**Portable measuring device for ultrasonic material thickness testing in Echo-Echo principle**

**Features**
- **External sensor**
- **Data interface RS-232**, standard
- **Delivered in a robust carrying case**
- **Scan mode** (10 measurements per sec.) or single point measuring mode possible
- **Internal memory** for up to 20 files (with up to 100 values per file)
- **Selectable measuring units**: mm, inch
- Two measuring modes to determine material thickness:
  - Pulse-echo mode
  - Echo-echo mode
- **Echo-echo measuring**: Determining the actual thickness of materials irrespective of any coating which might be present. In this way, the wall thickness of pipes, for example, can be determined in a non-destructive manner, without having to remove the coating and the measurement can be shown on the display, with the adjustment for the coating thickness already taken into account
- **Echo-echo measurements are only possible with the measuring head included as part of the delivery** (ATU-US12, see accessory)

**Technical data**
- **Precision**: 0.5 % of \([\text{Max}] \pm 0.04 \text{ mm}\)
- **Dimensions**: W×D×H 74×32×150 mm
- **Battery operation**: batteries standard 2× 1.5V AA, AUTO-OFF function to preserve batteries
- **Net weight**: approx. 245 g
- **Maximum thickness of coating (paints, lacquers or similar coatings which shall be eliminated)**: 3 mm

**Accessories**
- **Plug-In for data transfer of measuring data** from the measuring instrument and transfer to a PC, e.g. in Microsoft Excel®, SAUTER AFI-1.0
- **External sensor**, 5 MHz, \(\Omega\) 12 mm, for echo-echo measuring, SAUTER ATU-US12
- **Ultrasound contact gel**, standard, can be reordered, approx. 60 ml, SAUTER ATB-US03
- **RS-232/USB adapter**, SAUTER AFH 12
- **Note**: All following Pulse-Echo sensors can only be used in Pulse-Echo mode, not in Echo-Echo mode
- **External sensor (Pulse-Echo)**, 2.5 MHz, \(\Omega\) 14 mm, for thick samples, in particular cast iron with rough upper surfaces: Measuring range 3–300 mm (steel), SAUTER ATU-US01
- **External sensor (Pulse-Echo)**, 7 MHz, \(\Omega\) 6 mm, for thin test materials: Measuring range 0.75–80 mm (steel), SAUTER ATU-US02
- **External sensor (Pulse-Echo)**, 5 MHz, \(\Omega\) 10 mm, transducer at an angle of 90°, SAUTER ATU-US10

**Table: Measuring Range and Technical Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Measuring range Echo-echo</th>
<th>Measuring range Plus-Echo</th>
<th>Readout</th>
<th>Sensor</th>
<th>Sound velocity</th>
<th>Factory calibration certificates</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN 30-0.01EE</td>
<td>3–30</td>
<td>0.65–600</td>
<td>0,01</td>
<td>5 MHz</td>
<td>(\Omega) 12 mm</td>
<td>1000–9999</td>
</tr>
<tr>
<td>TN 60-0.01EE</td>
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</table>

**Price reduction**

SAUTER GmbH · c/o KERN & SOHN GmbH · Ziegelei 1 · 72336 Balingen · Germany · Tel. + 49-[0]7433-9933-0 · Fax + 49-[0]7433-9933-149 · www.sauter.eu
Adjusting program (CAL):
For quick setting of the balance’s accuracy. External adjusting weight required.

Calibration block:
standard for adjusting or correcting the measuring device.

Peak hold function:
capturing a peak value within a measuring process.

Scan mode:
continuous capture and display of measurements.

Push and Pull:
the measuring device can capture tension and compression forces.

Length measurement:
captures the geometric dimensions of a test object or the movement during a test process.

Focus function:
increases the measuring accuracy of a device within a defined measuring range.

Internal memory:
to save measurements in the device memory.

Data interface RS-232:
bidirectional, for connection of printer and PC.

Data interface USB:
to connect the balance to a printer, PC or other peripheral devices.

Data interface Infrared:
To transfer data from the balance to a printer, PC or other peripheral devices.

Control outputs (optocoupler, digital I/O):
to connect relays, signal lamps, valves, etc.

Analogue interface:
to connect a suitable peripheral device for analogue processing of the measurements.

Statistics:
using the saved values, the device calculates statistical data, such as average value, standard deviation etc.

PC Software:
to transfer the measurements from the device to a PC.

Printer:
a printer can be connected to the device to print out the measurements.

GLP/ISO record keeping:
of measurements with date, time and serial number. Only with SAUTER printers.

Measuring units:
Weighing units can be switched to e.g. non-metric at the touch of a key. Please refer to website for more details.

Measuring with tolerance range (limit-setting function):
Upper and lower limiting can be programmed individually. The process is supported by an audible or visual signal, see the relevant model.

Battery operation:
Ready for battery operation. The battery type is specified for each device.

Zero:
Resets the display to “0”.

Motorised drive:
The mechanical movement is carried out by a motor or stepper.

Motorised drive:
The mechanical movement is carried out by a synchronous motor (stepper).

Fast-Move:
the total length of travel can be covered by a single lever movement.

DAkkS calibration possible:
The time required for DAkkS calibration is shown in days in the pictogram.

Factory calibration:
The time required for factory calibration is specified in the pictogram.

Package shipment:
The time required for internal shipping preparations is shown in days in the pictogram.