shock on account of incorrect installation</b>                  The device's power supply uses life-threatening voltages. Unsafe or improper installation can lead to life-threatening situations from electric shocks obtained from working with or on the unit.</p> <ul style="list-style-type: none"> <li>▶ Ensure safe integration into an emergency off safety circuit.</li> <li>▶ Do not carry out your own conversions or modifications on the unit.</li> </ul>



## 2.3 Safety precautions



### Duty to provide information on potential dangers

The product holder or user is obliged to make all operating personnel aware of dangers posed by this product.

Every person who is involved in the installation, operation or maintenance of the product must read, understand and adhere to the safety-related parts of this document.



### Infringement of conformity due to modifications to the product

The Declaration of Conformity from the manufacturer is no longer valid if the operator changes the original product or installs additional equipment.

- Following the installation into a system, the operator is required to check and re-evaluate the conformity of the overall system in the context of the relevant European Directives, before commissioning that system.

### General safety precautions when handling the product

- ▶ Observe all applicable safety and accident prevention regulations.
- ▶ Check that all safety measures are observed at regular intervals.
- ▶ Recommendation: Establish a secure connection to the earthed conductor (PE); protection class I.
- ▶ Never disconnect plug connections during operation.
- ▶ Keep lines and cables away from hot surfaces (> 70 °C).
- ▶ Do not carry out your own conversions or modifications on the unit.
- ▶ Observe the unit protection category prior to installation or operation in other environments.

## 2.4 Product usage limits

Parameter	Air cooling
Permissible ambient temperature with heating	max. +35 °C <sup>1)</sup>
Ambient temperature	max. +12 °C to +40 °C
Protection degree	IP20
Relative air humidity	≤ 85 % not condensing

Tbl. 4: Permissible ambient and operating conditions

## 2.5 Proper use

- ▶ Use the air cooling exclusively for the cooling of Pfeiffer Vacuum turbopumps in ambient temperatures up to a max. 35 °C.
- ▶ Adhere to the installation, commissioning, operating, and maintenance instructions.
- ▶ Do not use any accessory parts other than those recommended by Pfeiffer Vacuum.
- ▶ Always use air cooling rather than water cooling for processes with a lower gas throughput and good fore-vacuum pressure.

## 2.6 Foreseeable misuse

Improper use of the product invalidates all warranty and liability claims. Any use that is counter to the purpose of the product, whether intentional or unintentional, is regarded as improper use, in particular:

- Connection to pumps or equipment which are not suitable for this purpose according to their operating instructions
- Connection to equipment with exposed live parts

1) Water cooling is required for higher temperatures

## 2.7 Personnel qualification

The work described in this document may only be carried out by persons who have appropriate professional qualifications and the necessary experience or who have completed the necessary training as provided by Pfeiffer Vacuum.

### Training people

1. Train the technical personnel on the product.
2. Only let personnel to be trained work with and on the product when under the supervision of trained personnel.
3. Only allow trained technical personnel to work with the product.
4. Before starting work, make sure that the commissioned personnel have read and understood these operating instructions and all applicable documents, in particular the safety, maintenance and repair information.

## 3 Product description

### 3.1 Function

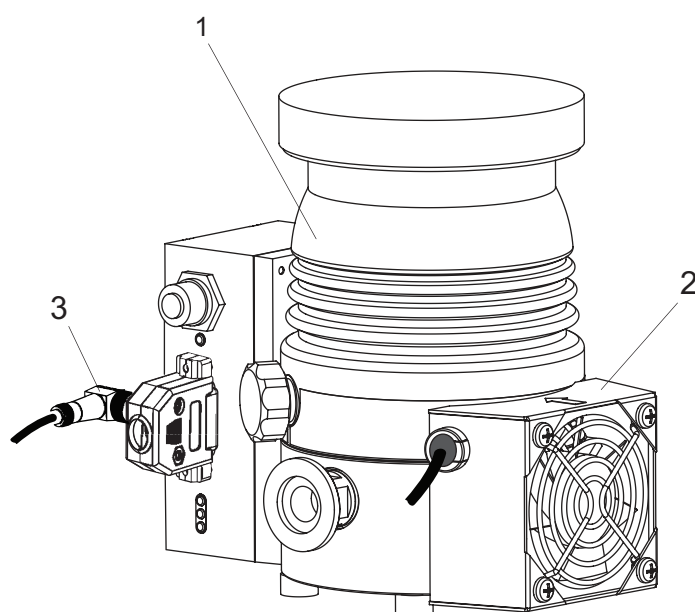
For processes with lower gas throughput and good fore-vacuum pressure, air cooling can be used instead of water cooling.

The air cooling for 24 V DC is connected to the respective electronic drive unit and then supplied with voltage from here. Configurations with a connection for mains voltage (115/230 V AC) feature an open cable connection for arbitrary convection.



