



Anton Paar

EasyDens
Instruction Manual
and Safety Information
(Original)

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Further information

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ABOUT THE INSTRUCTION MANUAL	4
SAFETY INSTRUCTIONS	5
EASYDENS – OVERVIEW	9
CHECKING THE SUPPLIED PARTS	10
VIEW OF EASYDENS	11
PUTTING EASYDENS INTO OPERATION	12
CONNECTING EASYDENS TO YOUR SMARTPHONE	14
PERFORMING A MEASUREMENT	14
CLEANING AND STORING THE INSTRUMENT	16
CHECKS AND ADJUSTMENTS	17
EXCHANGING THE BATTERIES	18
TECHNICAL DATA	19
DENSITY OF WATER	20
CE DECLARATION OF CONFORMITY	21
BLUETOOTH REGULATIONS	23
WARRANTY RETURN	23

ABOUT THE INSTRUCTION MANUAL

This instruction manual informs you about the installation and the safe handling and use of the product. Pay special attention to the safety instructions and warnings in the manual and on the product.

The instruction manual is a part of the product. Keep this instruction manual for the complete working life of the product and ensure that it is easily accessible for all people involved with the product. If you receive any additions to or revisions of this instruction manual from Anton Paar GmbH, these must be treated as part of the instruction manual.

**Download the current version of the EasyDens instruction manual from:
<http://www.easdens.com>**

CONVENTIONS FOR SAFETY MESSAGES

The following conventions for safety messages are used throughout this instruction manual:



WARNING!

Warning indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION!

Caution indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Notice indicates a situation which, if not avoided, could result in damage to property.

TIP

Tip gives extra information about the situation at hand.

SAFETY INSTRUCTIONS

Read this instruction manual before using the instrument.

Make this instruction manual easily accessible to all persons working with the instrument.

Follow all tips and instructions in this instruction manual to ensure the correct use and safe functioning of the instrument.

LIABILITY

- This instruction manual does not claim to address all safety issues associated with the use of the instrument and samples. It is your responsibility to establish health and safety practices and to determine the applicability of regulatory limitations.
- Anton Paar GmbH warrants the proper functioning of the instrument only if no modifications are made to mechanics, electronics, or instrument software.
- Use the instrument only for the purpose described in the instruction manual. Anton Paar GmbH is not liable for damages caused by incorrect use of the instrument.
- The results delivered by the instrument depend not only on the correct functioning of the instrument, but also on various other factors.
- Do not base any decisions concerning safety or commercial issues on data measured by EasyDens.

INSTALLATION AND USE



WARNING!

- Do not use the instrument in medical areas.
- Use EasyDens only as a stand-alone unit. (The EasyDens cannot be operated without a smartphone or tablet. Therefore, the smartphone is considered as a part of the measurement unit). Do not combine the instrument with other instruments or devices for automation purposes.
- The instrument is intended for indoor use only.
- Use only accessories and consumables supplied or approved by Anton Paar GmbH.
- Ensure that all operators are familiar with the safety instructions for the instrument.
- Keep the device away from children.
- Ensure that the instrument is sufficiently supervised during operation.



WARNING!

- In case of damage or malfunction, do not continue operating the instrument. Do not operate the instrument under conditions which could result in damage to goods or injuries or loss of life.
- Do not expose the instrument to temperatures below 0 °C (32 °F) if the measuring cell contains water. Freezing water will cause rupture of the measuring cell.



WARNING!

- Do not apply any overpressure to the measuring cell. Fill the measuring cell by hand using syringes only.
- Liquids may spurt out of the instrument. Always use the instrument with a waste hose.



WARNING!

RISK OF EYE INJURIES

- Liquids may spurt out of the instrument. Always use the instrument with a waste hose. Also observe the precautions found in the Personal Safety section and wear safety goggles and protective gloves.

OPERATION IN AREAS WITH RISK OF EXPLOSION



WARNING!

- The instrument is not explosion-proof and therefore must not be operated in areas with risk of explosion.

