

CELL-tainer® single-use bioreactor for microbial culture CM2SMEU / CM2SMUS

The CELL-tainer® bioreactor system provides accurate, low shear mixing and high mass transfer rates. Mixing is essential to create and maintain homogenous circumstances in the bioreactor. The single-use bioreactor bag is positioned in the tray and placed on the rocking platform creating a two-dimensional movement (including a wave like motion) in the culture medium. The rocker angle and frequency can be adjusted to increase or decrease the mixing time and the oxygen transfer rate.

The CELL-tainer® control system has three password protected access levels. The access to the local human interface can be blocked by the supervisory software allowing the system to be used in compliance with 21 CFR part 11.

The robust design and heavy-duty motor guarantees years of trouble-free operation at low noise levels.

System specifications – CM2SCEU / CM2SCUS	
Dimensions unit	W x H x D = 1400 x 530 x 880 mm (approx.)
Dimensions platform	W x H x D = 660 x 100 x 510 Removable tray (bag holder)
Light protection	Closed cabinet with frontloading (drawer). The front door is provided with a window which is UV protective and lux reducing. The interior of the cabinet can be made visible by switching (pushbutton) a non-UV LED light.
Movement profile	2D movement according EP 1739165A1: horizontal displacement combined with vertical displacement. Tilt is manually adjustable. Tilt angle: 5° – 17°; resolution 1.7°; accuracy 1.7°
Rotational speed	5- 30 rpm; resolution 1 rpm; accuracy 0.5 rpm
Temperature control	Sensor on platform, directly under the bag; accuracy ± 0.2°C Sensor in incubator room; accuracy ± 0.3°C Control range: 20 - 40°C (ambient: 15 - 25°C) Resolution: 0.5 °C

Cooling capacity	Additional cooling by a heat exchanger directly placed underneath the bag and to be connected to an external chiller device. Control of chilled water by solenoid valves. Cooling capacity > 400W at a $\Delta T > 25\text{ }^{\circ}\text{C}$
Heating capacity	2 x heating ventilator (230 W each)
DO measurement	Polarographic DO sensor mounted in the bottom of the bag.
	5 – 150 % air saturation (+/- 5% air saturation) Air flow control by direct reading flowmeter 16 L _n /min
DO control (PID)	Direct reading flowmeter / solenoid valve combination: 0 – 15 L _n /min O ₂ ; 0 – 12 L _n /min N ₂ DO control by mass flow controllers on request.
pH measurement	Electrochemical pH sensor fixed mounted in the bottom of the bag.
	pH = 2.00 – 10.00 (+/- 0.03 unit)
pH control (PID)	Alkaline: peristaltic pump Watson Marlow 313, 24VDC, 45 rpm. Pumphead 313: applicable with 1.6mm wall tubing. Complete with adjustable tube clamps for 0.5 mm to 8.0 mm ID tubing
	Acid: peristaltic pump Watson Marlow 313, 24VDC, 45 rpm. Pumphead 313: applicable with 1.6mm wall tubing. Complete with adjustable tube clamps for 0.5 mm to 8.0 mm ID tubing
Air supply	3 barg
Additional gasses (CO ₂ , O ₂ , N ₂)	3 barg Gasses internally reduced to 0.15 - 0.2 barg max
Maximum bag pressure (operating)	0.2 barg
Exhaust gas	Easy-Load filter heater for exhaust gas filter. Range: 5-50 °C; setpoint 10 °C above ambient; safety shut-off at 50 °C

Process monitoring and control	Single Board Computer & Display unit SBC CPU ARM9 300MHz 32MB Flash / 32MB RAM 3 x RS232 Serial interfaces 1 x Ethernet UTP interface 1 x SD-card slot Optional CAN 2.0 interface (DeviceNet) Embedded Linux OS
Process monitoring and control	DISPLAY 5.7 inch color CSTN graphical LCD 320x 240 pixels 4-wire touchscreen
	I/O Module MCU MCU Microchip PIC24FJ256GB106 (32MHz) MCU Microchip PIC24FJ256GB106 (32MHz) 256KB Flash / 16KB RAM 1 x RS232 Serial interface 4 x 1-Wire interface for DS18S20 (temperature sensor) 12 x Optical isolated digital inputs 18 x Relais outputs 4 x Analog inputs
Data storage and operation	<ul style="list-style-type: none"> - Measuring rpm, T, DO, pH up to 1/s (adjustable sampling time) - Data storage / batch - Alarm logs: door open, change set-points, not reaching set-point - Dose monitoring: show total sec/ml or percent in the Process View screen - Manual operation of valves and pumps - Manual position of tray (jog, sample, drain)
Data export	Ethernet UTP interface (xml.file) to be approached from web browser (via USB)
Safety	Emergency Stop Door opening / safety switch (stop) on all functions
Protection	CE / IP54
Mains	CM2SMEU: 230 Vac / 50 Hz – CM2SMUS: 115 Vac / 60 Hz

	to be specified with order
Cable cord & plug	To be specified with order
Manuals	Operation & Installation

Articles / accesories:

CM2MSEU	CELL-tainer 20L	microbial culture	230Vac / 50Hz	incl. skid
CM2MSUS	CELL-tainer 20L	microbial culture	120Vac / 60Hz	incl. skid
CMDOSEN	DO sensor (1 to be delivered together with CELL-tainer)			
CMDOELC	Electrolyte (bottle, 30 mL) for DO electrode			

Bags:

CB2DM20 Microbial bag – pillow shaped

- Disposable pH sensor (bottom mounted)
- Disposable DO membrane (bottom mounted)
- USP VI film material / Animal component free
- Pre-sterilized (Gamma – 25 – 40 KGy)
- 1x sample through sample septum
- 1x drain with Luer lock
- 3x addition tube with Luer lock (C-flex tubing)
- Gas inlet with filter (Zempure capsule filter)
- Gas outlet with filter(Zempure capsule filter)

