



## ***Instruction Manual***

***1071-EX***



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# 1 What you should know prior to starting

## 1.1 Safety information

This instruction manual contains information and warnings that must be observed for safe operation under the conditions described.

## 1.2 Faults and damage

If there are any grounds for believing the unit is no longer safe to use, it must be taken out of service and measures taken to prevent its further unintentional use. The safety of the unit may be impaired if, for example:

- external damage to the housing is visible
- the unit has not been stored correctly
- the unit suffered transport damage.

## 1.3 Safety regulations

When using the ECHOMETER 1071-Ex, the appropriate regulations must be observed to avoid incorrect operation of the unit.

### Attention!

**Unit must always be used in the leather case in the hazardous area! Please make sure that the case is securely fastened when using the unit. The unit must not be opened in the hazardous area.**

**Only probes intended for this instrument must be used.**

## 1.4 Batteries

If you will change the battery, make sure that only the ones intended for this purpose are used. Only batteries AAA according to IEC LR 6 may be used. The use of different batteries is strictly forbidden.

## 1.5 Ex-data

Certificate of conformance: PTB 97 ATEX 2231 X

Certification:  II 2 (1) G EEx ia IIC T4

Attention: **Echometer 1071-Ex operation permitted in zone 1.  
Probes operation permitted in zone 0.  
Probes can be exchanged in hazardous areas.**

## 1.6 Repair

The repair must be carried out by the manufacturer, since the protective circuits must be checked after repair for safety reasons.

## 1.7 Passing-on, availability and storage of this handbook

This handbook is a standard accessory and comes with the ECHOMETER 1071-Ex when delivered.

Please make sure that this handbook

- \* is passed to the **quality assurance dept.** of your company from where it can be ...
- \* handed on to the specific user.

\* Please store this handbook like a document.

## 1.8 Hints regarding this handbook

**Info** At the end of this manual you'll find a foldable view of the instrument with reference numbers. If there are instrument parts mentioned in the text a reference number is added so you easily can assign the corresponding parts.

## 1.9 Requirements concerning the test personnel

To operate the ECHOMETER according to the demands of the corresponding test task the user of the wall thickness gauge should be able to read and understand this manual. Moreover there should be a basic knowledge of methods used in the application of measurement technique so the operator can judge objectively the measured values and their tolerance. By this the possibility to recognize systematic or application malfunctions can be increased as well as the recognition of error caused by the gauge. By means of periodically executed check measurements using comparable test pieces with known wall thickness you can verify the correct function of the test system. The test personnel should be familiar with processes to be executed in the case of instrument malfunction or error.

## 1.10 Application range of the ECHOMETER

The ECHOMETER 1071-Ex is a gauge to measure wall thickness in the range from 0.7 to 400 mm.

Depending on the desired measuring range the instrument is connected to either a standard, a mini size or a low frequency probe.

## 1.11 Probe, measuring range, measurement tolerance and display range

The probe type SE is equipped with separate transmitter and receiver elements. The elements have a similar electrical and mechanical construction and are connected to the probe sockets (1) of the ECHOMETER by means of a fixed cable. The assignment to the sockets is free. The cable length is 1 m approx.

The possible measuring ranges depend on the probe type:

Standard probe DSE 10.4/6 PB 4 .....	1.5 to 250 mm
Mini size probe DSE 4.2/4 PB 8 .....	0.7 to 25 mm
Low frequency probe DSE 18/25 PB 1.5 <sup>1</sup> .....	5 to 400 mm.


Standard probe operating temperature up to 200 °C for a short time.

The stated measuring ranges are valid for fine-grain steel with plane-parallel and smooth surfaces. They are valid for measurements without foil. With different material, geometry and surface or when using foils the measuring ranges can be reduced.

The display resolution of the instrument can be selected from 1/10 mm (resp. 1/100 in) and 1/100 mm (resp. 1/1000 in).

<sup>1</sup> Material with high sound conductivity and a long sound path can cause phantom echoes so you will not obtain correct readings. In this case we recommend to use a probe with higher frequency.

The measuring tolerance<sup>2</sup> of the ECHOMETER in mm-operation mode is  $\pm 0.15$  mm (with resolution 1/10 mm) resp.  $\pm 0.05$  mm (with resolution 1/100 mm) and in inch measuring mode it is  $\pm 0.002$  in (with resolution 1/1000 in).

