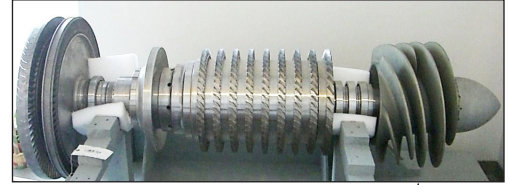


Cryogenic Turbopump Speed Measurements

Background

An axial-flow pump, or AFP, is a common type of pump that essentially consists of a propeller (an axial impeller) in a pipe. Cryogenic turbopumps (CTP) are the heart of a rocket engine. With today's generation of reusable heavy launch space vehicles, CTPs supply pressurized subcooled fuel and oxidizer fluids which are mixed and ignited to develop rocket thrust.



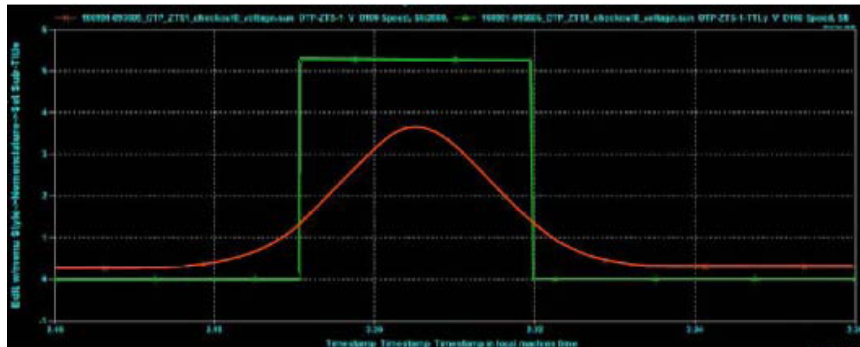
SPEED SENSOR

Turbopump speed is an important parameter monitored during full scale engine testing. Philtec's reflectance dependent (D sensors) are being used for rotor speed measurements with a proven track record of reliability in pressurized cryogenic fluids.

EXAMPLE

The Philtec sensor measures turbo RPM by detecting the passage of the propellor blade at 1/REV.

- The Red Trace shows the analog voltage signal rise and fall.
- The Green Trace is the optional TTL Output from the sensor.



TTL Output

Sensors equipped with the TTL Option provide a binary output of 0/5 volts in addition to the standard analog voltage output. The TTL threshold is set by the user.

