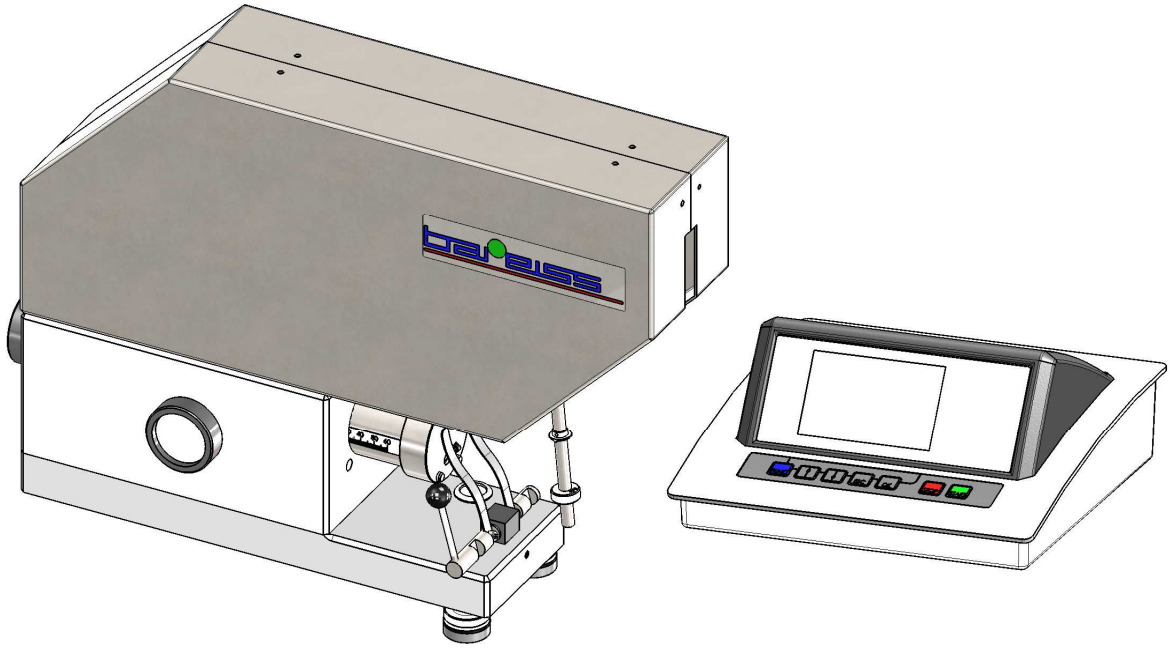
testing solutions since 1954

Operating instructions



Resilience- A-Elasticity Tester

Translation of original operating instructions

Although the information contained in these operating instructions was controlled carefully for accuracy and completeness, no liability can be taken for errors or omissions.
These operating instructions may not be multiplied partly or completely in any kind or translated to another language without the previous written consent.
Keep for future application! Technical changes without notice!

List of Contents

1 Safety hints

While working with Resilience-A-Elasticity Tester named as testing device in the following text, you should follow the following hints:

- Warning!
  All works are to be made only while power supply is disconnected:
  Pull power supply plug!
- The Testing device may only be used for determination of the resilience elasticity on material as described under Ranges of Application.
- Works on testing device may only be done by authorized persons.
- Before the Testing device is opened, the plug of power supply has to be unplugged.
- The Testing device is to be sheltered from dusty, oily, greasy and metal-dusty air, sources of heating (direct sun beaming, ovens), humidity, wetness and vibration as well as from damage caused by falling down.
- For cleaning of testing device you should only use smooth cleaning agents in order to avoid damaging the surfaces. The cleaning cloth should be soft and lint free.
- Alcohol, gasoline or other easily inflammable substances may not be used. The application of such substances can lead to fires.
- Possible danger of injury by squeezing by pendulum hammer within pendulum area.

2 Ranges of application

2.1 Resilience-A-Elasticity Tester

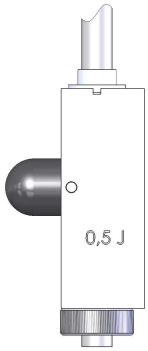
test method	range of application	standards
pendulum-principle acc. to Schob	evaluation of the elasticity characteristics of elastomers	DIN 53512 ASTM D 1054 ISO 4662
	evaluation of the elastic suspension of flexible pulps and hospital mattresses made from polyether foam acc. to DIN 13014	DIN 53573 (valid until 04/98)

2.2 Tempering Module (Option)

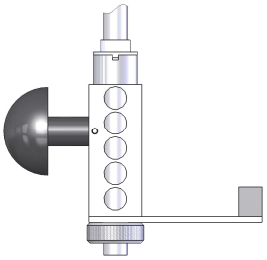
Appropriate application
The tempering module is for the heating of 2 specimens within the range of 20 °C and 100 °C.
The tempering module may only be used in combination with our Resilience-A-Elasticity Tester.

3 Technical details

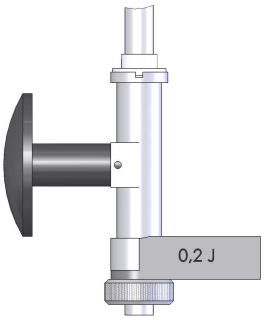
3.1 Pendulum hammer 0,5 J-hammer edge-hemisphere of Ø 15 mm

hammer edge	pendulum hammer	range of application	standards	specimen
	pendulum hammer 0,5 J hammer edge hemisphere Ø 15 mm	Elastomers 30 up to 85 Shore A	DIN 53512 ISO 4662 ASTM D 1054	thickness 12,5 ± 0,5 mm diameter 29 - 53 mm

3.2 Pendulum hammer 0,2 J-hammer edge-hemisphere of Ø 30 mm (Option)

hammer edge	pendulum hammer	range of application	standards	specimen
	pendulum hammer 0,2 J hammer edge hemisphere Ø 30 mm	soft elastic foams	DIN 53573 shape A	thickness 50 ± 2 mm square lateral length 80 x 80 mm

3.3 Pendulum hammer 0,2J cyl. Ø40mm with spherical cone r=40mm (Option)

hammer edge	pendulum hammer	range of application	standards	specimen
	pendulum hammer 0,2 J hammer edge cylinder Ø 40 mm with spherical cone r = 40 mm	soft elastic foams	DIN 53573 shape B	thickness 50 ± 2 mm square lateral length 80 x 80 mm

4 Start-Up

4.1 Control of Contents

Check supplied equipment for completeness and soundness, see "delivery note".

4.2 Installation of Resilience Elasticity Device

4.2.1 Unpacking of Resilience Elasticity Device

Mind your spine - the weight is about 30kg!

Pay attention that you take out the resilience elasticity device at its bottom plate!
Don't lift it at its cover. Danger of damage!
Squeezing danger of uncontrolled moving parts.

- Loosen transport screws (2.01) at bottom of wooden box (2.00) and take Resilience Elasticity Device (1.00) out carefully.
- In order to take out further accessories, the board (2.02) has to be removed; therefore loosen wooden screws (2.03).
- Take Resilience Elasticity Device out of wooden box.

