



BIOSTAT[®] B plus
Laboratory
benchtop system

Engineering by
Sartorius BBI Systems

BIOSTAT® B plus integrated system solution...

BIOSTAT® B plus destined to become the new benchtop standard in research fermentors and bioreactors, worldwide. Application driven preconfigured packages for microbial culture and cell culture are delivered being ready to use right "out of the box".

The completely equipped packages have an excellent value for money; the logical choice for users in teaching, research and industry.

Features & Benefits

- Graphical user interface with touch screen
- Trend display with up to 6 process values
- Direct balance connection
- 1 L-10 L UniVessel® culture vessel with storage bottle tray, lifting handles and sampling system
- One high performance stirrer motor for all applications and UniVessel® sizes
- 4 integrated peristaltic pumps, 2 external pump connections
- Application driven integrated gassing system
- Integrated thermostat system
- Space for Redox and turbidity measurement
- Pre-configured software for system extensions

Software

To accelerate your research activities, a powerful supervisory software MFCS/DA for extended visualization, data acquisition and trend display is included.

The functionality of each individual package is shown on the last page.

... ready to use packages for your drug discovery and small-scale-production



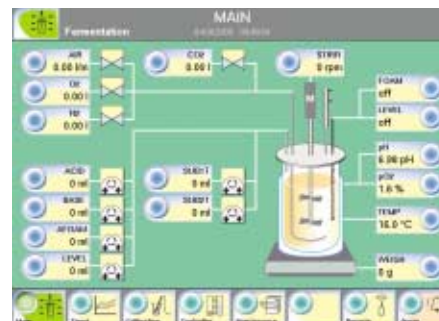
Basic unit content ...

- Stainless steel housing
- Digital controller
- Operating interface
- Gassing system with rotameter, solenoid valves or mass flow controller
- Motor with controller
- Thermostat system with circulation pump
- 4 peristaltic pumps
- 5 amplifier

Culture vessel equipped with ...

- Sensors for temperature, pH, DO, foam and level
- Stirrer shaft with industrial sealing
- Impeller
- Aeration tube with sparger, sterile filters and exhaust cooler
- Storage bottles, sample/harvest pipe, blind plugs
- Tube, O-ring and tool kit

... and optionally a full range of accessories to meet your future needs.



Space requirement

Required bench size approx. W x H x D (mm)	
BIOSTAT® B plus / 1 L	560 x 730 x 565
BIOSTAT® B plus / 2 L	590 x 730 x 565
BIOSTAT® B plus / 5 L	620 x 730 x 565
BIOSTAT® B plus / 10 L	670 x 820 x 565
Required inner autoclave dimension Ø x H [mm]	
UniVessel® 1 L	240 x 500 *
UniVessel® 2 L	270 x 550 *
UniVessel® 5 L	300 x 700 *
UniVessel® 10 L	350 x 820 *
Utility lines	Customer supply
Power supply	230 VAC or 120 AC
Gasses	Controlled @ 1.5 barg; dry, particle and oil free
Water	Controlled @ 2 barg
Drain	@ 0 barg

* Height reducible via flexible adaptor



Digital Controller

BIOSTAT® B plus controller created for the needs of today's bioprocess applications.

- Graphical user interface with color display and touch screen
- Integrated amplifiers for temperature, pH, DO, foam & level
- Space for Redox and turbidity amplifier
- Integrated digital control loops for temperature, pH, DO, agitation, gasmixing, air flow and 2x substrate
- Level control via probe or balance
- 2-stage DO cascade control
- Totalizer with digital calibration for probes and pumps
- In-process pH-recalibration
- Trend display for up to 6 process values
- Balance connection
- Developed according to GAMP guidelines

Thermostat System

Ensures precise temperature control with rapid heating and cooling rates.

- Integrated in basic unit
- Powerful heater (1 kW)
- Integrated cooling valve
- Circulation pump
- Temperature range 8 °C above cooling water up to 80 °C.

Gassing

Integrated culture vessel protection via safety valve

O₂-Enrichment

- For microbial cultures
- Gasmixing of Air and O₂
- Solenoid valve for O₂-Enrichment capability
- Controlled via DO controller
- Easy exchangeable Rotameter
- Optional massflow controller

Gas Flow Ratio Control

- For microbial cultures
- Gasmixing of Air and O₂
- Two integrated massflow controller for Air and O₂
- Controlled via DO controller
- Easy exchangeable Rotameter

Exclusive Flow

- For cell culture or multipurpose use
- Sparger and Overlay gas outlet
- Gasmixing of Air, O₂, N₂, CO₂ for Sparger aeration
- Air for Overlay aeration
- 2 easy exchangeable Rotameter
- Controlled via pH/DO controller
- Optional massflow controller

Pumps

Controlled via BIOSTAT® B plus controller for precise media conditioning, feeding and harvest.

