

D-72336 Balingen

Phone: +49-[0]7433-9933-0 Fax: +49-[0]7433-9933-149 E-Mail: info@kern-sohn.com Internet: www.kern-sohn.com

Operating instructions KERN Easy touch App <Density> **Density determination function**

KERN SET-04

Version 1.1 2021-02 GB



The current version of these instructions can also be found online under: https://www.kern-sohn.com/shop/de/DOWNLOADS/ Under the section Operating manuals

SET-04-BA-e-2111_density



KERN App Density Version 1.1 2021-02 Operating instructions SET-04

Contents

1	Weighing function Density – Density determination function	3
1.1	General hints	3
1.2	Select function	3
1.3	Determine density of a solid matter	4
1.4	Determining density of a liquid	8

1 Weighing function Density – Density determination function

1.1 General hints

The density determination function allows the professional determination of the density of solid matter and liquids according to the gravimetric-Archimedean principle (for weighing activities in air and in a reference liquid).

Typically for this purpose are used a precision balance with a resolution of 0.01 g or 0.001 g or an analytical balance with 0.1 mg and a densitiv determination set.

The density determination set contains all the accessories and aids required for easy and precise density determination.

Quickly and at low cost we find out the volume of the attached plummet in our DKD-calibration laboratory.

For further information please see KERN-Homepage (www.kern-sohn.com).

Notes:

- Take into account the attached operating manual of the density set.
- Density determination with help of the underfloor weighing device is recommended for samples that do not fit, due to size or shape, in the sample dish or glass beaker of the density determination set.

1.2 Select function



In the FUNCTIONS menu click the symbol **<Density>**, the start screen appears.

For density determination, the following two settings are available:

- Density determination of solid bodies (density < / > 1), see chap. 1.3
- > Density determination of liquids, see chap. 1.4

1.3 Determine density of a solid matter

In this case, the solid matter is first weighed in air and then in the reference liquid, whose density is known. From the weight difference results the buoyancy from where the software calculates the density.

Preparing the balance with density determination set (Take into account the operating manual of the density set).

Density Wählen Sie die Art der Dichtemessung				
Bitte wählen Sie d	ie Art von density			
Klicken / Tippen Festkörper messen	Klicken / Tippen Flüssigkeit messen			
Tap <measuring b="" body<="" solid="">>.</measuring>				

The screen appears for selection of the reference liquid in which the measurement shall take place.

In the master database of Easy Touch the density tables of various liquids are stored by the manufacturer.

ADB 200-4 4711 Max 210 g	Min 0 d 0.0001 g	DEU	KERN	+ Willko	Herzlich Albert
Wählen Referenzflüssigkeit			\$	05-02-	2021 10:16:34
Bitt	te wählen Sie die <mark>referenzflüssig</mark> l	keit	√	Functionen	atenbank Enstendingen
Suche Suche nach Flüssigkeitsname	Sorberen ID-Nummer	<u> </u>	٥	ŧĐ	C
Master- Objektname V Water	Master- Objektname Ethanol	Master- Objektname Methanol	Neue Referenzflüssigkeit hinzufügen	Datenbank	Zurücksetzen
Temperatur * 22	Unit* °C ✓				
Zurück		Bestätigen			
		6			

Select type and temperature of the reference liquid and tap **<Confirm>**.



If your desired reference liquid is not stored in the database, procede as follows:



In the master menu tap the symbol <Add new reference liquid>.

The input window for the new liquid appears.

Fill out all fields accordingly and save as master data record.

The screen for weighing in air appears.

Put the sample into the upper sample dish, the weight in air is diplayed.

ADB 200-4 4711 Max 210 g Min 0 d 0.0001 g	DEU KERN	Herzlich Albert Willkommen,
Dichte Messung in Luft	~	05-02-2021 10:17:30
4		Funktionen Datenbank Einsteilungen
😫 Luft 🕼 Flüssigkeit. 🖹 Ergebnis		per / wessung in cure
20.0424		C
20,0134 g	Datenbank	Zurücksetzen
0 g	210 g	
Tara 0,0000 g > 0 <		
Messung in	Flüssigkeit →	
Ĵ	Ĺ	
Tap <measuring in="" liquid="">.</measuring>)	

The weight of the solid body in air is saved.

Put the sample into the lower sifting bowl, the weight of the sample in liquid is displayed.

