

VPH-F200-T

Climate Control Housing

Manual



With regard to the supply of products, the current issue of the following document is applicable:
The General Terms of Delivery for Products and Services of the Electrical Industry, published
by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elek-
troindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause:
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1 Introduction

1.1 Content of this Document

This document contains safety-relevant information for using the device. This information is required to use the product in the relevant phases of the product life cycle. This may include information on the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal

Note



Availability of the Complete Product Documentation

Full information about the product can be found in the product documentation online at www.pepperl-fuchs.com. This documentation can be accessed by entering the product name (type code) or the item number of the product into the search field on the website.

1.2 About This Documentation

Note on Figures in the Documentation

The figures in this documentation are provided for basic understanding and may deviate from the actual design.

1.3 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:



Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.



Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.



Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

Informative Symbols



Note

This symbol brings important information to your attention.



Action

1. This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

2 Safety Information

Read the information in this document carefully and observe this information when working with the device. Failure to observe the safety information and warning messages in this documentation can lead to malfunctions of the safety devices of the machines or plants in which they are fitted.

This can result in serious personal injury or death.

Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismantling lies with the plant operator.

The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismantling of the device. The trained and qualified personnel must have read and understood the instruction manual.

Prior to using the product make yourself familiar with it. Read the instruction manual carefully.

3 Product Description

The "VPH-F200-T" climate control housing (hereinafter referred to as the VPH housing) extends the range of applications for the chosen sensor modules, allowing them to be used at an ambient temperature of up to +80 °C. The sensor fixture is designed for the Data Matrix positioning system (PXV) with the "F200" housing design.

The VPH housing encloses the sensor module, creating a compact component for integration at the operating location. Based on a constant difference in temperature, the internal housing temperature is regulated in line with the ambient temperature. This means that the system will follow temperature fluctuations after a specific delay.

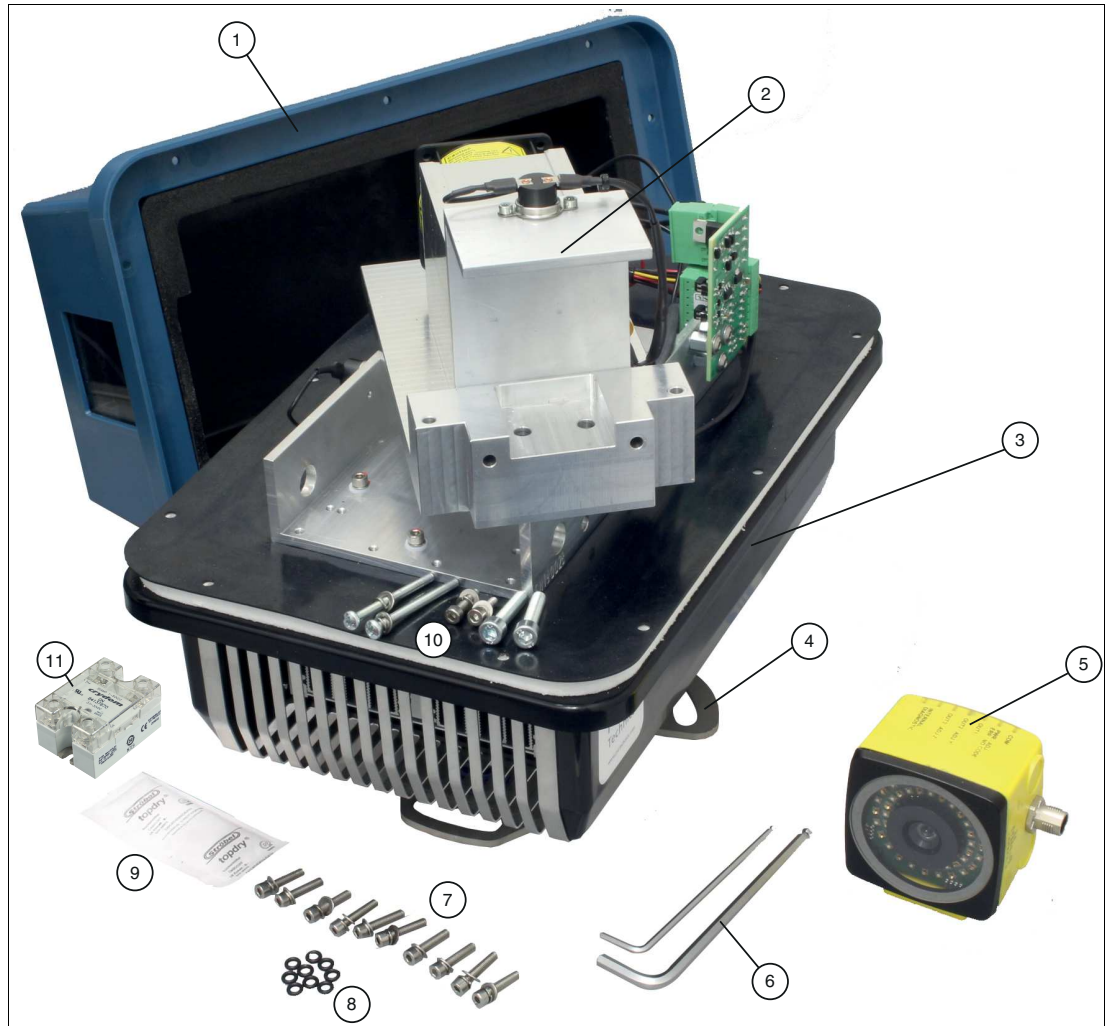


Figure 3.1 Overview

1. Upper shell
2. Sensor fixture
3. Housing base
4. Mounting foot
5. Sensor (example)
6. 4 mm and 5 mm Allen wrenches (not included in the scope of delivery)
7. Mounting screws for the upper shell (11 screws)
8. Sealing rings for the upper shell (11 sealing rings)
9. Silica gel bag
10. Mounting screws for the sensor (two screws included in the scope of delivery) and sensor fixture (two screws)
11. Solid state relay (SSR)

Front View

The key feature on the front of the VPH housing is the central protective panel. The protective panel is embedded in the front of the upper shell. The protective panel provides an opening to allow the chosen sensor module to capture positioning information and other data. The protective panel must be cleaned regularly to prevent the sensor from generating incorrect measurements and error messages. When mounting the VPH housing, do not obstruct the sensing range of the sensor.

Rear View

The rear of the VPH housing features cable glands for supplying electricity to the VPH housing and the chosen sensor module. The number of cable glands used may vary depending on the chosen sensor module. Unused cable glands must be fitted with a blind cap. The fan openings are located underneath the cable glands.



