sartorius stedim biotech

UniVessel® SU Single-Use Bioreactor
Proven Design, Ready for the Future

turning science into solutions

UniVessel® SU System Concept

The UniVessel® SU is a stirred tank single-use bioreactor. It combines the proven, scalable design of glass bioreactors and the fast turnaround of single-use systems. UniVessel® SU is compatible with your controller and can be used interchangeably with glass vessels to help you efficiently manage peak workloads despite challenging timelines.

The broad range of accessories, such as a heating | cooling jacket, heating blanket, pressure relief unit and dedicated motor adaptors, enables you to connect the UniVessel® SU culture vessel to virtually any brand of bioreactor controller that you already use. Moreover, single-use sensors for pH and DO are included with every UniVessel® SU.

Used together with the UniVessel® SU Connection Box, these sensors can be interfaced with nearly any bioreactor controller. As a result, this eliminates the need for labor-intensive steps involving probe autoclaving and insertion. Since you discard the complete vessel after use, you no longer have to bother with the hassle of cleaning, autoclaving and reinstallation.

UniVessel® SU Culture Vessel

Single-use from vessel to sensors

UniVessel® SU Connection Box

Single-use sensor convenience for existing bioreactor controller.

UniVessel® SU Holder

For more safety and non-invasive sensor technology.

Benefits

Proven and scaleable design
Reduce your time and effort for process development, optimization and validation

Compatible with your existing bioreactor controller
Upgrade your bioreactor controller with state of the art single-use culture vessels

Interchangeable with existing glass vessels
Helps you to manage peaks and challenging timelines

Single-use from vessel to sensors
For more runs with your available lab resources

Applications

- Process development
- Process optimization
- Stem cell cultivation
- Process validation
- Adherent cell culture with micro carriers

UniVessel® SU Culture Vessel

Technical Specifications

Material (product contact)	
Vessel & components	Polycarbonate
Tubings	Silicone, CFlex®
O-Ring | Seal	EPDM

Volume	
Total	2.6 L
Max. Working	2 L
Minimum	0.6 L

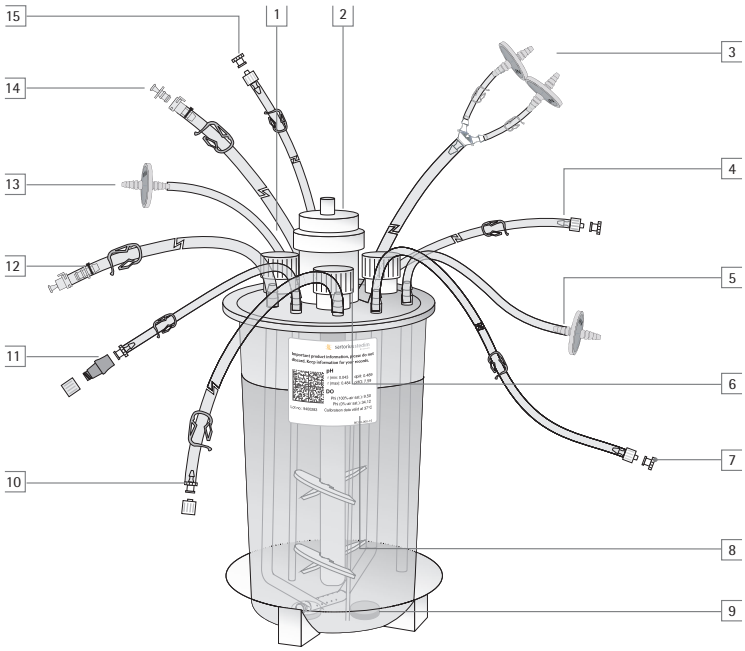
Impeller	
Type	3-blade segment impeller 30° angled
Number of impellers	2
Flow characteristics	down flow
Diameter	54 mm
Lower impeller distance to bottom	47.3 mm
Impeller distance	70.2 mm

Sparger	
Hole diameter	L-Sparger 0.5 mm

Dimensions	
Vessel inner diameter (top)	130 mm (1.5° slope)
Vessel inner height	242 mm
Vessel weight	1 kg
Diameter thermowell	8 mm
Gas Filters	Midisart, 0.2 µm
Maximum operating pressure	0.5 barg
Maximum operating temperature	50 °C
Vessel bottom design	torospherical
Sterilization	Irradiated to dose exceeding 25 kGy

The UniVessel® SU culture vessel is available with a working volume range of 0.6 to 2L. It is assembled, irradiated and shipped ready-to-use. Moreover, it comes with single-use pH and DO sensors that further reduce the preparation time required to an absolute minimum; for more runs with your available lab resources.