 The stated data regarding the measurement and reading tolerance are valid only for the a.m. measuring range of the probe. Outside this measuring range either measurement is not possible or the tolerance range can be greater, possibly to a great extent. Please also note chapter 4.3, "Wear of the probe".

## 2 Putting into operation

### 2.1 Connectors and controls

The reference numbers in the following chapter correspond to the reference numbers on the foldable view at the end of this manual.

#### a) Housing top

Probe cables are connected to the coaxial sockets (1). Assignment of the probe cables is free.

#### b) Foil keyboard

The keyboard shows four keys:



ON / OFF



Calibration / adjustment



Menu selection and  
incrementation (i.e. increase of value)



Decrementation (i.e. decrease of value)

Above the keyboard pad you see the LC-display (2).

The 5 mm calibration block (4) is mounted below the keyboard pad.

<sup>2</sup> Data regarding the measuring tolerance refer to an adjusted sound velocity of 5920 m/s (steel)




## 2.2 Display


The ECHOMETER is equipped with a Liquid Crystal Display (LCD). The display shows up to four symbols, letters or figures with decimal point.

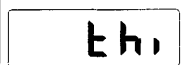





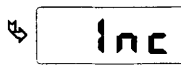
Depending on the operation mode additional special symbols are visible. These special symbols appear at the left margin of the LCD:

special symbol	meaning
LOW BAT	When it starts <b>flashing</b> , this message tells you that the inserted batteries are nearly dead. Usually you can go on measuring for at least several hours but you should fit new batteries as soon as possible. With <b>permanent</b> display of this message you should replace the batteries immediately since automatic switch-off is imminent.
:	The coupling mark (two spots at the left display margin) is visible when the probe is not placed on the workpiece or coupling is not sufficient for proper measurement. With a visible coupling mark no measurement is executed. The ECHOMETER waits for placing the probe.  The coupling mark is also visible if there is no proper measurement possible due to physical reasons, e.g. if the bottom echo is too small caused by high acoustic sound loss.

## 2.3 Operating principle / parameter set-up

The entire set-up and adjustment procedures are executed by means of the keys   and .

Striking the key  the measuring parameters will appear one after the other:

reading	measuring parameter
	material thickness (single sound path of the ultrasonic signal)
	sound velocity of the material
	upper measuring limit
	lower measuring limit
	reading and input unit
 or 	current reading and input unit: mm or inch.

<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">Snt,</div>	measuring sensitivity
↓ <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">H,</div>	If there is a strong surface echo (e.g. with aluminium measuring) this menu point must be switched to <div style="border: 1px solid black; padding: 2px; width: fit-content; display: inline-block;">Lo</div> .
or ↓ <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">Lo</div>	
	Standard measurements normally are executed using the setting <div style="border: 1px solid black; padding: 2px; width: fit-content; display: inline-block;">H,</div>



## 2.4 Altering a measuring parameter

If you want to alter the displayed measuring parameter strike the key 

CAL

.


After a short time the current value of the parameter will appear on the reading.

To alter the displayed value you need to strike one of the arrow keys  (for increase) or  (for decrease). Keep keys depressed for auto-increase resp. decrease.

Strike 

CAL

 again to confirm new value and return to measurement operation mode.

 Once the measuring parameters are entered they remain memorized (like the calibration) even if the instrument is switched off.


You can make them current again after switch-on: Just override the 

CAL

 inquiry by striking the key 

CAL

 instead of executing a calibration measurement.

 When exchanging batteries the memorized measuring parameters become deleted. This means, you need to enter the relevant parameters again and also need to execute an initial calibration.

After exchange of batteries you **must not override** the calibration inquiry by striking 

CAL

.

## 2.5 Illegal input

On striking  the input value is checked for plausibility and instrument-based limits. If there is a limit that becomes exceeded you will see a short error message  and the instrument switches to input mode again so you instantaneously can re-enter the corrected parameter.