Caution!

Do not obstruct the air flow

The fan openings must remain uncovered and be kept clean. Do not insert objects into the fan openings.

Dimensions

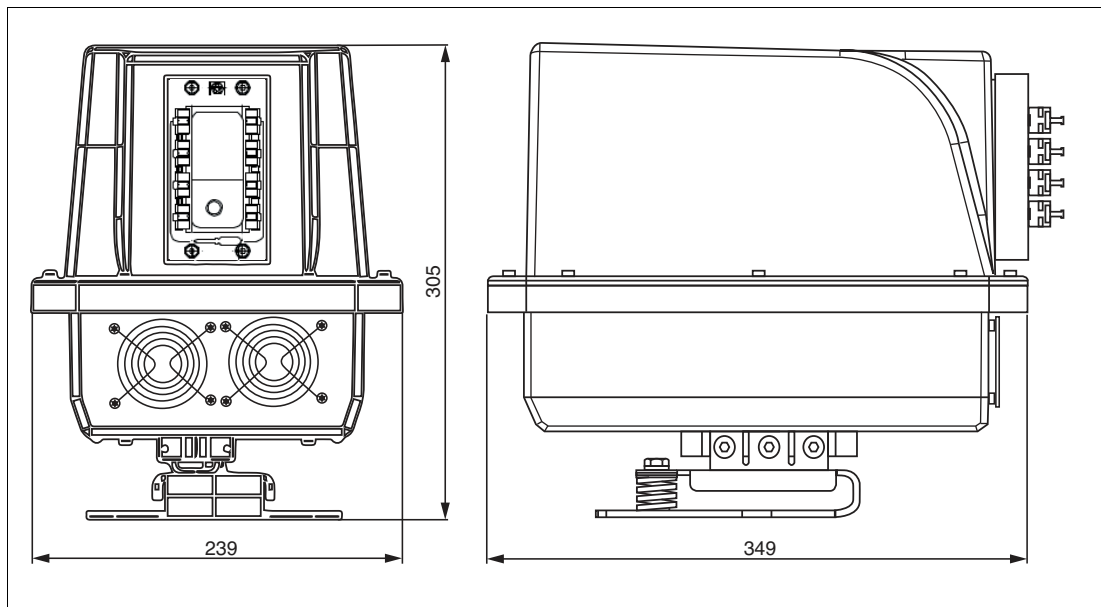


Figure 3.2 Dimensions of the VPH housing

4 Transport and Storage

Retain the original packaging. Always store or transport the device in the original packaging to protect it from electrostatic discharge (ESD) and mechanical damage.

5 Mounting



Caution!

Malfunctions caused by condensation

Severe fluctuations in the ambient temperature can impair the sensor functionality.

- Avoid excessive temperature fluctuations to prevent condensation forming on the protective panel at the front of the VPH housing.
-



Note

The VPH housing is designed for horizontal mounting. Mounting the housing in an alternative position is not permitted.



Mounting the Sensor



Caution!

Property damage caused by electrostatic discharge

If the housing is opened, the electronics may be damaged by electrostatic discharges.

- Avoid electrostatic charges.
 - Allow only qualified electricians to carry out work on the electrical components.
-

1. Loosen the 11 screws in the upper shell. Carefully lift up the upper shell. Place the upper shell to one side.
2. Remove the silica gel bag from the inside of the housing.
3. Loosen the four screws in the sensor fixture.

