



# OPERATING INSTRUCTIONS

EN

Translation of the Original

# SEALING GAS VALVE

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## 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

These operating instructions are for customers of Pfeiffer Vacuum. They describe the function of the designated product and provide the most important information for safe usage of the product. The descriptions comply with applicable directives. All information provided in these operating instructions refer to the current development status of the product. The documentation remains valid as long as the customer does not modify the product in any way.

## 1.2 Variants

Order number	Selection field
PM Z01 310	Sealing gas valve, shielded for HiPace 30/60/80 with TC 110
PM Z01 311	Sealing gas valve, shielded for HiPace 300 with TC 110/120
PM Z01 312	Sealing gas valve, shielded for HiPace 300 with TC 400 and TM 700, TCP 350
PM Z01 313	Sealing gas valve, shielded, HiPace 400/700/800 P with TC 400 and HiPace 1200–2300 with TC 1200
PM Z01 314	Sealing gas valve, shielded for HiPace 1200–2300 with TC 1200

Tbl. 1: Sealing gas valve versions

## 1.3 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.

## 1.4 Conventions

### 1.4.1 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. ...

## 1.4.2 Abbreviations

<b>DN</b>	Nominal diameter as size description
<b>ISO</b>	Flange: Connector in accordance with ISO 1609 and ISO 2861
<b>LED</b>	Illuminating diode
<b>M8</b>	Connector assembly with M8 thread
<b>M12</b>	Connector assembly with M12 thread
<b>TC</b>	Turbopump electronic drive unit (turbo controller)
<b>TCP</b>	External electronic drive unit for the turbopump (turbo controller) with current supply
<b>TM</b>	Drive and magnetic bearing controller of the Turbopump
<b>WAF</b>	width across flats

**Tbl. 2: Abbreviations used in this document**

## 2 Safety

### 2.1 General safety instructions

This document includes the following four risk levels and one information level.

<b>⚠ DANGER</b>
<p><b>Imminent danger</b>                  Indicates a hazardous situation which, if not avoided, will result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Instructions on avoiding the hazardous situation</li> </ul>
<b>⚠ WARNING</b>
<p><b>Possibly imminent danger</b>                  Indicates a hazardous situation which, if not avoided, could result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Instructions on avoiding the hazardous situation</li> </ul>
<b>⚠ CAUTION</b>
<p><b>Possibly imminent danger</b>                  Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.</p> <ul style="list-style-type: none"> <li>▶ Instructions on avoiding the hazardous situation</li> </ul>
<b>NOTICE</b>
<p><b>Danger of property damage</b>                  Notice is used to address practices not related to physical injury.</p> <ul style="list-style-type: none"> <li>▶ Instructions on avoiding property damage</li> </ul>
<div style="display: inline-block; border: 1px solid black; padding: 5px; margin-right: 10px;"> <b>i</b> </div> <div style="border: 1px solid black; padding: 5px;">                 Notes, tips or examples indicate important information on the product or on this document.             </div>

### 2.2 Proper use

- ▶ Use the sealing gas valve only for controllable inlet of inert gases to Pfeiffer Vacuum turbopumps designated for this purpose.
- ▶ Use the sealing gas valve to protect against penetration by corrosive media.

### 2.3 Foreseeable misuse

Improper use of the product invalidates all warranty and liability claims. Improper use is any, even unintended, use, which is contrary to the product purpose; and in particular:

- connecting to pumps and equipment that are not intended for this purpose according to their operating instructions
- connecting to equipment with exposed live parts

## 3 Product description

### 3.1 Shipment

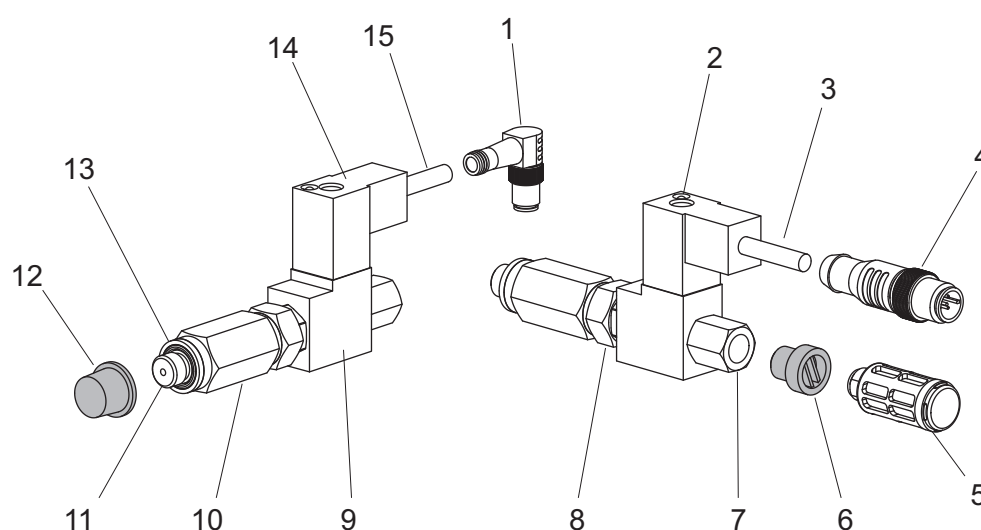
The shipment includes the following parts:

- Sealing gas valve
- 1 Sealing ring
- Filter
- Operating instructions

### 3.2 Functional description

The use of sealing gas serves to protect the vacuum pump in dusty processes or with excessive gas throughputs. Sealing gas prevents the ingress of damaging substances into the motor and bearing area.

The Pfeiffer Vacuum sealing gas valve supplies a vacuum pump with a suitable, constant flow rate with electric control.



**Fig. 1: Overview of Pfeiffer Vacuum sealing gas valve**

- |                                 |                                    |
|---------------------------------|------------------------------------|
| 1 Connection plug M8            | 8 Solenoid valve                   |
| 2 LED control lamp              | 9 Valve seat                       |
| 3 Control cable                 | 10 Filter housing with capillaries |
| 4 Connection plug M12           | 11 Gas outlet                      |
| 5 Filter (included in shipment) | 12 Protective plug                 |
| 6 Screw plug                    | 13 Sealing ring                    |
| 7 Gas inlet side adapter        | 14 Plug-in connector               |

# 4 Installing

**NOTICE**

**Property damage caused by unfiltered media supply**

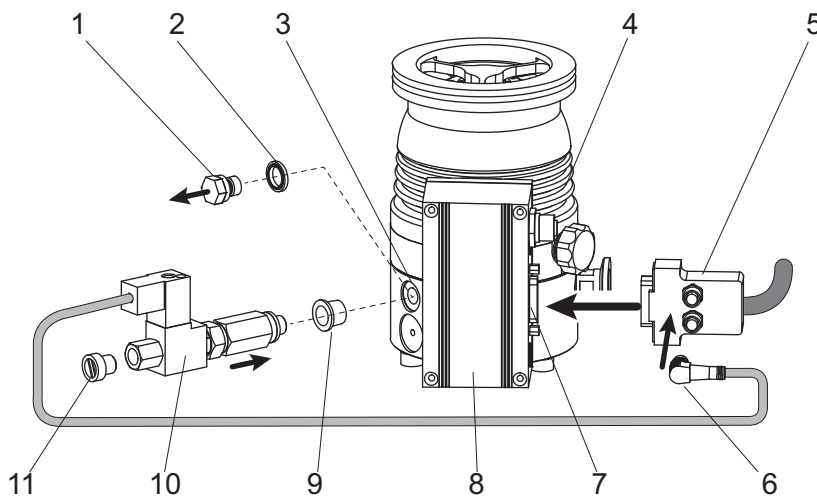
Using unfiltered media for the gas inlet of a vacuum pump may result in particle contamination. There is a risk of damage to, and even destruction of, vacuum components.

- ▶ Install suitable filters from the Pfeiffer Vacuum accessories range upstream of the gas inlet, before you use ambient air or other unclean media.



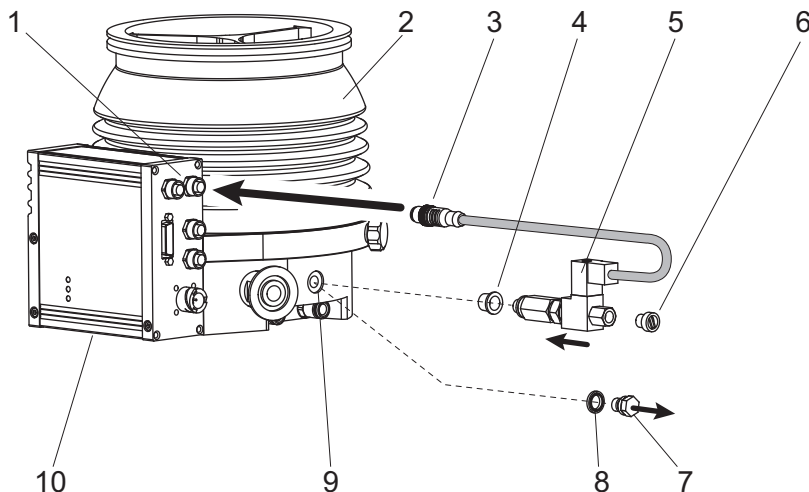
**Usage recommendation**

- Pfeiffer Vacuum recommends the use of sealing gas at 50 % of the maximum vacuum pump gas throughput or higher.
- The permissible inlet pressure for sealing gas is 1,500 hPa absolute.