The following limits must not be exceeded:

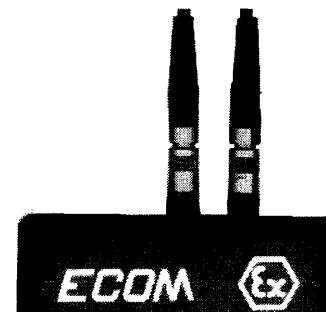
- A. the lowest sound velocity must not drop below 100 m/s (resp. 0.01 inch/ $\mu$ s)
- B. the maximum sound velocity must not exceed 19999 m/s
- C. the upper measuring limit must not be lower than the lower one and vice versa.

**Info** The input monitoring also scans those values resulting from internal calculations. Those values must not exceed the a.m. limits, too.

## 2.6 Connecting the probes, switch-on and calibration

- Switch-off the instrument
- Connect probe connection cable to the probe connectors of the instrument(1).

probe cable with single connectors



arbitrary connector combination



- Strike key  to switch the instrument on.
- The display will show  to inquire the calibration process.

**Info** The calibration process is used to feed the internal calculation processes with information on the properties of the connected probe and is executed by means of the built-in calibration block (4).

In addition the CAL-process resets

- the thickness to the measured thickness of the calibration block (i.e. 5.0 mm with the internal calibration block)
- the velocity to 5920 m/s
- the measuring unit to mm
- the sensitivity setting to high




 If a proper calibration already has been executed before, you can override the calibration by striking  when the CAL-inquiry appears. In this case the available calibration references (sound velocity and wall thickness) will be used. Overriding CAL after switch-on will also preserve the existing


- the calibration values
- the wall thickness parameter
- the sound velocity parameter
- the setting of the measuring unit
- the sensitivity setting


It will not preserve the high and low measuring limits. They **always** need to be re-entered when switching the unit off and on using the key



 When exchanging batteries all parameters are deleted. In this case you **always** need to execute the calibration procedure..

## 2.7 Calibration procedure

- Apply a drop of couplant (e.g. ECHOTRACE, oil etc.) to the probe or the calibration block (4).
- Place the probe on the centre of the built-in calibration block (4). Keep it coupled until the display shows . This is the thickness of the calibration block in mm.
- The instrument is calibrated now, the reference sound velocity has been automatically switched to 5920 m/s (steel).

 If you want to measure the thickness of different materials you need to alter the parameter "sound velocity" correspondingly (see following chapter).







Please, also refer to chapter 3.2 "Calibration on material with unknown sound velocity and known wall thickness" and chapter 3.3 "Calibration on material with unknown wall thickness and known sound velocity" for alternative calibration methods.


## 2.8 Wall thickness measurement

When measuring wall thickness the ECHOMETER 1071 must know the sound velocity of the material.

After calibration the sound velocity automatically is set to 5920 m/s. If the existing material features this sound velocity you directly may go to step ⑤.

If there is a different sound velocity you prior to measurement need to execute steps ① to ④.

- ① Strike  until the display shows .
- ② Strike . After a short time the current sound velocity value will be indicated.
- ③ Strike  or  until the display reading meets the sound velocity of the material to be measured in m/s resp. inch/ $\mu$ s (e.g. steel 5920 m/s resp. 233 inch/ $\mu$ s).
- ④ Strike  to return to measurement operation mode.
- ⑤ Apply a drop of couplant (e.g. ECHOTRACE, oil etc.) to the material to be measured or the probe. Place probe onto material.
- ⑥ After this the wall thickness will be displayed in mm resp. inch. The measurement can be repeated as often as required without re-entering the sound velocity.

 Altering the reference sound velocity will always alter the displayed wall thickness (due to the physical relation  $c=v/t$ ).

## 2.9 Monitoring measured values







You can monitor the measured values so the instrument generates optical and acoustical alarm when the measuring limits are exceeded.

These upper and lower measuring limits can be entered via the parameter setup of the ECHOMETER. When these limits are exceeded, a special alarm sound is generated and the display flashes.

The limit values can be entered any time during measurement.

### 2.9.1 Input of measuring limits







#### 2.9.1.1 Input of the lower limit value

- Strike  until the display shows .
- Strike .
- Adjust the lower limit with the aid of keys  and .
- Strike  to return to measurement operation mode.

With measured values dropping below the lower limit the display reading will start flashing.


In addition a **low frequency alarm signal** will sound.

### 2.9.1.2 Input of the upper limit value

- Strike  until the display shows .
- Strike .
- Adjust the upper limit value with the aid of keys  and .
- Strike  to return to measurement operation mode.

