



vision

without

limits

Single Use  
Bio-Reactors

# CANTY

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## PROCESS TECHNOLOGY

BUFFALO

DUBLIN

THAILAND

## How It Works

The CANTY S.U.BioCam™ is a process camera engineered and designed for foam measurement to automate the control. The S.U.BioCam™ combines the latest in LED lighting with Ethernet camera technology in a streamlined package. The camera utilizes a strobe LED light that has been optimized to run efficiently as to not obstruct photosensitive processes. Coupled with CantyVision™ software, the S.U.BioCam™ can be used for full control via OPC or 4-20mA. This system is perfect for controlling foam in a single use

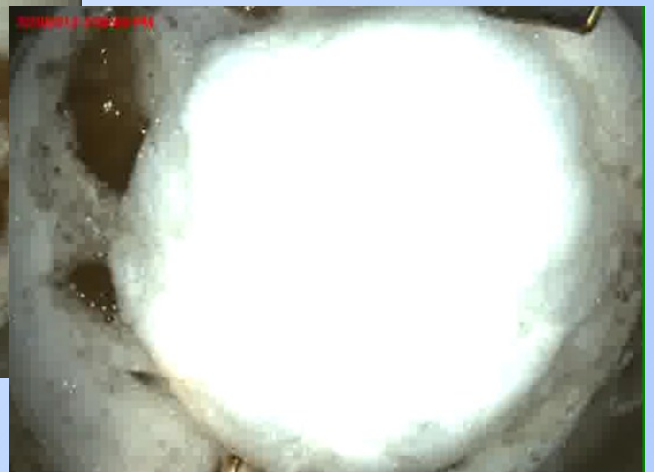
## Features

- LED Light Source - Maintenance Free
- Integrated Camera & Light
- Sanitary Lightweight Nickel Plated Aluminum Housing
- Available in 24V DC, 120V AC, 240V AC
- Strobe Light Allows For Optimized Illumination Without Interfering With Photosensitive Processes
- Includes CantyVision™ Software Standard For Analytics And Feedback
- Outputs - OPC, Modbus, Profibus or 4-20mA to a DCS or PLC
- Stainless steel reactor models are also available
- Optional antifoam metering pump for control



## Why It's Important

**The CANTY BioCam™ is uniquely qualified to view inside your fermentors and bioreactors and provides a continual control signal allowing the user to meter in antifoam. The image processor that determines the percentage of foam on the surface of the liquid. The foam control function allows for significant savings of antifoam, improves process performance in cell culture growth and eliminates the need for additional antifoam fluids in purification.**