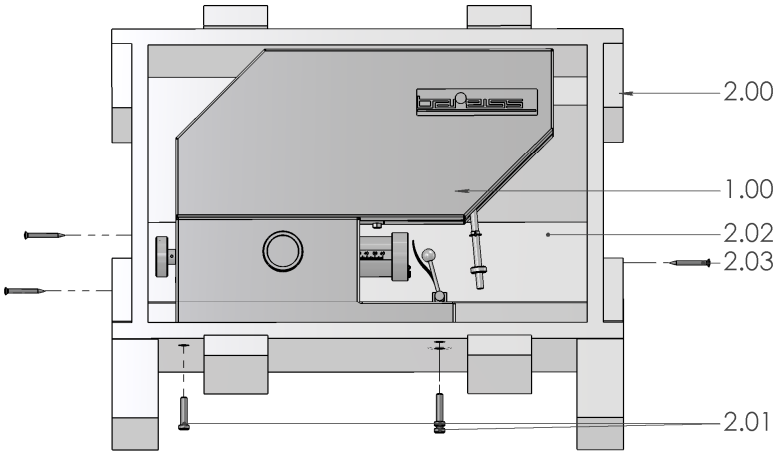


FIG. 1 UNPACKING OF RESILIENCE ELASTICITY DEVICE

4.2.2 Setting up of Resilience Elasticity Device

⚠ The Resilience Elasticity Device has to be placed on a stabile base with anti-gliding surface in order to avoid a sliding when pendulum hammer impacts specimen and wrong measurements caused by this!
Take care of pendulum area! Sufficient expansion place for movement of pendulum should be!

- Screw foot screws (1.02 / 1.01) into tapped holes at bottom of Resilience Elasticity Device (1.00).
- Align Resilience Elasticity Device (1.00) horizontally, by rotating foot screws (1.02) while knurled nuts (1.01) are loosened, until the bubble is within the ring of the levelling indicator (1.03).

⚠ Tighten knurled nuts (1.01).

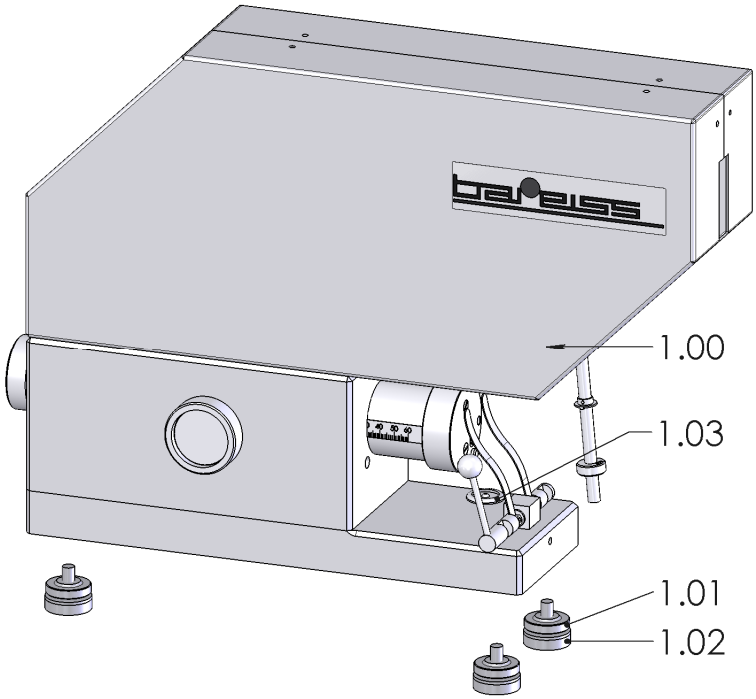


FIG. 2 HORIZONTALLY ALIGNMENT OF RESILIENCE ELASTICITY DEVICE

4.2.3 Connecting Resilience Elasticity Device

- Plug connecting cable “RPA” into socket of Resilience Elasticity Device and tighten screws.

FIG. 3 CONNECTING RESILIENCE ELASTICITY DEVICE

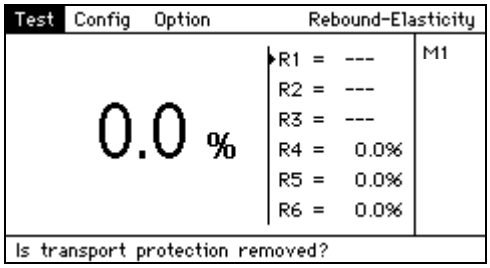
4.3 Assembly of pendulum hammer

- Tear off rubber strap which is for transport protection.

⚠ For return, pendulum bar (1.04) has to be secured by rubber strap.

- Switch on electronic unit by pressing power switch (3.08,Fig.4) **"See electronic unit".**

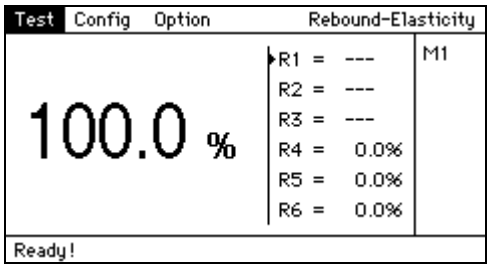
The display reads:



- Confirm by OK.

ⓘ The pendulum bar is moving automatically into its horizontal starting position.

The display reads:



- Push pendulum hammer (1.05) onto pendulum bar (1.04), up to stop disc (1.08), whereby hammer edge (1.07) points down.

ⓘ The pendulum hammer is aligned correctly, when the ridge (1.16) of stop disc looms completely into the slot (1.15) of pendulum hammer (1.05) and is even with stop disc (1.08).

- Fix pendulum hammer (1.05) by knurled nut (1.06) with denomination "0.5 J".

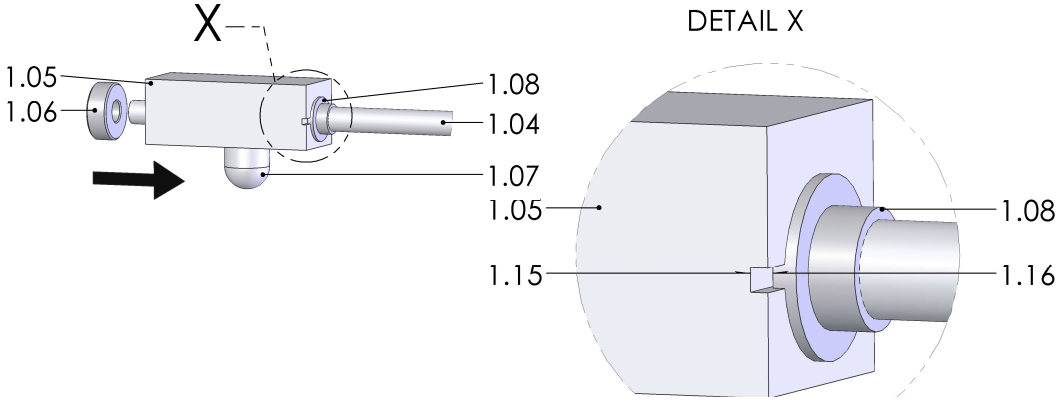


FIG. 4 ASSEMBLY OF STANDARD PENDULUM HAMMER

4.4 Assembly of tempering module

Mind your spine - the weight is about 30kg!

Pay attention that you take out the resilience elasticity device at its bottom plate!
Don't lift it at its cover. Danger of damage!
Squeezing danger of uncontrolled moving parts.

4.4.1 Assembly of the clamping device

- Tear off clamping device with chuck.
- Loosen screws and place chucks at the outer positions.
- Tighten screws again.
- Push clamping device with chuck in the front pick-up device.
- Fasten clamping device with chuck by tighten screws.

