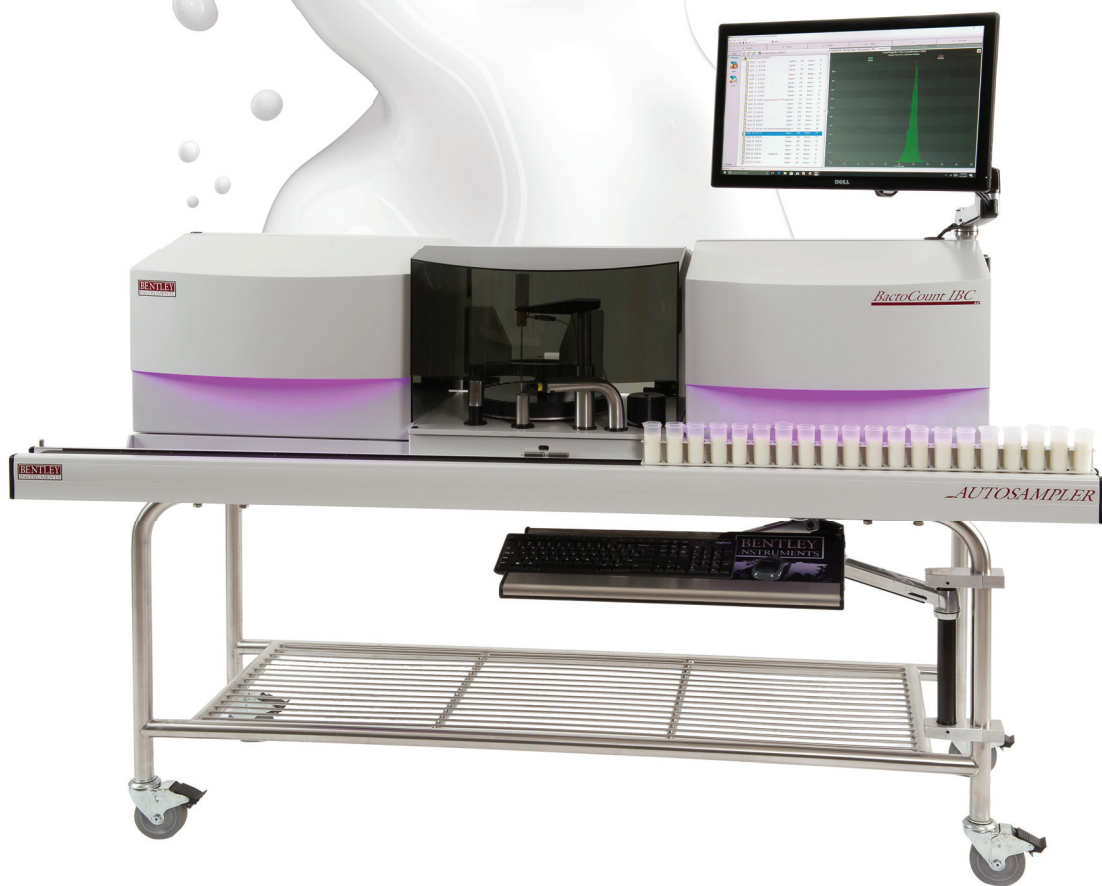


BENTLEY INSTRUMENTS

HIGHLY ACCURATE, RELIABLE AND REAL-TIME ENUMERATION
OF INDIVIDUAL BACTERIA AND SOMATIC CELLS FOR THE
DETERMINATION OF RAW MILK HYGIENIC QUALITY

