Scope

As of April 2020, Dynon Avionics supplies the following Kavlico fluid pressure sensors for monitoring oil pressure, fuel pressure, and coolant pressure:

- Dynon Avionics P/N 101715-000 Kavlico Gravity Fed Fuel / Fluid Pressure Sensor – 5 PSI
- Dynon Avionics P/N 103755-000: Fuel/Fluid Pressure Sender - Kavlico v2, 1/8-27 NPT, 15 PSI
- Dynon Avionics P/N 103713-000: Fuel/Coolant/Fluid Pressure Sender - Kavlico v2, 1/8-27 NPT, 50 PSI
- Dynon Avionics P/N 103757-000: Oil/Fuel/Coolant/Fluid Pressure Sender - Kavlico v2, 1/8-27 NPT, 150 PSI

This document is a supplement to the EMS-D10 (through Revision I), EMS-D120 (through Revision H), and FlightDEKD180 (through Revision H) Installation Manuals. To download the most recent version of firmware go to https://downloads.dynonavionics.com/. To download the most recent version of your unit's Installation Manual and Pilot User Guide, go to https://docs.dynonavionics.com

EMS-D10, EMS-D120, and FlightDEK-D180 Firmware

Note: The EMS-D10, EMS-D120, and FlightDEK-D180 require firmware v5.4.2 (or later) in order to work with Kavlico fluid pressure sensors. If your EMS-D10, EMS-D120, or FlightDEK-D180 does not have firmware v5.4.2 (or later), to use a Kavlico fluid pressure sensor, your EMS firmware must be updated. To check EMS firmware version: EMS > SETUP > VRSION.

Performance Notes

Newer Kavlico sensors exhibit a "0" reading until a minimum measurable pressure when installed on an EMS-D10, EMS-D120, or a FlightDEKD180.

- 15 PSI sensor may display "0" until approximately .75 PSI of actual pressure is attained.
- 50 PSI sensor may display "0" until approximately 4 PSI of actual pressure is attained.
- 150 PSI sensor may display "0"until approximately 11 PSI of actual pressure is attained.

When older Kavlico fluid pressure sensors - sold before approximately Sept 2014 - are installed on an EMS-D10, EMS-D120, or a FlightDEKD180, the pressure indicator on your EMS may not read "0" when the engine is off (no oil pressure, fuel pressure, coolant pressure, etc. applied to the sensors):

- 5 PSI sensor may display 0.4 PSI
- 15 PSI sensor may display 1.2 PSI
- 50 PSI sensor may display 4 PSI
- 150 PSI sensor may display 12 PSI

The above behaviors are normal and not indicative of a defective sensor. Above these pressure values, the sensor will display accurate pressure (within its pressure range).

Physical Installation

Mount the Kavlico pressure sensor securely using an Adel clamp or other method such as using a transducer mounting block on the firewall. Do NOT mount the sensor on the engine or other high-vibration surfaces. This will reduce the chance of mechanical failure of the pressure sensor due to engine vibration. Do NOT thread the sensor by the plastic portion of the sensor. Doing so will damage the sensor. Use a wrench only on the metal hex portion of the sensor to tighten. Installations should utilize restrictor fittings at the point of fluid interface to minimize fluid leaks in the event of a failure of any component downstream of that interface. Dynon encourages operators to evaluate their fluid pressure sensor installations to ensure that they are installed in accordance with accepted best practices.

The Kavlico pressure sensors have a dedicated ground wire: this eliminates the need to use the sensor case as ground.

Operators are additionally encouraged to examine the implications of a fluid leak and consider mitigation strategies such as physically isolating possible leak sources from surfaces that generate enough heat to start and sustain a fire.

Operators should evaluate the entirety of their installations to minimize all sources of fluid leaks, including but not limited to all junctions, fittings, hoses, and fluid pressure sensors.

Dynon recommends cleaning the sensors with a clean, dry cloth after installation to remove chemicals, fuels, and oil. Exposure to these substances can degrade the pressure sensor connector's silicone seal over time.

