

MANUAL

Warning Device NVD-111



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
Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause:
"Expanded reservation of proprietorship"

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1 Safety

1.1 General safety instructions

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

Installation and commissioning of all devices must be performed by a trained professional only.

Protection of operating personnel and the system is not ensured if the product is not used in accordance with its intended purpose.

Laws and regulations applicable to the usage or the intended purpose must be observed. The devices are only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

The Declaration of Conformity, Certificate of Compliance, Statement of Conformity, EC-type-examination certificate and data sheets are an integral part of this document.

The data sheet contains the electrical data of the Declaration of Conformity, the Certificate of Compliance and the EC-type-examination certificate.

The documents mentioned are available from <http://www.pepperl-fuchs.com> or contact your local Pepperl+Fuchs representative.

1.2 Used Symbols

Safety-relevant Symbols



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 devices and any connected facilities or systems, or result in their complete failure.

Informative Symbols



Note!

This symbol brings important information to your attention.



Action

This symbol indicates a paragraph with instructions.

1.3

Declaration of Conformity

All products were developed and manufactured under observance of the applicable European standards and guidelines.



Note!

A Declaration of Conformity can be requested from the manufacturer.

The product manufacturer, Pepperl+Fuchs GmbH, 68307 Mannheim, has a certified quality assurance system that conforms to ISO 9001.



ISO9001

1.4

Intended Use

The warning device is a compact alarm system for monitoring one or two sensors in grease interceptors.

The warning devices must only be installed in a suitable control cabinet or NVO5-KV installation housing.

The warning device was designed for:

- the monitoring of the fat layer thickness, i. e. an alarm if a certain limit of maximum receptacle capacity of fat has been reached.
- the monitoring of the overflow of liquid, e. g. in the event of a blocked drain

Only the following sensors must be connected to the warning device:

Description	Type code
Fat level sensor, for detecting fat layer thickness in an aqueous emulsion with small lumps of fat or a hardened layer of fat	FAU-104
Fat level sensor, for detecting fat layer thickness in a liquid layer of fat	KVF-F
Overflow sensor, for detecting excessively high liquid level	KVF-O

1.4.1

Designation

Warning device
Pepperl+Fuchs GmbH
Lilienthalstrasse 200, 68307 Mannheim, Germany
NVD-111

1.5

Maintenance

The device must not be cleaned with caustic fluids.

The devices are maintenance-free. However, to guarantee perfect operation of the complete alarm system, check the operation, including all sensors, at least once a year.

1.6

Delivery, Transport and Storage

Check the packaging and contents for damage.

Check if you have received every item and if the items received are the ones you ordered.

Keep the original packaging. Always store and transport the device in the original packaging.

Always store the device in a clean and dry environment. The permitted storage temperature (see data sheet) must be considered.

1.7

Installation and Commissioning

1.7.1

Installation of the warning device

The device must only be installed **outside potentially explosive zones**. The device must not be installed in places with potentially aggressive vapors.

The device must be free of voltage during installation and maintenance. The warning system must only be connected to the supply voltage after complete mounting and connection of the sensors.

The identification plate must not be removed.

1.8 Operation

1.8.1 Availability of Emulsion

Grease interceptors are plants which can separate fat from water. It may occur that fat is not separated due to the emulsion that has formed. An emulsion is a more or less stable mixture of fat and water. If the water content in the fat is too high, the sensor does not detect any fat.

1.9 Repair

The devices must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device.

1.10 Disposal

Disposal of devices and their packaging material must be performed in compliance with the applicable laws and guidelines of the corresponding country.

The devices do not contain batteries which need to be disposed of separately from the products.

1.11 Applied Standards and Directives

EN 50178:1997

EN 61000-6-4:2007

EN 61326-1:2013

EMC Directive 2004/108/EC

Low Voltage Directive 2006/95/EC

2

Product Specifications

2.1

Function

The warning device monitors the status of

- a fat level sensor or
- an overflow sensor or
- the combination of an overflow sensor and a fat level sensor

in a grease interceptor.

LEDs at the device indicate alarm, sensor fault and system and sensor status. In the event of an alarm, an additional acoustic signal sounds.

The fat in the grease interceptor can be of various compositions. The following conditions are possible:

- The fat is liquid. Such fat is found in, e. g., the manufacture and storage of vegetable fats. This fat forms a liquid fat layer which clearly separates from water. For this composition of fat, please use fat level sensor KVF-F for detecting the fat layer thickness.
- The fat is hard. Such fat is found in, e. g., waste water from sinks or dishwashers and in floor drains in large kitchens or catering establishments. This fat consists of a mixture of animal and vegetable fats. It typically forms an aqueous emulsion with small lumps of fat or a hardened layer of fat. For this composition of fat, please use fat level sensor FAU-104 for detecting the fat layer thickness.

2.2 Product Program

Warning device

Description	Type code
Warning device, 230 V AC	NVD-111

Sensors

Description	Type code
Fat level sensor, for detecting fat layer thickness in an aqueous emulsion with small lumps of fat or a hardened layer of fat	FAU-104
Fat level sensor, for detecting fat layer thickness in a liquid layer of fat	KVF-F
Overflow sensor, for detecting excessively high liquid level	KVF-O

Accessories

Description	Type code
Cable connector IP68 for one sensor	LAL-SK2
Mounting set for one sensor	NVO5-B
Installation housing with DIN mounting rail	NVO5-KV

2.3

Design and Dimensions

Warning device NVD-111

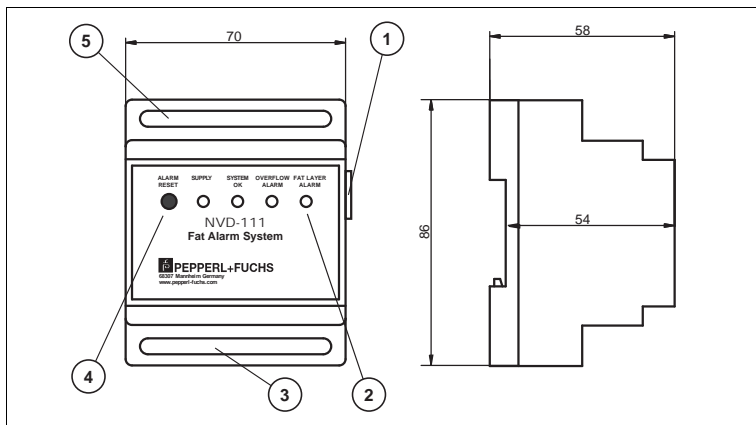


Figure 2.1

- 1 DIP switches
- 2 LEDs
- 3 Connections for power supply and potential-free contacts
- 4 Reset button
- 5 Sensor connections

