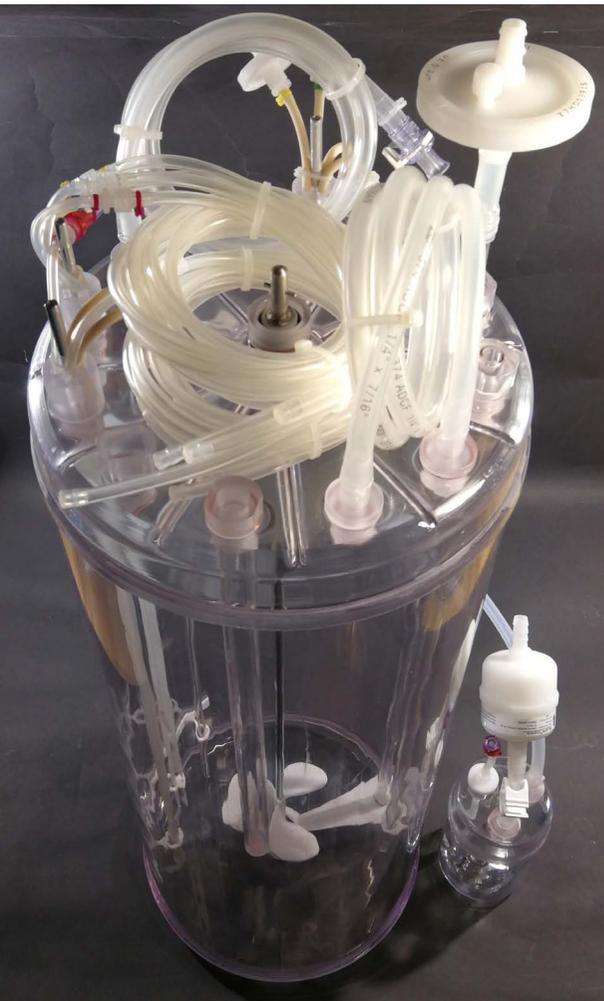


Customized scalable batch Single-Use-Bioreactor



**CellVessel
for mAb's
bio-manufacturing**

October 2018



Per Stobbe



Customized scalable batch

Size 0,5 - 2,1 - 3,2 - 5,7 - 13 - 30 liter VV



CellVessel are all Cultivation- Ready

- CellVessel SUBs ranging from 0,5 to 30 liter Vessel Volume (VV)
- CellVessel SUB with any type of impeller single or dual or triple
- Agitation by Magnetic-Bottom-Drive (MBD) on the Magnetic-Stirrer-Table (MST) driven by any servo motor < 3,2 liter
- Agitation by Head-Plate-Drive (HPD) by any servo motor you may have > 5,7 liter
- Range of Single-Use-Sensor's with connectors which fit your PCS
- Thermal control electrical or liquid



Ready to use
"right out of
the box"

The building block's for cultivation **ready SUB's**

Single-Use-Bioreactor

A SUB specifically designed and manufactured for your application.

Working Volume, special impeller and aerator, desired length and hose brand, fit your existing PCS.



Agitation system

What ever impeller design and as many as you prefer.

Freedom to choose from more than 500 different impellers.



Single-Use-Sensor's

Single-Use-Sensor's which fit your existing Process-Control-System connections.

Parameters measured DO with optical or polarographic SUS, pH with analogue SUS, optional biomass and level SUS.

