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HEIDENHAIN

Product Information

TS 444

Battery-Free Workpiece
Touch Probe with
Air Turbine Generator

September 2007

TS 444

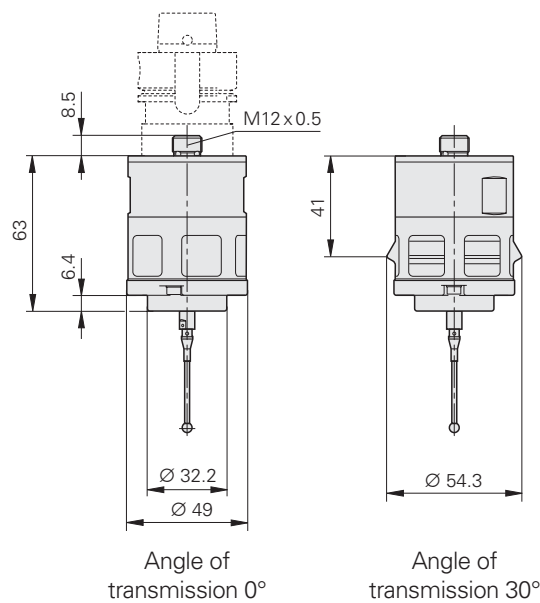
Workpiece Touch Probe with Air Turbine Generator

The TS 444 triggering touch probe was conceived for numerically controlled milling machines and machining centers with a tool magazine and tool changer. The trigger signal is transmitted over an infrared beam.

Unlike the conventional workpiece touch probes, the TS 444 does not need any batteries or charging units. The required electrical energy is generated by an integrated air turbine generator and is buffered by capacitors. The compressed air used by the cleaning blower for cleaning the probing point can also be used for driving the generator.

Benefits of the TS 444 with air turbine generator:

- High reliability
- System is ready for operation even after extended idle times
- Hermetically sealed electronics unit
- Selecting, storing, handling and disposing of batteries is no longer necessary



Dimensions in mm



Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

Workpiece touch probe	TS 444
Probe accuracy	≤ ± 5 µm when using a standard stylus
Probe repeatability Repeated probing from one direction	2 σ ≤ 1 µm at a probing velocity of 1 m/min <i>Typical values:</i> ≤ 1 µm at a probing velocity of 3 m/min ≤ 4 µm at a probing velocity of 5 m/min
Deflection of probe contact	≤ 5 mm in all directions (with stylus length L= 40 mm)
Deflection force	Axial: approx. 7 N Radial: approx. 0.7 to 1.3 N
Probe velocity	≤ 5 m/min
Protection IEC 60529	IP 67
Operating temperature Storage temperature	10 °C to 40 °C -20 °C to 70 °C
Weight without taper shank	Approx. 0.4 kg
Taper shank*	<ul style="list-style-type: none"> • With taper shank* (see <i>Touch Probes</i> brochure) • Without taper shank (connecting thread M12 x 0.5)
Signal transmission	Infrared transmission with 360° range
Transmission angle of infrared signal*	0° or +30°
Transmitter/receiver unit*	SE 540 or SE 640 (see <i>Touch Probes</i> brochure)
Energy supply	Compressed air Recommended operating pressure 5.5 x 10 ⁵ to 8 x 10 ⁵ Pa
Energy buffer	Integrated high-power capacitors
Charging time	Typ. 3 sec. at 5.5 x 10 ⁵ Pa
Operating time	120 seconds

* Please indicate when ordering.

10⁵ Pa ≙ 1 bar

Energy Generation through Air Turbine Generator

Mechanical design

The air turbine generator consists of an air turbine, the actual generator and high-power capacitors for energy storage. Compressed air that is supplied through the spindle is required for operating the turbine. The compressed air can also be used for cleaning the workpiece. Charging the capacitors and cleaning the workpiece are thus combined in one workstep. As a result, no additional idle times occur.