Installation housing NVO5-KV

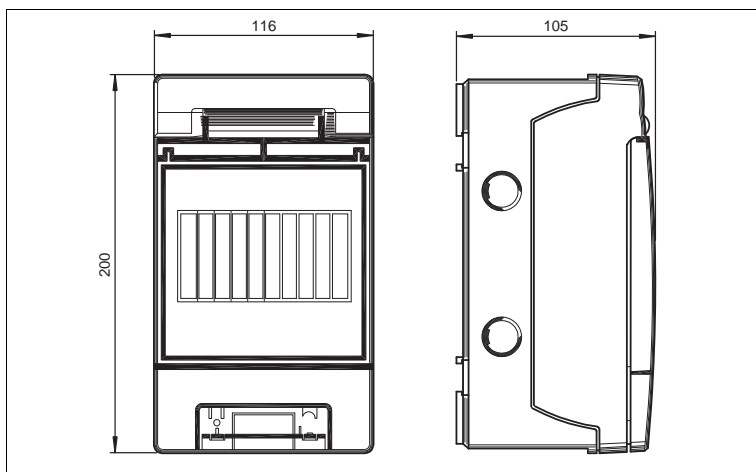


Figure 2.2

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Overflow sensor KVF-O

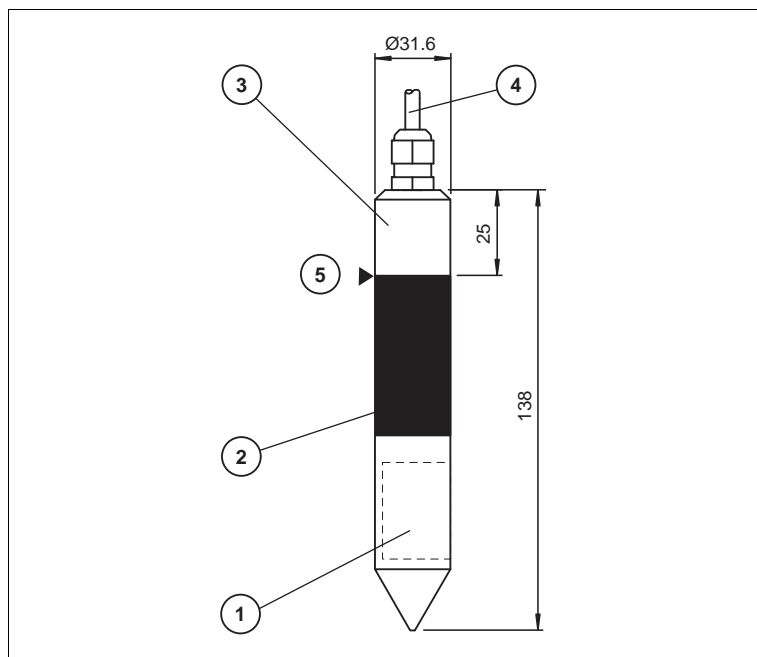


Figure 2.3

- 1 Lower section with laser marking
- 2 Middle section
- 3 Upper section
- 4 Cable
- 5 Switching point

Fat level sensor KVF-F

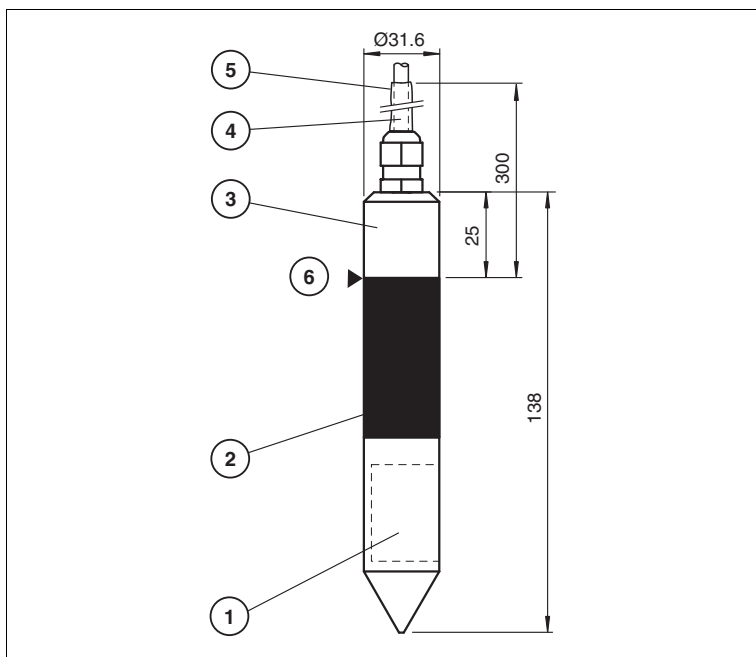


Figure 2.4

- 1 Lower section with laser marking
- 2 Middle section
- 3 Upper section
- 4 Cable
- 5 Shrink tubing
- 6 Switching point

Fat level sensor FAU-104

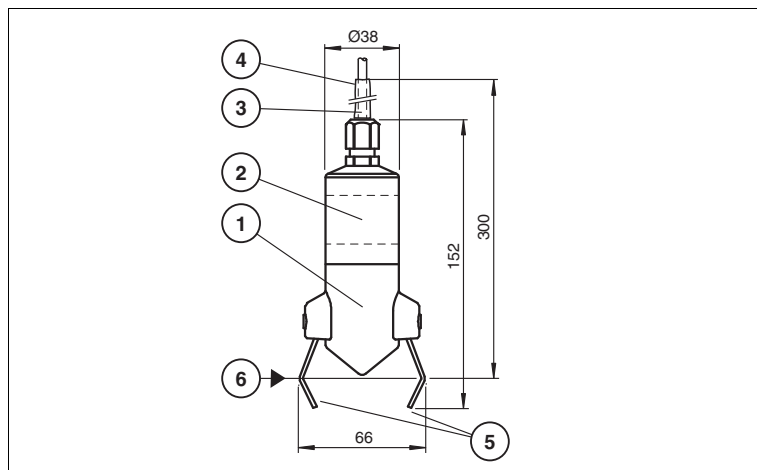


Figure 2.5

- 1 Lower section
- 2 Laser marking
- 3 Cable
- 4 Shrink tubing
- 5 Reflectors
- 6 Switching point

3 Installation

3.1 Mounting of the Sensors

Read the chapter on Safety and, in particular, the section on Installation and Commissioning (see chapter 1.7) before mounting the sensor. Do not remove the identification plate.



