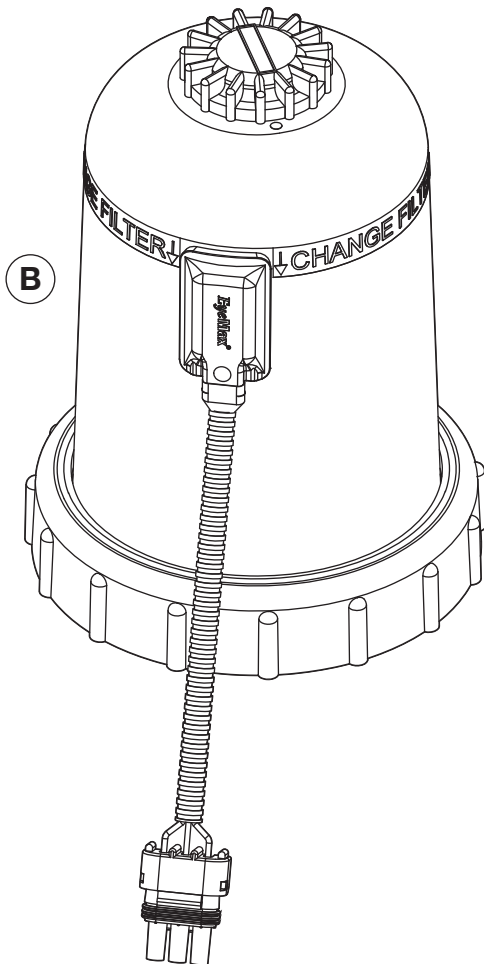
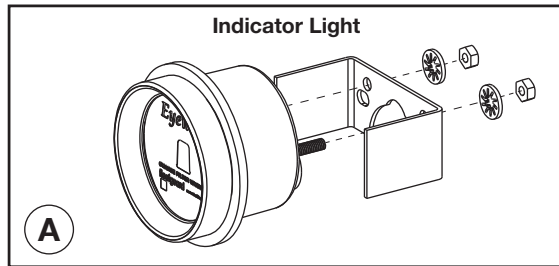




# EyeMax<sup>®</sup>

## IR (Infrared) Liquid Level Sensor Installation Instructions

### EyeMax<sup>®</sup> for Fuel Pro<sup>®</sup>

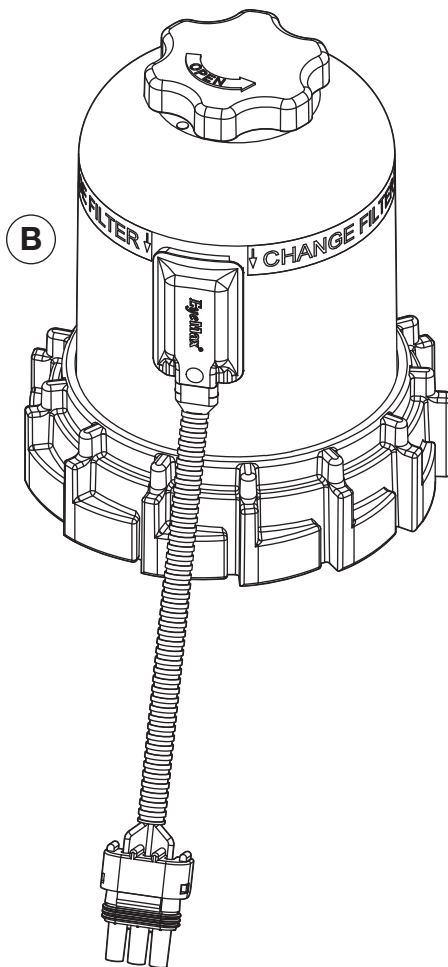
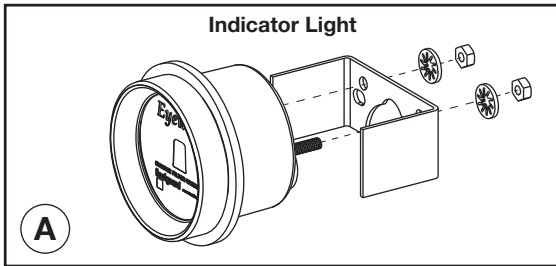


