

# OPERATING INSTRUCTIONS

EN

Translation of the Original

## VENTING VALVE

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## 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

- Venting valve, screened | M8 | straight valve connector
- Venting valve, screened | M12 | straight valve connector
- Venting valve, screened | M12 | 90° angled valve connector
- Venting valve, unscreened | C industry (micro)

## 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



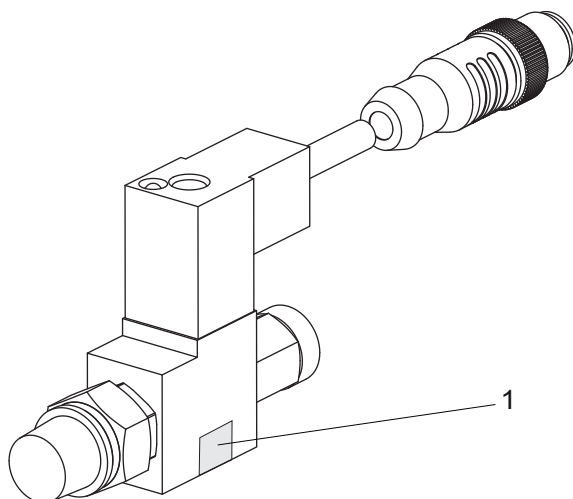
Tip

### 1.3.3 Stickers on the product

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

	<b>Rating plate (example)</b> The rating plate is located on the valve housing
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**Tbl. 2: Stickers on the product**



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

### 1.3.4 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. 3: Abbreviations used in this document**

## 2 Safety

### 2.1 General safety information

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

#### **DANGER**

##### **Immediately pending danger**

Indicates an immediately pending danger that will result in death or serious injury if not observed.

- Instructions to avoid the danger situation

#### **WARNING**

##### **Potential pending danger**

Indicates a pending danger that could result in death or serious injury if not observed.

- Instructions to avoid the danger situation

#### **CAUTION**

##### **Potential pending danger**

Indicates a pending danger that could result in minor injuries if not observed.

- Instructions to avoid the danger situation

#### **NOTICE**

##### **Danger of damage to property**

Is used to highlight actions that are not associated with personal injury.

- Instructions to avoid damage to property



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 operation**

#### **CAUTION**

##### **Risk of injuries due to contact with vacuum when venting**

While venting the vacuum pump there is a risk of minor injuries due to the direct contact of body parts with the vacuum, e.g. hematomas.

- Do not fully unscrew the venting screw out of the housing during venting.
- Keep a distance from automatic venting device, such as venting valves.

### 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.
- ▶ Never disconnect plug connections during operation.
- ▶ Keep lines and cables away from hot surfaces ( $> 70\text{ °C}$ ).
- ▶ Observe the unit protection degree prior to installation or operation in other environments.
- ▶ Do not carry out your own conversions or modifications on the unit.

## **2.4 Proper use**

- ▶ Use the venting valve only for controlled venting on the designated Pfeiffer Vacuum turbopumps.