- 4 integrated pumps
- Configurable to substrate controller
- Up to 2 external feed pumps
- Watson Marlow pump heads

Culture vessel

UniVessel® autoclavable culture vessels. Trust over 40 years experience in sterile design.

- 1 L – 10 L jacketed culture vessels
- Pre-configured for microbial or cell culture application
- Stirrer shaft with single mechanical seal
- Polished head plate for highest sanitary conditions
- Vertical lifting handles for easy handling
- Head plate with maximized numbers of ports
- Removable addition bottle support
- Minimized autoclave space requirement
- 316 L stainless steel for medium contact parts
- Real O-ring sealing, no compressed O-rings
- Full range of accessories for microbial and cell culture applications

Stirrer Drive

The high performance servo drive combines low shear agitation for cell cultures with high speed mixing for microbial high cell density fermentations.

- Speed range 20–2.000 rpm
- Maintenance free
- High torque
- Easy handling
- Gear-free

MFCS SCADA Software Family ... the Software Solution for your Bioprocess



Our key platform to automation is based on the use of flexible Digital Control Systems (Micro-DCU and DCU), which are specifically tailored for fermentation and cell culture applications. When combined with our Supervisory Control and Data Acquisition (SCADA) systems, this solution provides the most cost-effective platform for a broad range of applications.

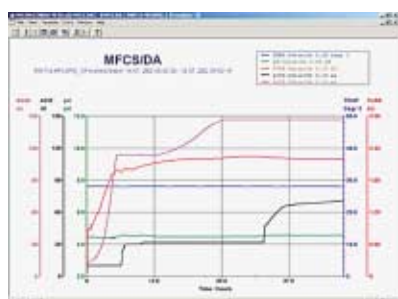
Our current SCADA Software Family consists of two products: MFCS/DA and MFCS/win...

Main features of MFCS/DA

- Plug and Play configuration
- Up to 4 fermentors
- Batch oriented software package
- Online data acquisition
- Sample Data Management
- Enhanced Plotting
- Export functions
- Easy to use programming interface

MFCS/DA

MFCS/DA has been designed as a self-explanatory system with plug and play configurations for micro-DCU based fermentors like the BIOSTAT® B plus. It provides simultaneous data acquisition and control from up to 4 process units. The Operator Service program acts as the main point of interaction with the software, providing access to all functions: set-up, control, plotting, etc.



MFCS/DA even includes the ability to incorporate other laboratory data, such as off-line process analysers. An Export function gives added flexibility for analysing data using other off-line programs. More advanced control strategies can be developed by the already included Programmer's Interface.

Operator Service

Batch Display provides an overview of all process units. Additional on-line, configurable views display for individual process units as well as an overall complete system display.

Sample Data Management

During a batch, off-line sample analysis generates critical process data, which should be included in the batch record. These values can be entered into a standard spreadsheet/table.

Plotting

Any combination of 1 to 10 variables can be displayed together. On-line data, as well as manually entered, off-line data can be selected. Line types, colors and other plot characteristics are user-definable. Preferences can be stored in re-usable plotting templates.

Data Export

Data from finished or still active bioprocesses can be further processed by 3rd party software using the Export Module.

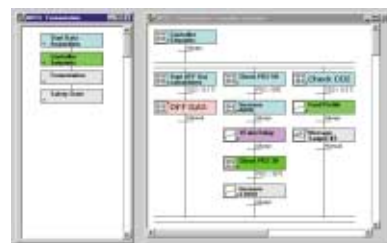
Programming Interface

Typical applications of this module could include calculation of Oxygen Uptake Rates (OUR), Carbon Dioxide Evolution Rate (CER) and Respiration Coefficient (RQ) for use in establishing new controller setpoints for more advanced process control.

MFCS/win 2.1

MFCS/win 2.1 the 4th generation of BBI's enhanced Supervisory Control and Data Acquisition software package satisfies a broad range of requirements in research, pilot and production area. Supplied preconfigured and "ready to use", the configuration can easily be adapted by the user to any change in process requirement. Main features include on-line data acquisition and storage, sample data management for off-line measured values, process evaluation and visualisation, as well as event dependent process control, process documentation via data export and batch reporting following the cGMP rules. The open system architecture provides connectivity to a wide range of 3rd party devices and software packages - via MFCS/win drivers, OPC-Client, OPC-Server or programmable interface (API).

Fully validatable according to GMP category 4 (Configurable System) and 21 CFR Part 11 compliance for electronic records and signatures, MFCS/win has all the necessary functionality for operation in a regulated cGMP production environment.



