

Countum Group

# SATAM

Metering Solutions

## DENSPAC

## Density Measuring System

DENSPAC is a complete density measuring package. Associated with a batch controller, this real-time density measuring system allows an automatic monitoring and registration of petroleum product density. As a complementary module of Satam measuring system, DENSPAC allows to calculate the loaded quantities in corrected volume or in mass and the average density of the batch.

Flow computers

Measuring systems

Flow meters

Accessories

### Sectors of application

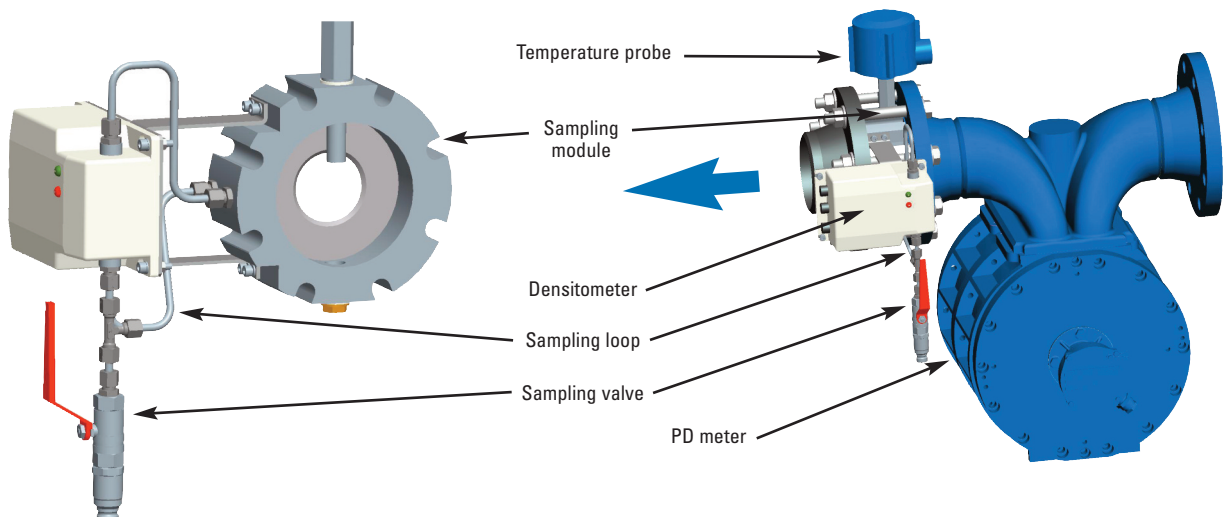
- Aircraft refuelling
- Tanker and railcar loading
- Monitoring of fuel quality

### Operating principle

The sampling module is an integral orifice plate used for pressure drop generation in order to feed the densitometer. Thanks to its ultra-compact design, the densitometer is directly mounted on the module allowing a very short density loop. The sampling valve is dedicated to periodic calibration of the Denspac.

### Key points

- **Easy to install**  
Ultra-compact measuring system
- **Ready-made technology**  
Supplied completely assembled, wired and tested at the production facility
- **Measurement stability and accuracy**  
High frequency sensing tube which eliminates impact of environmental vibrations on density measurement
- **Measurements reliability**  
Built-in flow control system for permanent monitoring of the density sampling flow rate
- **High accuracy density measurement**  
Measurement accuracy better than 0.0001g/cm<sup>3</sup> to ensure an accurate calculation of mass and corrected volume



## Technical data - Density measuring system

Model	DENSPAC	
Description	Complete density measuring package dedicated to measurement of petroleum products in association with a smart batch controller	
Measured parameters	Operating density, base density (density at 15°C) Temperature into the density sensing tube Temperature into the pressure drop module (upon request) Flowrate threshold into the sampling loop	
Measured liquids	Petrol, premium fuels, diesel, E5...E85, bio-diesel, ethanol, methanol, kerosene, fatty acid methyl ester oils	
Equipment	Sampling module	Generates a pressure drop to feed the sampling loop and the densitometer Wafer design for installation between flanges ASA150 and flanges TW Available in DN80, DN100 and DN150 - (3", 4" and 6")
	Sampling pump	Upon request Alternative to sampling module
	Temperature probe	Pt100 3 wires Thermowell mounted on pressure drop module
	Sampling loop	Stainless steel (tubes and fittings) Ball valve for densitometer calibration
	Densitometer	Measurement of operating density with vibrating tube technology (full protection against vibrations because of high frequency technology - 20 kHz) Calculation of base density (density at 15°C) Indication of sampling flowrate threshold Measurement of sensing tube temperature with embedded Pt100 Communication with batch controller via Modbus RS485
	Batch controller	Equalis S Calculation of base volume and masse when associated with a flowmeter Programming of densitometer adjustment constants Management of sampling flowrate threshold Communication with supervisory system or with on-board data capture system
Operating conditions	Pressure	10 bar max. (if associated with Satam PD meter), 21.7 bar max.
	Viscosity	20 cSt max.
	Liquid temperature	-20°C to +60°C
	Ambient temperature	-25°C to +55°C
	Certification for potentially explosive atmospheres	ATEX Zone 1 – II 2 G

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