

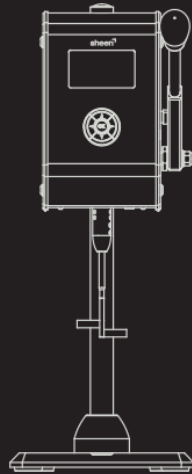


**sheen**

# Krebs Viscometer

**DV2300**

Operating Instructions  
(V4.0 042024)





**NOTE**

Please check the startup screen of the Krebs viscometer to check if this manual, written for version 2.0 and above applicable to you.

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## **1 GENERAL**

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### **1.1 Importance of operating manual**

This manual is written in order to become familiar with all the functions and possible applications of the instrument. It contains important instructions about how to use the instrument safely and economically; according to the purpose designated. Following these instructions is not only essential to avoid risks. It also reduces repair costs and down-time and increases the products reliability and service life.

Anyone who works with the instrument should follow the instructions in this manual, particularly the safety related instructions. Additionally local rules and regulations relating to environmental safety and accident prevention should be observed.

### **1.2 User-responsibility**

#### **The user should**

- a) Only allow persons to work with the instrument who are familiar with the general instructions on how to work safely and prevent accidents.
- b) Regularly check the safety-awareness of personnel at work.

### **1.3 Responsibility of personnel**

Before commencing work anyone appointed to work with the instrument should pay attention to the general regulations relating to work safety and accident prevention. The safety chapter and the warnings in this manual should have been read and understood.

### **1.4 Dangers**

This instrument has been designed and constructed in accordance with state-of-the-art technology and the acknowledged safety regulations. Nevertheless, working with the instrument may cause danger to the life and health of the operator or to others, or damage to the instrument or other property. Therefore the instrument should only be used for its designated purpose, and in a perfect technical condition. Any defect that could have a negative effect on safety should be attended to immediately.

### **1.5 Designated purpose**

The Krebs viscometer is exclusively designed to be used to measure the viscosity of paint and products in laboratory and production environments. The design is setup for use with a Sheen spindle and is carefully calibrated to conform to ASTM D562. Other applications constitute improper use. Industrial Physics will not be held liable for damage resulting from improper use.

## 1.6 Copyright

The copyright of this operating manual remains with Industrial Physics. Its instructions and guidelines may not be duplicated, circulated or otherwise passed on to others, neither fully, nor partly, without prior permission. Infringement of these restrictions may lead to legal action to be taken.

## 1.7 Manufacturer's/Supplier's address




Industrial Physics  
Molenbaan 19  
2908 LL Capelle aan den IJssel  
The Netherlands  
T +31(0)10-7900100

## 2 SAFETY INSTRUCTIONS

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### 2.1 Meaning of Symbols

The following symbols for dangers are used in this instruction manual.

Symbol	Explanation	Warning
 Danger	Possible immediate danger to the life or health of personnel	If this guideline is not noted it can lead to severe danger to health, up to fatal injury
 Warning	A dangerous situation could be caused	Non observance of this guideline can lead to injury or to damage to equipment
 NOTE	Special tips and particular information	Guidelines to make optimal use of the instrument

### 2.2 Availability of safety information

The instruction manual should be kept at the place of the instrument operation. In addition to the information contained in the instruction manual, general and local regulations for accident prevention and environmental protection should be kept available and observed. Always ensure all guidelines in respect of safety and dangers on the instrument are in readable condition.

In case of danger the instrument has to be switched off.

### 2.3 Training of personnel

- Anyone who operates the instrument should be trained properly.
- It has to be clear who has which responsibility regarding commissioning, maintenance and repairs, installation and operation.
- Anyone who hasn't finished training should be supervised by an experienced person while working with the instrument.

### 2.4 Power supply

- Work on the power supply may only be done by qualified personnel.
- The electrical equipment of the instrument must be checked regularly. Loose connections and cable damage must be corrected immediately.
- Always make sure the instrument's power is turned off while adjusting any electrical component.

### 2.5 Special attention



**Danger**

**The Krebs viscometer reaches high rotational speeds.  
Do not touch moving parts during testing.**

**Contacting a moving spindle may cause injuries.**

### 2.6 Care, maintenance and repairs

- Always make sure the instrument is connected to grounded outlet.
- Always make sure the instrument's power is turned off and the instrument is not connected to an outlet while adjusting any electrical component whenever maintenance, inspection or repair work is done.
- Do not open the instrument. In case of malfunction always consult the manufacturer.

