

Thread Verification

Thread Inspection

Thread Quality

**New Dimensional
Gauging**

**100% In-Process
Inspection of
Internal/External
Threaded Parts**

**Thread
Inspection
System**

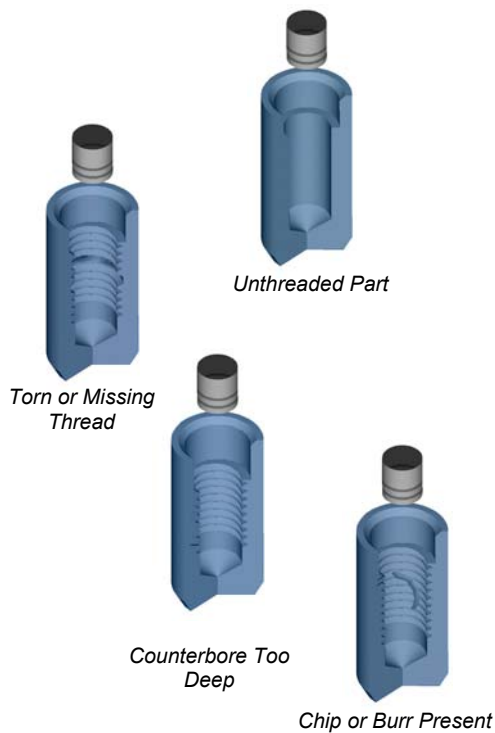


***AI* Automation
AI Innovation, Inc.**

Providing Process Monitoring Automation to Achieve Zero-Defects

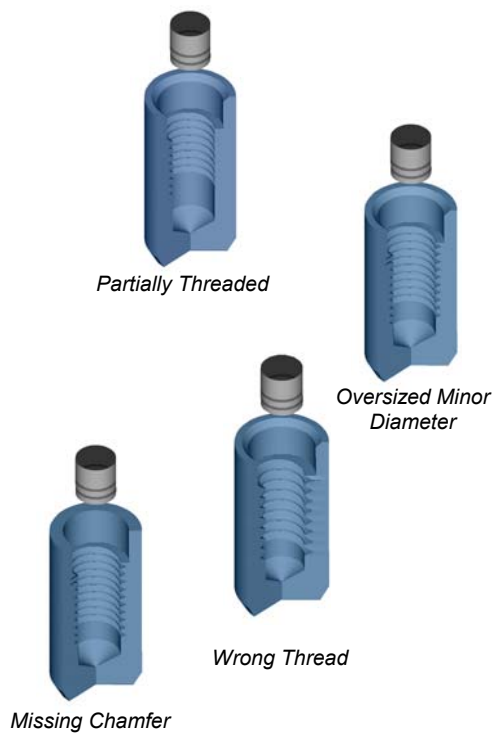
3337-3 Air Park Road • Fuquay-Varina, NC 27526 • Tel: (919) 557-6824 • Fax: (919) 557-8170 • E-mail: sales@auto-in.com

The Problem



Features Inspected

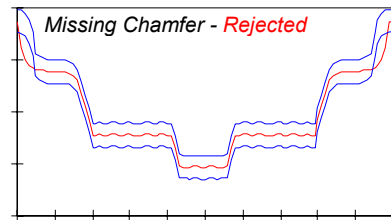
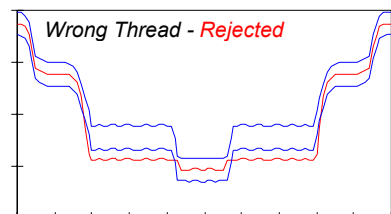
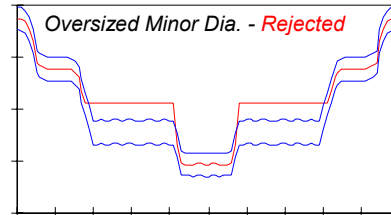
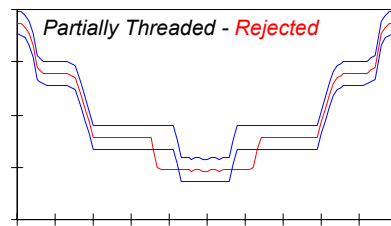
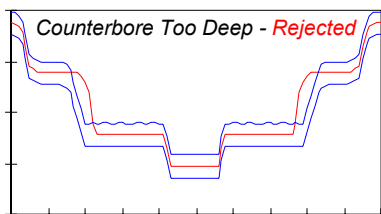
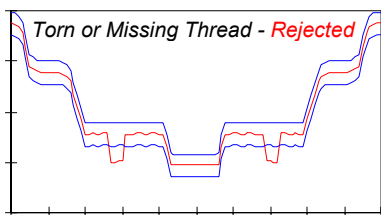
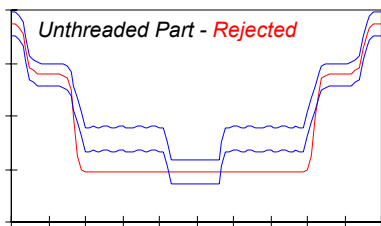
- Missing threads
- Damaged threads
- Minor Diameter
- Major Diameter
- Tap Wear
- Thread depth
- Hole depth
- Burrs, chips and debris
- Pitch
- Recesses
- Chamfers
- Other small features
- **NEW Dimensional Gauging**