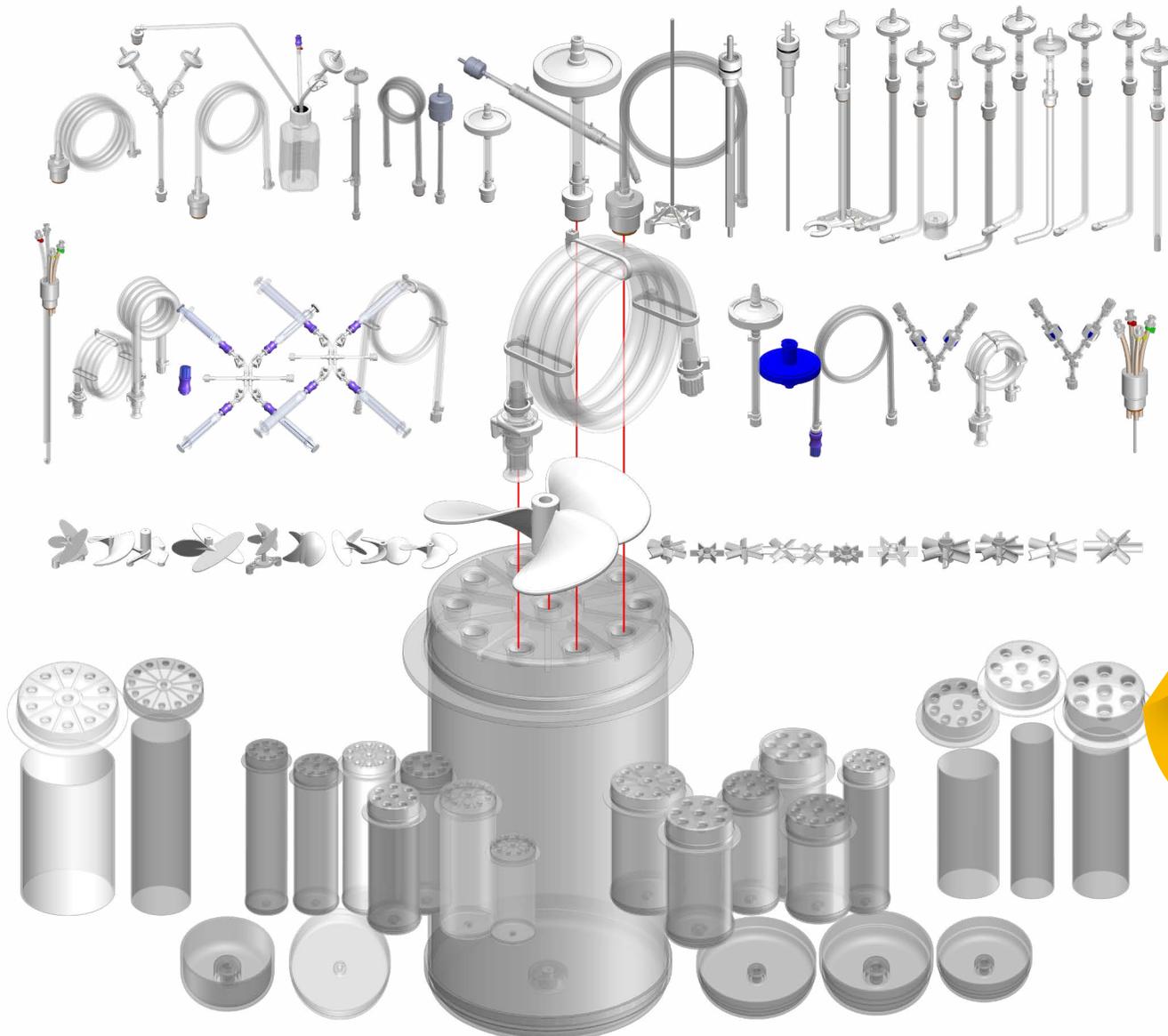


Silicone hoses

As many and as long and with the connections you preferred



What does **“Customized”** really mean?



Build your next SUB exactly to your needs ...

CellVessel is based on more than 5.000 different components designed to fit each other. That's millions of combinations!

Build your own Bioreactor

CellVessel parts are Plug & Play!

The 500 ml CellVessel

starts at only 150 ml Working Volume

CellVessel are all Cultivation-Ready

- CellVessel SUB's size 500 ml VV
- SUB available with any type of impeller
- Agitation by Magnetic-Bottom-Drive (MBD) on Magnetic-Stirrer-Table (MST) driven by any servo motor
- Range of Single-Use-Sensor's with connectors which fit your PCS



CellVessel 3,2 liter portfolio

size 3.200 ml Vessel Volume



CellVessel are all Cultivation-Ready

- CellVessel SUB's with size 3,2 liter VV is a well proven size
- SUB available with any type of impeller, single or dual or triple
- Agitation by Magnetic-Bottom-Drive (MBD) on Magnetic-Stirrer-Table (MST) driven by any servo motor (< 5,7 liter)
- Agitation by Head-Plate-Drive (HPD) by any servo motor you may have (SUB > 5,7 liter)
- Range of Single-Use-Sensor's with connectors which fit your PCS cabling