## **2.7 Modifications to the equipment**

- Any modifications, additions or alterations to the instrument may solely be made with permission from Industrial Physics.
- All measures involving modifications require written confirmation of approval from Industrial Physics.
- Instruments which are not in fault-free condition must immediately be switched off.
- Only use replacement parts from the original supplier. Parts used from other sources aren't guaranteed to meet the safety requirements.

## **2.8 Cleaning of the instrument and disposal of materials**

- When in use it is possible to spill paint on the instrument's base. Clean immediately before hardening.
- Try to keep the instrument as clean as possible to prevent malfunctioning.
- Use a suitable solvent to remove remains of paint or ink.
- Wear suitable gloves and don't spill solvent during cleaning.
- Cleaning materials must always be used and disposed of correctly.

## **3 TRANSPORT AND STORAGE**

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### **3.1 Packing**

Please take note of pictorial symbols on the packing and store the packaging for future transport for e.g. repair or recalibration.

### **3.2 Check on receipt**

Check packing for damage.

After unpacking check complete supply, using the scope of supply on page 10.

### **3.3 Reporting transport damage and documentation**

Any damage should be documented as accurately as possible (possibly photographed) and reported to the relevant insurers or, in the case of sales "delivered to customers works", to the supplier.

### **3.4 Storage and protective measures when not in use**

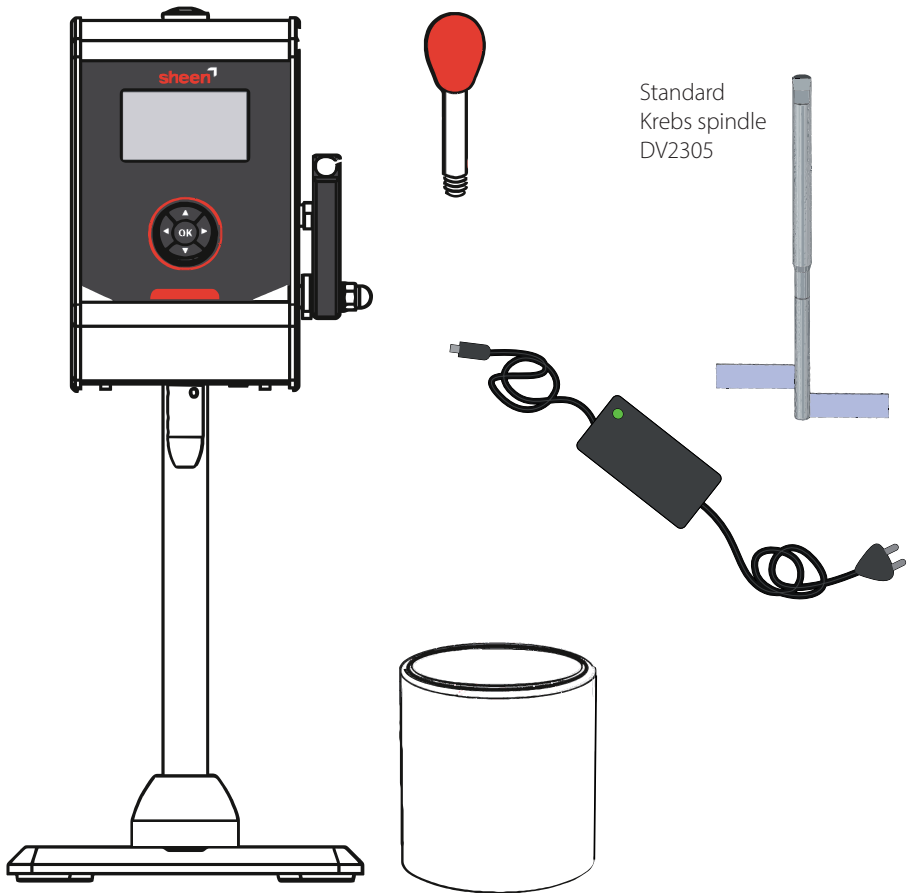
The instrument must be stored in a dry ( $\approx 40\%$  RH) place at a temperature between 10 - 40°C. Store instrument in the original packing if possible.