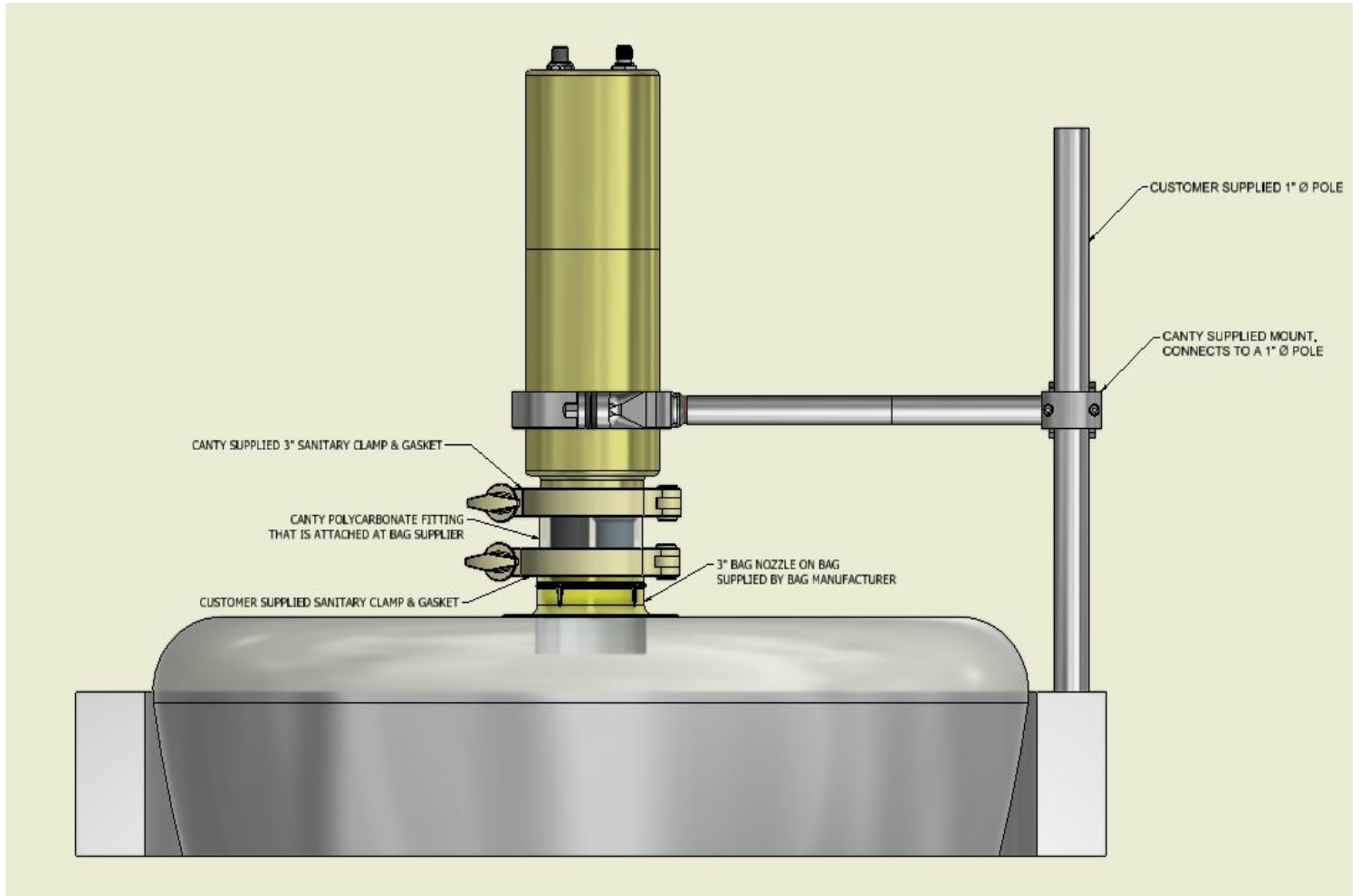
## Sanitary Design

All models feature nickel plated aluminum construction and are NEMA 4x Weatherproof rated. The S.U.BioCam™ features a strobe LED light source and high speed Ethernet camera mounted on a pole supported externally from the single use bag. The design includes a bracket with a ball and socket for ease of mounting on a single use bag.

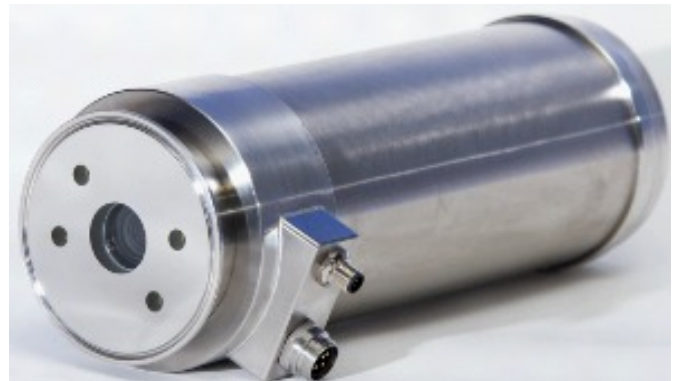


# 3" Mounting Detail:

*Ideal Mounting location is in the center of the bag*



- Light-weight, Nickel Plated Aluminum Camera & Light on one 3" Tri-Clamp Nozzle
- 1 Single Use Fittings
- Heaters inside light and camera combo to keep Single Use Fitting condensation free
- Rotational mount to allow for accommodation with bag