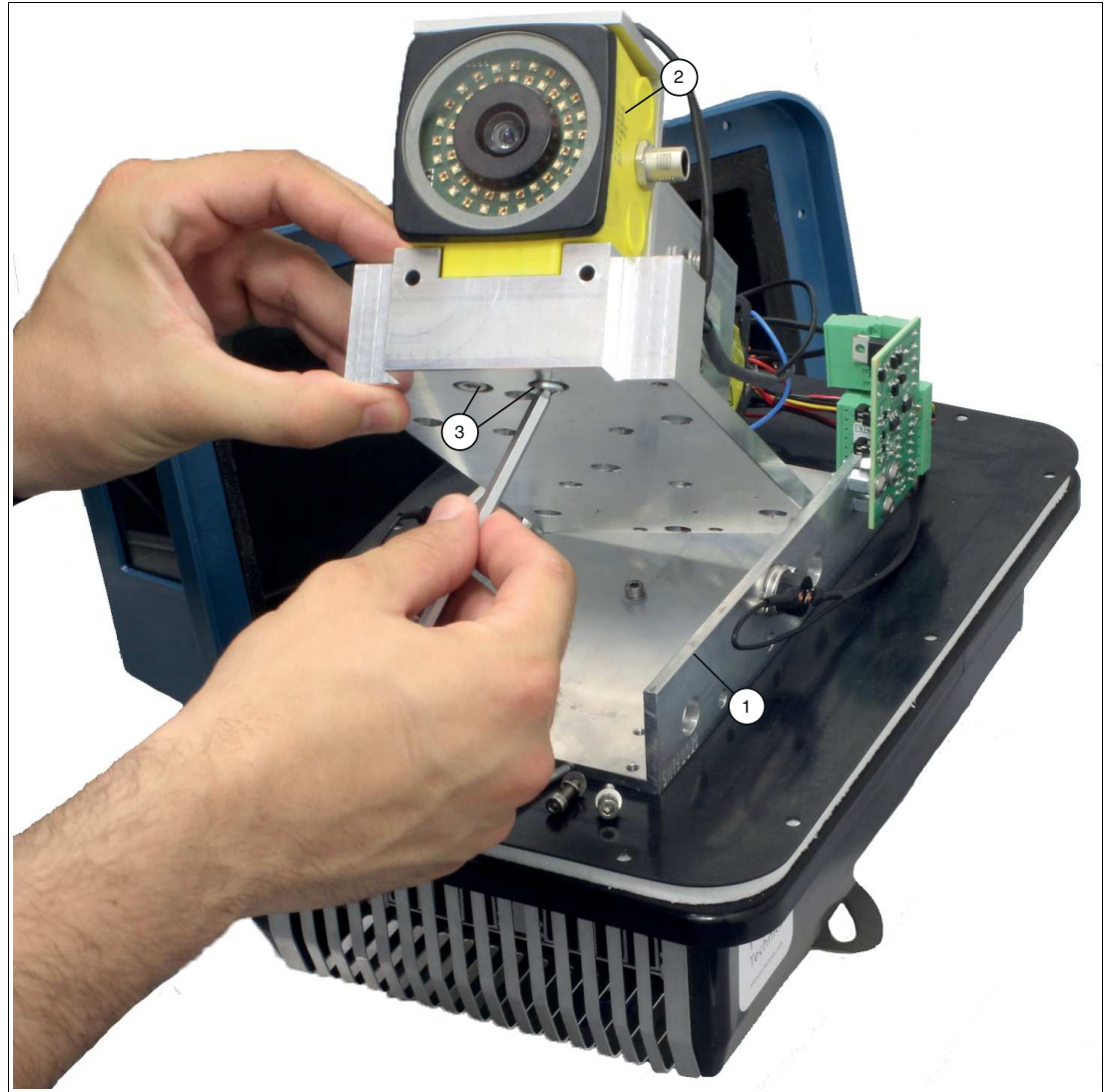


Figure 5.1 Mounting the sensor

4. Carefully lift the sensor fixture away from the connection board (1). Be careful with the cabling connected to the sensor fixture.
5. Insert the sensor into the designated recess (2).
6. Using two screws (3), secure the sensor in place from underneath the sensor fixture.
7. Position the sensor fixture on the connection board on the housing base. Be careful with the cabling connected to the sensor fixture.



Figure 5.2 Securing the sensor fixture

8. Tighten the four screws (1) in the sensor fixture.



Cabling



Danger!

Danger to life due to electrical current

Making contact with live parts causes electric shocks, which pose an immediate danger to life.

- Allow only qualified electricians to carry out work on the electrical components.
- Before working on electronic components, disconnect the power supply.

The cable gland comprises the modular SKINTOP® CUBE system. The 40x40 mm seal insert in the scope of delivery must be used for the power supply cable of the VPH housing. Various other seal inserts in different sizes are available for the sensor supply. The appropriate blind inserts must be fit into any unused space to achieve the designated protection class standards.

1. Remove the upper shell to connect the cables.
2. Route the cables through the cable glands at the rear of the upper shell.



Note

A SKINTOP® CUBE cable gland comprises two identical halves. The halves are placed around the cable and they plug into each other so that the retaining clips engage. These cable glands are inserted into the fixture and secured with the retaining bracket.

Carry out these steps in reverse order to dismantle the housing. To release the cable gland from the cable, release the retaining clips on each half and then pull the two halves apart.

