

OPERATING AND MAINTENANCE MANUAL SIMPLELEAK ATEX LIQUID SENSOR

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1. DEVICE DESCRIPTION:

PETROSTER SimpleLEAK ATEX sensors are devices designed to detect liquid substance leaks using dry or wet methods in category II, III, and V systems, in accordance with EN 13160-1. Depending on the application, they can also serve as sensors for industrial processes and other utilities related to liquid level detection, such as an overflow sensor. They are dedicated for use with PETROSTER control units but are also compatible with most available control panels.

These are reed switch sensors with a float equipped with a magnet, which moves along the sensor shaft as the liquid level changes, activating or deactivating the reed switch depending on the state. By default, the sensors operate as NO (normally open) for bottom-up operation and NC (normally closed) for top-down operation. The sensor states can be reversed by flipping the float, as indicated by the symbols marked on it. The sensors are equipped with a continuous cable monitoring system, in compliance with PN-EN 13160-1 requirements, which allows distinguishing between an alarm triggered by a liquid level change or leak detection and a cable fault.

These sensors are inherently simple in design, ensuring exceptional reliability. Made of acid-resistant stainless steel and featuring a float made of high-buoyancy, resistant material, SimpleLEAK ATEX sensors can be used with virtually any medium. Additionally, the floats are equipped with protrusions to prevent sticking to the housing at maximum levels, allowing their use with viscous and relatively high-density media. They are designed with minimal hysteresis, ensuring a very high level of indication accuracy.

They are intended for operation in temperatures ranging from -30°C to $+80^{\circ}\text{C}$. They have been certified under ATEX numer JSHP 18 ATEX 0018X. They meet the requirements of ATEX Directive 2014/34/EU and are manufactured in accordance with PN-EN 60079-0:2013-03 (EN 60079-0:2012) and PN-EN 60079-11:2012 (EN 60079-11:2012) standards. The sensors meet intrinsic safety requirements and can be used in explosive hazard zones, including Zone "0" in environments of gases, dust, and mists of explosion groups up to IIC, with a temperature class of T6.

2. CONSTRUCTION AND OPERATING PRINCIPLE:

The sensor consists of five main components:

- Sensor body (1): Made of acid-resistant stainless steel, threaded at the top, with an intrinsically safe electronic module sealed inside and a cable.
- Support plate (2): Made of acid-resistant stainless steel, screwed onto the sensor body as an upper stop; during production, the plate is permanently attached to the body using adhesive, making it a non-removable component.
- Float cover (3): Made of acid-resistant stainless steel; during production, it is permanently attached to the support plate using adhesive, making it a non-removable component.
- Float (4): Made of plastic with a ring magnet.
- Ring (5): Serves as the lower movement limiter.

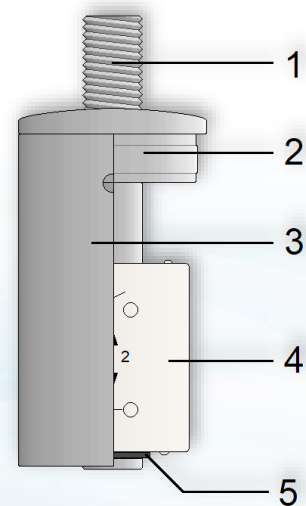


Diagram 1

Inside the sensor body, there is a sealed electronic module connected to a cable. The cable is oil-resistant, designed for intrinsically safe systems, shielded, and contains three numbered black conductors, of which only conductors 1 and 2 are used for sensor connection. Conductor 3 is not used in this sensor model. The sensor housing, along with the float cover and sensor shaft, is permanently bonded during production, forming an integral, non-dismantlable unit. The nuts on the threaded section are used for sensor mounting. The sensor shaft is slightly longer than the cover, allowing liquid to enter from below even when the sensor touches the ground. Additionally, the cover has a hole at the top for pressure equalization, enabling free inflow and outflow of liquid during level changes. By default, the sensor operates as NO (normally open) for bottom-up operation and NC (normally closed) for top-down operation. The sensor state can be reversed by flipping the float, as indicated by the symbols on it. This configuration is illustrated in Diagram 2. A change in liquid level causes the float to move, closing or opening the sensor circuit accordingly. The ends of the float have small protrusions—these should not be removed or trimmed, as they prevent the float from sticking in the upper position