#### 4 SCOPE OF SUPPLY

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- DV2300 - Sheen Digital Krebs viscometer
- Handle
- DV2305 - Standard Krebs spindle
- One 0,5l can
- 110 - 250VAC power adapter

**Note:** Verification oils have to be ordered separately.



## 5 TECHNICAL DATA DV2300 SHEEN KREBS VISCOMETER

Operating voltage	100-240 VAC / 50-60 Hz from a grounded wall outlet
Operating temperature	+5 °C - +40 °C / +41 °F - 104 °F
Net weight	8,5 kg / 18,7 lbs
Speed	200 rpm
Range	52 – 5.000 cP, 40 - 1.047 g*, 40 – 142 KU*
	(* density 1 g/ml)
Resolution	1 cP
	0,1 KU
	0,1 g
Accuracy	± 2% of full scale
Repeatability	± 1% of full scale
Sample container	500 ml, 86 x 102 mm and 60 mm opening
Dimensions (w x d x h)	200 x 360 x 550 mm / 7.9 x 14.2 x 21.7 inch

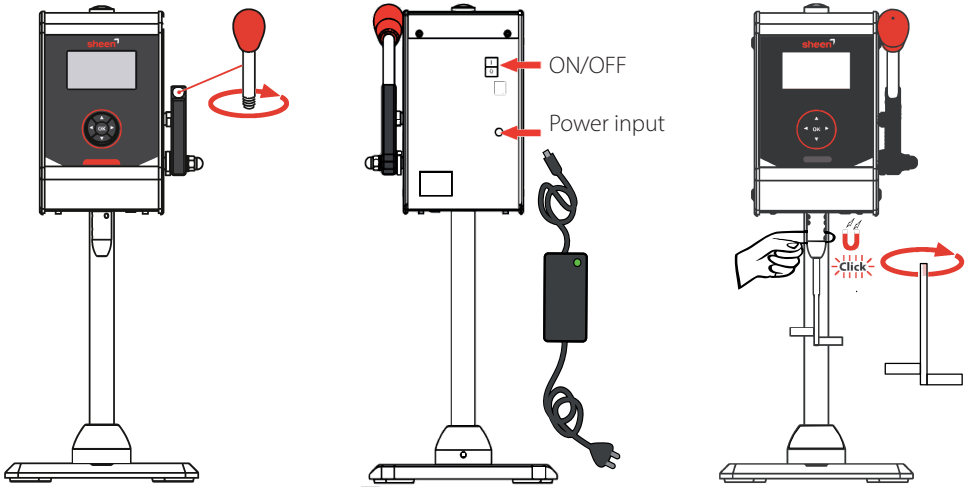
### CAN BOTTOM DIMENSIONS

Capacity	Diameter (mm)		Diameter (in)	
	inner	Outer	Inner	Outer
1 l	105	111	4,1	4,4
3/4 l	96	102	3,8	4,0
1/2 l	85	92	3,3	3,6
1/4 l	68	77	2,7	3,0

## 6 ASSEMBLY

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1. Install the handle.
2. Install the power supply.
3. Install the Krebs spindle .
  - The spindle is keyed and magnetic for easy installation and removal after taking a measurement.
  - The base of the instrument can be screwed to the tabletop for extra stability.