Wire Connection/Pinout

Note: If you are replacing Dynon Avionics' older (VDO-style) pressure sensors and your engine has a Dynon Avionics Manifold Pressure Sensor (P/N 100434-000), to avoid running new wires through the firewall, you can "tap" the Red Wire (5 volts) and the Black Wire (Ground) for the required 5V and Ground connections for a Kavlico sensor. Unlike Dynon's older (VDO-style) oil pressure sensor, Kavlico fluid pressure sensors have a dedicated ground wire, eliminating the need to use the sensor case as ground.

Red Wire: 5 Volt (EMS pin 18) – this connection can be shared with other sensors.

Green Wire: Fuel Pressure (EMS pin 8), Oil Pressure (EMS pin 6), or Coolant Pressure (EMS pins 4 (GP 1), 22 (GP 2), or 23 (GP 3), depending on function/configuration defined below.

Black Wire: Ground (EMS pins 3, 5, 13, 16, 17, or 30)
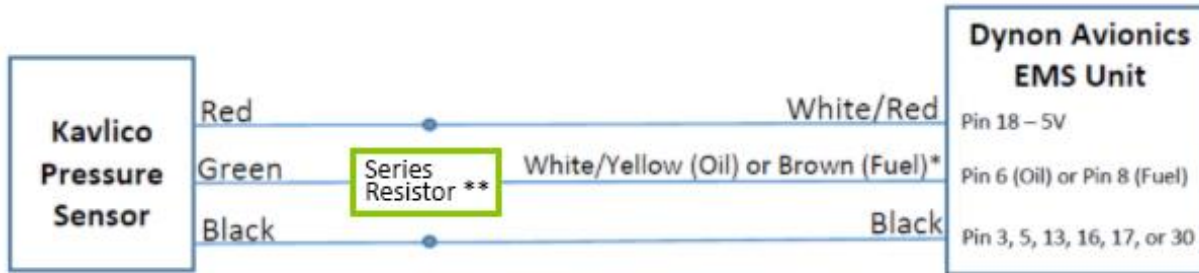
* For Coolant Pressure, use Pin 4 (GP 1) Violet/Blue wire; Pin 22 (GP 2) Violet/Yellow wire; or Pin 23 (GP 3) Violet/Green wire.

** Resistor only used in some applications. See below

Series Resistor

For newer Kavlico sensors, a resistor must be added in series to the green lead. Only the parts marked per below required a resistor.

Resistor values are different for each sensor. Take care to keep the resistor with the associated sensor. If in doubt, use a multimeter to verify the value of the resistor.

Use best practices to splice and solder the resistor leads, and to cover the resistor and exposed leads with a heat-shrink insulator.

Resistor Values:

SENSOR PART NUMBER	Sensor Part Marking	SENSOR	RESISTOR VALUE (included)
103755-000	P255-15G-EA4	0-15 PSI	13 Ohms, ¼ Watt, 1%
103713-000	P255-50G-EA4	0-50 PSI	5.36 Ohms, ¼ Watt, 1%
103757-000	P255-150G-EA4	0-150 PSI	6.8Ohms, ¼ Watt, 1%

Configuration

Once the sensor is physically installed and connected, refer to the instructions below when configuring the EMS Setup Menu. These sensor types are only available when your EMS unit has firmware v5.4.2 (or later).

- 5 PSI Fuel Pressure Sensor (Dynon Avionics P/N 101715-000): EMS > SETUP > SENSORS > FUEL PRESSURE > SENSOR TYPE: 5
- 15 PSI Fuel Pressure Sensor (Dynon Avionics P/N 103755-000 and 101690-000): EMS > SETUP > SENSORS > FUEL PRESSURE > SENSOR TYPE: 6

- 50 PSI Fuel Pressure Sensor (Dynon Avionics P/N 103713-000 and 101693-000): EMS > SETUP > SENSORS > FUEL PRESSURE > SENSOR TYPE: 7
- 50 PSI Coolant Pressure Sensor (Dynon Avionics P/N 103713-000 and 101693-000): EMS > SETUP > SENSORS > EMS GP INPUT (1, 2, or 3) > SENSOR TYPE: 2
- 150 PSI Oil Pressure Sensor (Dynon Avionics P/N 103757-000 and 101693-000): EMS > SETUP > SENSORS > OIL PRESSURE > SENSOR TYPE: 5