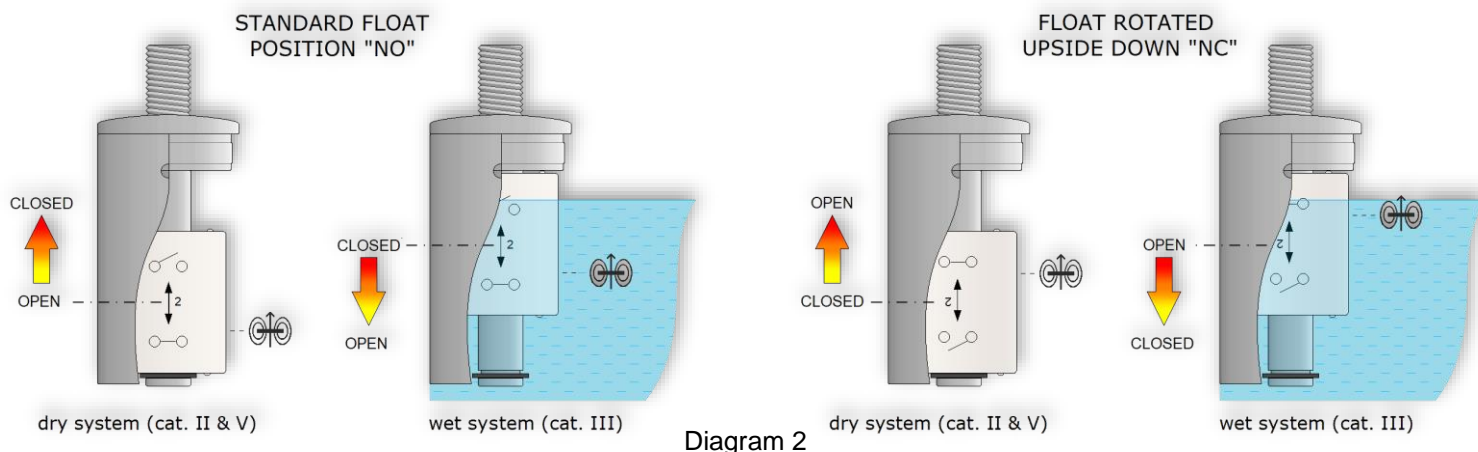


Diagram 2

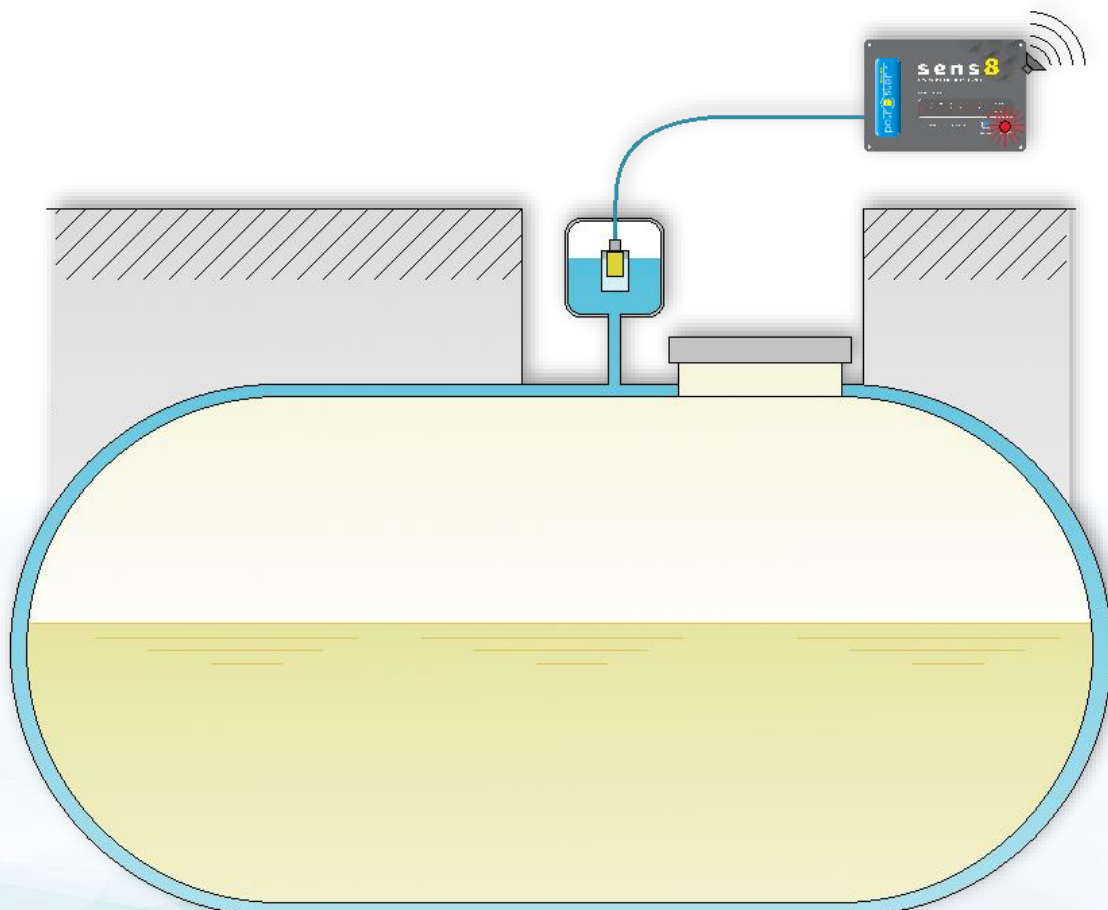
