

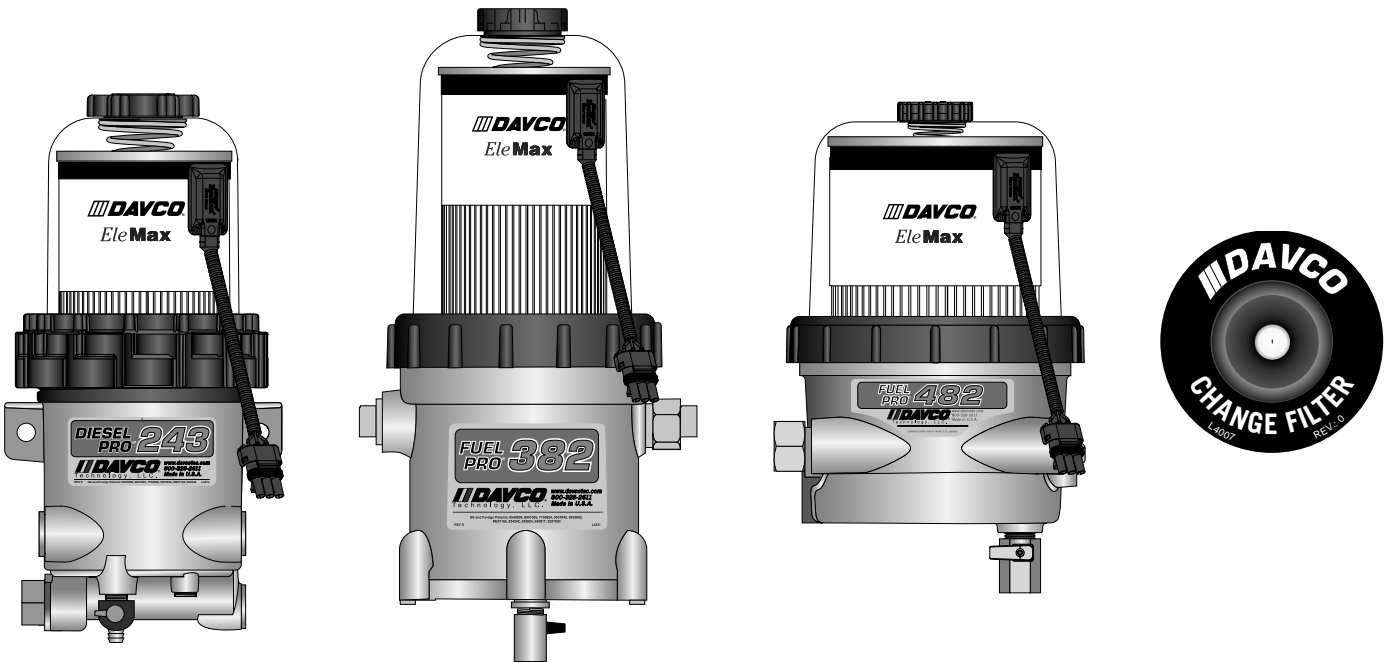
DAVCO

Technology, LLC

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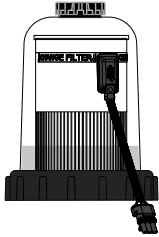
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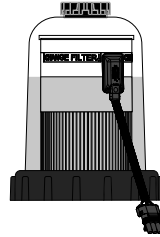
EyeMax[®]

TECHNICAL MANUAL

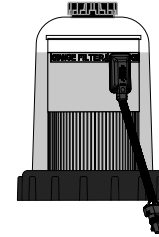
HOW IT WORKS



When the filter is 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.