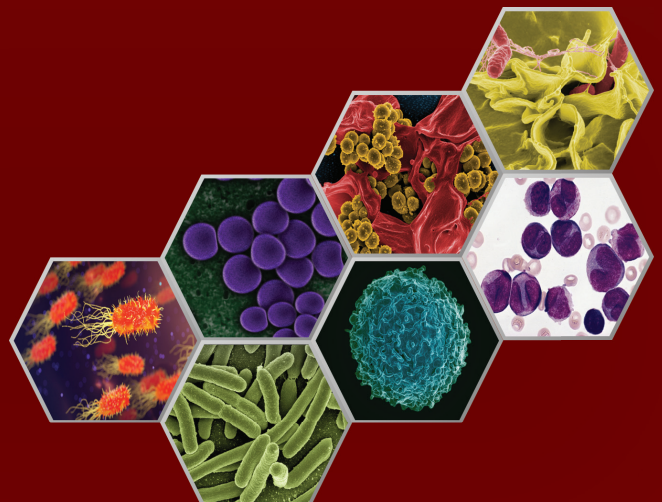


BACTOCOUNT IBCv3

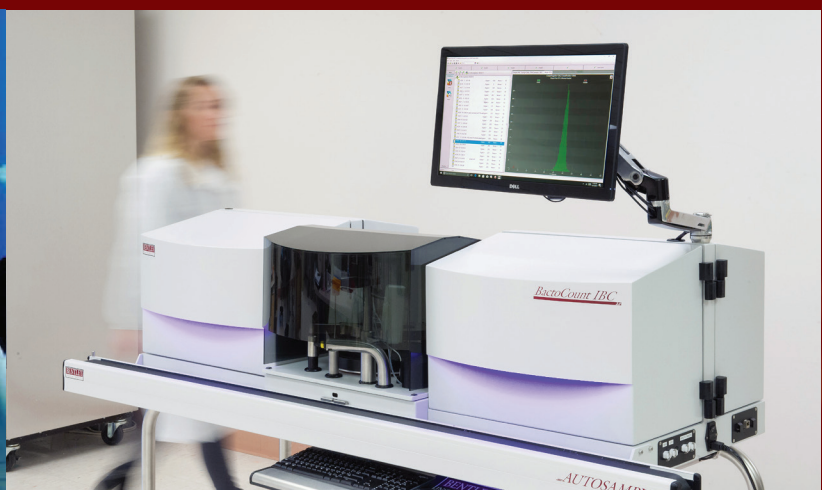
**THE MOST ACCURATE AND DEPENDABLE BACTERIA
AND SOMATIC CELLS COUNTER IN THE WORLD**

The IBCv3 is a fully automated instrument that uses a proprietary process based on flow cytometry (FCM) for the rapid, highly accurate and reliable enumeration of individual bacteria and somatic cells in raw milk.

The BactoCount high processing speed (up to 200 samples/hour) makes it the ideal solution for mid- to large size laboratories that need a highly accurate, easy-to-maintain, exceptionally fast and reliable bacteria and somatic cells counting system.



INNOVATIVE ANALYTICAL & AUTOMATION SOLUTIONS FOR THE DAIRY INDUSTRY



BactoCount IBC 3.0

What's New?

30 years ago Bentley Instruments was the first to apply Flow Cytometry for bacteria and somatic cells testing in raw milk. Since then, we have continued to innovate and improve our know-how in order to provide a unique solution able to characterize completely the raw milk hygienic quality.

The new BactoCount Multiplex platform completely opens up the field of applications for the in-depth scrutiny of milk bacteriological composition for enhanced diagnosis of mastitis, milk quality and safety monitoring.

We have completely redesigned the instrument from scratch to provide a unique, completely open and adaptable platform for a wide range of potential applications. The new BactoCount IBC 3.0 offers simultaneous real-time analysis of total flora and somatic cells in raw milk at a speed up to 200 samples/hour.

Inside the instrument, multiplex applications are made possible thanks to a second optional laser (16 wavelengths available) and four detectors (for fluorescence and scatter signals). Three applications can be handled at the same time on the same sample.

What does it mean for you?

Analytical advantages

- Real-time and highly accurate determination of raw milk hygienic quality in compliance with ISO 16140 standard.
- Unique high speed solution for multiplex automated testing.
- Highly standardized and reproducible method guaranteeing worldwide equivalence of results accross laboratories and countries.
- Highly accurate and robust universal conversion equation based on a very large and representative samples database.
- Excellent instrument standardization and quality control with our long shelf life lyophilized standards (IBC and SCC).

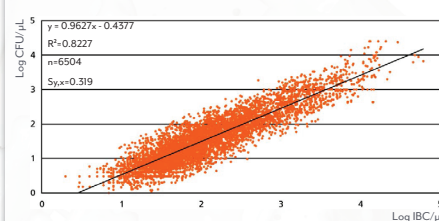
- Modular Design
- Up to 2 Lasers (16 λ \neq)
- Up to 4 Detectors
- Up to 200 samples/hour
- Simultaneous SCC & IBC analysis



Hardware & Software advantages

- Proprietary robust flow cytometer built on well-proven technology.
- Easy-to-use, low-maintenance design.
- Extensive Internet remote control capabilities.
- Low cost of ownership.
- Customizable interface depending on your applications.