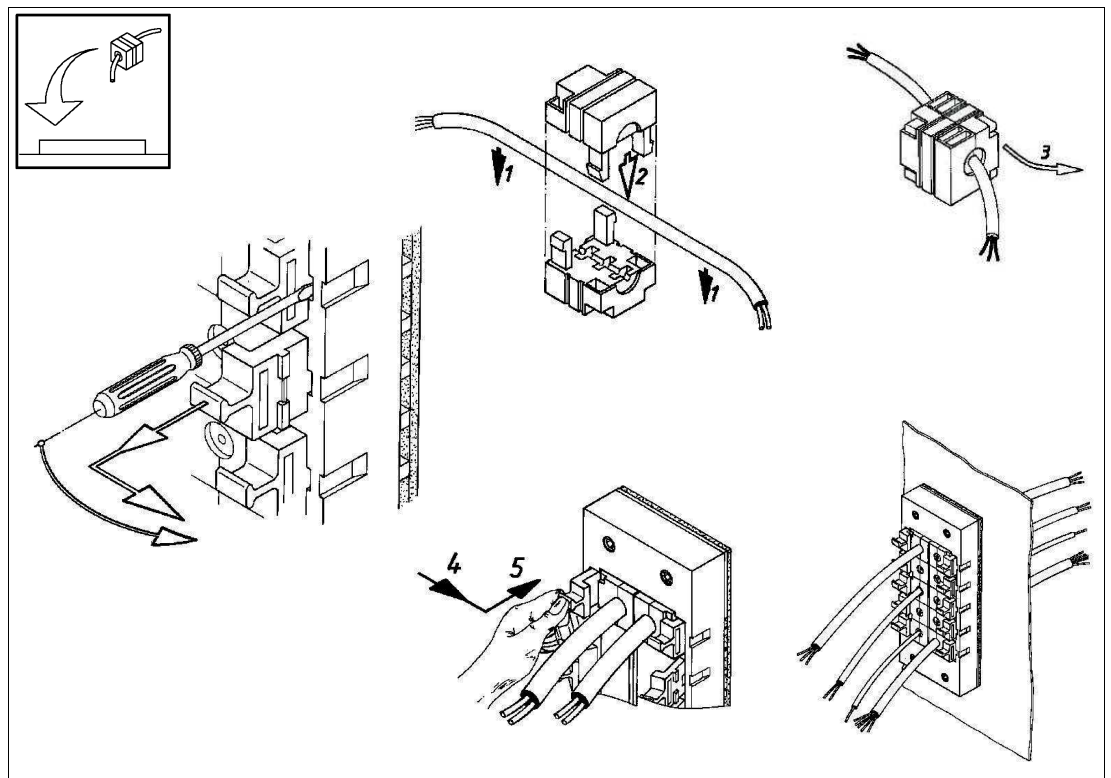


Figure 5.3 Installation

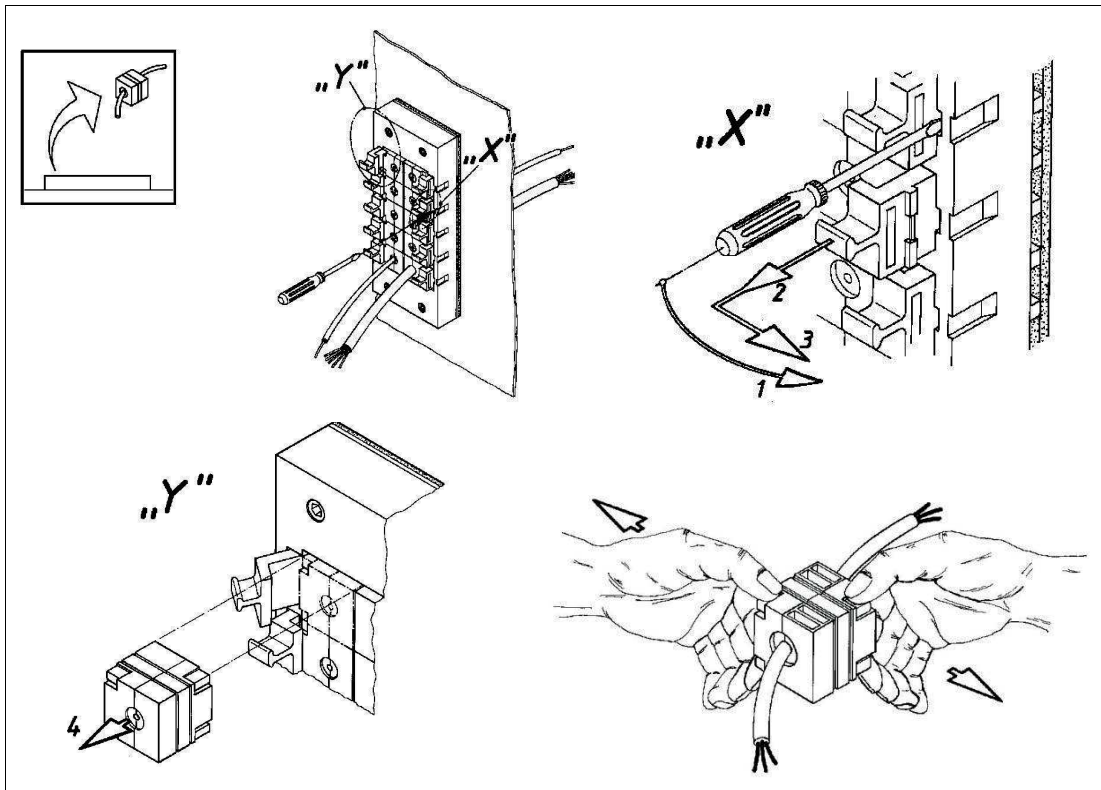


Figure 5.4 Removal

Electrical Connection



Caution!

Damage to the device

Connecting an alternating current or excessive supply voltage can damage the device or cause the device to malfunction.

Electrical connections with reversed polarity can damage the device or cause the device to malfunction.

Connect the device to direct current (DC). Ensure that the supply voltage rating is within the specified device range. Ensure that the connecting wires on the single-ended female cordset are connected correctly.

The figure below shows the cabling of the climate control housing.

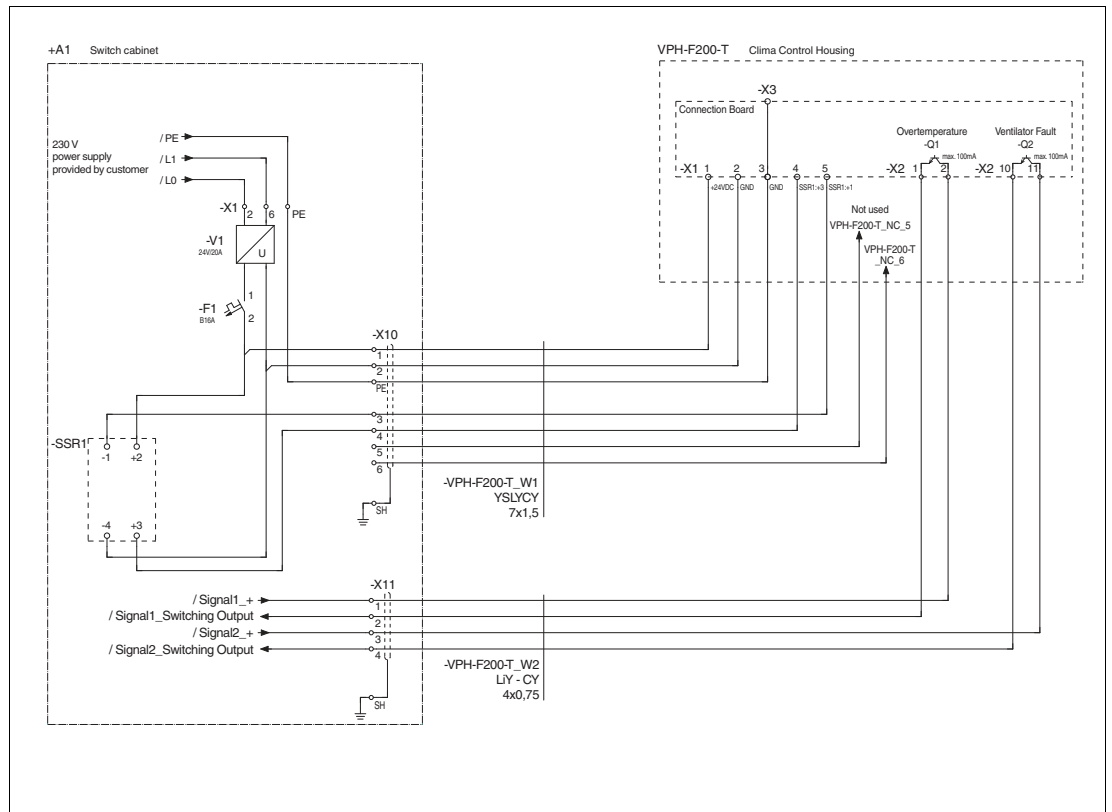


Figure 5.5 Connector assignment on the connection board

Connector assignment

The +24 VDC, GND, and PE connections at terminal -X1 represent the power supply of the climate protection housing and must be connected in line with the connection diagram above.

Apart from the fault monitoring function, the -X2 terminal is delivered fully connected.

The -X3 connection grounds the aluminum profile in the climate control housing. This connection is created via the mounting screws in the board. There is no need to make the connection retrospectively.

Make sure that the SSR1, SSR2, and SSR3 markings refer to the terminals of the solid state relay.

Fault Monitoring

The climate control housing has an integrated monitoring system for the fan function and the excess temperature shut-off function. The respective fault is indicated via a potential-free switching contact on terminal strip X2. There are also two red control LEDs on the inside of the board to indicate the status. The table below describes the different switch states.