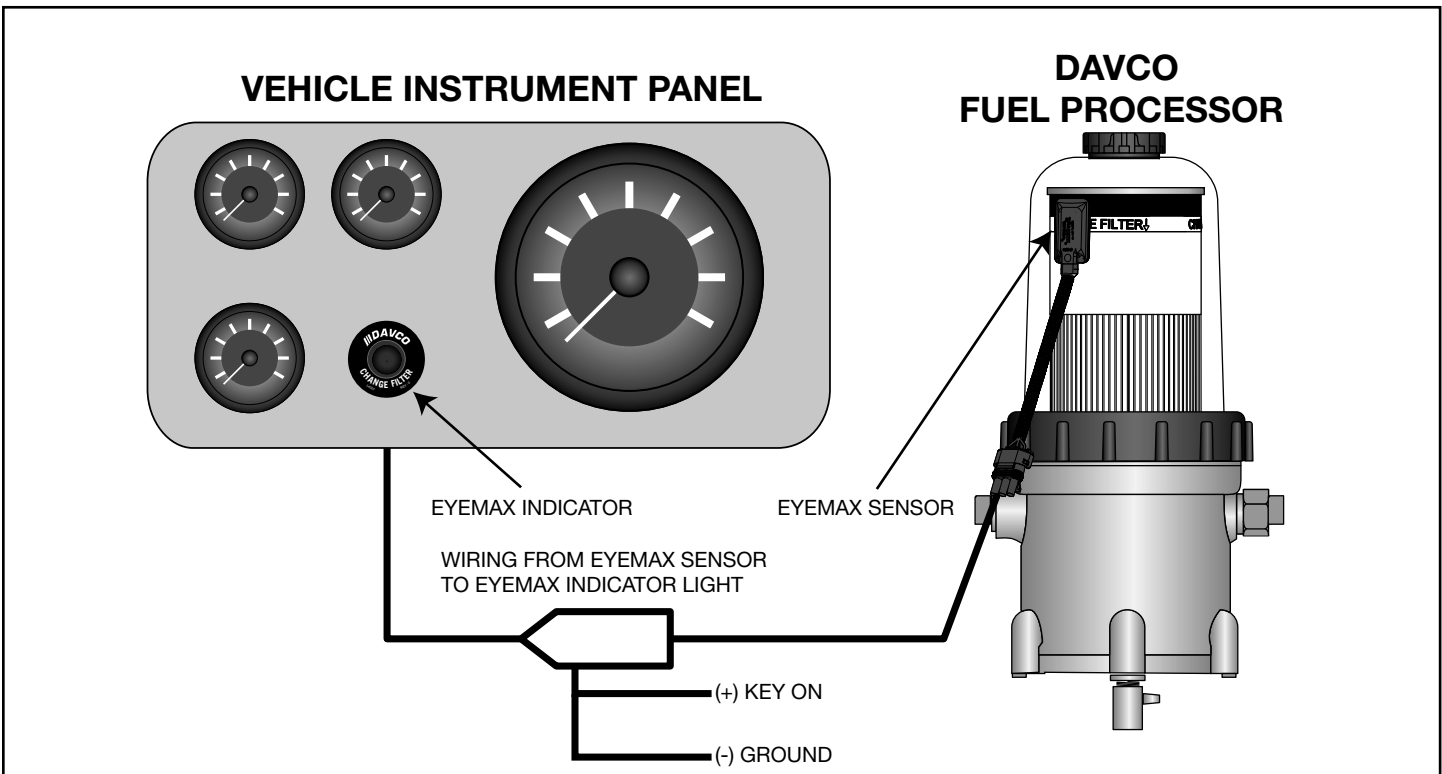


Fuel level remains low. Immediately after start up, EyeMax will allow the fuel in the cover to stabilize for six minutes before sending information.



The EyeMax indicator light will illuminate when the fuel rises to one half inch (approximate) from the top of the filter cartridge - before engine performance is affected. The filter should be changed as soon as practical.

TYPICAL INSTALLATION



OPERATION

INTRODUCTION

EyeMax is a DAVCO patented liquid level sensor that uses infrared (IR) technology to detect the presence of a liquid. EyeMax is able to detect the presence of fuel in the clear cover of a DAVCO fuel processor. Once the fuel level reaches the EyeMax sensor level, the EyeMax indicator light will illuminate, 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 will flash 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 will remain off.

There is approximately a six minute delay 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 which could occur due to extreme operating conditions.

Should the fuel level drop back below the EyeMax 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" section).

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 by the user to further reduce such potential:

- Do not expose EyeMax to direct or indirect sunlight while the ignition is on. The infrared (IR) spectrum of the sun will overpower the EyeMax IR signal, resulting in a false reading.
- Use only the filters designed for EyeMax operation that include the large black band at the top of the filter wrap. The black band reduces IR interference and is essential for reliable operation of the EyeMax. (See Figure 1.)

