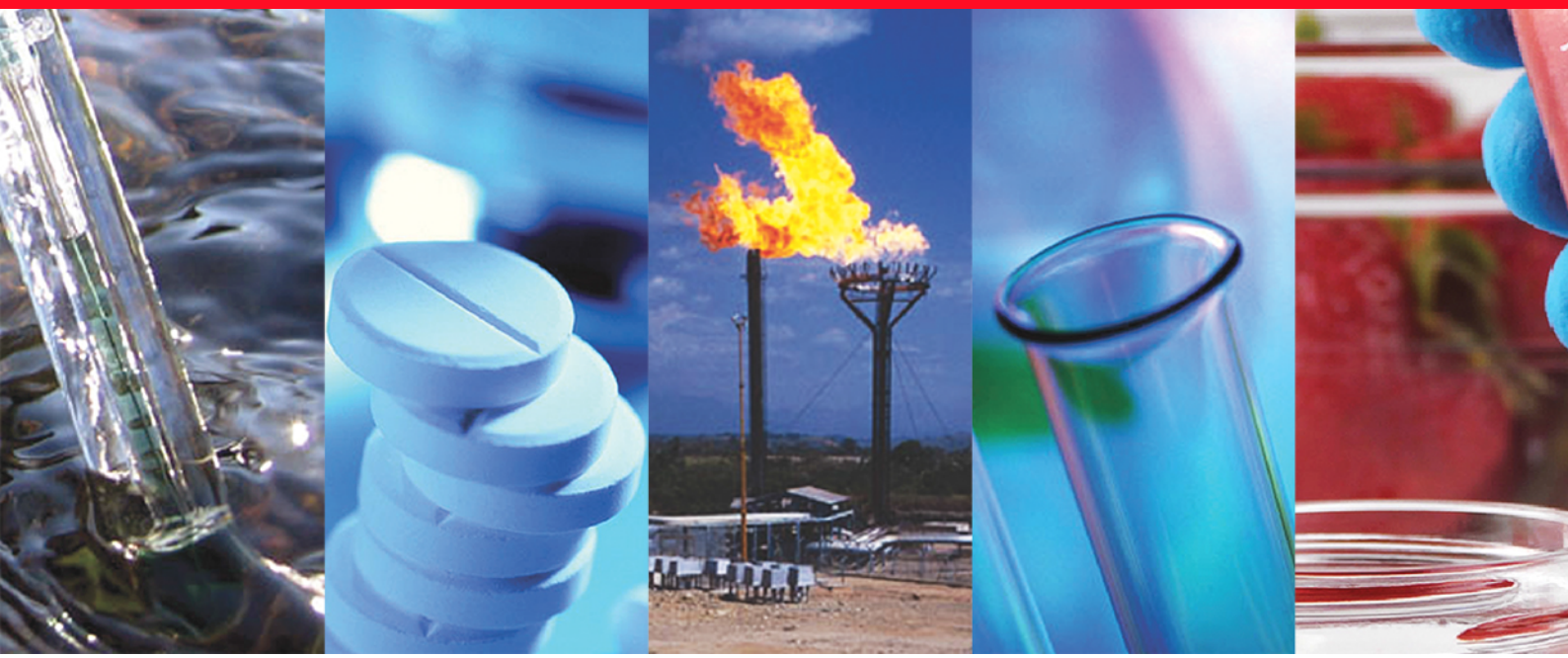
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Thermo Scientific

# HAAKE Viscotester 3

## Instruction Manual

006-5000 Version 1.8

ThermoFisher SCIENTIFIC

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**EG-Konformitätserklärung**
**EC Declaration of Conformity**
**Déclaration CE de conformité**

075-5058

| **Produktbezeichnung**<br>**Product name**<br>**Nom du produit** | **Identifikation**<br>**Identification**<br>**Identification** |
|---|---|
| HAAKE Viscotester 3 (R and L Version) | 399-0111, 399-0112 |

gilt nur für die oben aufgeführten Typen mit einer beginnenden Seriennummer
only valid for the types listed above with a starting serial number
ne s'applique qu'aux types mentionnés ci-dessus dont le numéro de série commence par

| ≥ 1 220049XX XXX |
|---|

| | |
|---|---|
| **Hersteller**<br>**Manufacturer**<br>**Fabricant** | **Thermo Electron (Karlsruhe) GmbH**<br>**Pfannkuchstraße 10-12**<br>**76185 Karlsruhe**<br>**Germany** |
| **Dokumentationsbevollmächtigte Person**<br>**Authorised person for technical file**<br>**Personne autorisée à constituer le dossier technique** | **Henry Eisenlohr**<br>**Thermo Electron (Karlsruhe) GmbH**<br>**Pfannkuchstraße 10-12**<br>**76185 Karlsruhe**<br>**Germany** |

**Richtlinie**
**Directive**
**Directive**

| | |
|---|---|
| 2006/42/EG | Maschinenrichtlinie<br>Machinery directive<br>Directive des machines |
| 2014/30/EU | Richtlinie für elektromagnetische Verträglichkeit<br>Electromagnetic Compatibility Directive<br>Directive relative à la compatibilité électromagnétique |
| 2011/65/EU | RoHS<br>RoHS<br>RoHS |

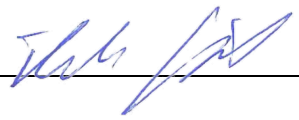
**Folgende harmonisierte Normen wurden angewandt:**
**Following harmonized standards are used:**
**On a appliqué les normes harmonisées suivantes:**

| | |
|---|---|
| EN ISO 12100:2010 | Sicherheit von Maschinen - Grundbegriffe, allgemeine Gestaltungsleitsätze<br>Safety of machinery – basic concepts, general principles for design<br>Sécurité des machines – Termes de base, principes généraux de conception |
| EN 61326-1:2013 | Elektrische Mess-, Steuer-, Regel- und Laborgeräte – EMV Anforderungen<br>Electrical equipment for measurement, control and laboratory use – EMC requirements<br>Matériel électrique de mesure, de commande et de laboratoire – Exigences CEM |

Wir erklären in unserer ausschließlichen Verantwortung, dass das Produkt, auf das sich diese Erklärung bezieht, mit den oben genannten Normen, normativen Dokumenten und den Bestimmungen der genannten Richtlinien übereinstimmt.