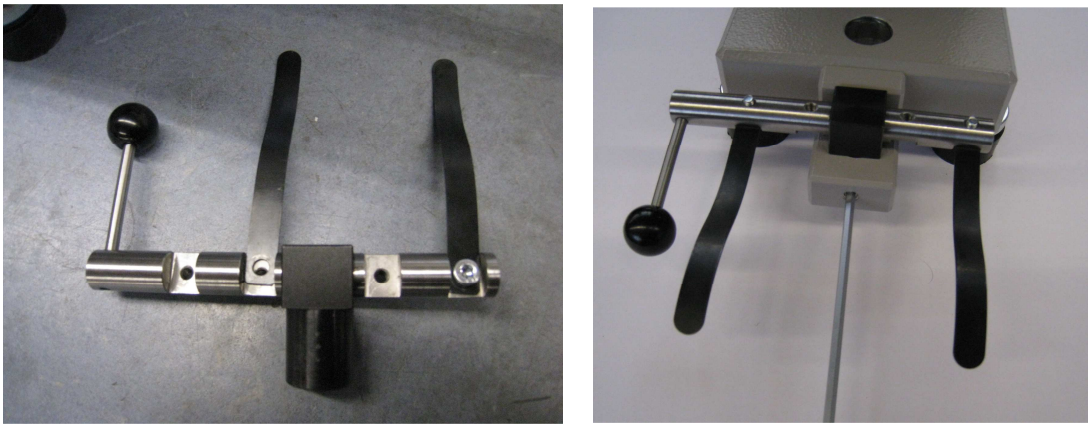


FIG. 5 ASSEMBLY OF CLAMPING DEVICE

4.4.2 Removing the anvil plate

- Loosen plug and tear off connecting cable for sensor.
- Remove screw while keeping hold of anvil plate.
- Tear off anvil plate.

FIG. 6 REMOVING ANVIL PLATE

4.4.3 Fixation of tempering module with anvil plate

- Tighten tempering module as shown.

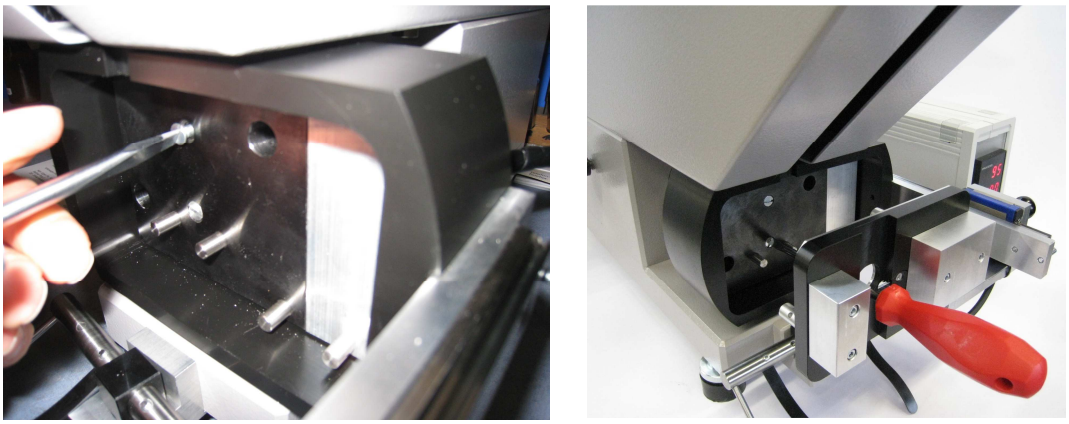


FIG. 7 FIXATION OF TEMPERING MODULE WITH ANVIL PLATE

4.4.4 Fixation of sensor cable

- Tighten sensor cable.

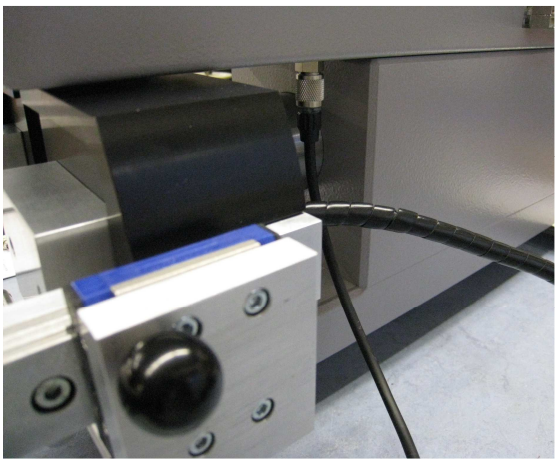


FIG. 8 FIXATION OF SENSOR CABLE

5 Working with tempering module

5.1 Loading of tempering module

- Put in the samples.
- Fix tempering module by the chuck and close it by cap.

1 = Place for preconditioning at the same temperature

ATTENTION HOT!

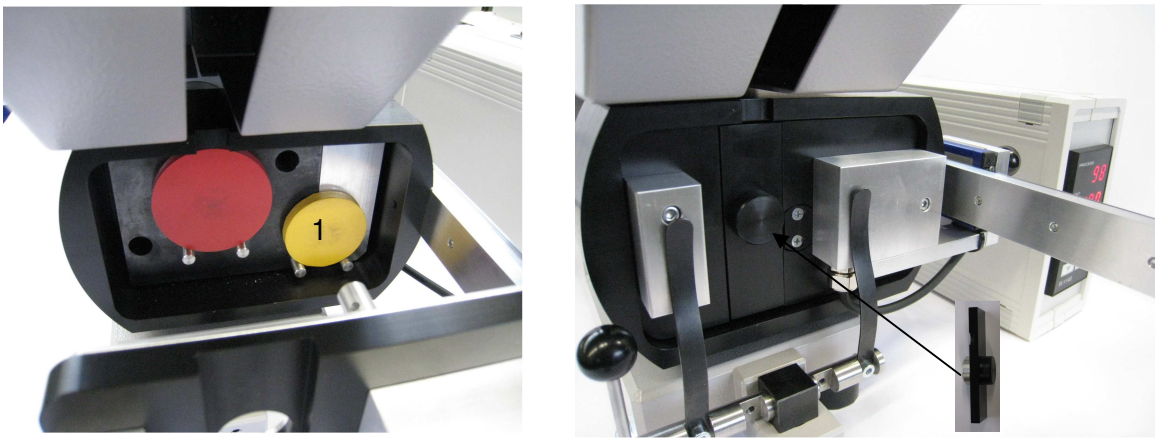


FIG. 9 LOADING AND CLOSING OF TEMPERING MODULE

5.2 Connections of temperature control

- Connect the tempering module and the temperature control by green plug.
- Plug in power supply cable and connect it to power supply.

FIG. 10 CONNECTIONS OF TEMPERATURE CONTROL

5.3 Heating and preparation of rebound test

- Switch on temperature control by power switch at the rear.
- Put in desired temperature.

The tempering module is heating for selected temperature -> ***see operating instructions "The temperature controller".***

A T T E N T I O N H O T !

The tempering module is configured for the operation up to max. 100°C.
The setting may <u>not</u> be changed in the works level of the temperature controller.

- Take off cap.

Make rebound test as under "***Determination of resilience elasticity***".

FIG. 11 HEATING AND PREPARATION OF REOUND TEST

5.4 Assembly of optional pendulum hammers with anvil plate

Deviating from anvil (1.10) for determination of the resilience elasticity on soft-elastic foams, an optional anvil plate (1.17) as well as a different placement of the clamping springs (1.12) at holding device (1.11) are necessary.
The optional anvil plate (1.17) is to be exchanged in connection with the optional pendulum hammer (1.18).