Warning!

Risk of short circuit

Injuries and damage to the device are possible when working with live parts.

- Before working on the device, always disconnect the supply voltage.
- Connect the device to the supply voltage only after completion of the work.

During installation, read the instructions provided by the grease interceptor manufacturer. Ensure that the suspension mechanism keeps the sensor permanently at the correct height. Where possible, secure the device in a position where it can be reached from the manhole opening so that it can be removed when emptying (disposal) or carrying out maintenance work on the grease interceptor.

The oil/petrol separator can be made of various materials. We therefore recommend using the following methods to secure the device in a suspended position:

- If mounting the device in concrete containers, use the NVO5-B mounting set. See the figure below.
- If mounting the device in containers made from other materials, such as plastic or metal, use other suspension devices as appropriate, for example, screws and screw anchors.

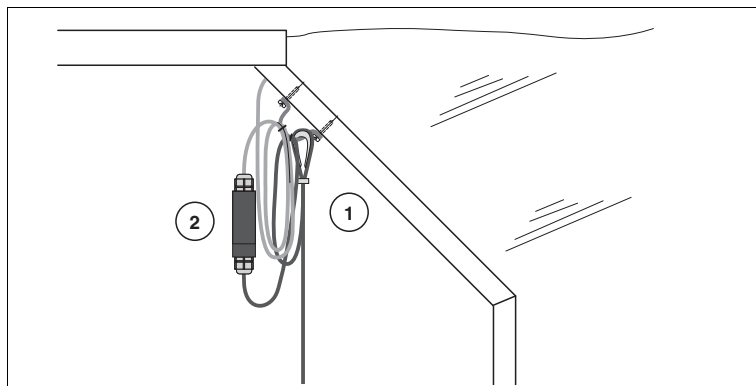


Figure 3.1 Mounting using cable connector and mounting set

- 1 Mounting set for one sensor NVO5-B
- 2 Cable connector for one sensor LAL-SK2

3.1.1

Mounting the KVF-O Overflow Sensor

Usually, the switching point of the sensor must be located a few centimeters above the normal liquid level (water zero line) in a position so close to the water zero line that the switching point is surrounded by liquid when an overflow occurs. This occurs

- when there is back pressure in the sewage system or
- if the drain is blocked.

The switching point of the sensor is located between the insulated connecting piece and the top metal section (see chapter 2.3).

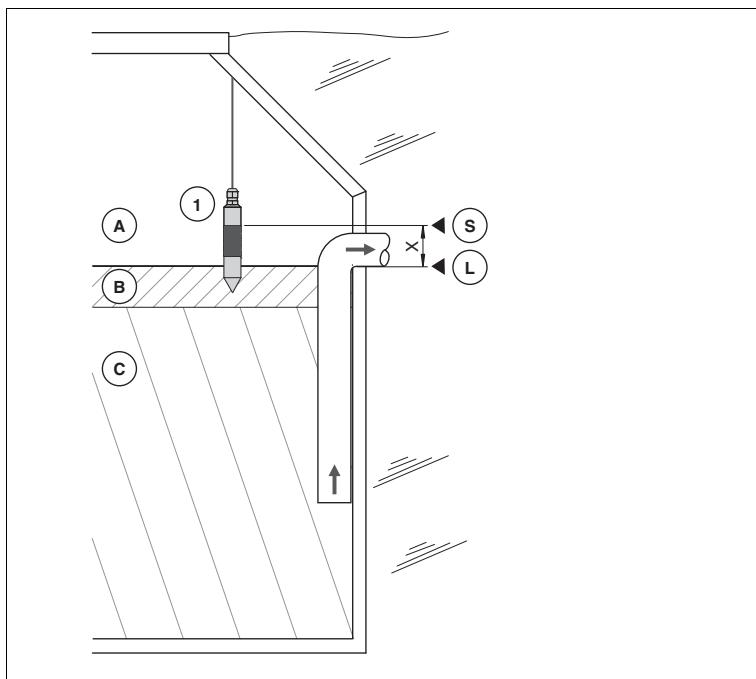


Figure 3.2 Mounting the overflow sensor

- 1 Overflow sensor KVF-O
- A Air
- B Fat, oil, grease (FOG)
- C Water
- L Water zero line
- S Sensor switching point
- X Alarm limit (maximum liquid level)

If a non-electrically conductive fat layer settles on the surface, there is a risk that a possible overflow will not be detected by the sensor. Therefore we recommend mounting a pitot tube for overflow sensor KVF-O. This ensures that the sensor only comes into contact with water and the overflow is detected. The following diagram shows the composition.

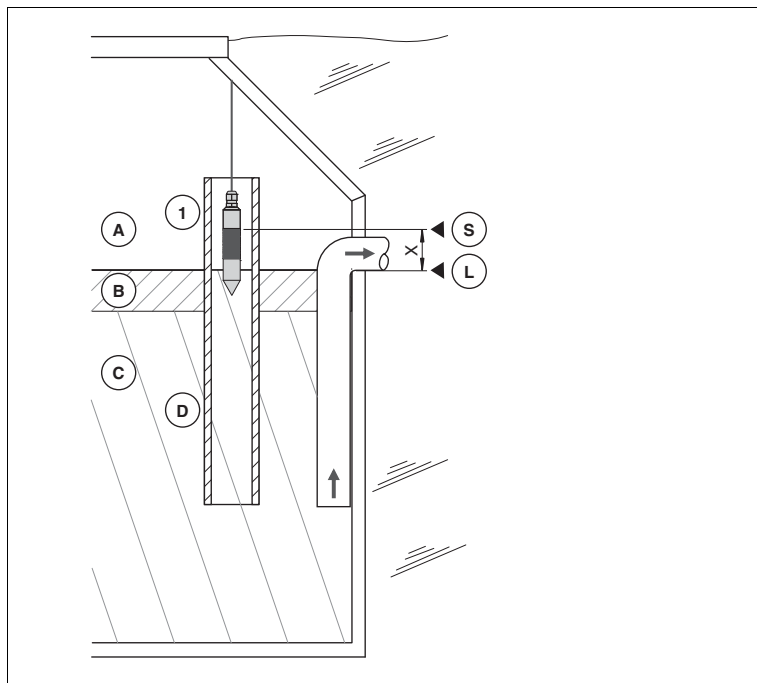


Figure 3.3 Mounting the overflow sensor KVF-O with pitot tube

- 1 Overflow sensor KVF-O
- A Air
- B Fat, oil, grease (FOG)
- C Water
- D Open pitot tube (not supplied)
- L Water zero line
- S Sensor switching point
- X Alarm limit (maximum liquid level)

