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A  General

1 | Preface

Thank you for opting for a Grünbeck product. Backed by decades of experience in the area of water treatment, we provide solutions for all kind of processes.

Drinking water is classified as food and requires particular care. Therefore, always ensure the required hygiene in operating and maintaining systems involved in the drinking water supply. This also applies to the treatment of water for industrial use if repercussions for the drinking water cannot completely be excluded.

All Grünbeck systems and devices are made of high-quality materials. This ensures reliable operation over many years, provided you treat your water treatment system with the required care. This operation manual assists you with important information. Therefore, please read the entire operation manual before installing, operating or maintaining the system.

Customer satisfaction is our prime objective and providing customers with qualified advice is crucial. If you have any questions concerning this system, possible extensions or general water and waste water treatment, our field staff, as well as the experts at our headquarters in Hoechstaedt, are available to help you.

Advice and assistance

For advice and assistance please contact your local representative (see www.gruenbeck.com) in case of emergency, please get in touch with our service hotline at +49 9074 41-333. We can connect you with the appropriate expert more quickly if you provide the required system data. In order to have this information handy at all times, please copy the data indicated on the type designation plate to the table in chapter C-1, paragraph 1.

2 | How to use this operation manual

This operation manual is intended for the users of our GENO-therm® analysis case. It is divided into several chapters, which are listed in the “Table of contents” on page 2 in alphabetical order. In order to find the specific information you are looking for, check for the corresponding chapter on page 2.

The headers and page numbers with chapter information make it easier to find your way around in the manual.
3 | General safety information

3.1 Symbols and notes

Important information in this operation manual is characterised by symbols. Please pay particular attention to this information to ensure the hazard-free, safe and efficient handling of the system.

**Danger!** Failure to adhere to this information will cause serious or life-threatening injuries, extreme damage to property or inadmissible contamination of the drinking water.

**Warning!** Failure to adhere to this information may cause injuries, damage to property or contamination of the drinking water.

**Attention!** Failure to adhere to this information may result in damage to the system or other objects.

**Note:** This symbol characterises information and tips to make your work easier.

Tasks with this symbol may only be performed by Grünbeck’s technical service/authorised service company or by persons expressly authorised by Grünbeck.

Tasks with this symbol may only be performed by trained and qualified electrical experts according to the VDE guidelines or according to the guidelines of a similar local institution.

Tasks with this symbol may only be performed by water supply companies or approved installation companies. In Germany, the installation company must be registered in an installation directory of a water company as per §12(2) AVBWasserV (German Ordinance on General Conditions for the Supply of Water).

3.2 Operating personnel

Only persons who have read and understood this operation manual may work with the GENO®-therm analysis case. The safety guidelines in particular are to be strictly adhered to.

3.3 Intended use

The GENO-therm® analysis case may only be used for the purpose outlined in the product description (chapter C). The guidelines in this operation manual as well as the applicable local guidelines concerning drinking water protection, accident prevention and occupational safety must be adhered to. Intended use also includes that the GENO-therm® analysis case and the devices and chemicals inside are only used if they are in good condition. Any malfunctions must be repaired at once.
3.4 Indication of specific dangers

The GENO-therm® analysis case contains chemicals that – if applied incorrectly - may be hazardous to the health and safety of the user or the environment.

Always keep the GENO-therm® analysis case or the components contained inside away from children.

Keep all the components inside the case when they are not in use.

You should not eat, drink or smoke while working.

Properly rinse your devices after each analysis in order to avoid carry-over errors.

4 | Shipping and storage

⚠️ Attention! The GENO®-therm analysis case and its content may be damaged by frost or high temperatures.

In order to avoid damage of this kind:

Protect from frost during transportation and storage!

Do not place or store the GENO-therm® analysis case near objects that radiate a lot of heat.

5 | Disposal of used parts and materials

Used parts and materials are to be disposed of, or made available for recycling purposes, according to the applicable local guidelines.

If a material is subject to specific regulations, adhere to the instructions indicated on the packing.