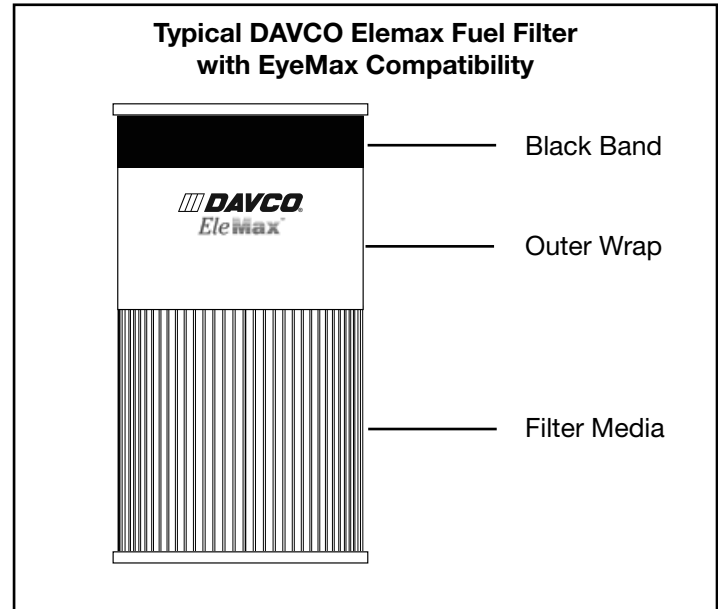


Figure 1

ENVIRONMENTAL CONDITIONS

EyeMax is 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 conditions will stop sampling :

- Ambient temperature below 40°F or above 150°F.
- Excessive ambient light from sunlight or other artificial light sources.

In addition to the temperature restriction, if the ambient temperature falls below 20°F, there will be an automatic twenty (20) minute delay before any sampling will occur. This will allow 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.

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 fuel to come in contact with eyes or unprotected skin. Allow the engine and fuel to cool to ambient temperature before replacing the fuel filter or performing service operations which could result in spillage of fuel from the fuel system. If this is not possible, protective equipment (face shield, insulated hat, gloves, and apron) must be worn.
- △ **Fire Prevention!** 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. Do not smoke during filter replacement or service operations.
- △ **Inhalation Prevention!** Always perform engine or vehicle fuel system maintenance in a well ventilated area that is kept free of bystanders.
- △ The ignition key must be in the **off** position.

INSTALLATION INSTRUCTIONS

INSTALLING THE EYEMAX COVER

Step 1: Remove the vent cap and open the drain valve on the bottom of the fuel processor to drain the fuel below the collar level.

Step 2: Remove the collar (using a DAVCO wrench) then remove the clear cover.

Step 3: Remove the filter, grommet, cover and vent cap seals. Dispose of them properly.

Step 4: Using a clean shop rag, clean the threads on the fuel processor body.

Step 5: Install a new EyeMax compatible fuel filter and grommet. Install the new seals on the cover and vent cap.

Step 6: Install the EyeMax-equipped clear cover. **Hand tighten the collar until contact and then continue to hand tighten two more ribs.**

Step 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.

Step 8: Install the vent cap. **Hand tighten only.**

Step 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.

Step 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 LED INDICATOR LIGHT

Step 1: Find a location on the instrument panel or an area where a ½" hole can be drilled to mount the EyeMax LED indicator light.

Note: This location should be visible from driver seat and allow for wiring access for electrical connection.

Step 2: Drill a ½" hole in the instrument panel.

Step 3: Insert the EyeMax LED indicator light into hole.

Step 4: Install EyeMax indicator label.

CONNECTING THE EYEMAX SENSOR TO THE INDICATOR LIGHT

Step 1: Attach the 15 foot long harness to the connector on the EyeMax cover.

Step 2: Route the harness towards the firewall and secure appropriately.

Step 3: Locate a knock out or an acceptable location to drill an access hole into the cab.

Step 4: Use the supplied grommet and route the harness into the cab.

Step 5: Route the harness to the EyeMax indicator light and secure.

Step 6: Connect the white signal wire (indicator light to the EyeMax sensor).

Step 7: Connect the red power wires (indicator light/ EyeMax sensor and 6 foot power lead).

Step 8: Connect the black ground wires (indicator light/ EyeMax sensor and 6 foot ground lead).

Note: The preferred method of connecting the wires is to "pigtail" the wires together and use the close end butt connectors accordingly. Cable tie the bundle together once all connections are complete.

Step 9: Route the red power lead to a "key on", switched power source and secure as needed.

Step 10: Connect the 6 foot power 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.

Step 11: Find a suitable ground and attach the 6 foot black ground lead using the supplied grounding eyelet.

Step 12: Install the three amp fuse.

USING THE EYEMAX INDICATOR LIGHT

Step 1: Turn the key to the "Accessory" position.

Step 2: The amber indicator light should flash for one second (this is a bulb test).

Step 3: The EyeMax system is now functioning.

