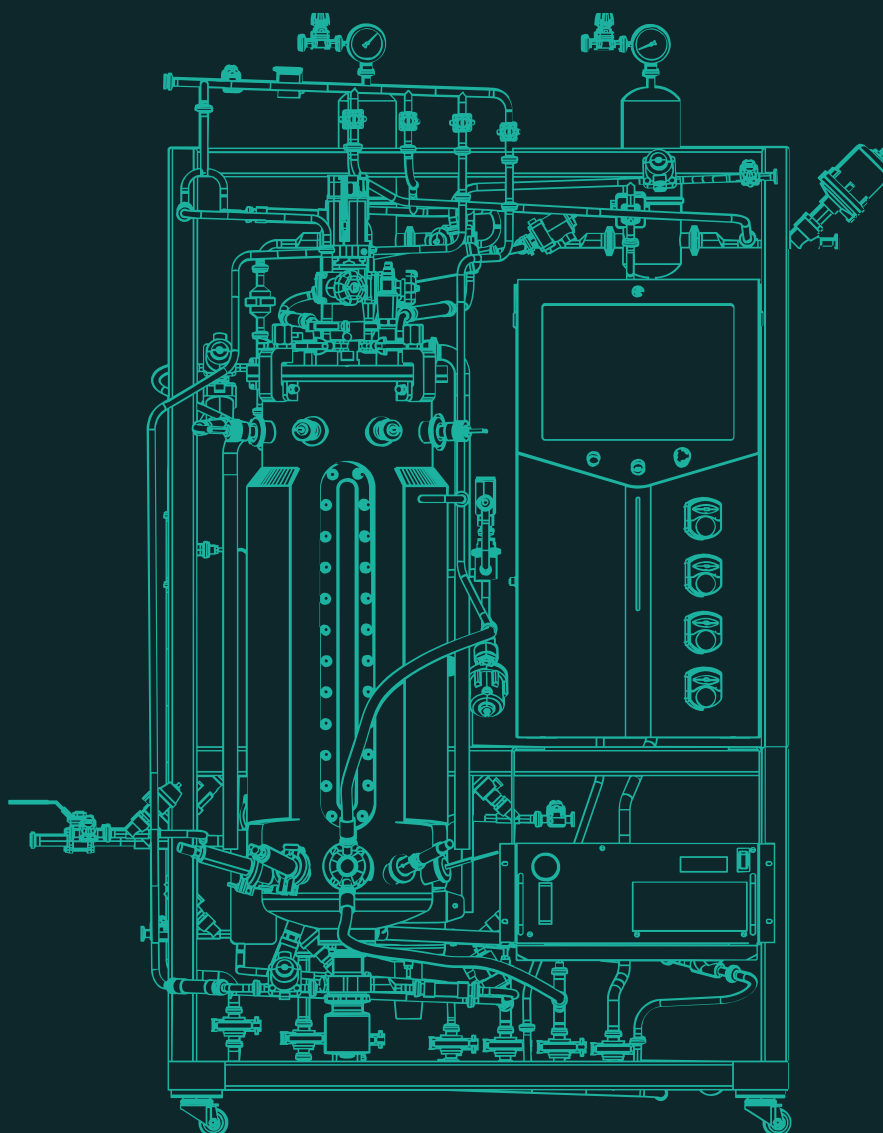


ePilot® bioreactor

Maximize research and
production results with ePILOT®

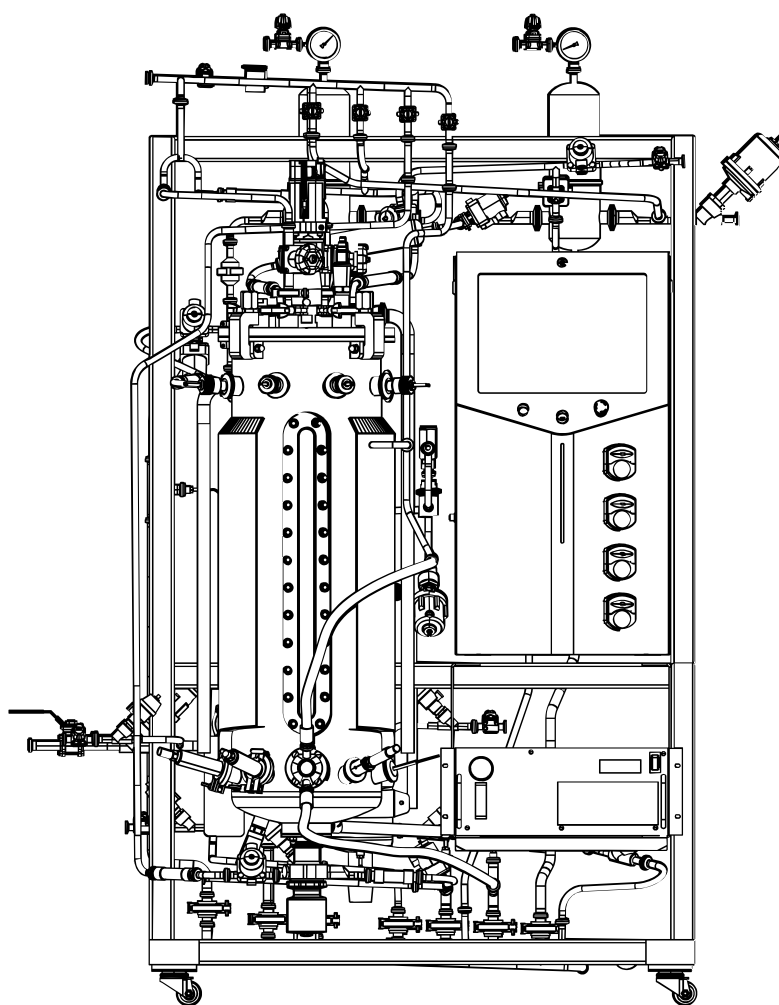


ePILOT® Bioreactor

The ePILOT® Bioreactor is a high-performance bioreactor designed to take microbial fermentation and cell culture to the next level. With replaceable vessels and working volumes of 10, 20, 30, and 50L, our bioreactors offer maximum efficiency and flexibility. The system is equipped with digital sensors for pH, pO₂, temperature, and foam/level, providing real-time monitoring and control of the process.