CellVessel 3,2 liter portfolio

integrating Single-Use-Sensor's



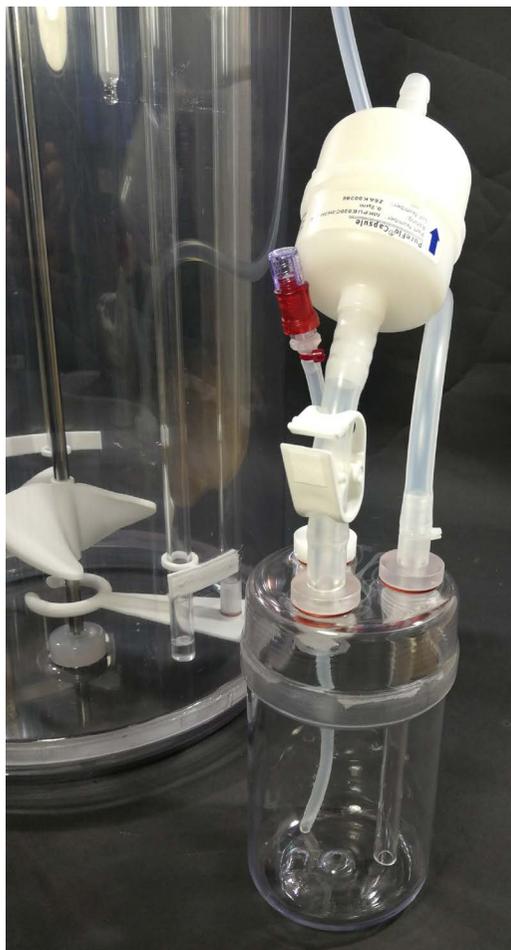
Medium size CellVessel are SUS-Ready

- CellVessel 3,2 liter Vessel Volume SUB, pre-assembled and ready to use right out of the box
- pH SUS pre-installed with brand new dry-storage tolerant design
- Thermocouple from your PCS fits into the standard and integrated non-invasive well
- New generation of Single-Use-Sensor's (SUS as required (and available))



CellVessel 5,7 liter portfolio

for any cell culture cultivation



Large rigid polymer wall SUB

- CellVessel is a batch SUB, pre-assembled and ready to use right out of the box
- CellVessel connects via integrated dip tube, silicone hose and aseptic coupling to by you preferred external containers
- For use with your own Process-Control-System (PCS)
- Single-Use-Sensor's (SUS) as required (and available)
- Agitation by Magnetic-Bottom-Drive (MBD) by Magnetic-Stirrer-Table (MST) with any servo motor
- Agitation by Head-Plate-Drive (HPD) by any servo motor you may have
- Check out thermal control below



CellVessel 30 liter

with Single-Use-Sensor's



Big rigid polymer wall SUB

- CellVessel is pre-assembled and ready to be used right out of the box
- CellVessel designed for connection to your preferred PCS and servo motor for HPD
- SUB outlet / inlet dip tubes connection with selectable hoses and aseptic connectors
- Any design of and as many IMPeller's as required
- Any customization is possible
- Single-Use-Sensor's (SUS) as required (and available)
- Check out thermal control below



CellVessel 30 liter

for any cell culture cultivation

Big batch ready SUB

- CellVessel's are independent of size pre-assembled and ready to be used right out of the box
- CellVessel 30 liter are designed for connection to your own preferred PCS
- SUB outlet / inlet dip tube connection with selectable hoses and aseptic connectors
- Any design of and as many IMPeller's as required
- Sparger(s), foam bottle, gas cooler as required
- Single-Use-Sensor's (SUS) as required (and available) here shown with VisiWell, pH, °C
- Gentle Head-Plate-Drive for any servo motor
- Check out thermal control below



SUM for mixing

with Single-Use-Sensor's

CellMiscelatore is Mixing Ready

- CellMiscelatore is all pre-assembled and ranging from 500 to 13 liter VV and ready to use right out of the box.
- Fully customized M-SUB design.
- Single-Use-Sensor's (SUS) as required (and available) - shown pH and conductivity
- Magnetic-Stirrer-Table driven on any small stirrer table