PERSONAL SAFETY

- Always keep a distance of at least 15 cm (6 in) between the instrument and an implanted cardiac pacemaker or defibrillator.
- During operation of the instrument, the operator must be equipped with appropriate protective clothing (safety goggles, gloves).

GENERAL PRECAUTIONS

- Observe and adhere to your national safety regulations regarding the handling of all substances associated with your measurements (e.g. use safety goggles, gloves, respiratory protection, etc.).
- For the handling of substances, abide by the corresponding material safety data sheets.



WARNING!

- Fill only substances which will not pose a risk if they leak from the instrument in case of damage or malfunction.



WARNING!

- Before a measurement, check the wetted parts of the instrument for chemical resistance to the samples and cleaning agents used.
- Fill only liquids which will not attack the wetted parts of the instrument (see section wetted parts).



WARNING!

- Take care that the liquids (samples and cleaning agents) that you use are chemically compatible when they come into contact with each other. They must not react exothermally or produce harmful substances.
- Before you start a measurement or cleaning procedure, take care that all parts, in particular the measuring cell, the syringe and the hose for waste are properly connected and in good condition.
- Before you start a measurement or cleaning procedure, check the connection between syringe and the hose for leak tightness.
- Take measures that spilled liquids cannot get into plug connections or venting slots of electrical appliances.
- Do not leave the instrument in a location exposed to direct sunlight or near a heat source for any extended period of time.
- Do not change the ambient temperature of the instrument suddenly.



WARNING!

- Do not expose the instrument to temperatures below 0 °C (32 °F) if the measuring cell contains water. Freezing water will cause rupture of the measuring cell.

HOT SAMPLES

- Be careful with hot samples. Handling samples with temperatures of more than 50 °C (122 °F) bears the risk of burns.
- Observe the maximum sample temperature. At temperatures over 80 °C (176 °F), plastic parts soften and connections become leaky.

PRECAUTIONS FOR FLAMMABLE SAMPLES AND CLEANING AGENTS

- Keep potential sources of ignition, like sparks or open flames, at a safe distance from the instrument.
- Store only the minimum required amount of sample, cleaning agents, and other flammable materials near the instrument.
- Do not spill sample/cleaning agents or leave their containers uncovered. Immediately remove spilled sample/cleaning agents.



WARNING!

- If the U-tube breaks, turn off the device and wipe off leaked liquids immediately to avoid risk of fire.
- Ensure that the setup location is sufficiently ventilated. The environment of the instrument must be kept free of flammable gases and vapors.
- Provide fire-extinguishing equipment.

BATTERY HANDLING

- Please see how to insert the batteries into the device as displayed in picture - View of how to add batteries and correct polarity. Make sure you put the batteries in according to the correct polarity.
- Keep batteries away from children.
- Do not leave batteries lying around unattended. They can be dangerous for children or pets if they use them as toys.
- If a battery has been swallowed, seek medical advice immediately.
- Leaking or damaged batteries can cause burns if they come into contact with your skin. Use gloves for their handling.
- Never short-circuit or open batteries.
- Do not expose batteries to heat or throw them into fire.
- Do not charge non-rechargeable batteries. There is a risk of explosion.



WARNING!

- Do not insert damaged batteries in the battery compartment. They can cause short circuits and fire.



WARNING!

- Do not use lithium ion rechargeable batteries or lithium ion batteries with the instrument.
- Use only batteries type AA LR6 (alkaline) or rechargeable batteries type AA HR6 (NiMH).
- When replacing batteries, this step should be performed in an environment where there is relatively low humidity.



WARNING!

- In the case that you are not using the instrument for a long time, remove the batteries. Batteries could leak or be damaged.

INSTRUMENT RETURNS

- For returns, contact the vendor of the instrument. The instrument must be cleaned before return.
- You must not return instruments which are contaminated by radioactive materials, infectious agents, or other harmful substances that cause health hazards.

DISPOSAL

- Concerning the disposal of the instrument, observe the legal requirements in your country.

