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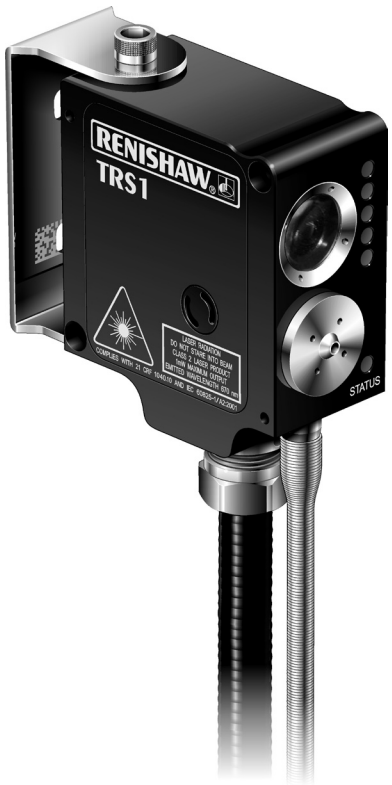
TRS1 Non-contact tool recognition system

New tool recognition 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 TRS1 is different. It contains unique tool recognition technology that can distinguish between the tool and coolant or swarf. TRS1 responds to the pattern of light reflected from the tool, offering benefits over conventional systems. It is fast and reliable under real machining conditions.

The device comprises a single unit containing the laser source and detection electronics. The laser beam is projected onto the end of the tool and is reflected back to the receiver. The single unit means installation is quick and easy and the device can be mounted outside of the working environment, saving valuable space on the table.

Key benefits

Cost effective, fast and reliable
The new TRS1 is a cost effective broken tool detection system which is fast and reliable, detecting tools as small as Ø0.5 mm*.

Simple installation and set-up
Being a single-sided device means only one small unit to install. Set-up is also simple and uses Renishaw software specifically written for the new TRS1.

Flexible system
The TRS1 can detect a whole range of solid centre tools including drills, taps, end mills, slot drills and ball nose end mills. The compact unit can detect tools between 0.3 m and 2.0 m away, making it suitable for a wide range of machines.

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

Innovations

New tool recognition system
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 and the chance of not detecting a broken tool due to coolant blocking the beam is reduced.

Single-sided compact design
With all the necessary technology incorporated into one small unit, the TRS1 can be mounted outside the working envelope of the machine, safe from collision. This also saves valuable room on the table.

Ultra quick detection
Typically, using the TRS1, the tool spends about 1 second in the laser beam.

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Specification

Principal application	High speed, non-contact tool breakage detection of solid tools on VMC and HMC machines.
Laser type	Visible red light <1 mW 670 nm. Conforms to American (21 CFR 1040.10 and 1040.11 except for deviations pursuant to laser notice no. 50 dated July 26, 2001) and European (IEC 60852-1:1993 + A1:1997 + A2:2001) laser safety standards. 
Working temperature	5° C to 50° C
Storage temperature	-10° C to 70° C
IP rating	The electronics are sealed to IPX8. The laser lens is sealed to IPX5 with air on.
Life	Tested to > 1 million on/off cycles.
Minimum tool diameter	Ø1 mm bright drill at 2 m (6.56 ft) and Ø0.5 mm bright drill at 0.3 m (0.984 ft), dependent on installation, set-up and tool type/condition.
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 **TRS1 air regulator unit** must conform to ISO 8573-1: Class 5 particles and moisture free. Air supply to the **TRS1 unit** must conform to ISO 8573-1: Air quality of class 1.7.2.
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 M4 mounting holes. Alternative mounting arrangement provided by M4 holes in the product housing
Input voltage	11 Vdc to 30 Vdc.
Current consumption	Typically less than 45 mA.
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).

More information

The TRS1 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