Similar to glass stirred-tank bioreactors, all vessel ports are located on the lid. The vessel lid has three addition ports, three ports with dip tubes for harvesting or media addition, three sensor ports, a thermowell for inserting a temperature sensor and a needle-free septum port for sampling. The stirrer shaft features two 3-blade segment impellers for efficient and low-shear mixing. Aeration takes place either in a submerged configuration via an L-type sparger with tiny holes and | or through the headspace. Both air inlet and exhaust are equipped with sterilizing-grade air filters; additionally, the exhaust features a dual parallel filter assembly. All fluid ports come with thermo-weldable tubing and with common MPC or Luer connectors. All tubing can be secured at the vessel lid to maintain an orderly working space.

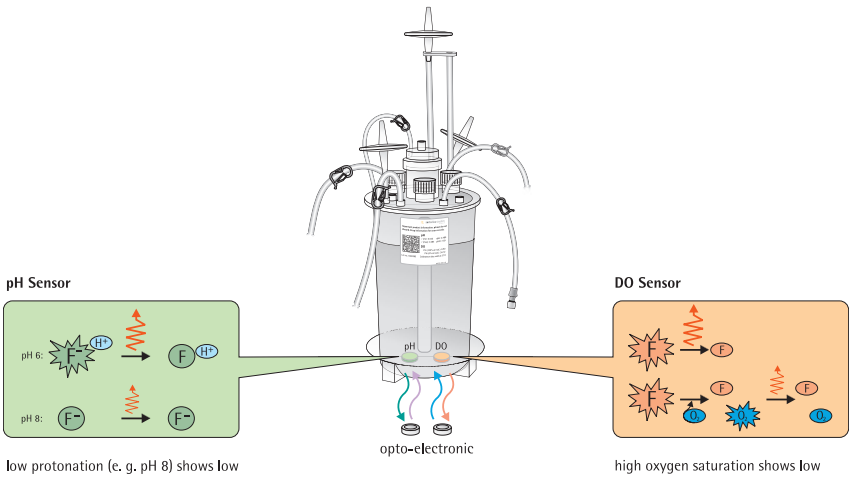


1	Thermowell (not shown)
2	Motor adaptor seat
3	Exhaust, silicone tubing with Y-piece and dual Midisart BV 0.2 µm filter
4	Addition 1, TPE tubing: 1/8" × 1/4" × 900 mm, male Luer 1/8"
5	Gas inlet: L- sparger, silicone tubing, with Midisart BV 0.2 µm filter
6	12 mm sensor port
7	Dip tube 3, below min. working volume, TPE tubing: 1/8" × 1/4" × 900 mm, male Luer 1/8"
8	Label with calibration data
9	Single-use sensors for pH and DO
10	Addition 3, TPE tubing: 1/8" × 1/4" × 900 mm, female Luer 1/8"
11	Sampling with needle free septum port
12	Dip tube 2, bended to vessel bottom, TPE tubing: 1/4" × 7/16" × 900 mm, male MPC 1/4"
13	Gas inlet: Overlay, silicone tubing, with Midisart BV 0.2 µm filter
14	Addition 2, TPE tubing: 1/4" × 7/16" × 900 mm, female MPC 1/4"
15	Dip tube 1, min. working volume TPE tubing: 1/8" × 1/4" × 900 mm, male Luer 1/8"

UniVessel® SU Holder

The UniVessel® SU holder securely supports the UniVessel® SU to ensure that the vessel cannot tip over during operation. It is available in two versions: basic and optical. The basic version is recommended when you use the UniVessel® SU with conventional sensors. The optical version features built-in optoelectronics for pH and DO single-use sensors.

Besides a digital communications port, the optical version has integrated electrochemical sensor (ECS) interfaces for pH and DO. The ECS interfaces can be easily connected to your existing bioreactor controller using the standard probe connections. What's more, you can directly connect a BIOSTAT® B-DCU II over the digital communication interface.



low protonation (e. g. pH 8) shows low emitted light intensity!

high oxygen saturation shows low emitted light intensity!