EASYDENS – OVERVIEW

The portable density meter EasyDens measures the density of liquids by the oscillating U-tube method. In addition, a temperature sensor measures the sample temperature directly at the measuring cell.

You operate and control the instrument via the EasyDens app running on your smartphone. For the communication between EasyDens and your smartphone, Bluetooth is used.

EasyDens features various measuring units for display:

- Density [g/cm³ or kg/m³]
- Specific Gravity SG
- Extract [°Plato]

MEASURING PRINCIPLE

Definition of density

The density (ρ) of a sample is defined as its mass (m) divided by its volume (V):

$$\rho = \frac{m}{V}$$

As the volume changes with temperature, density is a temperature-dependent measuring unit.

THE OSCILLATING U-TUBE METHOD

The sample is filled into a U-shaped borosilicate glass tube, which is electronically excited to vibrate at its characteristic frequency. The characteristic frequency changes depending on the density of the sample. With the determination of the characteristic frequency, the density of the sample can be calculated. Due to the temperature dependency of the density value, the temperature of the sample has to be determined precisely.

CONCENTRATION MEASUREMENT

In binary mixtures, the density of the mixture is a function of its composition. Thus, with the aid of density/concentration tables, the density value of a binary mixture can be used to calculate its composition.

This procedure is also applicable for so-called quasi-binary mixtures. These mixtures contain two major components and some additional ones in very small concentrations compared to the two main components.

Many decarbonated soft drinks, for example, can be considered to be quasi-binary mixtures of sugar and water because the concentrations of flavors and acids are very small compared to those of sugar and water. Hence the sugar concentration can be determined with a density meter.

The same holds for the determination of the alcohol concentration in distillates that can be considered to be quasi-binary mixtures of ethanol and water.

CHECKING THE SUPPLIED PARTS

EasyDens has been tested and packed carefully before shipment. However, damage may occur during transport.

Keep the packaging material for possible returns and for further questions from the transport or insurance company.

To check the delivery for completeness, compare the supplied parts to those listed in See Supplied parts.

If a part is missing or damaged, contact the vendor of the instrument.

Supplied parts

1 x EasyDens portable density meter

1 x 0.3 m Hose 3x5 mm silicone incl. 1 x Luer cone with hose grommet

1 x Syringe 10 mL Luer

Symbol	Pcs.	Article description	Mat. no.
	1	EasyDens portable density meter	234929
	0.3 m	Hose 3x5 mm silicone	50814
	1	Luer cone with hose grommet	254891
	1	Syringe 10 mL Luer	1427

VIEW OF EASYDENS

Front view of the instrument



Inspection window

View of how to insert batteries in correct polarity



Top view of the instrument



Sample inlet/outlet
Insert in the Luer
adapter in one of
them and insert
syringe into the
other one



Bottom view of the instrument.



Screws, which
have to be
removed to
access battery
compartment

Type plate

Rear view of the instrument



On/Off button

PUTTING EASYDENS INTO OPERATION

NOTICE

Protect the instrument against any collision or strong shock as this may lead to a malfunction of the instrument or break the measuring cell. If you notice that the U-tube is broken, immediately cover the sample inlet/outlet of the device with adhesive tape to prevent glass splinters from escaping.

CHECKING FOR LEAK TIGHTNESS

Close one injection hole tightly with your finger.

Use a plastic syringe to fill air with moderate pressure through the other injection hole.

Wait for a few seconds.

Release the plunger of the syringe.

If the connections are tight, the plunger of the syringe will be slowly pushed back by the pressure in the measuring cell.

If the connections are leaky, the plunger will not move. In this case, re-insert the syringe.

CONNECTING THE WASTE HOSE



WARNING! RISK OF EYE INJURIES

Liquids may spurt out of the instrument. Always use the instrument with a waste hose. Also observe the precautions found in the Personal Safety section and wear safety goggles and protective gloves.

Waste hose connected



Lead the waste hose into a suitable waste container.