3.1.2 Mounting the KVF-F Fat Level Sensor

The sensor must be immersed a few centimeters when the liquid is at its normal level (water zero line).

The exact immersion depth depends on

- the type of grease interceptor,
- its design,
- its capacity
- and the height of the maximum fat layer thickness.

The sensor must always be immersed in the liquid. The switching point of the sensor is located between the insulated connecting piece and the top metal section (see chapter 2.3).



Caution!

Damage to the cable as a result of aggressive greases

The sensor cable must not be in continuous contact with grease or with water that contains grease. The sensor is therefore fitted with shrink tubing. The shrink tubing protects the cable from the effect of the grease to a fat layer thickness of 30 cm.

If fat layer thicknesses of more than 30 cm occur in your application, protect the cable with additional shrink tubing.

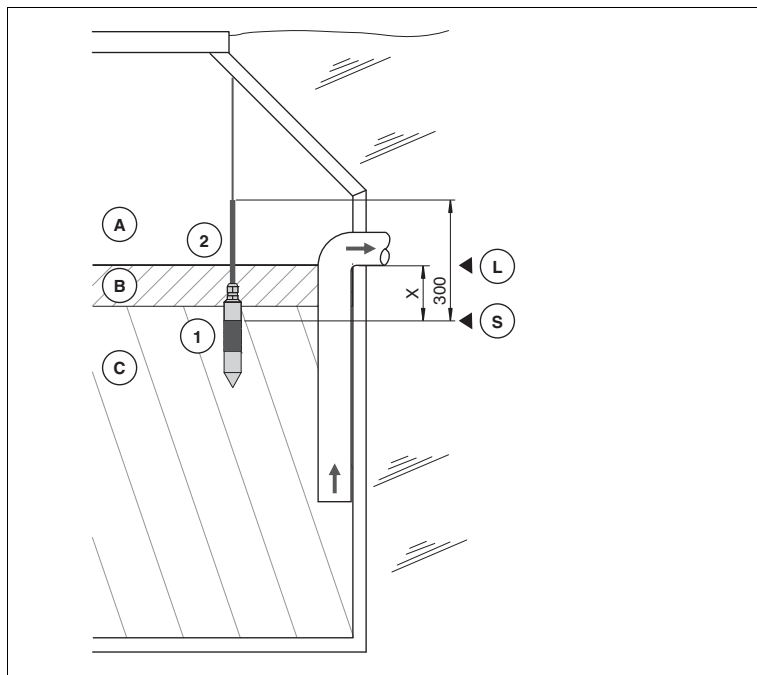


Figure 3.4 Mounting the fat level sensor

- 1 Fat level sensor KVF-F
- 2 Shrink tubing
- A Air
- B Fat, oil, grease (FOG)
- C Water
- L Water zero line
- S Sensor switching point
- X Alarm limit (maximum fat layer thickness)

3.1.3 Mounting the FAU-104 Fat Level Sensor

The sensor must be immersed a few centimeters when the liquid is at its normal level (water zero line).

The exact immersion depth depends on

- the type of grease interceptor,
- its design
- and the height of the maximum fat layer thickness.

The sensor must always be immersed in the liquid. The switching point of the sensor is located at the same level as the reflectors (see chapter 2.3).



Caution!

Damage to the cable as a result of aggressive greases

The sensor cable must not be in continuous contact with grease or with water that contains grease. The sensor is therefore fitted with shrink tubing. The shrink tubing protects the cable from the effect of the grease to a fat layer thickness of 30 cm.

If fat layer thicknesses of more than 30 cm occur in your application, protect the cable with additional shrink tubing.

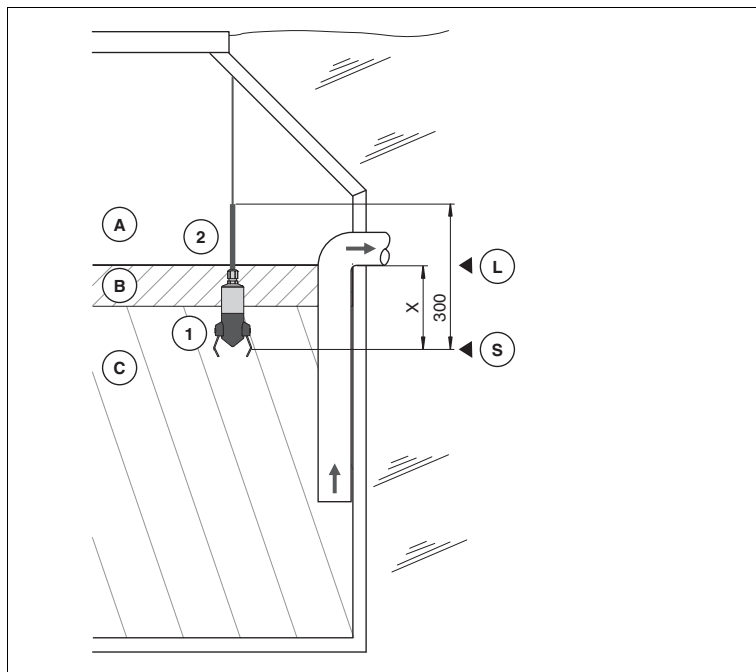


Figure 3.5 Mounting the fat level sensor

- 1 Fat level sensor FAU-104
- 2 Shrink tubing
- A Air
- B Fat, oil, grease (FOG)
- C Water
- L Water zero line
- S Sensor switching point
- X Alarm limit (maximum fat layer thickness)

3.2 Mounting the Warning Device



Note!

