

TRS2 non-contact broken tool detection system

New improved tool recognition system with ToolWise™ technology enables reliable high speed broken tool detection

Conventional non-contact broken tool detection systems depend on the laser beam being blocked (tool OK) or not blocked (tool broken).

The **TRS2** is different, featuring new improved tool recognition system with **ToolWise™** technology*

The unique tool recognition electronics determine whether a tool is present by analysing the reflective light pattern from the rotating tool. Random light patterns created by coolant and swarf are ignored, reducing the chance of not detecting a broken tool due to coolant blocking the beam.

* patent applied for.

Key benefits

Cost effective and reliable

The new TRS2 is a cost effective broken tool detection system. Its **ToolWise™** electronics have been enhanced to make detection of small, dark tools **more reliable, saving time and money.**

Ultra quick detection

Typically, using the TRS2, the tool spends about 1 second in the laser beam.

Simple installation and set-up

The device comprises a single unit containing the laser source and detection electronics. This means that there is only one small unit to install. Set-up is also simple and uses Renishaw software specifically written for the new TRS2. The unit can be mounted outside the working envelope of the machine, safe from collision. This also saves valuable room on the table.

Flexible system

The TRS2 can detect a whole range of solid centre tools including drills, taps, end mills, slot drills and ball nose end mills, typically detecting tools with a diameter of 0.2 mm or greater at a range of 300 mm**. The compact unit can detect tools between 0.3 m and 2.0 m away, making it suitable for a wide range of machines, although it is optimised for use at 1m and below.

** depending on the tool surface finish, machine environment and installation

Improvements over TRS1 technology

- improved tool detection reliability
- reduced cycle time
- works at a greater range of spindle speeds, so it can be used in a wider range of applications with a greater variety of tools



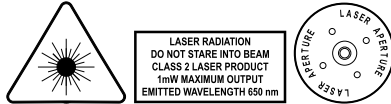
Principal application

High speed, non-contact tool breakage detection of solid tools on drill-tap machines, VMCs, and HMCs, including machines where gun drills are part of the tooling suite.

Specification

Laser type

Visible red light <1 mW 650 nm.
The laser is driven by a continuous pulse train running at a frequency of 125 kHz. The pulse duration is 2 µs and each pulse has a maximum energy of 7.2×10^{-9} J. Conforms to American (21 CFR 1040.10 except for deviations pursuant to laser notice no. 50 dated July 26, 2001) and European (BS EN 60825-1:1994) laser safety standards.



LASER

Minimum tool diameter

Each TRS2 unit is tested with a Ø0.5 mm dark coated drill at a range of 350 mm (14 in).

Test conditions: Dry tool, spinning at 5000 rpm, which must be detected by the TRS2 within 1 s.

Spindle Speed

Operates with tool spinning at 200 rpm, 1000 rpm or 5000 rpm. 5000 rpm is for use with high speed tools. It is the default speed and gives the shortest cycle times. 1000 rpm is for use with tools that cannot rotate at 5000 rpm. 200 rpm is for use only with gun drills.

Range

TRS2 can be used to detect tools at a distance of between 300 mm and 2 m, but it is optimised for use between 300 mm and 1 m.

Working temperature

5° C to 50° C

Storage temperature

-10° C to 70° C

Pneumatic supply

Ø4 mm air pipe. Recommended air pressure: 2 bar (29 psi) to 4.5 bar (65.25 psi), dependent on air pipe length.
Air supply to the **TRS2 air regulator unit** must conform to ISO 8573-1: Class 5 particles and moisture free.
Air supply to the **TRS2 unit** must conform to ISO 8573-1: Air quality of class 1.7.2.

Air blast

For optimum performance at 200 rpm and 1000 rpm, the optional Renishaw air blast is recommended. This consists of mounting plate, air nozzle, air pipe and air fittings. A solenoid valve is also available to turn the air on and off.

IP rating

The electronics are sealed to IPX8.

Life

Tested to > 1 million on/off cycles.

Weight

0.75 kg (1.65 lb), including 10 m of cable.

Dimensions

Height: 83 mm (3.27 in)
Width: 38 mm (1.50 in)
Depth: 73 mm (2.87 in)

Mounting

Mounting bracket provided, with M6 clearance slots. Alternative mounting arrangement is provided by M4 clearance holes in the product housing.

Input voltage

11 Vdc to 30 Vdc.

Current consumption

Typically less than 65 mA at 12 Vdc.

Cable

5 core plus screen cable. Each core 18/0.1 insulated. Ø5.0 mm (0.20 in) x 10 m (32 ft)

Output

Solid state relay (SSR) normally open/normally closed contact max. 40 mA (fused at 50 mA).

FLEXIBLE & FAST



RELIABLE

EASY TO INSTALL



More information

The TRS2 is available as a retrofit solution for existing machines, including probing software, installation and training. Contact your Renishaw supplier for further details.

For further details on the products mentioned in this flyer, please visit www.renishaw.com and choose "Machine tool products".

For worldwide contact details please visit our main website at www.renishaw.com/contact