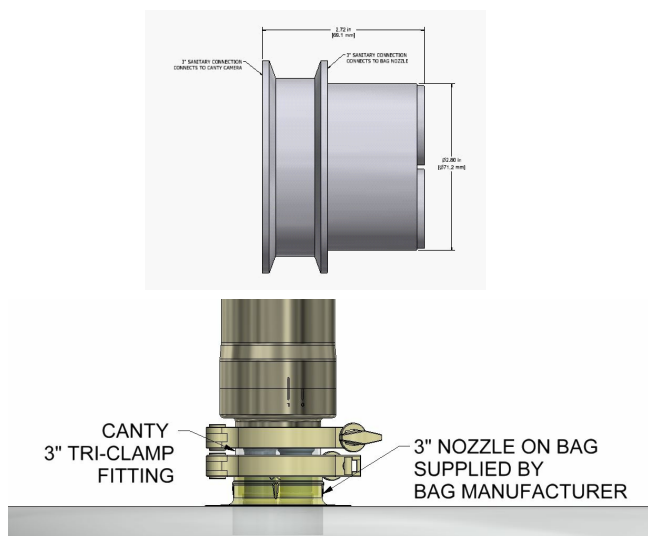


For more information on S.U. Biocam, please see datasheet TA11500-1046

For more information on Multi-Use Biocam, please see datasheet TA11500-1033

# SINGLE USE - FITTINGS INFORMATION

## 3" SINGLE USE SANITARY FITTINGS FOR CANTY S.U.BIOCAM (one fitting required per system)



### How to Order from Bag Manufacturer:

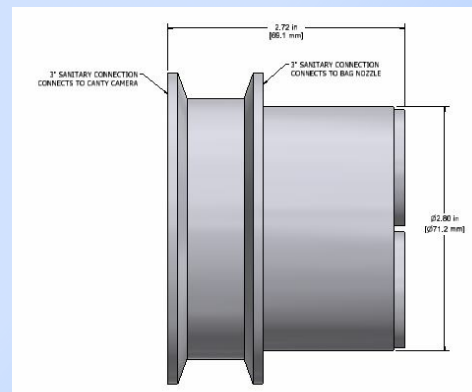
- Thermo Fisher: Part number SL20012.02 "CANTY 3 fitting"
- Cytivia: Request "the CANTY fitting" from your Cytiva sales representative
- Consult CANTY with questions

## SINGLE USE - TECHNICAL

SINGLE USE BAG OPTIONS	
<b>Pre-Assembled</b>	Use the CANTY system with pre-made bags from Thermo-Fisher® or GE®
<b>Assembly Required</b>	Buy material from CANTY but assemble under hood

### S.U.BIOCAM™ Single Use Fitting:

- Protects Camera & Light from Process
- Disposable
- 3" Tri-Clamps
  - Bag attachment
  - Camera/ Light attachment
- Single Use Fitting Material Options:
  - Generic Polycarbonate
  - Makrolon 2458®



# SINGLE-USE LABCAM



## IDEAL FOR FOAM & LEVEL CONTROL



### Features:

Uniquely qualified to view inside your glass lab fermenters and bioreactors and provides a continual control signal allowing the user to meter in antifoam.

The foam control function allows for significant savings of antifoam, improves process performance in cell culture growth and eliminates the need for additional antifoam fluids in purification.