#### Operational conditions for the air cooling

The use of air cooling is permitted up to a permissible ambient temperature of +35 °C.



**Fig. 2: Layout of air cooling**

- |               |                                   |
|---------------|-----------------------------------|
| 1 Turbopump   | 3 Control cable power supply plug |
| 2 Air cooling |                                   |

### 3.2 Identifying the product

- ▶ To ensure clear identification of the product when communicating with Pfeiffer Vacuum, always keep all of the information on the rating plate to hand.

### 3.3 Scope of delivery

The scope of delivery includes the following parts:

- Air cooling
- Mounting bracket (relative to type)
- Mounting kit (separate package)
- Operating instructions

## 4 Installation

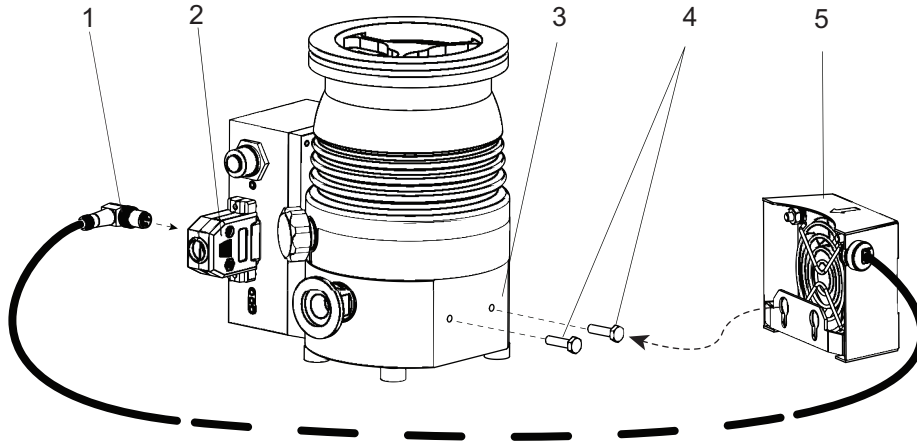
### 4.1 Connecting the air cooling for 24 V DC

**Prerequisites**

- Turbopump switched off and vented

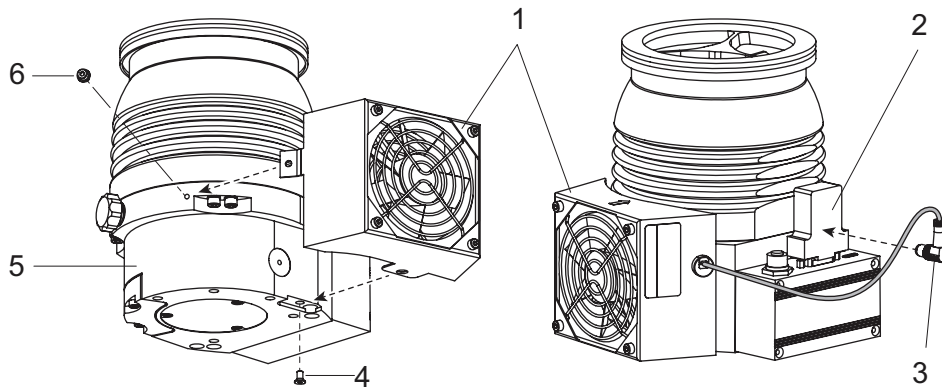
**Required tools**

- Open-end wrench, **WAF 7**
- Allen key, **WAF 2.5**
- Allen key, **WAF 3**



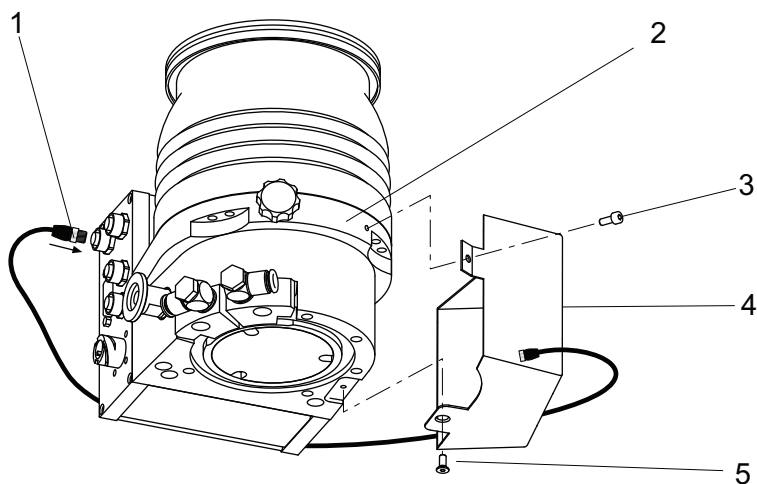
**Fig. 3: Connecting the air cooling to HiPace 30, HiPace 80, HiPace 60 P and SplitFlow 50**