If in doubt, contact your local waste disposal authority or the manufacturer for more information.
B  Basic information

1 | Laws, regulations, standards

According to VDI 2035 sheet 1 and sheet 2 and DIN EN 14868, heating water has to comply with certain water parameters, so as not to have a corrosive effect or to promote furring. Furring has an adverse effect on the efficiency of the heating system. Corrosion may attack the entire heating system, which can make it necessary to replace individual or several parts of the system.

To avoid this risk, the regulations state that the pH value should be measured 8 - 12 weeks after the initial filling and then once a year. If additives are added to the heating water in order to prevent furring or corrosion, their concentration must be measured every year as well.

2 | pH value

The pH value is defined as a negative, ten-base logarithm of the hydrogen ion concentration. The more acid a solution is, the lower its pH value. pH 7 indicates a neutral solution, whereas higher pH values indicate alkaline conditions.

<table>
<thead>
<tr>
<th>pH value acc. to VDI 2035 for heating systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH value at 25 °C</td>
</tr>
<tr>
<td>8.2 – 10.0</td>
</tr>
<tr>
<td>8.2 – 8.5 for components made of aluminium or aluminium alloys.</td>
</tr>
<tr>
<td>8.2 – 9.0 for components made of selected aluminium alloys according to the manufacturer’s information.</td>
</tr>
</tbody>
</table>
3 | Conductivity

Conductivity refers to the total of all salts dissolved in the water. It is well-known that water conducts electricity better, the more salts it contains. The ions of these dissolved salts can only be determined by measuring the electrical conductivity, the measuring unit being $\mu$S/cm.

4 | Total hardness

Total hardness refers to the sum of all alkaline earth ions (mainly calcium and magnesium) dissolved in the water. The hardness is measured in German degrees of hardness ($^\circ$dH) or mmol/l. The greater the hardness contained in the (heating) water, the more deposits can be formed.

5 | Molybdenum concentration

Molybdenum is a metal of the chromium group. In GENO®-safe A, molybdenum is present as molybdate, which can combine with surfaces (made of steel, copper and aluminium) to form a protective layer. This protective layer acts as a protection against corrosion. Check the molybdenum concentration in the (heating) water once a year. If the value is too low, corrosion may occur.
C Product description

1 | Type designation plate

In order to speed up the processing of your inquiries or orders, please specify the data shown on the type designation plate (fig. C-1) of your GENO-therm® analysis case when contacting Grünbeck.

Fig. C-1: Type designation plate of GENO-therm® analysis case

2 | Product components of GENO-therm® analysis case

![Diagram of GENO-therm® analysis case components]

1. Combined measuring device for pH and conductivity
2. Test cup
3. Calibrating solution pH 4
4. Calibrating solution pH 7
5. Calibrating solution for conductivity 1413
6. Storage solution for electrodes
7. Water test kit for total hardness in very soft water
8. Water test kit "Total hardness"
9. Water test kit for molybdenum
10. Type designation plate
3 | Intended use

The analysis case is essential for the proper determination of the heating water as well as the feed water parameters.

By means of the combined measuring device, the pH value and the conductivity (temperature-compensated up to 60 °C) can be measured. Calibrate the device before use in order to ensure correct measurements at all times. The calibrating solutions required to do so are supplied with the case. The corresponding measuring instruments to determine the hardness and to measure the molybdenum concentration are contained in the case (refer to chapter E).

**Note:** If a system was filled with fully demineralised water and then additives (e.g. GENO®-safe A) are mixed in, the conductivity will increase to > 800 µS/cm.

Measuring the molybdenum concentration is required to determine the efficiency of GENO®-safe A. In order to perform the calibration or to take samples, the case also contains three test cups. All individual components can also be ordered separately. Thanks to the analysis case, any parameter that is important for the trouble-free operation of a heating system can thus be determined quickly and easily.

Basically, the pH value, the conductivity, the total hardness and the molybdenum value can be measured in any water. If there are suspended particles in the water, the sample must be filtered prior to the measurement.