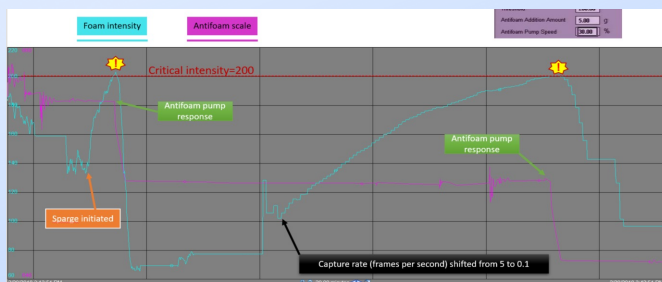
# VECTOR CONTROL MODULE

## VCM & CantyVision™ Software

The Vector Control Module (VCM) is a small solid state embedded processor that has CANTYVISION™ software pre-installed. It is designed to keep project costs low and to also eliminate the need for a computer. Since the VCM has analog outputs, there is no need for an additional analog output module purchase\*. The operator screen makes it simple for operators to see what is going on real time with visual verification. The VCM has OPC or 4-20mA outputs to a PLC or DCS for complete control. The VCM comes with the ability to have full administration controlled passwords and permissions. Customers will need to provide a monitor or use an existing one. Each VCM comes with a wireless access point to allow connection to a LAN either wirelessly or wired by the Ethernet access port.

### Features

- VCM - Vector Control Module
- 6 x Gigabyte Ethernet BioCam™ inputs
- 8 x 4-20 ma outputs
- OPC interface
- Modbus interface



For More Information, please see brochure TA12100-1012



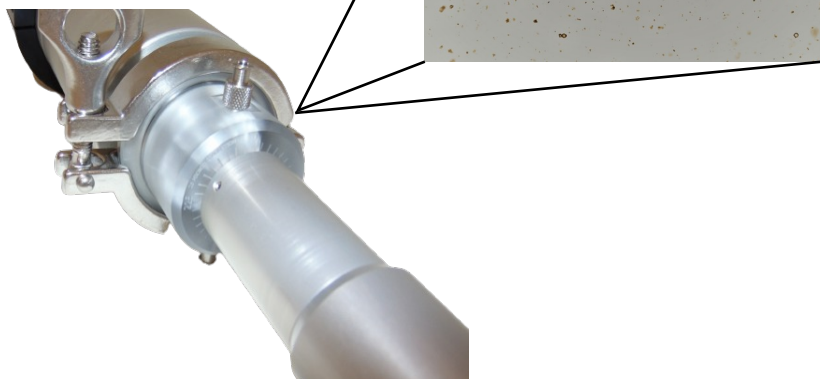
# S.U. PARTICLE ANALYSIS

## How Particle Analysis Works

The Canty MiniCell has been engineered to analyze small volume samples for particle size, shape and concentration. It offers microscopic, non-destructive viewing and provides particle size analysis with two dimensional results when used in conjunction with the CantyVision™ Software. The system operates by passing the particles between a camera fitted with micro or macroscopic optics, and high intensity LED lighting system. This allows for high resolution image capture of the particles. The powerful image analysis software uses a thresholding algorithm to identify the individual particles, and then measures each under 30+ different size & shape parameters. Sizing down to 0.7 micron is possible with the high magnification optics and high intensity light source. The Single Use Minicell uses a plastic Flow-Cell, which enables it to be used and replaced as necessary.

## APPLICATIONS

- Cell diameter, radius, area, and volume
- Particle Counting in WFI
- Turbidity Measurement
- Oil in Water/Water in Oil
- Crystallisation Analysis

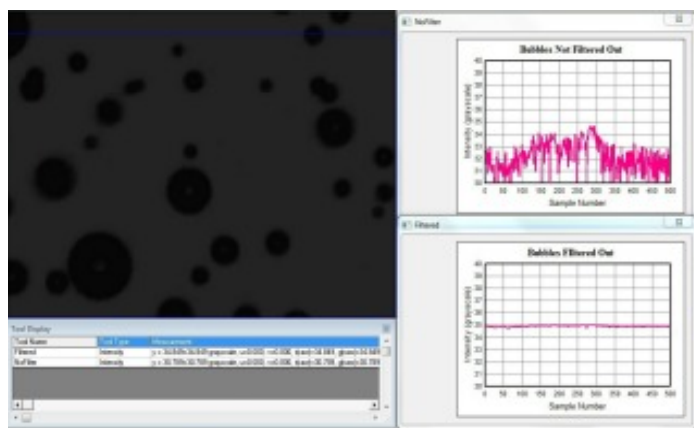


## FEATURES:

- Cell Size, Shape and Distribution with Real
- Time Analysis
- Fused Glass Pressure Barrier Standard
- Quick release Tri-Clamp™ body connections for easy cleaning
- Gigabit Ethernet High-Speed Imaging Device
- Small sample size analysis down to 5mL
- Easily converts from lab to on-line