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

DIAGNOSTICS

TEST MODE

In the event the user wants to verify the fuel level without the six minute delay, EyeMax may 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” section). To initiate the EyeMax Test Mode perform the following steps:

- Step 1:** Before entering test mode the fuel level must be below the bottom edge of the Eyemax sensor (open the vent cap and drain the fuel level down as needed).
- Step 2:** Turn the ignition on for 2 to 5 seconds. Then turn the ignition off for 2 to 5 seconds.
- Step 3:** Once again, turn the ignition on for 2 to 5 seconds. Then turn the ignition off for 2 to 5 seconds.
- Step 4:** Turn the ignition on a third time, this time leave it ON. EyeMax is now in Test Mode.

Step 5: Remove the vent cap and pour clean diesel fuel into the cover until it reaches the top of the filter. Note: The indicator should illuminate after 6 seconds.

Note: Test Mode is exited once the ignition is turned off for at least 8 seconds. 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, perform the following steps:

- Step 1:** Turn the ignition on for 2 to 5 seconds. Then turn the ignition OFF for 2 to 5 seconds.
- Step 2:** Repeat the previous step three more times for a total of 4 cycles.
- Step 3:** When EyeMax is properly reset, the indicator light will turn off on the 4th ignition cycle.

TECHNICAL SPECIFICATIONS

Supply Voltage	9 – 16 volts
Supply Current	2mA (average); 20mA (max) (indicator light off)
	22mA (average); 40mA (max) (indicator light on)
Operating Temperature	-55°C to +125°C
Sensor Output	0 volts (Fuel level high)
	5 volts (Fuel level low)
	(+/- 0.1 volts)

EyeMax[®] is a registered trademark of DAVCO Technology, LLC.
 EyeMax[®] technology is protected under U.S. Patent #7,508,312.

EYEMAX[®] KIT FOR DIESEL PRO[®] 243

KIT FOR DIESEL PRO 243 (DAVCO P/N 104408)	
1	Indicator light, EyeMax (Figure 2)
1	Connector, butt inline (14-16 AWG)
1	Fuse, ATO 3 AMP
1	Harness, interconnecting
1	Harness, power
1	Terminal, ring, Ø.38" 16-22 AWG
1	Terminal, ring, Ø.25" 16-22 AWG
1	Grommet, snap
5	Connector, closed end crimp
1	Cover assembly (Figure 3)
1	Seal, o-ring
1	Fuse holder, inline
5	Cable tie, black nylon (6.00"-9.00")