Agitation of Single-Use-Bioreactor's



CellVessel agitation ready

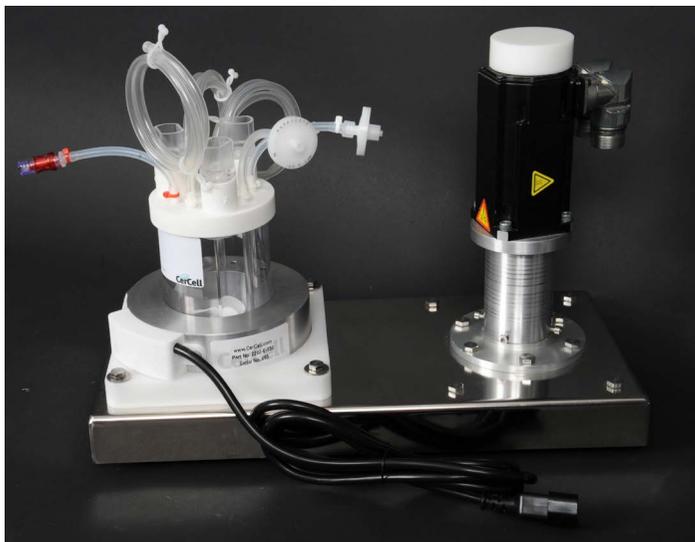
- CellVessel **IMP**eller's are designed with a set of identical blades attached to the central core, shaft.
- CerCell offer 650 different **IMP**eller design. **IMP** are described via principle, diameter, blade angle, number of blades.
- Suitable for Magnetic-Stirrer-Table driven (MST) agitation
- Suitable for Head-Plate-Drive agitation (HPD) agitation
- Any number, type, size, and mix of impeller's and turbine's.
- Radial or axial agitation as desired



Unlimited
IMPeller's

Drives for agitation

Magnetic-Bottom-Drive of CellVessel



Magnetic-Stirrer-Table

- CellVessel in size 500 ml to 5,7 liter is suitable for Magnetic-Bottom-Drive
- SUBs with Magnetic-Bottom-Drive is the most stable and easy setup on the Magnetic-Stirrer-Table driven by any servo motor
- No heavy servo motor on the light weight SUB
- More space on head plate for sensors
- Any number, type, size, and mix of impeller's and turbine's.



Drives for agitation

Head-Plate-Drive on top of CellVessel



Head-Plate-Drive

- CellVessel in size 10 to 30 liter is suitable for servo motor mounted on the head plate
- Head-Plate-Driven agitation (HPD) for any servo motor with a range of adaptors
- Any number, type, size, and mix of impeller's



Single-Use-Sensor's

measure DO, pH, bio-mass,
conductivity, temperature, level



The complete **CellVessel SUB family** optional may include through the head-plate vertically mounted, pre-installed Single-Use-Sensor's (SUS) for DO, pH, °C, and level.

Depending on SUB size PICO Futura SUS capacitance bio-mass SUS mounted vertical through head plate or horizontal at bottom.

For accurate DO measurements we pre-install either **VisiWell** or **PolarWell**. Use the optical or polarographic Re-Usable-Sensor (RUJ) supplied with your PCS.

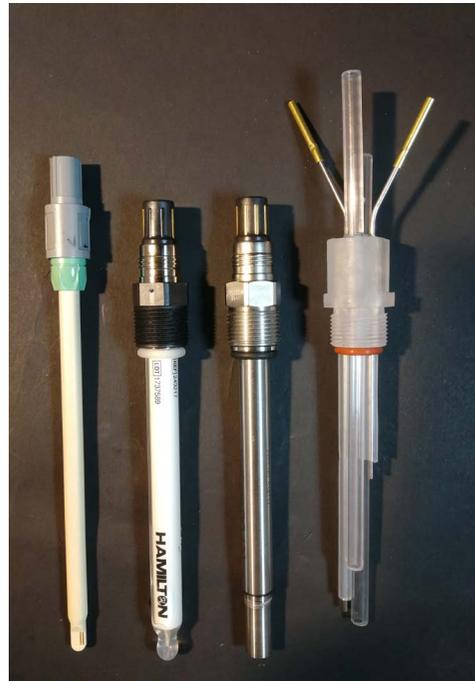
For pH measurements your PCS standard cabling offer either AK9 or AS8 connector. Easy connection to the pre-installed **pH SUS** made from glass or polymer.

Std. **temperature sensor** goes into the non-invasive well.

ConducCell is a high precision **conductivity** and Pt1000 SUS.

The unique **Single-Use-Sensor's** measures DO, pH, bio-mass, level, conductivity, temperature

- Capacitance bio-mass - SUS horizontal mounted
- Customized high quality pH - analogue or digital
- Customized high quality DO - optical or Polarographic, Amperometric
- Customized high quality level - vertical
- Customized high quality conductivity - vertical mounted



Thermal control



Whatever happens – you can run the PR-SUB dry, forget media, thermo couple fall out, PCS breaks down ... this advanced HSF will never destroy the PR-SUB and leak out media or burn your fingers when trying to solve the problem!