## TURBIDITY

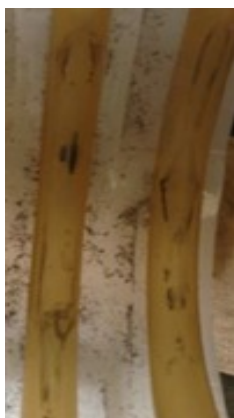
Turbidity analysis using a high resolution CCD/CMOS image sensor that detects turbidity changes in fluids by measuring the transmittance of light. Using advanced software algorithms the system automatically removes gas bubbles from the analysis resulting in highly accurate and repeatable data outputs. This system is designed for inline use with varying pressures, temperatures, and pipe diameters.



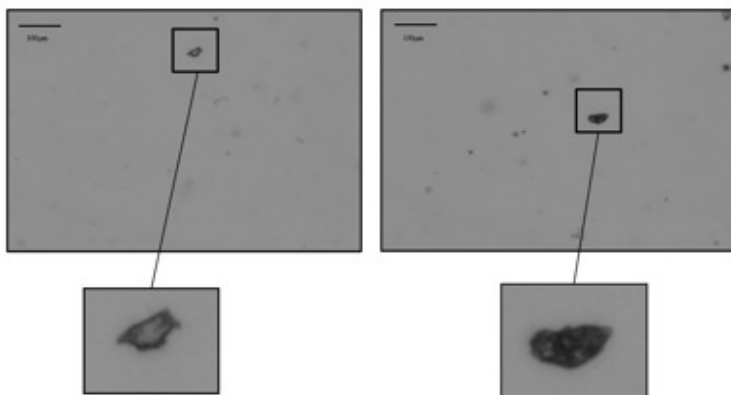
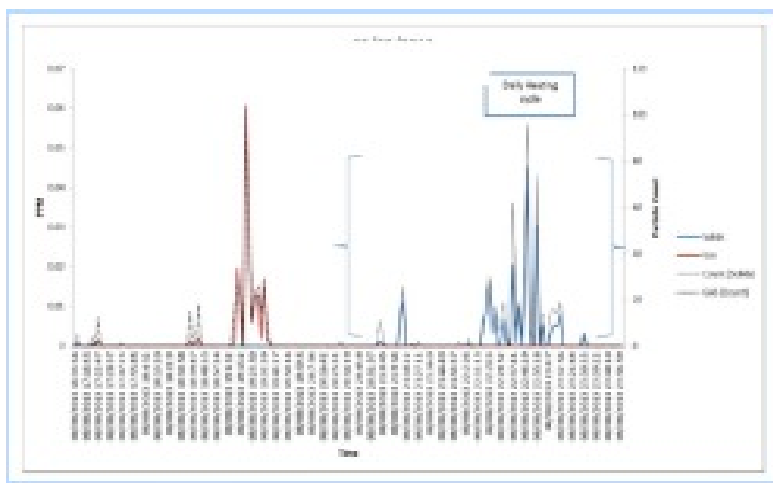
# WATER FOR INJECTION (WFI)

Water for injection is water of extra high quality without significant contamination. CANTY can output the particle concentration continuously so that if an upset does occur the operators are aware of it and take samples to the lab for further testing. What's more, CANTY's unique vision based system allows for differentiation between particles and gas bubbles. Visual verification is provided and 4-20mA signals or OPC can be used to alarm to an upset condition.