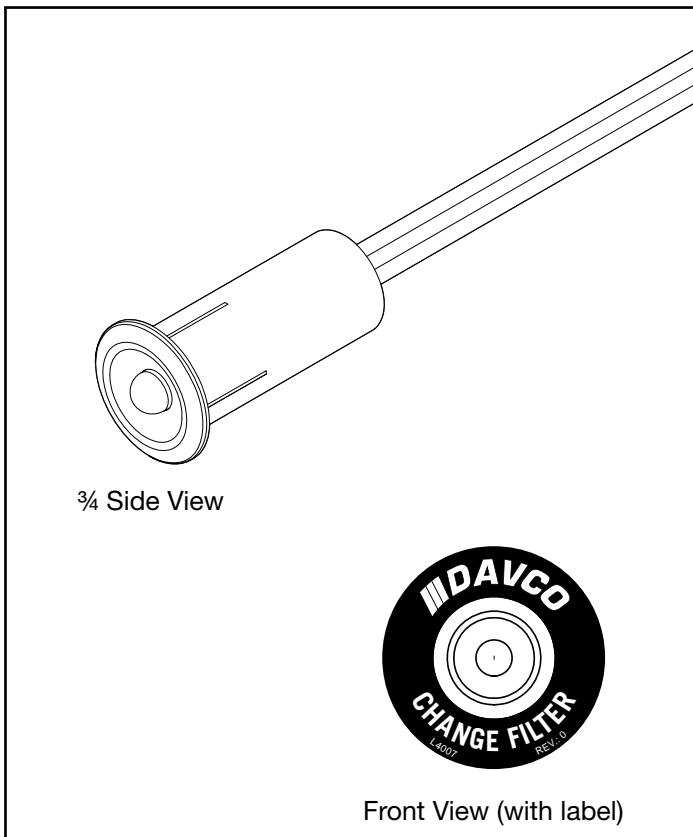


Figure 2

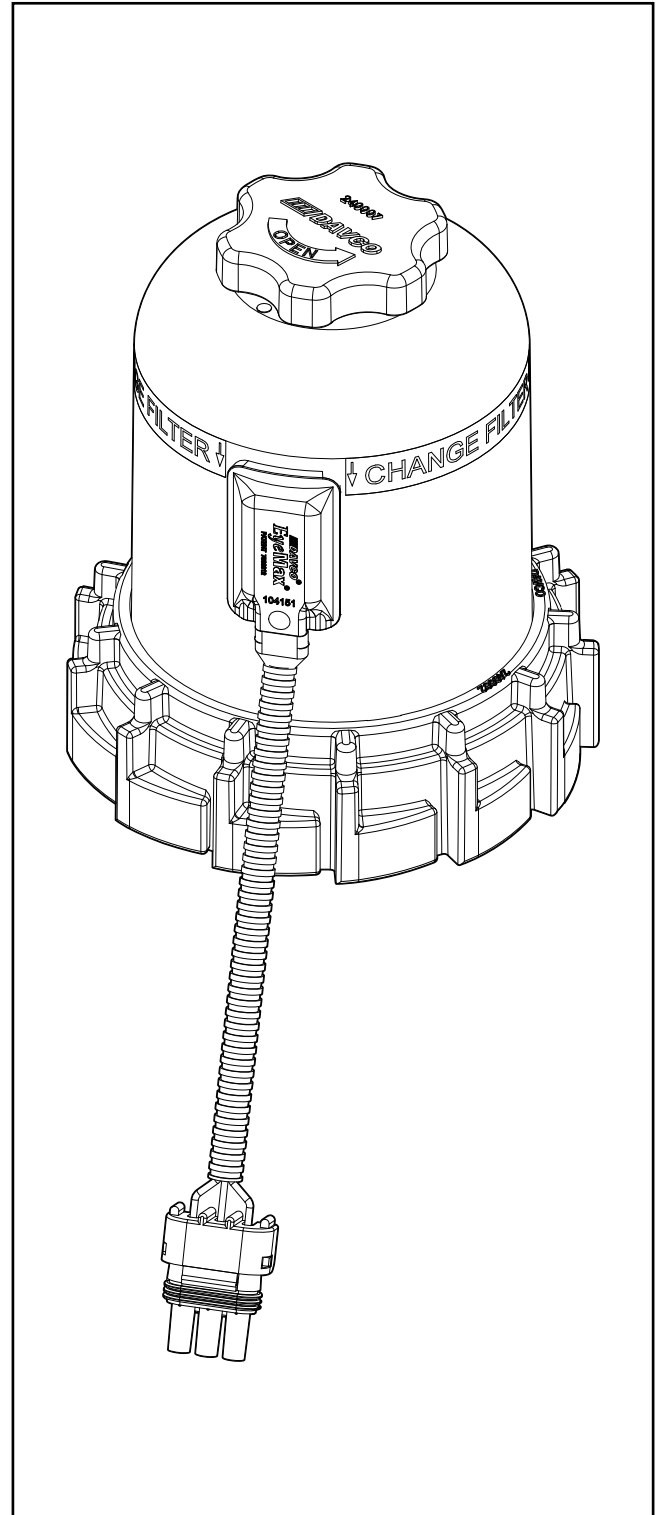


Figure 3

EYEMAX[®] KIT FOR FUEL PRO[®] 382

KIT FOR FUEL PRO 382 (DAVCO P/N 104409)	
1	Indicator light, EyeMax (Figure 4)
1	Connector, butt inline (14-16 AWG)
1	Fuse, ATO 3 AMP
1	Harness, interconnecting
1	Harness, power
1	Terminal, ring, Ø.38" 16-22 AWG
1	Terminal, ring, Ø.25" 16-22 AWG
1	Grommet, snap
5	Connector, closed end crimp
1	Cover assembly (Figure 5)
1	Seal, o-ring
1	Fuse holder, inline
5	Cable tie, black nylon (6.00"-9.00")

