MANUAL

Fat Level Sensor KVF-F

ISO9001

CE

PEPPERL+FUCHS

PROTECTING YOUR PROCESS

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 dismounting 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.

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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.

ISO**9001**

1.4 Intended Use

The fat level sensor KVF-F (referred to as "sensor" in the following sections) is a suspended sensor for monitoring fat layer thickness in grease interceptors.

The sensor must always be connected to an warning device of type NVD-111 (see product program).

1.4.1 Marking

Fat Level Sensor
Pepperl+Fuchs GmbH
Lilienthalstrasse 200, 68307 Mannheim, Germany
KVF-F

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1.5 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.

1.6 Installation and Commissioning

1.6.1 Installation of the Sensor

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

The sensor has IP68 protection and is weather- and oil/fat-resistant. It can therefore be installed in grease interceptors.

When installing the device in oil/petrol separators, observe the permissible ambient temperature in the range from -20 °C ... 60 °C (253 K ... 333 K).

1.6.2 Sensor Cable

Sensor cables must not be installed in cable or conductor bundles together with other current circuits. Avoid installing sensor cables parallel to other cables that may transmit interfering signals, which impair the sensor signal and thus the alarm function. The sensor itself must not be grounded.

If you extend the sensor cable, observe the applicable specifications with regard to color, quality and durability. Use unshielded cables.

1.7 Maintenance

For operation of grease interceptors, there may be standards, directives or laws that define regular system or sensor tests. Check the operation of the sensor at least twice a year and more frequently in the event of unfavorable environmental conditions.

When the grease interceptor is being emptied (disposal), the sensor must always be washed and dried. The sensor must not be cleaned with caustic fluids. A badly contaminated sensor can trip a wrong alarm or, in certain circumstances, fail to trip an alarm.

1.8 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.

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1.9 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.

1.10 Applied Standards and Directives

EN 61000-6-4:2007

EN 61326-1:2013

EMC Directive 2004/108/EC

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2 Product Specifications

2.1 Function

The sensor has an integrated electronic circuit which, via an oscillator circuit, emits a weak HF signal that changes depending on whether the sensor element is surrounded by water or fat.

The sensor is mounted suspended and immersed in liquid.

The sensor can distinguish between water and floating fat, oil and grease (FOG).

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

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2.3 Design and Dimensions

Fat level sensor KVF-F

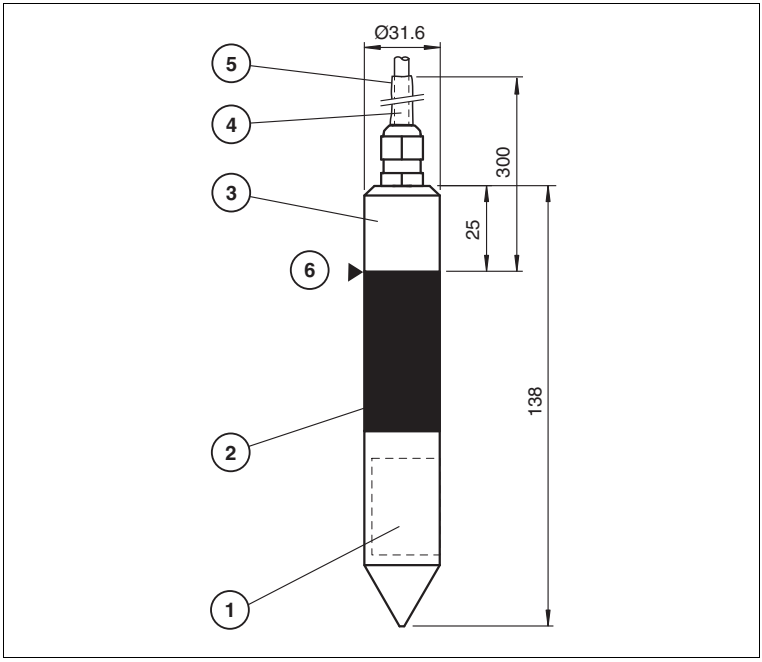

Figure 2.1

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

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3 Installation

3.1 Mounting of the Sensors

Read the chapter on Safety and, in particular, the section on Installation and Commissioning (see chapter 1.6) 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.

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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.