The Solution

Benefits

- 100% inspection for Zero-Defects (reduce your PPM's to less than ONE PART PER MILLION)
- Monitors the entire thread and hole depth (no "one shot" inspection here)
- More reliable than human inspectors (inspects 100% without tiring at rates of 720,000+ parts per hour)
- Noncontact inspection (no more plug gauges that wear out)
- Material changes have no effect (not like eddy current inspection systems)
- Inspect 360° inside/outside over the entire length (something a vision system just cannot do)
- Use it to improve your process (always know what your process is doing)
- Not affected by coolant or cutting fluids (uses advanced signature analysis to compensate)
- Extremely Fast (<2 milliseconds analysis time)
- Windows OS based user friendly/menu driven software for setup, teaching and running
- Retrofit to existing machines or lines
- System electronics adaptable to non-Automation Innovation sensors
- Economical components, kits, manual stations, robotic and turnkey solutions available



The Method

What makes Automation Innovation different?

Typical thread inspection systems measure only the presence of threads and take a single reading during the inspection cycle. They provide so little information concerning the overall quality of the thread and hole. **Automation Innovation** monitors the entire inspection cycle - from the lead-in chamfer to the bottom of the threaded hole - for precise in-process quality information.

Automation Innovation uses statistical methods to perform 100% part and process verification. No simple set uniform boundaries here! Boundaries for each point along the inspection cycle are calculated based upon that point's process variation - large process variations produce wider boundaries than more repeatable process points.

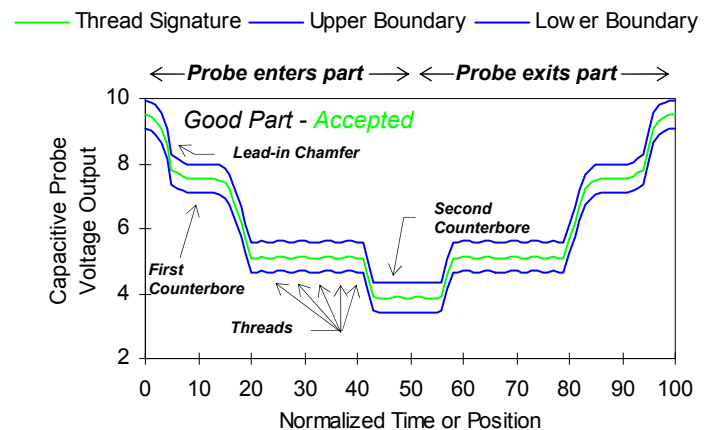
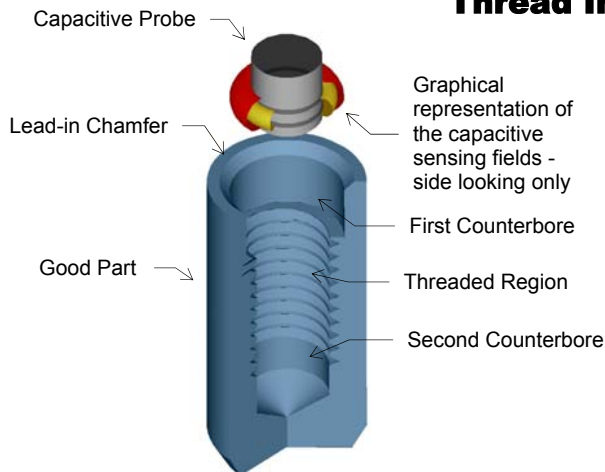
Automation Innovation has engineered specially designed capacitive probes with 360° sensing fields

that form a "doughnut-shaped" inspection ring around the probe. This unique design allows the probe to measure only the thread or hole quality while ignoring the bottom of the hole even when the probe is just 0.010 inches from the bottom.

Automation Innovation has developed a system that can operate 8 different sensors synchronously or asynchronously. That means you can use one system to inspect 8 holes in one part (same cycle) or a hole in 8 separate parts on different machines (different cycles).

