

MGL Liquid Flow Sensor



In-line liquid flow sensor optimised for the measurement of fuel flow in an aircraft engine installation.

The MGL Flow sender employs a unique bearing-less design where a rotating body is suspended by a vortex. As a result the sensor has no mechanical friction to contend with and is very compact and light weight. It can be inserted into a suitable location into the fuel supply system.

Failure or jamming of the moving part has no effect on the fuel flow or pressure drop through the sender.

No preference of flow direction exists, the sender may be mounted in any orientation and direction.

The flow sender body provides aviation standard 1/4" female NPT ports.

The complete assembly is made from aluminium. The actual sensor is encased in a machined aluminium housing and can be unscrewed from the sensor body for ease of installation or maintenance.

As a further convenience, the sensor body includes all required electronics and provides a LED light that flashes if flow is detected.

Specifications:

Power Supply:

- +5V DC Red wire
- Ground (0V) Cable shield braid

Current consumption: 20mA maximum.

Please note: The sender must be operated from a regulated 5V DC supply as is available with MGL Avionics fuel flow indicators and EFIS RDAC engine monitoring units.

Connection of the flow sender supply to 12/28V aircraft supply or any supply that is higher than 5V will destroy the sender electronics. Please observe polarity.

Output:

5v TTL - 10000 Pulses per Litre, Blue wire

Note: When configuring your instrument, set the k-factor to 10.000 if your flow meter works in liters, otherwise multiply this number by 3.785 for U.S. Gallons (37850 per Gallon).

Note: All MGL flow systems base their K-factor on liters/hour so use the K-Factor of 10.000.

Length: Including Hosetails 46mm.

Diameter: 27mm.

Distance between flattened sides: 24mm.

LED is on when there is power supply, flashes once a second when the turbine is turning.

Flow senders cause a pressure drop in your fuel system. Please ensure that the pressure drop of the MGL Flow sender is compatible with your fuel system. The pressure drops have been measured with automotive fuels as follows:

Low flow type (Golden coloured body):

15L/h (4USG/h)	- 0.02bar
25L/h (6.6USG/h)	- 0.06bar
30L/h (8USG/h)	- 0.11bar
45L/h (12USG/h)	- 0.20bar

High flow type (black coloured body):

50 L/h (13.2USG/h)	-0.025bar
100 L/h (26.4USG/h)	-0.10bar
200 L/h (52.8USG/h)	-0.40 bar

Weights: Complete assembly with standard length cable: 110 grams.

Media compatibility:

Avgas (100LL)

Automotive fuels including blends containing methanol

Diesel fuels used in the automotive environment

Water

Other media may be compatible – it is the users responsibility to verify this as this would fall outside of the intended use of this device. Aggressive liquids such as acids should not be used with this flow sender.



Image of the flow sensor body with sensor module removed



Image of the sensor body. It screws into the sensor body. The body contains the sensor and a small micro processor used to linearise the flow reading derived from the vortex suspended rotating object in the sensor housing.

General installation advice:

Flow through the sender should be as even as possible. Flexible fuel lines in combination with pulsed pressure pumps can result in liquid shunting through the sender in both directions. This may cause incorrect readings and is one of the most common installation problems.

The flow sender must be installed on the pressure side of the fuel pump to avoid possible vapour formation caused by the pressure drop in the flow sender at high flow rates.

Install at the low pressure side only after confirming that pressure drop at maximum expected flow rates will not cause a problem.

Consider usage of fuel filters as dampers in installations suffering from pulsed pressure effects. The vapour pocket in the fuel filter acts as a damper and helps to even out the fuel flow.

Fuel pressure damping is normally done before the fuel flow sender. In severe cases it may be required to place dampers both before and after the flow sender.

It is advisable that a fine mesh fuel filter be installed upstream, in line, so no debris can enter the flow sender or cause fuel starvation due to causing of blockages.

If using paper based filters, confirm that these will not cause possible issues with your fuel system or engine performance due to water absorption or other issues.

It is advisable to install a fuel pressure measurement system downstream of the sender in applications where a known minimum or maximum fuel pressure is required.

Qualified personnel:

Installation of the flow sender into any fuel system and connection of the flow sender to an electrical display instrument may only be performed by qualified technicians.

All installation and maintenance tasks must be performed according to prevailing rules and regulations pertaining to both qualified personnel and procedures as well as documentation.

Certifications:

The MGL flow sender does not hold any certifications of any kind. It is not TSO'd. Installation of such as device into a certified aircraft requires additional documentation and may require the approvals of field modifications by the relevant aviation authorities.

Warranty:

MGL warrants the product to be free of manufacturing defects. Warranty claims for defective parts are subject to local laws. MGL specifically excludes warranty related to damage of the flow sender sensor electronics caused by incorrect installation such as short circuit, reverse polarity or exceeding permitted supply voltage range or type.