Conversion Equation Developed According to ISO 21187 Standard



Brazil, Czech Republic, Estonia, France, Germany, Ireland, Italy, Japan, Lithuania, Switzerland, Turkey, USA

Bentley's

5 Module System

1 Computer

A powerful industrial computer allows the IBC to run and monitor the instrument at all times. Diagnostic features have been integrated in the software to warn the operator if the instrument is not functioning properly. In addition, all of the analytical data and peak distribution curves are saved in a database and can be recalled at anytime.

2 Auto Sampler

The BactoCount uses a standard linear auto sampler that can handle different types of racks and doesn't require any compressed air. A stirrer mechanism, designed with the least possible carryover (a single point of contact) stirs and draws the sample to be tested. The auto sampler is also equipped with a wash station to thoroughly clean the pipette inside and out with a cleaning solution after each sample. The carry-over is typically around 0.25% which fully complies with the ISO 16140 standard ($<< 1\%$).

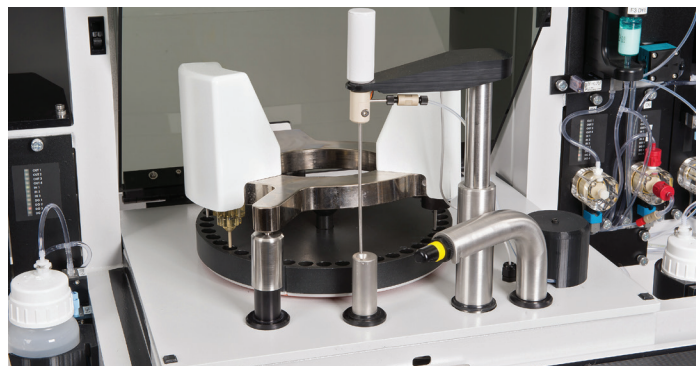


3 Fluid Handling

The fluid handling station is an enclosed module designed to filter and monitor the level of the two reagents used by the instrument in real-time. Sensors are continuously monitored by the computer, allowing it to warn the operator when fluid levels are low. This module also contains an easily accessible filtration station, which uses in-line filters to remove any possible outside contamination from all reagents.

4 Open Incubator/Sonic

The incubator consists of a carousel equipped with 44 wells held at 50°C. The milk and a proprietary incubation reagent are automatically dispensed into the wells and may be subjected to mechanical, chemical and heat treatment. During the incubation, the mixture can be sonicated with two ultrasonic probes to remove potential interfering components and stain the bacteria DNA and/or RNA with a fluorescent marker.



The use of ultrasonic probes is an important option for bacteria counting applications. The cavitation effect removes potential interfering components such as somatic cells and gives the method its high sensitivity and Signal-to-Noise ratio. The carousel is automatically cleaned before and after each analysis to eliminate carry-over. The carousel can also be easily removed from the instrument for a more thorough cleaning if necessary.

5 Industrial Flow Cytometer

The flow cytometer, also known as the counting assembly, includes the flow cell, microscope, narrow band filter, and one or two powerful and highly stable solid state laser(s) and highly sensitive photomultiplier(s). The laser excites the fluorescent marker that is intercalated into the bacteria DNA and/or RNA. The fluorescence output is then collected with optics, filtered with the narrow band filter, and detected with the photomultiplier(s). The intensity and width of the fluorescence pulses are recorded and used as gating parameters. After applying a conversion equation, the sorted pulses are then translated into an individual bacteria count (IBC) and to Colony Forming Units (CFU). The flow cytometer is compact, completely closed and temperature regulated to provide optimum stability.