Case of a fault	Output 1	Output 2	LED 1	LED 2
Fan 2 is faulty	Switched	Blocked	On	Off
Fan 1 is faulty	Switched	Blocked	On	Off
Fan 1 and 2 are faulty	Switched	Blocked	On	Off
Excess temperature	Blocked	Switched	Off	On

- Fault output 1 (terminal X2:11—X2:10) indicates that temperature monitoring has been triggered
- Fault output 2 (terminal X2:2—X2:1) indicates that one or more fans have failed

To monitor the fault outputs, e.g., with a PLC, the following connection diagram must be adhered to:

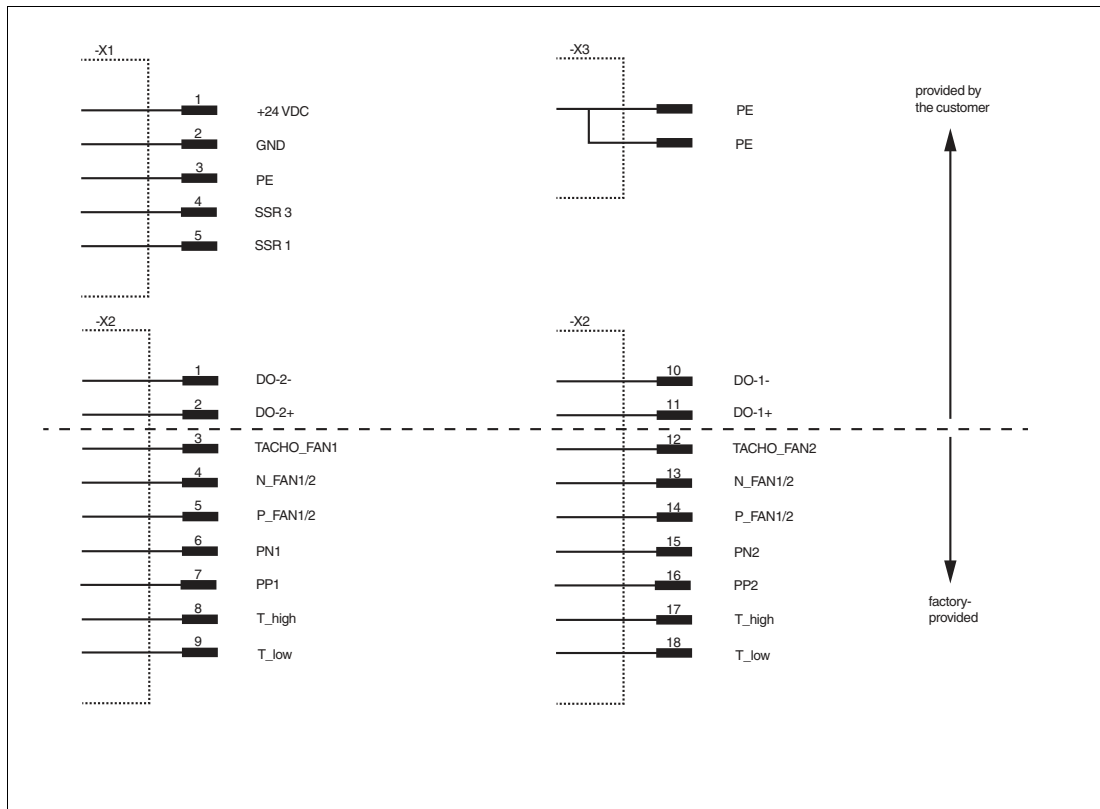


Figure 5.6 Connection diagram for PLC

Solid State Relay Connections

The figure below shows how the solid state relay (SSR) is connected. The LED on the SSR indicates the operating state of the SSR. If the LED is illuminated, this indicates that the SSR output is connected and the VPH housing is in cooling mode. If the LED is not illuminated, this indicates that the temperature in the VPH housing is below the limit value (+ 30 °C) or above the upper limit value (+ 50 °C). The lower limit value is set to prevent the sensor from getting too cold while the upper limit value is set to ensure the sensor does not overheat.

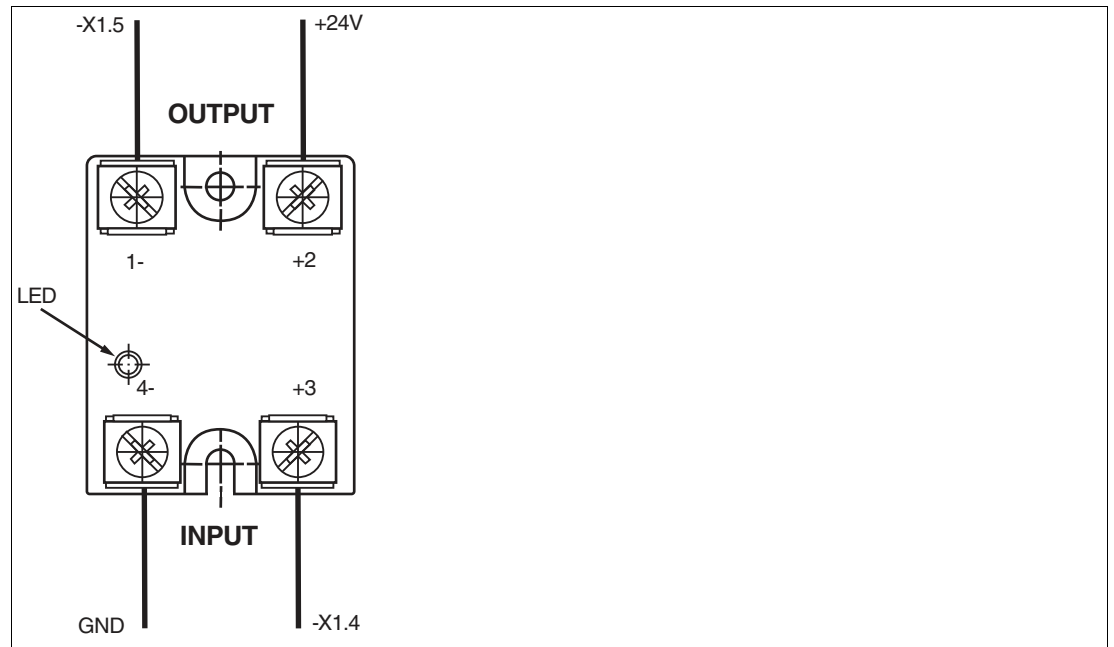


Figure 5.7 Solid State Relay Connections

Mounting the Solid State Relay

The SSR must be mounted in an open, easily accessible location in the switch cabinet using the two mounting holes on the inside wall of the switch cabinet.