### Parts List

Part	Description	Part Number
<b>A</b>	EyeMax <sup>®</sup> Indicator Light	<b>3977801 S</b>
	O-Ring Seal (not shown)	
	Inline Fuse Holder (not shown)	
	Black Nylon Cable Tie (not shown) (6.00" -9.00" (152.4 mm-228.6 mm))	
<b>B</b>	Fuel Pro <sup>®</sup> Cover Assembly	<b>3977802 S</b>
	Inline Butt Connector (14-16 AWG) (not shown)	
	Fuse, ATO, 3 A (not shown)	
	Interconnecting Harness (not shown)	
	Power Harness (not shown)	
	Ring Terminal, 0.38" (9.7 mm) dia., 16-22 AWG (not shown)	
	Ring Terminal, 0.25" (6.4 mm) dia., 16-22 AWG (not shown)	
Snap Grommet (not shown)		
Closed End Crimp Connector (not shown)		
<b>A + B</b>	Fuel Pro EyeMax Kit (includes Indicator Light and Cover Assembly with parts shown above )	<b>3977798 S</b>

**⚠ CAUTION:** These instructions are intended for use by professional mechanics who are trained in the proper use of power and hand tools, using appropriate safety precautions (including eye protection).

## EyeMax® for Diesel Pro®



## Parts List

Part	Description	Part Number
A	EyeMax® Indicator Light	3977801 S
	O-Ring Seal (not shown)	
	Inline Fuse Holder (not shown)	
	Black Nylon Cable Tie (not shown) (6.00"-9.00" (152.4 mm-228.6 mm))	
B	Diesel Pro® Cover Assembly	3977804 S
	Inline Butt Connector (14-16 AWG) (not shown)	
	Fuse, ATO, 3 A (not shown)	
	Interconnecting Harness (not shown)	
	Power Harness (not shown)	
	Ring Terminal, 0.38" (9.7 mm) dia., 16-22 AWG (not shown)	
Ring Terminal, 0.25" (6.4 mm) dia., 16-22 AWG (not shown)		
	Snap Grommet (not shown)	
	Closed End Crimp Connector (not shown)	
A + B	Diesel Pro EyeMax Kit (includes Indicator Light and Cover Assembly with parts shown above)	3977800 S

## Introduction

### Important Safety Precautions

- ⚠ **WARNING:** When diesel fuel is circulated through an operating engine, it can become very hot. To prevent personal injury:
- ⚠ **Scalding hazard!** Do not allow heated liquid fuel to come in contact with eyes or unprotected skin. Always allow the engine and fuel to cool to ambient temperature before replacing the fuel filter or performing service operations which could result in the spillage of fuel from the fuel system. If this is not possible, protective clothing (face shield, insulated hat, gloves, apron) must be worn.
- ⚠ **Fire hazard!** Heated diesel fuel can form combustible vapor mixtures in the area around the fuel source. To eliminate the potential for fire, keep open flames, sparks or other potential ignition sources away from the work area, and do not smoke during filter replacement or service operations which could result in the escape of diesel fuel or fuel vapors.
- ⚠ **Inhalation hazard!** Always perform engine or vessel fuel system maintenance in a well ventilated area that is kept free of bystanders.
- ⚠ **The ignition key must be in the OFF position during servicing unless otherwise specified.**

## How It Works

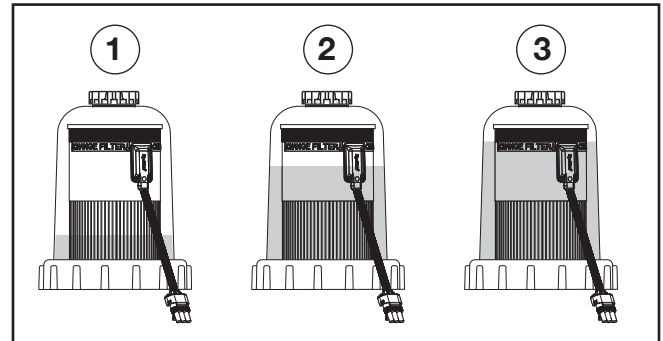


Figure 1: How EyeMax® Works

1. When new, the fuel level in the filter will be very low. The EyeMax indicator light will self-check at start-up, then remain unlit during operation.
2. Fuel level remains low. Immediately after start-up, EyeMax allows the fuel in the cover to stabilize for six minutes before sending information.
3. The EyeMax indicator light will illuminate when the fuel rises to one half inch (approximate) from the top of the filter cartridge - before filter performance is affected. The filter should be changed as soon as practical.

## Operation

EyeMax is a liquid level sensor that uses infrared (IR) technology to detect the presence of a liquid. When attached to the transparent cover of the fuel processor, EyeMax is able to detect the presence of fuel, indicating when it is time to change the fuel filter. Once the fuel level reaches the EyeMax sensor level, the EyeMax indicator light illuminates, indicating the fuel filter should be changed.

