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## Be Warned!

### Separator Alarm Systems from Pepperl+Fuchs

**For commercial facilities such as auto workshops, filling stations or car washes, which handle oil or gasoline or clean oil-contaminated parts, the installation of light liquid separator systems is required by law. Moreover, in order to guarantee long-term error-free operation, the systems must be continuously checked and maintained, and a general inspection undertaken every five years. This is regulated in detail by the technical standards for oil separators. These measures provide the ideal conditions for soil and ground water protection, however, the reality is often very different. Sludge traps are not always emptied regularly or oil layers above a permitted thickness disposed of incorrectly. This is often simply because no one notices that the systems buried in the ground have long been overflowing. In order to counteract this danger, Mannheim-based company Pepperl+Fuchs has developed alarm systems for light liquid separator systems that report loudly and clearly when a critical level is reached. The various device types and their features were presented at the IFAT ENTSORGA 2010 trade fair in Munich.**

The principle of the light liquid separator system is simple enough: because oil and gasoline are lighter than water, they float up and collect on the water's surface, where they can easily be siphoned off and disposed of. In filling stations or car washes, such systems should prevent fuel and lubricants leaking uncontrolled and polluting the environment.

"If, during refueling, a few drops fall from the nozzle or the tank overflows, it mustn't simply be washed into the sewer system next time it rains," explains Michael Göltz, Key Account Manager at Pepperl+Fuchs in Mannheim. "In facilities where oil or gasoline is handled, the installation of light liquid separator systems is required by law." However, installation alone is not enough. To guarantee long-term error-free operation, the systems must be checked monthly, maintained every six months and a specialist general inspection undertaken every five years. In the event of deficiencies, the operator is officially required to eliminate them.

This is regulated in detail by the technical standards for oil separators DIN 1999-100, EN 858-1 and EN 858-2.

The regulations, however, do not present the whole picture. "In this country, however, implementation is handled in very different ways in practice," admits Göltz. "In some of the Länder in Germany, there is particularly strict control, while in other areas, the responsibility is virtually left to the operators alone." From many years of experience, the expert is aware of many problems: some facility operators were simply overwhelmed with the technology, perhaps not even noticing that oil was continuously seeping into the ground as a result of leaking manhole covers and overfilled containers. "In one case, a system had been installed decades before, but was never operated correctly. The transportation lock was still attached. This kind of thing can go unnoticed for quite a while. When the environmental damage is discovered, the operator is immediately presented with the bill."

Oversight is no protection from liability, however. Even if the environment agencies are more casual in some places, the operators of separators should nevertheless err on the side of caution. For Michael Göltz, reliable and comprehensive monitoring of the functionality of light liquid separator systems is ultimately only possible with the aid of electronic alarm systems. Critical operating conditions must be automatically detected and reported. "You can't wait until an untrained employee may notice something at some point. In an urgent case, an alarm must be triggered automatically, and action taken immediately."

Although the standard fundamentally stipulates alarm systems for the installation of a new separator, local authorities may permit the use of separator systems without automatic alarm units. And according to conservative estimates, there are approximately 400,000 examples of old stock in Germany alone. This is a ticking bomb for the environment, however, the problem has not yet reached public awareness. In fact, neither decontamination of the containers, nor the installation of alarm systems is particularly expensive.

In order to ensure appropriate monitoring, the Pepperl+Fuchs alarm systems for light liquid separator systems can be combined with a variety of sensors. All sensors have ATEX approval and are approved for installation in Zone 0. The compact and robust design has no moving parts. The sensor can be optimally positioned, hanging from the pre-installed five meter cable, in the separator. "An alarm system consists of a control unit (usually installed in the building or in a small control cabinet) and various sensors, combined in accordance with the application," explains Henrik Villumsen, SAS Product Manager at Pepperl+Fuchs. "A sensor for measurement of the oil layer, a fluid sensor and, if there is a sludge trap, a sludge level sensor."

- The **oil layer sensor** monitors the thickness of an oil layer. It is able to distinguish between water and oil or gasoline as well as between water and air. If the layer thickness

exceeds a particular maximum level, a signal is triggered, which is evaluated by the control unit, and an alarm is triggered. This can prevent oil from overflowing and penetrating into the waste water.

- A **fluid sensor** can differentiate between gaseous and liquid media, and therefore between air and waste water. The sensor sends an alarm signal to the control unit as soon as the fluid level has exceeded a particular maximum level. For example, the fluid sensor can detect when a coalescence filter is contaminated, helping to prevent overflowing.
- The **sludge level sensor** differentiates between sludge and fluid and monitors the sludge level in the sludge trap or directly in the light liquid separator system. If the maximum level is reached, the sensor triggers a signal which is evaluated by the control unit, and an alarm is activated. This permits prompt detection in the event that the light liquid separator system has been obstructed with sludge.

Whether you're monitoring a single separator at a village filling station or a large-scale separator system at an international airport, the principle is always the same, and the same devices can be installed for large applications as well as small ones. "We always deliver the complete package," assures Key Account Manager Göltz, "from the control unit, probes, and housing right down to the suspension braces, everything is included."

"Normally, the systems are adjusted so that they trigger an alarm at 80 percent of the maximum storage capacity. This leaves enough time to take the required action," says Henrik Villumsen, adding that, "The alarm can be audible with a buzzer, visual with LEDs, or sent as a text message to a cell phone via an built-in GSM modem. It is not defined in standard EN 858-1 how the appropriate persons should be warned. The main thing is that they are informed and without delay."