- |   |                          |
|---|--------------------------|
| 1 Control cable connector plug                        | 4 Hexagon head set screw |
| 2 15-pin D Sub plug on multi-function connection "X3" | 5 Air cooling            |
| 3 Pump bottom part                                    |                          |



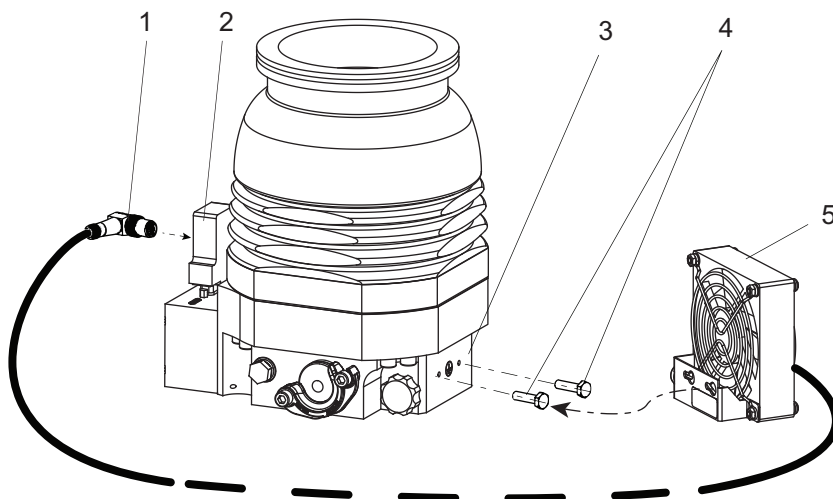
**Fig. 4: Connecting the air cooling to HiPace 300 with TC 110/TC 120**

- |   |                                 |
|---|---------------------------------|
| 1 Air cooling   | 4 Countersink screw             |
| 2 15-pin D Sub plug on multi-function connection "X3" | 5 Pump bottom part              |
| 3 Control cable connector plug                        | 6 Interior hexagon socket screw |



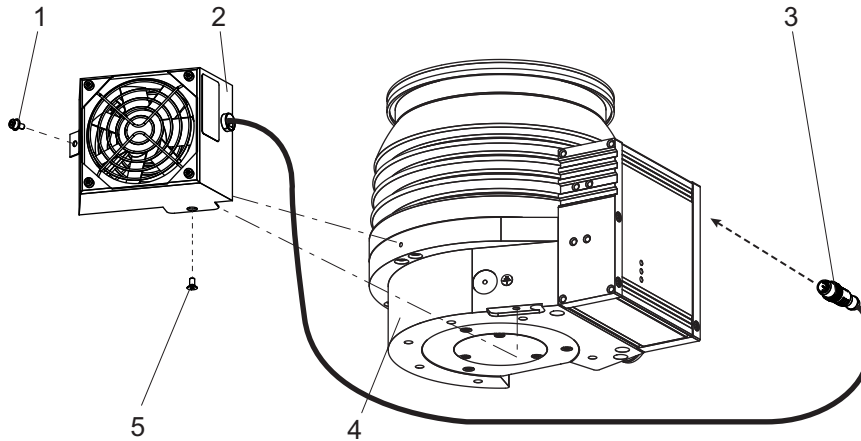
**Fig. 5: Connecting the air cooling to HiPace 300 with TC 400**

- |                                 |                     |
|---------------------------------|---------------------|
| 1 Control cable connector plug  | 4 Air cooling       |
| 2 Pump bottom part              | 5 Countersunk screw |
| 3 Interior hexagon socket screw |                     |



**Fig. 6: Connecting the air cooling to HiPace 350 and HiPace 450**

- |   |                          |
|---|--------------------------|
| 1 Control cable connector plug                        | 4 Hexagon head set screw |
| 2 15-pin D Sub plug on multi-function connection "X3" | 5 Air cooling            |
| 3 Pump bottom part                                    |                          |



**Fig. 7: Connecting the air cooling to HiPace 400, HiPace 700 and HiPace 800**

- |                                 |                     |
|---------------------------------|---------------------|
| 1 Interior hexagon socket screw | 4 Pump bottom part  |
| 2 Air cooling                   | 5 Countersink screw |
| 3 Control cable connector plug  |                     |

**Procedure**

1. Attach the air cooling to the pump bottom part using the screws from the mounting kit.
2. Screw the control cable of the air cooling valve into a vacant accessory connection on the electronic drive unit.
3. If necessary, configure the accessory output for the air cooling via the interfaces of the electronic drive unit.
  - The specification for the air cooling is "accessory A1".