4 | Application limits

The prescribed limit values of the various measuring devices and water test kits must be complied with.
### 5 | Scope of supply

#### 5.1 Standard equipment
- Combined measuring device for pH value and conductivity
- Calibrating solutions (5 small bottles)
- Storage solution for electrodes (1 small bottle)
- Water test kit "Total hardness" (2 ranges)
- Water test kit for molybdenum
- Test cup (3 pcs)
- Operation manual

**Note:** It is possible to equip existing GENO-therm® analysis cases with additional accessories. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstaedt for details.

#### 5.2 Optional accessories
- Spare electrode 170 605
- Carbon filter paper 888 09 011
- PE funnel 888 06 006

#### 5.3 Consumables
Only use genuine consumables in order to ensure the reliable operation of the system.
- Water test kit for molybdenum 170 140
- Water test kit "Total hardness" 170 145
- Water test kit for total hardness in very soft water 170 149
- Calibrating solution for conductivity 1413 µS/cm 203 624
- Calibrating solution pH 4 203 627
- Calibrating solution pH 7 203 628
- Storage solution for electrodes 50 ml KCl 3 mol/l 203 631
### 5.4 Spare parts and wearing parts

You may order spare parts and consumables from your local Grünbeck representative (see [www.gruenbeck.com](http://www.gruenbeck.com)).

pH electrodes and batteries (4 x button cell 357 A) are subject to a certain wear and tear.

**Note:** Although these are wearing parts, we grant a limited warranty period of 6 months.
D Combined measuring device

1 | Product components of the combined measuring device

1 Battery compartment
2 Display
3 On/Off key (mode key)
4 Exchangeable pH electrode
5 Temperature sensor
6 Conductivity (EC/TDS) probe
7 SET/Hold key
8 Indicator for automatic temperature compensation
9 Stability indicator
10 Battery charge indicator
11 Indicator for flat batteries
12 Secondary display
13 Primary display (main display of measured value)
14 Units to indicate the measuring result
15 Type designation plate (rear of the device)
16 Sealing cap

Warning! Strictly observe the identification of hazards indicated on the individual components of the packaging!
### Table D-1: Technical specifications

<table>
<thead>
<tr>
<th>Combined measuring device for pH and conductivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measuring ranges</strong></td>
</tr>
<tr>
<td>pH [0.0 - 14.0]</td>
</tr>
<tr>
<td>Conductivity (EC) [µS/cm] 0 - 3999</td>
</tr>
<tr>
<td>TDS [ppm(mg/l)] 0 - 2000</td>
</tr>
<tr>
<td>Temperature [°C] 0.0 - 60.0</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
</tr>
<tr>
<td>pH [0.01]</td>
</tr>
<tr>
<td>Conductivity (EC) [µS/cm] 1</td>
</tr>
<tr>
<td>TDS [ppm(mg/l)] 1</td>
</tr>
<tr>
<td>Temperature [°C] 0.1</td>
</tr>
<tr>
<td><strong>Accuracy (at 20 °C)</strong></td>
</tr>
<tr>
<td>pH ±0.01</td>
</tr>
<tr>
<td>EC ±2 % of the value displayed</td>
</tr>
<tr>
<td>TDS ±2 % of the value displayed</td>
</tr>
<tr>
<td>Temperature [°C] ±0.5</td>
</tr>
<tr>
<td><strong>Temperature compensation</strong></td>
</tr>
<tr>
<td>pH automatic</td>
</tr>
<tr>
<td>Conductivity (EC) with β=0.0 - 2.4 %/°C reference temp.: 25°C</td>
</tr>
<tr>
<td>TDS with β=0.0 - 2.4 %/°C reference temp.: 25°C</td>
</tr>
<tr>
<td><strong>Dimensions and weights</strong></td>
</tr>
<tr>
<td>Width [mm] 40</td>
</tr>
<tr>
<td>Height [mm] 163</td>
</tr>
<tr>
<td>Depth [mm] 26</td>
</tr>
<tr>
<td>Weight [g] 100</td>
</tr>
<tr>
<td><strong>Ambient data</strong></td>
</tr>
<tr>
<td>Protection IP 64</td>
</tr>
<tr>
<td>Max. humidity [%] 100</td>
</tr>
<tr>
<td>Batteries/service life (4 x 357 A (1.5 V)) / 100 operating hours</td>
</tr>
<tr>
<td>Automatic switch-off after a measuring break of 8 min.</td>
</tr>
<tr>
<td>EC/TDS factor (CONV) 0.45 - 1.00 (0.5 standard value)</td>
</tr>
<tr>
<td>Ambient temperature [°C] 0 - 50</td>
</tr>
<tr>
<td><strong>Order no.</strong></td>
</tr>
<tr>
<td>170 178e</td>
</tr>
</tbody>
</table>
1 | Operation