- Loosen knurled nut (1.06) and pull off pendulum hammer (1.05).
- Loosen plug (1.24) and tear off connecting cable.
- Plug in encoded plug (1.26) and tighten cap nut.

If using the optional equipment, the encoded switch has to be used!
The measurement can only be started when encoded switch is plugged in.
The safety function is off!

- In order to take off the anvil (1.10) remove countersink screws (1.19) while holding the anvil (1.10).

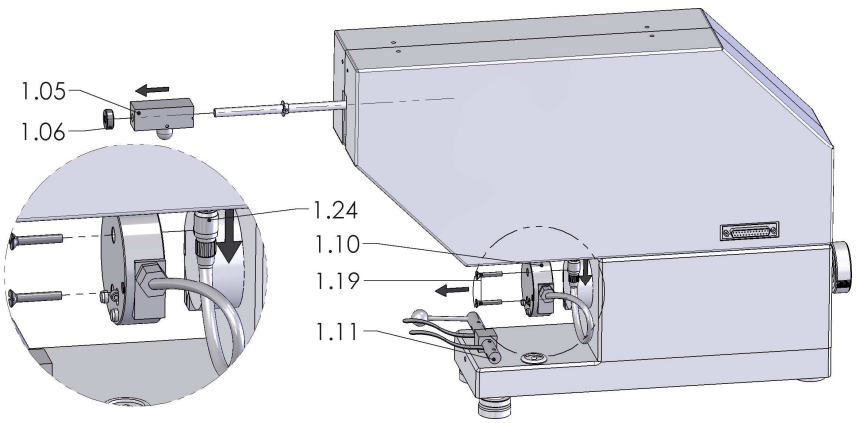


FIG. 12 REMOVING PENDULUM HAMMER WITH ANVIL PLATE

The optional pendulum hammer will be assembled, as already written under "Assembly of pendulum hammer".

For fixation, please use knurled nut (1.20) with denomination "0.2 J".

- Assemble anvil plate (1.17) as shown and fasten it by delivered countersink screws (1.19).
- Place clamping springs (1.12) of holding device (1.11) outward.

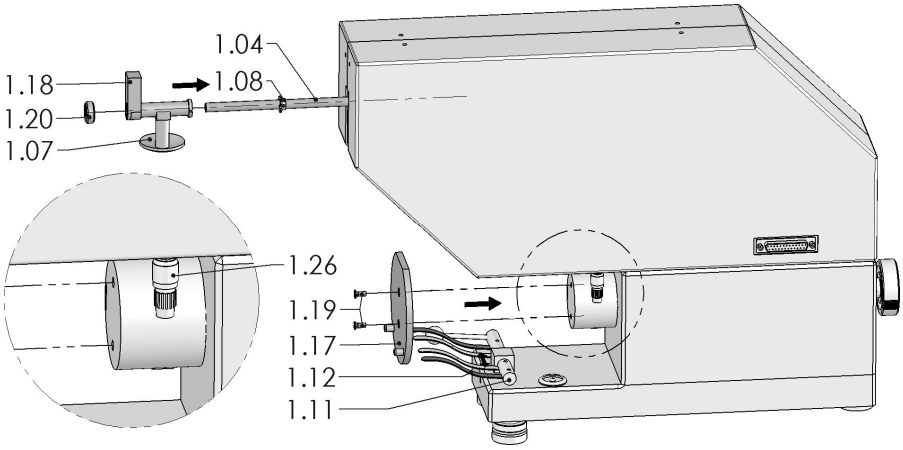


FIG. 13 ASSEMBLY OF OPTIONAL PENDULUM HAMMER WITH ANVIL PLATE

6 Software

requirement:
- digi test II electronic unit = “DTE”
- USB-cable (is delivered)
- Windows PC / notebook
- data processing software (DP-SW) or terminal program
- Internet

The USB-driver is necessary so that the digi test II can be used in connection to a PC/notebook.
You will find the data product-oriented on our website www.bareiss.de under COMPANY/Downloads

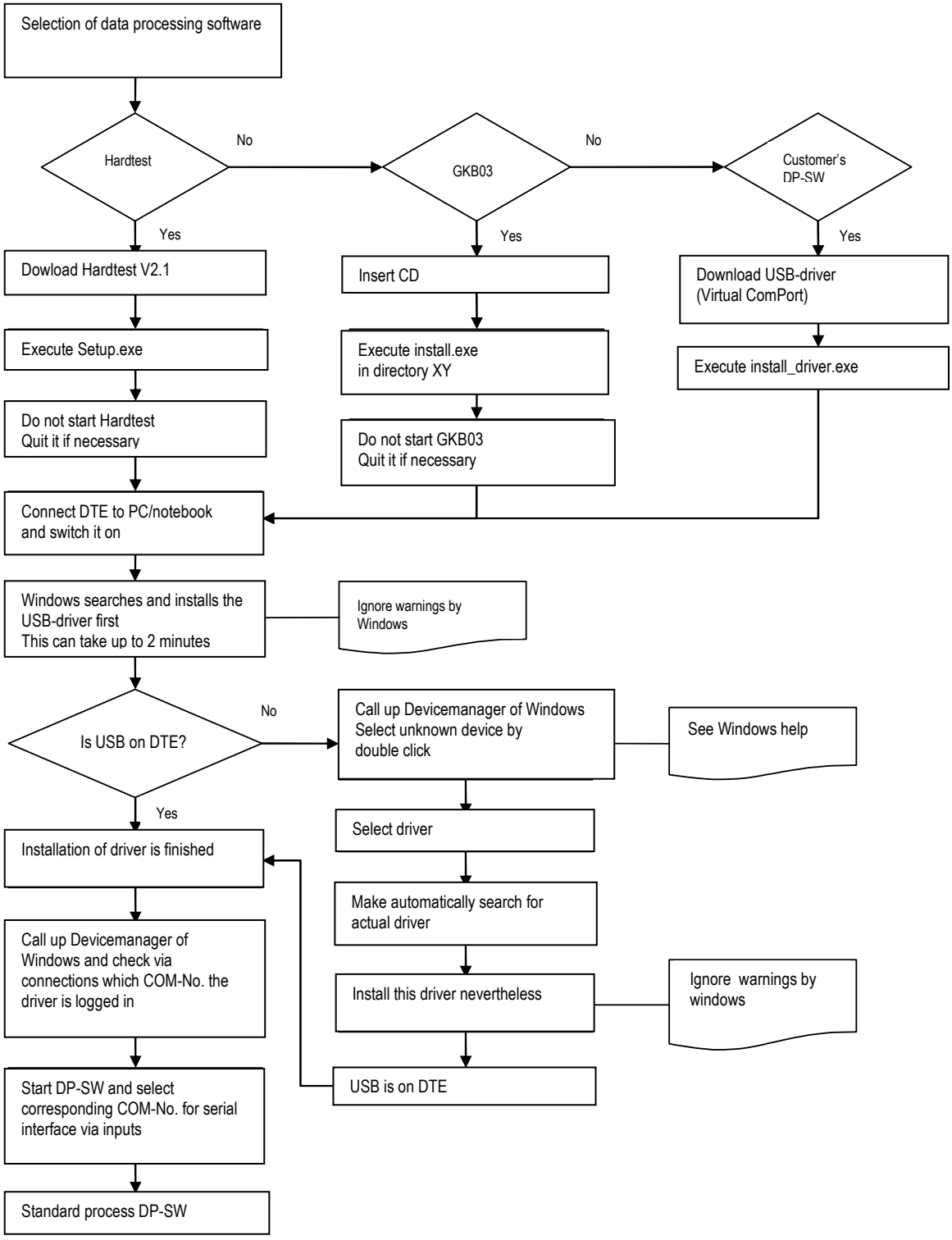
- Open under website: www.bareiss.de
- Push button Service
- Push button Downloads
  - User name: **vertrieb**
  - Password: **BAR9876**
  - Login