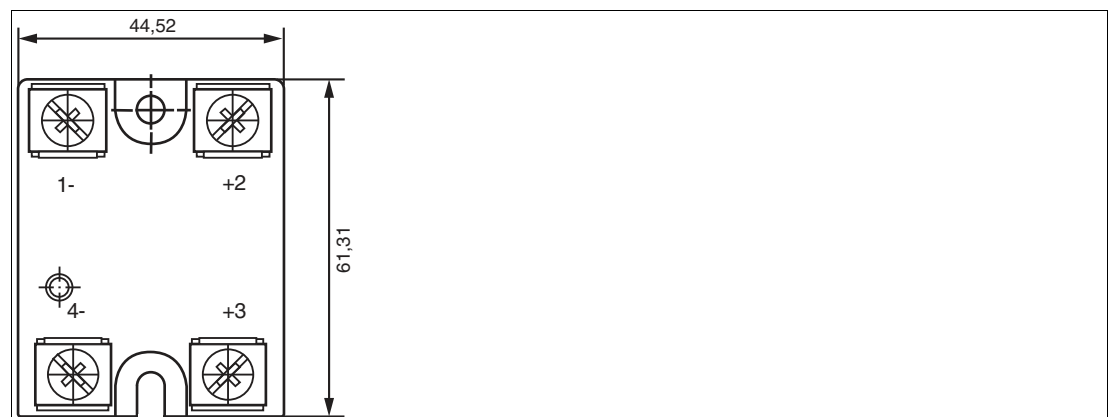


Figure 5.8 Dimensions of the solid state relay

Cable Length

We recommend a maximum cable length of 25 m. The power supply must be readjusted as shown in the figure below.

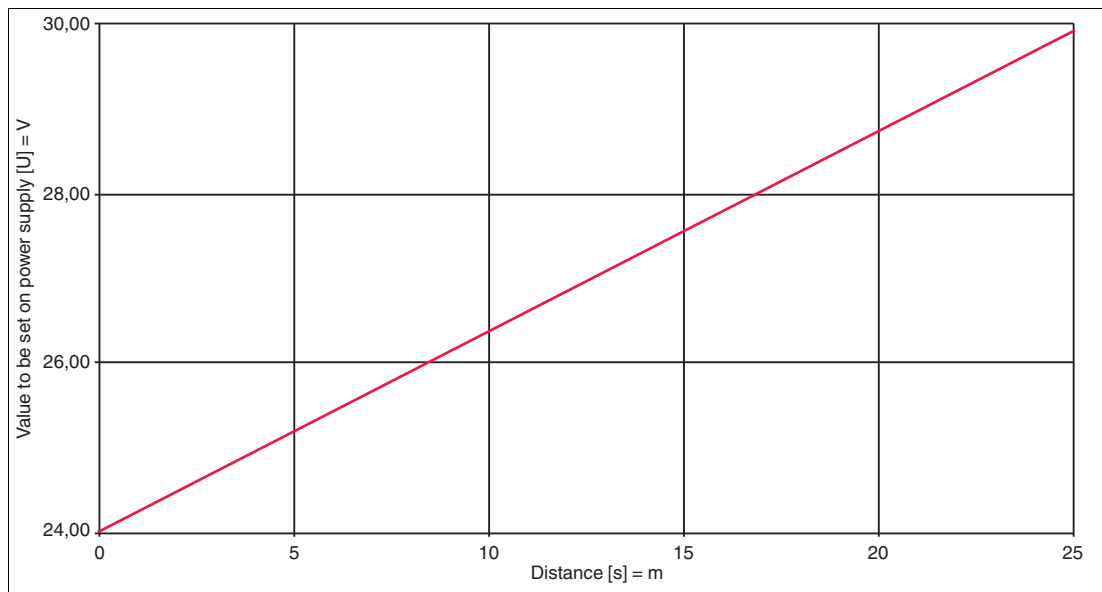


Figure 5.9 Voltage drop with a 1.5 mm² cable



Setting the Read Distance



Note

The optimal read distance between the sensor and the Data Matrix code tape is set out in the documentation provided with the chosen sensor. To find the relevant documentation, visit our website at www.pepperl-fuchs.com. Simply enter the product name or model number in the **product/keyword field** and click the search button. Select your sensor from the list of search results and click the **Documents** tab in the product information list. A list of all available downloads is displayed.

Before mounting the VPH housing, set the correct read distance for the chosen sensor. Proceed as follows:

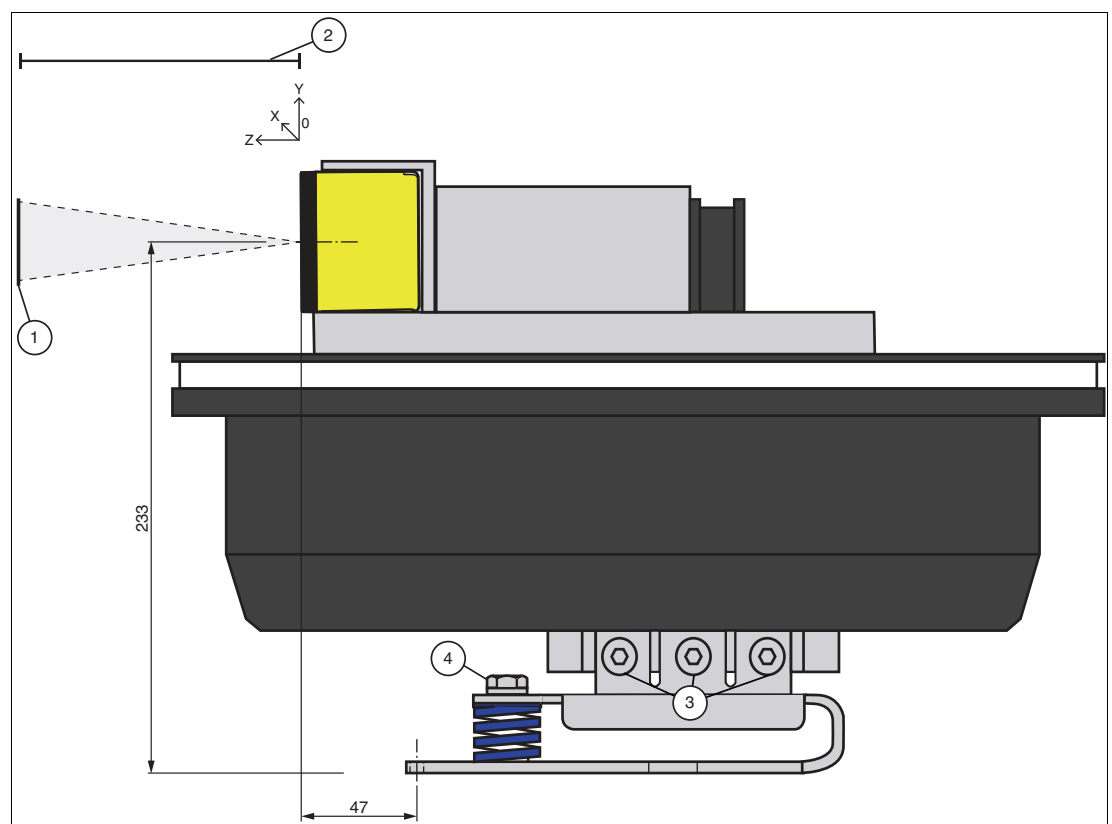


Figure 5.10 Read distance

1. Mount the sensor so that the lens of the read head with ring light and camera module is pointing toward the Data Matrix code tape (1).
2. Align the read head at an orientation of 0° to the Data Matrix code tape.
3. During mounting, observe the maximum angle tolerances and check that they are not exceeded. You can fine-tune the angle using the spring unit (4) on the mounting foot of the VPH housing.
4. Check that the distance Z (2) from the read head to the Data Matrix code tape (1) is the same as the read distance of the read head.