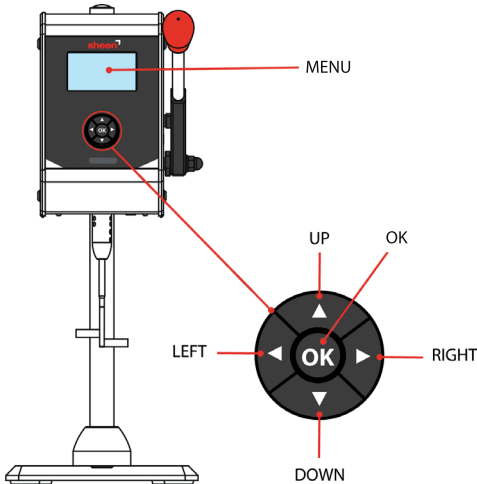
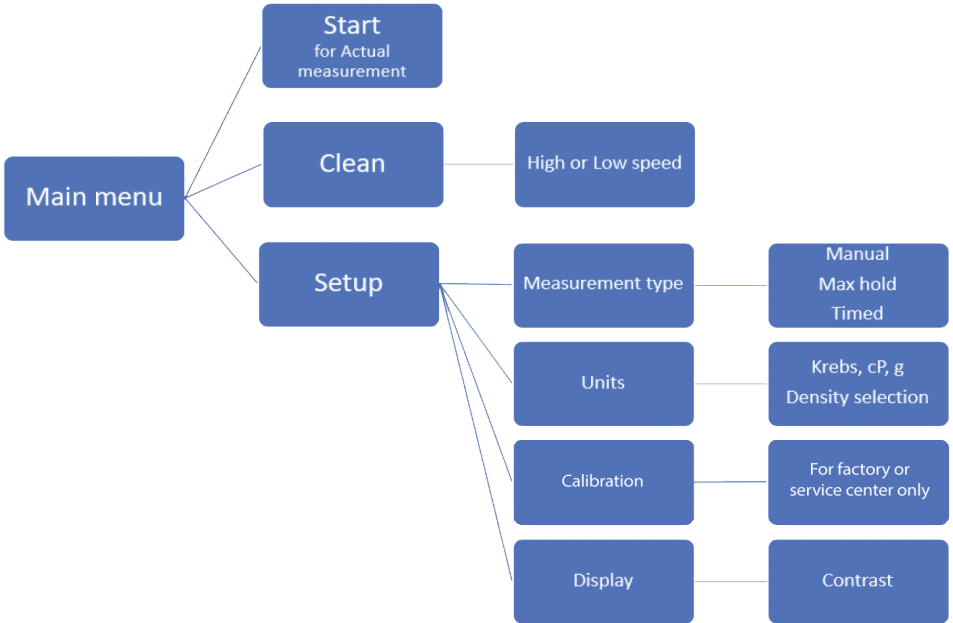
Stop the chuck from rotating.

## 7 MENU EXPLANATION

This section describes in detail all the menu options the instrument offers.

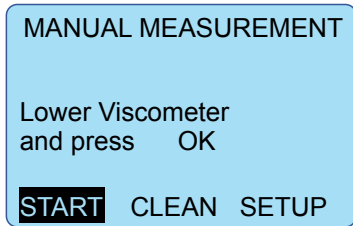
### 7.1 General menu structure

Below is a high level overview of the Krebs viscometer menu structure.



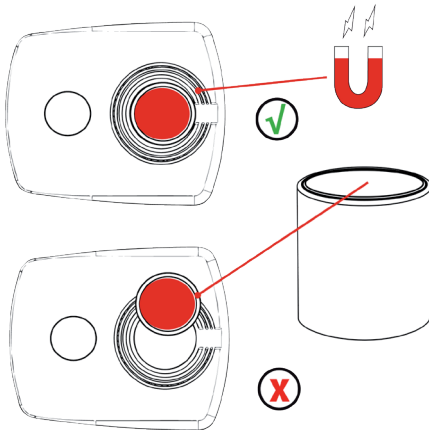
The menu is navigated using the buttons as indicated.

## 7.2 Main menu



After switching on the unit, this is the main menu. The machine will revert to the settings used the previous time. Use the control buttons to select SETUP and press the OK button.

## 7.3 Actual measurement



Place a can with the fluid to be measured on the base of the instrument making sure it is well centered and magnetically secured.

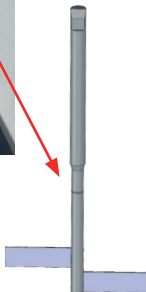
Measure and record the fluid temperature as indicated by your local procedures.

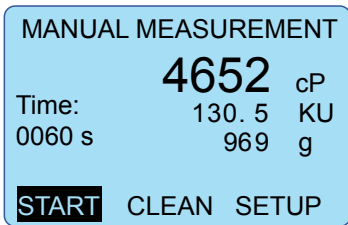
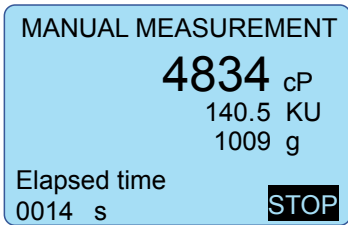
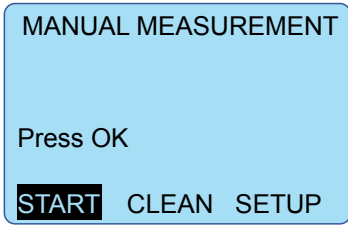


Lower the instrument with the handle and with that the spindle into the fluid right up to the level indicator on the spindle's shaft.

This is essential for a proper measurement.

With START highlighted (see section 7.2), pushing the OK button will start the paddle motor and the actual measurement.





