RENISHAW
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TRS2 non-contact broken tool detection system

Exceptional
ease of use

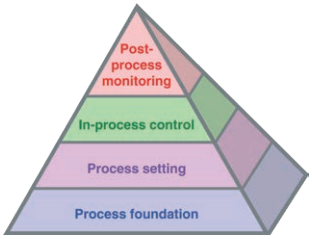
Rapid
broken tool detection

Outstanding
performance for less scrap and higher profits

TRS2 – innovative process control

Tackle process variation at source, and reap the rewards

The higher the degree of human involvement in the manufacturing process, the higher the risk for error. Automated in-process measurement using Renishaw probes can help ***eliminate the risk.*** The Renishaw TRS2 non-contact broken tool detection system can facilitate the following measures for enhanced management of your production leading to an ***increase in your profits.***



The Productive Process Pyramid™

In-process control

Tool recognition for non-contact broken tool detection of solid tools.

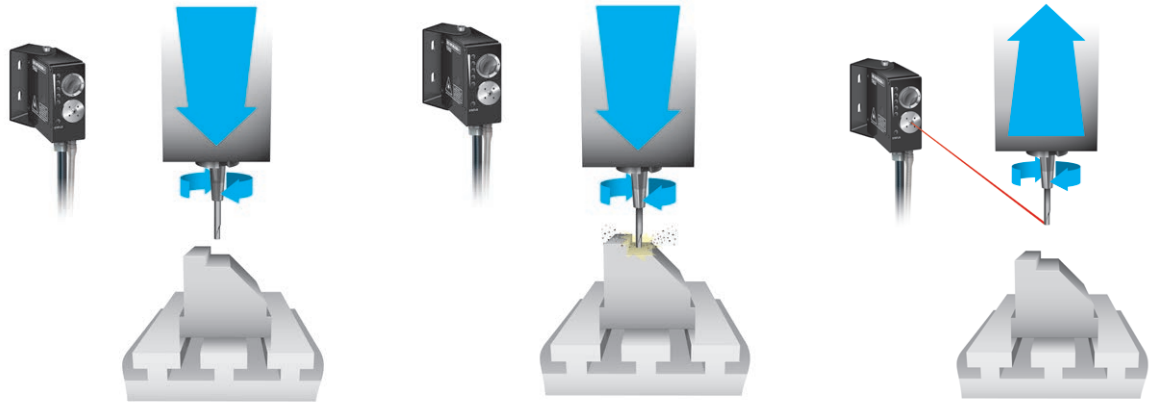
The TRS2 system delivers ultra-quick detection that is reliable and cost effective. Unlike conventional non-contact broken tool detection systems it does not rely on the laser beam being blocked.

- Improve process reliability and confidence
- Reduce cycle time
- Reduce non-productive time and scrap, increase productivity and profits

Manufacturing process focus: in-process control

To facilitate fully-automated machining cycles, it is important that tool inspection is both fast and reliable. The introduction of a Renishaw TRS2 non-contact laser system dedicated to tool breakage detection can enable an instant reduction in essential, but non-productive, tool checking time.

With TRS2, machine tools can automatically and efficiently identify the condition of a rotating tool during a machining cycle. When a broken tool is detected, the machine will stop, preventing potential damage to subsequent components.



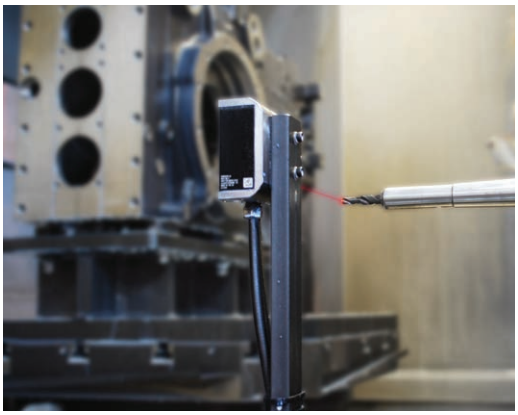
For further details regarding the benefits of all levels of process controls within the Productive Process Pyramid™, please refer to *Metrology solutions for productive process control* (Renishaw part no. H-3000-3038) or visit **www.renishaw.com/processcontrol**