### Normal Operation Mode

EyeMax is powered when the vehicle ignition is on. When the ignition is first switched on, the EyeMax indicator light flashes twice to verify the indicator light is operating correctly. When the fuel level inside the filter assembly is below the black band on the filter, the indicator light remains off.

There is a six minute delay (approximately) from the time the fuel level rises at or above the EyeMax sensor to the time the EyeMax indicator light illuminates. This delay is designed to prevent false indications that could occur due to extreme operating conditions.

Should the fuel level drop back below the EyeMax<sup>®</sup> sensor while the vehicle ignition is on, the indicator light will turn off after approximately six minutes.

The ignition needs to be in the off position during filter change out. Changing the filter while EyeMax is powered may cause unexpected sensor readings which will interfere with proper EyeMax operation. If this occurs, use the EyeMax reset function to turn off the indicator light (see “EyeMax Reset”).

When the filter change is complete, be sure to close the hood of the vehicle or equipment before turning on the ignition to avoid exposure to excessive ambient light. EyeMax has built-in precautions to prevent false readings, but the following steps should be taken to further reduce that possibility:

- Do not expose EyeMax to direct or indirect sunlight while the ignition is on.
- Use only the filters designed for EyeMax operation that include the large black band at the top of the filter wrap. (See Figure 2.)

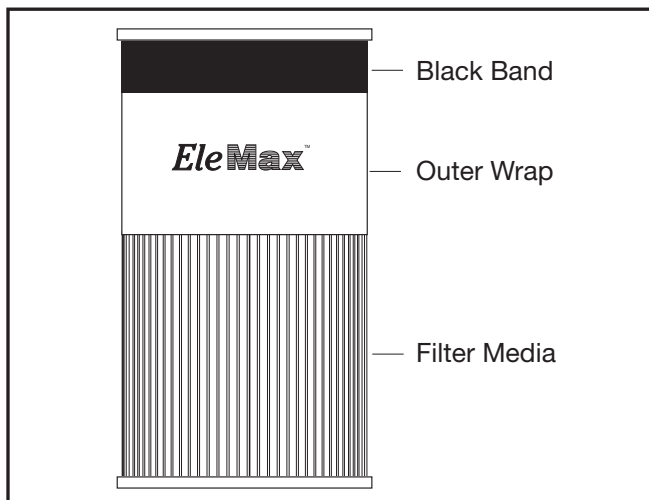


Figure 2: Typical EleMax<sup>®</sup> Fuel Filter with EyeMax Compatibility

## Environmental Conditions

EyeMax was designed to sample the fuel level only under certain environmental conditions. Conditions that are outside of EyeMax limits will cause EyeMax to stop sampling while these conditions are present. The following are the conditions that will stop sampling:

- Ambient temperature below 40 °F (4.4 °C) or above 150 °F (65.6 °C).
- Excessive ambient light from sunlight or other artificial light sources.

In addition to the temperature restriction, if the ambient temperature falls below 20 °F (6.7 °C), there will be an automatic twenty (20) minute delay before any sampling will occur. This delay allows time for any frost or condensation that has formed on the clear filter cover to dissipate. During the time sampling of the fuel level is suspended, the indicator light will not react to changes in the fuel level status until the ambient conditions are within the EyeMax operating criteria.

## Test Mode

In the event you want to verify the fuel level without the six minute delay, EyeMax can be put into Test Mode. Test Mode increases the sample rate and reduces the six-minute indicator light delay to approximately ten (10) seconds. The Test Mode also overrides temperature and ambient light restrictions (see “Environmental Conditions”).

To initiate the EyeMax Test Mode:

1. Turn the ignition on for 2 to 8 seconds. Then turn the ignition off.
2. Once again, turn the ignition on for 2 to 8 seconds. Then turn the ignition off.
3. Turn the ignition on a third time, this time leaving it ON. EyeMax is now in Test Mode.

Test Mode is exited once the ignition is turned off. The previous steps must be repeated to reenter Test Mode.

## Reset Mode

In the event of a system error, such as the indicator light is on but the fuel level is below the sensor level, EyeMax should be reset.

To reset EyeMax:

1. Turn the ignition on for 2 to 5 seconds. Then turn the ignition off.
2. Repeat the previous step three more times for a total of four cycles.
3. When EyeMax is properly reset, the indicator light will turn off on the fourth ignition cycle.