**Fig. 2: Example: Connecting a sealing gas valve to small HiPace**

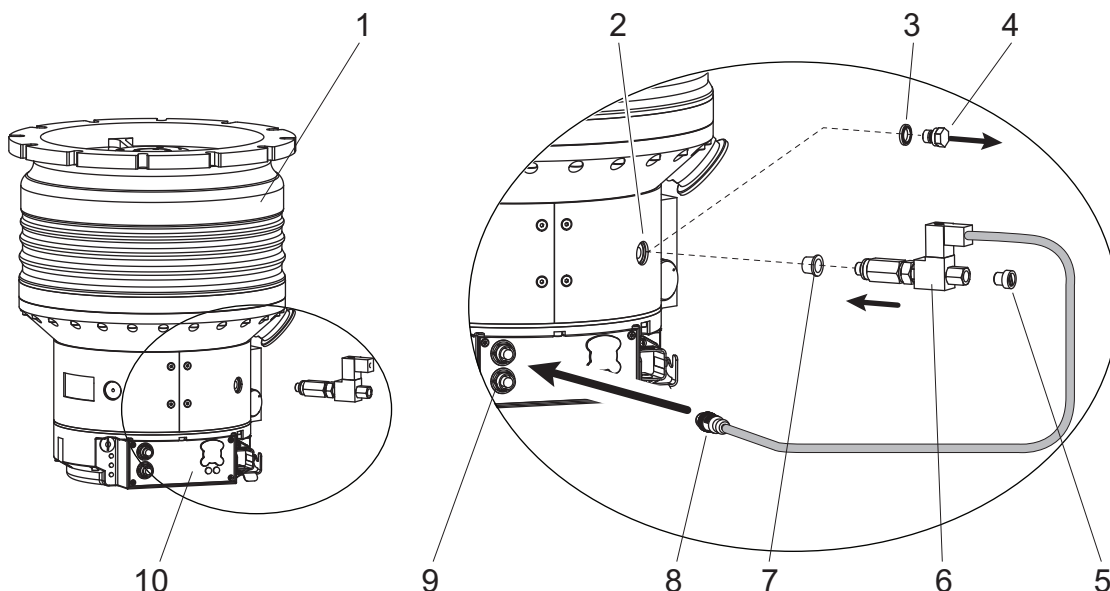
- |  |                            |
|--|----------------------------|
| 1 Locking screw                              | 7 Multifunction connection |
| 2 Sealing ring                               | 8 Electronic drive unit    |
| 3 Sealing gas connection                     | 9 Protective plug          |
| 4 Turbopump                                  | 10 Sealing gas valve       |
| 5 Connection cable with accessory connection | 11 Screw plug              |
| 6 Control line                               |                            |





**Fig. 3: Example: Connecting a sealing gas valve to medium HiPace**

- |   |                      |    |                        |
|---|----------------------|----|------------------------|
| 1 | Accessory connection | 6  | Screw plug             |
| 2 | Turbopump            | 7  | Locking screw          |
| 3 | Control line         | 8  | Sealing ring           |
| 4 | Protective plug      | 9  | Sealing gas connection |
| 5 | Sealing gas valve    | 10 | Electronic drive unit  |

**Fig. 4: Example: Connecting a sealing gas valve to large HiPace**

- |   |                        |    |                       |
|---|------------------------|----|-----------------------|
| 1 | Turbopump              | 6  | Sealing gas valve     |
| 2 | Sealing gas connection | 7  | Protective plug       |
| 3 | Sealing ring           | 8  | Control line          |
| 4 | Locking screw          | 9  | Accessory connection  |
| 5 | Screw plug             | 10 | Electronic drive unit |

**Required tools**

- Hexagon wrench, SW 17 mm
- Calibrated torque wrench (tightening factor  $\leq 1.6$ )

**Install sealing gas valve**

1. Unscrew the locking screw with sealing ring out of the sealing gas connection of the turbopump.
2. Screw the sealing gas valve, with sealing ring on the outlet side, into the sealing gas connection of the turbopump.
  - Tightening torque: **5 Nm**.

**Connecting the sealing gas valve**

The electrical connection of the sealing gas valve is dependent on the turbopump electronic drive unit and its connection variants.