We declare under our sole responsibility, that this product to which this declaration relates is in conformity with the a.m. standards or other normative documents and is following the provisions of the a.m. directives.

Nous déclarons, sous notre seule responsabilité, que le produit auquel cette déclaration fait référence est conforme aux normes susmentionnées, aux autres documents normatifs et aux dispositions des directives citées.

| | | |
|---|---|---|
| Name<br> | Karlsruhe<br>25.11.2022 | Thermo Electron (Karlsruhe) GmbH<br>Pfannkuchstraße 10-12, 76185 Karlsruhe<br>Tel. + 49-721-4094-444<br>Fax + 49-721-4094-418 |
| Unterschrift<br>Signature<br>Signature<br>Produktlinienleiter<br>Product Line Manager<br>Chef de ligne de produits | Ort und Datum<br>Place and Date<br>Lieu et date | Hersteller<br>Manufacturer<br>Fabricant |

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# UK Declaration of conformity

UK CA

We, Thermo Electron (Karlsruhe) GmbH, part of Thermo Fisher Scientific
Pfannkuchstraße 10-12
76185 Karlsruhe
Germany

an ISO9001 certified company

declare under our sole responsibility that the

| | |
|---|---|
| Product Name: | HAAKE Viscotester 3 (R and L Version) |
| Model: | 399-0111, 399-0112 |
| Declaration ID: | 075-5058 |

only valid for the types listed above with a starting serial number ≥ 1 220049XX XXX

Meets the provisions of the regulations:

Supply of Machinery (Safety) Regulations 2008

Electromagnetic Compatibility Regulations 2016

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

using to the following standards and normative documents:

| | |
|---|---|
| EN ISO 12100:2010 | Safety of machinery – basic concepts, general principles for design |
| EN 61326-1:2013 | Electrical equipment for measurement, control and laboratory use EMC-requirements, Part 1 general requirements |

Place and Date of issue: 25.11.2022

Name:

Function:
Product Line Manager

Signature



D06184

# China RoHS Declaration

| Identification<br>标识 | Product name<br>产品名称 | Declaration ID |
|---|---|---|
| 399-0111, 399-0112 | HAAKE Viscotester 3 (R and L Version) | 075-5058 |

| Part name<br>**零件号** | Toxic or Hazardous substances and elements<br>**有毒或危**险物质或元素 | | | | | |
|---|---|---|---|---|---|---|
| | Lead<br>铅<br>(Pb) | Mercury<br>**汞**<br>(Hg) | Cadmium<br>镉<br>(Cd) | Hexavalent Chromium<br>**六价**铬<br>($Cr^{6+}$) | Polybrominated biphenyls<br>**多溴**联苯<br>(PBB) | Polybrominated diphenyl ethers<br>**多溴**联苯醚<br>(PBDE) |
| Mechanics<br>**机械**类 | o | o | o | o | o | o |
| Electronics<br>电子类 | o | o | o | o | o | o |

o: Indicates that this toxic or hazardous substance contained in all of the homogenous materials for this part is below the limit requirement in SJ/T 11363-2006

**表明**该产品中，无任何一种有毒或危险物含量高于限量标准 SJ/T 11363-2006

x: Indicates that this toxic or hazardous substance contained in at least one of the homogenous materials for this part is above the limit requirement in SJ/T 11363-2006

**表明**该产品中，至少有一种有毒或危险物含量高于限量标准 SJ/T 11363-2006



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# Contents

**Preface** . . . . . **ix**
Safety and special notices . . . . . ix
Safety Notes and Warnings . . . . . ix
Quality assurance . . . . . xii
Warranty and service. . . . . xii
Contacting us . . . . . xii

**Chapter 1** **Instrument Description** . . . . . **1**
Functional Elements . . . . . 2

**Chapter 2** **Installation** . . . . . **4**
Installation requirements . . . . . 4
Space Requirements. . . . . 4
Mains supply . . . . . 4
External power supply . . . . . 4
Battery power . . . . . 4
Ambient conditions according to EN 61010 . . . . . 5
Unpacking. . . . . 5
Transportation damage . . . . . 5
Contents of the delivery. . . . . 6
Installation. . . . . 6

**Chapter 3** **Operation.** . . . . . **8**
Rotor selection . . . . . 8
Change of the unit from mPa.s to dPa.s . . . . . 9
Change the brightness of the display. . . . . 9
Start of measurement . . . . . 9
Reference value. . . . . 9

**Appendix A** **Technical Specifications** . . . . . **10**
Dimensions, power consumption . . . . . 10
Main instrument . . . . . 10
Power supply unit . . . . . 11
Rotors . . . . . 11
Measuring cups . . . . . 11
Standard liquids. . . . . 11
Accessories . . . . . 12

# WEEE Compliance

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EU. It is marked with the following symbol:



Thermo Fisher Scientific has contracted with one or more recycling or disposal companies in each European Union (EU) Member State, and these companies should dispose of or recycle this product. See the www.thermoscientific.com WEEE web-page for further information on Thermo Fisher Scientific's compliance with these Directives and the recyclers in your country.