## **2.5 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

## **2.6 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.

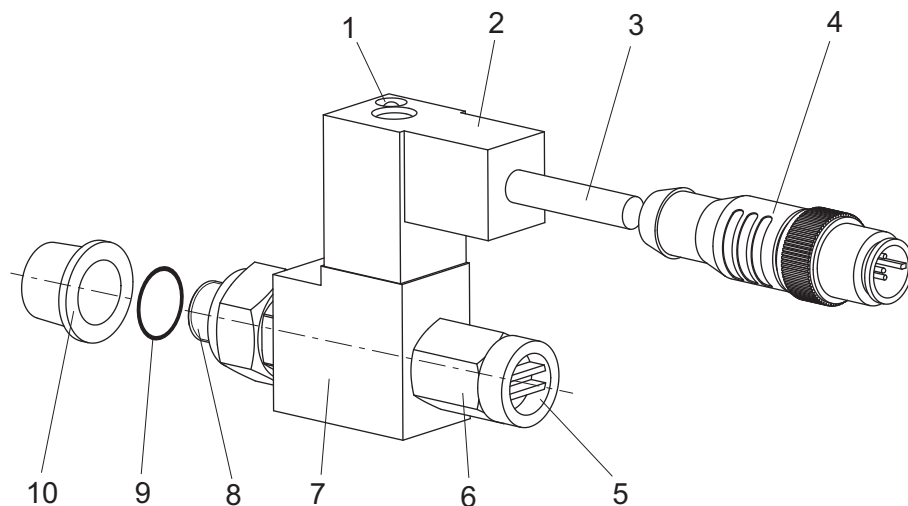
#### **Training people**

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

The Pfeiffer Vacuum venting valve ensures automatic venting of a turbopump after shutting down or in the event of a power failure.



**Fig. 2: Layout of venting valve**

- |                     |                                      |
|---------------------|--------------------------------------|
| 1 LED control lamp  | 6 Gas inlet, internal thread G 1/8"  |
| 2 Valve connector   | 7 Solenoid valve                     |
| 3 Control cable     | 8 Gas outlet, external thread G 1/8" |
| 4 Power supply plug | 9 Sealing ring                       |
| 5 Screw plug        | 10 Protective cap                    |

### 3.2 Scope of delivery

The scope of delivery includes the following parts:

- Venting valve
- 1× sealing ring
- Operating instructions

## 4 Installation

### 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.



#### Connect accessory devices to the TC 110

- The use of Pfeiffer Vacuum accessories via the TC 110 electronic drive unit is only possible using the corresponding connection cable and/or adapter on the X3 multi-functional connection.
- Configure the required accessory output via RS-485 using Pfeiffer Vacuum display and control units or PC.



#### Electronic drive unit TC 400 accessory connection

The electronic drive unit of the turbopump offers space for the connection of maximum 4 accessory devices. M12 connector sockets with the designation "accessory" are available for this purpose.

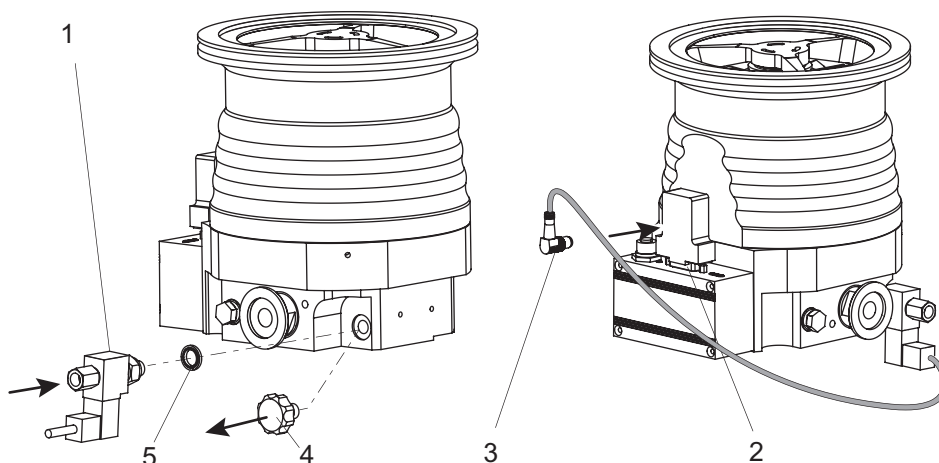
- The accessory connections have been preconfigured ex factory.
- After connecting preconfigured accessory devices, these are immediately ready for operation according to the factory settings.
- The use of other accessories for turbopumps is possible and requires settings in the configuration of the electronic drive unit.
- The desired accessory output is configured via RS-485 using Pfeiffer Vacuum display and control units or a PC.
- You can find detailed information in the "Electronic drive unit TC 400" operating instructions.