An alarm by cell phone is becoming increasingly important particularly at filling stations, as the product manager explains: "In more and more filling stations, there are no qualified personnel on site anymore. Students or homemakers stand at the checkout. It is quite obvious that an alarm is of little use to this type of staff." A text message to the operator or service firm responsible can save a lot of time in case of an emergency and during an unpreventable event like a cloudburst, prevent considerable damage to the environment.

Certainly, the prerequisite is that the sensors are correctly installed and configured. For this purpose, Pepperl+Fuchs hosts detailed product training courses as well as information events for end customers. "The alarm system of a regularly maintained oil separator may never trigger an alarm," admits Henrik Villumsen. "But if it does, haste is required: then everyone needs to know what to do."

<<Text Box>>

## **Facts and figures about Pepperl+Fuchs**

Pepperl+Fuchs was founded in 1945 by Walter Pepperl and Ludwig Fuchs as a radio repair workshop. In 1948, Pepperl+Fuchs expanded its activities to the production of electronic components, which in 1958, led to the development of the first proximity sensor and the first transistor amplifier with an intrinsically safe circuit. Since then, Pepperl+Fuchs has developed into a diversified industrial enterprise and employs 3,700 workers at over 80 locations on six continents and has production facilities in Germany, the USA, Singapore, Hungary, Indonesia, Vietnam, China, and India, the majority of which are certified in accordance with ISO 9001. At Pepperl+Fuchs, the production of alarm systems for light liquid separator systems began with the purchase of the Mannheim company Ruf, which had supplied systems of this type since 1975.

## **About Pepperl+Fuchs**

Pepperl+Fuchs is a leading developer and manufacturer of electronic sensors and components for the global automation market. For more than 60 years, our continuous innovation, high quality products, and steady growth has guaranteed us continued success.

## **One Company – Two Divisions**

### **Pepperl+Fuchs – PROTECTING YOUR PROCESS**

The **Process Automation Division** is a market leader in intrinsically safe explosion protection. We offer comprehensive, application-oriented system solutions, including customer-specific control cabinet solutions for the process industry. A large portfolio of components is available from our various product lines: isolated barriers, fieldbus infrastructure solutions, remote I/O systems, HART interface solutions, level measurement devices, purge and pressurization systems, industrial monitors and HMI solutions, power supplies, separator alarm systems for oil and petrol separators, signaling equipment, lighting as well as emergency shutdown equipment and accessories.

### **Pepperl+Fuchs – SENSING YOUR NEEDS**

With the invention of the inductive proximity sensor in 1958, the company set an important milestone in the development of automation technology. Under the motto “Sensing your needs”, customers benefit from tailor-made sensor solutions for **factory automation**. The main target markets of the factory automation are machine and plant construction, the

automotive industry, storage and material handling, printing and paper industry, packaging technology, process equipment, door, gate and elevator construction, mobile equipment, renewable energies.

The division offers a wide product range of industrial sensors whether it's inductive, photoelectric or ultrasonic sensors, rotary encoders, identification systems, barcodes, code readers for data-matrix-codes and vision sensors.

Key words: Separator Alarm Systems, light liquid separator system, oil separator, EN 858-1, EN 858-2, DIN 1999-100, oil layer sensor, fluid sensor, sludge level sensor

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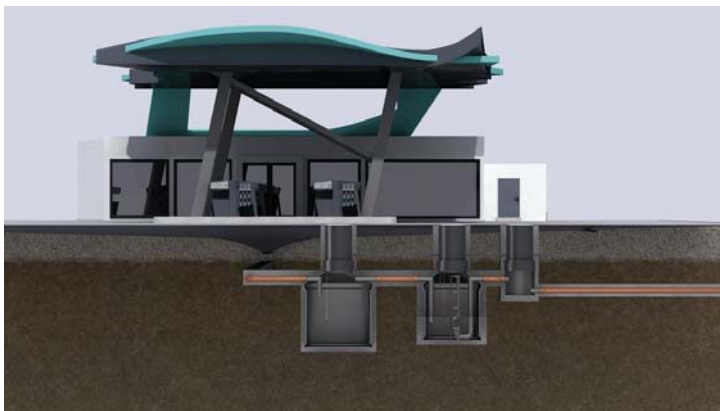
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August 2010



**Fig. 1: Pepperl+Fuchs Headquarters in Mannheim**



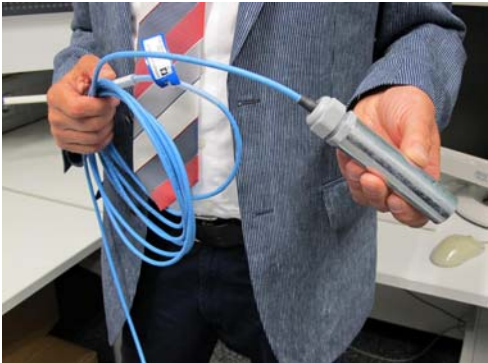
**Fig. 2: In filling stations or car wash installations, such systems are aimed at preventing fuel and lubricants leaking uncontrolled and polluting the environment.**



**Fig. 3: Michael Göltz, Key Account Manager at Pepperl+Fuchs in Mannheim.**



**Fig. 4: Henrik Villumsen, SAS Product Manager at Pepperl+Fuchs**



**Fig. 5: The sensor can be optimally positioned in the separator, on its pre-fitted five meter cable.**



**Fig. 6: Sludge level sensor in a set with control unit, wall box, cable connectors and suspension brace.**



**Fig. 7: Complete set for combined monitoring of overflow and oil-level.**