# WEEE Konformität

Dieses Produkt muss die EU Waste Electrical & Electronic Equipment (WEEE) Richtlinie 2012/19/EU erfüllen.  Das Produkt ist durch folgendes Symbol gekennzeichnet:



Thermo Fisher Scientific hat Vereinbarungen mit Verwertungs-/Entsorgungsfirmen in allen EU-Mitgliedsstaaten getroffen, damit dieses Produkt durch diese Firmen wiederverwertet oder entsorgt werden kann. Mehr Information über die Einhaltung dieser Anweisungen durch Thermo Fisher Scientific, über die Verwerter, und weitere Hinweise, die nützlich sind, um die Produkte zu identifizieren, die unter diese RoHS Anweisung fallen, finden sie unter www.thermoscientific.com.

# Conformité DEEE

Ce produit doit être conforme à la directive européenne (2012/19/EC) des  Déchets d'Equipements Electriques et Electroniques (DEEE). Il est marqué par le symbole suivant:



Thermo Fisher Scientific s'est associé avec une ou plusieurs compagnies de recyclage dans chaque état membre de l'union européenne et ce produit devrait être collecté ou recyclé par celles-ci. Davantage d'informations sur la conformité de Thermo Fisher Scientific à ces directives, les recycleurs dans votre pays et les informations sur les produits Thermo Fisher Scientific qui peuvent aider la détection des substances sujettes à la directive RoHS sont disponibles sur www.thermoscientific.com.

# Preface

This manual describes how to install and operate the HAAK Viscotester 3 and the use of accessories.

## Safety and special notices

Make sure that you follow the cautions and special notices presented in this manual. Cautions and special notices appear in boxes; those concerning safety or possible damage also have corresponding caution symbols.

This manual uses the following types of cautions and special notices.



**CAUTION** Highlights hazards to humans, property, or the environment. Each CAUTION notice is accompanied by an appropriate CAUTION symbol.

**IMPORTANT** Highlights information necessary to prevent damage to software, loss of data, or invalid test results; or may contain information that is critical for optimal performance of the system.

**Note** Highlights information of general interest.

**Tip** Highlights helpful information that can make a task easier.

## Safety Notes and Warnings

The HAAKE Viscotester 3 corresponds to the relevant safety regulations. However the operator is solely responsible for the correct handling and proper usage of the instrument.

This instrument is used exclusively for measuring the viscosity of liquid to pasty substances. These materials may not be tested if people can be hurt or devices be damaged.



**CAUTION**

- The instrument must be operated in such a way that it will not endanger anyone.
- The instrument may not be operated if there are any doubts regarding safe operation because of its outer appearance (e.g. damages).
- A safe operation of the instrument cannot be guaranteed if the user does not comply with this instruction manual.
- Ensure that this instruction manual is made readily available to every operator.
- The operator must have an uninterrupted view of the instrument and its surroundings.
- This instrument must only be used for the application it was designed for.
- Repairs, alterations or any work involving opening up the instrument should only be carried out by specialized personnel. Considerable damage can be caused by incorrect repair work. The Thermo Fisher Scientific-service department is at your disposal for any repairs you may require.
- After a repair the instruments safety must be inspected thoroughly by qualified personnel.
- Have the instrument serviced by specialists at regular intervals.

**IMPORTANT**

- Do not operate the instrument with any other power supply as the supplied wall wart type external power supply.
- To disconnect the instrument from the mains, first switch the instrument off, then unplug the wall wart type external power supply from the wall socket.
- Make sure that the instrument has been switched off before you connect or disconnect the power cable. This is to avoid electrostatic charging resulting in a defect of the electronic circuit boards.
- Do not operate the instrument with wet or oily hands.
- Do not immerse the instrument in water or expose it to spray water.
- Do not bend the power cable, do not subject the power cable to stress or high temperatures (higher than 70 °C).
- Use the supplied batteries (AA 1.2 V) only.

**IMPORTANT**

- Disconnect the AC adapter when using batteries always.
- Use branded batteries only.
- If the used batteries leak, use protective gloves when removing and disposing of them and ensure adequate ventilation.
- For stationary use with a lab stand: Use only the supplied holder.
- Keep the instrument horizontal while measuring with the help of the built-in electronic level always.
- Do not clean the instrument using solvents (fire danger!), a damp cloth applied with a household cleaning substance is often sufficient.
- The HAAKE Viscotester 3 is used exclusively for measuring the viscosity of liquid to pasty substances. These materials must not be measured with the HAAKE Viscotester 3 in case the operator (or other people) can be injured or the device can be damaged. Especially explosive, combustible and toxic materials must not be measured with the HAAKE Viscostester 3.
- Suitable personal protective gear, consisting of lab coat, protective eye wear and safety gloves, must be worn at all times when working with the HAAKE Viscotester 3.

**IMPORTANT**

We do not know which substances you intend to test using this instrument.

**Many substances are** inflammable, easily ignited, explosive, hazardous to health, environmentally unsafe, that means **dangerous**.

You alone are responsible for your handling of these substances.

Our advice:

- If in doubt, consult a safety specialist.
- Read the product manufacturer or supplier EU SAFETY DATA SHEET.
- Read the REGULATIONS CONCERNING DANGEROUS MATERIALS.
- Observe relevant guidelines for laboratories in your country
- Do not examine substances with a flash point below 40 °C.
- Use a protecting sample hood when measuring dangerous samples.
- It must to be carried out a risk assessment (hazard analysis) for the handling of hazardous substances in combination with the HAAKE Viscotester 3.