#### Prerequisites

- Turbopump switched off and vented

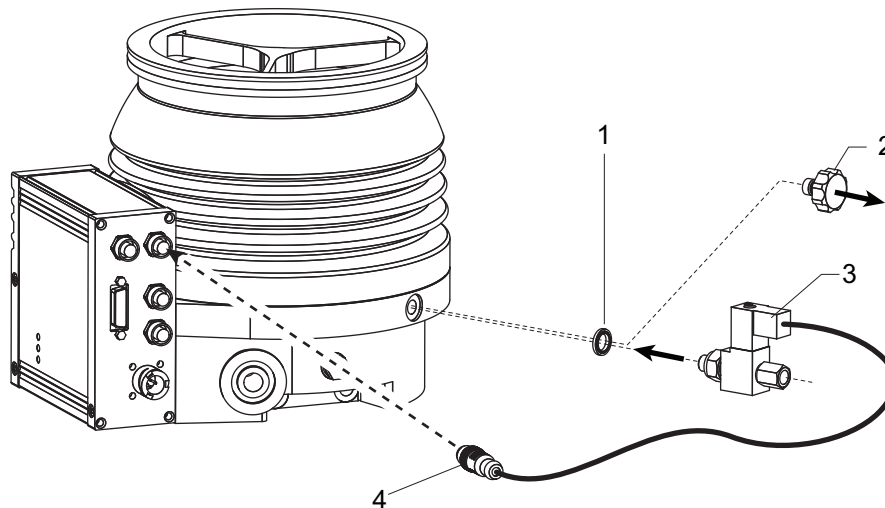
#### Required tools

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



**Fig. 3: Example: Connecting the venting valve to HiPace and TC 110**

- |   |                 |
|---|-----------------|
| 1 Venting valve                                       | 4 Venting screw |
| 2 15-pin D Sub plug on multi-function connection "X3" | 5 Sealing ring  |
| 3 Control cable power supply plug                     |                 |



**Fig. 4: Example: Connecting the venting valve to HiPace and TC 400**

- |                 |                                   |
|-----------------|-----------------------------------|
| 1 Sealing ring  | 3 Venting valve                   |
| 2 Venting screw | 4 Control cable power supply plug |

#### Fitting the venting valve

1. Unscrew the venting screw with sealing ring out of the turbopump by hand.
2. Screw the venting valve with the outlet side into the venting connection of the turbopump.
  - Tightening torque: **5 Nm**

#### Connecting the venting valve to the electronic drive unit

The electrical connection of the venting valve depends on the turbopump electronic drive unit and its connection variants.

- ▶ Configure the accessory output for the venting valve via the interfaces of your electronic drive unit.
  - The specification in the configuration is "accessory B1". Alternatively:
  - the "accessory A1" option is also possible.
- ▶ **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.

#### Establish the venting gas supply

In case you want to use dry ambient air as venting gas, the venting valve is ready for operation immediately.

If you wish to use a different inert gas (e.g. nitrogen N<sub>2</sub>) as the venting gas, follow the steps below.

1. Provide an external venting gas supply with a maximum inlet pressure of 1,500 hPa absolute.
2. Connect the venting gas supply to the inlet side (G 1/8") of the valve.
3. If required, use a connecting adapter from the accessory of the valve (not included in the scope of delivery).

## 5 Operation

### ⚠ CAUTION

#### Risk of injuries due to contact with vacuum when venting

While venting the vacuum pump there is a risk of minor injuries due to the direct contact of body parts with the vacuum, e.g. hematomas.

- ▶ Do not fully unscrew the venting screw out of the housing during venting.
- ▶ Keep a distance from automatic venting device, such as venting valves.

### NOTICE

#### Damage to the turbopump due to non-permissibly fast pressure rise during venting

Non-permissibly high pressure rise rates place a significant load on the rotor and the magnetic bearing of the turbopump. During venting very small volumes in the vacuum chamber or the turbopump, there is a risk of uncontrollable pressure rises. This causes mechanical damage to the turbopump, including potential failure.

- ▶ Observe the prescribed maximum pressure rise speed of **15 hPa/s**.
- ▶ Avoid manual and uncontrolled venting of very low volumes.
- ▶ Where necessary, use a venting valve from the Pfeiffer Vacuum range of accessories.