You are logged in as: vertrieb

Please logout after Download

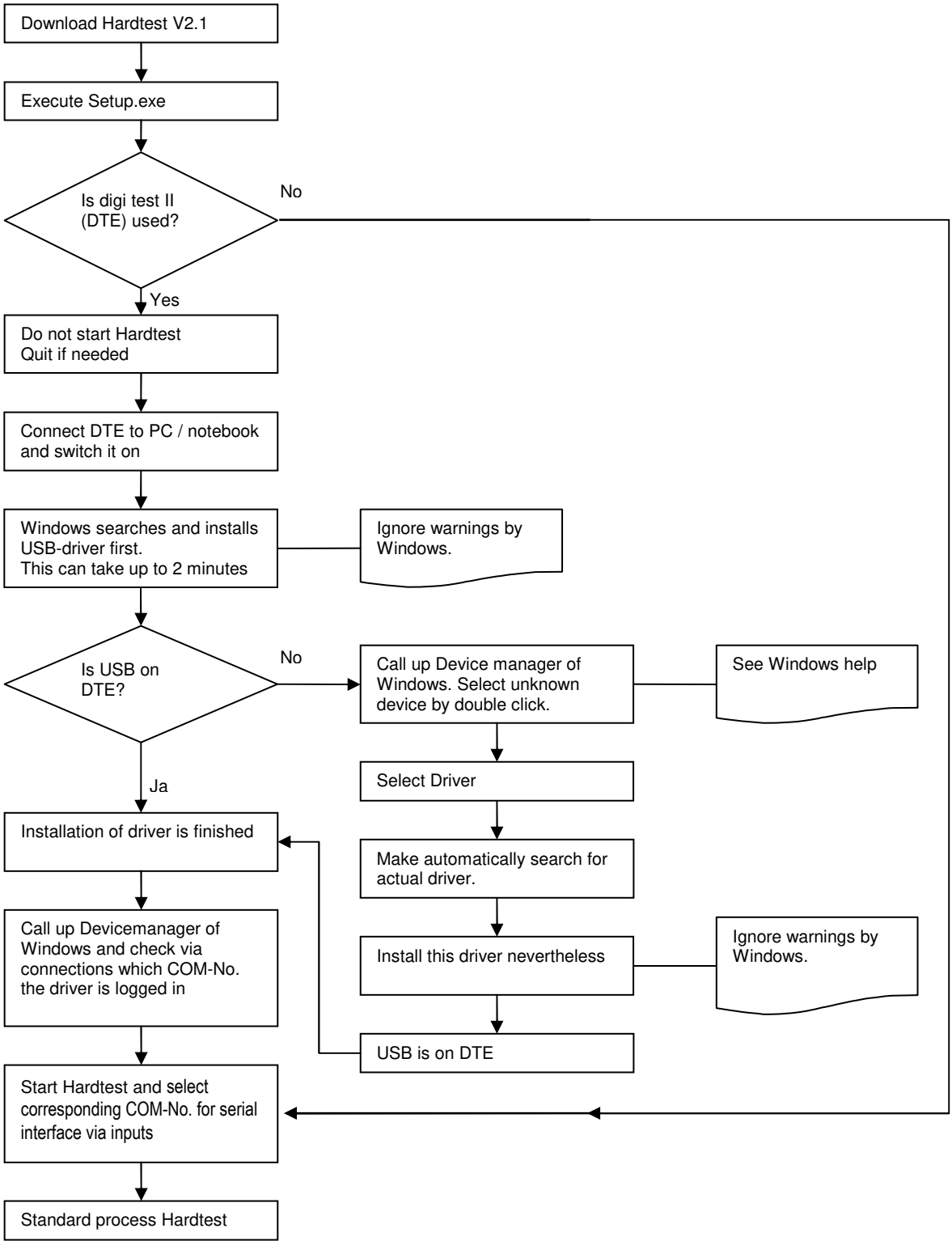
6.1 Installation for Instruction of USB-driver

- Press **USB-driver**



6.2 Hardtest – Instructions of installation and licensing

- Press **Hardtest**



6.3 Registration of Hardtest Software

⚠ The Hardtest Software has to be registered and licensed so that it can be used as a full version.

- Start Hardtest Software
- Click on **?** which is at the tool bar
- Select **Register now**
- Put in data and confirm by **OK**
- Store generated **txt-file**
- Send **txt-file** to **sales@bareiss.de** or
  per Fax to: +49 7305 9642 22

6.4 Licensing of Hardtest Software

- Start Hardtest Software
- Click on **?** which is at the tool bar
- Select **Input of license data**
- Put in **received license data** and confirm by **OK**
- Start **Hardtest Software** again

7 Electronic unit

7.1 Function keys, connectors

3.00	electronic unit	
3.01	DISPLAY	reading of different parameters
3.02	FUNC	operating modes
3.03	Arrow-keys	selection of menu
3.04	ESC	back to activated value
3.05	OK	acceptance
3.06	STOP	interruption of measurement
3.07	START	start of measurement
3.08	power switch	
3.09	sockets of	no function
3.10	Resilience Elasticity Device	Sub-D-plug with 15-poles
3.11	serial interface RS 232	
3.12	USB interface	
3.13	Socket for power supply connection	
3.14	Spare fuse	

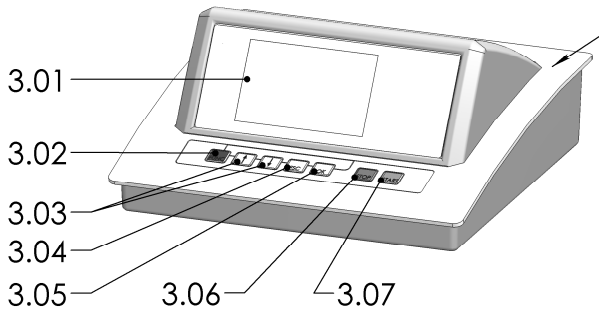


FIG. 14 ELECTRONIC UNIT FRONT

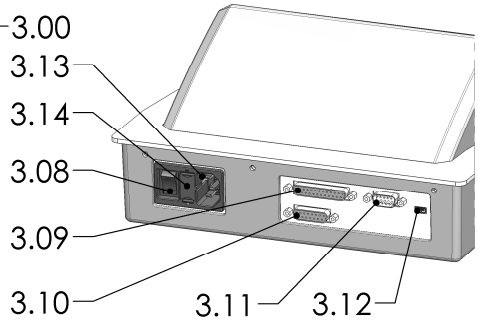


FIG. 15 ELECTRONIC UNIT REAR

7.2 Connecting electronic unit

- Place electronic unit (3.00) beside Resilience Elasticity Device.
- Plug connecting cables “DTE II” of Resilience Elasticity Device into sockets (3.09 and 3.10) of electronic unit and tighten screws.
- Plug power supply cable into socket for power supply (3.13) of electronic unit.
- Make connection to electricity mains by power supply cable.