If installing the device in an enclosure or switch cabinet, follow the mounting instructions provided by the manufacturer of the enclosure or switch cabinet.



Caution!

Malfunction or damage resulting from overheating

If the external temperature exceeds 60 °C at maximum load, the device may become damaged.

- Ensure sufficient ventilation at the installation site
- Maintain a minimum distance of 5 mm between the devices on the DIN mounting rail.



Mounting the warning device on the DIN mounting rail.

Clip the device onto the DIN mounting rail.

➞ The warning device engages with an audible click. The warning device is mounted.

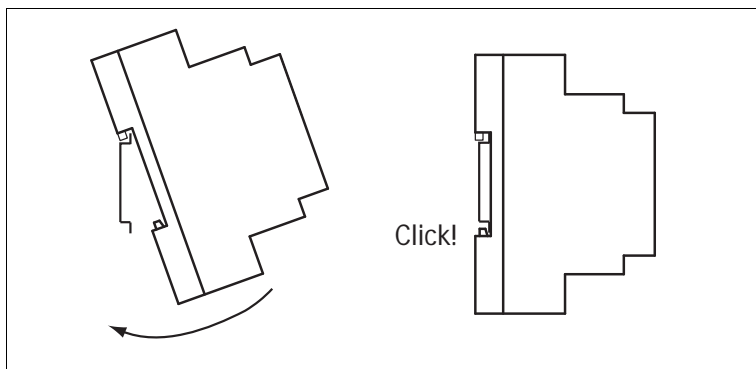


Figure 3.6

3.3 Connection

Read the chapter on Safety and, in particular, the section on Installation and Commissioning (see chapter 1.7) before installing the device. Do not remove the identification plate.



Warning!

Risk of short circuit

Injuries and damage to the device are possible when working with live parts.

- Before working on the device, always disconnect the supply voltage.
- Connect the device to the supply voltage only after completion of the work.

Take care not to reverse the polarity when connecting the sensor cable. The loop resistance of the extension cable should not exceed 20 Ω for the sensors.

Connecting and configuring the warning device with overflow sensor KVF-O

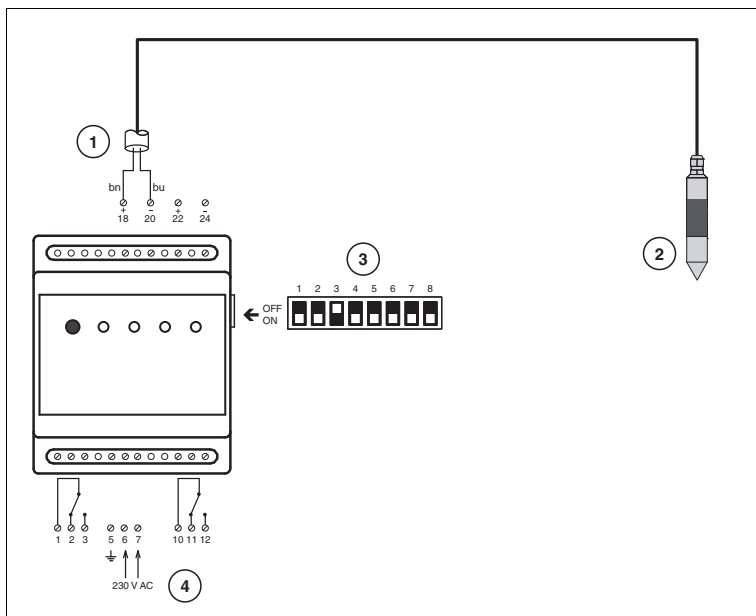


Figure 3.7

- 1 Overflow sensor connection
- 2 Overflow sensor KVF-O
- 3 DIP switches
- 4 Power supply
- bu blue
- bn brown

Connecting and configuring the warning device with fat level sensor KVF-F

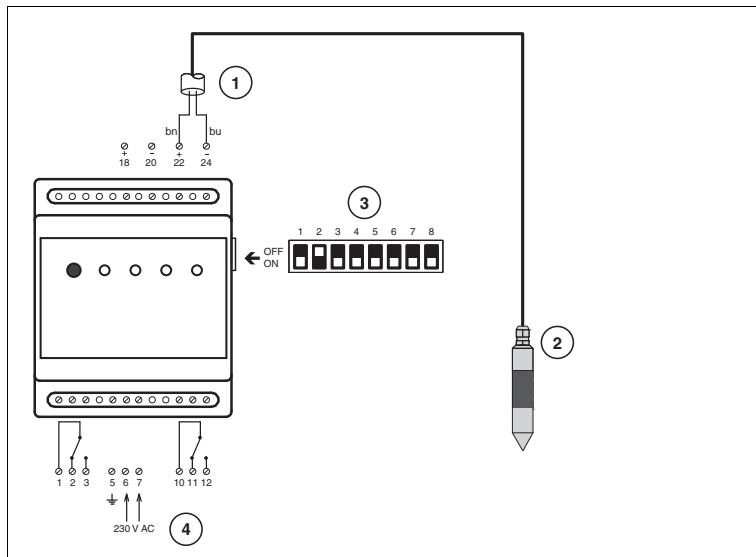


Figure 3.8

- 1 Fat level sensor connection
- 2 Fat level sensor KVF-F
- 3 DIP switches
- 4 Power supply

bu blue

bn brown

Connecting and configuring the warning device with fat level sensor FAU-104

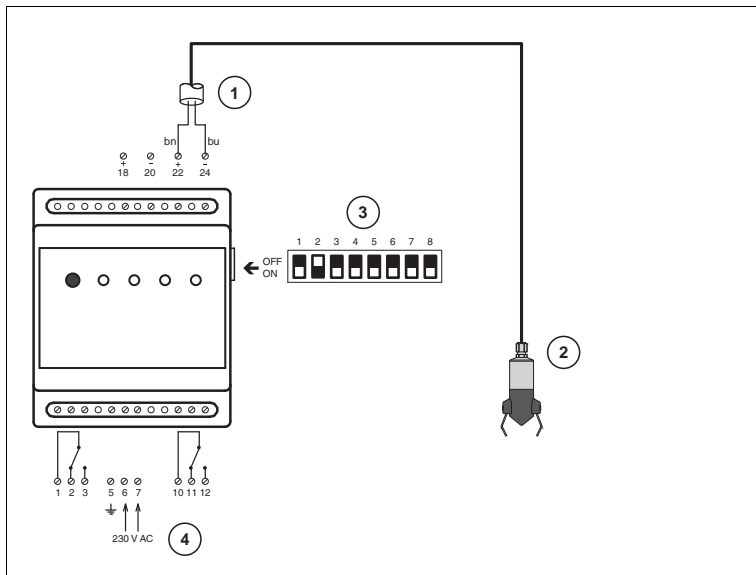


Figure 3.9

- 1 Fat level sensor connection
- 2 Fat level sensor FAU-104
- 3 DIP switches
- 4 Power supply
- bu blue
- bn brown