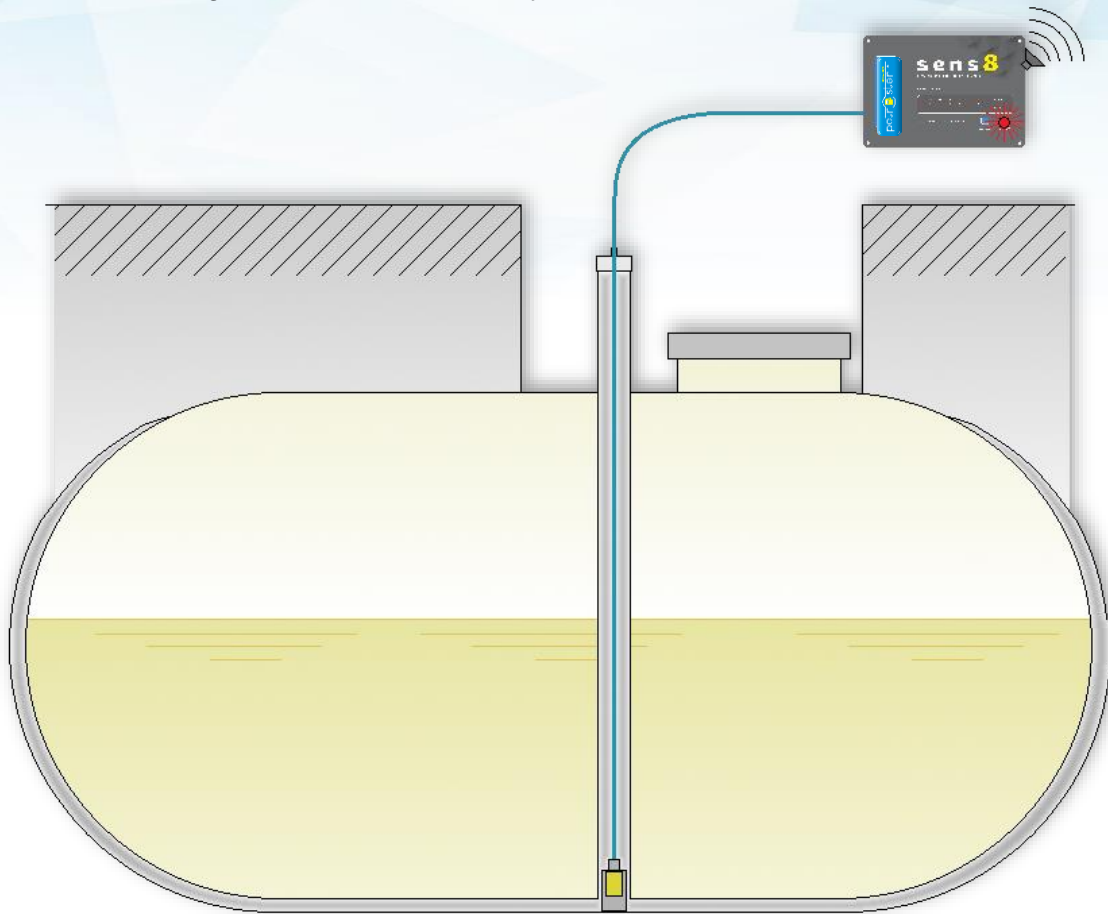
3. INSTALLATION INSTRUCTIONS:

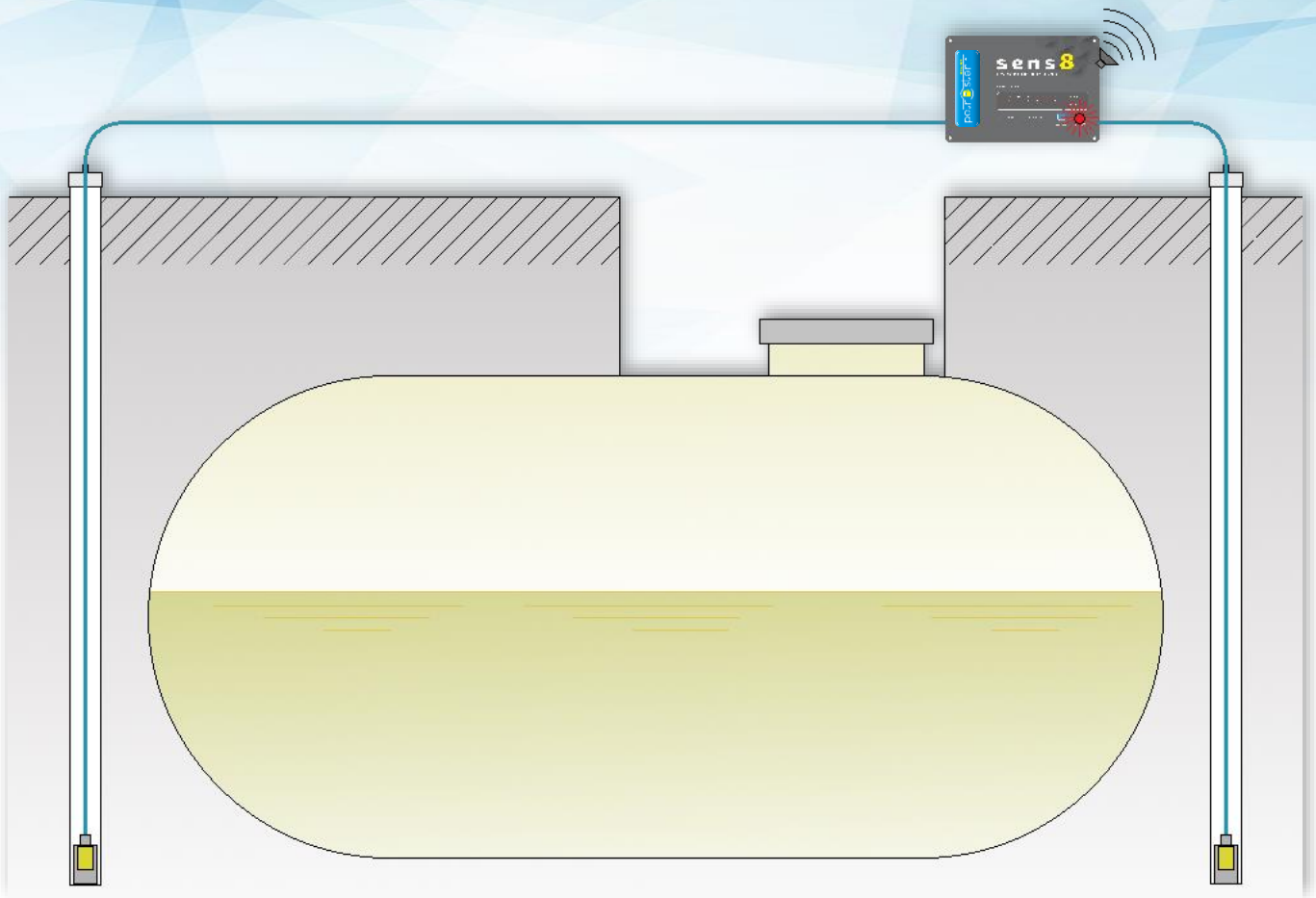
The sensor should be connected to a control unit with a sensor power supply not exceeding 30V, using cable No. 1 and cable No. 2. Cable No. 3 is not used. This is a sensor that causes the circuit to open or close, and the direction of cable connection does not matter. The sensor should be placed in a vertical position, in dry systems at the lowest possible point of the monitored space, and in wet systems at the highest point of the monitored liquid. When installing with a PETROSTER control unit, the sensor should be mounted in the standard configuration, selecting positive logic for a dry system or negative logic for a wet system.

When using it with other control units, the function of the sensor as NO or NC should be considered and adjusted to the control unit's requirements. For example, when using it with OPW or VeederRoot control units, which require NC sensors for bottom-up operation, the float must be reversed. To do this, the securing ring should be removed from the sensor shaft, the float should be taken out, installed in the opposite position, and secured again with the ring. The orientation of the float and the sensor state are indicated by the symbols on the float, as shown in Diagram 2, Section 2 of the Manual. The sensor is designed for installation in a 1" or larger pipe, as well as in tank spaces, separators, and others. In special cases, it may also be installed in a bottom-up position..