CAUTION!

Ensure that the material of the waste container is resistant to the samples and cleaning agents that you are going to fill.

Waste container properly connected



SWITCHING THE INSTRUMENT ON/OFF

To switch the instrument on , press the On/Off button on the rear of the device.

A blinking LED will light up (visible in the inspection window) indicating that EasyDens is switched on.

To switch the instrument off , press the button again.

CONNECTING EASYDENS TO YOUR SMARTPHONE

GETTING STARTED

The EasyDens works with the EasyDens app for iOS, or Android installed on a supported device. Data is transmitted via Bluetooth wireless technology.

For a list of supported devices, go to: www.easydens.com

The app can be downloaded on the Apple App Store or on the Google Play Store.

STARTING UP

Start the EasyDens app on your smartphone. It will guide you to connect the app with the EasyDens. After a successful connection has been established you will be able to perform measurements and see the results in the app.

PERFORMING A MEASUREMENT



CAUTION!

Handling samples with temperatures of more than 50 °C (122 °F) bears the risk of burns.

Wear appropriate protective clothing or take other protective measures when you handle hot samples.



CAUTION!

Observe the maximum sample temperature. At temperatures over 80 °C (176 °F), plastic parts soften and connections become leaky.



CAUTION!

Before you perform a measurement, make sure that the wetted parts are resistant to the sample and cleaning agents. See Wetted Parts.

IMPORTANT

Sample containing dissolved CO₂ will cause bubbles in the measuring cell, which will lead to invalid measurement results. Degas your sample carefully before measurement.

TO DEGAS YOUR SAMPLE

Either boil the sample for several minutes, or stir the sample for 5 to 15 minutes until no more bubbling occurs, or put the sample in an ultrasonic bath for approx. 5 to 10 minutes.

IMPORTANT

Do not degas your sample by boiling or stirring it in an open container if it contains volatile components which you are going to measure, e.g. alcohol. With these methods, the volatile components will have (partially) evaporated after the procedure.

A suitable method for samples containing alcohol:

- Fill the sample into a 1 L flask up to max. 1/3.
- Seal the flask with a stopper.
- Alternately shake the flask and release the pressure until no pressure is built up anymore.

GENERAL INSTRUCTIONS FOR MEASURING

- Ensure that the measuring cell is filled free of gas bubbles. Reasons for gas bubbles in the measuring cell may be
 - gas bubbles in the sample,
 - leaky fitting of adapter or syringe.
- Fill the measuring cell completely.
- For best measurement performance, ensure that the sample temperature does not deviate too much ($\pm 5^{\circ}\text{C}/\pm 9^{\circ}\text{F}$) from the ambient temperature.
- Carefully clean the instrument after each measurement series to avoid deposits in the measuring cell.
- Have suitable solvents for cleaning at hand.

FILLING SAMPLE AND MEASURING

- Ensure that the waste hose is properly connected and leads into a waste vessel. See Connecting the Waste Hose.
- Fill a Luer tip syringe with the sample.
- Stick the tip of the syringe in the open injection hole (sample inlet).
- Push the plunger of the syringe slowly and steadily until a drop emerges from the sample outlet adapter (where the waste hose is connected).
- Leave the syringe in the filling position during the measurement to keep the liquid from running out.
- Read the measuring results on the measuring screen of the EasyDens app on your smartphone.
- Measure the next sample, or clean the measuring cell.

CLEANING AND STORING THE INSTRUMENT

REGULAR CLEANING OF THE MEASURING CELL

Always clean the measuring cell after work at the end of the day. You may need to clean it more often when you are going to measure a sample that could chemically react with the previous sample, when you are going to measure a sample that is not miscible with the previous sample.

CLEANING LIQUID

A suitable cleaning liquid must dissolve and remove sample residues in the measuring cell. It has to be a good solvent for all sample components.

Use warm ultra-pure water as the cleaning liquid for beer or wine samples.

IMPORTANT

Do not use tap water instead of ultra-pure water because tap water will leave limescale in the measuring cell causing the measurement quality to deteriorate.