Switch on measuring device
Keep the MODE key (fig. D-1, item 3) pressed until the display (fig. D-1, item 2) switches on. First, the display performs a self-test during which all display segments must light up briefly. After that, the charge level of the batteries is displayed in % (e.g. % 100 BATT).

"Freeze" a measured value (HOLD function)
If measurements are carried out at locations that are difficult to access and therefore the measured value cannot immediately be read at the display, the measured value can be frozen on the display by pressing a key.

To do so, keep the SET/HOLD key (fig. D-1, item 7) pressed for at least 3 seconds. In the secondary display (fig. D-1, item 12), the signal HOLD will appear.

Now, the measured value is shown continuously on the display and can be read off.

Press any key to return to the measuring mode.

Switch off the measuring device
To do so, press the MODE key in the measuring mode (fig. D-1, item 3).
OFF will be displayed (fig. D-1, item 2). The device switches off.

1.1 pH measurement and calibration

Note: By pressing the SET/HOLD key (fig. D-1, item 7), you can go through the various measuring modes (for pH, conductivity, TDS).

Performing a pH measurement
Call up pH measuring mode by pressing the SET/HOLD key (fig. D-1, item 7). Immerse the electrode in the measuring sample. The displayed measured value can be read off as soon as it is stable.

The temperature-compensated pH value measured is indicated in the primary display (fig. D-1, item 13). The secondary display (fig. D-1, item 12) indicates the temperature of the measuring sample.

Use the last decimal place for rounding up and down, and specify the measurement result in the format pH 5.8 (25 °C), for example.
Selection of standard buffer series
The factory settings for the standard buffers are pH 4.01, pH 7.01 and pH 10.01. Only change these values if the buffers pH 4.01, pH 6.86 and pH 9.18 are required.

To do so, press and hold the MODE key in measuring mode (ignore the OFF and CAL displays) until TEMP and the current unit of temperature appear on the display, e.g. TEMP °C. Press the MODE key once again. The display shows the current buffer series: pH 7.01 BUFF (for the series 4.01/7.01/10.01) or pH 6.86 BUFF (for the series 4.01/6.86/9.18). Confirm the selection with the MODE key. The measuring device reverts to the measuring mode.

pH calibration

Note: The pH electrode can be stored in dry form. However, after a longer period of dry storage (at least 1 month), the device must be soaked in the storage solution for 1 hour (order no.: 203 631)!

After that, calibrate the device!

In case of measurements taking place at least 1 x per week → calibrate at least 1 x per month
In case of non-use > 1 week → calibrate prior to the next measurement

Switch on the measuring device. Press and hold the MODE key (fig. D-1, item 3) until CAL is indicated in the display (fig. D-1, item 2). Ignore the OFF display in this case. Now release the key. Depending on the set buffer series, pH 7.01 USE or pH 6.86 USE will appear in the display (fig. D-1, item 2). The automatic buffer recognition is now active.
For a 1-point calibration, proceed as follows:
1. Immerse the pH electrode in the first buffer solution (e.g. pH 7.01, pH 4.01 or pH 10.01). The device automatically recognises the buffer if the measured value does not deviate from that of the calibrating solution by more than +/-0.4 pH units. In case of larger deviations, clean or replace the pH electrode (fig. D-1, item 4).