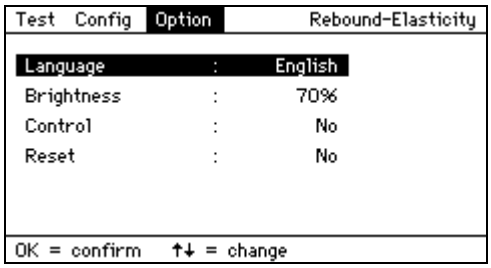
7.3 Input of parameters

- Pressing the function key (3.02, Fig.3) you move between Test / Config / Option.
- Pressing OK-key you confirm the input and move to next parameter line.
- Pressing ESC-key the original setting is indicated.
- Pressing the Arrow-keys the settings are changed.

7.3.1 Input of language and brightness

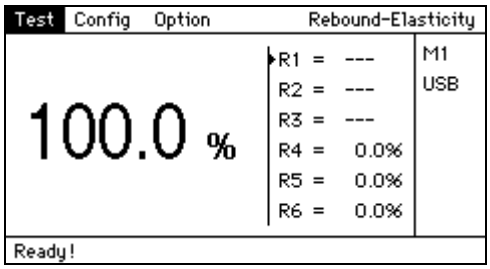
- Press "FUNC" (3.02,Fig.3)

until display reads:



- Select language by pressing arrow keys and confirm by "OK".
- If wanted, select brightness by pressing arrow keys and confirm by "OK". Press "OK" 3.05,Fig.3) until

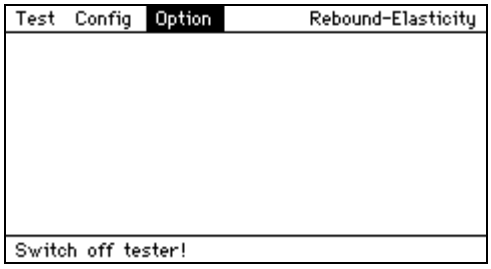
display reads for measurement acc. to standards:



7.3.2 Parking function

- Press "FUNC".
- Select function “Parking” by pressing the arrow-keys and confirm by "OK"

until display reads:



The pendulum bar is lowering automatically.

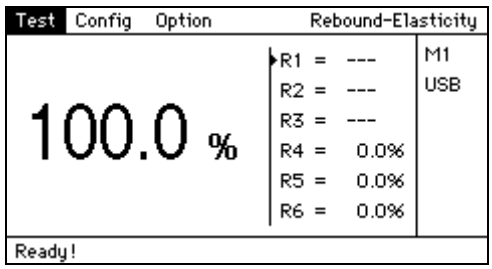
- Switch off testing device by power switch.

The function “Parking” is only needed for transport of testing device!
See "Info for return of goods“.

8 Determination of resilience elasticity

8.1 Switching on the electronic unit

9 Switch on electronic unit (3.00,Fig.3) by power switch (3.08,Fig.4).

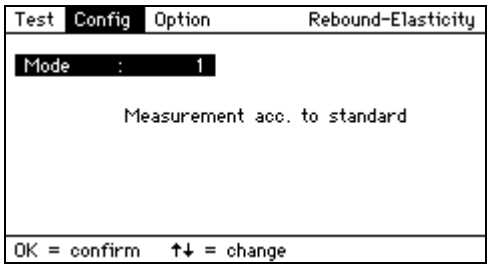


The display reads:

8.2 Setting of measurement acc. to standards

- Press "FUNC" (3.02,Fig.3)

until display reads:



- Confirm by "OK" (3.05,Fig.3) (factory setting)

The measurement acc. to standards is activated.

8.3 Procedure of measurement acc. to standards

The pendulum is dropped 6times from horizontal position to the same place of the specimen (1,25) and caught or stopped before the repeated impact on specimen.
The first three impacts serve for mechanical conditioning of the specimen.
The resilience elasticity will be read for the 4^{th}, 5^{th} and 6^{th} impact.
A median value will be calculated from these 3 readings.

9 Settings for Standard Device without Tempering

9.1 Setting of specimen thickness

- Loosen clamping of center sleeve (1.21).
- Set specimen thickness (1.25) by hand wheel (1.23) according to scales (1.22).
- Tighten clamping of center sleeve (1.21).

9.2 Insertion of specimen

- Rotate holder (1.11) down.
- Insert specimen whereby holding it.
- Rotate holder back.

Safety function by sensor (1.14):
The measurement can only be started when a specimen according to standards is inserted. For specimens of deviating dimensions the safety function may not be activated because of too less contact pressure onto sensor or if the sensor is not operated.

Using the resilience elasticity device with pendulum hammers of 0.2 J and the corresponding anvil plate, an encoded plug (1.26, Fig.7) is plugged in and the safety appliance, mentioned above, is deactivated.

The specimen is fixed by holder.

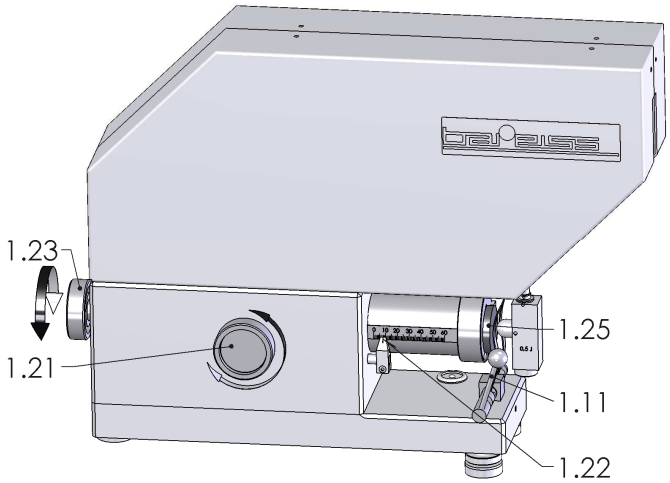


FIG. 16 SETTING OF SPECIMEN THICKNESS AND INSERTION OF SPECIMEN

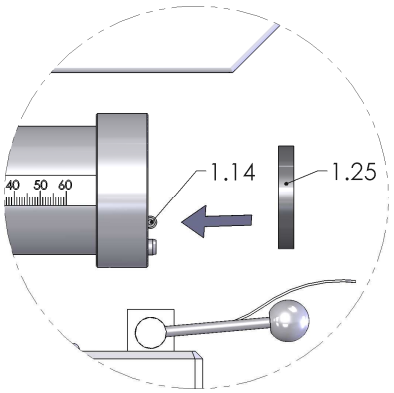


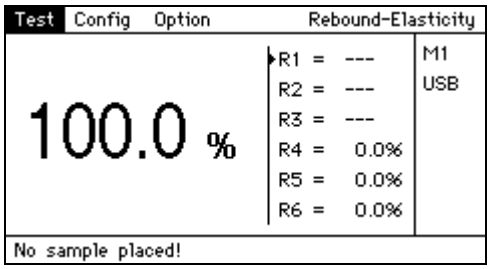
FIG. 17 SENSOR

9.3 Measuring procedure acc. to standards

- Confirm by START (3.07,Fig.3).

