OKOndt GROUP™

ULTRASONIC THICKNESS GAUGE

UTG-8

Quick start guide

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CONTENTS

1 PURPOSE

1.1 UTG-8 ultrasonic thickness gauge is intended for:

— measuring the thickness of various materials with only one-side access to them;

— measuring the propagation velocity of ultrasonic waves in different metals with a known thickness.

1.2 The thickness gauge can be applied in various industries for measuring the wall thickness of vessels, pipes, body parts, sheets, etc., including the ones with corroded surfaces, during production and operation.

1.3 The thickness gauge is serviced by one operator.

It is allowed to use the thickness gauge only after the present operation manual has been carefully read.

2 MAIN SPECIFICATIONS

2.1 Main parameters and dimensions

2.1.1 The thickness gauge consists of an electronic unit and piezoelectric transducer.

2.1.2 The range of thickness measurements (for steel) varies from 0.6 to 500 mm.

2.1.3 The range of thickness measurements (for steel) by different transducers corresponds to the values indicated in Table 1.

Table 1 – Transducer designations and measurement ranges

Transducer designation	Measurement range (for steel), mm
.250” 5 MHz	1.2 ÷ 150 mm
.500” 5 MHz	1.2 ÷ 500 mm
.187” 7.5 MHz	1.0 ÷ 50 mm
.250” 7.5 MHz	0.6 ÷ 150 mm
.187” 10 MHz	1.0 ÷ 50 mm

2.1.4 The measurement range of ultrasonic waves propagation velocity varies from 1250 to 10000 m/s.

2.1.5 Value of the smallest indication digit is as follows:

— for measuring the ultrasound propagation velocity – 1.0 m/s;
— for measuring the product thickness of less than 199.99 mm – 0.01 mm;
— for measuring the product thickness of more than 200.00 mm – 0.1 mm.

2.1.6 Time of the thickness gauge operation mode setup is up to 10 s.

2.1.7 Power supply of the thickness gauge is provided by three alkaline “AAA” batteries (1.5 V) or nickel-cadmium cells (1.2 V).

2.1.8 Time of continuous thickness gauge operation on alkaline batteries and with backlighting switched off is about 200 hours, on nickel-cadmium cells – about 120 hours.

2.1.9 Overall dimensions of electronic unit of the thickness gauge are no more than 35 mm × 70 mm × 125 mm.

2.1.10 The thickness gauge weight with one piezoelectric transducer (without spare parts, accessories and bag) is no more than 0.176 kg.

2.2 Specifications

2.2.1 The limits of allowable basic absolute error for thickness measurement are ± (0.03 + 0.002·Hx) mm, where Hx is a numeric thickness value expressed in millimeters.

2.2.2 The limits of allowable relative error for ultrasound propagation velocity measurement are ± 1.5 % of the measured value.

2.2.3 The limits of allowable complementary error of the thickness gauge for thickness measurement, which occurs due to the variation of ambient temperature by every 10 °C from the temperature range limits (20 ± 5) °C in the operating temperature interval are $\pm 0.5 \cdot \Delta_H$, where ΔH is a value of absolute thickness measurement error expressed in mm.

2.2.4 The limits of allowable complementary error of the thickness gauge for thickness measurement from a rough surface side, which occurs due to the surface roughness R_z = 40 μm, are no more than $\pm 0.5 \cdot \Delta_H$.

2.2.5 The limits of allowable complementary error of the thickness gauge, occurred due to the surface roughness R_z = 160 μm for .187” 7.5 MHz, .500” 5 MHz, .187” 10 MHz transducers, and R_z = 80 μm for .250” 5 MHz, .250” 7.5 MHz transducers during the thickness measurement from a smooth surface side, are no more than $\pm 0.5 \cdot \Delta_H$.

2.2.6 The limits of allowable complementary error of the thickness gauge for measuring the thickness of curved surfaces with the curvature radius of 10 mm for .187” 7.5 MHz, .250” 7.5 MHz transducers, and curvature radius of 20 mm for .250” 5 MHz, .187” 10 MHz transducers, are $\pm 0{,}5 \cdot \Delta_H$.