## Installation

### Installing the EyeMax® Cover

1. Remove the vent cap and open the drain valve in the housing to drain the fuel below the collar level.
2. Remove the collar using the Collar/Vent Cap Wrench then remove the clear cover.

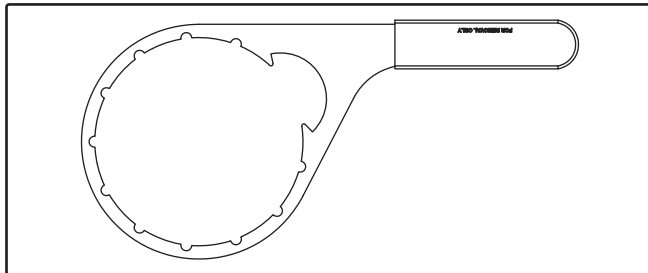


Figure 3: Collar/Vent Cap Wrench

3. Remove the filter, cover, and vent cap seals. Dispose of them properly.
4. Using a clean shop rag, clean the threads on the fuel processor body.
5. Install a new EyeMax filter that includes the black band at the top of the wrap. This black band is required for EyeMax operation. Install the new seals on the cover and vent cap.
6. Install the EyeMax-equipped clear cover through the vent cap opening and collar assembly. **Hand tighten the collar.**
7. Prime the unit by filling the clear cover through the vent cap opening with clean diesel fuel until it reaches the top of the filter.
8. Install the vent cap. **Hand tighten only.**
9. Start the engine and run for one minute. **Slowly** open the vent cap and allow the fuel to drop to about one inch above the collar.
10. Close the vent cap. **Hand tighten only.**

It is normal for the fuel level to vary after the initial start-up and during engine operation. Filter performance is not affected.

### Installing the EyeMax Indicator Light

1. Locate a 2" (51 mm) diameter "indicator light knock out" on the instrument panel or an area where a 2" (51 mm) diameter hole can be drilled to mount the EyeMax indicator light. An "L" bracket is available for greater mounting

flexibility, if needed. The location should be visible by the driver but should not impair sight or movement in the cab.

2. Remove the indicator light mounting clamp and install the unit in the 2" (51 mm) diameter hole
3. Replace the indicator light mounting clamp and tighten the mounting hardware.

### Connecting the EyeMax Sensor to the EyeMax Indicator Light

1. Attach the 15' (4.6 m) long harness to the connector on the EyeMax cover.
2. Route the harness towards the firewall and secure as needed.
3. Locate a knock-out or an acceptable location to drill an access hole into the cab.
4. Use the supplied grommet and route the harness into the cab.
5. Route the harness to the EyeMax indicator light and secure.
6. Connect the three (3) harness wires to the indicator light wires using the supplied crimp connectors.

### Connecting the EyeMax Indicator Light to the Power Source

1. Attach the 6' (1.8 m) long red and black power leads to the EyeMax indicator light using the supplied crimp connectors.
2. Route the power leads to a "key on," switched power source and secure as needed.
3. Connect the red lead to the switched source using the supplied fuse link and butt connector.

**Note:** ATO and ATC Add-a-Fuse adapters can be used for ease of installation.

4. Find a suitable ground and attach the black lead using the supplied grounding eyelet.
5. Install the 3 A fuse.

### Using the EyeMax Indicator Light

1. Turn the key to the "Accessory" position.
2. The amber indicator light should flash for one second (this is a bulb test).
3. The EyeMax system is now functioning.

**Note:** As the fuel filter becomes contaminated, the fuel level will rise and the EyeMax indicator light will illuminate when the fuel rises to the level of the EyeMax sensor.

## Ordering Information

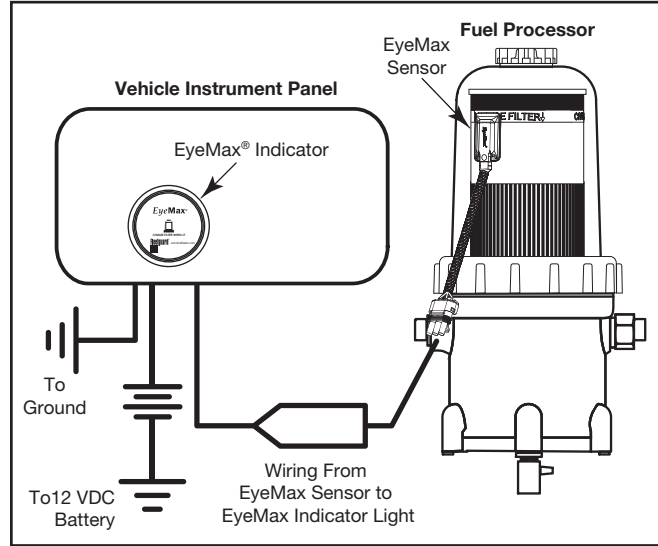
Part Number	Description
3977798 S	Fuel Pro® Kit (includes EyeMax® Indicator Light Assembly and Cover Assembly)
3977800 S	Diesel Pro® Kit (includes EyeMax Indicator Light Assembly and Cover Assembly)
3977801 S	EyeMax Indicator Light
3977802 S	Fuel Pro EyeMax Cover Assembly
3977804 S	Diesel Pro EyeMax Cover Assembly