In this example Manual measurement was selected previously and it's the operator that has to watch the duration of the measurement and press the OK button again to stop the spindle from turning. (see section 7.5.1 for measurement type selection)

Follow your local instructions for the time to measure.

In general it is wise to measure for a short time (e.g. 10 s) to prevent a change in temperature of the fluid being measured.

**Note** Centipoise (cP) was selected as Unit and is shown big. The other two units are also valid measurements, but just shown smaller. (see section 7.5.2 for unit selection)

Press OK to stop the spindle from rotating.

After stopping: measure and record the fluid temperature as indicated by your local procedures. Record the viscosity values.

**Note** When the handle is raised the measurements are deleted.

Raise the handle and let the fluid drip. Then clean the spindle with a cloth before removing the can.

Before taking another measurement or leaving the instrument, it is advised to thoroughly clean the spindle. See the Clean High - Low section.

MANUAL MEASUREMENT  
**Over** cP  
Over KU  
Over g  
Elapsed time  
0019 s **STOP**

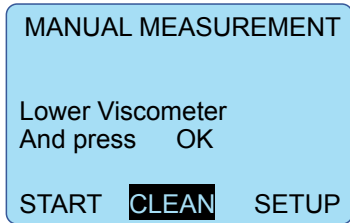
Possible errors:

The fluid being measured is too thick  
(viscosity >5.000 cP)

MANUAL MEASUREMENT  
**Under** cP  
Under KU  
Under g  
Elapsed time  
0006 s **STOP**

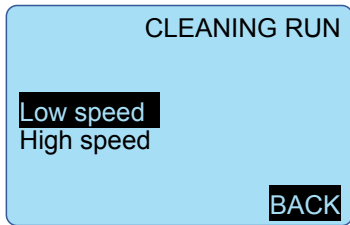
The fluid is too thin (<52 cP) or the spindle hasn't be lowered into the fluid properly.

## 7.4 Clean High - Low

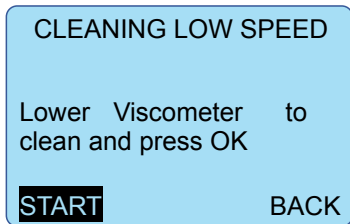


In the main menu, use the control buttons to highlight CLEAN and press the OK button.

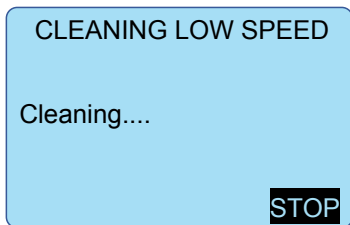
CLEAN is just the spindle turning in an appropriate solvent, without measurements being made.



Next highlight Low speed or High speed and push the OK button.



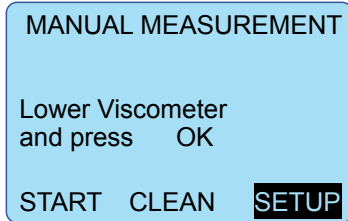
With a can, filled with appropriate solvent securely installed (see also 7.3) and proper safety measures taken against spillage or eye or hand contact, lower the handle to be able to start the cleaning process.



Raising the handle or pressing the OK button will stop the spindle rotating.

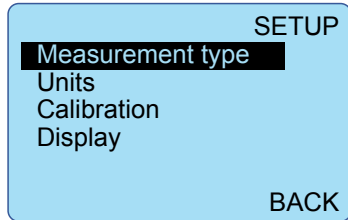
## 7.5 Setup menus

The menus available for setting up the instrument's functionality are explained in this chapter.



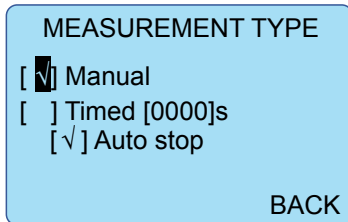
In the main menu, use the control buttons to highlight SETUP and press the OK button.

### 7.5.1 Measurement type

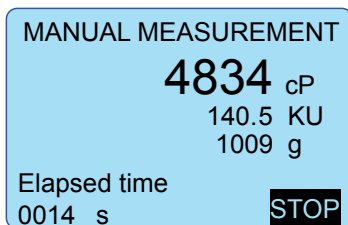


The Measurement type selection will allow the user to select Manual or Timed measurements.

Press the OK button



Manual measurement is started from the main window and lasts as long as the operators decides. Press the OK button to select and then navigate to BACK and press the OK button to return to the main window and start a manual measurement.