2.2.7 The limits of allowable complementary error of the thickness gauge for measuring the thickness of nonparallel surfaces with the out-of-parallelism of 3 mm on the reference length of 20 mm, are $\pm 0{,}5 \cdot \Delta_H$, mm, in the range from 1 to 10 mm, and ± (0.2 + 0.01Hx) mm, where Hx is a numeric thickness value expressed in millimeters, in the range from 10 to 50 mm.

2.2.8 When operated, the thickness gauge is resistant to the effect of the following climatic factors:

— ambient air temperature from - 20 to + 50 °C;
— relative air humidity up to 95 % at 35 °C, without condensation;
— atmospheric pressure from 84 to 106.7 kPa.

2.2.9 The degree of thickness gauge case protection against the ingress of solids and water corresponds to IP64.

2.2.10 The thickness gauge in its transportation packing is resistant to the effect of the following climatic factors:

— ambient air temperature from - 40 to + 55 °C;

— relative air humidity up to 98 % at 35 °C.

2.2.11 The mean expected time to first failure of the thickness gauge is no less than 32000 hours.

Failure criterion is non-conformity to para 2.1.3, 2.2.1.

2.2.12 The mean total lifetime of the thickness gauge without transducers till its limit state, taking into account the spare parts and maintenance in accordance with the regulatory documents, is no less than five (5) years.

The limit state criterion for the thickness gauge is economic inexpedience of its repair in order to restore the instrument performance.

2.2.13 The mean total lifetime of transducers is no less than six (6) months*.

* if testing is carried out on surfaces, whose roughness does not exceed Rz 80, and maintenance is performed according to para 8.1.

3 COMPOSITION AND OPERATION

3.1 Outer appearance of the thickness gauge is illustrated on Fig. 1.

Fig. 1 – Outer appearance of UTG-8 thickness gauge

3.2 **Functions of keys:**

« ON/OFF » - this key is used to turn the thickness gauge ON and OFF.

When the gauge is turned ON, it will first perform a brief display test by illuminating all of the segments in the display. After one second, the gauge will display the internal software version number. After that, the display will show "0.000" (or "0.00" if metric units were used for measurements before the last switch-off of the instrument), indicating the gauge is ready for use.

The thickness gauge is turned OFF by pressing the ON/OFF key. All settings are saved after the gauge has been turned off.

The gauge also features an auto-powerdown mode designed to conserve the battery life. If the gauge is idle for 5 minutes, it will automatically turn itself off.

« PRB 0 » - this key is used to “zero” the thickness gauge (delay calibration in the wedge of piezoelectric transducer together with hardware delays).

The correctness of the above operation affects the measurement accuracy.

“Zero” calibration procedure is detailed in para. 6.6 of this Manual.

« 

» - the CAL key serves to enter and exit the calibration mode. This mode is used to adjust the ultrasound velocity value that will be applied for thickness calculation. Calibration can be performed based on a known thickness, known ultrasound velocity, or on two points.

The procedure of thickness gauge calibration with a known ultrasound velocity is detailed in para 6.7 of this Manual.

The procedure of thickness gauge calibration with an unknown ultrasound velocity is detailed in para 6.8 of this Manual.

The procedure of thickness gauge two-point calibration is detailed in para 6.9 of this Manual.

« 

» - the IN/MM key is used to switch back and forth between metric and inch units. This key may be used at any time, whether the gauge is displaying a thickness (in or mm) or ultrasound velocity value (in/μs or m/s).

« 

» - the UP arrow key has two functions. When the thickness gauge is in calibration mode, this key is used to increase numeric values on the display. In normal mode, this key takes the gauge into scanning mode.

Detailed description of the scanning mode can be found in para 7.7 of this Manual.

« 
» - the DOWN arrow key has two functions. When the thickness gauge is in calibration mode, this key is used to decrease numeric values on the display. In normal mode, it serves for setting up one of the three display backlight modes – ***“Off” / “Auto” / “On”***.

“Off” will be displayed when the backlight is switched off.

In the ***“Auto”*** mode, the backlight will illuminate when the gauge is actually making a measurement.

“On” will be displayed when the backlight is set to stay on.

3.3 **Display**

To show information on the display, the thickness gauge uses 4 main digits and some additional indicators, the functions of which are described below.

Fig. 2 – Outer appearance of display

When the gauge is displaying thickness measurements, the display will hold the last value measured, until a new measurement is made.