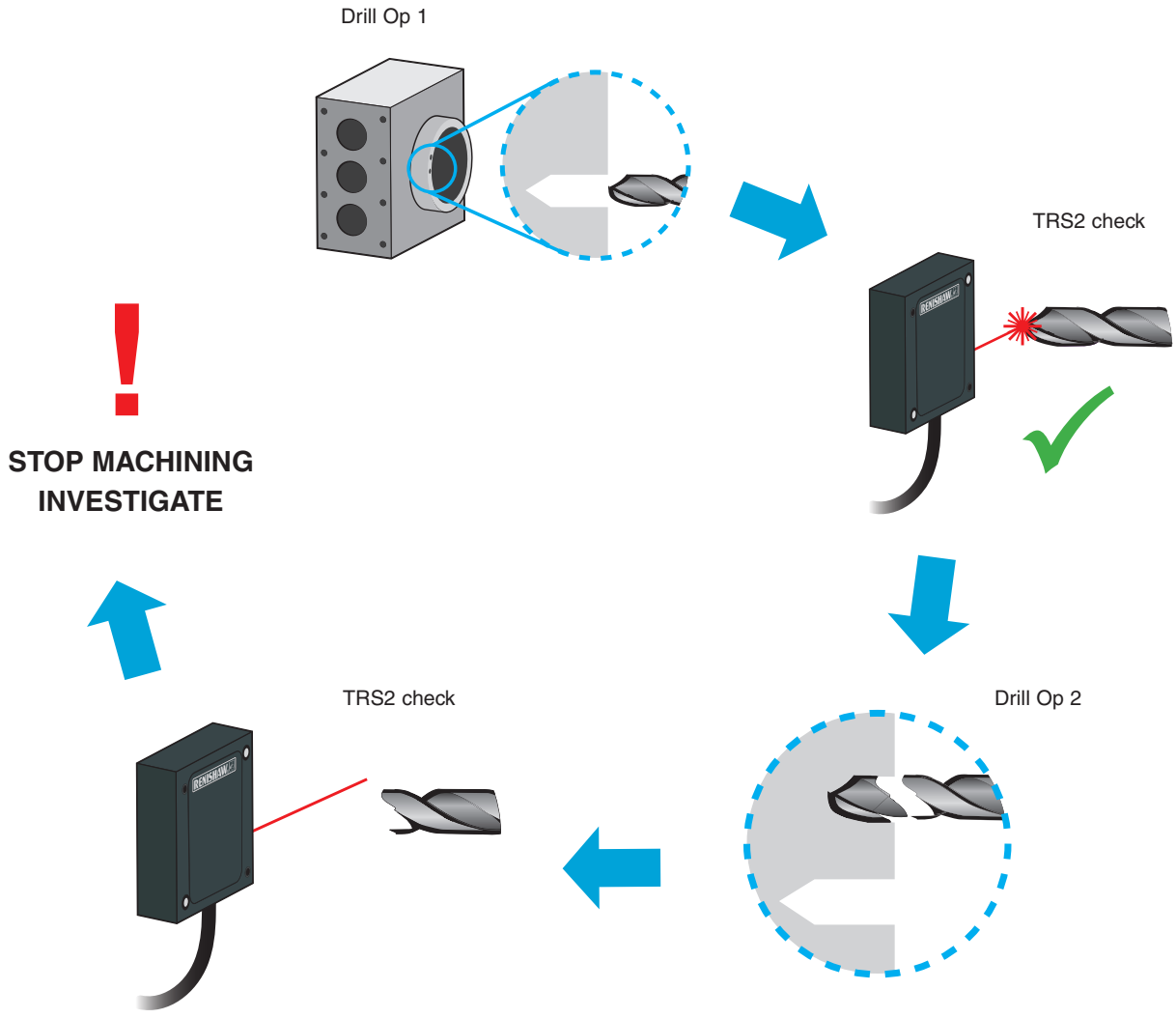
TRS2 non-contact broken tool detection

TRS2 is a single-sided, non-contact, laser-based tool breakage detection device. It offers high-speed detection of solid tools on all sizes of vertical and horizontal machining centres, all gantry machining centres and multi-tasking machines.

The single unit can be mounted outside the working environment, saving valuable space on the table. Optimally positioned within the machine tool, cutting tools pass efficiently through the TRS2 laser beam in between cutting and tool change operations. When broken tools are detected, the machining process is stopped or a replacement tool is substituted via the automatic tool changer.

The potential for scrap reduction is easily realised and the improvements to process control are significant.