Description	BIOSTAT® B plus-MO O ₂ -Enrichment with UniVessel®				BIOSTAT® B plus-MO GFRC with UniVessel®				BIOSTAT® B plus-CC Exclusive Flow with UniVessel®			
	1L	2L	5L	10L	1L	2L	5L	10L	1L	2L	5L	10L
Cat. No. 230 VAC	8843479	8843481	8843483	8843487 8843485	8843489	8843491	8843493	8843497 8843495	8843499	8843501	8843503	8843507 8843505
Cat. No. 120 VAC	8843480	8843482	8843484	8843488 8843486	8843490	8843492	8843494	8843798 8843496	8843500	8843502	8843504	8843508 8843506

Culture Vessel	UniVessel®											
Total volume [L]	1.6	3	6.6	13	1.6	3	6.6	13	1.6	3	6.6	13
Working volume [L]	0.4-1	0.6-2	0.4-5	1.5-10 5-10	0.4-1	0.6-2	0.4-5	1.5-10 5-10	0.4-1	0.6-2	0.4-5	1.5-10 5-10
Culture vessel tripod	•				•				•			
Stirrer shaft with single mechanical seal	•				•				•			
Magnetic coupling	-				-				o 8847339			
6-blade disk impeller	2	2	2	3	2	2	2	3	-			
3-blade segment impeller	-				-				1	1	2	2
Storage bottle 250 mL	3	3	-	-	3	3	-	-	3	3	-	-
Storage bottle 500 mL	-	-	3	3	-	-	3	3	-	-	3	3
Air Inlet and Exhaust filter	2				2				3			
Aeration tube with ring-sparger	•				•				-			
Aeration tube with μ-sparger	-				-				•			
Inoculation port	•				•				•			
Exhaust cooler	•				•				•			
4-way addition fitting	•				•				•			
Universal adaptor 3.2 mm for overlay aeration	-				-				•			
Sample-/Harvest pipe	•				•				•			
Manual sampler	•				•				•			
Baffle Cage with 4 baffles	•				•				-			
pH electrode, cable	•				•				•			
DO electrode, cable	•				•				•			
Level sensor, cable	•				•				•			
Foam sensor, cable	•				•				•			
Temperature sensor Pt100	•				•				•			

Basic unit

Digital controller color display with touch screen	•				•				•			
Amplifier for Temperature pH, DO, Level, Foam	•				•				•			
200 watt servo motor (rpm)	20-2.000	20-2.000	20-1.500	20-800	20-2.000	20-2.000	20-1.500	20-800	20-2.000	20-2.000	20-1.500	20-800
Gasmixing	O ₂ -Enrichment				Gas Flow Control via MFC for Air and O ₂				Exclusive Flow			
Rotameter Sparger [l/min]	0.16-1.6	0.42-4.2	1.3-13	2-20	0.16-1.6	0.42-4.2	1.3-13	2-20	0.016-0.166	0.016-0.166	0.05-0.5	0.1-1.0
Rotameter for Overlay	--				--				0.1-1.0	0.16-1.6	0.42-4.2	0.8-8.3
O ₂ -Enrichment	•				--				•			
Gas Flow Air MFC [l/min]	--				0.06-3	0.06-3	0.4-20	0.4-20	--			
Ratio Control O ₂ MFC [l/min]	--				0.06-3	0.06-3	0.4-20	0.4-20	--			
Gasmixing of Air, O ₂ , N ₂ , CO ₂	--				--				•			
MFC (Sparger)	o 0.06-3 [l/min] 8847770		0.4-20 [l/min] 8847797		2x included				0.02-1 [l/min] 8847754			
MFC (Overlay)	o --				--				0.2-10 [l/min] / 8847789			
Peristaltic pumps (integrated)	4				4				4			
Thermostat system	•				•				•			
Tubing, o-ring spare set	•				•				•			
MFCS/DA	•				•				•			
Balance for culture vessel	o 8843513	8843513	8843513	8843513	8843513	8843513	8843513	8843513	8843513	8843513	8843513	8843513
Turbidity measurement	o --	8843473	8843474	8843474	--	8843473	8843474	8843474	--	8843511	8843512	8843512
Redox measurement	o 8843469	8843470	8843471	8843471	8843469	8843470	8843471	8843471	8843469	8843470	8843471	8843471

- = included
- = not included
- o = option
- = unavailable

Sartorius BBI Systems GmbH
Postfach (P.O.B.) 1363
34203 Melsungen
Germany

Schwarzenberger Weg 73–79
34212 Melsungen
Germany

Phone +49.5661.71.3400
Fax +49.5661.71.3702

Sartorius BBI Systems, Inc.
2800 Baglyos Circle
Bethlehem, PA 18020
USA

Phone +1.610.866.4800
Fax +1.610.866.4890

Sartorius BBI Systems s.r.l.
Via Vigliani 13
20148 Milano
Italy

Phone +39.02.4817.327
Fax +39.02.4983.176

Sartorius India Pvt. Ltd.
10, 6th main, 3rd Phase Peenya
KIADB Industrial Area
Bangalore – 560 058
India

Phone +91.80283.91963
Fax +91.80283.98262

www.sartorius-bbi-systems.com
info@sartorius-bbi-systems.com