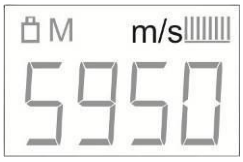
Besides, when the battery charge is low, "🔋" icon starts flashing in the upper left corner of the display. If this happens, it is necessary to replace (or recharge) the battery.

This indicator shows the stability of thickness measurement (16 vertical bars). If the measurement is stable, more than a half of such vertical bars should be displayed.

When the **"in"** symbol is on, all thickness measurements are made in inches. The maximum thickness that can be displayed is 19.999 inches.

When the **"mm"** symbol is on, all thickness measurements are made in millimeters. The maximum thickness (for steel) that can be displayed is 600 mm.

When the **"in/us"** symbol is on, the velocity of ultrasonic waves is measured in inches-per-microsecond.



When the **“m/s”** symbol is on, the velocity of ultrasonic waves is measured in meters-per-second.

Numeric (main) field of the display consists of five digits. This field is used to show numerical values, as well as simple words in different operation modes of the thickness gauge.

When performing the manual thickness measurement, **“M”** indicator is illuminated on the display.

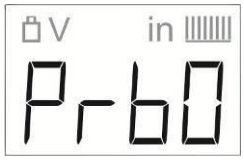
When switching on the scanning mode, **“S”** indicator is illuminated on the display.

“H_1” indicator appears after pressing  button, which serves for calibration of ultrasound velocity at a known thickness (1 point calibration). For details, please refer to para 6.8 of this Manual.

“H_2” indicator appears during the 2 point calibration. For details, please refer to para 6.9 of this Manual.

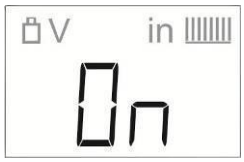
“Z” indicator appears during zero calibration (wedge).

"V" indicator appears during the calibration at a known ultrasound velocity in a test object. For details, please refer to para 6.7 of this Manual.



"Prb0" symbol is on, after the zero calibration has been finished. For details, please refer to para 6.6 of this Manual.

"Auto" symbol indicates that automatic display backlight mode is switched ON. For details, please refer to para 6.5 of this Manual.



"On" symbol indicates that permanent display backlight mode is switched ON. For details, please refer to para 6.5 of this Manual.

"Off" symbol indicates that display backlight mode is switched OFF. For details, please refer to para 6.5 of this Manual.

"1-OK" symbol indicates the two point calibration, namely calibration of the 1st point. For details, please refer to para 6.9 of this Manual.

"2-OK" symbol indicates the two point calibration, namely calibration of the 2nd point. For details, please refer to para 6.9 of this Manual.

Battery charge indicator.

3.4 Operation principle of the thickness gauge is based on ultrasonic pulse-echo method of measurement, which utilizes the property of ultrasonic waves to reflect from interface of media with different acoustic impedances.

Piezoelectric plate of dual element transducer generates an ultrasonic pulse through a delay line (wedge) in the direction of outer surface of a product, whose thickness is to be measured. The ultrasonic pulse propagates in the product up to the opposite surface, reflects from it, goes in reverse direction, and having passed the delay line (wedge), it is accepted by receiving piezoelectric plate. Time of ultrasound propagation from one surface of a product to another and back depends on the product thickness:

$$H = \frac{C \cdot t}{2} \quad , \qquad (1)$$

where H – thickness of test product;
C – velocity of ultrasound propagation in the product's material;
t – time of ultrasound propagation from one surface to another and back.

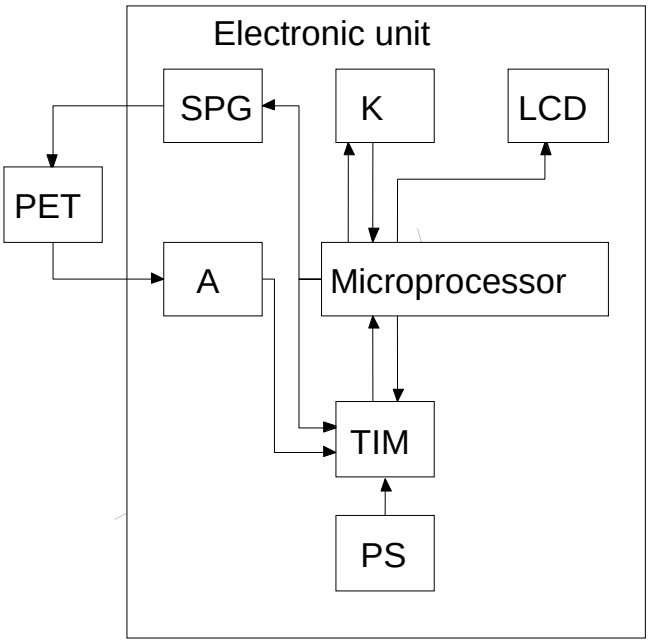
3.5 Schematic structure of the thickness gauge is shown on Fig.3.