To clean the measuring cell

- Fill air with a syringe into the measuring cell to empty the cell.
- Rinse the measuring cell with a suitable cleaning liquid, e.g. ultra-pure water.
- If you have not used ultra-pure water as the cleaning liquid in step 2, rinse the measuring cell with at least 10 mL ultra-pure water to remove the other cleaning liquid.
- Empty the measuring cell as in step 1.

ADDITIONAL CLEANING OF THE MEASURING CELL

Depending on the used substances and how well the cell is cleaned after each usage as described above, additional cleaning of the measuring cell with a suitable laboratory cleaner (e.g. Mucasol®) is recommended.

IMPORTANT

Be sure to attend to the product information concerning the cleaning agent's concentration. E.g., Desana® is to be diluted as suggested by manufacturer (e.g. 300mL for 10L cleaning agent), Mucasol® is to be used as a 3 % solution, Alconox® Tergazyme® as a 1 % solution.

NOTICE

Do not keep the laboratory cleaner inside the measuring cell for more than 5 minutes because the glass of the measuring cell is susceptible to attack by alkaline liquids.

1. Fill the measuring cell with the laboratory cleaner and leave the cleaner in the cell for approx. 5 minutes.
2. Rinse the measuring cell with at least 80 mL ultra-pure water.
3. Fill air with a syringe into the measuring cell to empty the cell.

IMPORTANT

Dispose of the samples and cleaning agents according to legal regulations.

CLEANING THE HOUSING AND THE INSPECTION WINDOW

Clean the housing and the inspection window with a soft cloth dipped in ethanol or warm water. If necessary, you can use a mild solvent (pH < 10).

STORING

Before you store away the instrument, clean it as described in See Regular Cleaning of the Measuring Cell.

After cleaning the measuring cell with ultra-pure water, empty the measuring cell.

You need not worry about the measuring cell being still wet as long as you take care that the instrument is not exposed to freezing temperatures.

CHECKS AND ADJUSTMENTS

If the measuring cell is not sufficiently cleaned, residues can form deposits in the measuring cell. Over time this will result in your measuring values deviating from the correct values.

You can detect the effect by comparing the density values that your instrument gives for ultra-pure water with the correct values (at the respective temperature) that you can find in See Density of Water. The two values must not differ by more than $\pm 0.005 \text{ g/cm}^3$.

However, you may find this procedure too laborious. Conveniently, there is a much simpler method: The measuring unit "Extract [°Plato]" already comes with temperature compensation, so you do not need to consider the measuring temperature. And with extract, the target value for ultra-pure water is 0, so you need not bother looking values up in a table.

Perform a check measurement with ultra-pure water regularly, See Check Measurement.

If you get a measuring value that deviates from the target value by more than given tolerances, you need to readjust the instrument by performing a water adjustment, See Water Adjustment.

CHECK MEASUREMENT

- Clean the measuring cell as described in See Regular Cleaning of the Measuring Cell.
- Rinse the measuring cell thoroughly with ultra-pure water so that potential residues from other cleaning liquids are removed.
- Select the measuring unit "Extract [°Plato]".
- Perform a measurement (See Filling Sample and Measuring) with ultra-pure water.
- Read the measured extract value.
 - If the measuring value is in the range $\pm 0.3 \text{ }^{\circ}\text{Plato}$, your EasyDens is ready for measurements.
 - If the measuring value is below $-0.3 \text{ }^{\circ}\text{Plato}$ or over $+0.3 \text{ }^{\circ}\text{Plato}$, perform a water adjustment, See Water Adjustment.

WATER ADJUSTMENT

Fill the measuring cell with ultra-pure water and perform a calibration through the app.

EXCHANGING THE BATTERIES

IMPORTANT

For proper battery handling, also observe See Battery Handling of the safety instructions.

You find the battery status of the instrument in the EasyDens app.

When the batteries are depleted, the instrument switches itself off.