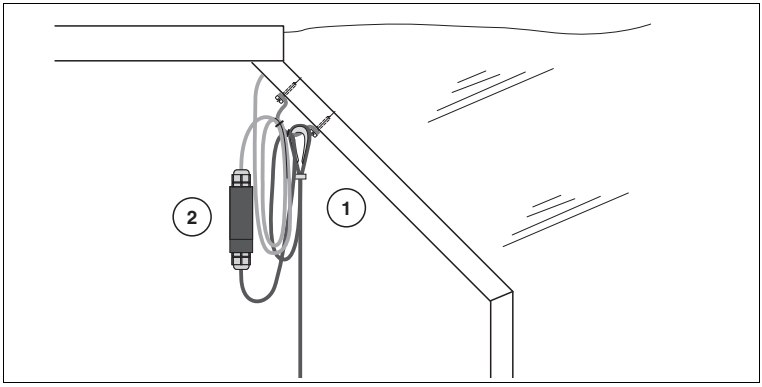

Figure 3.1 Mounting using cable connector and mounting set

1 Mounting set for one sensor NVO5-B

2 Cable connector for one sensor LAL-SK2

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3.2 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.

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.

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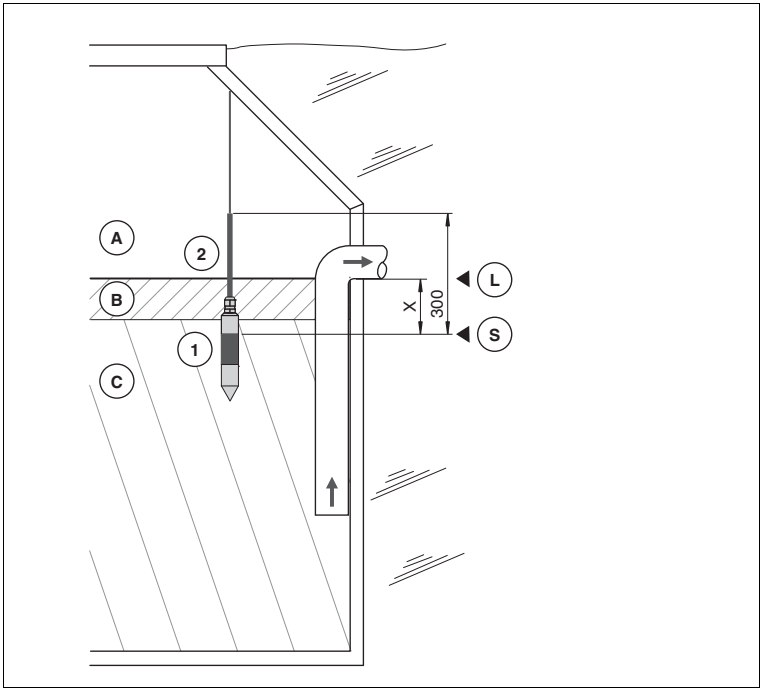

Figure 3.2 Mounting the fat level sensor

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)

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3.3 Connection of the Sensor

Read the chapter on Safety and, in particular, the section on Installation and Commissioning (see chapter 1.6) before connecting the sensor.

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.

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.

Note!

Further information on connection of the sensors to the warning device is available in the manual of the warning device NVD-111.

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4 Operation

4.1 Emptying (Disposal) of the Container

The sensor is a sensitive component. Therefore always observe the following safety information during emptying (disposal):

Caution!

Malfunction or damage through mechanical stress of the sensor.

In case of nonobservance, the safety and operation of the sensor or the entire alarm system is not guaranteed.

- Before emptying (disposal) the grease interceptor, remove the sensor from the container.
- Protect the sensor against impacts, knocks and unnecessary tensile forces in the cable.
- Insert the sensor in the grease interceptor only after it has been filled.

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5 Maintenance and Repair

5.1 Function Testing

Test frequency

The sensor is maintenance-free. However, to guarantee perfect operation of the complete alarm system check the operation of the sensor at least once a year, or more frequently in the event of unfavorable environmental conditions.

Checking the normal status

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 or
5. Immerse the sensor in water.

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

Checking the alarm situation

1. Switch DIP switch 1 to position OFF.
2. Suspend the fat level sensor freely in air.

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

Note!

Further information on connection of the sensors to the warning device is available in the manual of the warning device NVD-111.

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6 Troubleshooting

6.1 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.

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7 Technical Specifications

7.1 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	∅31.6 mm x 138 mm

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