Important settings and function-related variables are programmed ex factory as parameters of 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	Setting
[P:036]	CfgAccB1	Accessory connection B1	1 = Venting valve, normally closed
[P:035]	CfgAccA1	Accessory connection A1	1 = Venting valve, normally closed (As an alternative to accessory connection B1)
[P:012]	EnableVent	Enable vents	1 = On
[P:030]	VentMode	Vent mode	0 = Delayed venting 1 = Do not vent 2 = Direct venting

Tbl. 4: Parameter settings in the electronic drive unit of the turbopump

Venting speed [P:720]	Venting duration [P:721]	Venting duration in the event of a power failure
50 % of rated speed	3600 s	3600 s

Tbl. 5: Factory settings for delayed venting in turbopumps

## 6 Accessories

Description	Order number
Screw-on flange, DN 16 ISO-KF, G 1/8"	PM 016 780 -T
Push-in fitting for 6 mm tube, G 1/8"	PM 016 781 -T
Push-in fitting for 8 mm tube, G 1/8"	PM 016 782 -T
Hose nozzle for 9 mm hose, G 1/8"	PM 016 783 -T
TTV 001, Drier for Venting Turbopumps	PM Z00 121

**Tbl. 6: Optional accessories**

## 7 Technical data and dimensions

### 7.1 Technical data

Classification	Venting Valve, Shielded	Venting Valve, Shielded	Venting Valve, Shielded	Venting Valve
Part number	PM Z01 290	PM Z01 291	PM Z01 292	PM Z01 293
Connection flange (in)	G 1/8"	G 1/8"	G 1/8"	G 1/8"
Connection flange (out)	G 1/8"	G 1/8"	G 1/8"	G 1/8"
Weight	100 g	100 g	120 g	67 g
Inlet pressure max.	1500 hPa (absolute)	1500 hPa (absolute)	1500 hPa (absolute)	1500 hPa (absolute)
Integral leakage rate	$< 1 \cdot 10^{-9} \text{ Pa m}^3/\text{s}$	$< 1 \cdot 10^{-9} \text{ Pa m}^3/\text{s}$	$< 1 \cdot 10^{-9} \text{ Pa m}^3/\text{s}$	$< 1 \cdot 10^{-9} \text{ Pa m}^3/\text{s}$
Gas flow at atmospheric pressure min.	130 hPa·l/s	130 hPa·l/s	130 hPa·l/s	130 hPa·l/s
Gas flow at atmospheric pressure max.	130 hPa·l/s	130 hPa·l/s	130 hPa·l/s	130 hPa·l/s
Electronic drive unit	TC 110, TC 120, TCP 350	TC 400, TC 1200, TCP 350, TM 700	TC 400, TC 1200, TCP 350, TM 700	—
Electrical connection	M8	M12	M12	C-Industry (Micro)
Mechanical connection	G 1/8"	G 1/8"	G 1/8"	G 1/8"
Control voltage	24 V DC	24 V DC	24 V DC	24 V DC
Valve connector	Straight 0°	Straight 0°	Twisted 270°	—

