

# LP Gas Low Fuel Warning Sensor

## Application Bulletin 239



Application of the OPBA100 LP Gas low fuel warning sensor into various LP Gas powered applications.



Most LPG powered vehicles in the market today lack a consistent, cost-effective, and reliable means of determining a low fuel situation. The most common solution is a device that monitors vapor pressure, but since pressure in the tank varies greatly with temperature, these can give false readings, or provide almost no warning before the fuel runs out.

A consistent problem plaguing industrial vehicles such as lift trucks, sweepers and scissor lifts is running out of fuel in the plant far way from refueling areas. Due to safety regulations, vehicles must be towed and moved to a safe location to replace the fuel tanks. This causes down time and loss of productivity. In an effort to minimize the problem, operators of these vehicles will replace the tank at the beginning of a shift if they believe they'll run out of fuel. LPG tanks returned for refueling can have up to 30% of the LPG remaining in the tank due to these premature replacements.

The OPBA100 provides a solution to these problems by sensing when the fuel in the gas line switches from mostly liquid to vapor, which occurs when the liquid fuel level falls below the dip tube in the tank. This remaining fuel in the tank can be used to accurately estimate the average remaining run-time for a given LPG powered system. OPTeK's low fuel detection sensor utilizes proprietary optical sensing technology and contains no moving parts.

### Operation

The most common applications utilize horizontal LP gas tanks. When the liquid level in the tank falls below the dip tube, the remaining liquid fuel in the line and in the sensor will quickly vaporize, and the sensor will then switch output states. The change in state from liquid to gas drives a protected open collector output that is capable to control a low fuel LED, horn, or other warning device. Reference the OPBA100 Data sheet for specifications

The low fuel detection sensor also contains a vapor / bubble management system that compensates for vapor pockets and or bubbles that may occur during low demand conditions or sloshing of the remaining fuel in the tank. These conditions can be compensated through programming adjustments in the bubble management system. The sensing period and output timing can also be programmed to meet application requirements.

The length of time from low fuel warning to empty tank for a typical horizontal 15 gallon tank is typically 15 to 18 minutes and is dependent on engine size, operating conditions, and fuel demand. Length of run time after low fuel warning can be calculated based on tank size, remaining fuel, and engine demand in BTU's or volume of fuel per unit time.

### Installation & Mounting

The low fuel detection sensor is designed to be directly connected to the fuel delivery line between the tank and the fuel regulator / vaporizer. Connections to the sensor are through inlet and outlet ports with standard ¼" NPT fittings. Reference the fuel system diagram below:

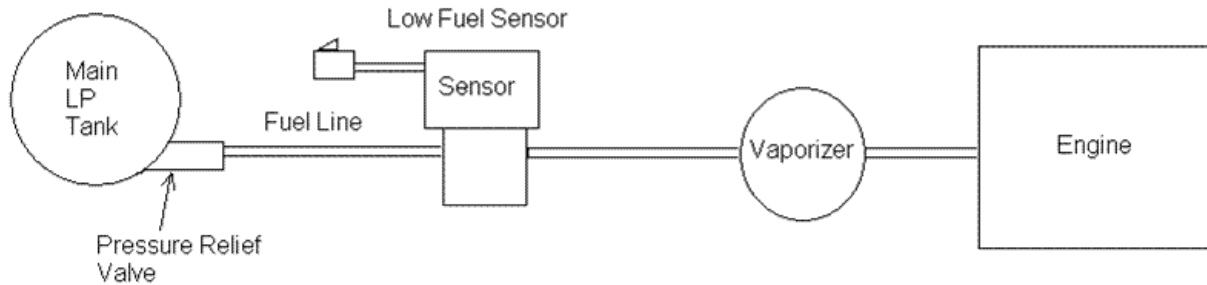
Mounting the sensor in application is achieved through use of the fuel line connections and or a band clamp around the body of the sensor. Optimum placement of the sensor will depend on the system and may require some considerations for mounting.

