

Semi-Solid and Solid Density Analyzers



Ultrapyc Series

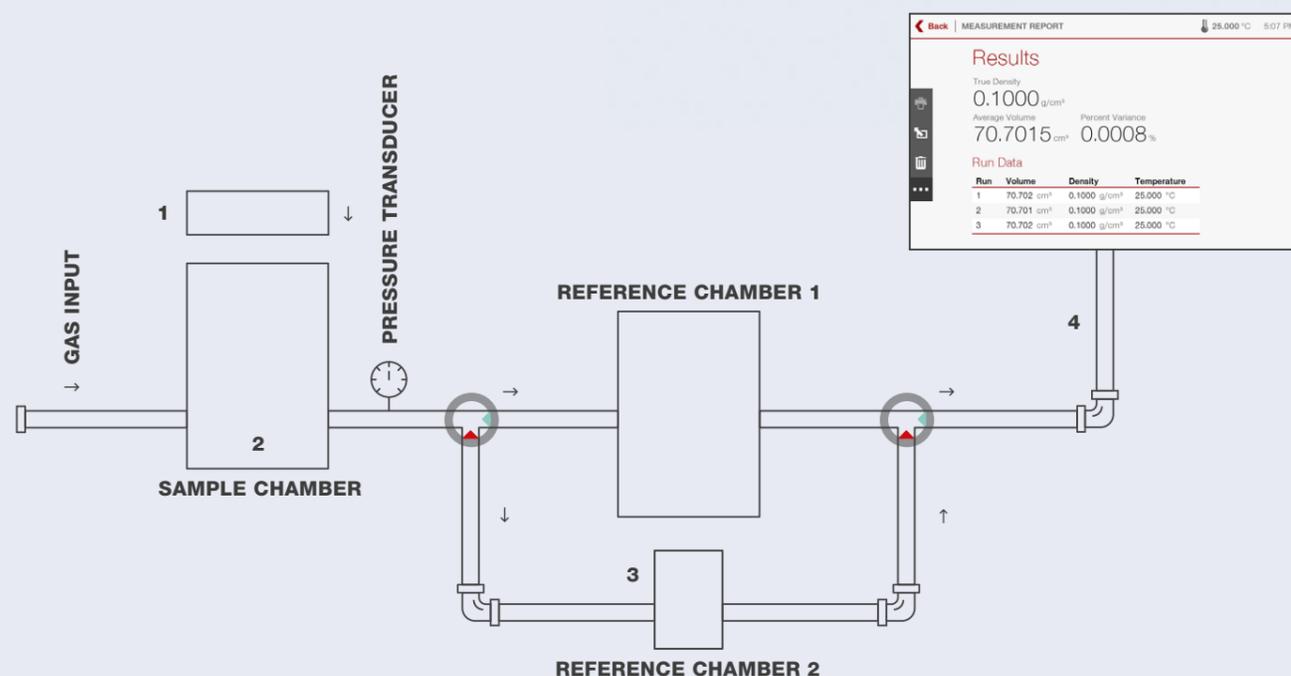
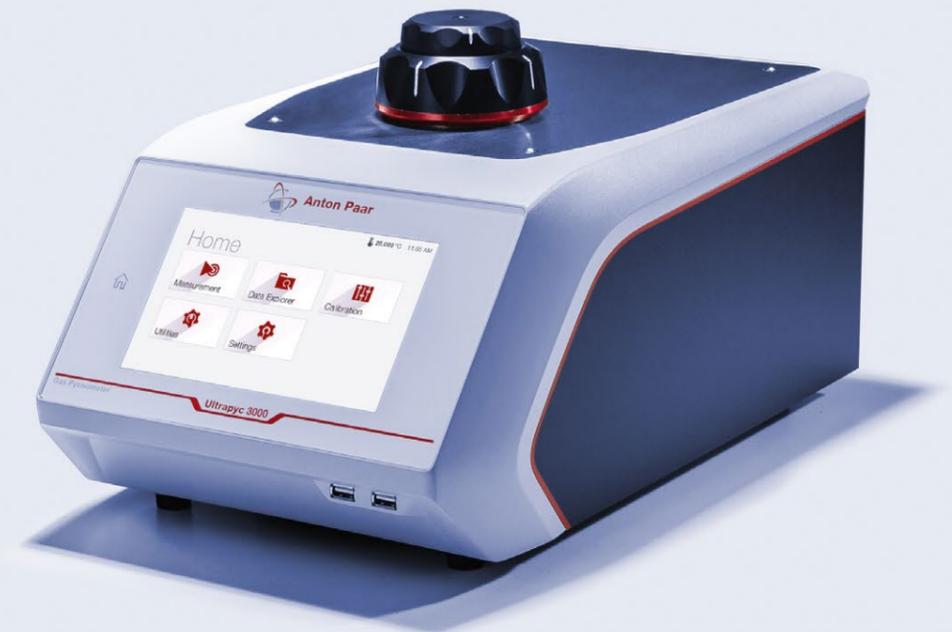