2. If the pH 4.01 or pH 10.01 calibrating solution is used, the device displays OK for about 1 second and then reverts to the measuring mode.

3. If you are using the pH 7.01 solution, the device (upon recognition) requests the pH 4.01 calibrating solution for a 2-point calibration. Press the MODE key (fig. D-1, item 3) to revert to the measuring mode or continue the calibration with item 2. as described in the following.

Note: A 2-point calibration guarantees higher accuracy over a wide pH range.

Note: Calibrating solutions may only be used once.

In case of a 2-point calibration, proceed as follows:
1. Switch on the measuring device. Call up the pH measuring mode by pressing the SET/HOLD key (fig. D-1, item 7).

2. Press and hold the MODE key (fig. D-1, item 3) until CAL is indicated in the display (fig. D-1, item 2). Ignore the OFF display in this case. Now release the key. In the display (fig. D-1, item 2) pH 7.01 USE will appear. Now the automatic recognition of the calibrating solution is active (the CAL indication is flashing during the calibrating phase).

3. Immerse the pH electrode (fig. D-1, item 4) in the pH 7.01 calibrating solution. The device recognizes the calibrating solution and then indicates pH 4.01 USE (the calibration takes 60 seconds max.).

4. Thoroughly rinse the pH electrode (fig. D-1, item 4).

5. Immerse the pH electrode (fig. D-1, item 4) in the second calibrating solution( pH 4.01). When the second calibrating solution is recognised, the display (fig. D-1, item 2) will indicate OK (for 1 second) and the device automatically revert to the measuring mode. (The calibration takes 60 seconds max.) The CAL symbol is illuminated continuously and indicates that the device is calibrated.
1.2 Conductivity measurement and calibration

**Performing a measurement**

Call up the conductivity measuring mode by pressing the SET/HOLD key (fig. D-1, item 7). Immerse the probe (fig. D-1, item 6) in the measuring sample. The displayed measured value can be read off as soon as it is stable.

The measured temperature value shown on the display corresponds to the actual temperature of the measuring probe.

**Calibrating the conductivity**

1. Switch on the measuring device. Call up the conductivity measuring mode (µS will appear at the top of the display) by pressing the SET/HOLD key (fig. D-1, item 7).

2. Press and hold the MODE key (fig. D-1, item 3) until CAL is indicated in the display (fig. D-1, item 2). Ignore the OFF display in this case. Now release the key. In the display (fig. D-1, item 2) 1413 USE will appear. Now the automatic recognition of the calibrating solution is active (the CAL indication is flashing during the calibrating phase).

3. Immerse the probe in the corresponding calibrating solution and stir it for a few seconds. Once the device has recognised the calibrating solution, the display (fig. D-1, item 2) indicates OK for 1 second and the device reverts to the measuring mode. The CAL symbol is illuminated continuously and indicated that the device is calibrated (the calibration takes 60 seconds max.)

**Note:** If a high measuring accuracy is required, the measuring device must be in calibrated condition.

An easy-to-do test in the calibrating solution is of assistance: Immerse the sensor in the calibrating fluid and check if a significant deviation from the measured value can be observed (applies to pH and conductivity).

If you want to measure several samples in succession, initially rinse the electrode carefully with the next sample before you carry out the measurement.

Impurities floating on the water surface can contaminate the sensors, especially if such impurities are not soluble in water.
1.3 Setting of the EC/TDS factor (CONV) and the temperature coefficient (β)

The TDS value can be determined by converting the conductivity value. The factory setting is 1.9 %/°C. This setting is ideal for many types of water.

Press and hold the MODE key (fig. D-1, item 3) in measuring mode (ignore the OFF and CAL displays) until TEMP appears on the display (fig. D-1, item 2), e.g. TEMP °C.

Press the MODE key (fig. D-1, item 3) again to display the set factor, e.g. 0.50 CONV.

Press the SET/HOLD key (fig. D-1, item 7) to change the factor.

Press the MODE key (fig. D-1, item 3) again to display the set coefficient, e.g. 1.9.

Press the SET/HOLD key (fig. D-1, item 7) to change the value.