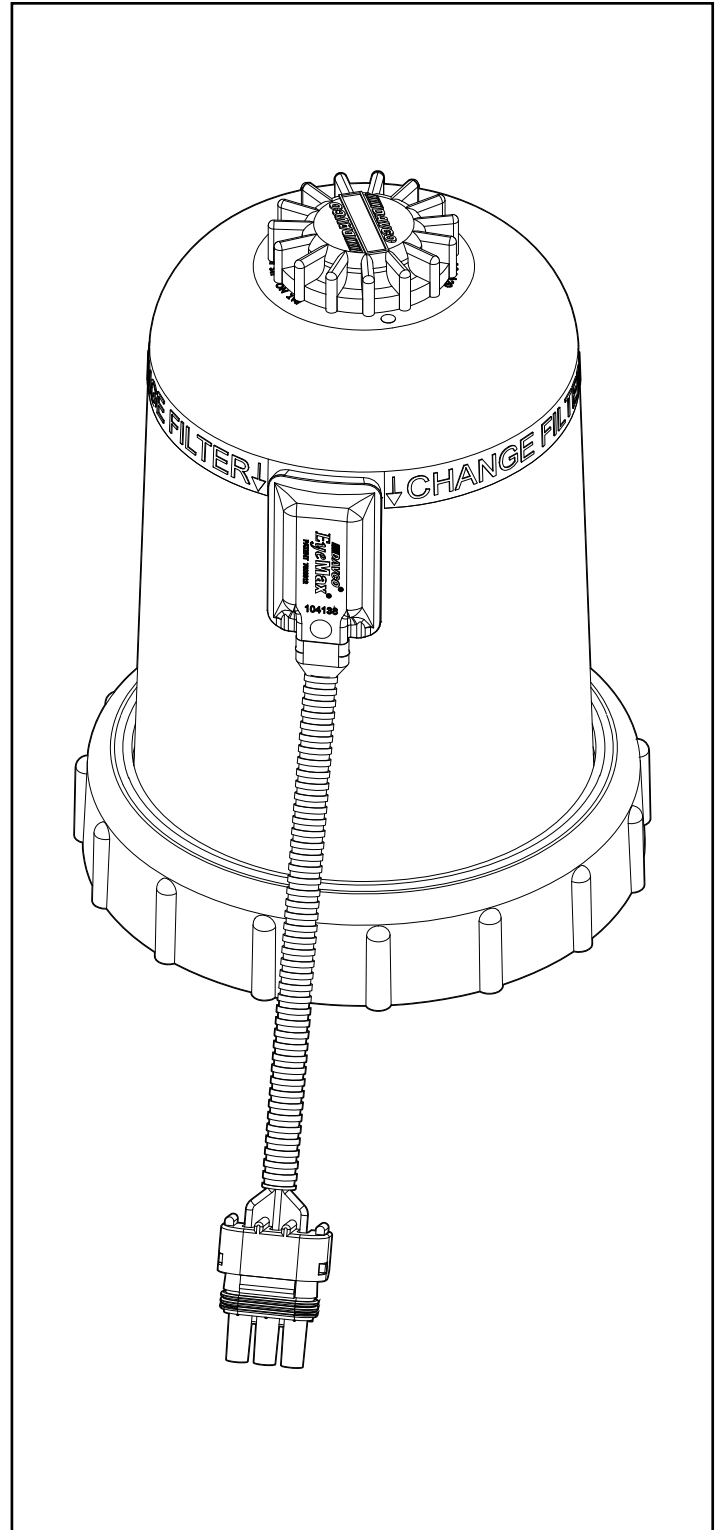


Figure 5

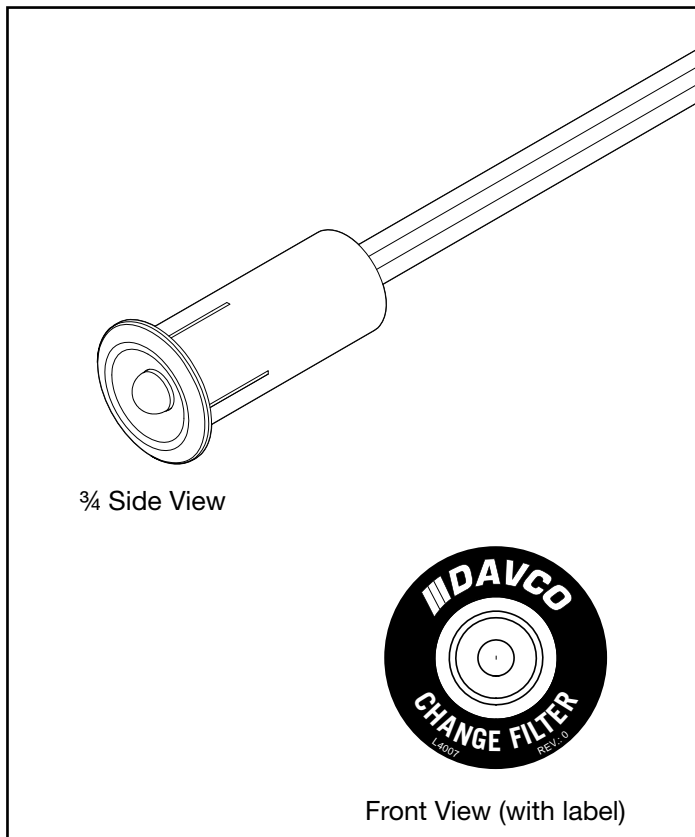


Figure 4

EYEMAX[®] KIT FOR FUEL PRO[®] 482

KIT FOR FUEL PRO 482 (DAVCO P/N 104410)	
1	Indicator light assembly, EyeMax (Figure 6)
1	Connector, butt inline (14-16 AWG)
1	Fuse, ATO 3 AMP
1	Harness, interconnecting
1	Harness, power
1	Terminal, ring, Ø.38" 16-22 AWG
1	Terminal, ring, Ø.25" 16-22 AWG
1	Grommet, snap
5	Connector, closed end crimp
1	Cover assembly (Figure 7)
1	Seal, o-ring
1	Fuse holder, inline
5	Cable tie, black nylon (6.00"-9.00")

