

Fuel Gauging Systems

Overview

AMETEK active fuel probes operate on the capacitance principle. Electronic circuits built into the probe measure the capacitance and produce a DC output signal.

The active probe's robust signal simplifies installation and maintenance. It is immune to wiring problems such as stray capacitance, leakage resistance, or poor shield connections. The outer electrode is grounded, shielding the probe from electromagnetic interference. Current, voltage, and stored energy on the wiring are limited to 20V, 20 mA, and 20 microjoules respectively.

AMETEK active probes are designed for internal tank mounting using quick-release clamps. The design of the probes is highly flexible, allowing AMETEK to produce custom designs using standard parts and proven materials. Probes can also be furnished with integral flanges for external mounting. Crash-worthy probes are available with load spreading caps or frangible design.

Signal Conditioners

Signal conditioners process the probe signals and produce analog or digital outputs (ARINC 429, RS232). They perform the following functions:

- Tank profiling
- Fuel type compensation
- Digital filtering to suppress sloshing
- Attitude compensation
- Low level detection
- Pump and valve control
- Built-in-test and system monitoring

Signal conditioner software is modular, so it can be tailored for a specific application with a minimum of new code. Software is developed and verified in accordance with RTCA DO-178B. Standard signal conditioner designs are available for installation in pressurized or unpressurized locations.

System Design Features

- Robust signal
- Self shielding grounded probe
- All components factory-calibrated
- Current, voltage and energy are limited



Features

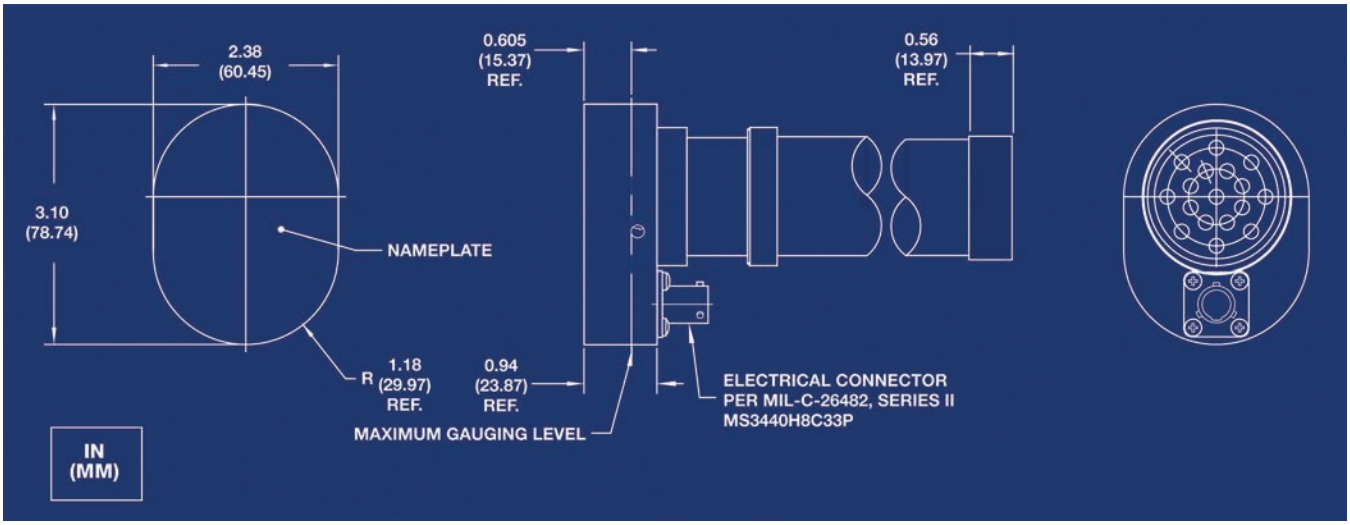
- *Does not require shielded wiring*
- *Probes are not affected by nearby structure*
- *Long term accuracy*
- *Plug-and-play system – no aircraft calibration*
- *Intrinsically safe – facilitates compliance with SFAR 88*
- *Easy to maintain – built- in-test identifies faults*

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Specifications

Probe Signal:	0.5 to 5 mA or V
Operating Temp. Range:	-67° to 158°F (-55°C to 70°C)
System Accuracy:	+0, -1% at empty; +2% at full scale
Probe MTBF:	250,000 hours
Weight:	0.28 + 0.022 lbs/inch (probes); 1.7 lbs (signal conditioner)
Stored Energy:	<20µJ
Fuel Conductivity:	up to 1 x 10-6 Siemens/m

Dimensions



Complete System Capability

AMETEK supplies systems for all fuel measurement and control functions. We perform tank studies, starting from customer-supplied CAD files which define the tank shapes. AMETEK uses custom software tools to determine the optimum number and location of probes and the corresponding profiling data. Prototypes can be built quickly from standard parts. Following system integration, in-house FAA DERs and DMIRs facilitate certification.

- Fuel probes
- Signal conditioners
- Refuel panels and controls
- Flow, pressure, and level switches and sensors
- Densitometers
- Cable harnesses
- Transient suppressors



SFMS
SENSORS AND FLUID MANAGEMENT SYSTEMS
AMETEK

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