3.6 The thickness gauge consists of a piezoelectric transducer and electronic unit.

3.6.1 Piezoelectric transducer

Transducer types, ranges of thickness values to be measured, and dimensions of work surfaces are listed in Table 1.

3.6.2 The electronic unit induces a high-voltage sounding pulse in order to excite the transducer, amplify the signal exiting the transducer, generate and measure a time interval, which corresponds to the time of ultrasound propagation from one edge of a test product to another, as well as mathematical processing of obtained data, storage of variable and intermediate measurement results, control of operation modes, and display of measurement results in thickness units.



PET – piezoelectric transducer;
SPG – sound pulse generator;
K – keypad;
LCD – liquid crystal display;
A – amplifier;
TIM – time interval meter;
PS – power supply.

Fig. 3 - Schematic structure of UTG-8 thickness gauge

3.7 The thickness gauge can be operated in the following modes:

– ***"Measurement"*** – basic operation mode of the gauge. The product thickness is measured in this mode;

– ***"0 calibration"*** – this mode is designed to compensate the time of ultrasound propagation in the transducer wedge during thickness measurement;

– ***"V calibration"*** – this mode is intended for setting up the velocity (V) of ultrasound propagation in the material of test product;

– ***"T calibration"*** – this mode is used to determine the velocity of ultrasound propagation in the material of test product at a known thickness (T);

– ***"Two point calibration"*** – this mode is designed to compensate the time of ultrasound propagation in the transducer wedge (estimating the delay in the transducer wedge) and to determine the velocity of ultrasound propagation in the material of test product by two thickness calibration gages.

3.8 **Design**

Electronic circuit of the thickness gauge is assembled on a PCB, housed in a plastic case. Power supply source comprised by three (3) 'AAA' battery cells is placed inside the case.

The bottom panel of the case includes a 5-mm thick probe disc (Fig. 4). The top panel of the case includes connectors for transducers (Fig. 5).

Fig. 4 – Bottom panel of the thickness gauge

Fig. 5 – Top panel of the thickness gauge

4 SETTING-UP PROCEDURE

4.1 Test object surface preparation

In any ultrasonic measurement scenario, the shape and roughness of the test surface are of paramount importance. Rough, uneven surfaces may limit the penetration of ultrasound through the material, and result in unstable, and therefore unreliable, thickness measurements. The surface being measured should be clean and free of any small particles, rust, or scale. The presence of such obstructions will prevent the transducer from seating properly against the surface. Often, a wire brush or scraper will be helpful in cleaning surfaces. In more extreme cases, sanders or grinding machines may be used, after which the test surface should be cleaned of resulting abrasive dust and chips.

Extremely rough surfaces, such as castings, will prove most difficult to measure due to diffusion of ultrasonic waves.

Besides, rough surfaces contribute to excessive wear of the transducer, particularly in situations where the transducer is "scrubbed" along the test surface. Therefore, the transducers should be checked for wear on a regular basis.

4.2 Transducer selection

The thickness gauge is inherently capable of performing measurements on a wide range of various materials. Different types of material, however, will require the use of different transducers.

Choosing the correct transducer for a job is critical to being able to easily perform accurate and reliable measurements.

The important properties of transducers should be considered when selecting a transducer for a specific job.

Generally speaking, the best transducer for a job is one that sends sufficient ultrasonic energy into the material being measured, so that a strong, stable echo-signal is received by the thickness gauge.

Initial signal strength is largely a factor of the size of the ultrasound emitter in the transducer. A large emitting area will send more energy into the material being measured than a small emitting area.

Furthermore, as ultrasound travels through any material, it is partly absorbed or scattered. The higher grain coarseness of the material, the more ultrasonic energy is scattered.