Automation Innovation offers a **FREE part evaluation program** to its customers. Send in your good and bad parts and receive back color graphs showing how well your defects are distinguished from good quality parts.

Thread Inspection Strategy



The **Automation Innovation** Thread Inspection System consists of a Windows OS industrial IBM-PC compatible based electronic unit which monitors the signals from either a capacitive thread probe or a capacitive thread probe and position sensor mounted on the parts fabrication or parts handling machinery.

The capacitive thread probe has a 360° field of view which gives a detailed inspection of the entire thread. The capacitive probe provides greater detail than other types of thread inspection probes and was pioneered by **Automation Innovation** personnel.

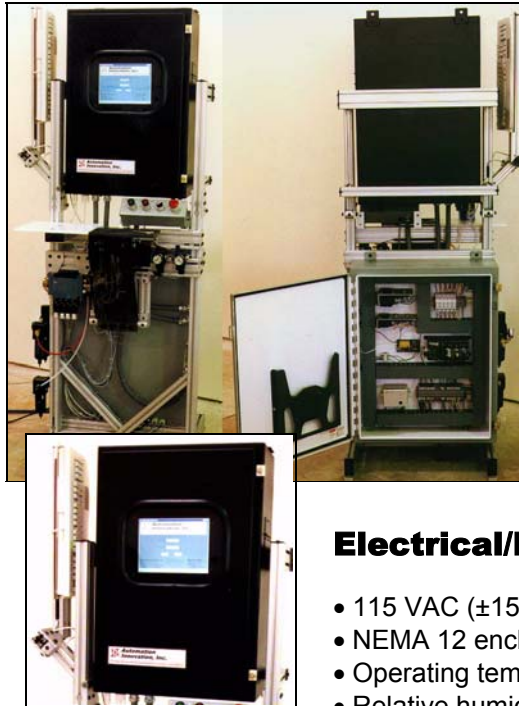
The probe's voltage output creates a quality "signature" of both the thread and hole. This signature is statistically compared to a previously taught set of boundary limits (upper and lower boundaries). If any part of the inspected thread's signature goes outside the taught boundary limits the part is rejected.

Each "Reject" or "Accept" is indicated through the graphical user's interface and optically isolated I/O signals are provided for machine interfacing. In addition, the system can be interfaced to factory networks to relay the inspection data to the company's quality information system.

The Product

General

- 8 to 256 channels of sensor input (synchronous or asynchronous)
- IBM-PC compatible latest Pentium processor
- Windows OS based analysis software
- 3-1/2" 1.44 Mbytes floppy
- Hard disk drive
- Color TFT LCD display upgradeable
- User Windows OS based viewing and analysis software
- Optional network support
- Optional sensing technologies (capacitive, inductive, laser, ultrasonic, air gauge, magnetic, etc.)



Communications

- 24 lines of digital optically-isolated I/O (PLC interface Cycle Start, Cycle Done, Accept Line for each analog channel)
- RS-232C serial
- IBM-PC compatible printer port

Data Processing

- up to 2,000 MHz (2 GHz) sampling rate
- 16-bits of analog resolution
- less than 2 msec analysis time

Electrical/Hardware

- 115 VAC ($\pm 15\%$) 60 Hz, 5-Amps
- NEMA 12 enclosure 30.0"x20.0"x11.5", weight 30 lbs
- Operating temperatures: 32°F to 105°F
- Relative humidity: 10-80%, non-condensing

The Company

Automation Innovation is the leading engineering and manufacture of complete sensing systems for in-process applications (*thread inspection, press fit/force monitoring, assembly/robotic verification, leak testing, test benches, LabVIEW test systems, etc.*). With over 100 years of combined process monitoring automation experience and approaching **10,000 successful solutions**, **Automation Innovation** is more than a simple sensor builder but a complete engineering solutions provider who designs, builds, installs and supports systems that include components, manual stations, semi-automatic, turnkey and robotic solutions.

Automation Innovation's in-plant engineering design and manufacture of sensors, microprocessors and software assures the highest degree of quality control

as well as application flexibility to meet your ever changing needs. **Automation Innovation** is engineering, manufacturing and marketing their products world-wide. **Automation Innovation's** objective is to offer "complete" high quality, in-process monitoring solutions.

Automation Innovation is dedicated to support and service which is reflected in our **FREE part evaluation program** (call for details).

Automation Innovation has a full line of products that can aid you in your process monitoring needs and our engineers have installed more Capacitive Thread Inspection Systems than all other thread inspection companies combined. **Call our Application Engineers now to discuss your in-process monitoring application needs.**

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Since product improvement is a continuing effort, we reserve the right to make changes in specifications without notice.

Additional Information at www.auto-in.com

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