With measured values exceeding the upper limit the display reading will start flashing.



In addition a **high frequency alarm signal** will sound.

 The limit values can be entered in any sequence. It is not required that you enter both limits: a single upper or lower limit is sufficient (depending on your requirements).



### 2.9.2 Displaying the limit values

You can show the stored limit values on the display.

#### 2.9.2.1 Displaying the lower limit

Strike  until the display shows . Wait for approximately one second. The display will then show the current lower limit value.

#### 2.9.2.2 Displaying the upper limit

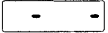
Strike  until the display shows . Wait for approximately one second. The display will then show the current upper limit value.


### 2.9.3 Deleting the limit values

Just enter "0" as limit value to cancel the corresponding limit monitoring function.

### 2.10 Stand-by mode

After about 1 minute of not using the instrument it will switch to the stand-by mode in order to save energy.

When switching to stand-by mode you will hear a short signal tone. Afterwards the display will show two horizontal bars .

Strike  to return to the previous operating mode.

## 3 Other features

### 3.1 Measurement on highly sound-conductive workpieces (e.g. aluminium)

To measure the wall thickness of material with low sound attenuation, e.g. aluminium, the sensitivity of the instrument can be reduced:

- Use the arrow keys to select menu point **5nt1**.
- Enter the adjustment mode by striking **CAL**.
- Use the arrow keys to adjust the sensitivity to **L0**.

With standard measurements the sensitivity should be set to

**H1**.


### 3.2 Calibration on material with unknown sound velocity and known wall thickness



When calibration is executed using the built-in calibration block the reference sound velocity is 5920 m/s (steel).

If the sound velocity of the material to be measured is different to 5920 m/s and unknown, you need a reference block of the material. The thickness (i.e. the single sound path) of the reference block must be known as exactly as possible. Proceed as follows:

- Determine the thickness of the reference block.
- Switch-on the instrument. Override the calibration inquiry by striking **CAL**.

- Apply a drop of couplant and put probe to reference block.

- Strike  until the display shows **t h1**.

- Strike **CAL**. Hit  or  until the display shows the thickness of the reference block.

- Finally strike **CAL** again.

The instrument now is calibrated to the material with unknown sound velocity.


### 3.3 Calibration on material with unknown wall thickness and known sound velocity



There is also an alternative possibility to calibrate the instrument if you have a reference block with known sound velocity and unknown wall thickness.


Proceed as follows:

- Determine the sound velocity of the reference block, if not already known.
- Switch-on the unit. Override the inquiry for calibration by striking the key **CAL**.

- Execute a measurement on the reference block.

- Strike the key  until you see **VEL** on the display.

- Strike the key **CAL**. Use  or  until the display of the sound velocity is equal to the sound velocity of the reference block.

- Strike the key  again.

Finally you'll see the thickness of the reference block with reference to the sound velocity entered.

The instrument now is calibrated to the material with unknown wall thickness.

### 3.4 Altering the display resolution

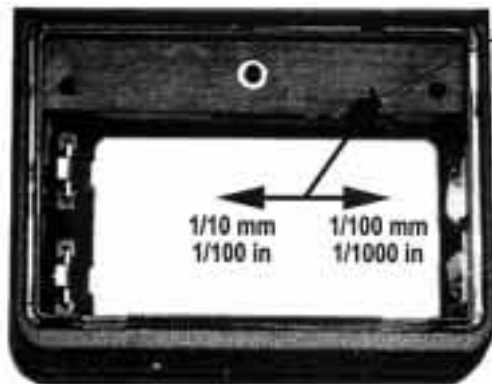
The instrument can be operated using either a display resolution of 1/10 mm (1/100 in) or 1/100 mm (1/1000 in).

To alter the display resolution you should proceed as follows:

- Switch-off the instrument.
- Open battery compartment and remove batteries.
- Use an appropriate tool (e.g. a small screw driver) to select the slide switch, that has become visible now, to the desired position:



left = 1/10 mm resp. 1/100 inch

right = 1/100 mm resp. 1/1000 inch



Here you will find the slide switch to alter the display resolution

- Fit batteries again and close the battery compartment.