# Quality assurance

Dear customer, Thermo Fisher Scientific Karlsruhe has implemented a Quality Management System certified according to ISO 9001 ff. This guarantees the presence of organizational structures which are necessary to ensure that our products are developed, manufactured and managed according to our customers expectations. Internal and external audits are carried out on a regular basis to ensure that our QMS is fully functional.

We also check our products during the manufacturing process to certify that they are produced according to the specifications as well as to monitor correct functioning and to confirm that they are safe. The results are recorded for future reference.

Please inform us if, despite our precautionary measures, you should find any product defects. You can thus help us to avoid such faults in future.

# Warranty and service

For the warranty and any potential additional warranty, the user must ensure that the device is serviced by a Thermo Fisher Scientific approved service engineer at the following intervals:

The maintenance is required after approx. 500 operating hours.

We recommend to have the maintenance carried out by Thermo Fisher Scientific or by staff authorized by Thermo Fisher Scientific as special knowledge and tools are required.

The maintenance and calibration work carried out has to be recorded by certificates in conformity with ISO 9001 ff.

# Contacting us

There are several ways to contact Thermo Fisher Scientific for the information you need.

If you have any questions regarding installation or technical issues, please contact the helpdesk. You will find the contact form at:

https://tfs-3.secure.force.com/materialcharacterization/

❖ **To contact International Technical Support or Sales**

| | |
|---|---|
| Company | Thermo Electron (Karlsruhe) GmbH)<br>Part of Thermo Fisher Scientific |
| Adress | Pfannkuchstraße 10-12 |
| | 76185 Karlsruhe, Germany |
| Phone | +49(0)721 4094 444 |
| Fax | +49(0)721 4094 300 |
| E-mail | support.mc.de@thermofisher.com |
| Internet | www.thermofisher.com/ |
| | rheometers |

# Instrument Description

The HAAKE Viscotester 3 is a rotational viscometer with color display and color-coded measuring geometries, specially suited for fast tests and comparative measurements on liquids.

Measuring Principle: A constant speed rotor is immersed into the liquid to be tested; the rotational resistance is a measure for the viscosity of the liquid. The measured viscosity is shown on the viscometer's digital display.

**Figure 1.** The HAAKE Viscotester 3 as a basic instrument (left), attached to the support stand (right).

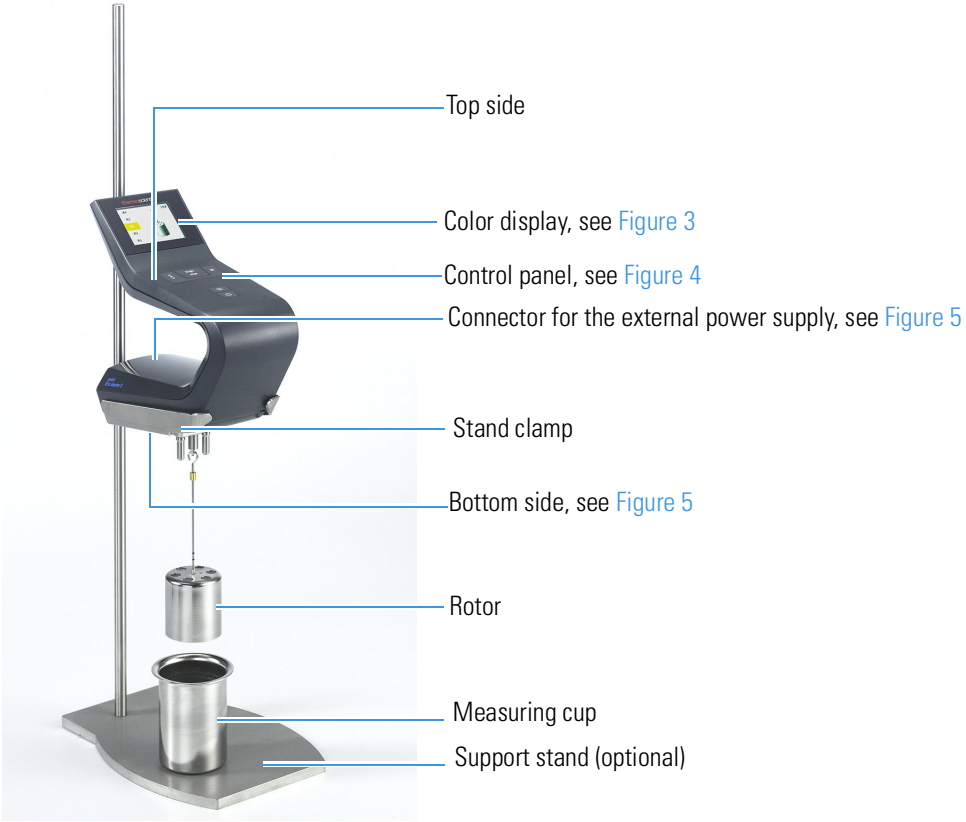




# Functional Elements

The HAAKE Viscotester 3 rotational viscometer consists of a basic instrument, a stand clamp, a rotor (color coded), a measuring cup, a support stand (optional) and an external power supply, see Figure 2.