#### General Note

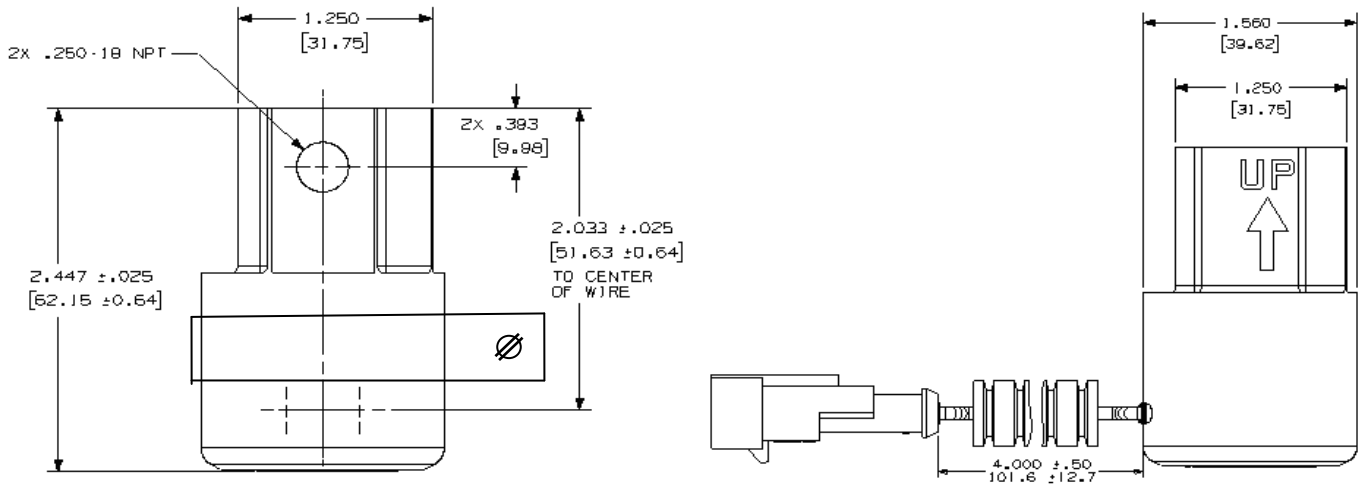
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

TT Electronics | Optek Technology  
1645 Wallace Drive, Suite 130, Carrollton, TX, USA 75006 | Ph: +1 972-323-2300  
www.ttelectronics.com | sensors@ttelectronics.com

# LP Gas Low Fuel Warning Sensor



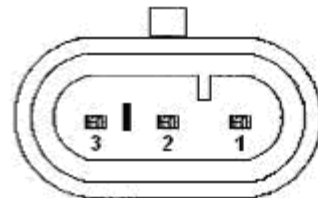
## Packaging Dimensions



Band Clap mounting shown

## Electrical connections

The OPBA100 low fuel detection sensor can be connected directly to existing engine management systems utilizing the output to drive a low fuel warning lamp.



- 1 = GROUND (BLACK WIRE)
- 2 = OUTPUT SIGNAL (WHITE WIRE)
- 3 = SUPPLY VOLTAGE (RED WIRE)

### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

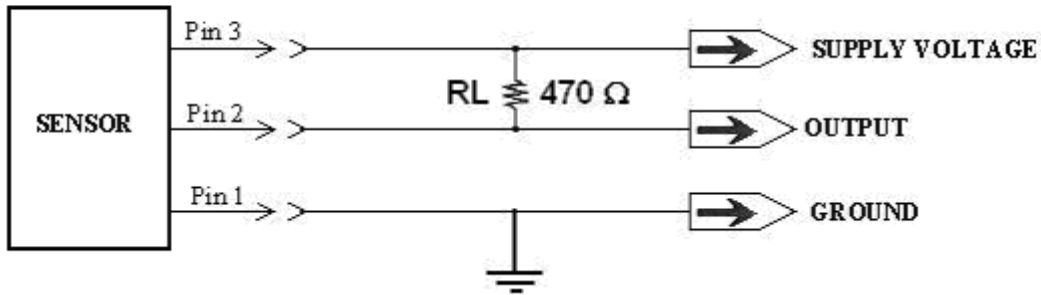
TT Electronics | Optek Technology  
 1645 Wallace Drive, Suite 130, Carrollton, TX, USA 75006 | Ph: +1 972-323-2300  
[www.ttelectronics.com](http://www.ttelectronics.com) | [sensors@ttelectronics.com](mailto:sensors@ttelectronics.com)

# LP Gas Low Fuel Warning Sensor



## LOAD CIRCUIT SCHEMATIC:

- 1 = GROUND (BLACK WIRE)
- 2 = OUTPUT SIGNAL (WHITE WIRE)
- 3 = SUPPLY VOLTAGE (RED WIRE)



### Optional Vehicle Interface Kit

A vehicle interface kit part No. OPBA100-KIT is available for retrofitting the sensor to existing applications. The interface kit provides the following:

1. Sealed Interface box (3.5"X2.1"X1.5") (88.9mmX53mm X38.1mm)
2. Mating three pin sensor connector with 96" (244cm) 18AWG harness for sensor connections.
3. 4 pin connector for PWR, GND, Horn Output, Horn GND and 24" (60.9cm) 18AWG harness
4. 2 pin connector for Low fuel LED connections including dash mount LED holder amber LED with 18 AWG harness 36" (91.4cm)

Horn not included.

### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

TT Electronics | Optek Technology  
1645 Wallace Drive, Suite 130, Carrollton, TX, USA 75006 | Ph: +1 972-323-2300  
www.ttelectronics.com | sensors@ttelectronics.com