 After change of the display resolution the instrument needs to be re-calibrated when switching it on again. In this case the calibration request must not be overridden by striking the key .

## 4 General notes

### 4.1 Measurement principle

The ECHOMETER 1071-Ex is a measuring instrument based on ultrasound technique. It can be used for measurement of wall thickness of various materials. The instrument determines the transit time of ultrasonic pulses.

Periodically an electrical pulse transmitter excites a piezoelectric crystal to generate high-frequency thickness oscillations (pressure pulses). The frequency of these pressure oscillations cannot be heard by the human ear (ultrasound range is 1 to 10 MHz approx.).

In sound-conductive materials ultrasound waves spread straight forward. At interfaces, e.g. at the rear side of a measurement object, they are reflected and return to the piezoelectric crystal (it may be the transmitter crystal or, as it is with the ECHOMETER 1071, a different one). The piezo crystal transforms the pressure pulse to an electrical pulse again.

The transit time (t) between transmitted and received electrical pulse is determined and with known sound velocity (c) the wall thickness (s) can be calculated (according to the formula  $s = c * t$ ), or with known wall thickness the sound velocity can be displayed (to the formula  $c = s/t$ ).


The factor 2 caused by the forward and return sound path is considered automatically: The display shows the single path only.

### 4.2 Operating and storage temperature

The ECHOMETER 1071-Ex can be operated in environment temperatures from 0° C to 50° C.

The permissible storage temperatures of the ECHOMETER with inserted batteries lies in the range 0° C to 50° C.

With removed batteries you can store the instrument in temperature ranges from -20° C to 60° C.

 Inside temperatures behind glass (e.g. in cars) in sunshine easily can be higher than 60° C!


### 4.3 Wear of the probe

Depending on the intensity of use the probe housing can become shorter.

Wear of up to 1 mm will not affect the measurement accuracy. Wear exceeding this limit can decrease the normal measurement accuracy.

The following table gives information on the effects of wear with regard to the various probe types:

	shortening limits w/o influence on accuracy	total useable shortening (add ± 0.1 mm to the normal tolerance)	length of housing ex works
probe DSE 10.4/6 PB 4	1 mm	up to 5 mm	30 -0,2 mm
probe DSE 4.2/4 PB 8	1 mm	up to 2 mm	15 -0,1 mm
probe DSE 18/25 PB 1.5	1 mm	up to 5 mm	33 -0,2 mm


 You can estimate the actual shortening by comparison with the original length of the housing ex works.


#### 4.4 Exchanging batteries

Batteries are inserted into the compartment in the bottom side of the instrument.



To exchange batteries you first have to unscrew the Phillips screw of the compartment cover. Then *carefully* lift the cover. Make sure that the rubber sealing of the cover will not be damaged or removed from the guiding notch. Insert new batteries. Ensure correct orientation according to the sketch. Re-assembling is made in the reverse order.

 When exchanging batteries, the memorized parameter and calibration values are deleted. Therefore you need to execute a new calibration and enter the relevant parameters again after exchange of the batteries.

 After battery replacement you should switch the instrument on/off **twice** to reset it to a defined operating status.

**Attention:** Only primary cells according to IEC LR 6 may be used. The use of different batteries is strictly forbidden!

#### 4.5 Housing

The ECHOMETER housing is made from sturdy plastics (ABS UL-94 HB / polyester). The housing is splash proof to IP 54.

#### 4.6 Cleaning keyboard and housing

To clean housing and keyboard you can use a cloth soaked with a soft cleansing agent. Make sure that there are no solvents or scratching agents in the cleanser. If you are using a plastics-cleanser make sure that it does not dissolve ABS (UL-94 HB) and polyester.

## 5 What to do when...?

**What to do when the display shows  ?**

**Cause:** The combination of current or just entered parameter leads to a value that exceeds the permissible parameter limits (see chapter 2.5, "Illegal input").

**Remedy:** Alter the parameter values correspondingly.

**What to do when the coupling mark  won't disappear?**

**Cause:** Insufficient coupling

**Remedy:** Apply a sufficient drop of couplant to the probe or the measurement location (ECHOTRACE, oil etc.) or increase the coupling pressure a little bit (**do not use force !!**).