All three units (cP, KU and g) are shown with the selected unit (see chapter 7.5.2) in a large font.

**MEASUREMENT TYPE**

[ ] Manual  
 [✓] Timed [0000]s  
 [✓] Auto stop

**BACK**

Timed measurement lets the spindle rotate for the set amount of time.

The time can be set by navigation to the digits between [ ] and using the up and down buttons to cycle from 1 to 9. Use left and right to select a digit.

Auto stop is optional and the spindle will stop after the set time. Without auto stop the spindle will continue to rotate and produce measurements while the timed value remains fixed.

Press the OK button to select the desired measurement type and then navigate to BACK and press the OK button to return to the main window.

**Timed measurement with Auto stop example**

Ⓐ **TIMED MEASUREMENT**

Lower Viscometer  
 and press OK

**START** CLEAN SETUP

Lower the instrument with the handle and with that the spindle into the fluid right up to the level indicator on the spindle's shaft.

Ⓐ **TIMED MEASUREMENT**

Press OK

**START** CLEAN SETUP

Press the OK button to start a timed measurement.

Ⓐ **TIMED MEASUREMENT**

**4834** cP  
 140.5 KU  
 1009 g

Remaining time  
 0004 s **STOP**

Here it shows cP in a large font but it could also have been KU or g, depending on the unit selected in section 7.5.2.

The spindle has been rotating and the remaining rotation time is 4 seconds.

Ⓐ TIMED MEASUREMENT

1573 cP

Time: 99.4 KU  
0010 s 346.3 g

**START** CLEAN SETUP

The previously set time has passed and the spindle stopped.

After stopping: measure and record the fluid temperature as indicated by your local procedures. Record the viscosity values.

**Note** When the handle is raised the measurements are deleted.

TIMED MEASUREMENT

Lower Viscometer  
and press OK

**START** CLEAN SETUP

### Timed measurement without Auto stop example

Lower the instrument with the handle and with that the spindle into the fluid right up to the level indicator on the spindle 's shaft.

TIMED MEASUREMENT

Press OK

**START** CLEAN SETUP

Press the OK button to start a timed measurement

TIMED MEASUREMENT

Last:	Timed:
122.4 KU	117.9 KU
645.8 g	575.3 g
3040 cP	2699 cP

Elapsed time  
0004 s

**STOP**

The spindle is still rotating but the set period has passed. The measurement exactly at the set time is fixed under "Timed:".

Ongoing measurements are shown under "Last:"

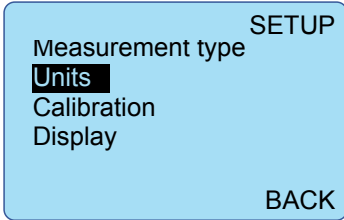
TIMED MEASUREMENT

Last:	Timed:
122.4 KU	117.9 KU
645.8 g	575.3 g
3040 cP	2699 cP

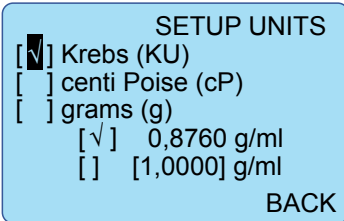
**START** CLEAN SETUP

After stopping the measurement the results are fixed and shown until the handle is raised. Record these with the temperature measured.

## 7.5.2 Units



In the main SETUP menu, navigate to Units and press the OK button.



The selection for Krebs (KU), centi Poise (cP) or grams (g) will define:

The top measurement unit shown in a large font.

The Sheen Krebs viscometer allows the user to set a custom value for the density. This density setting influences the calculated grams and Krebs using the actually measured centipoise (cP).

$$g = \frac{(6.10 O + 906.6 D)}{30}$$

$g$  is in grams,  $O$  is viscosity in cP and  $D$  the density in g/ml

The Sheen Krebs viscometer allows for accurately setting the density of your product and getting a more precise measurement of the viscosity in grams and in Krebs.

The grams and Krebs scale are hard linked to each other. This correlation is **not** the same as commonly seen when calculating from cP to centistokes (cSt).

The value of 0,8760 as shown is the fixed default and backwards compatible with previous instruments and firmware releases and other commonly available Krebs viscometer brands.

### 7.5.3 Calibration

The required knowledge, experience and high quality and well calibrated tools are outside the scope of a normal user instruction and it is therefore that the calibration of the Krebs unit is no longer part of the manual.

