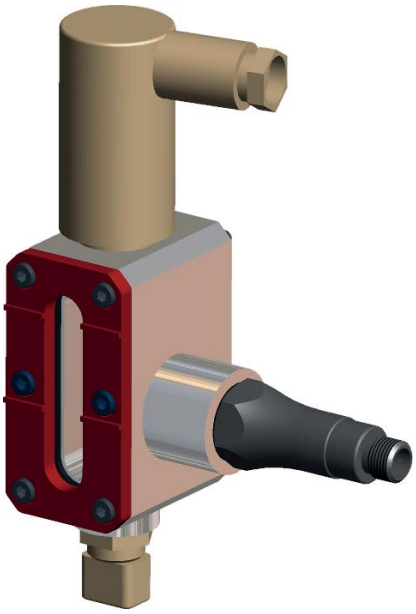


# OPERATING INSTRUCTIONS

EN

Translation of the original instructions

# OPERATIONS MONITORING UNIT

**for operating fluid level, -temperature and exhaust pressure**

PFEIFFER VACUUM

PD 0004 BEN/D (1607)

# Table of contents

# 1 About this manual

## 1.1 Validity

This operating manual is for customers of Pfeiffer Vacuum. It describes the functioning of the designated product and provides the most important information for safe use of the unit. The description follows applicable EU guidelines. All information provided in this operating manual refers to the current state of the product's development. The documentation remains valid as long as the customer does not make any changes to the product.

Up-to-date operating instructions can also be downloaded from www.pfeiffer-vacuum.com.

## 1.2 Conventions

### Safety instructions

The safety instructions in Pfeiffer Vacuum operating instructions are the result of risk evaluations and hazard analyses and are oriented on international certification standards as specified by UL, CSA, ANSI Z-535, SEMI S1, ISO 3864 and DIN 4844. In this document, the following hazard levels and information are considered:

| DANGER |
| --- |
| **Imminent danger**<br>Indicates an imminent hazardous situation that will result in death or serious injury. |

| WARNING |
| --- |
| **Possibly imminent danger**<br>Indicates an imminent hazardous situation that can result in death or serious injury. |

| CAUTION |
| --- |
| **Possibly imminent danger**<br>Indicates an imminent hazardous situation that can result in minor or moderate injury. |

### Pictographs

Prohibition of an action to avoid any risk of accidents, the disregarding of which may result in serious accidents

Warning of a displayed source of danger in connection with operation of the unit or equipment

Command to perform an action or task associated with a source of danger, the disregarding of which may result in serious accidents

### Instructions in the text

➔ Work instruction: here you have to do something.

# 2 Safety

## 2.1 Safety precautions

**Duty to inform**

Each person involved in the installation, operation or maintenance of the vacuum pump must read and observe the safety-related parts of these operating instructions.

➔ The operator is obligated to make operating personnel aware of dangers originating from the vacuum pump, the pumped medium and the entire system.

➔ Before carrying out any work read and observe the operating and safety instructions of the pumping station and the individual components.

➔ Observe the safety and accident prevention regulations.

➔ Check regularly that all safety precautions are being complied with.

➔ When returning the components to us please note the instructions in the Service section.

## 2.2 Proper use

➔ Only use the operations monitoring unit to monitor the operating status of the rotary vane pumps provided for that purpose.

➔ Only install the operations monitoring unit between casing and sight glass.

➔ Only use the sensors for control or triggering an alarm in order to protect the rotary vane pumps against impermissible operating states.

## 2.3 Improper use

Improper use will cause all claims for liability and warranties to be forfeited. Improper use is defined as usage for purposes deviating from those mentioned above, especially:

➔ connection to pumps or units which are not suitable for this purpose according to their operating instructions

➔ connection to units which have exposed voltage-carrying parts

➔ use of accessories or spare parts, which are not named in this manual

➔ operation in potentially explosive areas

# 3 Transport and storage

## 3.1 Storage

➔ Store the unit in a cool, dry place; preferably at temperatures between +5 °C and +40 °C

– For a longer period of storage, seal the pump in a PE bag with drying agents enclosed.