The higher the frequency of ultrasonic waves, the more ultrasonic energy is absorbed and scattered. While it may seem that using a lower frequency transducer might be better in every instance, a higher frequency transducer would be the best choice for testing objects with small thicknesses.

The physical constraints of measuring environment may also determine a transducer's suitability for a given job. Some transducers may simply be too large to

be used in tightly confined areas. Besides, the choice of a transducer can also be affected by the curvature of tested surface, since the establishment of ultrasonic contact between a transducer and tested surface is of paramount importance while making the measurements.

The choice of a proper transducer often becomes an issue of finding a compromise between different characteristics. A need may arise to try different transducers in order to find the one which would best suit a specific job.

4.3 **Transducer connection**

Choose a proper transducer for the required thickness range of products to be tested. Plug the connecting cable “Transducer/Thickness gauge” in the connector on the thickness gauge (Fig. 5).

The connecting cable “Transducer/Thickness gauge” is structurally included into the transducer set.

4.4 S**witching the thickness gauge ON**

Switch the thickness gauge ON (by pressing 

button) and make sure that the battery is not exhausted (“” icon should not be flashing).

In case the batteries (or cells) are discharged, replace them with new ones (see para 8.2) or charge the batteries using an external charging device (not included into the thickness gauge delivery set).

When the battery charge is low, “” icon will start flashing in the upper left corner of the display:

Fig. 6

Note - When switched on, the thickness gauge is automatically placed in the “Measurement” mode, saving all the settings, which were active before its prior turning off.

4.5 Selection of display backlight mode

By successive pressing of  button, select the desired display backlight mode:

– ***"Auto"*** – the backlight will illuminate when the gauge is actually making a measurement;

– ***"On"*** – this mode will be displayed when the backlight is set to stay on;

– ***"Off"*** – this mode will be displayed when the backlight is switched off.

Note - It should be borne in mind that the selected display backlight mode affects the continuous operation time of the thickness gauge.

4.6 Zero calibration

ATTENTION!

Zero calibration (time compensation of ultrasound propagation in the transducer wedge) is important for correct thickness measurement. If the gauge is not "zeroed" correctly, all measurements the gauge makes will be erroneous by some fixed percentage. When the UTG-8 is "zeroed", this fixed error value is measured and automatically corrected for in all subsequent measurements.

For zero calibration, please perform the following actions:

1) Plug an appropriate transducer into the thickness gauge using the connecting cable.

2) Switch the thickness gauge ON by pressing 

button.

3) Apply a few droplets of couplant onto the built-in 5mm thick probe disc (Fig. 4).

4) Press the transducer against the probe disc, making sure that the transducer sits flat against the probe disc surface. The display should show some thickness value, and the Stability Indicator should have nearly all its bars illuminated.

Fig. 7

Note - Zero calibration of the thickness gauge should be performed only on the built-in 5mm thick probe disc.

5) Remove the transducer from the probe disc and press PRB 0 button.

After that, the display will show a message (Fig. 8) about the successful zero calibration, along with a shortly-displayed measured value of ultrasound propagation delay in the transducer wedge (in μs), which will be used for subsequent measurements.

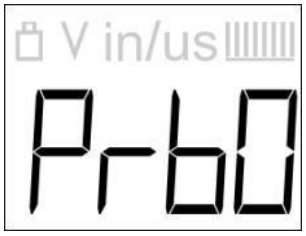


Fig. 8

Notes:

1 Calibration can be also done with a transducer placed on the surface of a calibration block.

2 After the calibration is completed, "zero" value (time delay) will be saved to the memory of the thickness gauge, and will be used for further measurements.

ATTENTION!

Before starting the operation, always perform the wedge delay calibration.

4.7 Thickness gauge calibration at a known ultrasound velocity ("V calibration")

Note - This procedure requires that the operator know the ultrasound velocity of the material to be tested.

For the thickness gauge calibration at a known ultrasound velocity, please perform the following actions:

1) Plug an appropriate transducer into the thickness gauge using the connecting cable.

2) Switch the thickness gauge ON by pressing ON/OFF button.

3) Carry out zero calibration in accordance with para 6.6. Press twice CAL button. The "m/s" or "in/us" symbols will start flashing on the display, with "V"

symbol illuminated, and the main indicator will show the ultrasound velocity value (Fig. 9).

