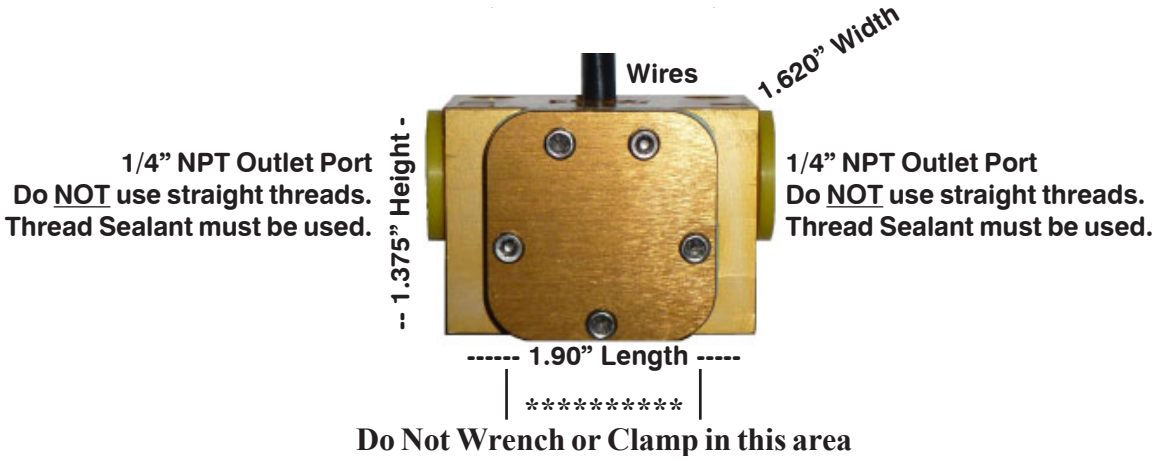
FT-90 Flow Transducer Data Sheet

(Gold Cube)



Warnings:

If the installation of the FT-90 transducer is not covered on a separate STC, **you must perform the flow and pressure tests in FAA document AC 23-16 to insure safe and proper engine operation. Installation must conform to aircraft standards and practices (AC 43.13).** The results of this test must be entered into the aircraft log book. DO NOT attempt to remove the screws in this transducer because doing so will cause the screws to break and render the FT-90 UNSAFE.

Typically engine manufacturers specify a minimum fuel pressure limit necessary to obtain acceptable engine operation. It is your responsibility to insure that the installation of this fuel flow transducer, related fittings and fuel lines does not cause the fuel pressure in the system to drop below the specified Minimum Inlet Pressure plus a reserve pressure, as outlined in AC 23-16. A copy of AC 23-16 can be found at FAA.gov (go to FAA.gov and search for AC 23-16).

Teflon Tape and Pipe Dope (Thread Sealant):

WARNING: The Inlet and Outlet ports are NPT threads. NPT threads are NOT self-sealing, thread sealant must be used. If thread sealant is not used, NPT threads WILL leak. If Teflon Tape is wrapped over the end of a male fitting, it will be sheared off during installation and can wrap itself around the flow transducer rotor or lodge itself in an orifice in the engine causing a dangerous fuel restriction.

If Pipe Dope is placed in the female fitting or forward of the threads on the male fitting, it will dislodge and flow through the fuel system. It can attach itself to the flow transducer rotor or lodge itself in an orifice in the engine causing a dangerous fuel restriction.

General:

The Gold Cube FT-90 has considerably less pressure drop than other units on the market and a blocked rotor does not affect pressure drop. The overall accuracy and linearity of the Gold Cube FT-90 is superior to most other flow transducers. The Gold Cube FT-90's design vacates bubbles and is not nearly as susceptible to debris as other units on the market. Additionally, rotor pin to jewel clearances are matched on every unit resulting in a single K-factor for all units. Note: Installation configuration can affect the K-factor.

The FT-90 is compatible with gasoline, Av gas, diesel, jet A, kerosene and any other fluid with similar optical characteristics.

Identification:

The Gold Cube FT-90 can be identified by its gold anodized body and cube shape (see above drawing).

Electrical Interface:

The Gold Cube FT-90 interfaces with the FP-5L and most other fuel flow instruments. The input (red power lead) will operate from 8 to 30 Volts. Typical supply current is 14 mA over the entire operating range. Power to the FT-90 should be regulated and supplied by the instrument interfacing with the FT-90.

The FT-90 incorporates an open collector output (white lead). The output can operate from 0 to 30 Volts. Saturation voltage at a given sink current is 0.25 Volts (typical) at 4 mA and 0.7 Volts (max) at 10 mA. The output should be limited to 15 mA max. Recommended pull-up current is 1 mA. The output incorporates a two-stage comparator that keeps the output waveform square, even at low flow rates.

Mechanical Interface:

If the aircraft has a fuel pump(s), the flow transducer MUST be installed downstream of the last fuel pump. Installing the transducer upstream of the fuel pump(s) can cause vapor lock and jumpy/inaccurate readings. The Gold Cube FT-90 has 1/4" NPT ports. Apply thread sealant to fittings, assemble and torque fittings to 8-10 ft. Lbs., DO NOT EXCEED a torque of 12 ft. Lbs. The Gold Cube FT-90 should NOT be installed with the wires pointing DOWN (the best situation is with wires pointing UP). Also, the fuel line on the outlet port should not drop down after exiting the transducer. Both of these configurations can trap bubbles in the transducer causing jumpy readings. The inlet port, outlet port and flow direction are marked on the top of the Gold Cube FT-90. This transducer must be suspended between flexable hoses on the inlet and exiting ports. The hoses must be supported within 6 inches of the transducer.

Specifications:

Model: FT-90 (Gold Cube)

K-Factor: 33,800 Pulses/Gal (installation configurations can affect the K-Factor) (use 338 when programing the K-Factor in the FP-5L.

Pressure Drop (with 6.0 Lbs/Gal fuel), (blocked or unblocked rotor) : 0.5PSI @ 63 Gal/Hr
2.0PSI @ 127 Gal/Hr

To Calculate Pressure Drop: $P = \frac{(Flow)2 \times Wf}{48114}$

P = Pressure Drop in PSI
Flow = Fuel Flow in Gal/Hr.
Wf = Weight of Fuel in Lbs/Gal

Non-Flow Restricting Design (a blocked rotor does not restrict flow)
Fuel Flow Range: 2 to 125+ Gal/Hr.
Fuel Flow Over Range (with no damage to transducer): Unlimited
Linearity: +/- 1% over an engine's normal operating range.
Repeatability: +/- 1/4%
Maximum Operating Pressure: 250 psi
Burst Pressure: 4,000 psi minimum
Temperature Range: -65°C to 125°C
Weight: 5.26 Oz.
FAA TSO'd, STC'd and PMA'd