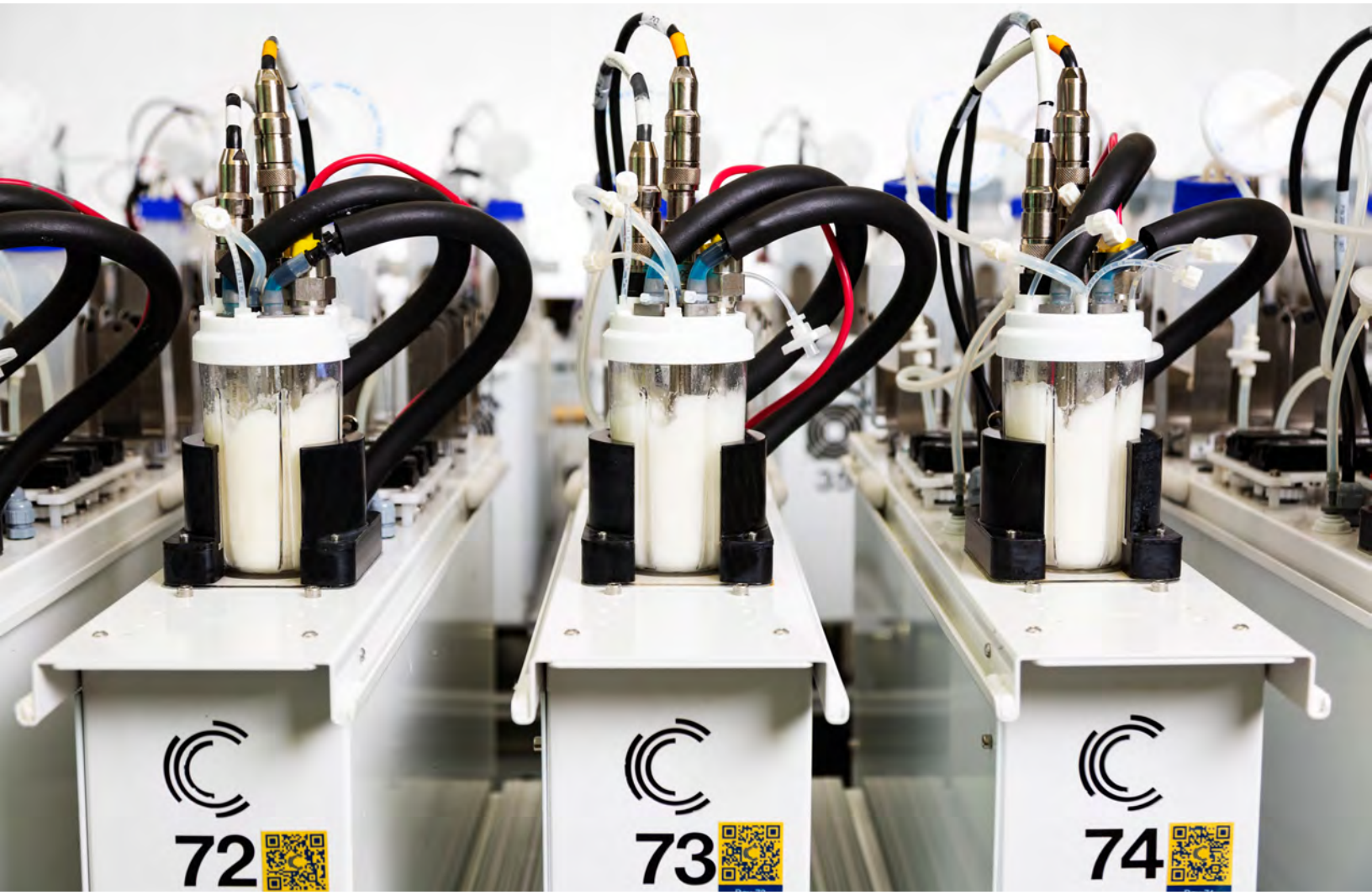
culture
BIOSCIENCES

Technical Specifications



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OPERATING PARAMETERS

OPERATING PARAMETERS		MICROBIAL CULTURE	MAMMALIAN CULTURE
Agitation speed		0 - 4000 rpm	0 - 3200 rpm Typical: 400 rpm
Temperature range		4 - 60 °C	
Temperature shift rate		0.5 °C / min (at 37 °C)	
pH monitor type		Reusable glass electrolyte probe	
pH range		0-14 pH	
pH accuracy		0.02 pH	
DO monitor type		Reusable fluorescence probe	
DO monitoring range		4 ppb to 25 ppm (0 - 300 %-sat) (0 - 62.85 %-vol)	
DO accuracy		1 ± 0.05 %-vol : 21 ± 0.2 %-vol : 50 ± 0.5 %-vol	
DO control range		5 - 95 %	
Sparge	**air**	0 - 1000 sccm ± 5 sccm	0 - 100 sccm ± 0.5 sccm
	O_2	0-100 sccm ± 0.5 sccm	0 - 100 sccm ± 0.5 sccm
	CO_2	N/A	0 - 100 sccm. ± 0.5 sccm
Overlay	**air or N_2**	N/A	0 - 100 sccm. ± 0.5 sccm
Exhaust gas O_2		0 - 25% ± 0.5%	
Exhaust gas CO_2		0 - 20% ± 5% relative	
Pump style		Peristaltic (5 independent pumps)	
Pump flow rates		0.01 mL/min - 30 mL/min	
Scale Feedback		All 5 pumps	