4. EXAMPLES OF SENSOR APPLICATIONS:

For various categories of leak detection systems, in accordance with PN-EN 13160-1:





5. MAINTENANCE AND OPERATION:

The sensor should be used in accordance with its intended purpose and within the specified inspection intervals. To ensure proper operation, a service inspection is recommended every six months and required once a year. Inspection intervals may be shortened if operating conditions indicate the need for more frequent inspections, such as internal company regulations or harsh working conditions, e.g., sensor contamination, medium condensation, and others. Inspections should be carried out by a qualified service technician and confirmed with an appropriate protocol.

The inspection should include:

- Visual inspection of the sensor, wiring, and connections
- Cleaning the sensor along with checking the proper operation of the float
- Checking the sensor's electronic functionality by simulating an alarm state

If an alarm state is detected, the cause of the alarm should be removed, the sensor should be serviced, cleaned, and checked for proper operation before being reused. Submersion of the sensor in the medium for which it is intended does not affect its subsequent functionality.


If any mechanical or electronic defect is observed that affects the sensor's performance or could lead to malfunction in the near future, the sensor must be replaced with a new one. Sensor repairs are not anticipated.

6. STANDARDS COMPLIANCE:

The sensor has been manufactured in compliance with the following standards:

- PN-EN 60079-0
- PN-EN60079-11

7. SENSOR DATA:

Operating Temperature	-30 / +80°C
Max Power Supply	30V
Max Current	0,40A
Max Power	2,175W
Weight (excluding cable)	0,095kg
ATEX Certification	 II 1G Ex ia IIC T6 Ga ATEX nr: JSHP 18 ATEX 0018X
Dimensions	Measuring part with cover: H = 48mm, Ø 25mm Total height with thread: 60mm (tolerance ± 2%)
Material	Body and shaft: Acid-resistant stainless steel Float: NBR or PP





J.S. Hamilton Poland S.A.

(do dnia 30.04.2018r. JOAiCW TEST Sp. z o.o.)

Jednostka Notyfikowana NB 2057

ul. Wyzwolenia 14
41-103 Siemianowice Śląskie



CERTYFIKAT BADANIA TYPU UE

- (1)
- (2) Urządzenie lub system ochronny przeznaczony do użytku w atmosferze potencjalnie wybuchowej
Dyrektywa 2014/34/UE
- (3) Certyfikat badania typu UE Nr: **JSHP 18 ATEX 0018X**
- (4) Produkt: **Czujnik cieczy SimpleLEAK**
- (5) Producent: **PETROSTER Sp.J.**
Jan Dziura-Bartkiewicz, Grzegorz Bartkiewicz
- (6) Adres: **30-240 Kraków, ul. B. Leśmiana 2**
- (7) Niniejszy produkt wraz ze swymi odmianami jest określony w załączniku do niniejszego certyfikatu oraz w wymienionych w nim dokumentach.
- (8) J.S. Hamilton Poland S.A., Jednostka Notyfikowana nr 2057, zgodnie z Artykułem 17 Dyrektywy 2014/34/UE Parlamentu Europejskiego i Rady z dnia 26 lutego 2014, zaświadcza, że produkt został uznany za zgodny z zasadniczymi wymaganiami zdrowia i bezpieczeństwa, dotyczącymi projektowania i budowy produktów przeznaczonych do użytku w atmosferze potencjalnie wybuchowej, przedstawionymi w załączniku II Dyrektywy.
Oceny i wyniki badań zostały wyszczególnione w poufnym raporcie Nr JSHP/RW/20/18/RM
- (9) Zgodność z wymaganiami bezpieczeństwa i ochrony zdrowia zrealizowano poprzez zgodność z normami:
PN-EN 60079-0:2013-03+A11:2014-03 PN-EN 60079-11:2012
(EN 60079-0:2012+A11:2013) (EN 60079-11:2012)
- (10) Jeśli za numerem certyfikatu umieszczono znak „X”, wskazuje to, że produkt podlega szczególnym warunkom użytkowania określonym w załączniku do niniejszego certyfikatu.
- (11) Niniejszy certyfikat badania typu UE odnosi się tylko do projektu i konstrukcji określonego produktu. Certyfikat nie obejmuje pozostałych wymagań Dyrektywy dotyczących procesu produkcji i wprowadzenia produktu do obrotu.
Niniejszy certyfikat obowiązuje w całości z załącznikiem (załącznikami).
- (12) Oznakowanie produktu musi zawierać poniższe symbole:

 **II 1G Ex ia IIC T6 Ga**



Romuald Matlachowski

Z-ca Kierownika Jednostki
Certyfikującej

Siemianowice Śl., dnia 25 czerwca 2018 r.

Strona 1 z 2