

## THRU-WALL LEVEL SWITCHES GPLS-25

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## PRODUCT DESCRIPTION

Through wall level switches GPLS-25 are intended for liquid (conductive and non-conductive) level detection on glass or plastic gauge-pipes, tubes and tanks. The sensor is equipped with high frequency technology, which allows reliable operation even for sensing of the adherent electrically conductive medium. The sensitivity and modes (O - normally open or C - normally closed) of the switches can be easily set by placing magnetic pen on sensitive spot. Output performance - transistor output with open collector (PNP) or two wire electronic switch (S). This connection is done by means of two wires directly into a circuit with relay or to binary input of control system.

## FEATURES OF VARIANTS

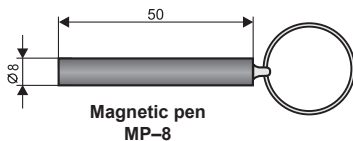
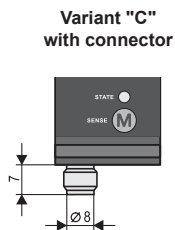
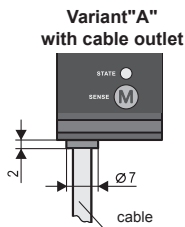
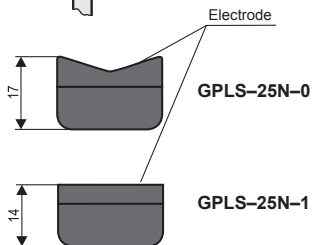
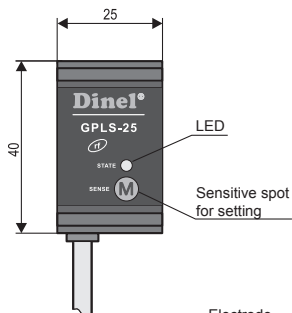
- **GPLS-25N-0** **Prismatic (refracted) electrode**, shape-adapted to be attached to the gauging pipe or other tube. The fixing of the sensor onto a pipe is provided by plastic straps.
- **GPLS-25N-1** **Plannar electrode**, suitable for installation on flat surfaces (e.g. plastic or glass tanks). The sensor can be fixed with plastic straps or by double sided adhesive layer.

## TECHNICAL SPECIFICATIONS

Supply voltage		6 ... 30 VDC
Supply current	– Output type P (OFF / ON state) – Output type S (OFF state)	Max. 0.6 / 7 mA Max. 0.6 mA
Switching current (Min. / Max.)	– Output type P (open collector PNP) – Output type S (two wire el. switch)	100 mA 3.3 / 40 mA
Remanent voltage - ON state	– Output type P (open collector PNP) – Output type S (two wire el. switch)	1.8 V 6.0 V
Max. switching frequency		1 Hz
Ambient temperature range		-20 ... +80°C
Temperature range at the tube or vessel surface		-20 ... +90°C
Temperature range for using of double-side self adhesive tape		-20 ... +60°C
Max. thickness of the vessel wall	– Conductive liquids – Non.conductive liquids with $\epsilon_r < 10^*$	8 mm 3 mm
Protection class		IP67
Housing material		Plastic (PP)
Connection cable type (Variants „A“)	– Output type P – Output type S	PVC 3 x 0.34 mm <sup>2</sup> PVC 2 x 0.34 mm <sup>2</sup>
Weight (including 2m cable)		Approx. 60g

\*)  $\epsilon_r$ , see "Table of dielectric constant"

## DIMENSION DRAWINGS



## RECOMMENDED RANGE OF APPLICATION

Detection of various types of liquids - water, diesel, oil, cooling liquids, water solutions, some types of solvents. It is suitable for glass or plastic gauge-pipes, vessels, plastic container tanks, plastic tubs, pools, canisters, etc.

## UNSUITABLE RANGE OF APPLICATION

The sensor also is not intended for level measurement on the gauge-pipe and the container wall with antistatic treatment (partially electrically conductive).

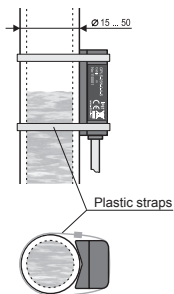
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## PROCEDURE FOR PUT SENSOR INTO OPERATION

### 1. INSTALLATION

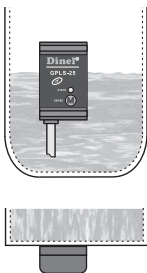
- a) The sensor type **GPLS-25N-0**, which is intended to point level detection on **plastic or glass and gauge-tubes**.