## Specifications

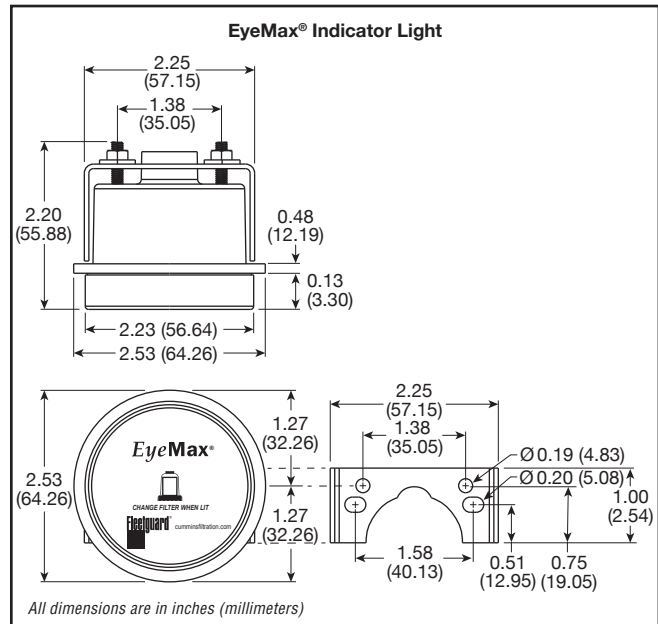
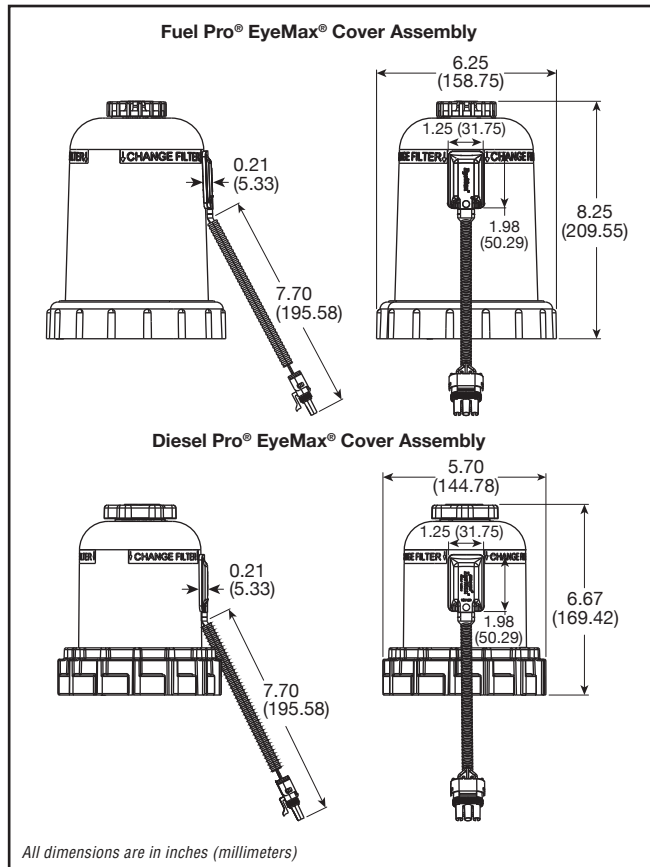
Specification	EyeMax®
Supply Voltage	9 V to 16 V
Supply Current	2 mA (average), 20 mA (max) (Indicator Light off)
	22 mA (average), 40 mA (max) (Indicator Light off)
Operating Temperature	-67 °F to 257 °F (-55 °C to 125 °C)
Sensor Output, Fuel Level High	0 V ± 0.1 V
Sensor Output, Fuel Level Low	5 V ± 0.1 V

Specifications subject to change without notice.

## Typical Installation



## Dimensions



**Filtration**

For more information, visit  
[cumminsfiltration.com](http://cumminsfiltration.com)

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