- ▶ Configure the accessory output for the sealing gas via the interfaces of your electronic drive unit.
- ▶ **TC 110, TC 120, TCP 1200:** Connect the control cable connecting plug to the electronic drive unit using a suitable connection cable or adapter.
- ▶ **TC 400, TC 1200, TM 700:** Connect the control cable connecting plug directly to the corresponding electronic drive unit accessory connection.

**Establishing the sealing gas supply**

1. Screw the filter (included in shipment) onto the valve inlet side by hand, if you wish to use dry ambient air as sealing gas.
2. Alternatively: Connect an inert gas supply (e.g., nitrogen) to the inlet side.

3. If required, use a connection adapter from the Pfeiffer Vacuum accessories range (not included in shipment).

## 5 Accessories

Description	Order number
Screw-on flange, DN 16 ISO-KF, G 1/8"	PM 016 780 -T
Centering ring with protection filter, pore size 20 µm, FPM/stainless steel	PF 117 216 -T

**Tbl. 3: Optional accessories**

## 6 Technical data and dimensions

### 6.1 Technical data

	mbar l/s	Pa m <sup>3</sup> /s	sccm	Torr l/s	atm cm <sup>3</sup> /s
mbar l/s	1	0.1	59.2	0.75	0.987
Pa m <sup>3</sup> /s	10	1	592	7.5	9.87
sccm	$1.69 \cdot 10^{-2}$	$1.69 \cdot 10^{-3}$	1	$1.27 \cdot 10^{-2}$	$1.67 \cdot 10^{-2}$
Torr l/s	1.33	0.133	78.9	1	1.32
atm cm <sup>3</sup> /s	1.01	0.101	59.8	0.76	1

Tbl. 4: Conversion table: Units for gas throughput

Selection field	Sealing gas valve, shielded for HiPace 30/60/80 with TC 110	Sealing gas valve, shielded for HiPace 300 with TC 110/120	Sealing gas valve, shielded for HiPace 300 with TC 400 and TM 700, TCP 350	Sealing gas valve, shielded, HiPace 400/700/800 P with TC 400 and HiPace 1200–2300 with TC 1200	Sealing gas valve, shielded for HiPace 1200–2300 with TC 1200
Order number	PM Z01 310	PM Z01 311	PM Z01 312	PM Z01 313	PM Z01 314
Gas flow at atmospheric pressure	7.5 – 9.5 sccm	12.5 – 15 sccm	12.5 – 15 sccm	17.5 – 20 sccm	22 – 27 sccm
Inlet pressure max.	1500 hPa (absolute)	1500 hPa (absolute)	1500 hPa (absolute)	1500 hPa (absolute)	1500 hPa (absolute)
Mechanical connection	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"
Flange (out)	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"
Electrical connection	M8	M8	M12	M12	M12
Control voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Power consumption	2 W	2 W	2 W	2 W	2 W
Weight	161 g	161 g	161 g	161 g	161 g

Tbl. 5: Technical data for Pfeiffer Vacuum sealing gas valves



#### Gas flow

The flow rate (gas flow) increases according to inlet pressure.