# 4 Product description

## 4.1 Function

The operations monitoring unit is used for the electrical operations monitoring of the rotary vane pumps of the Duo 5/10/20 M as well as Duo 3, 6, 11 -/M model series, and includes the following sensors:

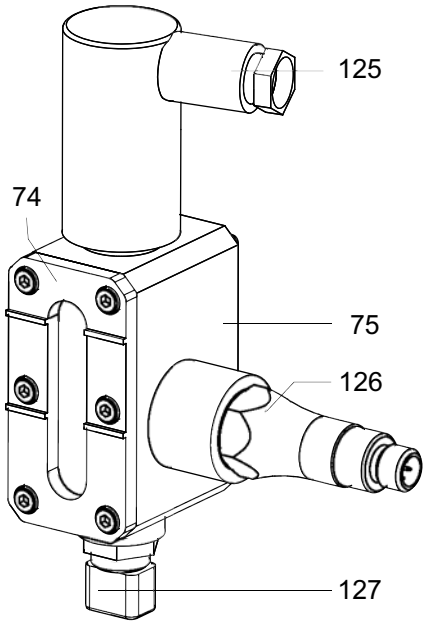



**Fig. 1: Sight glass adapter with sensors**

| | | | | | |
|---|---|---|---|---|---|
| 74 | Sight glass frame | 125 | Exhaust pressure switch | 127 | Operating fluid temperature resistor |
| 75 | Sight glass adapter | 126 | Operating fluid level switch | | |

- Exhaust pressure with pressure switch,
  – pressure switch switches at 1500 hPa (absolute)
- Operating fluid level with fill level switch,
  – level switch switches at a fill level of ≤ minimum fill level.
- Operating fluid temperature with PT 100 temperature resistor,
  – set the external control so the switching point is at max. 90 °C

# 5 Installation

## 5.1 Assembling and dismantling the sight glass adapter

**WARNING**

**Hot operating fluid!**

Danger of burns when draining due to contact with skin.

➔ Wear suitable protective clothing.

➔ Use a suitable collecting vessel.

**WARNING**

**Operating fluid may contain toxic substances from the pumped media!**

Danger of poisoning from the emission of harmful substances from the operating fluid.

➔ Wear suitable protective clothing and respirators.

➔ Dispose of operating fluid according to the local regulations

➔ Turn off the vacuum pump, vent to atmospheric pressure and allow to cool.

➔ Unscrew operating fluid filler screw 198.

➔ Unscrew operating fluid drain screw 198a.