Note

Note that the read distance of the sensor shifts by approx. 47 mm because the first clearance hole in the mounting foot sits 47 mm behind the sensor (see the figure above). We recommend that you measure the distances within the device before mounting. You can fine-tune the distance to the Data Matrix code tape by approx. ± 2.5 mm using the three screws (3) on the mounting foot.

↳ Once you have set the read distance, attach the VPH housing to the system using the mounting foot.



Mounting the Upper Shell



Note

Before mounting the upper shell, remove the protective film on the inside and outside of the protective panel.

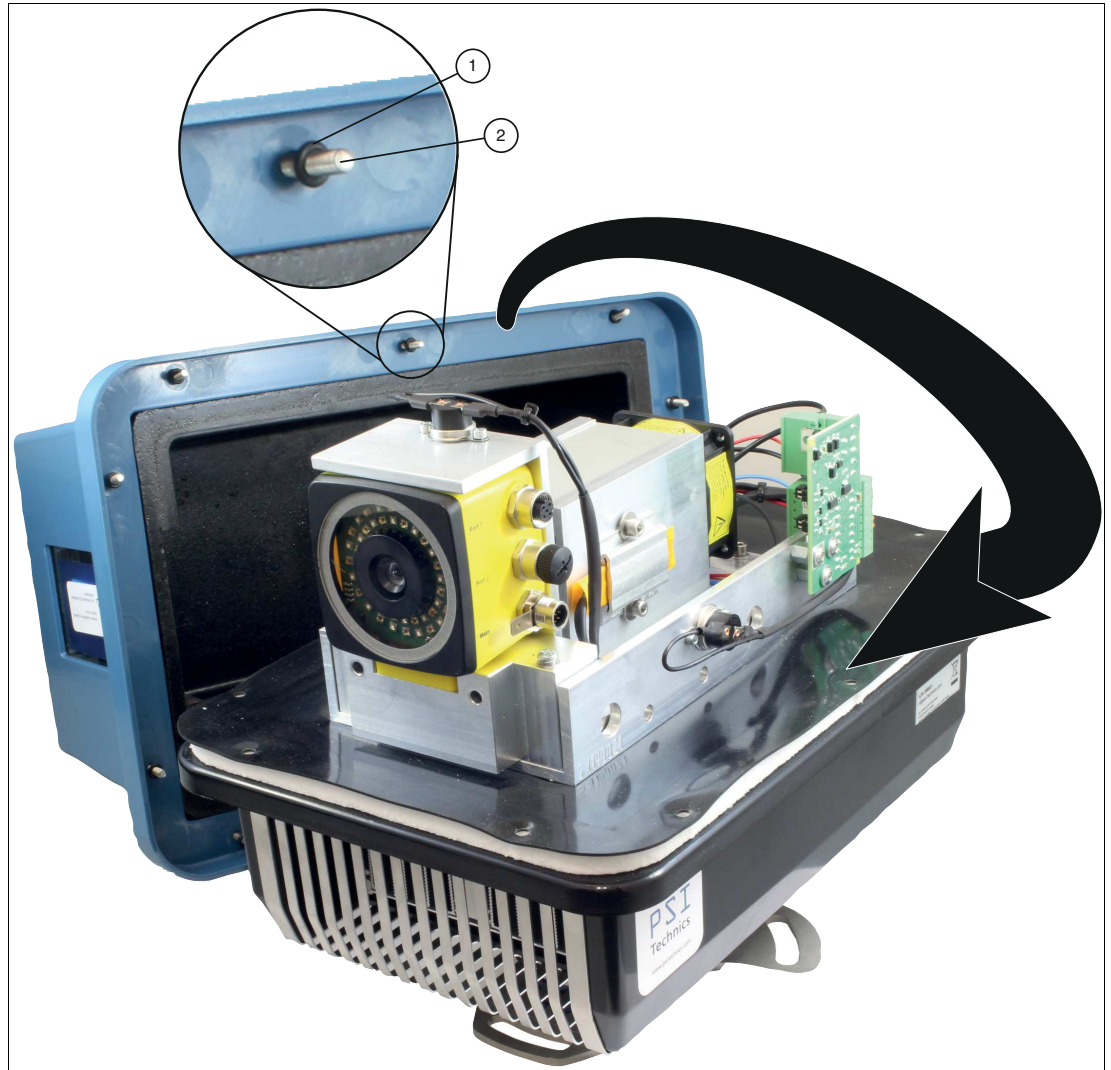


Figure 5.11 Preparing for mounting

1. Distribute the 11 sealing rings (1) among the screws (2) for mounting the upper shell.
2. Place the upper shell onto the housing base. When inserting the screws into the mounting holes, make sure that the sealing rings do not move.



Figure 5.12 Mounting the upper shell

3. First tighten the screws, spring washers, and washers in the upper shell manually and then to a tightening torque of 1 Nm. This is the only way to guarantee the relevant degree of protection.