**Tbl. 7: Technical data for venting valve**

## 7.2 Dimensions

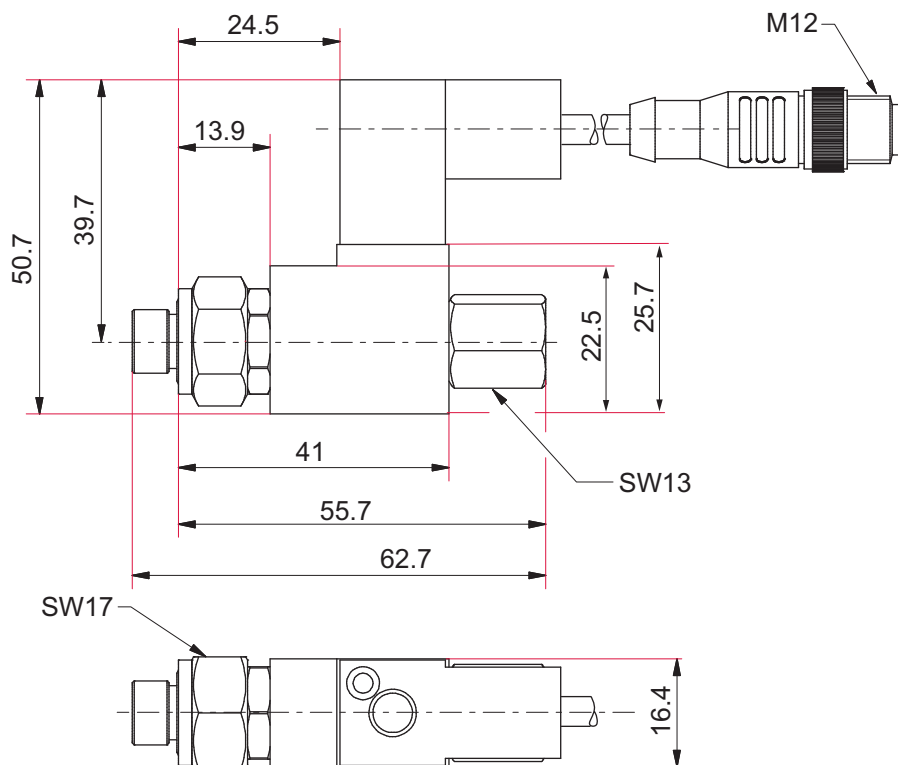


Fig. 5: Dimensions of venting valve with straight power supply plug

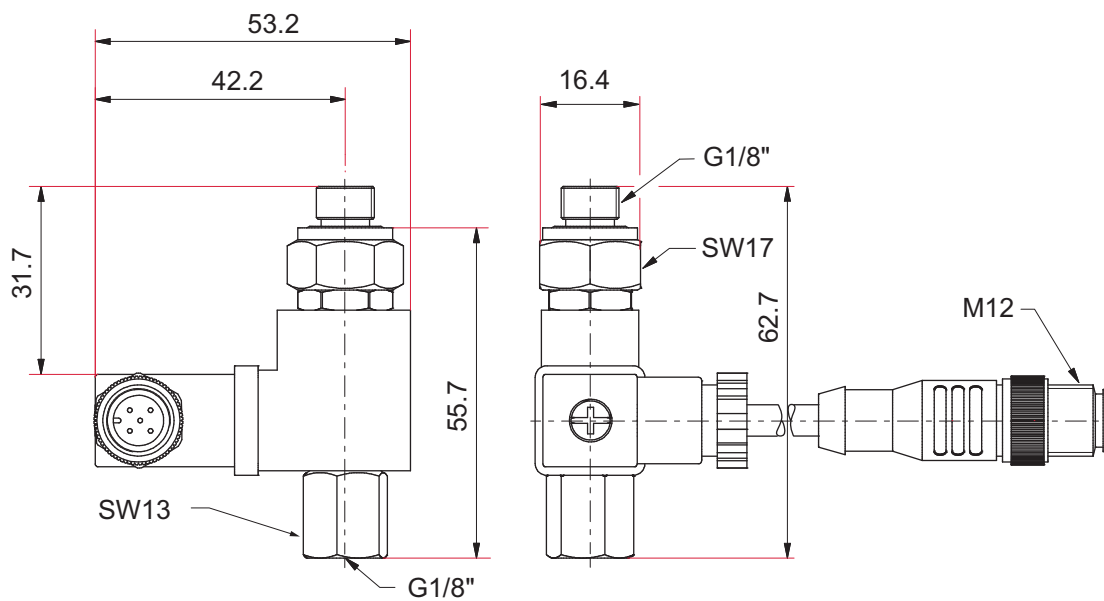


Fig. 6: Dimensions of venting valve M12 with angled power supply plug  
Dimensions in mm



# Declaration of conformity

Declaration for product(s) of the type:

**Venting valve**

Turbopumps

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 61326-1 : 2013

DIN VDE 0580 : 2011

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Signature:



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Asslar, 2020-04-28



## VACUUM SOLUTIONS FROM A SINGLE SOURCE

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

## COMPLETE RANGE OF PRODUCTS

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We are the only supplier of vacuum technology that provides a complete product portfolio.

## COMPETENCE IN THEORY AND PRACTICE

Benefit from our know-how and our portfolio of training opportunities!

We support you with your plant layout and provide first-class on-site service worldwide.

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