## 4.2 Connecting the air cooling for 115/230 V AC

**⚠ DANGER**

**Danger to life from electric shock**

Contact with exposed and live elements generate an electric shock. Incorrect connection of the mains supply leads to the risk of live housing parts that can be touched. There is a risk to life.

- ▶ Before the installation, check that the connection leads are voltage-free.
- ▶ Make sure that electrical installations are only carried out by qualified electricians.
- ▶ Provide adequate grounding for the device.
- ▶ After connection work, do a PE conductor check.

**⚠ WARNING**

**Risk of fatal injury due to electric shock on account of incorrect installation**

The device's power supply uses life-threatening voltages. Unsafe or improper installation can lead to life-threatening situations from electric shocks obtained from working with or on the unit.

- ▶ Ensure safe integration into an emergency off safety circuit.
- ▶ Do not carry out your own conversions or modifications on the unit.

**NOTICE**

**Property damage due to incorrect polarity**

Incorrect or excessive supply voltage will destroy the air cooling.

- ▶ Always observe the rating plate specifications.
- ▶ When connecting the supply cable, observe the colored marking on the corresponding wires.
- ▶ Always provide a suitable mains fuse.

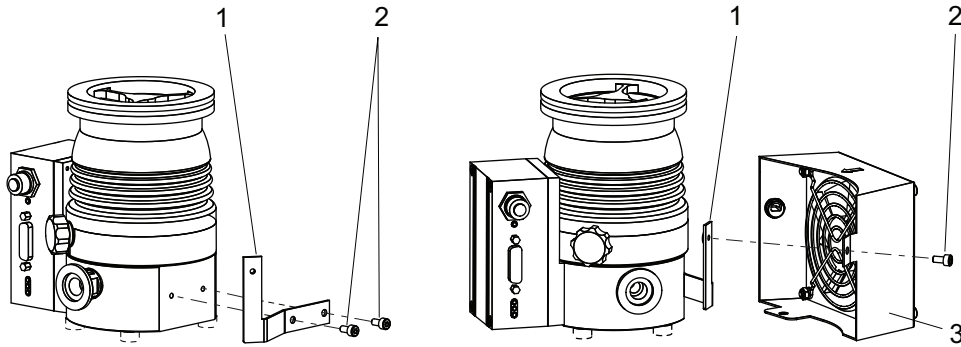
## 4.2.1 Connecting the air cooling for HiPace 60 P, HiPace 80, and SplitFlow 50

### Prerequisites

- Turbopump switched off and flooded

### Required tools

- Allen key, **WAF 2.5**
- Allen key, **WAF 3**

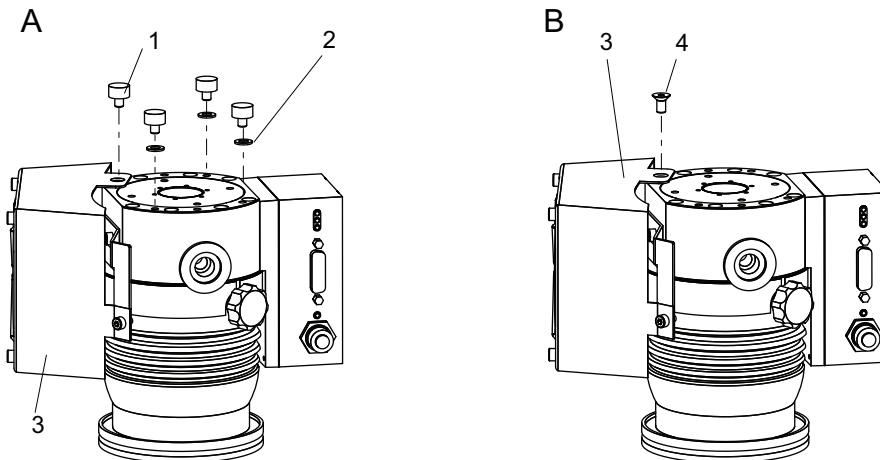


**Fig. 8: Fitting the mounting bracket for air cooling**

- 1 Mounting bracket  
2 Interior hexagon socket screw  
3 Air cooling

### Fitting the mounting bracket

1. Screw the mounting bracket onto the pump bottom part with 2 interior hexagon socket screws.
2. Attach the fan housing to the mounting bracket.



**Fig. 9: Mounting the air cooling onto the bottom part**

- 1 Rubber foot  
2 Washer

### Mounting the air cooling onto the bottom part

The method of mounting onto the pump bottom part differs depending on whether rubber feet are being used.

1. **A: Mounting with rubber feet:** Secure the fan housing using one rubber foot without washer.
2. Level the 3 remaining rubber feet with a washer inserted for each.
3. **B: Mounting without rubber feet:** Attach the fan housing with the countersunk screw.