Fig. 9

4) Using SCAN and ▼ keys, adjust the displayed velocity up or down, until it matches the actual (true) ultrasound velocity of the material to be measured.

5) Press CAL key once again to exit the calibration mode.

6) The thickness gauge is now ready to perform measurements.

Note - After the calibration is completed, the ultrasound velocity value will be saved to the memory of the thickness gauge, and will be used for further measurements.

4.8 Thickness gauge calibration at an unknown ultrasound velocity ("One point calibration")

Note - For the thickness gauge to perform accurate measurements, the velocity of ultrasonic waves in the material of a test object should be set up correctly.

Since the material composition (and thus, its ultrasound velocity) may vary from lot to lot and from manufacturer to manufacturer, the calibration to a sample of known thickness made of the same material as a test object will ensure the most accurate measurements.

For the calibration to a known thickness, please perform the following actions:

1) Plug an appropriate transducer into the thickness gauge using the connecting cable.

2) Switch the thickness gauge ON by pressing ON/OFF button.

3) Carry out zero calibration in accordance with para 6.6.

4) Press the transducer against the sample of a known thickness prior wetted with couplant, making sure that the transducer sits flat against the surface of the sample. The display should show some (probably incorrect) thickness value, and the Stability Indicator should have more than a half of its vertical bars on.

5) Press CAL key, after which the main indicator will show the thickness value, the “H1” symbol will appear on the display, and the “mm” symbol will start flashing.

6) Remove the transducer from the sample piece.

7) Using SCAN and keys, adjust the displayed thickness up or down, until it matches the actual (true) thickness of the sample piece.

8) Press CAL key, after which the calculated ultrasound velocity of the calibration sample will be displayed in the main indicator field, the “V” symbol will appear, and in a short period of time the “V” symbol will change to “M” symbol, the “m/s” symbol will change to “mm” symbol, and the main indicator field will show the resulting measured thickness (Fig. 10).

Fig. 10

The thickness gauge is now ready to perform measurements.

Note - After the calibration is completed, the ultrasound velocity value will be saved to the memory of the thickness gauge, and will be used for further measurements.

4.9 Two point calibration of the thickness gauge

Note - Two sample pieces of a known thickness are required to perform the two-point calibration of the thickness gauge.

For the two-point calibration, please perform the following actions:

1) Plug an appropriate transducer into the thickness gauge using the connecting cable.

2) Switch the thickness gauge ON by pressing ON/OFF button.

3) Press the transducer against the 1st sample of a known thickness prior wetted with couplant, making sure that the transducer sits flat against the surface of the 1st sample. The Stability Indicator should have nearly all vertical bars on.

4) Press CAL key on the keypad, after which the main indicator will show some (probably incorrect) thickness value, the “H1” symbol will appear on the display, and the “mm” or “in” symbol will start flashing (Fig. 11).

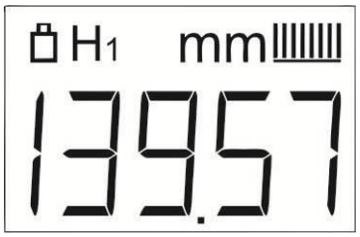


Fig. 11

5) Remove the transducer from the 1st sample piece.

6) Using SCAN and ☀ keys, adjust the displayed thickness up or down, until it matches the actual (true) thickness of the 1st sample piece.

7) Press PRB 0 key, after which the “1-OK” symbol will appear on the display, and the “H1” symbol will change to “H2” (Fig. 12).

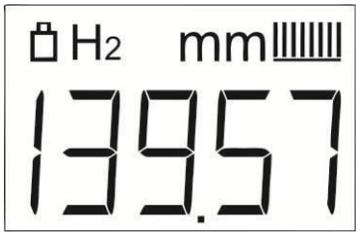


Fig. 12

ATTENTION!

The thickness difference between the 1st and 2nd sample pieces should not be less than 2 mm. If the thickness difference is less than 2 mm, an error message will be displayed.

8) Press the transducer against the 2nd sample of a known thickness prior wetted with couplant, making sure that the transducer sits flat against the surface of the 2nd sample. The Stability Indicator should have nearly all vertical bars on.

9) Press CAL key, after which the main indicator will show the current thickness value, and the “mm” or “in” symbol will start flashing.