The best thermal control for all 3.200 ml size SUB's

Its all Plug & Play!

Heating-Support-Foot (HSF) that fits any of the CellVessel 3.200 ml vessel's. Able to operate with small volumes starting from few hundred ml up to 2.000 ml.

Allow installation of 3.200 ml Vessel Volume sizes with horizontal mounted PICO bio-mass Single-Use-Sensor.

Thermal control



Heated CellVessel

- When volume of media is as low as 100 ml in a mini SUB combined thermal control and mechanical support makes sense.
- The Heating-Support-Foot for the 500 ml CellVessel SUB may be mounted on most laboratory stirrer table or CerCell Magnetic-Stirrer-Table.



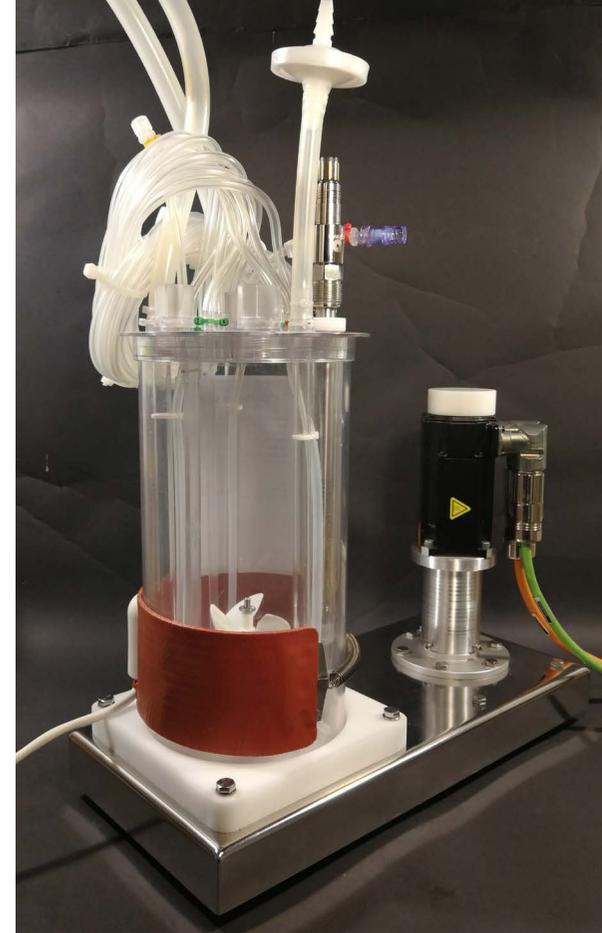
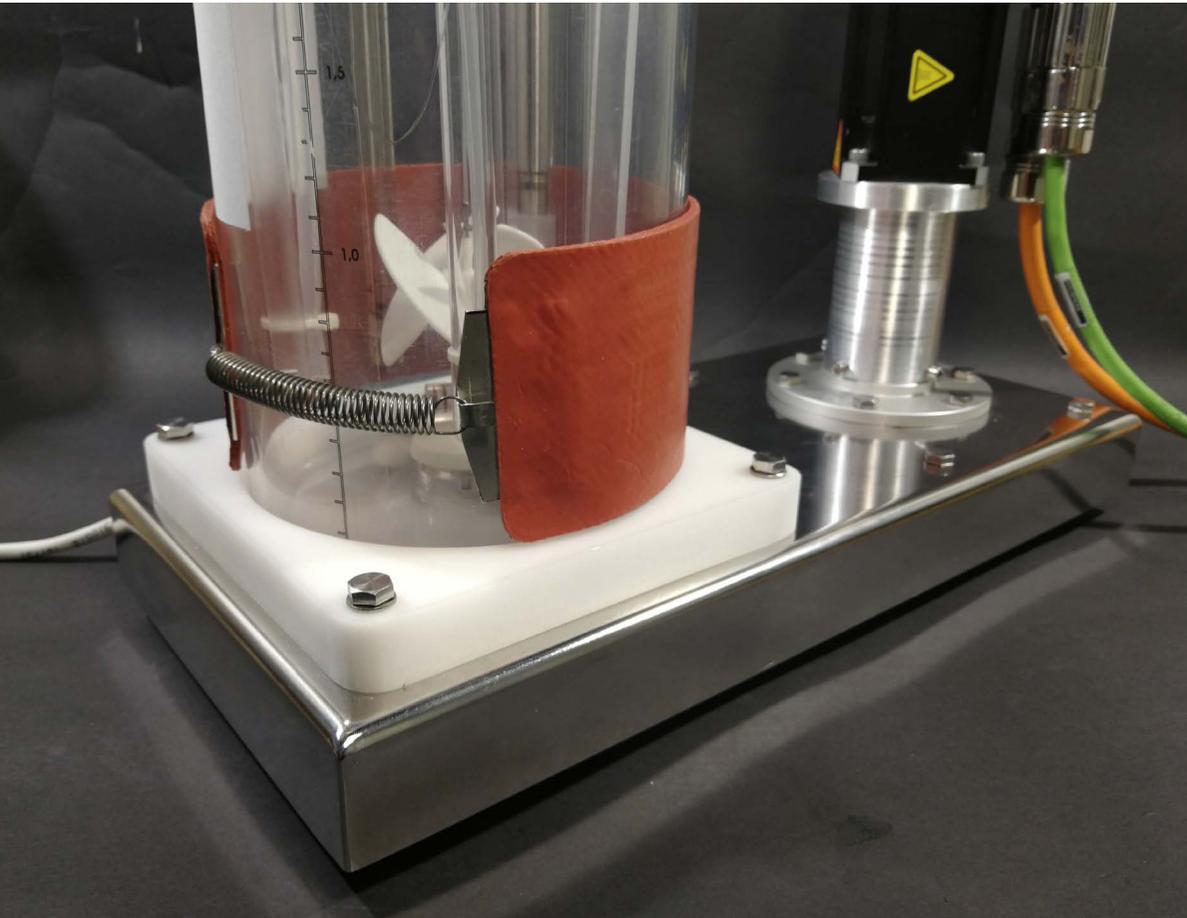
The best thermal control for all 500 ml size SUBs