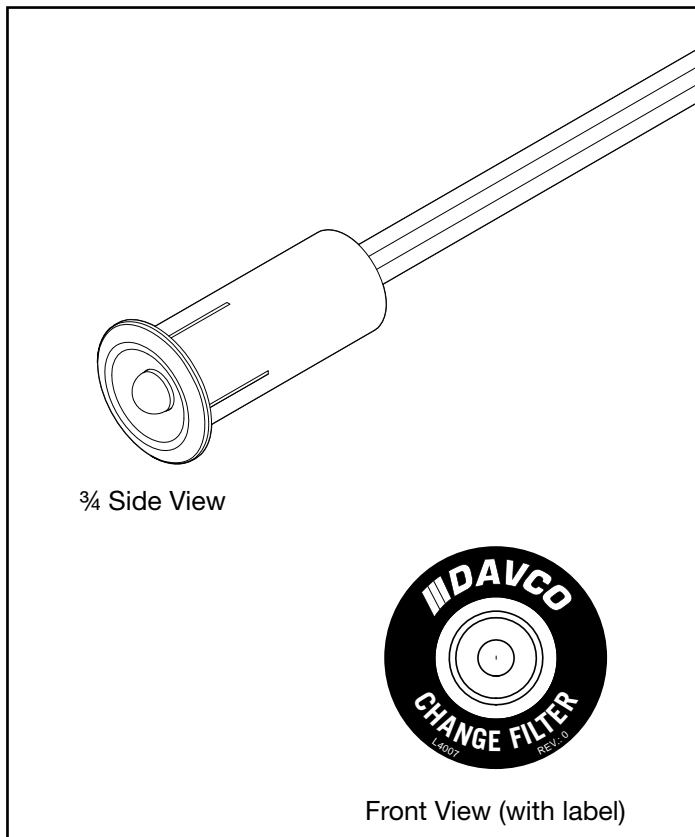


Figure 6

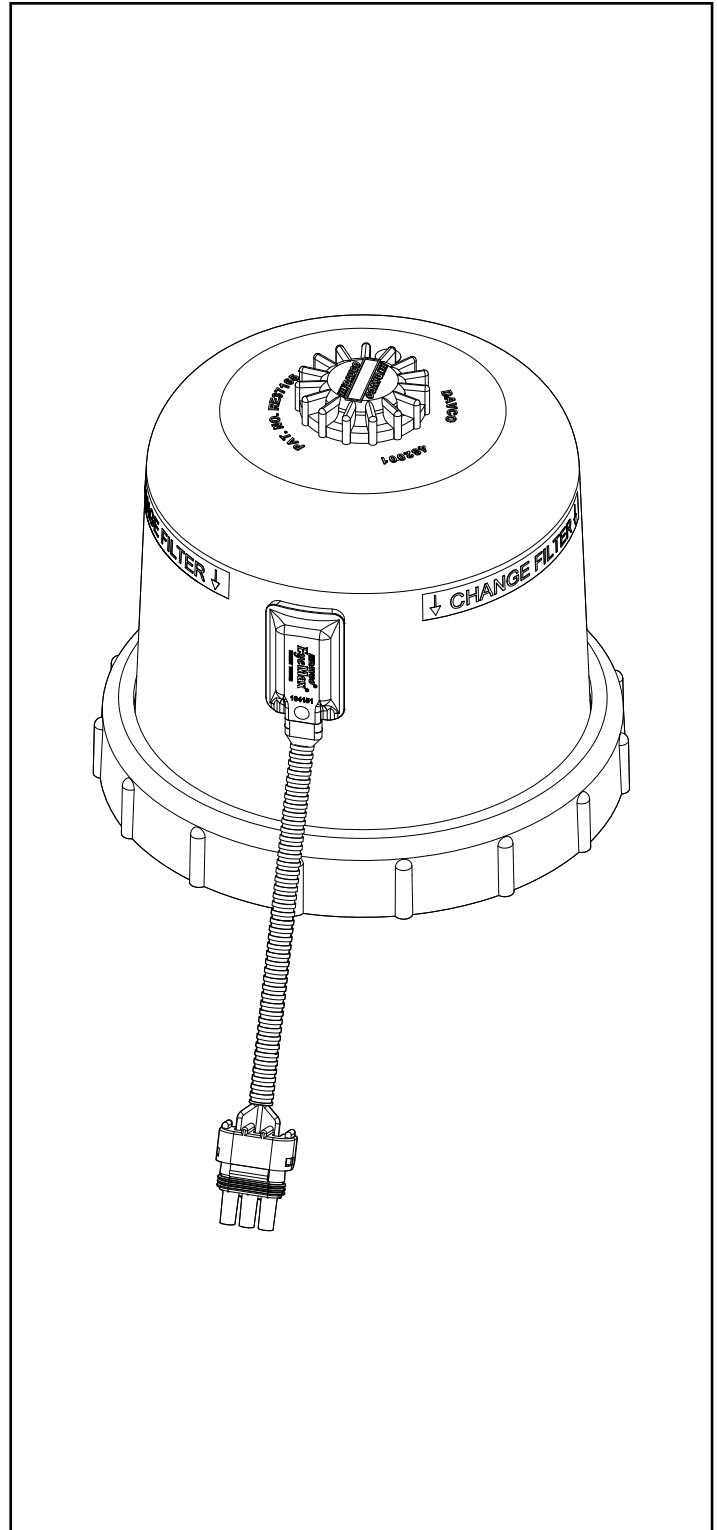


Figure 7

WARRANTY AND CUSTOMER SERVICE

PRODUCT WARRANTY

Fuel Pro 482, Fuel Pro 382, Diesel Pro 243, Industrial Pro, Shop Pro, Pro-Chek, Sea Pro and REN Products

DAVCO Technology, LLC warrants these products to be free of defects in material and workmanship for 5-years, 500,000 miles or 10,000 hours (whichever comes first) and electrical parts for 2-years, 200,000 miles or 4,000 hours (whichever comes first) from the purchase date. Shop Pro Motor has a one year warranty from the date of purchase.

EyeMax, Electronic Gauges, Electronic Dipsticks, Fuel Pro 384

DAVCO Technology, LLC warrants these products to be free of defects in material and workmanship for 2-years or 200,000 miles (whichever comes first) from the purchase date.*

Limitation:

- DAVCO is not responsible for failures resulting from misuse, misapplication, faulty installation, alteration, poor maintenance, neglect or accident.
- DAVCO is not responsible for downtime, loss of profits or income, living expenses, or other incidental, special or consequential damages.
- This warranty is the sole warranty made by DAVCO.
- DAVCO makes no other warranties, expressed or implied, of merchantability or fitness for a particular purpose.
- DAVCO does not warranty any aftermarket or OEM component not approved specifically to work with a DAVCO manufactured product.

In the event of a defective product, DAVCO will either rework the defective product or replace it at DAVCO's discretion. If you feel you have a warrantable issue, contact DAVCO at 800-328-2611 for a Return Goods Authorization (RGA) number. An RGA number is required **prior** to the return of any product.

*Purchase Date: The date of the first retail purchase of a new vehicle or piece of equipment from the OEM dealer or factory. For "Over the Counter" purchases: The date of the sale of a DAVCO product to the first retail customer.

PARTS RETURN GENERAL POLICY

Note: A Return Goods Authorization (RGA) must be obtained from DAVCO prior to returning any products. Returns may be accepted under the following circumstances:

Order Shipping Error: A credit against the original invoice, including freight charges for both ways will be issued for returns in which DAVCO inadvertently shipped incorrect quantity or product.

Overstock: Returns for ordering more product(s) than required, or incorrect part(s), will be accepted within 60 days from the date of purchase. Proof of purchase will be required, IE: original invoice/delivery receipt. These types of return(s) are subject to a minimum restock fee of 40% or \$40.00, whichever is higher. Additional restock fees may apply. Product(s) will be inspected for "like new" condition and additional costs will be the responsibility of the customer. No obsolete parts may be returned.

Freight charges for return(s) will be the responsibility of the customer.