If no specimen is inserted, the measurement cannot be started because safety function is activated by sensor and

display reads:

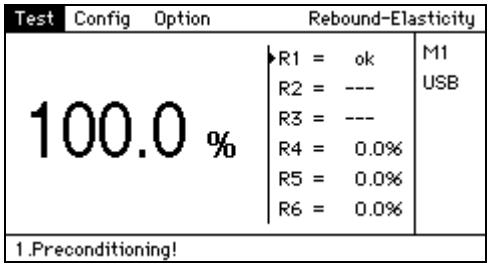


Possible danger of injury by squeezing by pendulum hammer within pendulum range.

Keep hands out of pendulum range during measuring procedure.

- Press START.

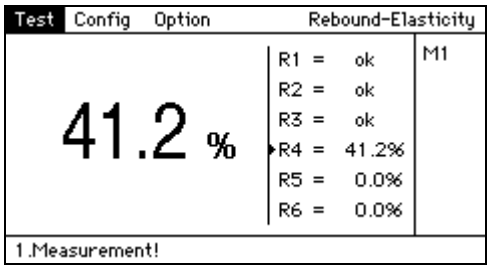
The measurement acc. to standards is running down automatically and the display reads the single steps, as follows:



Hereby the preconditioning are read:

1. Preconditioning - R1 = ok
2. Preconditioning - R2 = ok
3. Preconditioning - R3 = ok

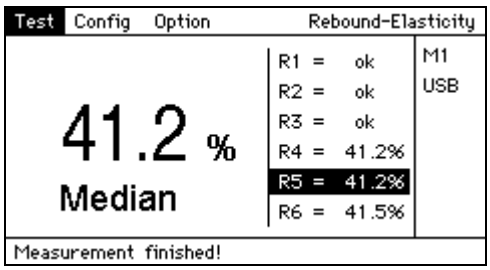
The display reads e.g.:



Hereby the three measurements are read:

1. Measurement - R1 = 41,2 %
2. Measurement - R1 = 41,2 %
3. Measurement - R1 = 41,5 %

The display reads e.g.:



The Median value is read and sent to the PC via the interface.

9.4 Start of next measurement

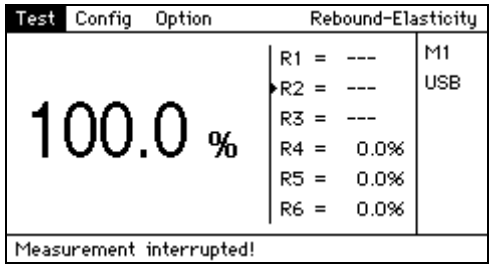
- Place next specimen (1.25,Fig.8) at the anvil (1.10,Fig.6) and fix it by Holder (1.11,Fig.8).

Proceed as under "Measuring procedure acc. to standards".

9.5 Interruption of measuring procedure

- Press STOP in order to interrupt measuring procedure (3.06,Fig.3).

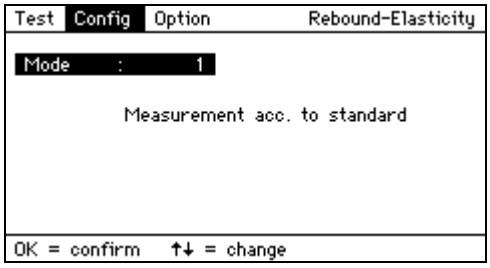
The display reads:



9.6 Setting of single measurement

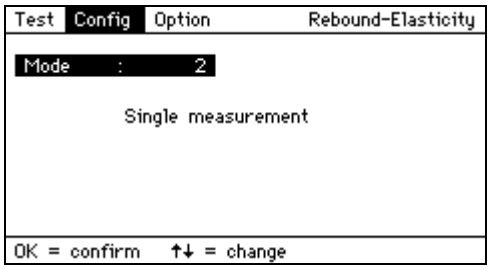
- Press "FUNC" (3.02,Fig.3)

until display reads:



- Set single measurement by arrow keys.

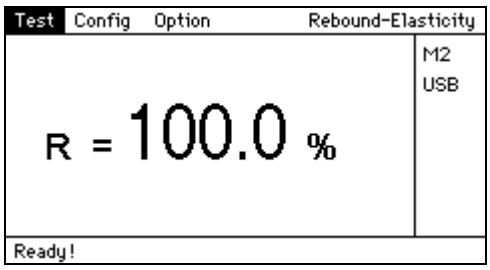
The display reads:



- Confirm by OK (3.05,Fig.3).

The single measurement is activated.

The display reads:



Go on as under "Measuring procedure acc. to standards".

After successful procedure the display reads the rebound value in %.

The measured value is read after each measurement and transferred to PC via interface.

10 Control of friction

10.1 Setting of control procedure

The standards recommend a regular control of friction of the guidance of pendulum by help of the number N by 50 oscillations in a given time of 44,6 up to 45,06 s. When number N will not be reached, the Resilience Elasticity Device does not produce reliable results.

See **"Troubleshooting"**

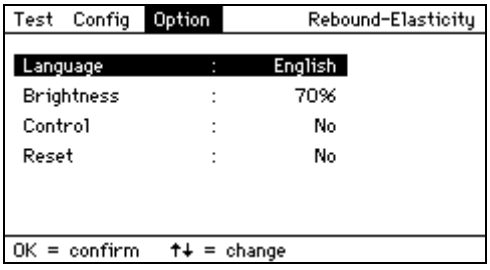
10.2 Control procedure

- Switch on electronic unit by power switch (3.08,Fig.4).

The display reads the selected test mode:
measurement acc. to standards or single measurement, as described

- Loosen clamping of center sleeve (1.21).
- Set specimen thickness (1.25) for **"30"** by hand wheel (1.23) according to scales (1.22).
- Tighten clamping of center sleeve.
- Rotate holder (1.11) down.
- Remove specimen.
- Press FUNC (3.02,Fig.3).

until display reads:



- Press OK until black bar is on control.
- Activate control by arrow keys.
- Confirm by OK (3.05,Fig.3).

The control procedure is running down automatically.

The display reads: 50 T is determined! Please wait!
A signal sound informs about the end of the control procedure.
The display (3.01,Fig.3) reads the number of collected oscillations and needed time.

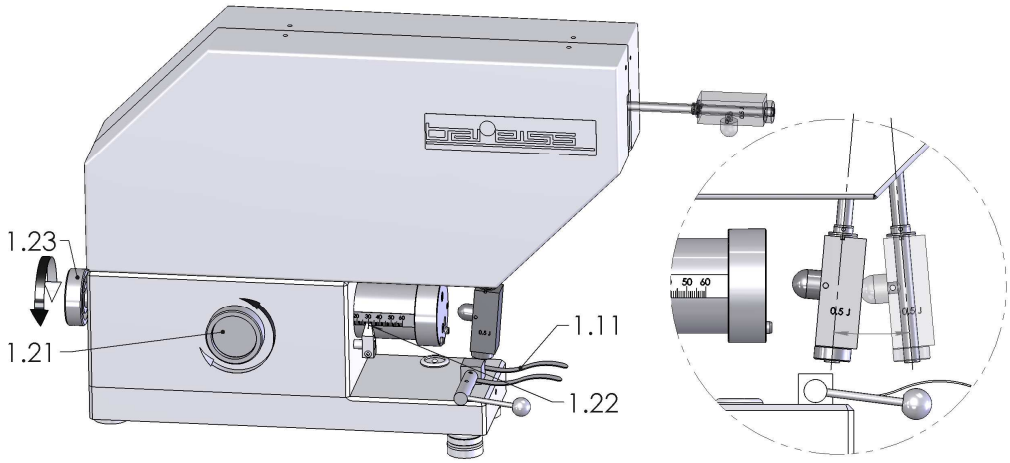
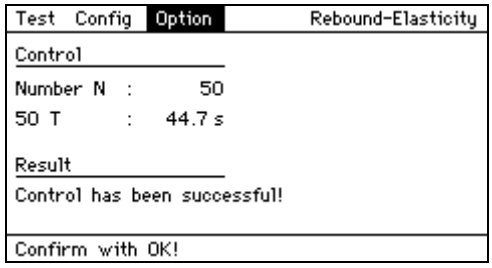


FIG. 18 CONTROL PROCEDURE

If control has been successful

the display reads



- Confirm by OK.