## 4.2.2 Establishing mains connection

### Procedure

1. Attach the air cooling to the pump bottom part in accordance with the 24 V/DC variants of the same pump type.
2. If necessary, configure the accessory output for the air cooling via the interfaces of the electronic drive unit.
  - The specification for the air cooling is "accessory A1".

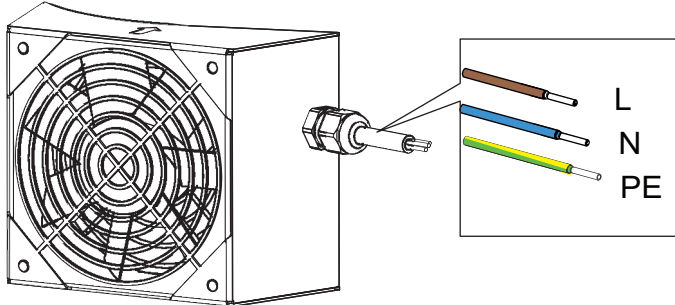


Fig. 10: Mains connection

### Procedure

- ▶ Ensure the correct supply voltage.
- ▶ Configure the open cable connection according to the mains voltage specified on the rating plate.
- ▶ Always ensure a secure connection to the earthed conductor (PE), protection class I.

## 4.3 Connecting the air cooling, 24 V DC for TeleTC



### Recommended use of air cooling on the electronic drive unit

With commensurate ambient temperatures, Pfeiffer Vacuum recommends that an additional air cooling be fitted on the TC of the turbopump.

- Use the Y-distributor from the range of accessories as a connection for the air cooling.

### Required tools

- Open-end wrench, **WAF 7**
- Allen key, **WAF 3**

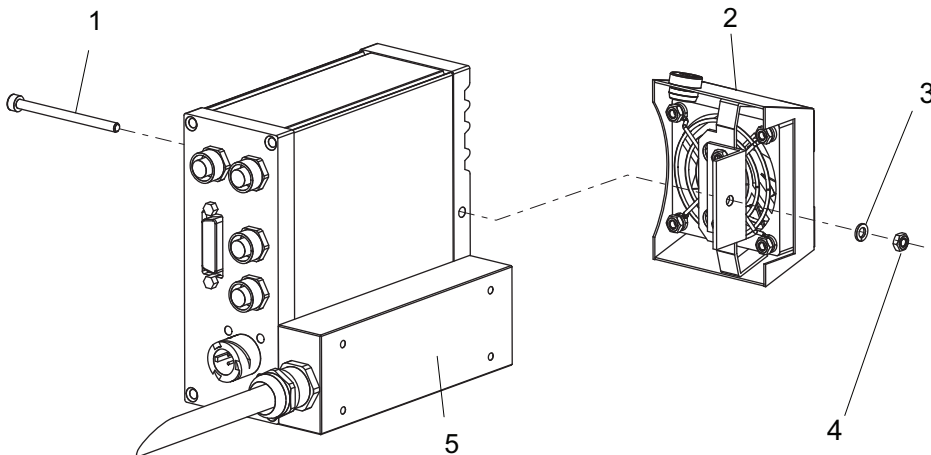


Fig. 11: Mounting the air cooling to the electronic drive unit TC 400

- |                                 |               |
|---------------------------------|---------------|
| 1 Interior hexagon socket screw | 4 Hexagon nut |
| 2 Air cooling                   | 5 TC adapter  |
| 3 Lock washer                   |               |



**Procedure**

1. Attach the air cooling at the upper bore of the electronic drive unit using the installation materials (separate package) and the interior hexagon socket screw.
2. Screw the control cable of the air cooling valve into a vacant accessory connection on the electronic drive unit.
3. Use the Y-distributor from the accessories should you wish to connect multiple devices.
4. If necessary, configure the accessory output for the air cooling via the interfaces of the electronic drive unit.
  - The specification for the air cooling is "accessory A1".

## 5 Operation

Important settings and function-related variables are programmed ex factory as parameters in the vacuum pump electronic drive unit. Each parameter has a three-digit number and a description. Parameter-driven operation and control is supported via Pfeiffer Vacuum displays and control units, or externally via RS-485 using Pfeiffer Vacuum protocol.

Parameter	Name	Designation	Adjustment/comment
[P:035]	CfgAccA1	Accessory connection A1	0 = fan (continuous operation) 4 = fan (temperature controlled)
[P:330]	TempPmpBot	Pump lower part temperature	Factory setting for respective pump, for status requests only (readable)
[P:342]	TempBearng	Bearing temperature	

**Tbl. 5: Parameter settings in the electronic drive unit of the turbopump**

### Information regarding commissioning of the turbopump with air cooling

- ▶ **Continuous operation:** The fan runs in continuous operation as soon as voltage is supplied.
- ▶ **Temperature controlled:** The fan runs according to the switch point settings ex factory.