10) Remove the transducer from the 2nd sample piece.

11) Using SCAN and ☀ keys, adjust the displayed thickness up or down, until it matches the actual (true) thickness of the 2nd sample piece.

12) Press 

key, after which the “2-OK” symbol will appear on the display, and on the display for a short period of time will appear the calculated wedge delay along with ultrasound velocity.

Note - After the two-point calibration is completed, the ultrasound velocity and wedge delay values will be saved to the memory of the thickness gauge to be used for further measurements.

5 OPERATION PROCEDURE

5.1 The thickness gauge is serviced by one operator. It is allowed to use the thickness gauge only after the present operation manual has been carefully read.

5.2 Clean the surface, which comes in contact with the transducer, from flake scale, protective coating, paint, metal plating or other coarse micro-irregularities by mechanical scrubbing (using a wire brush, scraper, abrasive cloth strip or grinder).

5.3 Apply a layer of couplant to the surface of test object in the point of placing a transducer. The normal consumption rate of couplant shall not exceed 1 g per one measurement.

5.4 Switch the thickness gauge ON.

5.5 Prepare the thickness gauge for operation in accordance with Section 6.

5.6 **Thickness measurement. Manual mode**

For the manual thickness measurement (in one point), please perform the following actions:

1) Plug an appropriate transducer suitable for the selected type of measurements into the thickness gauge.

2) Switch the thickness gauge ON by pressing 

button.

3) Carry out zero calibration in accordance with para 6.6 of this Manual.

4) Set up the ultrasound velocity in a test object or perform the calibration of the thickness gauge in accordance with para 6.8 of this Manual.

5) Press the transducer against the test object prior wetted with couplant, making sure that the transducer sits flat against the surface of the test object. The Stability Indicator should have the maximum number of its vertical bars on, while the measured thickness value will appear on the display.

The measured thickness value will stay on the display, even after the transducer has been removed from the tested surface, until the next measurement is performed.

Note - If the Stability Indicator has less than a half of its vertical bars darkened, or the readings on the display seem erratic, first check to make sure that there is an adequate film of couplant beneath the transducer, and that the transducer is seated flat and tightly against the tested surface. If the condition persists, it may be necessary to select a different type of transducer (in size or frequency) for the

material being measured.

5.7 Thickness measurement. Scan Mode

Note - It is sometimes desirable to examine a larger region of test object, in order to find the thinnest point. The UTG-8 includes a feature, called Scan Mode, which allows it to do that.

In manual measuring mode, the UTG-8 performs and displays four measurements every second, which is quite adequate for single-point measurements. In Scan Mode, however, the gauge performs sixteen measurements every second. While the transducer is in contact with the material being measured, the UTG-8 is keeping track of the lowest measurement it finds. When the transducer loses contact with the surface for more than a second, the UTG-8 will display the smallest thickness it has found.

For the thickness measurement in Scan Mode, please perform the following actions:

1) Plug an appropriate transducer suitable for the selected type of measurements into the thickness gauge.

2) Switch the thickness gauge ON by pressing 

button.

3) Carry out zero calibration in accordance with para 6.6 of this Manual.

4) Set up the ultrasound velocity in a test object or perform the calibration of the thickness gauge in accordance with para 6.8 or 6.9 of this Manual.

5) Go to Scan Mode by pressing 

key. Observe that the “S” symbol should appear instead of “M” in the upper part of the display.

6) Place the transducer onto the test object prior wetted with couplant, and perform the scanning. While scanning, the display will show the measured thickness value. In case of a loss of acoustic contact for more than 1 sec., or when finishing the scanning and removing the transducer from the surface of the test object, the display will show the minimum thickness, which has been found during scanning.

The minimum measured thickness value will stay on the display, even after the transducer has been removed from the surface of the test object, until the next scanning is performed.

5.8 Ultrasound velocity measurement

Ultrasound velocity is measured by the thickness gauge during its calibration at an unknown ultrasound velocity ("T calibration").

Note - For more accurate measurement of ultrasound velocity, it is recommended that the thickness of sample piece exceed 20 mm.

The procedure of ultrasound velocity measurement is detailed in para 6.8 of this Manual.

6 INFORMATION ABOUT MANUFACTURER

OKOndt GROUP

www.oko-ndt.com

E-mail: global-sales@oko-ndt.com