The sensor is fixed to the gauge pipe or tube by means of two plastic straps (2.5 mm width). The cable should be vertically downwards oriented. The maximum wall thickness of the tube depends on the detected medium (see technical data), the maximum is 8 mm.



- b) The sensor type **GPLS-25N-1**, which is intended to thru-wall level sensing of liquids in **plastic or glass vessels with flat walls**.

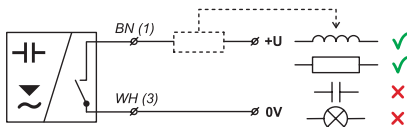
The sensor is installed on a clean and degreased surface of the vessel wall. The attachment is done by double-sided adhesive layer. Orientation of the sensor can be arbitrary. Maximum thickness of the vessel wall depends on the detected medium (see technical data), the maximum is 8 mm.



## 2. ELECTRICAL CONNECTION

### a) The type of sensor **GPLS-25N-\_-S**

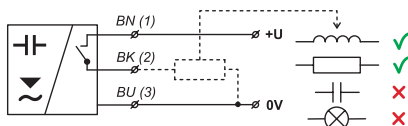
Positive pole (+U) of power supply is connected through a load (relay) to brown wire or pin connector No. 1, negative pole is connected to white wire or pin connector No.3.



Connection scheme of sensor with "S" type output

### b) The type of sensor **GPLS-25N-\_-P**

Positive pole (+U) of power supply is connected to brown wire or pin connector No.1, negative pole is connected to blue wire or pin connector No.3. Load (relay) is connected to black wire or pin connector No.2.



Connection scheme of sensor with "PNP" type output

Legend:

(1)...- Terminals number for variants with connector  
BN - Brown  
WH - White  
BU - Blue

Note:

The sensor output is protected against short circuits. Capacity loads and loads with low sleep resistance (bulb) the sensor evaluation as a short circuit. In case of high ambient electromagnetic interference, parallel conductors with power lines, or lines at distances greater than 30 m, we recommend to use shielded cable.

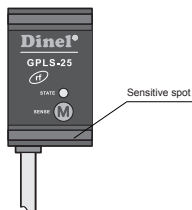


**Electrical connection must be done in de-energized state!**

For switching supply sources, it is necessary to check that the input is galvanically separated from the network side and that they are fitted with a filter suppressing the conforming interference (terminals + and - oscillate together towards the ground potential), or the interference is removed in another manner.

### 3. SENSOR SETTINGS

The setting is done by placing of magnetic pen MP-8 to sensitive spot (M) located on the front of the sensor. Short time attaching (up to 2 sec.) of the magnetic pen to the sensitive spot (M) makes the sensor open. Long attach (at least 4 sec.) of the pen when the level is changed, defines closed state of the sensor. In this way the sensitivity for the measured medium and switching modes "O" (normally open) or "C" (normally closed) is set. When changing the fluid it is necessary to make the new setting.



#### a) Mode O (normally open)

1. Put the level of the measured medium in the state **below the lower edge** of the sensor in the tank or in the gauge-pipe.
2. Attach the magnetic pen MP-8 to the sensitive spot (M) for **maximum 2 seconds**. When the LED goes out, the sensor is in the state open.
3. After removal of the magnetic pen check the status of orange lights:
  - If the LED doesn't light or is flashing rapidly (0.2 s), go to step 4.
  - If the LED lights, you must repeat step 2 so as not to exceed the limit of 2 seconds attaching magnetic pen.
4. Put the level of the measured medium in the state **above the upper edge** of the sensor in the tank or in the gauge-pipe.
5. Attach the magnetic pen MP-8 to the sensitive spot (M) for **minimum 4 seconds**. When the LED lights up, the sensor is in the state closed.
6. After removal of the magnetic pen check the status of orange lights:
  - If the LED lights, settings of the sensor is correct.
  - If the LED doesn't light, the sensor was set incorrectly and you must repeat the procedure from step 1.
  - If the LED is flashing, the sensor didn't recognize upper and lower limits. In this case, first verify that at the step 1 the level of the measured medium was below the lower edge of the sensor and at the step 3 the level of the measured medium was above the upper edge of the sensor. Then make sure that the thickness of the gauge-pipe wall or the tank wall does not exceed the limit specified in the Technical specifications (p. 2). If not, check there isn't a thick layer of sediment on the inner wall of the tank or the gauge-pipe.