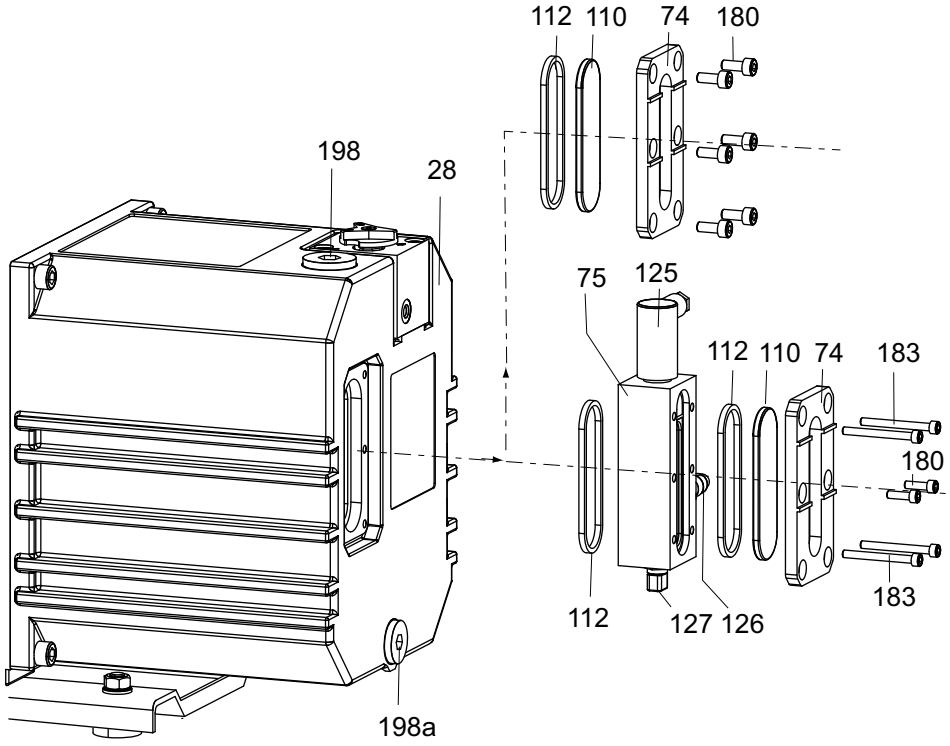



**Fig. 2: Assembling and dismantling the sight glass adapter**

| | | | | | |
|---|---|---|---|---|---|
| 28 | Casing | 112 | Sight glass seal | 180 | Screws, M4 x 10 |
| 74 | Sight glass frame | 125 | Exhaust pressure switch | 183 | Screws, M4 x 55 |
| 75 | Sight glass adapter | 126 | Operating fluid level switch | 198 | Operating fluid filler screw |
| 110 | Sight glass | 127 | Operating fluid temperature resistor | 198a | Operating fluid drain screw |

➔ Unscrew screws 180 and sight glass frame 74, remove sight glass 110 and sight glass seals 112.

➔ Collect the remaining operating fluid from the sight glass area.

➔ Screw in and tighten the respective sensor in the respective tapped hole; only then assemble the sight glass adapter in order not to exceed the permissible shear stress of screws 183.

➔ Install sight glass adapter 75, sight glass seal 112, sight glass 110 and sight glass frame 74 with two screws 180 (M4 x 10).

➔ Screw assembled sight glass adapter 75 and sight glass seal 112 to casing 28 using 4 screws 183 (M4 x 55).

➔ Screw in operating fluid drain screw 198a; pay attention to O-ring.

➔ Fill up the operating fluid.

– First fill when the pump is cold: Maximum 3/4 of the min./max. range.

➔ Screw in operating fluid filler screw 198.

## Upgrade sensors

Sight glass adapter 75 is equipped with 3 tapped holes to upgrade the sensors. **Note:** The operating fluid of the pumps must always be drained beforehand, except when assembling the exhaust pressure switch.

.

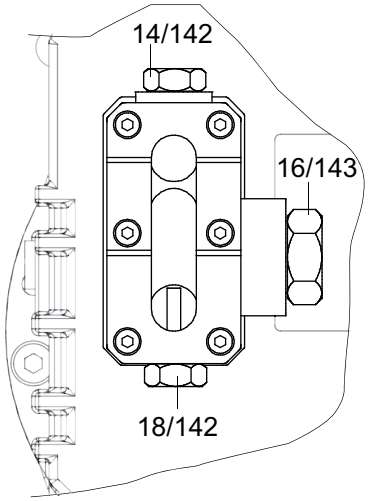
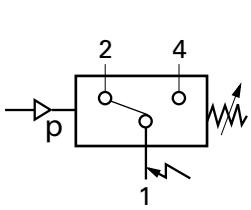



**Fig. 3: Sight glass adapter with locking screws**

### Fitting the exhaust pressure switch




1/2 --> open (closed without pressure)
1/4 --> close

**Fig. 4: Circuit diagram**

➔ Unscrew locking screw 14 (G 1/4"), pay attention to the O-ring 142.

➔ Screw in exhaust pressure switch 125 with O-ring 142.

– **Max. torque 30 Nm**.

### Fitting the operating fluid level switch

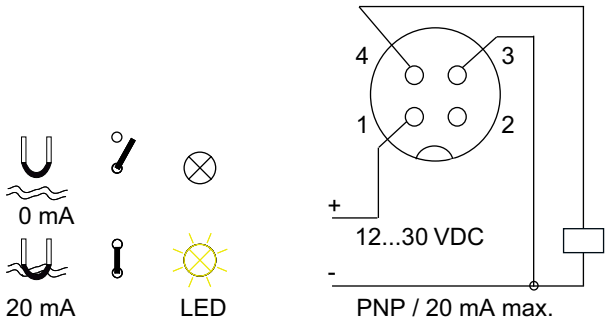



**Fig. 5: Circuit diagram (N.O. contact)**

| Pin assignment M12 plug | Cable | Function |
|---|---|---|
| 1 | brown | + V DC |
| 2 | white | N.C. contact |
| 3 | blue | -V DC |
| 4 | black | N.O. contact |

➔ Unscrew locking screw 16 (G 1/2"), pay attention to the O-ring 143.
➔ Screw in operating fluid level switch 126 with O-ring 142.
– **Max. torque 30 Nm**.