Principle of function

After inserting the TS 444 touch probe, the high-power capacitors are charged through the air turbine generator. This can be done when the touch probe moves from the tool changer to the measuring position, and also when the workpiece is cleaned with compressed air.

Charging times

The charging times of the capacitors vary depending on the available compressed air. The higher the pressure, the shorter is the charging time (see diagram).

Operating time

When the capacitor is fully charged, the TS 444 is ready for 120 seconds of continuous operation. The battery warning signal reports that the capacitors need to be recharged.

Requirements for compressed air quality

The air turbine generator can already operate at a minimum pressure of 2×10^5 Pa. An operating pressure between 5.5×10^5 and 8×10^5 Pa is recommended for effective charging. Specially cleaned air is not required.

10^5 Pa $\hat{=}$ 1 bar

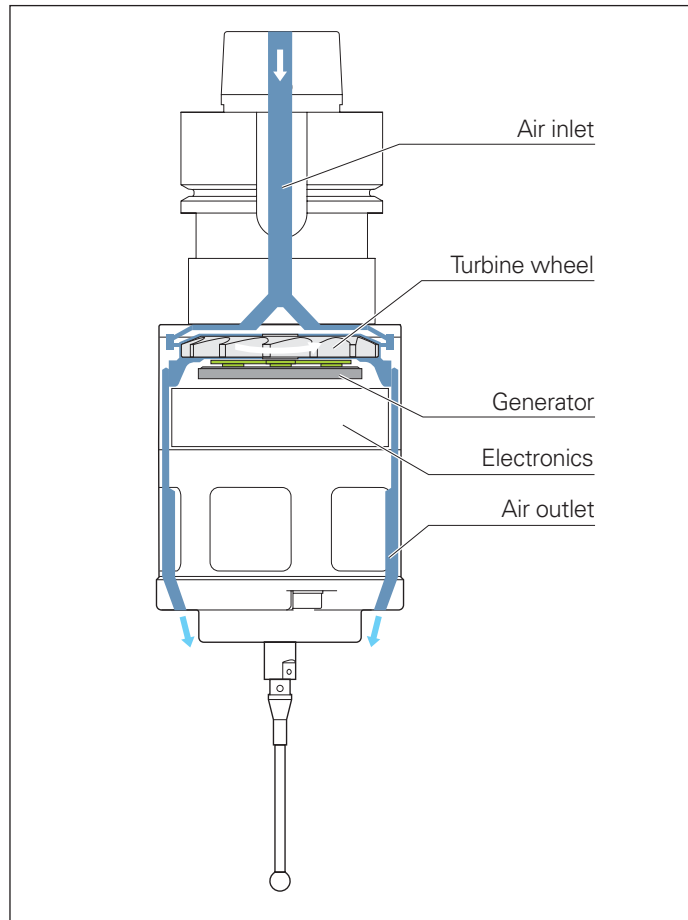
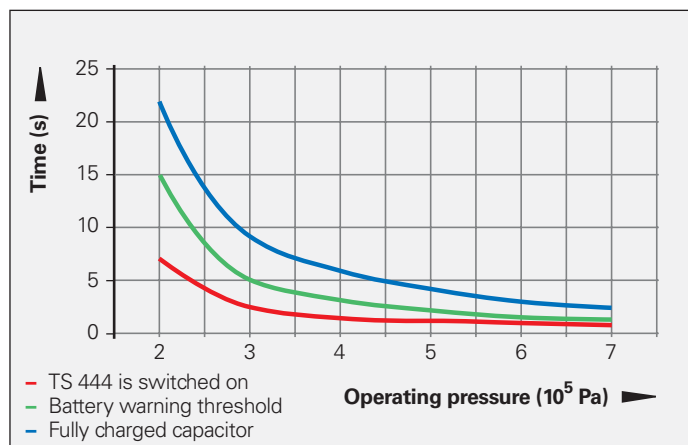


Illustration of turbine and air inlet/outlet (principle)



Charging time as a function of supplied pressure

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For more information

- Touch Probes brochure

