

# DENSITOMETERS, PHOTOMETER



**DEN-1**  
Densitometer



**DEN-1B**  
Densitometer



**DEN-600**  
Photometer

## DEN-1 and DEN-1B, McFarland Densitometers

DESCRIPTION

Densitometers **DEN-1** and **DEN-1B** are designed for measurement of cell suspension's turbidity in the range:

0.0–6.0 McFarland units  
( $0-180 \times 10^7$  cells/ml);

Densitometers provide the opportunity to measure solution turbidity in a wider range (up to 15.0 McFarland units), however, it is necessary to remember that, in this case, the standard deviation values increase.

A densitometer is used for measurement of cell concentration (bacterial, yeast cells) during the fermentation process, determination of microorganism sensitivity to antibiotics, microorganism identification using various test-systems, for measurement of absorption at the definite wavelength, as well as for quantitative estimation of the colour solution concentration, absorbing green light.

The operation principle is based on the measurement of optical density with digital presentation of results in McFarland units. The unit is calibrated at the factory (for operation with 16 mm diameter glass tubes) and keeps calibration without power supply. However, if necessary, it is possible to calibrate the unit by 2–6 points in 0.0–6.0 McFarland unit range. Both commercial standards offered by Biosan and the cell suspensions prepared in a laboratory can be used for calibration.

### Following polymer microparticles calibration kits and glass tubes are available on request:

- **CKG16** for glass tubes with diameter 16 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0 McFarland Turbidity Standards (latex particles)
- **CKG1802** for glass tubes with diameter 18 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0; 5.0 McFarland Turbidity Standards (BaSO<sub>4</sub>)
- **CKG12** for glass tubes with diameter 12 mm, set of 0.0 (blank); 0.5; 2.0; 3.0 McFarland Turbidity Standards (latex particles) (only for **DEN-1B**)
- **Glass sample tubes** without lid (diameter 16 mm, height 100 mm), which are suitable for working with **DEN-1**, **DEN-1B** factory calibration

Up to date information on calibration kits can be found on the website: [www.biosan.lv](http://www.biosan.lv)

### Two versions of the product are available:

1. **DEN-1** powered from external energy supply;
2. **DEN-1B** powered both from external energy supply and batteries (AA).

Basic Plus  
Product Class



Premium  
Product Class

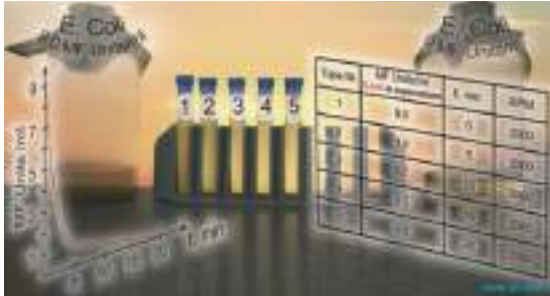


DEN-1B rear side with calibration controls



## DEN-1 and DEN-1B, McFarland Densitometers

	DEN-1	DEN-1B
Light source	LED	
Wavelength	$\lambda = 565 \pm 15 \text{ nm}$	
Measurement range	0.00–15.00 McF	
Display resolution	0.01 McF	
Accuracy	(0.0–6.0 McF) $\pm 3\%$	
Measurement time	1 s	
Sample volume	not less than 2 ml	
Tube external diameter	18 mm (without adapter) 16 mm (using included A-16 adapter)	18 mm (without adapter) 16 mm (using included A-16 adapter) 12 mm (using optional A-12 adapter)
Possibility to restore factory calibration settings		
Display	LCD	
Overall dimensions (W×D×H)	165×115×75 mm	
Weight	0.7 kg	
Independent power supply	—	3×AA batteries
Input current/power consumption	12 V, 7 mA/0.1 W	
External power supply	Input AC 100–240 V, 50/60 Hz, Output DC 12 V	
Standard set	Adapter A-16 External power supply	Adapter A-16 External power supply and 3×AA batteries



Application of **DEN-1** for determining microbial cells concentration of supernatant in tubes during centrifugation. Turbidity is determined in McFarland units.



DEN-1B

### ORDERING INFORMATION:

Cat. number

**DEN-1** with **A-16** adapter

BS-050102-AAF

**DEN-1B** with **A-16** adapter

BS-050104-AAF

#### Optional accessories:

**A-12** adapter for 12 mm tubes (only for **DEN-1B**)

BS-050102-IK

**CKG16** for glass tubes with diameter 16 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0 McF

BS-050102-BK

**CKG1802** for glass tubes with diameter 18 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0; 5.0 McF

BS-050102-GK

**CKG12** for glass tubes with diameter 12 mm, set of 0.5; 1.0; 2.0; 3.0 McF (only for **DEN-1B**)

BS-050102-DK

**Glass sample tubes** 16 mm diameter without lid (16 × 100 × 0.8 mm), 78 pcs.

BS-050102-LK

Fits DEN-1, DEN-1B factory calibrated

## DEN-600, Photometer NEW

### DESCRIPTION

**DEN-600** is a compact, portable, rechargeable battery-powered photometer. It comprises of 600 nm wavelength optical system, which enables to apply — 1) OD<sub>600</sub> method estimates the total number of cells, 2) McFarland (McF) turbidity measurement method, 3) Bradford protein assay method for protein concentration measurement.

The device serves as an inexpensive alternative to a spectrophotometer commonly used for these applications. Because **DEN-600** is battery powered and compact, it can be comfortably located in a biosafety cabinet, anaerobic chamber or quickly moved to another lab room. Additionally, the vessel holding mechanism allows accommodating round bottom bottom, conical vials or falcon tubes, therefore enabling to measure the absorbance (Abs) and turbidity in Abs, OD and McFarland units.

USB connectivity and DEN software allow for data transfer, data processing and calculation, software calibration for Bradford protein assay method or a custom calibration for a specifically applicable vessel.

### SPECIFICATIONS

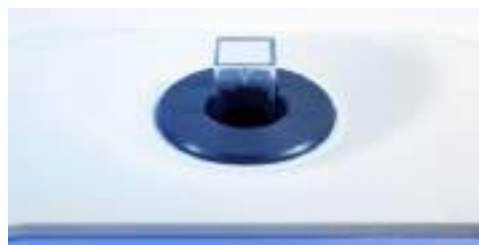
Light source	LED, self-calibrating
Photodetector	Silicone photodiode
Measurement wavelength (λ)	600 nm ±10 nm
Vessel type	Cuvettes, round bottom tubes, falcon tubes
Battery type	LiPo
PC system requirements:	Intel/AMD Processor, 1 GB RAM, Windows Vista/7/8/10, USB
Dimensions (WxDxH)	120 × 145 × 65 mm
Weight	0.5 kg
External power supply	Input AC 100–240 V 50/60 Hz, Output DC 12 V

Measurement modes	Absorbance	McFarland
Measurement range	0–3.0 Abs	0–16.00 McF
Resolution	0.001 Abs	0.01 McF
Accuracy	±0.006 @ 1 Abs	±0.1 @ 0–8 McF
Repeatability	±0.003 @ 1 Abs	±0.05 @ 0–8 McF



### COMMON APPLICATIONS:

- Cell concentration measurement
- Cell growth data estimation
- Log phase estimation for microbial cells induction
- Competent cell preparation
- Bradford protein assay method
- Antibiotic susceptibility testing
- Inhibitory tests



### ORDERING INFORMATION

DEN-600

Cat. number

BS-050109-AAA