## External Tube Spallation - Internal tube spallation needs to be measured



## Internal Tube Spallation Data



## APPLICATIONS

- Crystallization research
- Protein analysis
- Tube Spallation
- Fermentation
- Precipitation
- Cell growth and count
- Amorphous dissolution
- Dissolving and solubility of solids
- Sub-Visible Particles
- Bag inspection

## SUB-VISIBLE PARTICLES

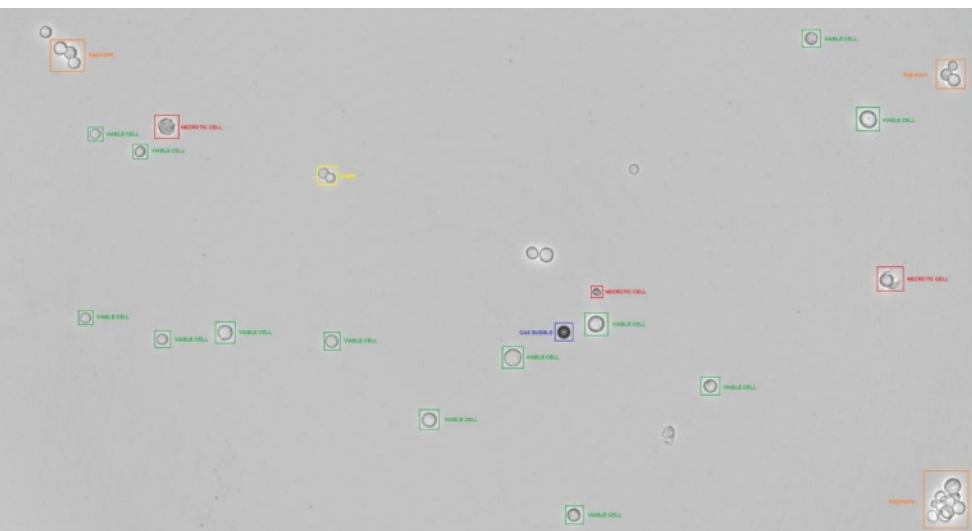
The FDA has put a recent focus on measuring and quantifying SVP to look for particles in product and process streams. The CANTY system is an invaluable tool in the lab and in-line. The LED light source with the Ethernet gigabit camera and the imaging-based software can analyze both size and shape as well as count and concentration of particles. Both continuous and lab options are available.

## USP788 and USP1788

Measurement Range from 0.7 to 400 microns, in line with USP788 and USP1788. A WFI preparation complies if the average number of particles equal to or greater than 10 and 25  $\mu\text{m}$  falls within the below counts per ml.

Size	Maximum Count per ml
$\geq 10 \mu\text{m}$	25
$\geq 25 \mu\text{m}$	3

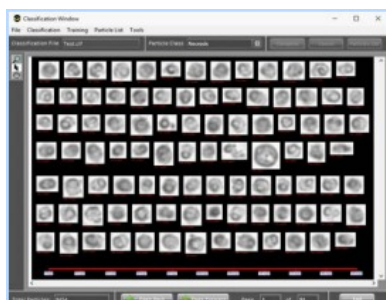
# CELL COUNTING



Canty Systems are uniquely designed to allow for the analysis of minimal sample volumes without the need for additive reagents. The system facilitates detailed concentration, viability, size and morphology outputs with no need for process additives. The CantyVision Intelligent Analysis software suite uses integrated machine learning to distinguish between multiple cell morphologies during real time analysis. This determination facilitates detailed process analytics on multiple cell cycle stages including mitosis, apoptosis and necrosis.



**Viable cells**



**Necrotic Cells**

## ADVANTAGES

- Label-Free
- Cell Count, Viability & Morphology
- Superior Data to Trypan Blue
- Visual Monitoring
- No Staining Reagents
- Real-Time Viability
- Autosampling
- Built in LED

## CANTY ADVANTAGE

- Real time measurement, particle size & shape/characterization.
- Visual verification and the ability to timestamp recorded video.
- Lab-friendly design with linear rail stand to allow for ease of cleaning during sample change out.
- Image based microscopy / Two dimensional.
- Multiple flow configurations (on-line, at-line, syringe pump, peristaltic pump).
- Available Tri-Clamp™ connections allow for optimal sanitary conditions, CIP or SIP.
- Auto dilution with peristaltic pump or syringe pump done through the software.