The Ultrapyc Series: Ultra-Simple, Ultra-Precise

We understand that you handle many measurement technologies, sample types, and responsibilities during your laboratory workday. Instruments that have complicated analysis routines and clutter valuable workspace aren't welcome.

The Ultrapyc gas pycnometer series is the solution for you. We've combined decades of knowledge in producing fast, accurate, and reliable semi-solid and solid density measurement with groundbreaking innovations and a state-of-the-art graphical user interface to create the most user-friendly gas pycnometer on the market today.

Whether you analyze cements, pharmaceuticals, catalysts, ceramics, fine powders, polymers, foams, toothpaste, marmalade, paints, adhesives, drilling muds, or synthetic tissue, density measurement has never been more simple or more precise.



1 Sample is loaded into a chamber of known volume. The TruLock lid is closed and secured.

2 The system is then pressurized to a specified value with the analysis gas.

3 When stable, a valve opens to allow the gas to expand into another chamber whose volume is also known.

4 From the resulting pressure drop, the volume is determined and the density is calculated.

The Features That Make **Ultrapyc** Ultra-Simple and Ultra-Precise



←
DISPOSABLE CUPS

TruPyc technology provides unmatched accuracy across the widest range of sample amounts

Matching the free space in the sample chamber to the volume of the reference chamber is the key to accurate gas pycnometry results. Unlike gas pycnometers, which use a single reference chamber, the Ultrapyc series features multiple built-in reference chambers. Select your sample cell size and Ultrapyc automatically uses the most appropriate chamber.

Precise, fast, and hassle-free temperature control*

With built-in Peltier temperature control, external water baths for temperature control are a thing of the past. With the broadest temperature range on the market (15 °C to 50 °C), Ultrapyc 5000 pycnometers ensure quick temperature stabilization. With them, you know your samples are always being measured at precisely the right temperature irrespective of your environmental conditions.

PowderProtect mode offers bi-directionality and eliminates contamination

Using the standard "sample first" expansion direction ensures control over the maximum pressure to which the sample is exposed during the measurement. Switching the unit to PowderProtect mode reverses this order and eliminates the possibility of contaminating your instrument with fine powders or slurries' vapor and fumes.

An intuitive user interface for simple instrument control

With a 7-inch touchscreen, Ultrapyc has a user interface similar to that of a smartphone. The graphical overview of the measurement keeps you informed of temperature, pressure, valve status, and preliminary results at all times. Seeing reports on the touchscreen is easy and doesn't require computers to be installed, which saves you precious lab bench space.

Disposable cups to measure sticky and hard-to-clean samples quickly and simply

Disposable aluminum cups expand the capabilities of the Ultrapyc series for measuring semi-solids. They dramatically increase test throughput and provide the flexibility to measure density of curing materials and hard-to-clean samples with single-use convenience.