*For security reasons, we recommend to set the mode O (normally open, sensor closes when immersed) for minimum level detection. Any failure of the sensor or wiring is equally apparent as the emergency level state. Analogously – for the maximum level detection is recommended to set the mode C (normally closed, sensor opens when immersed).*

## b) Mode C (normally closed)

1. Put the level of the measured medium in the state **below the lower edge** of the sensor in the tank or in the gauge-pipe.
2. Attach the magnetic pen MP-8 to the sensitive spot (M) for **minimum 4 seconds**. When the LED lights up, the sensor is in the state closed.
3. After removal of the magnetic pen check the status of orange lights:
  - If the LED lights or is flashing rapidly (0.2 s), go to step 4.
  - If the LED doesn't light, you must repeat step 2 so as to observe the limit of 4 seconds attaching magnetic pen.
4. Put the level of the measured medium in the state **above the upper edge** of the sensor in the tank or in the gauge-pipe.
5. Attach the magnetic pen MP-8 to the sensitive spot (M) for **maximum 2 seconds**. When the LED goes out, the sensor is in the state open.
6. After removal of the magnetic pen check the status of orange lights:
  - If the LED doesn't light, settings of the sensor is correct.
  - If the LED lights, the sensor was set incorrectly and you must repeat the procedure from step 1.
  - If the LED is flashing, the sensor didn't recognize upper and lower limits. In this case, first verify that at the step 1 the level of the measured medium was below the lower edge of the sensor and at the step 3 the level of the measured medium was above the upper edge of the sensor. Then make sure that the thickness of the gauge-pipe wall or the tank wall does not exceed the limit specified in the Technical specifications (p. 2). If not, check there isn't a thick layer of sediment on the inner wall of the tank or the gauge-pipe.

After this settings the sensor responds to the level immersion and emersion in the upper half of the sensing area and the **hysteresis** size 5 mm (1/8 of the distance between the bottom and the top of the sensor).

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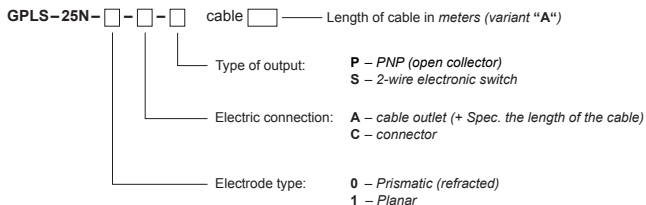
## STATUS SIGNALIZATION

<i>Indicator</i>	<i>Function</i>
<b>Orange LED</b>	<b>Continuous light</b> – Sensor is closed (switched ON) <b>Dark</b> – Sensor is open (switched OFF) <b>Rapid flashing (period 0,2 sec.)*</b> – Unrecognized upper and lower limits of setting mistake <b>Slow flashing (period 0,8 sec.)</b> – Short circuit at sensor output

\* Sensor with "S" type output, for each flash of the LED switches its output on for approx. 3 ms. This period is sufficiently short to avoid unwanted switching of relay contacts. For binary inputs, we recommend to set the filter so as not to respond to pulses shorter than 3 ms.



## ORDER CODE



## CORRECT SPECIFICATION EXAMPLES

GPLS-25N-1-A-P cable 5m

(1) planar electrode, (A) cable outlet with 5 m length fixed cable; (P) output type PNP.

GPLS-25N-0-C-S

(0) prismatic electrode, (C) electric connection with connector; (S) output type S (electronic switch).

## ACCESSORIES

**Standard - included in the level sensors price**

- 2 pcs of Plastic straps 2,5 x 200 mm
- 1 pc of Double-side self adhesive tape (GPLS-25N-1)
- 1 pc of Magnetic pen MP-8

**Optional - for extra charge**

- Connector ELKA KV 3308

## SAFETY, PROTECTIONS AND COMPATIBILITY

The level sensor is equipped with a protection against electric shock on electrode, polarity, overvoltage and short-term current overload on the output.

Electromagnetic compatibility is provided by conformity with standards ČSN EN 55022/B, ČSN EN 61326-1, ČSN EN 61000-4-2, ČSN EN 61000-4-3, ČSN EN 61000-4-4, ČSN EN 61000-4-6.

## NOTE

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