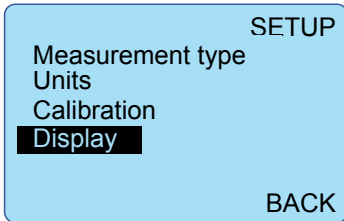
A separate calibration manual will be made available on request.

Your Krebs viscometer can be recalibrated at the Industrial Physics factory.

Using calibration oils with certificates, calibrated thermometers with 0,01 °C reading capability and 0,1 °C accuracy at 25 °C, in a well controlled environment, following ASTM D562 will allow a user to check the instruments accuracy using the normal measurement functionality.

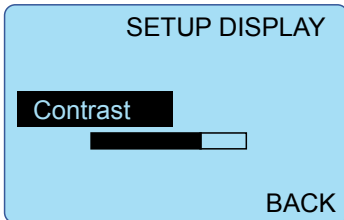
The Industrial Physics oils suitable for Krebs are: DV2205, DV2206, DV2207, DV2208, DV2209, DV2210. Please also see: <https://industrialphysics.com/product/viscosity-calibration-oils/>

### 7.5.4 Display



The display setup offers a simple adjustment of the LCD's contrast.

Use the Left, Right buttons to decrease or increase contrast.



Pres the OK button or navigate to BACK and press the OK button to back go to the Main window.

## 8. FREQUENTLY ASKED QUESTIONS

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**Q:** Can I calibrate the instrument ?

**A:** Yes, but the needed knowledge, experience and high quality and well calibrated tools are outside the scope of normal use and it is therefore that the calibration of the Krebs unit is no longer part of the manual. A special Krebs calibration manual will be made available on request.

**Q:** Can I verify the accuracy of the viscometer ?

**A:** Yes by using one or more calibration oils in a well regulated environment with appropriate 0.01 °C resolution and 0.1 °C calibrated thermometers, a warm bath and in-depth viscosity knowledge.

**Q:** Which oils are appropriate for instrument verification ?

**A:** The Industrial Physics oils suitable for Krebs viscometer verification are: DV2205, DV2206, DV2207, DV2208, DV2209, DV2210.

Also see: <https://industrialphysics.com/product/viscositycalibration-oils/>

**Q:** Which spindle type is supported by the Krebs viscometer ?

**A:** Only the supplied DV2305 Krebs spindle complies with the ASTM D562 set dimensions for the spindle .

**Q:** What is the input voltage range of the Krebs viscometer ?

**A:** The instrument is powered by a medical safety approved (2xMOPP) external power supply that works from 100 to 240 VAC and 50-60Hz.

**Q:** What kind of power plugs are shipped ?

**A:** The viscometer is shipped with either a EU and US plug or a UK plug.

**Q:** Does the viscometer need a grounded wall outlet ?

**A:** Yes, for the safety features of the medical safety approved (2xMOPP) external power supply to function properly it must be connected to a well grounded wall outlet.

**Q:** What kind of container should I use ?

**A:** ASTM D562 advises to use a 500 ml (1 pint) can with a diameter of 85 mm (3 ⅜ in)  
Other containers maybe used but can give different results.

## 9. CARE AND MAINTENANCE

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### 9.1 Inspection and Maintenance

- Though robust in design, this instrument is precision machined. Use with care.
- Always clean the instrument after use.
- Clean the instrument using a soft dry cloth. Never clean the instrument by any mechanical means such as a wire brush or abrasive paper. This may cause, just like the use of aggressive cleaning agents, permanent damage.
- Do not use compressed air to clean the instrument.
- Generally, the Sheen Krebs Viscometer does not require any maintenance.
- After finishing a viscosity measurement, always clean the paddle immediately. Do not allow any paint to dry on the spindle.

### 9.2 Customer Service

When requesting service always include Model No. and Serial No. from device tag. Customer service is provided on request by:

#### Industrial physics

Molenbaan 19  
2908 LL Capelle aan den IJssel  
The Netherlands  
info@industrialphysics.com  
info-china@industrialphysics.com

<https://industrialphysics.com/support/> to request support

## 10. DISCLAIMER

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The right of technical modifications is reserved. Please refer to our terms and conditions as published on our website. The information given in these instructions may be incomplete. Anyone using the product for a purpose other than that described in this document does so at his/her own risk.

Sheen is a brand of Industrial Physics Inc.