**Figure 2.** The HAAKE Viscotester 3 rotational viscometer.




The basic instrument is equipped with a color display (see Figure 3)

**Figure 3.** Color display panel.

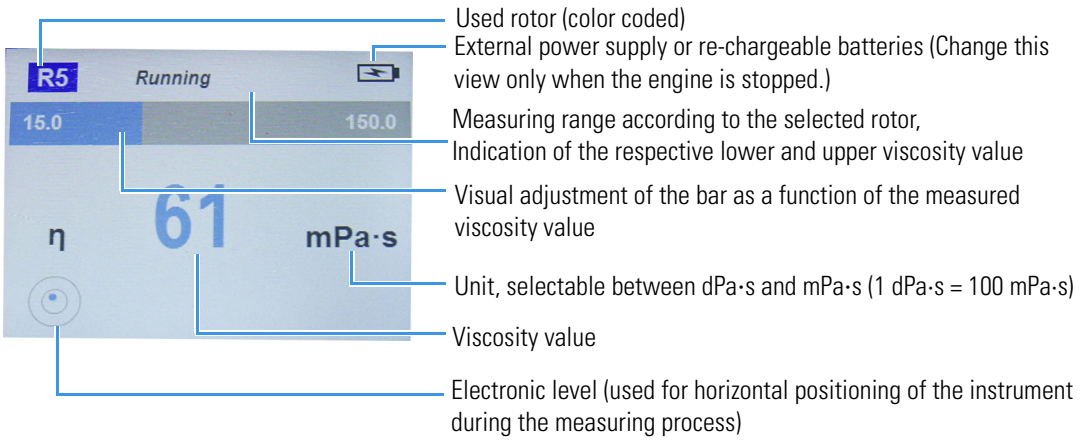


**Figure 4.** Control panel.




Rotor selection button; By pressing the button the rotor used selected.

Start/Stop button: By pressing the button start or stop the measurement.

"Memory Assist" button: If the button is pressed, then the currently measured value is stored as the reference value. All measured values are compared with this reference value. Within ±10% the measured viscosity value is displayed as a okay in blue, outside in red. If the button is pressed for more than 5 seconds, the stored value is deleted.

Button for brightness control of the color display (by short press adjustable); by long press the unit (mPa·s or dPa·s) is selectable.

Switch-on button - press to switch on.

**Figure 5.** Side view.



Cover of the battery box.

Drive shaft for mounting the rotor.

Clamping device - Use for measuring cups A and B to protect the measuring shaft when setting down on an even surface.

**Figure 6.** Rear view.



Power connection for external power supply.

Interface for service (e.g. for calibration)

# Installation

This chapter describes the installation requirements, how to unpack the instrument, how to setup the instrument for the first time.

**IMPORTANT** Read this chapter completely before starting the installation.

## Installation requirements

This paragraph lists the requirements to the laboratory environment and other ambient conditions that must be fulfilled for operating the HAAKE Viscotester 3 instrument.

### Space Requirements

The HAAKE Viscotester 3 can be placed as a hand-held instrument or with a support stand (optional) on the lab bench. The space required for the HAAKE Viscotester 3: 0.3 m x 0.3 m.

### Mains supply

You need to the power supply an external power supply or batteries.

1. with re-chargeable batteries and power supply, the batteries can remain in the instrument when using the power supply,
2. with batteries, the batteries must be removed when the power supply is connected.

#### External power supply

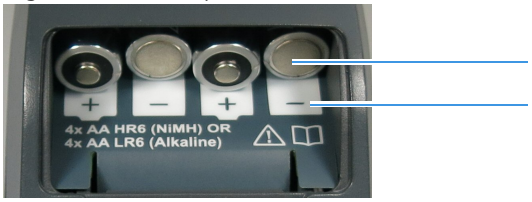
The external power supply of the HAAKE Viscotester 3 automatically adapts to the applied AC voltage supply. The applied voltage must be in the range of 100 V to 240 V, the frequency in the range of 50 Hz to 60 Hz.



**CAUTION** Connect the adapter cable to the HAAKE Viscotester 3 first always, and then plug the AC adapter into the electrical socket, to avoid the risk of electric shock.

#### Battery power

**Figure 7.** Battery box with batteries.



❖ **Inserting the batteries**

1. Open the cover of the battery box, see Figure 5 on page 3.
2. Insert the batteries (4 pieces) into the battery box compartment according to the mark.

**IMPORTANT** Use only the supplied batteries type AA 1.2V.

3. Close the cover.

**IMPORTANT** Disconnect the AC adapter always when using batteries.

**IMPORTANT** Use protective gloves when removing and disposing of the batteries should the used batteries leak. Ensure adequate ventilation.

## Ambient conditions according to EN 61010

The ambient conditions under which the HAAKE Viscotester 3 is operated must fulfill the following requirements:

- Indoors, at a maximum altitude of 2000 meters above sea level.
  (Operation at higher altitudes is allowed as long as all other requirements are fulfilled.)
- Ambient temperature 15 °C < $T_{ambient}$< 40 °C.
- Relative humidity < 80% at 31 °C (< 50% at 40 °C).
- Excess voltage category II, contamination level 2.

It is recommended to operate the HAAKE Viscotester 3 in an air-conditioned laboratory, with the temperature set to approximately 23 °C.

# Unpacking

The packaging consists of a transport case and cardboard box.
Before unpacking the instrument carefully check the outside of the packaging for damage. In case of any visible damage make a photo of the damaged area and take a note. Damage to the packaging may, but must not, indicate damage to the instrument.

## Transportation damage

When the instrument is damaged proceed as described below:

- Compile a damage report.
- Notify the carrier (i.e. forwarding merchant, railroad company, post office, etc.).

  Before returning the delivery in case of problems:

- Always first inform the dealer or the manufacturer (small problems can often be dealt with locally.)

## Contents of the delivery

This section describes the contents of delivery of the HAAKE Viscotester 3.