Securing the Mounting Foot Using Threaded Holes

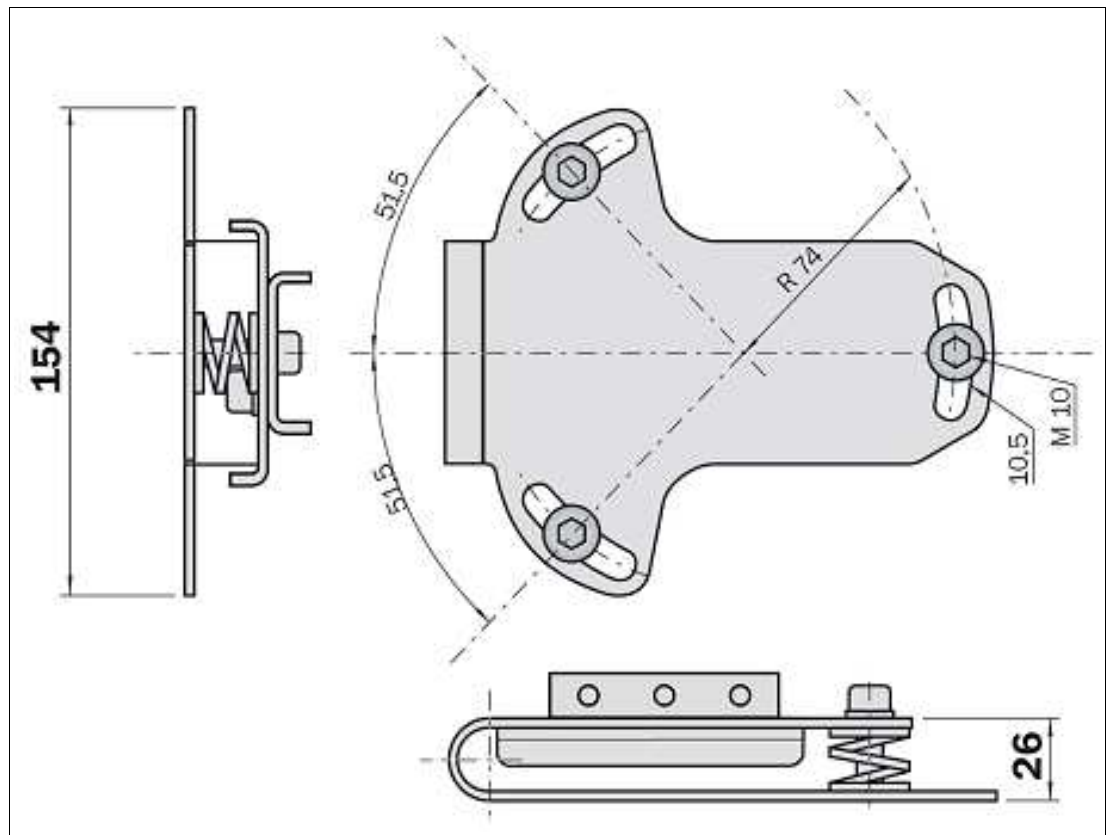


Figure 5.13 Mounting foot

1. Drill three $\varnothing 8.5$ mm holes as shown in the figure above.
2. Cut M10 threads into the three holes.
3. Insert and lightly tighten the screws, washers, and spring washers (not included in the scope of delivery) as shown in figure above.
4. The VPH housing is now ready to be aligned.
5. After aligning the housing, tighten the screws to the appropriate torque.



Securing the Mounting Foot Using Clearance Holes

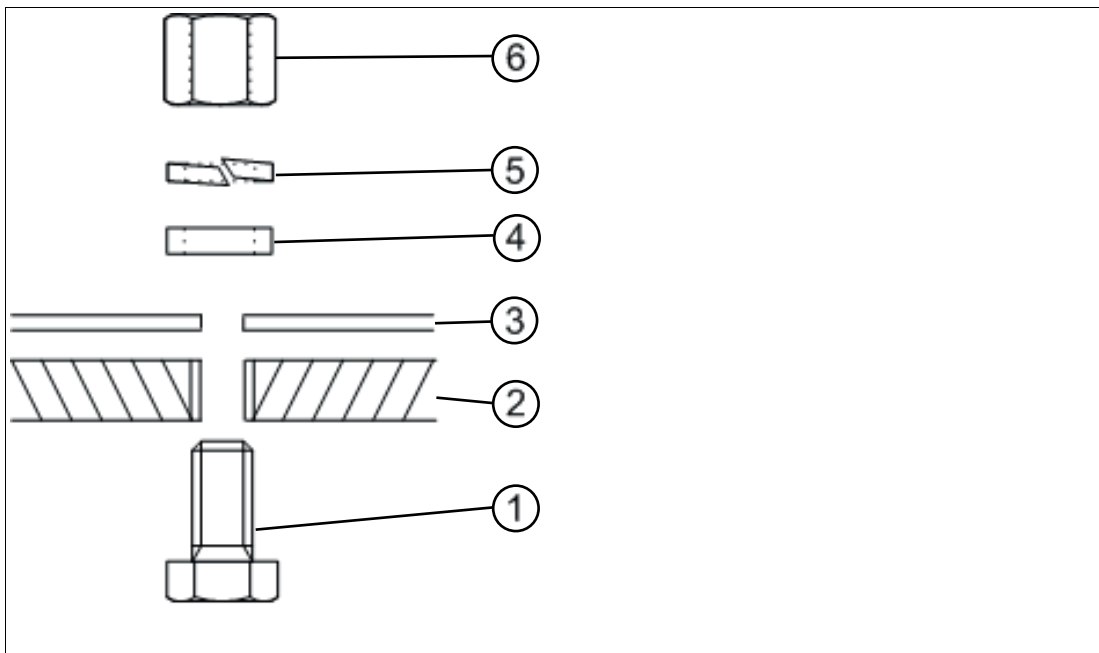


Figure 5.14 Clearance hole

1. Drill three $\text{\O} 10.5$ mm holes as shown in the "Mounting foot" figure.
2. Insert and lightly tighten the screw (1), washer (4), spring washer (5), and nut (6) as shown in figure above (2 = mounting surface, 3 = mounting foot). The mounting material is not included in the scope of delivery.
3. The VPH housing is now ready to be aligned.
4. After aligning the housing, tighten the screws to the appropriate torque.

6 Commissioning

Once the VPH housing has been fully mounted, it is ready for commissioning. Commissioning may be carried out only by trained and qualified personnel and by personnel specially trained in handling the device to ensure that it functions properly.

7

Servicing

**Danger!**

Danger to life due to electrical current

Making contact with live parts causes electric shocks, which pose an immediate danger to life.

- Allow only qualified electricians to carry out work on the electrical components.
 - Before working on electronic components, disconnect the power supply.
-

Depending on the ambient conditions in which the device is used, an inspection and, where relevant, cleaning of the heat sink must be included in the maintenance schedule. A heavily contaminated heat sink obstructs the air flow and thus the cooling functionality of the unit.

The heat sink must be cleaned using a compressed air nozzle small enough to be inserted through the fan and into the heat sink. Compressed air in spray cans is ideal for this purpose. This cleaning method also prevents the fans from over-rotating, which can be a problem when compressed air guns are used.

**Note**

Once cleaning is complete, check that the fans are working properly.

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