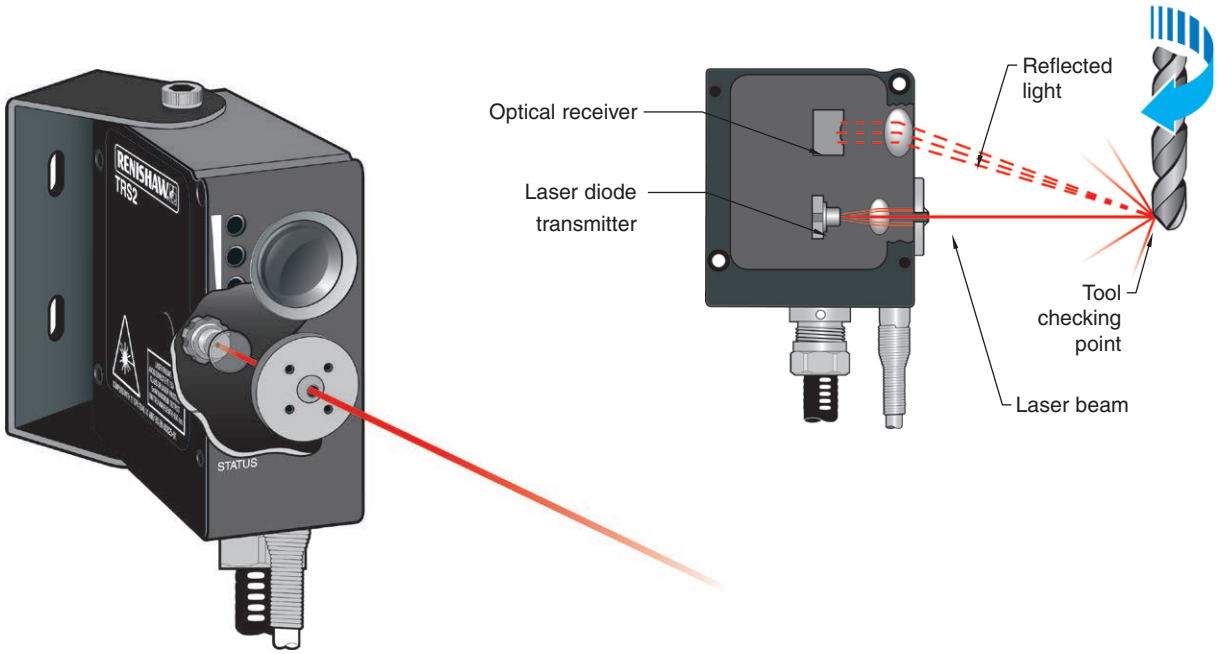


NOTE: Class 2 laser product. Laser Radiation – do not stare into beam. 1 mW maximum output emitted wavelength 670nm.

Single-sided laser-based broken tool detection system

Non-contact broken tool detection uses a similar technology to non-contact tool setting but it is distinguished by differences in use and configuration.

TRS2 utilises a laser transmitter and receiver incorporated in the same unit and detects the presence of a tool via the reflection of the laser beam off the tool. In operating mode, a laser beam is emitted from the unit and reflected off a rotating tool – typically 3 mm above the tool tip – back to the receiver. The reflected levels of light vary due to the tool's rotation, resulting in a repeating pattern. This pattern is analysed by the unique ToolWise™ tool recognition technology within the TRS2, resulting in rapid indication of a good tool and allowing the machining cycle to continue. If no tool is detected during the user-defined time period, a 'broken tool' alarm is issued, allowing a sister tool to be called.



Tool enters laser beam

Reflected light is analysed by ToolWise™ electronics

'Tool OK' signal issued and tool withdraws

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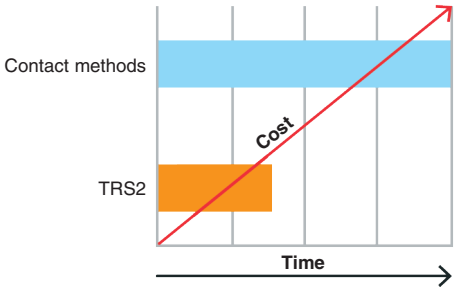
Tool breakage detection pays...

Machine tools that are optimised to cut more metal, more reliably and more accurately will quickly ***maximise productivity, profits and your competitive edge.***

Automated tool detection with the Renishaw TRS2 broken tool detection system can improve tool detection times by up to 69% compared to contact methods, which means immediate and ***significant cost savings.***

Tool breakage detection



Scrap and rework reduce productivity and profits. The Renishaw TRS2 broken tool detection system helps guarantee “right first time” parts which means ***reduced waste and increased profits.***

TRS2 key features

- Cost-effective, fast and reliable.
- The latest ToolWise tool-recognition technology.
- Ultra-quick detection: typically the tool spends approximately one second in the laser beam.
- Simple installation and set-up.

... the Renishaw way

Renishaw, an established world leader in metrology solutions, invented the touch-trigger probe in the 1970s.

Decades of customer focus and investment in development, coupled with our own manufacturing experience enables us to provide ***innovative*** and ***exceptional products*** that are unmatched for technical excellence and performance.

Customer comment

After a detailed analysis, based on the cost to run machines, we know this equates to savings of more than €150K in the first year. This is because most of the non-productive machine time taken to check tools has now been released to machine components. We have paid back the initial investment in the TRS2 units in a matter of just 5 months.

When we started we had several options for improving machining productivity, but this was by far the best; the others would have taken much longer to pay back.

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About Renishaw

Renishaw is an established world leader in engineering technologies, with a strong history of innovation in product development and manufacturing. Since its formation in 1973, the company has supplied leading-edge products that increase process productivity, improve product quality and deliver cost-effective automation solutions.

A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Products include:

- Additive manufacturing and vacuum casting technologies for design, prototyping, and production applications
- Dental CAD/CAM scanning systems and supply of dental structures
- Encoder systems for high-accuracy linear, angle and rotary position feedback
- Fixturing for CMMs (co-ordinate measuring machines) and gauging systems
- Gauging systems for comparative measurement of machined parts
- High-speed laser measurement and surveying systems for use in extreme environments
- Laser and ballbar systems for performance measurement and calibration of machines
- Medical devices for neurosurgical applications
- Probe systems and software for job set-up, tool setting and inspection on CNC machine tools
- Raman spectroscopy systems for non-destructive material analysis
- Sensor systems and software for measurement on CMMs
- Styli for CMM and machine tool probe applications

For worldwide contact details, visit www.renishaw.com/contact

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