Check the contents of the delivery carefully. The standard content of the delivery of the HAAKE Viscotester 3 is shown in Figure 8 and Figure 9.

**Figure 8.** Standard delivery of the HAAKE Viscotesters 3 version L (399-0111) for low viscosities.

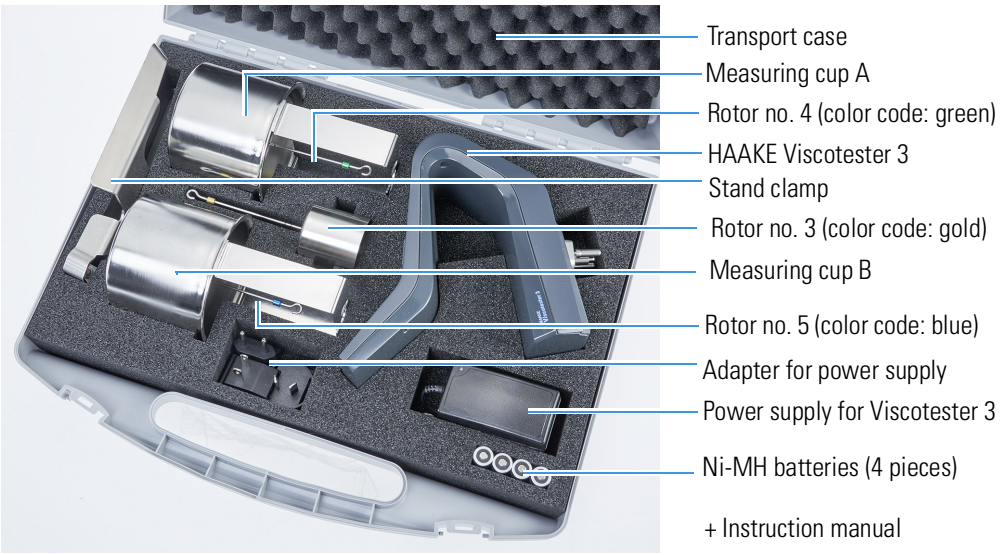
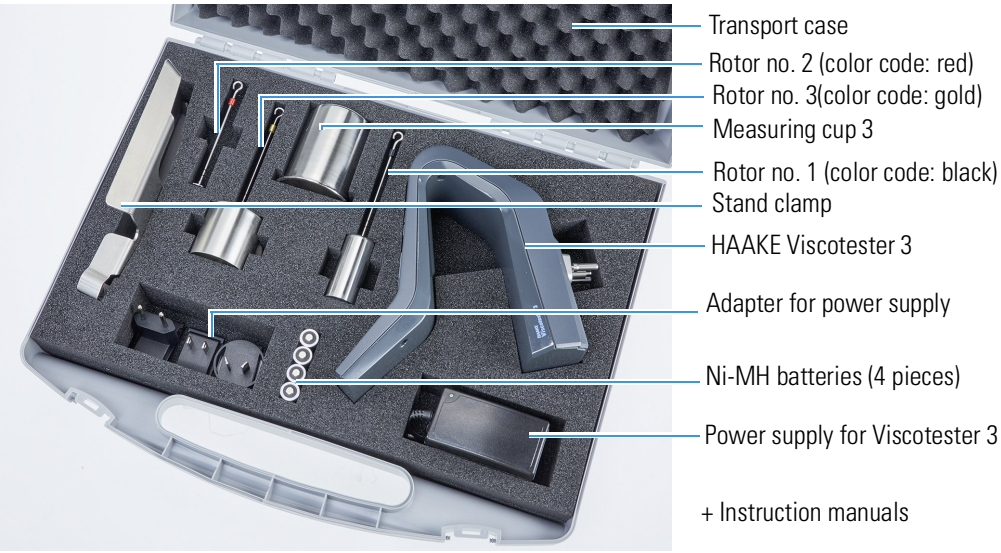



**Figure 9.** Standard delivery of the HAAKE Viscotesters 3 version R (399-0112) for higher viscosities.




# Installation

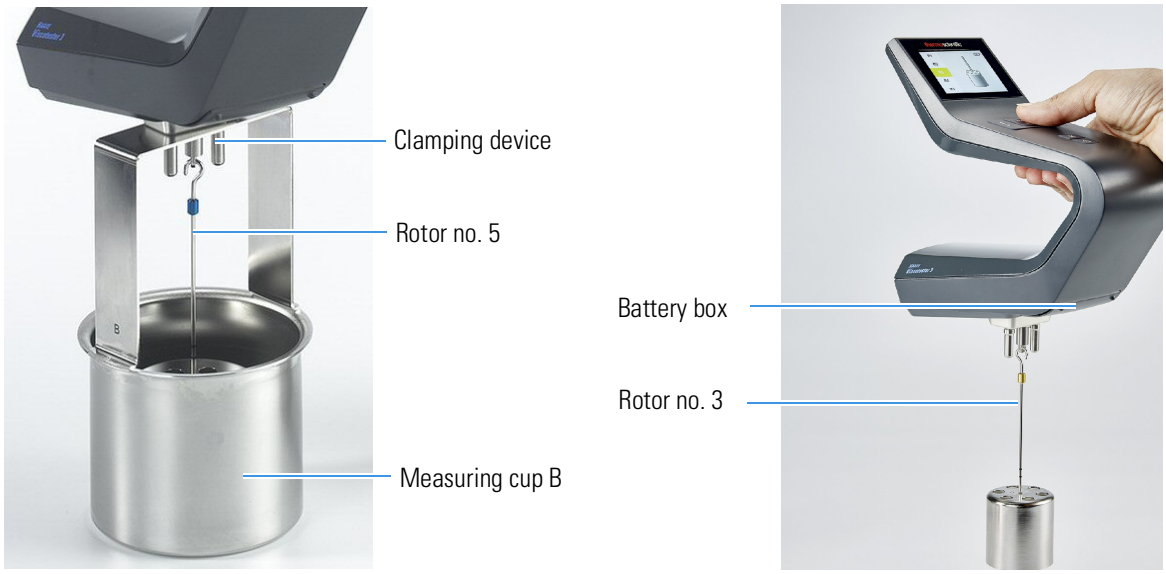
This section describes how to set up the HAAKE Viscotester 3 for the measurement process.