## 6 Service solutions by Pfeiffer Vacuum

### We offer first-class service

High vacuum component service life, in combination with low downtime, are clear expectations that you place on us. We meet your needs with efficient products and outstanding service.

We are always focused on perfecting our core competence – servicing of vacuum components. Once you have purchased a product from Pfeiffer Vacuum, our service is far from over. This is often exactly where service begins. Obviously, in proven Pfeiffer Vacuum quality.

Our professional sales and service employees are available to provide you with reliable assistance, worldwide. Pfeiffer Vacuum offers an entire range of services, from [original replacement parts](#) to [service contracts](#).

### Make use of Pfeiffer Vacuum service

Whether preventive, on-site service carried out by our field service, fast replacement with mint condition replacement products, or repair carried out in a [Service Center](#) near you – you have various options for maintaining your equipment availability. You can find more detailed information and addresses on our homepage, in the [Pfeiffer Vacuum Service](#) section.

**You can obtain advice on the optimal solution for you, from your [Pfeiffer Vacuum representative](#).**

**For fast and smooth service process handling, we recommend the following:**



1. Download the up-to-date form templates.
  - [Explanations of service requests](#)
  - [Service requests](#)
  - [Contamination declaration](#)



- a) Remove and store all accessories (all external parts, such as valves, protective screens, etc.).
  - b) If necessary, drain operating fluid/lubricant.
  - c) If necessary, drain coolant.
2. Complete the service request and contamination declaration.



3. Send the forms by email, fax, or post to your local [Service Center](#).

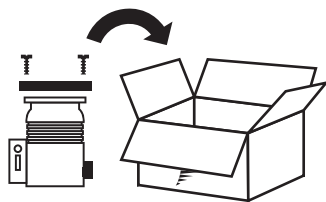


4. You will receive an acknowledgment from Pfeiffer Vacuum.

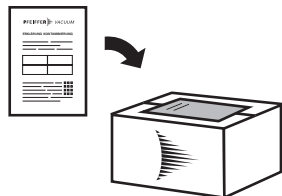
PFEIFFER VACUUM

### Submission of contaminated products

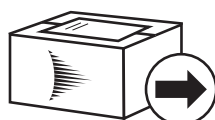
No microbiological, explosive, or radiologically contaminated products will be accepted. Where products are contaminated, or the contamination declaration is missing, Pfeiffer Vacuum will contact you before starting service work. Depending on the product and degree of pollution, **additional decontamination costs** may be incurred.



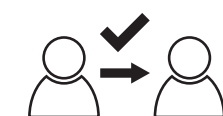
5. Prepare the product for transport in accordance with the provisions in the contamination declaration.
  - a) Neutralize the product with nitrogen or dry air.
  - b) Seal all openings with blind flanges, so that they are airtight.
  - c) Shrink-wrap the product in suitable protective foil.
  - d) Package the product in suitable, stable transport containers only.
  - e) Maintain applicable transport conditions.



6. Attach the contamination declaration to the **outside** of the packaging.



7. Now send your product to your local Service Center.



8. You will receive an acknowledgment/quotation, from Pfeiffer Vacuum.

PFEIFFER VACUUM

Our sales and delivery conditions and repair and maintenance conditions for vacuum devices and components apply to all service orders.

## 7 Technical data and dimensions

### 7.1 Technical data

Classification	Air Cooling	Air Cooling	Air Cooling
Part number	PM Z01 300	PM Z01 301	PM Z01 348
Pump	HiPace 60   HiPace 80   Split-Flow 50/80	HiPace 300/450	HiPace 30
Electronic drive unit	TC 110, TC 120, TCP 350	TC 110, TC 120, TCP 350	TC 110, TC 120
Control voltage	24 V DC	24 V DC	24 V DC
Electrical connection	M8	M8	M8

**Tbl. 6: Air cooling with M8 connecting thread unshielded, 24 V DC**

Classification	Air Cooling, shielded	Air cooling, shielded	Air cooling, shielded
Part number	PM Z01 373	PM Z01 360	PM Z01 361
Pump	HiPace® 350/450	SplitFlow 50/80, HiPace 60P, HiPace 80	HiPace 300
Electronic drive unit	TC 110, TC 120	TC 110, TC 120, TCP 350	TC 110, TC 120, TCP 350
Control voltage	24 V DC	24 V DC	24 V DC
Electrical connection	M8	M8	M8

**Tbl. 7: Air cooling with M8 connecting thread shielded, 24 V DC**

Classification	Air Cooling	Air Cooling	Air cooling, shielded	Air cooling, shielded	Air Cooling, shielded
Part number	PM Z01 302	PM Z01 303	PM Z01 362	PM Z01 363	PM Z01 374
Pump	HiPace 300	HiPace 400/700/800	HiPace 300	HiPace 400/700/800   HiPace 300 M/700 M/800 M	HiPace® 350/450
Electronic drive unit	TC 400, TCP 350	TC 400, TCP 350	TC 400 PB, TCP 350	TC 400 PB, TCP 350, TM 700	TC 400, TCP 350
Control voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Electrical connection	M12	M12	M12	M12	M12