Technical Specifications

UniVessel® SU Holder, basic

Dimensions (W × H × D)	265 × 110 × 350 mm 10.4" × 4.3" × 13.8"
Weight (incl. adaptor ring)	13.7 kg | 28.7 lbs

UniVessel® SU Holder, optical

Dimensions (W × H × D)	265 × 110 × 350 mm 10.4" × 4.3" × 13.8"
Weight (incl. adaptor ring)	14 kg | 30.9 lbs

Interface optical holder	Connector
Digital RS485	M12
Temperature*	M12
ECS pH*	K8
ECS DO*	T82

* Only required for use with UniVessel® SU Connection Box

Optical DO measurement

Measurement range	0-100% air saturation (a.s.)
ECS sensor signal (37°C)	0 – 300 nA 0 – 76 ± 6 nA = 0 – 100% a.s.
Resolution	0.1% a.s.
Accuracy (37°C)	± 1% a.s.
Temperature range	5 – 50°C
Drift (1 min. sampling interval)	< 0.5% a.s per day

Optical pH measurement

Measurement range	6.0 – 8.0
ECS sensor signal	-500 – 500 mV
Resolution	0.01
Accuracy (±1.0 pH range centered around pH of 1-point-cal)	0.1
Temperature range	5 – 50°C
Drift (1 min. sampling interval)	< 0.05 per day

UniVessel® SU Connection Box

Technical Specifications

UniVessel® SU Connection Box	
Dimensions (W × H × D)	226 × 200 × 188 mm 8.9" × 7.9" × 7.4"
Weight	4 kg | 8.8 lbs
Enclosure rating	IP 20
Operating temperature	+5°C – 40°C
Operation	
Display	7"
Operation	Touch screen
Interfaces	
Power supply	24 V DC +/- 5%, 40 W
Bar code scanner	1 × USB
UniVessel® SU Holder optical	4 × RS485
Installation	Desk or wall mounting
Power adaptor	
AC adaptor* (included)	100 – 240 V (AC), 50 – 60 Hz, 1,1 A

In combination with the UniVessel® SU optical holder, the UniVessel® SU Connection Box enables you to utilize single-use pH and DO sensors with a bioreactor controller that cannot be directly connected over a digital interface. The Connection Box is designed to align the pH and DO measuring path of the bioreactor controller via setting the reference value for calibration, as well as for inputting calibration data for single-use sensors. The sensor calibration data can be entered either manually or quickly read in by a barcode scanner.

The touch-screen control panel has a frameless design, which eliminates difficult-to-clean edges and gaps, and therefore is well protected against moisture and cleaning agents. The UniVessel® SU Connection Box can be connected to up to four (4) UniVessel® SU optical holders. By simple rotation of the control panel, it can be conveniently converted from a desktop unit to a space-saving wall- or rack-mounted version.

UniVessel® SU Accessories

UniVessel® SU Heating Blanket

The blanket is used to control the temperature of the UniVessel® SU for bioreactor controllers that have a heating blanket socket. The heating blanket can be easily wrapped around the UniVessel® SU and secured tightly by hook and loop connectors for optimal heat transfer.

UniVessel® SU Pressure Relief Unit

A bioreactor controller for glass culture vessels may have safety valves integrated that require relatively high pressure to trigger, or even none at all. The UniVessel® SU pressure relief unit features two flowpaths - one for Overlay and one for Sparger – that each have a safety valve to protect the UniVessel® SU from excessive operating pressure.

UniVessel® SU Filter Heater

The filter heater is used for heating the exhaust filter to prevent potential blockage. In addition, it holds the exhaust filter in an upright position to ensure that condensate flows back into the culture vessel as it forms.

UniVessel® SU Heating | Cooling Jacket

The heating | cooling jacket controls the temperature of the UniVessel® SU with a bioreactor controller that has a built-in or external thermocirculator. The jacket can be easily wrapped around the UniVessel® SU and tightly secured by hook and loop connectors for optimal heat transfer.

UniVessel® SU Motor Adaptor

The UniVessel® SU can be used with most bioreactor controllers for glass culture vessels. Stainless steel adaptors for several existing motors are available and can be mounted on the UniVessel® SU stirrer shaft coupling. The motor adaptor features a bayonet lock for secure motor and vessel connection.

Technical Specifications

UniVessel® SU Heating Blanket	
Material	Silicon
Insolation	Silicon foam
Power	200 W
Power supply	120/230 VAC
Plug	Amphenol eco | mate 6-pol +PE
Connection cable	1 m

UniVessel® SU Pressure Relief Unit	
Dimensions (W × H × D)	133 × 136 × 88 mm 5.2" × 5.4" × 3.5"
Weight	0.55 kg | 1.2 lbs
Housing material	Stainless steel
Gas inlet | outlet	Hose barb OD 6 mm
Opening pressure	≤ 0.5 barg

UniVessel® SU Filter Heater	
Material	Silicon
Power	7 W
Power supply	100 – 240 V (AC), 50 – 60 Hz

UniVessel® SU Heating | Cooling Jacket	
Outer material	Silicon coated fiberglass
Fluid flow line	Flexible stainless steel pipe
Insulation	Elastomer
Connections	Quick couplings
Operating pressure	max. 6 barg
Operating temp.	4 °C – 95 °C
Heating time	0.2 °C/min

* at flow temperature 80 °C

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