Connecting and configuring the warning device with overflow sensor KVF-O and fat level sensor KVF-F

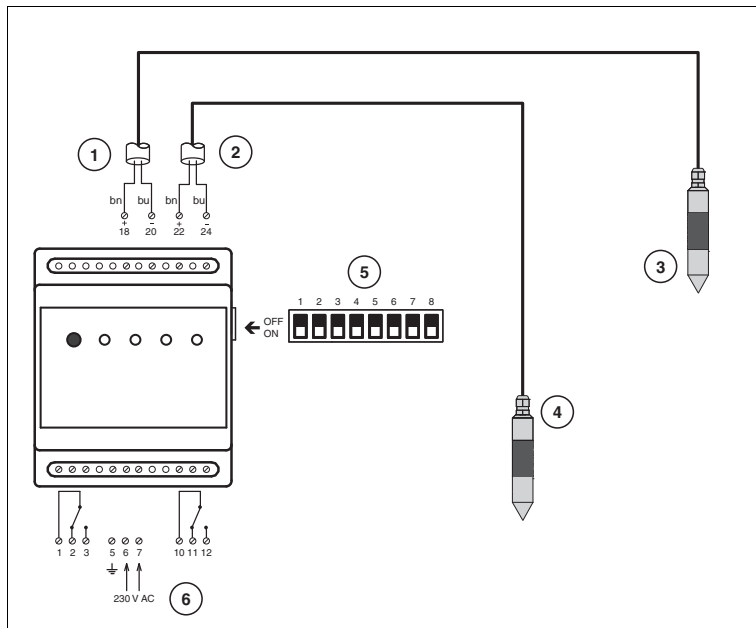


Figure 3.10

- 1 Overflow sensor connection
- 2 Fat level sensor connection
- 3 Overflow sensor KVF-O
- 4 Fat level sensor KVF-F
- 5 DIP switches
- 6 Power supply
- bu blue
- bn brown

Connecting and configuring the warning device with overflow sensor KVF-O and fat level sensor FAU-104

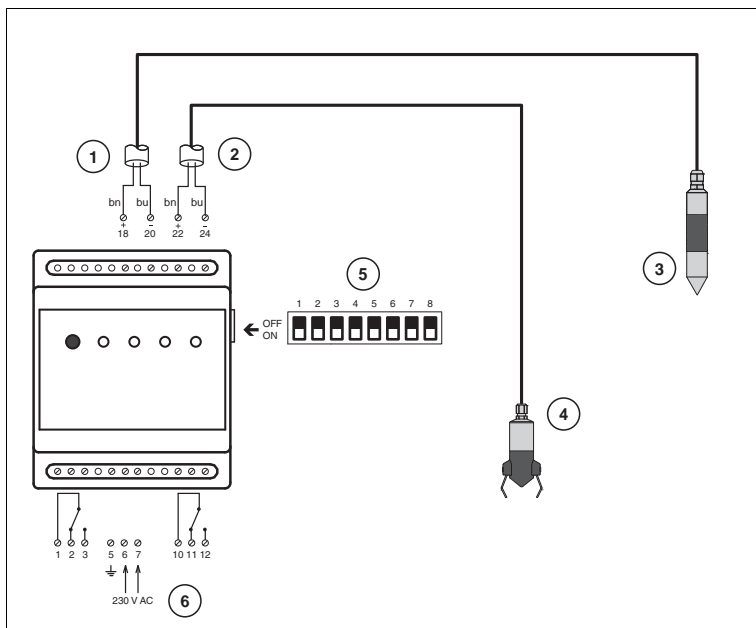


Figure 3.11

- 1 Overflow sensor connection
- 2 Fat level sensor connection
- 3 Overflow sensor KVF-O
- 4 Fat level sensor FAU-104
- 5 DIP switches
- 6 Power supply
- bu** blue
- bn** brown

The product is a Class II device (with reinforced insulation). Connect the power supply as follows:

- Terminal 7: phase (F/L2)
- Terminal 6: zero (N/L1)
- Terminal 5: ground (loop terminal)



Note!

Additional relays can be connected via terminals 1 to 3 and 10 to 12. They can be used, for example, for an external alarm or the connection to a central monitoring system.

For extending the sensor cable, use cable connector LAL-SK2.



Note!

Avoid routing the sensor cable parallel to other cables, as these cables may transmit interfering signals. These interfering signals may affect the sensor signal and impair the alarm function. Use unshielded 2-strand cables for each sensor.

To ensure the warning device functions correctly, do not exceed the following maximum sensor cable lengths:

- With a cable cross section of 0.75 mm^2 , the maximum cable length is 190 m.
- With a cable cross section of 1 mm^2 , the maximum cable length is 250 m.

4

Commissioning

4.1

Configuring the Warning Device using DIP Switches

Often, suspended particles (e. g. leftovers) can be found in the grease interceptor and lumps of fat often form. These suspended particles and lumps of fat can cause a false alarm for the fat level sensor. Therefore, it is possible to set two possible monitoring states for the fat level sensor on the warning device via the setting of DIP switch 1 (reaction time of the fat level sensor).

Switch setting ON – operating mode

- The reaction time for detection of a fat layer is 24 hours (warning device in normal mode, green "SYSTEM OK" LED lights up). The device becomes active only after the fat level sensor has remained in a fat layer undisturbed for a period of 24 hours.
 - The device uses the "FAT LAYER ALARM" LED to display the alarm status.
 - The device triggers an audible alarm where necessary.
 - The device activates the relay.
- The reaction time for detection of water is 1 hour (warning device in alarm mode, red "FAT LAYER ALARM" LED lights up). The device becomes active only after the fat level sensor has remained in water undisturbed for a period of 1 hour.
 - The "FAT LAYER ALARM" LED goes out.
 - The "SYSTEM OK" LED flashes.