### 6.2 Dimensions

Dimensions in mm

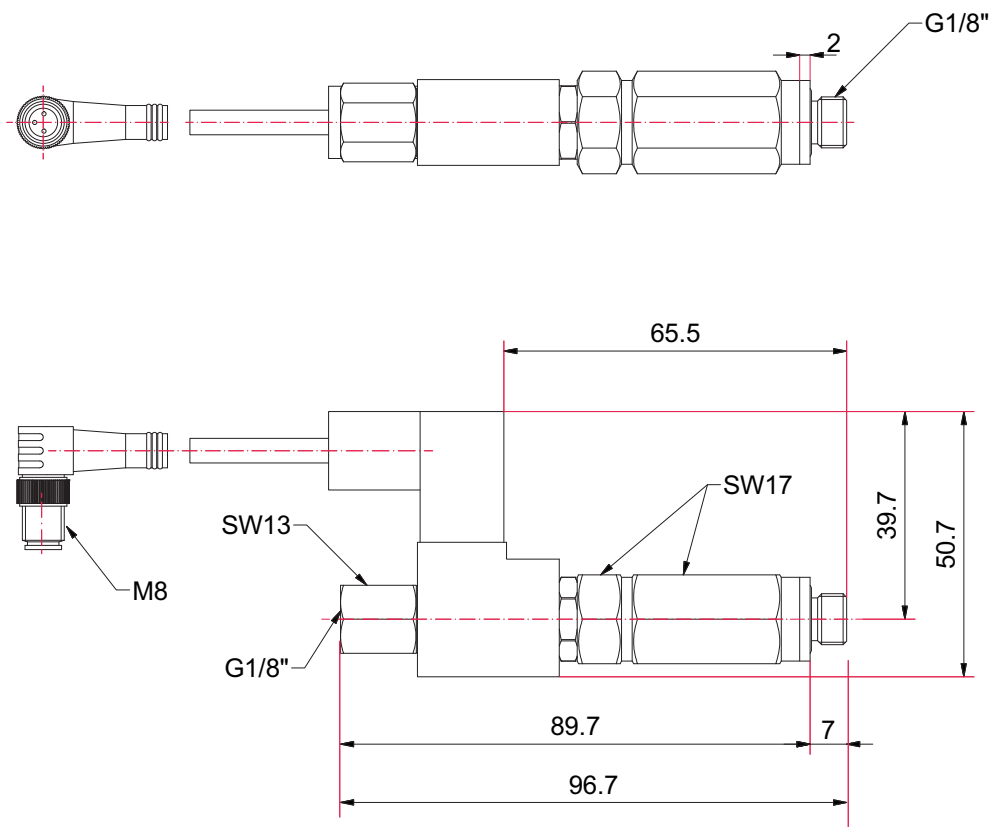


Fig. 5: Sealing gas valve with M8 connecting cable

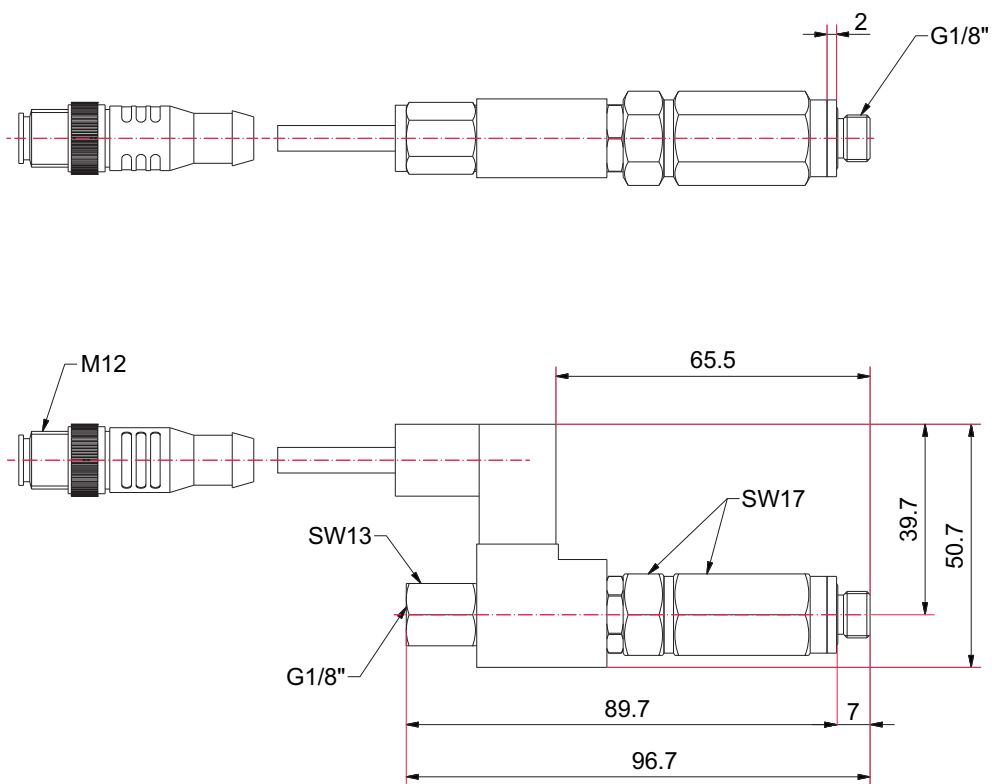


Fig. 6: Sealing gas valve with M12 connecting cable



# Declaration of conformity

We hereby declare that the product cited below satisfies all relevant provisions of the following **EU Directives**:

- **Electromagnetic compatibility 2014/30/EU**
- **Restriction of the use of certain hazardous substances 2011/65/EU**

**Sealing gas valve**

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

DIN EN 61000-3-2 : 2014

DIN EN 61000-3-3 : 2013

DIN EN 61326-1 : 2013

DIN VDE 0580 : 2011

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Signature:

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(Dr. Ulrich von Hülsen)  
Managing Director

Aßlar, 2018-09-12



## VACUUM SOLUTIONS FROM A SINGLE SOURCE

Pfeiffer Vacuum stands for innovative and custom vacuum solutions worldwide, technological perfection, competent advice and reliable service.

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