❖ **Installation steps for version L (399-0111)**

1. Select the electric power supply (see “Mains supply” on page 5).
2. Attach a suitable rotor for viscosity measurement of the sample fluid.

3. Fill the measuring cup.
4. Position the filled measuring cup and screw it to the instrument using the clamping device (the rotor must be immersed in the substance up to the mark on the rotor axis, see Figure 10).

**Figure 10.** The HAAKE Viscotesters 3 version R with measuring cup B and rotor no. 5 (on the left side) and with rotor no. 3 (without measuring cup) (on the right side).




❖ **Installation steps for version R (399-0112)**

1. Select the electric power supply (see "Mains supply" on page 5).
2. Attach a suitable rotor for viscosity measurement of the sample fluid.
3. Fill the measuring cup.
4. Position the filled measuring cup so that the rotor is immersed in the substance up to the mark on the rotor axis (see Figure 10).

The measurement can be performed in any vessel or in the measuring cups provided with the HAAKE Viscotester 3. The displayed viscosity values are only valid when the measuring cup is used, and only when Newtonian liquids are measured.

It is recommended to use the measuring cups if the measurements have to be made under almost equal conditions.

A slight concentric movement of the rotor during the measurement is absolutely normal. The influence on the measuring signal does not go beyond the accuracy of the HAAKE Viscotester 3.

# Operation

This chapter describes how to operate the instrument after installation.

**IMPORTANT** Read this chapter completely before starting the installation.

**IMPORTANT** Wear suitable protective equipment according to the laboratory conditions and the sample to be measured, when operating the HAAKE Viscotester 3.

After installation of the HAAKE Viscotester 3 (see Chapter 2, "Installation." ) please note the following steps:

1. Switch on the instrument without rotor. Initialization takes place. First, the current firmware version is displayed, then the display, see Figure 11.

**Figure 11.** Initialization of the HAAKE Viscotester 3.



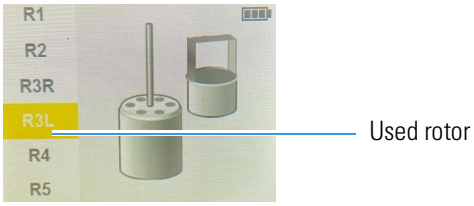

The remaining operating hours are displayed during initialization of the instrument.

**Note** The instrument must be serviced after total operating time (500 hours).

## Rotor selection

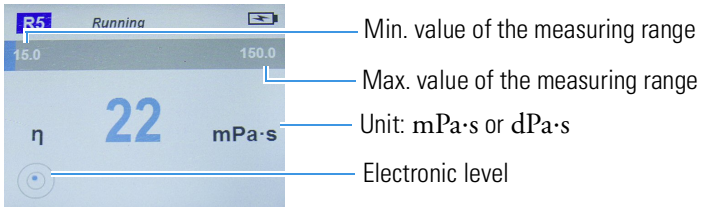
2. After initialization, use the rotor selection button to select the used rotor.

**Figure 12.** Selection of the used rotor.




The rotor R3 is listed twice, as it can be used in combination with the measuring cup A or B as well as with the measuring cup No. 3. If you press the selection button for 3 seconds on a rotor, the display will show the setting for the measurement, see Figure 13.

**Figure 13.** Settings on the instrument.



### Change of the unit from mPa.s to dPa.s

3. Select the unit viscosity by long pressing the brightness button (dPa·s or) mPa·s (see Figure 4).

### Change the brightness of the display

4. Adjust the brightness of the color display by short pressing the brightness button, see Figure 4.
5. Check the correct measuring position of the device by the integrated electronic level.

**IMPORTANT** Hold the instrument with the integrated electronic level horizontal during the measurement.

### Start of measurement

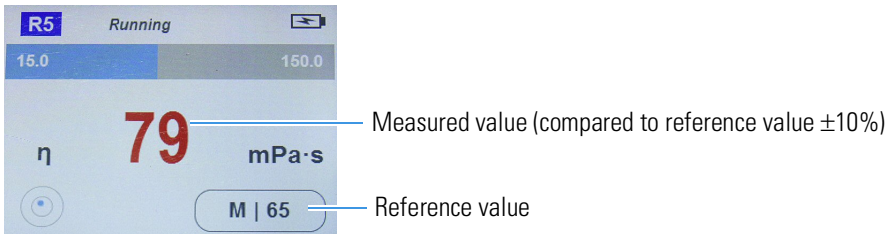
6. Start the measurement by pressing the start button (see Figure 4).

### Reference value

7. Press the memory button during the measurement (see Figure 4), the current value will be saved. The measured value is compared with the reference value. If the deviation is > ±10%, the viscosity value on the display appears in red (< ±10% in blue), see Figure 14.
   If the memory button is pressed for more than 5 seconds, the stored reference value is deleted.