BactoCount IBC

3.0

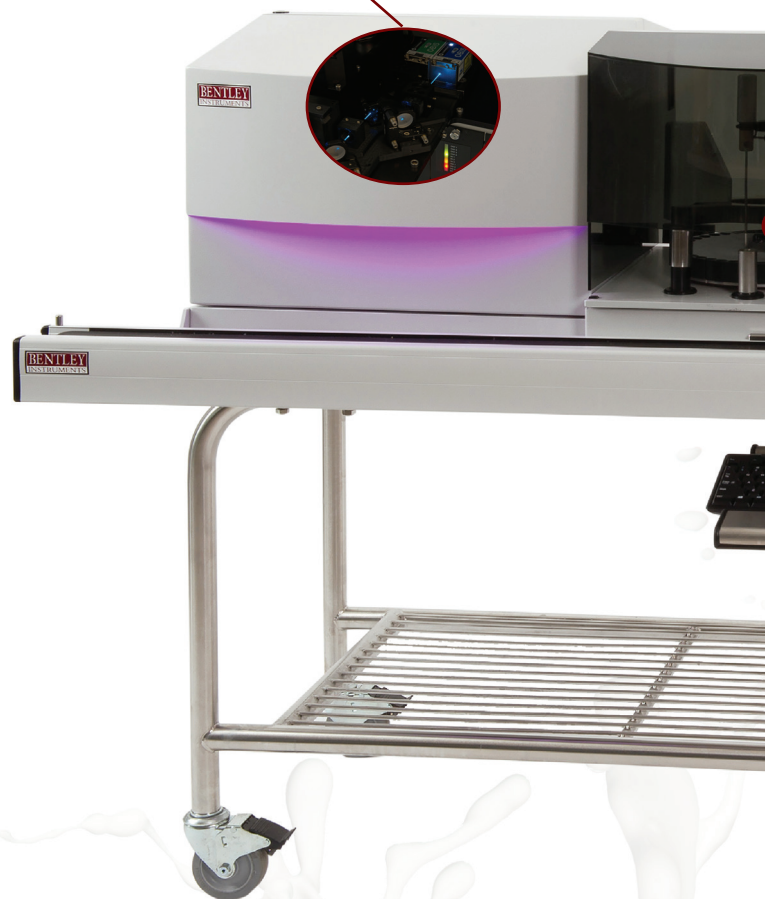
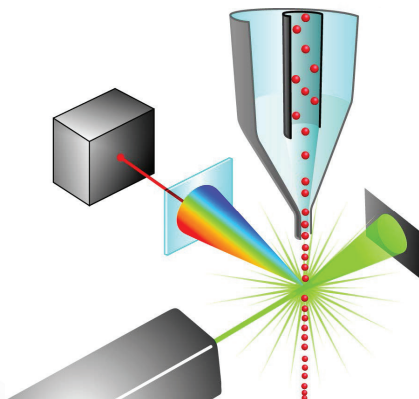
High-powered, long-lifetime, solid-state lasers for fluorescence excitations.

This third generation IBC can be equipped with **two lasers** with superior power stability (16 wavelengths available) and four detectors for multiplex testing.

Kinetic, self aligned mounted flow cell for easy access and maintenance

BactoCount IBC Technical Overview & Principle of Operation

- An incubation reagent consisting of a clarification buffer, a proteolytic enzyme, and a fluorescent marker is added to the milk in order to lyse the somatic cells, solubilize the fat globules and proteins, permeabilize the bacteria and stain their DNA.
- The fluorescent marker intercalates rapidly and selectively into all the bacteria double-stranded nucleic acid.
- The mixture is sonicated during the incubation period to help the chemical breakdown of the interfering particles, disrupt the remaining bacteria colonies to improve the detection of individual bacteria, and reduce the background fluorescence.
- After the incubation period, a portion of the incubation mixture is transferred to the flow cytometer where the bacteria are aligned and exposed to an intense laser beam and fluoresce.
- The fluorescent signal is collected by the optics, filtered, and detected with a photomultiplier.
- The intensity and height of the fluorescent pulses are recorded and used as gating parameters.
- The sorted pulses (IBC) are then converted into Colony-Forming Units (CFU) after the application of a conversion equation.





Ergonomic display monitor and keyboard are easily adjustable to individual operators.

Powerful Windows-based software integrates simultaneous control, data collection, analysis, archiving, and report generation.

Laser-drilled sample pipette filter.

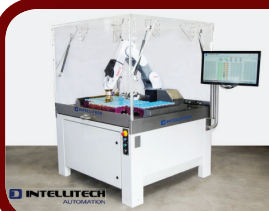
Front panel LEDs provides immediate visual feedback to the operator on overall instrument status and operation.

Noncontact optical sensors are used to control the rack position and movement.