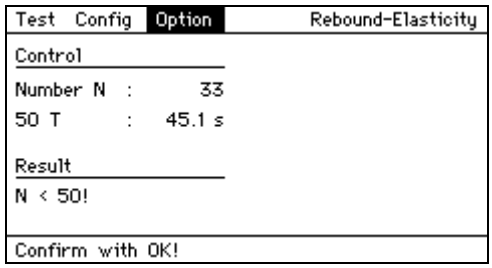
The pendulum moves back to its horizontal starting position and the display reads the preselected measurement

- Insert specimen whereby you hold it.
- Rotate holder (1.11) back.

The specimen is fixed by holder.

If number of oscillations has not been reached in given oscillation time

the display reads:



- End control procedure by OK. Contact our address partners.

10.3 Interruption of control procedure

- Press ESC (3.04,Fig.3) for interruption of control procedure.

A double signal sound informs about the interruption of the control procedure.

The pendulum moves back to its horizontal initial position and display reads the preselected measurement.

11 Technical data

voltage	power supply set INPUT: 100 – 240 VAC; 50/60 Hz OUTPUT: 3,3 VDC
kind of protection	IP 20
resolution	0.1 %
test method	Resilience Elasticity test
interface RS 232	9600 Baud, 1 Start bit, 8 Data bits, 1 Stop bit
interface USB	
capacity	0,5 J und 0,2 J
pendulum length	200 mm
drop angle of pendulum	90°
impact speed	2 m/s
range of specimen thickness	0 ... 60 mm
scales value	1 mm
dimensions (LxWxH)/weight	rebound device: 200 x 250 x 570 mm / 33 kg electronic unit: 290 x 260 x 120 mm / 2 kg

12 Volume of delivery

see delivery note

13 Accessories / spare parts

number of article	denomination
51004301	pendulum hammer of 0,5 J hammer edge - hemisphere Ø 15 mm acc. to DIN 53512, ISO 4662, ASTM D 1054
fm01063	pendulum hammer of 0,2 J hammer edge – hemisphere of Ø 30 mm acc. to DIN 53573 shape A
fm01061	pendulum hammer of 0,2 J hammer edge- cylinder Ø 40 mm, spherical cone r=40 mm acc. to DIN 53573 shape B
fm01062	anvil plate (80 x 80 mm)
wks09130	works calibration certificate

14 Troubleshooting

Problem	Cause	Solution
The testing device does not show any reaction	no power supply cable of power supply is faulty fuse(s) is (are) faulty	Check power supply Renew cable for power supply Replace fuse(s) *
USB - data transfer to PC is not possible USB is not read in display	faulty cable connection no driver is installed installation of driver has failed	Check USB-cable connection Install driver again - if driver has been installed correctly Bareiss driver is read in device manager of system control of Windows
USB - data transfer to PC is not possible USB is read in display	the software program has been started before the testing device has been switched on wrong COM-Port has been set in the program	Switch on testing device first and then start the software. (This is necessary because testing device is logged in Windows as virtual COM-Port and therefore the program can only find the COM-interface after the log in. Set correct COM-Port
The measurement cannot be started	No specimen inserted Dimensions of specimen are too small in order to activate sensor encoded plug is unplugged	Insert specimen  **see insertion of specimen** Take care that specimen has got the corresponding dimensions acc. to standards Plug in encoded plug  **see assembly of optional pendulum hammers with anvil plate**
wrong measuring result	the friction is too big Specimen is not fixed correctly	 **see "control procedure"** Check fixation of specimen
Number N < 50	the friction is too big	 **see "control procedure"**
* Switch off testing device and pull off power supply plug when replacing fuses Loosen the fixation of the fuse holder by delivered screw driver and pull it out - see electronic unit After replacement of the fuse(s) push fuse holder until it clicks.		

15 Conditions of warranty

The duration of the warranty please take from our common business conditions "AGB's" (see: www.bareiss.de)

There is no claim of guarantee for damages or faults caused by:

- ignoring the correct connection
- inappropriate handling
- neglecting the operating instructions
- repair works on testing device by persons without authorization
- removing the type plates

16 Info for return of goods

Dear Customer,

We ask you to test the machine before you return it to us because there could be e.g. a defect or malfunctioning due to wrongly selected parameters.
If there should be some uncertainties we are glad to be of help for you by our telephone / fax / E-Mail service.
In order to avoid further inquiries, give us please a precise error description.

For return of goods:

- you have to remove foot screws (1.02) of Resilience Elasticity Device (3 pieces)
- you have to screw pendulum hammer (1.05) off and pack it separately
- you have taken care that pendulum bar is in its “parking” position and the pendulum bar (1.04) is secured by transport protection (1.13) (see assembly of pendulum hammer).
- you have to tighten the Resilience Elasticity Device by transport securing screws (2.01) at the bottom of the wooden box.

The Resilience Elasticity Device and the electronic unit should be sent back in the original packing. A transport-suitable packing protects against transport damages..

BAREISS PRÜFGERÄTEBAU GmbH
DAkkS / **DKD** - calibration laboratory
Breiteweg 1
D - 89610 Oberdischingen
Germany

Fon: +49-7305/9642-0
Fax: +49-7305/964222
info@bareiss.de
www.bareiss.de
www.bareiss-germany.com

17 Disposal

The disposal of the instrument is to be accomplished according to the local disposal regulations.
Dispose the packing clean according to sorts.

18 Care

Warning!
All works on testing device may only be done without connection to power supply:
⚠ Pull off Power supply plug!
For cleaning of instrument only mild and inflammable cleaners should be used, in order to avoid damages of the surfaces of the electronic unit.
Alcohol, gasoline or other easily inflammatory substances may not be used for the cleaning or maintenance of the instrument. The use of such substances can lead to fires.

19 Declaration of conformity

EG – declaration of conformity

acc. to EC Machinery Directive 2006/42/EG appendix II 1. A

Manufacturer: Bareiss Prüfgerätebau GmbH
Breiteweg 1
D-89610 Oberdischingen

We hereby declare that the product: **Resilience- A-Elasticity Tester**
conforms to the above-mentioned Directive
The machine conforms to:
- low voltage 2006/95/EG and
- EMV 2004/108/EG

Applied harmonized norms:
M-RL - EN ISO 12100:2010
- DIN EN ISO 13857:2008
- DIN EN ISO 13849-1
NS-RL - DIN EN 61010-1:2011
EMV-RL - DIN EN 61326-1:2006

Authorized representative: Mr. Harald Glöggler
Address: see address of manufacturer

Oberdischingen, 07.01.2011

Place / Date Head of sales

20 List of figures