Its all Plug & Play!

Heating-Support-Foot (HSF) that fits any of the CellVessel 500 ml vessel's. Able to operate with small volumes starting from hundred ml up to 300 ml.

HSF-E integrate a thermal protection which cut of at 55°C and connect again at 35°C. Thermal protection is NOT for cultivation purposes – only for your personal protection!

Thermal control



Heated CellVessel

- Electrical-Heating-Blanket (EHB) surrounding the 3.200 ml CellVessel
- Shown smallest EHB cover 1.000 ml volume and impeller and SUS on 3.200 ml SUB
- EHB covers all sizes up to 30 liter SUB

Thermal control



Heated CellVessel

- Re-Usable-Jacket (RUJ) for CellVessel SUBs offer easy use with liquid controlled Process-Control-System.
- The RUJ-MST is designed for integration with Magnetic-Stirrer-Table (MST)
- Available in several sizes covering 2,1 liter up to 5,7 liter SUB

Thermal control

Heated CellVessel

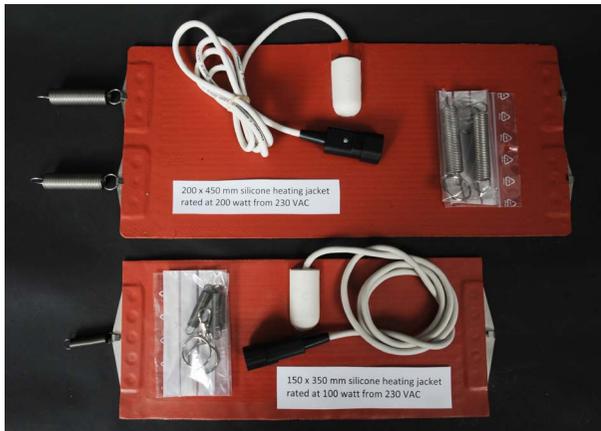
Some Process-Control-System (PCS) facilitate thermal control by recirculating liquids.

The optional integrated Single-Use-Jacket (SUJ) heat exchanger is an efficient option.

- Single-Use-Jacket (SUJ) for CellVessel SUBs offer easy use with liquid controlled Process-Control-System.
- The SUB-SUJ also for use with Magnetic-Stirrer-Table (MST)
- Available in several sizes from 2,1 liter up to 30 liter SUB
- Example here show is the 3,2 liter SUB



Accessories for CellVessel



Customized



**Thank
you for
your
attention**



www.cercell.com