ADB 200-4 4711 Max 210 g Min 0 d 0.0001 g	DEU	KERN	Herzlich Albert Willkommen,
Dichte Messung in Rüssigkeit		\$	05-02-2021 10:18:23
↓ ≓ Luft 🔕 Flüssigkeit 🗐			rper > Messung in Flüssigkeit
17,5289 g		£⊕ Datenbank	Zurücksetzen
0 g Tara 0,0000 g	210 g ≻0<		
← Messung in Luft	Dichte - Ergebnis →		Neue Benachrichtigungen (Aus)
Tap <density -="" result=""></density> .	$\langle \rangle$		

The density of the sample is calculated and displayed.

🛤 ADB 200-4 4711 Max 210 g Min 0 d 0.00	001 g	DEU	KERN	Herzlich Albert Willkommen,
Dichte Dichte - Ergebnis			\$	Funktionen Datenbank Einstellungen
🚔 Luft 🔕 Rüssi	gkeit 🖹 Ergebnis			örper > Dichte - Ergebnis
8,047	0 g/cm3	k.d	Datenbank	Zurücksetzen
0 g		210 g		
	Ergebnis des Senkkörpers in der Luft	20,0134 g		
	Ergebnis des Senkkörpers in der Flüssi	gkeit 17,5289 g		
← Messung in Flüssigkeit	Spe	eichern →		
Tap <save< b="">>.</save<>		5		

The measuring data record is displayed and can be printed out or saved as master data record, if necessary.

ster-Objekt-ID te reben Se die Master-Objekt-ID ein	Master-Objektname Bitte reben Se den Objektnamen ein	()	
o Brook on an anotal college to out	units generic de cert angenommer en	ADB 200-4	1
similarihe Objelit-ID	Dynamischer Objektname		
te geben Sie die dynamische Objekt-ID ein	Bitte geben sie den dynamischen Objektnamen ein	Serlennummer WE123123123	
Referenzflüssigkeit Water	Messung in Luft (Nettogewicht) 20,0134 g	Interner Code 4711	Ē
Messung in Luft (Taragewicht) 0,0000 g	Messung in Luft (Bruttogewicht) 20,0134 g	Letzte Justierung 2021-02-02	
Messung in Flussigkeit (Nettogewicht) 17,5289 g	Messung in Flussigkeit (Taragewicht) 0,0000 g	Temperatur 21 C	
Messung in Flussigseit (Bruttogewicht) 17,5289 g	Temperatur der Heferenzflüssigteit 22 C	Control of the second s	
Density	Außentemperatur		
8,0470 g/cm3	21 C	KERN & Sohn GmbH Ziegelei 1, 72336, Balingen, Germany	
		Telefon: +49 7344 9933 0	
Bandatum Wahlen Drucken der Ergebnisse		Email: info@kern-sohn.com	
Turbat			

After saving the balance automatically returns to density determination mode. A new density determination can be started.

1.4 Determining density of a liquid

For this purpose a plummet with known volume will be used. The plummet is weighed first in air and then in the liquid whose density is to be determined. From the weight difference results the buoyancy from where the software calculates the density.

Preparing the balance with density determination set (Take into account the operating manual of the density set).



Tap <Measuring liquid>.

At the first commissioning the window to create a plummet object will appear.

For that purpose fill out the required obligatory fields.

Density Neuen Senkkörper hinzufügen				
	Bitte das Volur	nen festleg	en von senkkörper-objekt	
Senkkörper Name * Edelstahlkörper			Volumen (in cm³)* 2,55	
Dynamic Temperatur* 21	Unit* °C	~		
Wählen Objekt als Stammdatum speichern				
Zurück				Bestätigen
				L

To save tap **<Confirm>**.

Moreover this new plummet can also be stored as master data record, in order to use it for further density determinations.

J

If a plummet object has already been created, it appears in the display and can be selected and used:

🗮 ADB 200-4 4711 Max 210 g Min	0 d 0.0001 g	DEU	KERN	Herzlich Albert Willkommen,
Bitte wählen Sie ein Datenobjekt aus, um f	Messreihen ^{fortzufahren}	3	~	05-02-2021 10:43:09
suche	Sortieren ID-Nummer	✓ Ξ‡	SP F G > Density	unktionen Datenbank Einstellungen Datenbank
Master-Objektname Testgewicht Edelstahl	Master-Objektnam Edelstahl Senkka	e örper		
D001	Edelstahl Senkkörper			
Turisk				

