

SFMS

SENSORS AND FLUID MANAGEMENT SYSTEMS

AMETEK®

POSITION, SPEED & PROXIMITY

Speed Sensors

Overview

AMETEK has an extensive revolutions per minute (RPM) sensor background with more than 30 years of aircraft applications. In fact, we can measure RPM in all turbine applications. This experience of producing many different types of RPM sensors can solve your speed measurement needs.

Success of your application is assured as we custom design and qualify each speed sensor to your specified requirements. AMETEK is experienced and understands the interface, signal, temperature, vibration, EMI, and all other aircraft turbine requirements.

AMETEK RPM Experience:

- | | |
|---------------------|--|
| Large fan turbines: | Both core and power turbine wheels
fan speed with Mg alloy blades |
| Small fan engines: | Core and power wheels |
| Helicopter engines | Power turbine, sensor in hot section
turboprop propeller speed |

Depending on the target, RPM sensors operate by variable reluctance or eddy current effects. Most applications use variable reluctance, which produces an electric pulse each time a target tooth passes the sensor. The target is usually a ferromagnetic alloy wheel in gear form. At high speeds, the electric pulse generated from each target tooth combine and appear as a continuous sine wave; a target is typically comprised of many teeth. In comparison, eddy current sensors respond to any conductive target with back emf, which is detected with a trigger circuit embedded in the sensor. With either pulse or sine, the signal zero-crossing frequency indicates RPM with no error.

Signal specifications include:

- Minimum output at low speed
- Maximum output at high speed
- Operation throughout a broad pole/tooth gap range (e.g., 0.02 to 0.05 inches)
- Operation through a broad RPM range (e.g., sometimes 25:1)
- Operation up to 400°F (200°C)



Features

- *Non-contact RPM indication operates on the variable reluctance principle*
- *Sensors can be packaged with dual or triple mutually isolated outputs with multiple electrical receptacles*
- *Spring-loaded and fixed speed sensors*
- *Sensors are designed to eliminate the need for shimming*
- *Outstanding field service reliability*
- *High temperature performance*
- *Hermetically sealed sensor assembly*

Speed Sensors

AMETEK RPM sensors are made with simple, small flange mounts. As an added benefit, the flange mounts can be spring loaded to accommodate thermal expansion, which eliminates the need to install shims for signal requirements.

Our speed sensors are qualified with samarium cobalt magnets, permeable nickel-alloy cores, and high temperature insulation copper wire. All hermetically sealed enclosures are assembled with proprietary strain relief methods and high temperature potting. Of course, all sensors are tested 100% of the time.

AMETEK Aerospace speed sensors are featured on numerous current commercial and military engines

Specifications

Typical Output Voltage Range:	0.20 to 60 volts peak-to-peak
Operational Airgap Range:	0.015 to 0.100 inches (no shimming required)
Typical Circuit Resistance:	200 ohms
Typical Circuit Inductance:	50 mH
Operating Temperature Range:	-65° to 400° F (-54° to 204° C)

Benefits

- Engine core speed indication
- Engine N1 & N2 speed indication
- Propeller speed indication
- Multiple engine synchronization
- Feedback for engine control
- Engine health monitoring (once per revolution indication)



www.ameteksfms.com

© 2024 AMETEK Corporation. All Rights Reserved. Specifications are subject to change without notice. Other company names and product names used in this document are the registered trademarks or trademarks of their respective owners.

SFMS-DS-10024A - 02/24