TO EXCHANGE THE BATTERIES

- Unscrew the screws at the bottom of the instrument to open the battery compartment.
- Remove the depleted batteries.
- Insert the new batteries. See picture - View of how to add batteries and correct polarity.
- When replacing the batteries, check if the O-ring between battery compartment cover and enclosure is undamaged and in place.
- When replacing the batteries, make sure to properly tighten the screws so that the battery compartment cover fits seamlessly.
- Ensure that the screws are tightened all the way so that no liquid can get inside.

NOTICE

Consider the polarity of the batteries when you insert them in the battery compartment.

Insert only equally charged batteries of the same type.

Close the cover and tighten the screws of the battery compartment.

After replacing the batteries, be sure to only use the original screws to fix the battery compartment cover. Please note that the hole at the bottom is not a reset button, do not try to push it with sharp items.

TECHNICAL DATA

SPECIFICATIONS

Measuring range

Density	0.7 g/cm ³ to 1.2 g/cm ³
Extract	-10 °Plato to 40 °Plato
Temperature	5 °C to 30 °C (41 °F to 86 °F)

Accuracy

Density	0.005 g/cm ³ (0.001 g/cm ³ for aqueous solutions)
Extract	0.3 °Plato
Temperature	0.2 °C (0.36 °F)

Repeatability (s.d.)

Density	0.002 g/cm ³
Extract	0.2 °Plato
Temperature	0.1 °C (0.18 °F)

Resolution

Density	0.001 g/cm ³
Extract	0.1 °Plato
Temperature	0.1 °C (0.18 °F)
Sample volume	approx. 2 mL
Sample temperature	0 °C to 80 °C (32 °F to 176 °F)

Ingress protection: IP65 according IEC 60529

INSTRUMENT DATA AND OPERATING CONDITIONS

Dimensions (L x W x H)	101 mm x 58 mm x 44 mm (4 in x 2.3 in x 1.7 in)
Weight (incl. batteries)	approx. 190 g (0.42 lbs)

Power supply

Battery type two 1.5 V LR6 AA alkaline batteries or two AA NiMH rechargeable batteries

Battery operation time	> 40 hours
Environmental conditions (EN 61010)	indoor use only
Ambient temperature	5 °C to 35 °C (41 °F to 95 °F)
Storage temperature	5 °C to 35 °C (41 °F to 95 °F)
Air humidity	5 % to 90 % relative air humidity, non-condensing
Interface	Bluetooth™ Low Energy
Frequency band	2400–2480 MHz
Transmit power	max. 7.5 dBm (5.6 mW)

WETTED PARTS

Material

flame retardant Polybutylene Terephthalate/Polycarbonate (PBT), UL94V0
borosilicate glass
silicone

