

# Level Sensors Optical Types VP, Modulated, Metal Housing

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- Modulated light
- Built-in amplifier
- Output: NPN or PNP, 4-wire (NO & NC)
- Housing: Stainless steel or nickel plated brass
- Tip: Polysulphone or glass
- High chemical resistance to most acids and bases
- Liquid and electrical circuit completely isolated
- Power supply: DC models 10 to 40 VDC

## Product Description

Optical level probe with modulated infrared light for detection of liquids. Self-contained unit has built-in amplifier. Separate transmitting and receiving elements

sealed behind the tip. Designed for direct mounting through the wall of a tank. The polysulphone tip is especially resistant to most acids and bases.

## Ordering Key

**VPB1 M NA-1**

Type: Refraction principle

Housing material

Tip material

Light source

Output type

Connection

## Type Selection

| Housing material    | Tip material | Ordering no.<br>NPN, Make &<br>break switching<br>Cable | Ordering no.<br>NPN, Make &<br>break switching<br>M12 Plug | Ordering no.<br>PNP, Make &<br>break switching<br>Cable | Ordering no.<br>PNP, Make &<br>break switching<br>M12 Plug |
|---------------------|--------------|---|--|---|--|
| Stainless steel     | Polysulphone | VPA1MNA   | VPA1MNA-1  | VPA1MPA   | VPA1MPA-1  |
| Stainless steel     | Glass        | VPA2MNA   | VPA2MNA-1  | VPA2MPA   | VPA2MPA-1  |
| Nickel plated brass | Polysulphone | VPB1MNA   | VPB1MNA-1  | VPB1MPA   | VPB1MPA-1  |
| Nickel plated brass | Glass        | VPB2MNA   | VPB2MNA-1  | VPB2MPA   | VPB2MPA-1  |

## Specifications

|                                  |  |                           |   |
|----------------------------------|--|---------------------------|---|
| <b>Rated operational voltage</b> | 10 - 40 VDC  | <b>Pressure</b>           | ≤ 10 bar at +60°C (+ 140°F)                                     |
| <b>Ripple</b>                    | ≤ 10 V   | <b>Environment</b>        |   |
| <b>Output current</b>            |  | Degree of protection      | IP 67   |
| Continuous                       | ≤ 200 mA   | Operating temperature     | -20° to +80°C (-4° to +176°F)                                   |
| <b>No-load supply current</b>    | ≤ 7 mA   | Storage temperature       | -40° to +100°C (-40° to +212°F)                                 |
| <b>Voltage drop</b>              | ≤ 2.5 VDC  | <b>Liquid temperature</b> | +100°C (+212°F) for ≤ 60 s                                      |
| <b>Protection</b>                | Reverse polarity,<br>short circuit, transients             | <b>Housing material</b>   | Stainless steel or<br>nickel plated brass                       |
| <b>Ambient light</b>             | ≤ 50.000 lux   | <b>Cable</b>              | 2 m, 4 x 0.3 mm <sup>2</sup> , grey, Ø 5.2<br>oil resistant PVC |
| <b>Transient voltage</b>         | 1 kV   | Resistance                | ≤ 100 Ω, extension possible                                     |
| <b>Delay after power-on</b>      | 20 ms  | <b>Weight</b>             | 90 g  |
| <b>Operating frequency</b>       | ≤ 30 Hz  | <b>Tightening torque</b>  |   |
| <b>Indication for</b>            |  | Stainless steel           | 30 Nm   |
| Output ON                        | LED, yellow<br>No LED indication on plug types             | Nickel plated brass       | 30 Nm   |
| <b>Sensing accuracy</b>          |  | <b>External thread</b>    | 3/8" (ISO 228/1)  |
| Liquid level difference          | Horizontal mounting: ± 5 mm<br>Vertical mounting: ± 2.5 mm | <b>CE-marking</b>         | Yes   |
| LED indication on plug types     |  |                           |   |

## Mode of Operation

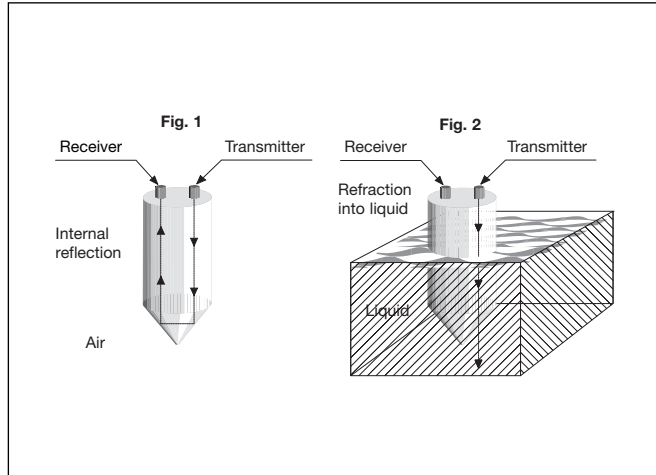
The probe contains IR transmitter, receiver and amplifier with open collector NPN or PNP output. The light source is a Ga-As diode emitting modulated, infrared light in short pulses.