### Fitting the operating fluid temperature resistor

➔ Unscrew locking screw 18 (M14 x 1.5), pay attention to the O-ring 142.
➔ Screw in operating fluid temperature resistor 127 with O-ring 142.
– **Max. torque 30 Nm**.

# 6 Operation

**CAUTION**

**Hot surface!**

Danger of burns if hot parts are touched. Depending on the operating and ambient conditions, the surface temperature of the pump may rise above 70 °C.

➔ In this case, use suitable finger guards.

**Make sure the operating fluid level monitoring is functioning properly!**

Varying operating conditions such as change in temperature impact the proper functioning of the operating fluid level monitoring.

➔ The pump has to be running.
➔ Create reproducible operating conditions; e.g. measure ultimate pressure or intake pressure ≤ 500 hPa;
– if the intake pressure cannot be measured, then, for example, allow for a time delay of ≥ 10 min between the reaction and the alarm
➔ Disable the alarm signal during the warm-up phase or in the case of high process-dependant gas throughput, if necessary.

# 7 Service

**Pfeiffer Vacuum offers first-class service!**

- Maintenance/repairs on site by Pfeiffer Vacuum field service
- Maintenance/repairs in a nearby service center or service point
- Fast replacement with exchange products in mint condition
- Advice on the most cost-efficient and quickest solution

Detailed information and addresses at: **www.pfeiffer-vacuum.com (Service)**.

**Maintenance and repairs in Pfeiffer Vacuum ServiceCenter**

The following steps are necessary to ensure a fast, smooth servicing process:

➔ Download the forms "Service Request" and "Declaration on Contamination".[1)]
➔ Fill out the "Service Request" form and send it by fax or e-mail to your Pfeiffer Vacuum service address.
➔ Include the confirmation on the service request from Pfeiffer Vacuum with your shipment.
➔ Fill in the contamination declaration and enclose it in the shipment (required!).
➔ Dismantle all accessories.
➔ Drain operating fluid/lubricant.
➔ Drain cooling medium, if used.
➔ Send the pump or unit in its original packaging if possible.

**Sending of contaminated pumps or devices**

No units will be accepted if they are contaminated with micro-biological, explosive or radioactive substances. “Hazardous substances” are substances and compounds in accordance with the hazardous goods directive (current version). If pumps are contaminated or the declaration on contamination is missing, Pfeiffer Vacuum performs decontamination at the shipper's expense.

➔ Neutralise the pump by flushing it with nitrogen or dry air.
➔ Close all openings airtight.
➔ Seal the pump or unit in suitable protective film.
➔ Return the pump/unit only in a suitable and sturdy transport container and send it in while following applicable transport conditions.

**Service orders**

All service orders are carried out exclusively according to our repair conditions for vacuum units and components.

1) Forms under www.pfeiffer-vacuum.com

# 8 Spare parts

The spare parts packages listed here are only applicable for standard models.

Please state all information on the rating plate when ordering spare parts. Other spare parts than those described in this manual must not be used without the agreement of Pfeiffer Vacuum.

| Pos. | Designation | Size | Article no. |
|---|---|---|---|
| 125 | Exhaust pressure switch incl. O-ring | | PK 196 380 -T |
| 126 | Operating fluid level switch incl. O-ring | | PK 006 001 -T |
| 127 | Operating fluid temperature resistor | | PK 006 040 -T |
| 112 | Sight glass seal (O-ring) | 42 x 2.5 | P 4070 671 PV |
| 142 | O-ring | 10 x 2.5 | P 4070 166 PV |
| 143 | O-ring | 18 x 2.0 | P 4070 313 PV |

# 9 Disposal

Products or parts thereof (mechanical and electrical components, operating fluids, etc.) may cause environmental burden.

➔ Safely dispose of the materials according to the locally applicable regulations.