**Cause:** Low sound conductive material

**Remedy:** Ensure that the parameter SENSITIVITY is set to high. If this is the case you can contact ECOM. We can tell you whether it is possible to connect a more sensitive probe.

**What to do when the display shows  ?**

This is no **error message**. Nevertheless it is mentioned here in order to avoid confusion when you see it on the display and you **think** it is an error message. The simple reason is that the instrument has switched to stand-by mode. You can return to measuring mode by striking  once.

**What to do when measured wall thickness is changing depending on specimen?**

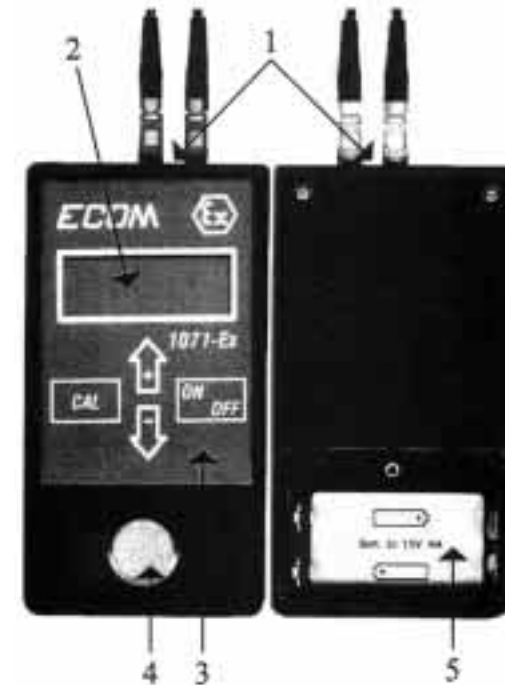
Be aware that the sound velocity (either the physical one or the one entered as measuring parameter) directly influences the reading of wall thickness. Always ensure that you have entered the correct sound velocity of the respective material.



## 6 Technical data

housing material:	ABS (UL-94 HB)
type of protection:	IP 54
keyboard material:	polyester
housing size:	65 x 120 x 25 mm <sup>3</sup> approx. (w*h*d)
housing:	approx. 150 g with batteries approx. 120 g w/o batteries
power supply:	2 * 1.5 V primary cells according to IEC LR 6
power consumption:	stand-by mode: 200 $\mu$ A at 2,5 V 35 $\mu$ A for data memory when instrument is switched off
operating time:	more than 200 hrs permanent operation
controls:	<ul style="list-style-type: none"><li>• foil keyboard with perspex window for the LCD (character height 10.2 mm)</li><li>• probe connectors</li></ul>
measuring range:	1,5 to 250 mm with standard probe DSE 10.4/6 PB 4  0,7 to 25 mm with mini size probe DSE4.2/4 PB 8  5 to 400 mm with low frequency probe DSE18/25 PB 1.5
measuring tolerance:	+/- 0.05 mm resp. (at $v_s = 5920$ m/s) +/- 0.0015 inch
display tolerance:	+/- 0.1 mm resp. 0.02 inch (at $v_s = 5920$ m/s)
environmentals:	-10 °C to + 50 °C

## 7 Instrument view



- (1) probe connectors
- (2) LC-display
- (3) keyboard
- (4) calibration block (5mm thickness)
- (5) battery compartment (open)

# 8 Certificate of Conformance

Translation

Physikalisch-Technische Bundesanstalt  
Braunschweig und Berlin (Federal Institute of Physics and Metrology)

PIB



(1) **EC-Test Certificate for Design Samples**

(2) Devices and protective systems to be duly used in potentially explosive atmospheres  
- Directive 94/9/EC

(3) Number of EC-test certificate for design samples

**PTB 97 ATEX 2231 X**

(4) Device: Echo meter type 1071 - Ex

(5) Manufacturer: ECOM Rolf Nied GmbH

(6) Address: D-97959 Assamstadt

(7) The design of this device as well as its different permissible variations are stipulated in the appendix to this test certificate for design samples.

(8) The Physikalisch-Technische Bundesanstalt (Federal Institute of Physics and Metrology) certifies as qualified authority no. 0102 according to article 9 of the directive of the European Council dated 23rd March 1994 (94/9/EC) that this device meets the basic safety and health requirements for design and construction of devices and protective systems to be duly used in potentially explosive atmospheres according to appendix II of the directive.