This level probe is thus insensitive to ambient light (up to 50,000 lux) and suitable even for adhesive liquids.

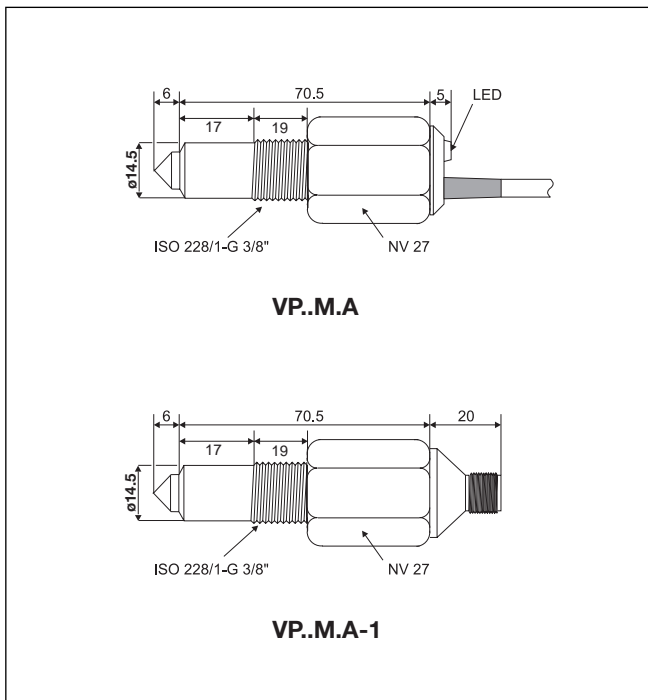
The conical tip of the sensor forms an angle of 90°. This angle acts as a prism, i.e. the beam, emitted from the Ga-As diode placed in one side of

the sensor head, is reflected internally to the phototransistor placed in the other side of the sensor head (fig. 1), provided that the tip of the sensor is situated in free air. If the sensor tip is immersed in a liquid, always having a refractive index different from air (fig. 2), the beam will be refracted into the liquid.

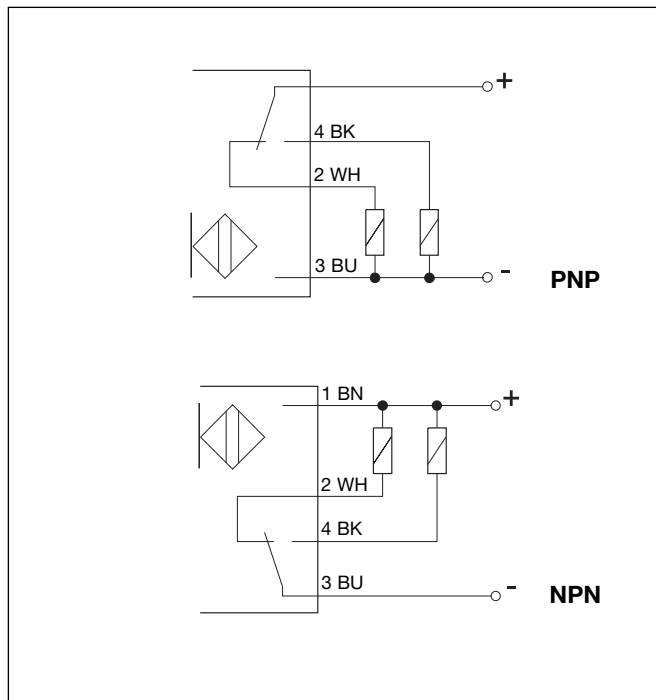
All types of sensors can operate in oil, waste water, aqueous solutions such as beer, wine, alcohol etc. without any kind of accessory.



## Dimensions



## Wiring Diagrams



## Accessories

- Plugs: Standard M 12, CONH1A-.. or CONH1O-.. series.