Press the MODE Key (fig. D-1, item 3) to revert to the measuring mode.
1.4 Electrode care

Thoroughly clean the pH electrode (fig. D-1, item 4) with water (preferably distilled water) after every measurement.

⚠️ Attention! Do not keep the electrode (D-1, item 4) in distilled or de-ionised water for indefinite periods!

>Note: The pH electrode can be stored in dry form. However, after a longer period of dry storage (at least 1 month), the device must be soaked in the storage solution (order no.: 203 631) for 1 hour!

After that, calibrate the device.

In case of measurements taking pace at least 1 x per week → calibrate at least 1 x per month

In case of non-use > 1 week → calibrate prior to the next measurement

Should you wish to avoid soaking the pH electrode, the pH electrode must be kept in the storage solution during measuring breaks. To do so, you can soak a commercially available sponge with storage solution and put it into the closing cap. While this solution is drying off, white deposits may occur at the closing cap, which can easily be removed with water.

If it is necessary to replace the pH electrode (fig. D-1, item 4), it can easily be exchanged using the supplied tool. Carefully guide the tool into the opening in the electrode, without touching the glass sensor.

Use the tool to turn the pH electrode anticlockwise and pull it out of the housing.

Reinstall the new pH electrode by proceeding in reverse order.
1.5 Replacing the batteries

When it is switched on, the device indicates the battery charge status in %. If 5 % is displayed together with the battery symbol (fig. D-1, item 11), the battery needs to be replaced. The device switches off automatically if the batteries are too flat to ensure accurate measurements.

To renew the batteries, remove the four screws of the battery compartment (fig. D-1, item 1) on the upper side of the housing.

Open the battery compartment (fig. D-1, item 1) and replace the batteries. Observe correct polarity. Close the battery compartment (fig. D-1, item 1) again and screw the screws back in.
E Total hardness

1 | Product description of water test kit for “total hardness”

1.1 Product components

Fig. E-1: Product components of the water test kit

1 Test tube
2 Titration solution
1.2 Intended use

The water test kit is designed for the quick check of the total hardness and covers the entire hardness range. Its accuracy is 1 °dH or 0.2 mmol/l.

Thanks to its easy handling without any additional equipment, this system is particularly suited for quick determinations.

1.3 Operation

![Diagram showing the water test kit being used](image)

<table>
<thead>
<tr>
<th>°dH</th>
<th>°f</th>
<th>mmol/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.78</td>
<td>0.18</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0.10</td>
</tr>
<tr>
<td>1 mmol/l</td>
<td>5.60</td>
<td>10</td>
</tr>
</tbody>
</table>
2 | Product description of water test kit for the determination of the total hardness in very soft water

2.1 Components of the water test kit
- Measuring tube with 5 and 10 ml marking and plug
- Measuring pipette
- Dropping bottle with indicator solution 8 ml
- Bottle of special buffer solution 8 ml
- 1 Bottle of titration solution 0 - 2 °dH or 0 - 0.36 mmol/l; 50 ml

⚠️ Warning! Strictly observe the identification of hazards indicated on the individual components of the packaging!

2.2 Intended use
This water test kit is especially designed for the determination of the total hardness in very soft water, 0 - 2 °dH or 0 - 0.36 mmol/l.

2.3 Application limits
By adding special buffer solution (order no. 170 533), this test kit can also be used for highly alkaline boiler water. The handling is easy and the measured values are accurate to 0.05 °dH.
2.4 Operation

1. Rinse the measuring tube with the water sample and then fill it up to the 5 ml marking with the water sample (fig. E-2, item 1).

2. Add one drop of the indicator and dissolve it by swirling the tube (fig. E-2, item 2). If the solution's colour changes to green, no hardness is present.

3. If the colour changes to red, seal the measuring tube with the supplied plug (fig E-2, item 3).

4. With the measuring pipette (fig. E-2, item 4 a), draw up the titration solution from the supply bottle until the lower edge of the black plunger ring is level with the 0 marking (uppermost tick mark) (fig. E-2, item 4 b).