Part

housing
measuring cell
hose 3x5 mm silicone

DENSITY OF WATER

Density of Water [g/cm³] (0.0 °C to 40.9 °C)¹⁾

Temp. °C	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
0	.99984	.99985	.99985	.99986	.99987	.99987	.99988	.99988	.99989	.99989
1	.99990	.99990	.99991	.99991	.99992	.99992	.99993	.99993	.99993	.99994
2	.99994	.99994	.99995	.99995	.99995	.99995	.99996	.99996	.99996	.99996
3	.99996	.99997	.99997	.99997	.99997	.99997	.99997	.99997	.99997	.99997
4	.99997	.99997	.99997	.99997	.99997	.99997	.99997	.99997	.99997	.99997
5	.99996	.99996	.99996	.99996	.99996	.99995	.99995	.99995	.99995	.99994
6	.99994	.99994	.99993	.99993	.99993	.99992	.99992	.99991	.99991	.99991
7	.99990	.99990	.99989	.99989	.99988	.99988	.99987	.99987	.99986	.99985
8	.99985	.99984	.99984	.99983	.99982	.99982	.99981	.99980	.99980	.99979
9	.99978	.99977	.99977	.99976	.99975	.99974	.99973	.99973	.99972	.99971
10	.99970	.99969	.99968	.99967	.99966	.99965	.99964	.99963	.99962	.99961
11	.99960	.99959	.99958	.99957	.99956	.99955	.99954	.99953	.99952	.99951
12	.99950	.99949	.99947	.99946	.99945	.99944	.99943	.99941	.99940	.99939
13	.99938	.99936	.99935	.99934	.99933	.99931	.99930	.99929	.99927	.99926
14	.99924	.99923	.99922	.99920	.99919	.99917	.99916	.99914	.99913	.99911
15	.99910	.99908	.99907	.99905	.99904	.99902	.99901	.99899	.99897	.99896
16	.99894	.99893	.99891	.99889	.99888	.99886	.99884	.99883	.99881	.99879
17	.99877	.99876	.99874	.99872	.99870	.99869	.99867	.99865	.99863	.99861
18	.99859	.99858	.99856	.99854	.99852	.99850	.99848	.99846	.99844	.99842
19	.99840	.99838	.99836	.99835	.99833	.99831	.99828	.99826	.99824	.99822
20	.99820	.99818	.99816	.99814	.99812	.99810	.99808	.99806	.99803	.99801
21	.99799	.99797	.99795	.99793	.99790	.99788	.99786	.99784	.99781	.99779
22	.99777	.99775	.99772	.99770	.99768	.99765	.99763	.99761	.99758	.99756
23	.99754	.99751	.99749	.99747	.99744	.99742	.99739	.99737	.99734	.99732
24	.99730	.99727	.99725	.99722	.99720	.99717	.99715	.99712	.99709	.99707
25	.99704	.99702	.99699	.99697	.99694	.99691	.99689	.99686	.99683	.99681
26	.99678	.99676	.99673	.99670	.99667	.99665	.99662	.99659	.99657	.99654
27	.99651	.99648	.99646	.99643	.99640	.99637	.99634	.99632	.99629	.99626
28	.99623	.99620	.99617	.99615	.99612	.99609	.99606	.99603	.99600	.99597
29	.99594	.99591	.99588	.99585	.99582	.99579	.99577	.99574	.99571	.99568
30	.99564	.99561	.99558	.99555	.99552	.99549	.99546	.99543	.99540	.99537
31	.99534	.99531	.99528	.99524	.99521	.99518	.99515	.99512	.99509	.99506
32	.99502	.99499	.99496	.99493	.99490	.99486	.99483	.99480	.99477	.99473
33	.99470	.99467	.99463	.99460	.99457	.99454	.99450	.99447	.99444	.99440
34	.99437	.99433	.99430	.99427	.99423	.99420	.99417	.99413	.99410	.99406
35	.99403	.99399	.99396	.99393	.99389	.99386	.99382	.99379	.99375	.99372
36	.99368	.99365	.99361	.99358	.99354	.99350	.99347	.99343	.99340	.99336
37	.99333	.99329	.99325	.99322	.99318	.99314	.99311	.99307	.99304	.99300
38	.99296	.99292	.99289	.99285	.99281	.99278	.99274	.99270	.99267	.99263
39	.99259	.99255	.99252	.99248	.99244	.99240	.99236	.99233	.99229	.99225
40	.99221	.99217	.99214	.99210	.99206	.99202	.99198	.99194	.99190	.99186

¹⁾ Excerpt from F. Spieck, H. Bettin: Review: Solid and liquid density determination. tm – Technisches Messen 59 (1992) 7–8, pp. 285–292.

