TORSIONAL CONVERTER

Model CV250

What is torsional vibration?

Torsional vibration is the speed change of a rotating shaft within one rotation period.

How can torsional vibration be measured?

If the rotating shaft is exposed, the most accurate method of detecting torsional components is to attach an optical shaft encoder. The encoder output is connected to the torsional converter and then to a spectrum analyzer for analysis. An alternate approach to acquiring the signal data for torsional measurements is to use an eddy probe to detect the passage of gear teeth from a gear mounted on the shaft and inputting this signal to the torsional converter. This method is less accurate than the encoder method. In some cases, a sensing bar pattern tape can be wrapped around a shaft, but the bar pattern must remain evenly spaced or erroneous signals will be created and detected.

What are the benefits of detecting torsional vibration?

Torsional vibration measurements detect damaging shaft vibrations that cannot be sensed in any other convenient way.

Excessive torsional vibration can fatigue and fracture shafts, prematurely destroy couplings, and even rob a machine of efficiency. The torsional measurement is an excellent method of determining the proper damper (viscous or rubber) needed for fine tuning diesel or other internal combustion engines.

FEATURES

- Dual-channel operation: two completely independent channels

- Operates on wide range of tach signals (20-400 ppr)

- One pulse per revolution output for strobe or rpm readout

- Outputs of angular velocity degrees per second peak

- Accommodates torsional frequencies from 1 Hz to 2 kHz (60-120,000 rpm)

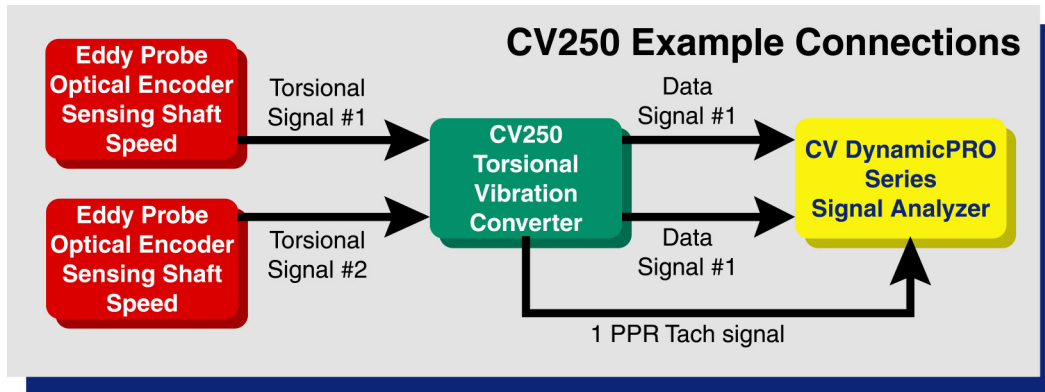- Warning LEDs for out-of-limit signals on each channel (frequency and amplitude)

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CV250 Example Connections

Eddy Probe Optical Encoder Sensing Shaft Speed → Torsional Signal #1 → CV250 Torsional Vibration Converter → Data Signal #1 → CV DynamicPRO Series Signal Analyzer

Eddy Probe Optical Encoder Sensing Shaft Speed → Torsional Signal #2 → CV250 Torsional Vibration Converter → Data Signal #1 → CV DynamicPRO Series Signal Analyzer

1 PPR Tach signal

SPECIFICATIONS

Number of channels
- Two, each completely independent velocity

Inputs
- Tach (carrier) Level: +0.5 V to +40 V
- Polarity: Switchable bipolar or unipolar
- Frequency: 50 pps to 20 kpps
- Impedance: 10 kΩ

Outputs
- Tach/Strobe
  Frequency: 1 ppr
  Amplitude: TTL positive
- Optical Encoder Power:
  Voltage: 5 Vdc
  Current: 100mAmax
- Modulated Data
  Impedance: 1k Ohm nominal
- Displacement (1):
  Frequency Range:

  1 Hz to 1 kHz; +0 -0.5 dB
  1 Hz to 2 kHz; +0 -3 dB
- Displacement (10):
  Frequency Range:
    10 Hz to l kHz; +0 -0.5 dB
    10Hzto2Khz; +0-3dB
  Sensitivity: 10mVms/degpk-pk
- Velocity
  Frequency Range:
    1 Hz to 1 kHz; +0 -1.2 dB
    1 Hz to 2 kHz; +0 -3 dB
  Sensitivity: 0.05 mVms/deg/sec pk

Calibration Signal
- Carrier Frequency: 5031.4 Hz
- Modulation Frequency: 50.31 Hz
- Velocity Output: 145 deg/sec pk
- Displacement Output: 0.918 deg pk-pk
- Accuracy: 2.0%

Pulse/Rev Selector
- Range (N): 20 to 400 ppr

- Increment: 1 ppr

Indicators
- Level: Green OK; red out-of-range
- Frequency: Green OK; red out-of-range

Note: If "input" level is out-of-range, all "output" parameters are shut down

General
- Line Voltage:
  120/240 V~,0.6A/0.3A, 50-60 Hz
- Power Consumption: <20W
- Operating Temperature:
  5°C to 45°C (41°C to 113°~)
- Humidity: up to 80% per EN61010-1
- Dimensions:
  Height: 12.1 cm (4.75")
  Width: 30.5 cm (12")
  Depth: 34.9 cm (13.75")
  Weight: 3.4 kg (7.75#)

Specifications and product availability subject to change without notice.

COGNITIVE VISION