5. The measuring pipette must be filled with titration solution up to the plunger ring (no air bubble), otherwise a correct titration result cannot be guaranteed. You can easily remove an air bubble contained inside the measuring pipette by injecting the drawn up titration solution back into the supply bottle. To do so, forcefully press the plunger down to the end position. Afterwards, draw the titration solution up to the 0 marking once again. When injecting the content of the measuring pipette back into the supply bottle, the tip of the measuring pipette must be immersed in the titration solution, too.

6. While slightly twisting the filled measuring pipette, firmly place it into the bore of the plug on the measuring tube (fig. E-2, item 5a). While shaking the pipette (fig. E-2, item 5 b), slowly press down the plunger of the measuring pipette (fig. E-2, item 5 c) until the colour changes from red to green (fig. E-2, item 6a).

7. Read off the total hardness of the water sample on the scale of the measuring pipette at the level of the underside of the black plunger ring (fig. E-6 b). If one filling of the measuring pipette is not sufficient to cause a colour change, fill the measuring pipette with titration solution again according to paragraph 4 and complete the titration in the same water sample according to paragraphs 5 and 6. Take previously consumed filling of the measuring pipette into account when making the determination.

Fig. E-2: Operation of the water test kit
2.5 Consumables

In order to ensure a reliable analysis, you should only use genuine consumables.

- Measuring tube with 5 and 10 ml marking and plug 888 05 510
- Measuring pipette 170 537
- Dropping bottle with indicator solution 8 ml 170 532
- Bottle of special buffer solution 8 ml 170 533
- 1 Bottle of titration solution 0 - 2 °dH, 0 - 0.36 mmol/l; 50 ml 170 531
F    Water test kit for GENO-safe A, FSK, KW 0, KW 1700

1 | Product description
1.1 Product components

Fig. F-1: Product components of the water test kit

1   2 Bottles of molybdenum-1 reagent
2   Tin with 100 test strips
3   1 Test tube
4   Measuring spoon

Warning! Strictly observe the identification of hazards indicated on the individual components of the packaging!
1.2 Intended use

The water test kit is designed for the quick detection of GENO®-safe A, GENO®-heating protection FSK as well as the cooling water products KW 0 and KW 1700. The analysis can quickly be performed on site.

Thanks to its easy handling without any additional equipment, this system is particularly suited for quick determinations.

1.3 Application limits

Molybdenum concentrations in the range of 5 - 250 mg/l Mo may be detected. In case of higher values, the sample can be diluted with water that is free from molybdenum. The accuracy of the measurement is limited to the colour nuances detectable with the eye.
1.4 Operation

1. Take a water sample from the system. Discharge the first 5 litres.

2. If the sample is turbid, filter the sample or wait until the turbidity has settled. The sample should have a temperature of between 15 and 25 °C.

3. Repeatedly and thoroughly rinse the test tube with the water to be analysed.

4. Fill the test tube up to the 5 ml marking with the water sample.

5. Add two level measuring spoons full of molybdenum-1.

6. Swirl the sample until the reagent has dissolved.

7. Put a test strip into the solution for the duration of one minute.

8. Remove the test strip and shake off any excess liquid.

9. Compare the reaction zone with the colour scale.

10. Determine FSK, KW 0, KW 1700 and GENO®-safe A as per the table below.

<table>
<thead>
<tr>
<th>Mo [mg/l]</th>
<th>GENO®-safe A [mg/l]</th>
<th>KW 1700 [mg/l]</th>
<th>KW 0 [mg/l]</th>
<th>FSK [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1150</td>
<td>1150</td>
<td>1950</td>
<td>3.8</td>
</tr>
<tr>
<td>100</td>
<td>2300</td>
<td>2300</td>
<td>3900</td>
<td>7.7</td>
</tr>
<tr>
<td>250</td>
<td>5700</td>
<td>5700</td>
<td></td>
<td>19.2</td>
</tr>
</tbody>
</table>


Corresponds to: Mo [mg/l] 90 - 220 90 - 220 50 - 80 250 - 650