CE DECLARATION OF CONFORMITY

EU Declaration of Conformity

(original)

 Anton Paar

The Manufacturer **Anton Paar GmbH**, Anton-Paar-Str. 20, A-8054 Graz, Austria – Europe hereby declares that the product listed below

Product designation: **EASYDENS DIGITAL DENSITY METER**

Model: **EasyDens**

Material number: **234929**

is in conformity with all the relevant European Union harmonisation legislation of the

Radio Equipment Directive (2014/53/EU, ABI. L153/62 of 22.5.2014)

RoHS Directive (2011/65/EU, OJ L 174/88 of 1.7.2011)

is in conformity with all the safety objectives of the

Electromagnetic Compatibility (2014/30/EU, OJ L 96/79 of 29.3.2014)

Low Voltage Directive (2014/35/EU, OJ L 96/357 of 29.3.2014)

complies with the provisions of the following harmonized standards:

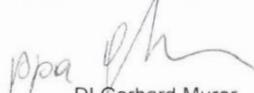
- ETSI EN 301489-1 V2.1.1: 2017-02
- ETSI EN 301489-17 V3.1.1: 2017-02
- ETSI EN 300328 V2.2.2: 2019-07
- EN 62479: 2010
- EN 62311: 2008

complies with the provisions of the following technical standards:

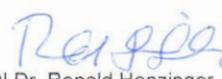
- IEC 61326-1: 2012
- 47 CFR Part 15, Subpart C, Intentional radiators, section 15.209 and section 15.247 / RSS-247, Issue 2 and RSS-GEN, Issue 5
- FCC, part 15 B, Class B, SDoC, ICES-003, Issue 6,
- IEC 61010-1: 2010 + A1: 2016

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Place and date of issue: Graz, 2020-10-29



DI Gerhard Murer
Future Business Activities Management
Business Unit Research & Development



DI Dr. Ronald Henzinger
Head of Technology Incubator
Business Unit Research & Development

CE DECLARATION OF CONFORMITY

UK Declaration of Conformity



The Manufacturer **Anton Paar GmbH**, Anton-Paar-Str. 20, A-8054 Graz, Austria – Europe hereby declares that the product listed below

Product designation: **EASYDENS DIGITAL DENSITY METER**

Model: **EasyDens**

Material number: **234929**

is in conformity with all the relevant UK legislation

Radio Equipment Regulations 2017

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

is in conformity with all the UK safety objectives of the

Electromagnetic Compatibility Regulations 2016

Electrical Equipment (Safety) Regulations 2016

complies with the designated standards:

- ETSI EN 301489-1 V2.1.1: 2017-02
- ETSI EN 301489-17 V3.1.1: 2017-02
- ETSI EN 300328 V2.2.2: 2019-07
- EN 62479: 2010
- EN 62311: 2008

complies with the provisions of the following designated standards:

- IEC 61326-1: 2012
- 47 CFR Part 15, Subpart C, Intentional radiators, section 15.209 and section 15.247 / RSS-247, Issue 2 and RSS-GEN, Issue 5
- FCC, part 15 B, Class B, SDoC, ICES-003, Issue 6,
- IEC 61010-1: 2010 + A1: 2016

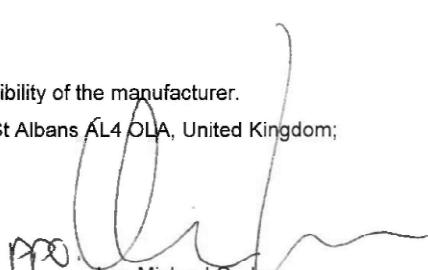
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Importer: Anton Paar Ltd, Unit F, The Courtyard, Hatfield Rd, St Albans AL4 0LA, United Kingdom;

Place and date of issue: Graz 2022-05-13


DI Gerhard Murer

Future Business Activities Management
Business Unit Research & Development


Ing. Michael Gruber
Executive Director
Business Unit Research & Development

BLUETOOTH REGULATIONS

Canada

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

USA

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help.

Taiwan

注意！依據 低功率電波輻射性電機管理辦法第十二條 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，改善至無干擾時方得繼續使用。前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

WARRANTY RETURN

The warranty covers electronical and mechanical defects and is valid for 1 year from the date of purchase. The warranty excludes user-caused damage to the device, such as glass breakage. In case of a warranty claim, contact the vendor of your instrument who will take care of the necessary steps. The instrument must be cleaned before return.

See also Instrument Returns for the corresponding safety instructions.