Note!

Note that the "SYSTEM OK" LED light ups under the following conditions:

- After switching on the warning device
- After switching the DIP switch from OFF to ON
- After pressing and holding the "ALARM RESET" button (approximately 3 to 4 seconds)

The device becomes active only after the fat level sensor has remained in a fat layer undisturbed for a period of 24 hours.

- The device uses the "FAT LAYER ALARM" LED to display the alarm status.
- The device triggers an audible alarm where necessary.
- The device activates the relay.

Switch setting OFF – service/test mode

After switching on the warning device or after switching the DIP switch from ON to OFF, an alarm is detected immediately and the warning device displayed.

The DIP switches are located on the right of the device (see chapter 2.3).

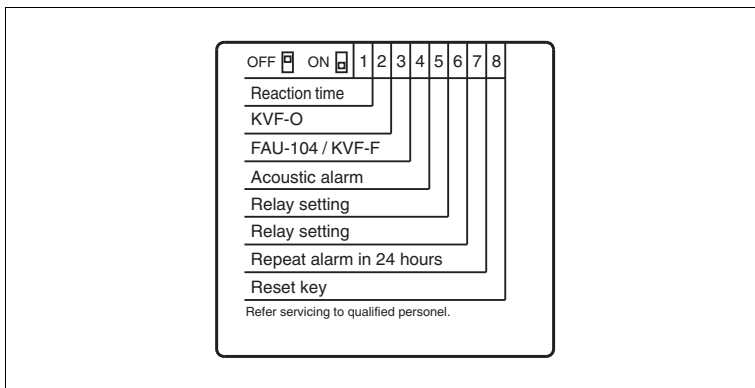


Figure 4.1 Overview of the warning device DIP switches

The following table contains a list of possible configuration settings.

EN

Switches			Description
DIP 1	Reaction time (reaction time of the fat level sensor)	ON	Operating mode – delay of the sensor reaction
		OFF	Service/test mode – instant sensor reaction
DIP 2	Overflow sensor KVF-O	ON	connected
		OFF	not connected
DIP 3	Fat level sensor KVF-F or FAU-104	ON	connected
		OFF	not connected
DIP 4	Acoustic alarm	ON	Acoustic alarm on.
		OFF	Acoustic alarm off.
DIP 5	Relay setting	ON	Relays 1 and 2 switch irrespective of the alarm states and with which sensor. If the alarm status disappears, relays 1 and 2 switch again (if "ALARM RESET" is actuated, the relays switch again).
DIP 6		ON	
DIP 5	Relay setting	ON	Relays 1 and 2 switch, irrespective of the alarm states. After 3 minutes, relay 2 switches again (even if an alarm status is present). If the alarm status disappears, relay 1 and/or relay 2 switches again (if "ALARM RESET" is actuated, the relays switch again).
DIP 6		OFF	
DIP 5	Relay setting	OFF	In the case of active alarm status, relay 1 switches to overflow sensor KVF-O and relay 2 switches to fat level sensor KVF-F/FAU-104. If the alarm status disappears, relay 1 and/or relay 2 switch again (if "ALARM RESET" is actuated, the relays switch again).
DIP 6		ON	
DIP 5	Relay setting	OFF	Relays 1 and 2 switch, irrespective of the alarm states. If an alarm event is no longer present, relay 1 automatically switches back and relay 2 remains unchanged until the alarm is cleared by actuating "ALARM RESET". It shows that an alarm occurred.
DIP 6		OFF	
DIP 7	Repeat alarm in 24 hours	ON	Repeat alarm on. This also applies to the function of relays 1 and 2.
		OFF	Repeat alarm off.
DIP 8	Reset key (ALARM RESET activation)	ON	"ALARM RESET" button is activated. The acoustic alarm and the alarm relay can be reset.
		OFF	"ALARM RESET" button is deactivated. The acoustic alarm and the alarm relay cannot be reset.

5

Operation

5.1

Alarm Signals

The warning device indicates an alarm status or sensor fault both visually and acoustically. The respective "OVERFLOW ALARM" or "FAT LAYER ALARM" LEDs are illuminated until the system returns to a normal status.

LED	Status	Meaning
Yellow LED "SUPPLY"	lights up	The device is connected to the power supply. The device is in operation.
	flashes briefly	Prerequisite DIP switch 1 = ON In this mode, a brief flash of the "SUPPLY" LED indicates that a change in status has been detected by the sensor.
Green LED "SYSTEM OK"	lights up	No errors or alarms active – normal operation
	flashes	No alarm or error active, there was an alarm or error in the past.
Red LED "OVERFLOW ALARM"	lights up	Alarm active, overflow sensor is covered with liquid.
	flashes	Internal sensor error, lead breakage or short-circuit
Red LED "FAT LAYER ALARM"	lights up	Alarm active, fat level sensor is covered with fat.
	flashes	Internal sensor error, lead breakage or short-circuit

5.2 Resetting the Alarm Signal

There are two options available to reset the alarm.

Briefly press the “ALARM RESET” button

The acoustic alarm is switched off. The potential-free relay is reset.

Press and hold the “ALARM RESET” button (for approx. 3 to 4 seconds)

Combined test and reset function

The test function is started by pressing and holding the button.

- The LEDs light up in turn briefly.
- The acoustic alarm is briefly activated.
- Both relays are activated in turn.

The reset function is started (prerequisite DIP switch 1 (“Reaction time”) is ON)

- The hour counters (1 hour or 24 hours) are set to 0.
- The “System OK” LED lights up. If there is a current fat layer alarm, this alarm status is only displayed after 24 hours via the “FAT LAYER ALARM” LED and, if applicable, an acoustic alarm triggered and relay activated.



Note!

In the event of lead breakage or short-circuit, irrespective of the setting of the DIP switch 1 (“Reaction time”) **immediately** an alarm status is displayed via the “FAT LAYER ALARM” LED and, if applicable, an acoustic alarm triggered and relay activated.