**Note** The deviation ±10% cannot be changed by the user.

**Figure 14.** Display of the saved reference value in comparison with measured value.




8. Stop the measurement at time X.

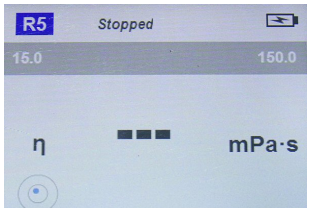
**Note** The maximum measuring time lasts 5 minutes.

After the measurement is finished, the last measured value appears.

- If the minimum value of the measuring range for the rotor used is undershot, the minimum value of the range display flashes.
- If the maximum value of the measuring range for the rotor used is exceeded, the maximum value of the range display flashes.

In both cases, the viscosity is displayed as faulty and with " --- ", see Figure 15.

**Figure 15.** Display indication for faulty measured value due to exceeding or falling below the measuring range for the used rotor.



# Technical Specifications

This appendix contains the technical specifications of the HAAKE Viscotester 3.

## Dimensions, power consumption

This section contains information on the dimensions and the power consumption of the HAAKE Viscotester 3 instrument and the power supply unit.

### Main instrument

Table 1 lists the technical specifications of the HAAKE Viscotesters 3.

**Table 1.** Technical specifications

| Property | Value |
|---|---|
| Input line voltage | 12 V DC |
| Maximum input current | 2 A |
| Rated speed | 62.5 $min^{-1}$ |
| Maximum operating temperature | 40 °C |

Table 2 lists the mechanical properties of the HAAKE Viscotesters 3.

**Table 2.** Mechanical properties

| Basic instrument | Value | | Basic instrument with support stand, see | Value |
|---|---|---|---|---|
| Height (H) | 175 mm |  | Height (H) | 610 mm |
| Width (W) | 180 mm | | Width (W) | 230 mm |
| Depth (D) | 90 mm | | Depth (D) | 150 mm |
| Weight | 0.65 kg | | Weight | 3.0 kg |

Table 3 lists the dimensions of the case des Koffers for HAAKE Viscotesters 3.

**Table 3.** Mechanical properties

| Transport case | Value | |
|---|---|---|
| Height (H) | 319 mm |  |
| Width (W) | 378 mm | |
| Depth (D) | 110 mm | |
| Weight with /without instrument and accessories | 2.5 kg / 1.1 kg | |

## Power supply unit

The HAAKE Viscotester 3 is delivered with an external power supply, see Table 4.

**Table 4.** External power supply unit electrical properties

| Property | Value |
|---|---|
| Mains voltage | 100 V - 240 V AC ±10% |
| Mains frequency | 50 Hz - 60 Hz |
| Power consumption, max. | 12 W |
| Output voltage | 24 V |
| Output current | 2.0 A |

# Rotors

Table 5 lists mechanical properties of the rotors for HAAKE Viscotester 3.

**Table 5.** Mechanical properties of the rotors (material: stainless steel DIN no. 1.4301)

| Rotor (with color code) | Diameter (∅) | Height (h) | Measuring range |
|---|---|---|---|
| Rotor no. 1 (black) | 24.0 mm | 53.0 mm | 300 mPa·s - 15 000 mPa·s |
| Rotor no. 2 (red) | 15.0 mm | 1.0 mm | 10 000 mPa·s - 400 000 mPa·s |
| Rotor no. 3 R* (gold) | 45.1 mm | 47.0 mm | 30 mPa·s - 1 300 mPa·s |
| Rotor no. 3 L** (gold) | 45.1 mm | 47.0 mm | 30 mPa·s - 400 mPa·s |
| Rotor no. 4 (green) | 78.0 mm | 46.0 mm | 1.5 mPa·s - 33 mPa·s |
| Rotor no. 5 (blue) | 61.2 mm | 36.0 mm | 15 mPa·s - 150 mPa·s |

*in combination with measuring cup no. 3.
**in combination with measuring cup A or B.

# Measuring cups

Table 6 lists mechanical properties of measuring cups for HAAKE Viscotester 3.

**Table 6.** Mechanical properties of the measuring cups (material: stainless steel DIN no. 1.4301)

| Measuring cup | Diameter (∅) | Height (h) | Height with frame (H) | Volume |
|---|---|---|---|---|
| A | 90.0 mm | 75.5 mm | 95.0 mm | ca. 400 ml |
| B | 90.0 mm | 75.5 mm | 95.0 mm | ca. 400 ml |
| No. 3 | 52.6 mm | 75.0 mm | | ca. 150 ml |




# Standard liquids

Table 7 contains information on usable standard liquids.

**Table 7.** Standard liquids

| Rotor | Measuring cup | Accuracy for Measuring system[a] | Standard liquid | Order no. |
|---|---|---|---|---|
| Rotor no. 1 | 3 | ±5% | E6000 (6000 mPa·s at 20 °C) | 082-5046 |
| Rotor no. 2 | 3 | ±5% | E15000 (15000 mPa·s at 20 °C) | 082-5336 |

**Table 7.** Standard liquids

| Rotor | Measuring cup | Accuracy for Measuring system[a] | Standard liquid | Order no. |
|---|---|---|---|---|
| Rotor no. 3 | 3, A | ±5% | E200 (120 mPa·s at 20 °C) | 082-5043 |
| Rotor no. 4 | A | ±10% | E7 (5 mPa·s at 20 °C | 082-5042 |
| Rotor no. 5 | A | ±7.5% | E200 (120 mPa·s at 20 °C) | 082-5043 |

[a] related to the measuring range of the used rotor.

# Accessories

The Figure 16 contains accessories of the HAAKE Viscotester 3 with order numbers.

**Figure 16.** Accessories - rotors, measuring cups and support stand.

