

PRODUCT OVERVIEW

vibro-meter®

TQ9xx, EA90x and IQS900 proximity measurement chains



TQ902 proximity sensor with integral cable
and IQS900 signal conditioner



For measurements that you can trust

TQ9xx-based proximity measurement chains from Meggitt's vibro-meter® product line allow contactless measurement of the relative displacement of moving machine elements, and provide an output signal proportional to the distance between the sensor tip and the target. Accordingly, these measurement chains are ideally suited for measuring the relative vibration and axial position of rotating machine shafts such as those found in steam, gas and hydraulic turbines, as well as in alternators, turbo-compressors and pumps.

A TQ9xx-based measurement chain consists of a TQ9xx proximity sensor, an optional EA902 extension cable and an IQS900 signal conditioner, configured for a particular industrial application. Together, these form a calibrated proximity measurement chain in which each component is interchangeable.

The IQS900 signal conditioner performs all required signal processing and generates the output signal (current or voltage) for input to a machinery monitoring system such as a VM600 or VibroSmart®. In addition, the IQS900 supports optional diagnostic circuitry that continuously runs health checks on the components of the measurement chain in order to automatically detect and remotely indicate any problems.

Benefits

Trust your measurements

The output signal from an IQS900 signal conditioner with diagnostics automatically indicates the validity of the measurement, so that you always know when it is safe to run your machinery.

Driven by certification

To meet the highest international safety levels, TQ9xx-based measurement chains are certified SIL 2 "by design" in accordance with IEC 61508 and PL c Cat 1 in accordance with ISO 13849. In addition, they are fully compliant with API 670 5th edition.

To support sensors/measurement chains installed in hazardous areas, all TQ9xx-based measurement chains are available in Ex certified versions.

Easily update measurement chains

TQ9xx-based measurement chain components (TQ9xx, EA90x and IQS900) are fully backward compatible with the TQ4xx, EA40x and IQS45x. So existing TQ4xx-based proximity measurement chains can be quickly and easily replaced or upgraded.

For example, replacing an IQS45x signal conditioner with an IQS900 with diagnostics brings enhanced reliability and significant risk reduction, while an IQS900 signal conditioner without diagnostics is a direct replacement for an IQS45x in most TQ4xx-based measurement chains.

TQ9xx, EA90x and IQS900 measurement chain features

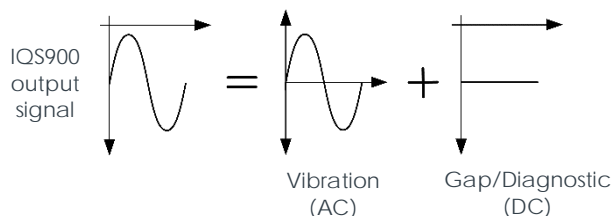
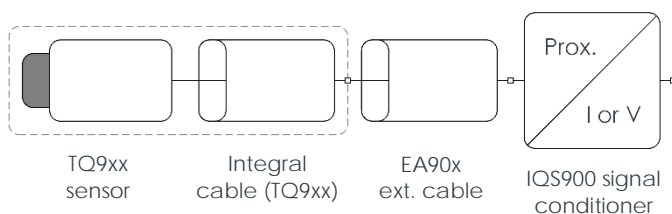
Sensor compatibility	TQ9xx and TQ4xx proximity sensors – non-contact eddy-current principle
Measurement range (and sensitivity)	TQ9x1: 2 mm (2.5 $\mu\text{A}/\mu\text{m}$ or 8 mV/ μm). TQ9x2: 2 mm (2.5 $\mu\text{A}/\mu\text{m}$ or 8 mV/ μm) or 4 mm (1.25 $\mu\text{A}/\mu\text{m}$ or 4 mV/ μm). TQ9x3: 12 mm (0.417 $\mu\text{A}/\mu\text{m}$ or 1.33 mV/ μm).
Frequency range	DC to 20000 Hz
Temperature range	-40 to 180 °C (-40 to 356 °F) for sensor, -40 to 200 °C (-40 to 392 °F) for cabling, -40 to 85 °C (-40 to 185 °F) for signal conditioner
Signal transmission	Current output for 2-wire signal transmission over longer distances (up to 1 km). Voltage output for 3-wire signal transmission over shorter distances.
Signal processing	New grounding concept for improved frame-voltage immunity. New “raw” voltage output signal and a test input signal that allow the measurement chain/system operation to be tested in situ.
Diagnostics technology	Optional diagnostic circuitry (that is, built-in self-test (BIST)) provides continuous feedback on the health of the measurement chain
TQ4xx, EA40x and IQS45x replacement	Form, fit and functionally equivalent replacements that match or better the outstanding performance of TQ4xx-based measurement chains. Each component is interchangeable, for example, an IQS900 for an IQS45x.

How it works

The output signal from a TQ9xx-based measurement chain (IQS900 signal conditioner) consists of a dynamic component (AC) that corresponds to the measured vibration (displacement) and a quasi-static component (DC) that corresponds to the measured gap.

For an IQS900 signal conditioner with diagnostics, the quasi-static DC component also functions as a diagnostic indicator. The IQS900’s diagnostic circuitry continuously checks the integrity of the measurement chain and will drive the measurement/diagnostic component (DC) outside of its normal operating range to indicate a problem with the sensor, the cabling and/or the signal conditioner itself.

TQ9xx-based measurement chain



Output signal (IQS900 with diagnostics)

-20.5 to -15.5 mA_{DC}
or
-17.6 to -1.6 V_{DC}:

Normal operation – the output from the measurement chain can be trusted

<-20.5 or >-15.5 mA_{DC}
or
<-17.6 or >-1.6 V_{DC}:

Problem with the measurement chain or power supply

Certifications

- TQ9xx-based proximity measurement chains using an IQS900 signal conditioner with diagnostics are certified for use in functional safety contexts: SIL 2 “by design” (IEC 61508) and PL c Cat 1 (ISO 13849).
- TQ9xx-based proximity measurement chains conform to API 670 5th edition.
- Ex versions certified for use in hazardous areas (potentially explosive atmospheres).