5.3

Function Testing

Fat level sensors

Checking the normal status

Checking the normal status for fat level sensor KVF-F

1. Switch DIP switch 1 to position OFF.
2. Remove the sensor from the grease interceptor.
3. Wash and dry the sensor.
4. Hold the sensor in your hand (no gloves). Only touch the upper and lower metal section (→ see Figure 2.3 on page 9) or
5. Immerse the sensor in water.

↳ The green "SYSTEM OK" LED on the warning device flashes or lights up.

Checking the normal status for fat level sensor FAU-104

1. Switch DIP switch 1 to position OFF.
2. Remove the sensor from the grease interceptor.
3. Wash and dry the sensor.
4. Immerse the sensor in water.

↳ The green "SYSTEM OK" LED flashes or lights on the warning device.

Checking the alarm status

Checking the alarm situation for fat level sensors

1. Switch DIP switch 1 to position OFF.
2. Suspend the KVF-F or FAU-104 fat level sensor freely in air.

↳ The red "FAT LAYER ALARM" LED lights and, if applicable, an acoustic signal sounds.

Overflow sensor

Checking the normal status

Suspend the sensor freely in air.

↳ The green "SYSTEM OK" LED lights on the warning device.

Checking the alarm situation

1. Hold the sensor in your hand (no gloves). Only touch the upper and lower metal section (→ see Figure 2.3 on page 9) or
2. Immerse the sensor in water.

↳ The red "OVERFLOW ALARM" LED lights and, if applicable, an acoustic signal sounds.

6 Troubleshooting

6.1 Troubleshooting and Alarm States


Note!

If switched on ("Acoustic alarm" DIP switch) an acoustic signal sounds in the event of an alarm and sensor malfunction.

LED indication	Cause	Action
All LEDs are off. 	The warning device is not functioning.	Check that the supply voltage is connected.
<div> <div></div> <div>"SUPPLY" LED lights up.</div> <div></div> <div>"SYSTEM OK" LED lights up.</div> <div></div> </div>	No alarm at present. The warning system is operating normally.	
<div> <div></div> <div>"SUPPLY" LED lights up.</div> <div></div> <div>"SYSTEM OK" LED flashing.</div> <div></div> </div>	No alarm at present. An alarm occurred in the past.	1. Check the status of the separator. 2. Press the "ALARM RESET" button.
<div> <div></div> <div>"SUPPLY" LED lights up.</div> <div></div> <div>"OVERFLOW ALARM" LED lights up.</div> <div></div> </div>	Excessive liquid level	It is essential to check the separator status. If necessary, takes measures to stop the alarm situation. The alarm situation can arise from a faulty or blocked drain.
<div> <div></div> <div>"SUPPLY" LED lights up.</div> <div></div> <div>"OVERFLOW ALARM" LED flashing.</div> <div></div> </div>	Sensor fault or lead breakage	Check sensor and sensor installation and replace the overflow sensor, if necessary.
<div> <div></div> <div>"SUPPLY" LED lights up.</div> <div></div> <div>"FAT LAYER ALARM" LED lights up.</div> <div></div> </div>	Maximum fat layer thickness is reached.	It is essential to check the separator status. Empty (disposal) the grease interceptor, if necessary.
<div> <div></div> <div>"SUPPLY" LED lights up.</div> <div></div> <div>"FAT LAYER ALARM" LED flashing.</div> <div></div> </div>	Sensor fault or lead breakage	Check sensor and sensor installation and replace the fat level sensor, if necessary.

6.2 Sensor Maintenance



Caution!

Malfunction or false alarm caused by a contaminated sensor

If the sensor is very dirty, this may trigger a false alarm or mean that no alarm is triggered under certain circumstances.

- Clean and dry the sensor when emptying/disposing of the oil/petrol separator or container.
- Do not clean the sensor with corrosive liquids.



Cleaning the Sensor

The sensor is maintenance free. To ensure the entire alarm system functions correctly, clean the sensor at the following intervals:

1. Clean the sensor at least once a year.
2. Pay particular attention to cleaning the sensor tips of all oil, grease, and other dirt residues using a grease-dissolving cleaning agent.
3. If the sensor is used in difficult conditions, clean the sensor more often.

7 Technical Specifications

7.1 Warning Device NVD-111

Power supply	
Rated voltage	230 V AC \pm 10%, 50 Hz ... 60 Hz
Power consumption	4.5 VA ... 6 VA
Max. fusing	10 A
Overvoltage category	III
Connection	terminals 5, 6, 7
Input	
Connection overflow sensor KVF-O	terminals 18, 20
Connection fat level sensor KVF-F or FAU-104	terminals 22, 24
Output	
Connection relay 1	terminals 1, 2, 3
Connection relay 2	terminals 10, 11, 12
Output	potential-free changeover contact
Contact load	250 V AC/4 A/100 VA
Galvanic isolation	
Output/supply	reinforced insulation acc. to EN 50178, rated insulation voltage 300 V _{eff}
Output/output	reinforced insulation acc. to EN 50178, rated insulation voltage 300 V _{eff}
Ambient conditions	
Ambient temperature	-25 °C ... 60 °C (248 ... 333 K)
Mechanical specifications	
Mass	approx. 325 g
Protection degree	IP20
Mounting	DIN mounting rail acc. to EN 60715
Dimensions	70 mm x 86 mm x 58 mm

7.2

Overflow Sensor KVF-O

Power supply

Rated voltage 13 V DC

Ambient conditions

Ambient temperature -20 °C ... 60 °C (253 K ... 333 K)

Mechanical specifications

Protection degree IP68

Connection cable

Material stainless steel

Cable 5 m

Mass approx. 520 g

Dimensions Ø31.6 mm x 138 mm

7.3

Fat Level Sensor KVF-F

Power supply

Rated voltage 13 V DC

Ambient conditions

Ambient temperature -20 °C ... 60 °C (253 K ... 333 K)

Mechanical specifications

Protection degree IP68

Connection cable

Material stainless steel

Cable 5 m

Mass approx. 520 g

Dimensions Ø31.6 mm x 138 mm

7.4

Fat Level Sensor FAU-104

Power supply

Rated voltage 13 V DC

Ambient conditions

Ambient temperature -20 °C ... 60 °C (253 K ... 333 K)

Mechanical specifications

Protection degree IP68

Connection cable

Material stainless steel

Cable 5 m

Mass approx. 410 g

Dimensions Ø38/66 mm x 152 mm

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