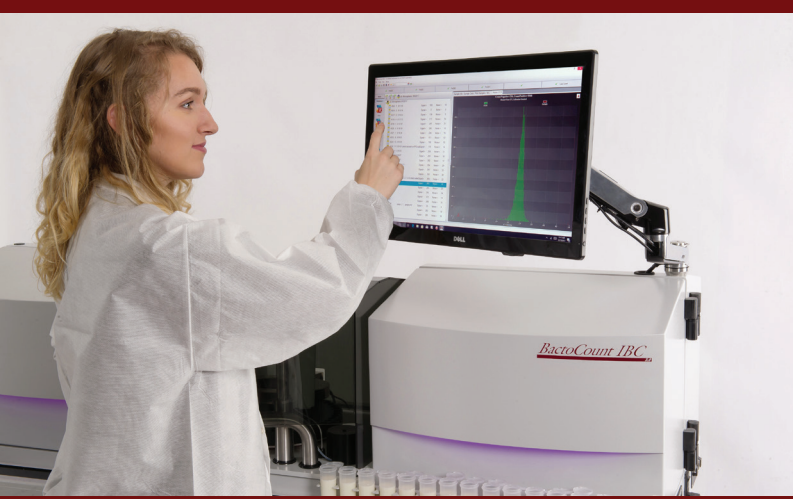
Samples are automatically placed under the pipette station, identified (barcode or RFID), stirred, aliquoted and dispensed into the carousel at a maximum speed of 200 samples/hour.

All standard rack configurations and vial sizes are supported.

Optional, adjustable keyboard.



Compatible with new ILAS 4000 for a total automation and standardization of the analytical chain.

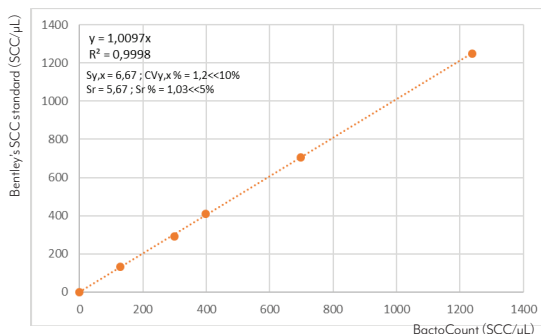


Methods standardisation

SRM Bacteria (IBC)

Consisting of bacteria present in raw milk, these long shelf life Secondary Reference Materials (SRM), which can be quickly reconstituted, allow the control of the proper functioning and optimal standardization of bacteria counters.

INSERTION IMAGE ANALYSE DE STANDARD SUR NOUVEL IBCv3



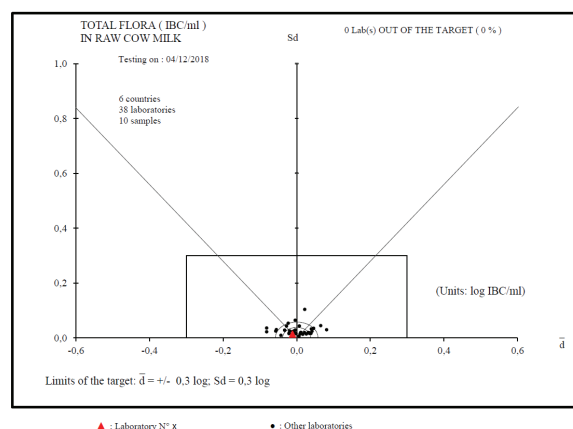
SRM Somatic Cells (SCC)

Made up of 5 long shelf life Secondary Reference Materials (SRM), which can be quickly reconstituted, these calibration ranges enable the standardization and optimal calibration of somatic cell counters.



Proficiency Testing Total Bacteria ISO 17043 (IBC)

Our international monthly Total Bacteria (IBC) ISO 17043 certified Proficiency Testing (PT), organized in collaboration with Actalia-Cecalait (French reference laboratory), is the optimal way to control the **BactoCount standardization** and to guarantee **IBC and CFU results global equivalence** after application of our universal conversion equation.



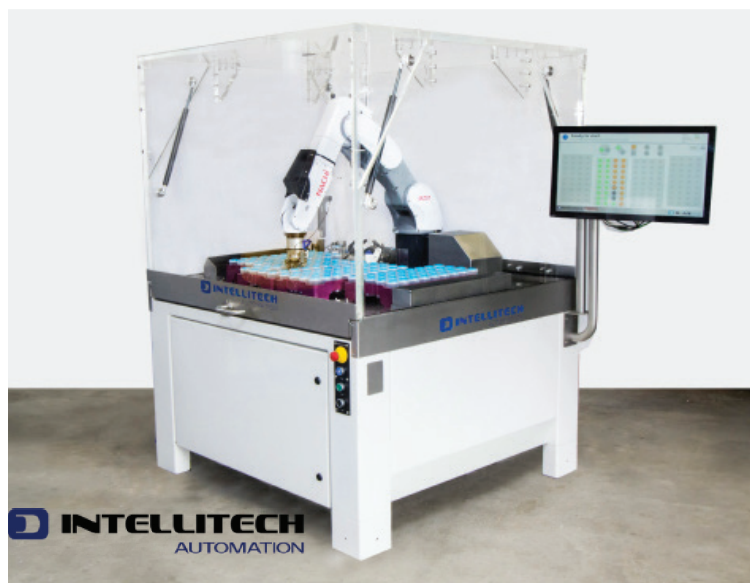
New ILAS 4000

Automation system

The new ILAS 4000 robot is an unique solution to automate and standardize sample preparation for bacteria counters in a refrigerated environment.