# 10 Technical data and dimensions

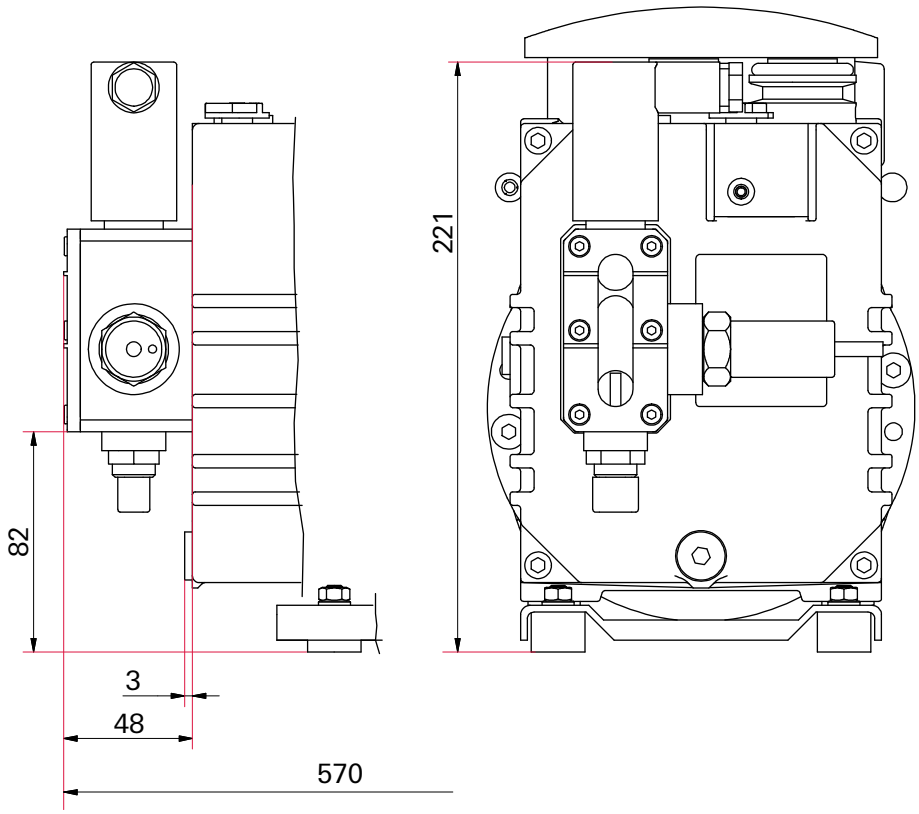
## 10.1 Technical data

| Exhaust pressure switch | Unit | Value |
|---|---|---|
| Media temperature | °C | -50 ... +300 |
| Voltage | V | max. 250 |
| Current | A | 6 |
| Protection class | | IP 55 |

| Operating fluid level switch | Unit | Value |
|---|---|---|
| Media temperature | °C | -40 ... +115 |
| Ambient temperature | °C | -40 ... +85 |
| Operating pressure | bar | 100 max. |
| Protection class | | IP 67 |
| Parts in contact with the media | | 1,4305, PEEK |
| Output | | PNP (20 mA max.) current-less at ≤ minimum fill level |

| Operating fluid temperature sensor | Unit | Value |
|---|---|---|
| Media temperature | °C | -50 ... +300 |
| Measuring resistor | | PT 100 |
| Protection class | | IP 65 |
| Parts in contact with the media | | 1,4301 |

## 10.2 Dimensions



# Declaration of conformity

We hereby declare that the product cited below satisfies all relevant provisions according to the following **EC directives**:

- **Electromagnetic Compatibility 2014/30/EU**
- **Low Voltage 2014/35/EU**

**Operations monitoring unit**

Harmonised standards and national standards and specifications which have been applied:

DIN EN 61010-1 : 2010
DIN EN 61010-2 : 2013
DIN EN 61000-6-2 : 2006

Signature:

Pfeiffer Vacuum GmbH
Berliner Straße 43
35614 Asslar
Germany

(Dr. Ulrich von Hülsen)
Managing Director

2016-07-20

PFEIFFER VACUUM

## 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

**From a single component to complex systems:**
**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.**

**Are you looking for a perfect vacuum solution? Please contact us:**

**Pfeiffer Vacuum GmbH**
Headquarters • Germany
T +49 6441 802-0
info@pfeiffer-vacuum.de

**www.pfeiffer-vacuum.com**

PFEIFFER VACUUM