The results of the tests are described in the confidential test records PTB Ex 97-27224.

(9) The basic safety and health requirements are met in accordance with

EN 50014:1997

EN 50020:1994

(10) If the sign "X" is printed after the number of the certificates, special conditions for the safe operation of the device are mentioned in the appendix to this certificate.

(11) This EC-test certificate for design samples only refers to the construction and design of the specified device according to the directive 94/9/EC. Further requirements included in this directive apply to the manufacturing, marketing and selling of this device.

(12) The device must be marked with the following:

**Ex II 2(1)G EEx ia IIC T4**

Certifying Authority Ex-proofness  
By order (signature and stamp)  
Dr.-Ing. U. Johannsmeyer  
Regierungsdirektor

Braunschweig, 7th January 1998

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EC-test certificates for design samples without signature and official stamp are invalid.  
This EC-test certificate for design samples must be reproduced in full.  
Excerpts or alterations must officially be approved by the  
Physikalisch-Technische Bundesanstalt  
(Federal Institute of Physics and Metrology) Bundesallee 100 - D-38116 Braunschweig

Physikalisch-Technische Bundesanstalt  
Braunschweig und Berlin (Federal Institute of Physics and Metrology)

PIB



(13) **Appendix**

(14) **EC-Test Certificate for Design Samples PTB 97 ATEX 2231 X**

(15) Description of the device

The echo meter type 1071 - Ex serves the calculation of wall thickness of sound conducting material. The device complies with category 2, the sensor complies with category 1.

Electrical data  
Supply U = 3 V, 2 pcs. of batteries Alkaline AA  
(internal battery) according to IEC LR6

Measuring circuitry type of protection inherent safety EEx ia IIC  
(sockets) only for connection with relevant measuring heads with following marking  
EDSE 18/25PB 1.5  
EDSE 10.4/6PB4  
EDSE 4.2/4P8

(16) Test record PTB Ex 97-27224

(17) Particular conditions

1. The batteries of the echo meter are only to be replaced outside potentially explosive atmospheres.
2. Within potentially explosive atmospheres the echo meter is only to be operated in a leather bag.

(18) Basic safety and health requirements  
Covered by standards.

Certifying Authority Ex-proofness  
By order (signature and stamp)  
Dr.-Ing. U. Johannsmeyer  
Regierungsdirektor


Braunschweig, 7th January 1998

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Physikalisch-Technische Bundesanstalt  
(Federal Institute of Physics and Metrology)  
Bundesallee 100 - D-38116 Braunschweig

Certified English Translation  
The translation of the official document issued in German language is TRUE, CORRECT and COMPLETE to the best of my knowledge.

Sersheim, 12th January 1998

  
(Signature)  
Claudia Salamon, Translator (BDÜ)  
Alleenstraße 17/1, 74372 Sersheim, FRG,  
Tel: 07042/32984 - Fax: 07042/34663

ECOM Rolf Nied GmbH

**Erklärung der EG-Konformität**  
**Declaration of EC-Conformity**  
**Attestation de conformité CE**

Wir / We / Nous

**ECOM Rolf Nied GmbH**  
**Industriestraße 2**  
**D-97959 Assamstadt**

erklären in alleiniger Verantwortung / declare under our sole responsibility / attestons sous  
notre responsabilité  
daß unser Produkt / that the product / que le produit

**1071-Ex**

auf welches sich die Erklärung bezieht / to which this declaration relates / se référant à cette  
attestation  
den Bestimmungen der folgenden Richtlinien entspricht / is in accordance with the provision  
of the following directives / correspond aux dispositions des directives suivantes

**89/336/EWG EG-EMV-Richtlinie** geändert durch **92/31/EWG**

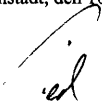
und mit folgenden Normen oder Dokumenten übereinstimmt / and is in conformity with the  
following standards or other normative documents / et est conforme aux normes ou documents  
normatifs ci dessous

**EN 50081-1 (VDE 0839 Teil 81-1)**

**EN 50082-2 (VDE 0839 Teil 82-2).**

ECOM Rolf Nied GmbH

Assamstadt, den 10.07.98



Rolf Nied  
Geschäftsführer

**ECOM**  
**INSTRUMENTS**

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