ADB 200-4 4711 Max 210 g Min 0 d 0.0001 g DEU		KERN	Herzlich Albert Willkommen,
Density Wahlen Sie den Senkkörper			05-02-2021 10:43:47
Bitte das Volumen wählen <mark>senkkör</mark> p	er-objekt messen Edelstahl Senkkörper	√ → Density	Funktionen Datenbank Einstellungen
Suche Suche nach Namen des Senkkörpers	Sortieren ID-Nummer ─ =↓	Ð	
Master-Objektname Edelstahl Senkkörper]	Neuen Senkkörper hinzufügen	Datenbank Zurücksetzen
Temperatur ★ Unit ★ 21			
Zurück	Bestätigen		
To save tap <confirm></confirm>	5		

The screen to calculate the weight of the plummet in air appears. Put the plummet into the upper sample dish of the density determination set. The weight of the plummet in air will be displayed:

ADB 200-4 4711 Max 210 g Min 0 d 0.0001 g DEU	KERN' Herzlich Albert
Dichte Messura in Luft	05-02-2021 10:45:37
- modeling in care	Funktionen Datenbank Einstellungen
↓ Second Second Second	G → Flüssigkeit → Messung in Luft
20.0444	
20,0144 g	Datenbank Zurücksetzen
0 g 210 g	
Tara 0,0000 g > 0 <	
Senkkörper Name Edelstahl Senkkörper	
Messung in Flüssigkeit →	
$\left\{ \right\}$	

Tap <Measuring in liquid>.

The weight of the plummet in air is saved.

The screen for weighing in the test liquid appears. Put the plummet into the lower sifting bowl. The weight of the plummet in the test liquid will be displayed:

ADB 200-4 4711 Max 210 g Min 0 d 0.0001 g DEU	Herzlich Albert Willkommen,
Dichte Messung in Flüssigkeit	05-02-2021 10:46:12
Ų	Funktionen Datenbank Einstellungen
🚔 Luft 🔕 Flüssigkeit 🖹 Ergebnis	
47 5200	
17,5209 g	Datenbank Zurücksetzen
-	
0 g 210 g	
Tara 0,0000 g > 0 <	
Senkkörper Name Edelstahl Senkkörper	
← Messung in Luft Dichte - Ergebnis →	
Ο	
Tap <density -="" result="">.</density>	

The density of the liquid is calculated and displayed.

C ADB 200-4 4711 Max 210 g	Min 0 d 0.0001 g		DEU	KERN		Herzlich Albert Wilkommen, 05-02-2021 10:46:29
ے اسلامی الم	,248	ter tradecia 0 g/cm3			Funkt t > Dichte - Ergebnis	ionen Datenbank Einstellungen
0g Tara	0,0000 g		210 g			
Senikkörper Name	Edelstahl Senkkörper	Ergebnis des Senkkörpers in der Luft	20,0144 g			
Master-Objekt-ID Master-Objektname Püösigket	: Edelstahl Senkk : Edelstahl Senkk	Ergebnis des Senkkörpers in der Flüssigkeit	17,5204 g			
		Senkkörper Volumen	2,0000 cm ³			
		Flüssigkeitstemperatur	21,0000 C			
🤶 Messung in Flüssigkeit			Speichern →			
Tap <save></save> .			\mathcal{S}			

The measuring data record is displayed and can be printed out or saved as master data record, if necessary.

Ergetros			1
Dynamiane Olgaio ID	Operation Diplomane Cardo mit Clarcional	1. The second se	
5002	Jerre min riuzzignen	ADB 200-4	1
Manor Bapes D Edebtani SenikArper Olgensenanna 2.5449 cm ³ Mensorg in Luft (Plentogewicht) 200146 g	Maren - Opinersme Edebaahl Senkhörper Edebaahl Senkhörper Edebaahl Senkhörper Mensung in Lant (Tanzgesicht) 0.0000 g Mensung in Takagient (Nerzgesicht) 17,5304 g	Sananouswar WE123123123 Inservor Cade 4711 Latter Jatemurg 2021-06-00 Tangenetat 21 C	6
Mensurg in Fluxagent (Enregenetist 0.0000 g Temperatur de Referenciausgines 21 C Automomperatur 21 C	Messang in Russigket Brutsgewold 175594 g Dennin 1,2489 g/cm3	Explores generator durinh Albert Sauter auf 2021-02-05 10:47:19 KERN & Sohn GmbH Zegnie 1, 7238, Balager, Generaty Tabeler + 48:7344 9933 0 Execute Redeformation com	
Summakerspecher aktualtieren		Productive Week Approved To Approximate Control Contro	

After saving the balance automatically returns to density determination mode. A new density determination can be started.