VESSEL PARAMETERS

VESSEL PARAMETERS		MICROBIAL CULTURE	MAMMALIAN CULTURE
Wetted materials	**vessel**	USP Class VI Polycarbonate	
	headplate	Polypropylene	
	agitator	Polypropylene, 316SS	
Vessel dimensions	**diameter**	70 mm	
	height	120 mm	
Total volume		400 mL	
Working volume		80 - 250 mL	
Sparger type		open pipe	
Impeller type		Rushton turbine - 2 x 24 mm	Pitched blade - 2 x 24 mm
Impeller spacing		38.5 mm	31.5 mm
Submerged volume (1st/2nd impeller)		60 mL / 176 mL	35 mL / 127 mL
Distance between Impellers		39 mm	45 mm
Impeller power number		8.0	3.14
Peak k_La (water + air)		450/hr	165/hr
Max OUR		> 500 mmol/Lhr	-
Max power input		62 kW/M3	12 kW/M3
Max Reynolds number		5.8 x 10e4	4.7 x 10e4
Tip speed		5.03 m/s (at 4000rpm)	0.5 m/s (at typical constant 400rpm)
Mixing time		< 10 s	-

ANALYTICAL CAPABILITIES

DEVICE	MEASUREMENT	RANGE	UNITS
Cedex BioHT	Acetate	.01 - 230	g / L
	Ala-Gln	21 - max solubility	mg / L
	Ammonia	4.73 - 23600	mg / L
	Calcium	0.008 - 2000	mg / L
	Cholesterol	3.87 - 80000	mg / L
	Ethanol	0.5 - 202	g / L
	Formate	9 - 90000	mg / L
	Galactose	0.01 - max solubility	g /L
	Glucose	0.02 - max solubility	g / L
	Glutamate	0.015 - 150	g / L
	Glutamine	0.015 - max solubility	g / L
	Glycerol	9.21 - 9210	mg / L
	IgG (Human)	0.01 - 1.6	g / L
	IgG (Mouse)	0.01 - 1.5	g / L
	Iron	0.05 - 1000	mg / L
	LDH	20 - 100000	U / L
	Lactate	0.004 - 140	g / L
	Magnesium	3.65 - 608	mg / L
	Optical density (OD)	0.1 - 360	OD
	Phosphate	9.5 - 79,500	mg / L
	Pyruvate	8.7 - 69,600	mg / L
	Sucrose	0.1 - max solubility	g / L
	Total Protein	2 - max solubility	g / L

ANALYTICAL CAPABILITIES

DEVICE	MEASUREMENT	RANGE	UNITS
Manual	Wet cell weight (WCW)	-	g/kg , g/L
Advanced Instruments 2020	Osmolality	0 - 2000	mOsm / kg H_2O
Nova Flex2	pH	5.000 - 8.000	pH
	PO_2	3.0 - 500.0	mmHg
	PCO_2	3.0 - 300.0	mmHg
	Gln	0.10 - 12.0	mmol / L
	Glu	0.10 - 12.0	mmol / L
	Gluc	0.10 - 30.0	g /L
	Lac	0.10 - 12.0	g / L
	NH4+	0.2 - 25.0	mmol / L
	Na+	40 - 300	mmol / L
	K+	1.0 - 100.0	mmol / L
	Ca++	0.10 - 10.0	mmol / L
	Osm	0 - 2000	mOsm / kg
ViCell BLU	Total ($x10^6$) cells/mL	0.05 - 15	($x10^6$) cells / mL
	Viable ($x10^6$) cells/mL	0.05 - 15	($x10^6$) cells / mL
	Viability (%)	0 to 100%	percent
	Average diameter (µm)	2 - 60	µm
	Average viable diameter (µm)	2 - 60	µm
	Average circularity	0 - 1.00	unitless
	Average viable circularity	0 - 1.00	unitless

ANALYTICAL CAPABILITIES

DEVICE	MEASUREMENT	RANGE	UNITS
YSI 2900D	Methanol	0.1-2.5	g / L
Agilent 1290 Infinity II UPLC **Agilent 1260 Inifinity II Diode Array Detector** **Multicolumn thermostat and tray chiller**	Transfer your custom HPLC or plate reader assays to our site – contact us for more details.		
Cytation 5 - Cell Imaging Multi-Mode Reader			