**Tbl. 8: Air coolings with M12 connecting thread, 24 V DC**

Classification	Air Cooling	Air Cooling	Air Cooling	Air Cooling
Part number	PM Z01 308	PM Z01 309	PM Z01 342	PM Z01 341
Pump	HiPace 300	HiPace 300	HiPace 400/700/800	HiPace 400/700/800
Mains connection: Voltage	115 V	230 V	115 V	230 V

**Tbl. 9: Air coolings 115/230 V/AC**

Classification	Air Cooling	Air Cooling
Part number	PM Z01 343	PM Z01 344
Pump	HiPace 60 P   HiPace 80   Split-Flow 50/80	HiPace 60 P   HiPace 80   Split-Flow 50/80
Mains connection: Voltage	230 V	115 V

Tbl. 10: Air coolings 115/230 V/AC

## 7.2 Dimensions

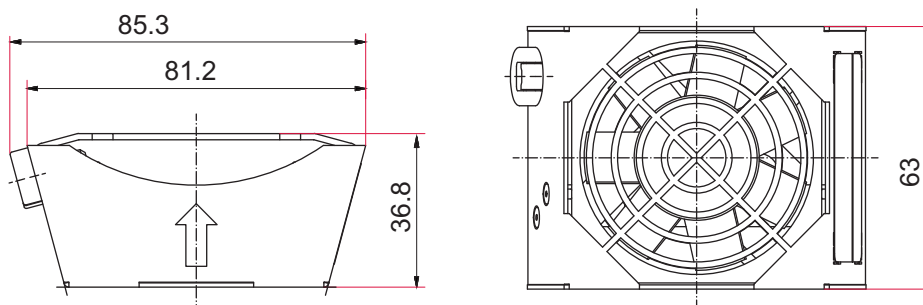


Fig. 12: Dimensions PM Z01 300 A | PM Z01 360 A | PM Z01 348

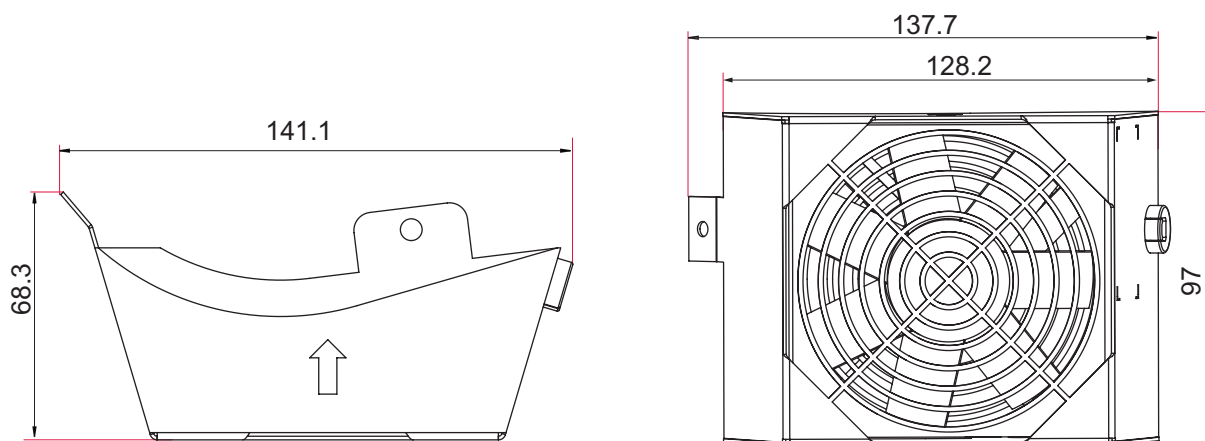


Fig. 13: Dimensions PM Z01 301 A | PM Z01 302 A | PM Z01 361 A | PM Z01 362 A

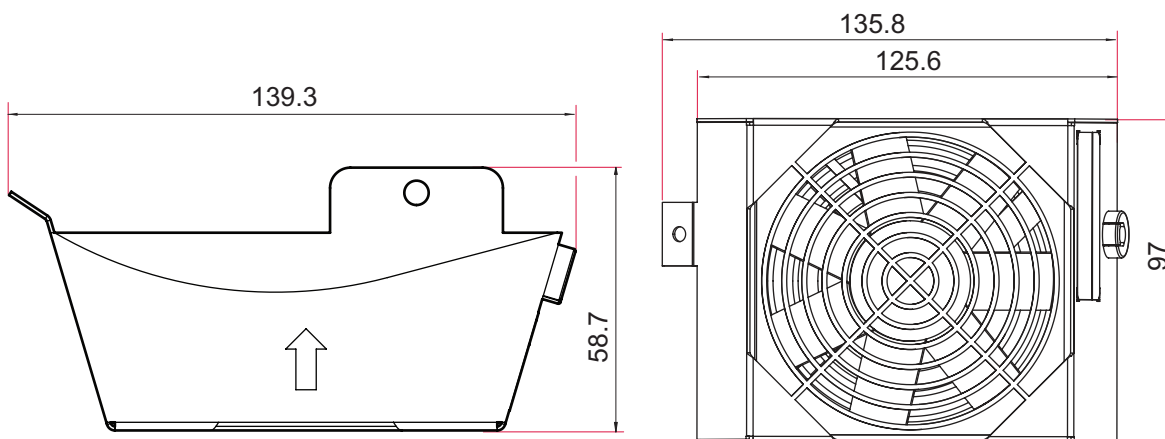


Fig. 14: Dimensions PM Z01 303 A | PM Z01 363 A

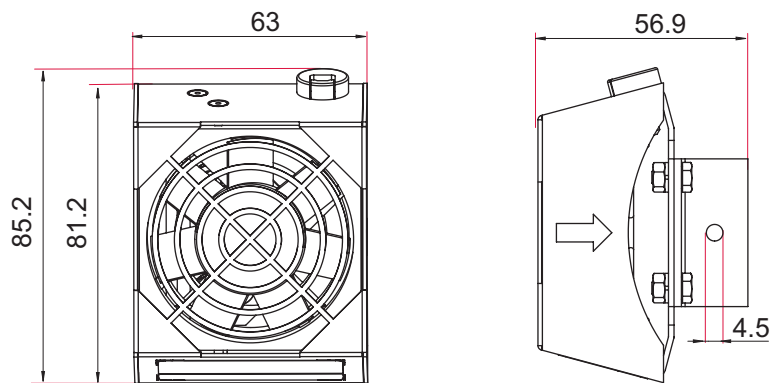


Fig. 15: Dimensions PM Z01 304 A | PM Z01 364 A

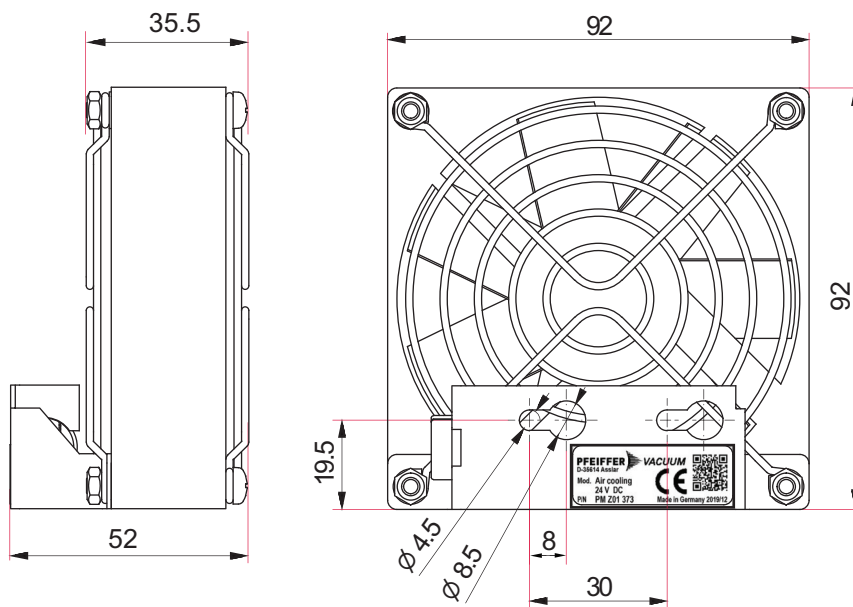


Fig. 16: Dimensions PM Z01 373 | PM Z01 374  
Dimensions in mm

# Declaration of conformity

Declaration for product(s) of the type:

**Air cooling**

HiPace 30 – 800

SplitFlow 30 – 80

We hereby declare that the listed product satisfies all relevant provisions of the following **European Directives**.

**Electromagnetic compatibility 2014/30/EU**

**Low voltage 2014/35/EC**

**Restriction of the use of certain hazardous substances 2011/65/EU**

**Restriction of the use of certain hazardous substances, delegated directive 2015/863/EU**

**Harmonized standards and applied national standards and specifications:**

DIN EN 61000-3-2: 2014

DIN EN 61000-3-3: 2013

DIN EN 61010-1: 2010

DIN EN 61326-1: 2013

DIN EN 62061: 2005

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Signature:



(Daniel Sälzer)  
Managing Director

Pfeiffer Vacuum GmbH  
Berliner Straße 43  
35614 Asslar  
Germany

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Aßlar, 2020-04-30







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