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HIGH-PERFORMANCE NDT SOLUTIONS

PRIMO TG-MILL

CNC-Integrated Ultrasonic EMAT Thickness Measurement

Equipment Highlights

Automated, non-contact, couplant-free ultrasonic thickness measurement for aluminum, titanium, and other non-ferromagnetic metallic components.

Fast, Couplant-Free Thickness Measurement

EMAT technology provides ultrasonic thickness measurements without physical contact or liquid couplant.

High-Accuracy Measurements

Provides single-sided thickness measurement accuracy of ±5 µm (±0.0002 in.) or better on components from 0.5 to 100 mm (0.020 to 4.0 in.) thick.

Seamless CNC Integration

The EMAT instrument and sensor are integrated into a standard CNC toolholder and spindle interface. Measurements are transmitted wirelessly to a base station that communicates with the CNC controller for fully automated operation.

Wireless, Battery-Powered Operation

Provides approximately 8 hours of continuous operation with wireless data transmission and wireless charging, eliminating cables between the measurement system and the machine.

Designed for the Mill Environment

Rugged, sealed construction with replaceable sensors. Measurements are unaffected by cutting fluids, coolant, debris, or metallic dust on the surface of the component.

sales@innerspec.com www.innerspec.com

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PRIMO TG-MILL is an integrated ultrasonic thickness measurement system designed for automated inspection of non-ferromagnetic metallic components directly within a CNC machining environment. Using Electromagnetic Acoustic Transducer (EMAT) technology, the system provides non-contact, couplant-free thickness measurements from a single side of the component on aluminum, titanium, and most non-ferromagnetic materials.

The instrument and sensors are purpose-built for integration with CNC machines through a standard spindle interface, allowing thickness measurement to become part of the automated machining process. The battery-powered instrument transmits measurement data wirelessly to a base station connected to the CNC controller, enabling automated inspection, thickness verification, and process control without removing the component from the machine.

Because EMAT does not require physical contact or liquid couplant, measurements can be performed directly on machined surfaces without cleaning or interrupting the manufacturing process. The system is designed for operation in the CNC environment and is unaffected by cutting fluids, coolant, and machining debris present on the component surface.

The PRIMO TG-MILL Charging Cradle provides a dedicated docking and charging location when the instrument is not installed in the CNC machine. Designed specifically for the TG-MILL, the compact cradle securely supports the instrument while providing wireless charging to keep it powered and ready for operation.

PRIMO TG-MILL SYSTEM			
Materials	Most non-ferrous metals (titanium, copper, aluminum)		
Equipment Included	PRIMO TG-MILL (Instrument) Wireless Access Point (WAP) PRIMO TT (Dedicated Computer)		
Communications **PRIMO TG-MILL – WAP**	Wi-Fi 2x802. 11ac/ax dual band CommScope Ruckus T350D – Wireless Access Point		
Communications **PRIMO TT – CNC**	TCP/IP, PLC Ethernet/IP		
PRIMO TT Software	NDT-WEB COMPOSER (Setup & Calibration)		
PRIMO TG-MILL – INSTRUMENT			
CNC Tool Interface	BT30, BT40, HSK63A, HSK100A, HSK-125A		
Sensors	Shear and Longitudinal **Small:** 1.00 D (in.) (spot checking) **Large:** 2.20 D (in.) (spot checking and scanning) Custom sensor options available		
Sensor – Material Distance	0.5-2 mm (depending on sensor type and material)		
Ultrasonic Pulsers	1		
Bandwidth	1500 kHz to 8 MHz		
Pulse Repetition Rate	400 Hz		
RF Pulser	1-3 Cycles (Toneburst) 16 kW power output 800 Vpp @ 40 Amp pk		
Receivers	20 dB to 90 dB Gain		
Analog/Digital Converters	14-bit, 100 MSPS		
Filtering	Programmable Digital Filters		
Rechargeable Battery	18 WH		
Charging Cradle	**Wired Charging:** 20% - >80% - 45 minutes	**Wireless Charging:** 3 hours **Wireless Duty Cycle:** 25%	
Operating Temperature	32°F to 105°F (0°C to 40°C)		
Dimensions	**With sensor:** 15.05 H x 3.78 D (in.) 382.27 H x 96.012 D (mm.)	**Without sensor:** 9.30 H x 3.78 D (in.) 236.22 H x 96.012 D (mm.)	
Weight	**TG-MILL Instrument:** 9.5 lb / 4.31 kg	**Large EMAT Sensor:** 0.85 lb / 0.39 kg	**Small EMAT Sensor:** 0.30 lb / 0.14 kg
Intellectual Property	**Patent:** US 11,123,766 **Patent Pending:** US 19,766,473		