Data connectivity

By connecting Ultrapyc directly to any balance with RS232 communication, eliminate the risk of transcription errors that can occur when manually entering data from an external balance. Additionally, data connectivity enables the Ultrapyc instrument to communicate with a personal computer using special firmware for better data storage and management.

*Only available on Ultrapyc 5000 models

Industry Solutions

Gas pycnometry is used extensively for determining the density of solids and semi-solids. The Ultrapyc series complies with many ASTM, ISO, MIPF, and JIS standard test methods that are used across a wide variety of industries.



1 Powder coatings and dried film coatings

The crystallinity of plastics and the true density of dry pigments are monitored by gas pycnometry to better understand the mechanical behavior of these materials. In addition, gas pycnometry can help determine the volatile organic content within dried films in order to assess the level of curing.

2 Cements

The true density of cement is used for the accurate calculation of powder characteristics. Measured after setup time, the insights gained are important for formation and stability determination.

3 Ceramics and catalysts

Density values are used in the development, manufacturing, and troubleshooting of refractory materials to confirm that the desired crystal phase is present and closed porosity is absent.

4 Mining and oil exploration

Gas pycnometry is the primary technique used to quickly assess the composition of the solids used in drilling fluids.

5 Polymers and foams

Gas pycnometry is widely used to characterize the relative amounts of crystalline and amorphous phases within polymer materials. This technique is also used to assess the open cell content of foam materials to predict their performance as insulators or as sound- or collision-dampening materials.

6 Cosmetics

The density of cosmetics and personal care materials is used for formulation quality control and is important in the packaging of the final product.

7 Metallurgy

The true density of complex metal shapes formed by powder metallurgy is used to track the purity of raw materials or the presence of open or closed pores throughout processing.

	Ultrapyc 3000 ↓ The base model	Ultrapyc 5000 ↓ Includes built-in temperature control and PowderProtect mode	Ultrapyc 5000 Foam ↓ Includes built-in temperature control, PowderProtect mode, and foam mode	Ultrapyc 5000 Micro ↓ Includes built-in temperature control and PowderProtect mode
Large cell: 135 cm ³		Accuracy: 0.02 % Repeatability: 0.01 %		
Medium cell: 50 cm ³		Accuracy: 0.02 % Repeatability: 0.01 %		
Small cell: 10 cm ³		Accuracy: 0.03 % Repeatability: 0.015 %		
Micro cell: 4.5 cm ³				Accuracy: 0.10 % Repeatability: 0.05 %
Meso cell: 1.8 cm ³				Accuracy: 0.30 % Repeatability: 0.15 %
Nano cell: 0.25 cm ³				Accuracy: 1.00 % Repeatability: 0.50 %
Preparation modes	Flow, pulse		Flow, pulse, vacuum	
Transducer accuracy		Better than 0.1 %		
Pressure reading resolution		Digital pressure display resolution of 0.0001 psi		
Connections		4 USB ports		

INSTRUMENT DIMENSIONS

Weight	10 kg
W x D x H	27 cm x 48 cm x 25 cm
Built-in temperature range	15 °C to 50 °C with stability better than ±0.05 °C

Available connectivity to any balance using RS232 communication | Results available on screen, via a printer, or electronically in text and pdf formats | All units calibrated at the factory using NIST-traceable spheres | A pressurized gas source up to 20 psi and a standard power outlet are required for operation

ACCESSORIES



Micro cell option



Non-elutriating cells

SELECTED INTERNATIONAL STANDARDS

ASTM B923-10	Metal Powders	ASTM D5550-14	Soils
ASTM C110-15	Cements	ASTM D5965-02 (2013)	Coatings
ASTM C2604-02 (2012)	Refractories	ASTM D6093-97 (2011)	Pigments
ASTM D2638-10	Carbon	ASTM D6226-15	Rigid Foams
ASTM D4892-14	Carbon	USP 699	Pharmaceuticals

Trademarks

Ultrapyc (5362587)