Samples Preparation & Method Standardization

The ILAS4000 is easy to operate and takes over all monotonous tasks. A single operator can easily manage 2-3 BactoCount on their own. Training is fast and simple. The robot follows a strict procedure which standardizes completely the analatical chain.



Automated Functions

The ILAS4000 automates a series of monotonous sample handling tasks. It ensures that samples are:

- Mapped from trays and grabbed by the robot
- Identified by RFID scanner (or barcode reader)
- Mixed by inversion to ensure a homogenous sub-sample
- De-capped
- Placed in the carousel
- Presented to the BactoCount pipette
- Re-capped and placed back into the tray after testing

Quality Assurance

The ILAS4000 is refrigerated at 4°C to maintain samples integrity and inhibits bacterial growth. An acrylic case seals the robot off to insulate and protect the operator. The general operating procedure greatly reduces the risk of cross-contamination.

Productivity Increase

Up to four trays can be loaded into the robot at once. Throughput is maximized with the ILAS 4000 as it handles multiple samples simultaneously at a speed of up to 200 samples per hour.

Standardized Tray (4x8) for Laboratory Automation

The Bentley Instruments tray is made of **high-resistance ABS plastic** (-18°C / +80°C) and identifiable by HF/BF RFID chips or barcode. It lets circulate water in a water bath, is stackable with fall blocking system and positions from 1 to 32 are indicated. Usable with ILAS robots, it is also **compatible with most vials (84 mm height max - diameter 36 mm max)**.



BactoCount IBCv3 - ID card*

Raw milk type	Cow, goat, sheep, buffalo, ...		
Carry-over	≤ 1% (typically ≤ 0.5%)		
Total Bacteria	IBCv3 100, 200 - equivalent to BactoCount IBC Range: 2,000 - 10,000,000 IBC/mL		
Repeatability & Reproducibility	Range (IBC/μL)	Specifications	
	10 - 50	$S_r \leq 0,07 \log$	$S_R \leq 0.14 \log$
	51 - 100	$S_r \leq 0,06 \log$	$S_R \leq 0.12 \log$
	101 - 300	$S_r \leq 0,05 \log$	$S_R \leq 0.10 \log$
	> 300	$S_r \leq 0,03 \log$	$S_R \leq 0.06 \log$
Accuracy	Sy, x ≤ 0.3 log (ISO 4833) Cow: Sy, x = 0.167 (AIA) ; Sheep: Sy, x = 0.245 (AIA) Buffalo: Sy, x = 0.201 (AIA)		
Somatic cells	0 - 10,000,000 cells (SCC)/mL		
Accuracy	≤ 10% (ISO 13366-1)		
Repeatability	Range (SCC/μL)	Specifications	
	100 - 300	Cv ≤ 5%	
	300 - 500	Cv ≤ 3%	
	> 500	Cv ≤ 2%	
Technical specifications			
Speed	Analyzing time: < 1 minute ; Prep time: 15 seconds Incubation time: 10 minutes (SCC)/10 minutes (IBC)		
Undiluted Work Factor	10 - 100		
Power supply	115/220 V ; 50/60 Hz		
Dimensions (WxHxD)	152.4 x 121.9 x 61.0 cm		
Weight	115.0 kg		
Connected to the local database and remotely accessible			

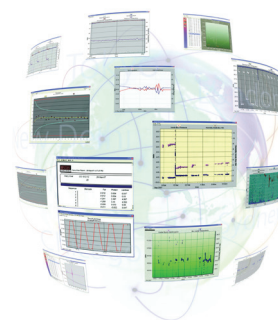
* Specifications subject to change without any prior notice.



World Class Service and Support

Delivering a rapid and superior level of customer support is a top priority at Bentley Instruments.

Our experienced team provides on site installation, training and service as well as phone and Internet support to help you maintain the highest level of productivity.



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