The Control Unit of the ePILOT® Bioreactor, manufactured by TECNIC, features a 15" touch screen, gas supply systems, and peristaltic pumps, providing complete control of the fermentation and cell culture process.

Whether you need a bioreactor for research, development, or production, the ePILOT® Bioreactor can be tailored to meet your requirements. The ePILOT® Bioreactor offers maximum efficiency and flexibility.



Basic configuration - Microbial

Control configuration	
Temperature control	Included
DO control (simple cascade controller)	Included
Stirrer speed control	Included
pH control via addition of acid or base	Included
Foam control	Included
Mass flow controller for air addition	Included
Mass flow controller for O ₂ addition	Included
Advanced gas performance (total gas management)	Included
Automatic sequence for bioreactor sterilization	Included
Integrated peristaltic pumps	4x for acid, base, antifoam and media addition
Automatic pressure control	Included
eR&ID eADVANCED	Included Included
TECNIC OPC server	Included
Recipes management (included in eSCADA R&ID and Advanced)	Included
Advanced pH ₂ control with addition pumps / CO ₂	Optional
Advanced pO ₂ control with addition pumps / N ₂	Optional
PAT (Qubicon and Lucullus)	Optional
Reports (included with R&ID and Advanced)	Included
21CFR Part 11 Compliant (included with Advanced)	Optional
User's management (included with R&ID and Advanced)	Included
Heating system	
Process temperature control	Recirculation loop with pump and heat exchanger for cooling and electrical resistance for heating
External SIP version	Included
Piping system with valves and steam traps SIP	Included
Temperature measurement of condensate traps	Included
AUTO SIP version	Optional
Culture vessel	
Jacketed	Included
Sight glass	Included
Servomotor agitation	Included
Stirrer shaft with mechanical seal	Included
3x 6-blade rushton impeller	Included
Inlet gas line with filter housing including 0.2 µm cartridges	Included
Outlet gas line with filter housing including 0.2 µm cartridges	Included
Inlet gas through overlay or sparger	Included
Aeration through ring sparger	Included
Burst disk	Included
4 baffles for mixing performance	Included
Exhaust condenser	Included
Lamp	Included
2x CIP balls	Included
4x aseptic addition valves	Included
Double position sampling valve for sterile sampling	Included
Sterilizable bottom valve for harvesting/transferring	Included
pH sensor with cable	Included
DO sensor with cable	Included

Foam sensor with cable	Included
Temperature sensor Pt100	Included
Pressure sensor	Included
Weight measurement, load cell	Included
Off-gass analysis	Optional
Double wall jacketed	Optional
External CIP unit (more info in ePLUS® CIP datasheet)	Optional
Biomass sensor (optical or capacitance)	Optional
ORP sensor	Optional
External pump for additional feeding	Optional
N ₂ MFC	Optional
CO ₂ MFC	Optional
Harvest port for continuous operation	Optional
Sanitary safety valve	Optional
Aseptic sampling device	Optional
External balance	Optional
PAT-BOX	Optional
Certificate 3.1	Optional

Basic configuration - Cellular

Control configuration	
Temperature control	Included
DO control (simple cascade controller)	Included
Stirrer speed control	Included
pH control via addition of acid or base	Included
Foam control	Included
Mass flow controller for Air addition	Included
Mass flow controller for O ₂ addition	Included
Mass flow controller for CO ₂ addition	Included
Mass flow controller for N ₂ addition	Included
Advanced gas performance (total gas management)	Included
Overlay / sparger parallel flow: Air	Included
Automatic sequence for bioreactor sterilization	Included
Integrated peristaltic pumps	4x for acid, base, antifoam and media addition
Automatic pressure control	Included
eR&ID eADVANCED	Included Included
TECNIC OPC server	Included
Recipes management	Included
Advanced pO ₂ control with addition pumps / N ₂	Included
Advanced pH ₂ control with addition pumps / CO ₂	Included
2nd overlay / Sparger simultaneous flow: other gas	Optional (with MFC)
Overlay / Sparger alternate flow: other gas	Optional (with 3-way valves)
PAT	Optional
Reports	Included
21CFR Part 11 Compliant (included with Advanced)	Optional
User's management (included with R&ID and Advanced)	Included

Heating system

Process temperature control	Recirculation loop with pump and heat exchanger for cooling and electrical resistance for heating
External SIP version	Included
Piping system with valves and steam traps SIP	Included
Temperature measurement of condensate traps	Included
AUTO SIP version	Optional

Culture vessel

Jacketed	Included
Sight glass	Included
Servomotor agitation	Included
Stirrer shaft with mechanical seal	Included
2x pitched-blade impeller	Included
Inlet gas line with filter housing including 0.2 µm cartridges	Included
Outlet gas line with filter housing including 0.2 µm cartridges	Included
Overlay gas line with filter housing including 0.2 µm cartridges	Included
Aeration through ring sparger	Included
MFC for overlay air	Included
Burst disk	Included
Exhaust condenser	Included
Lamp	Included
2x CIP balls	Included
4x aseptic addition valves	Included
Double position sampling valve for sterile sampling	Included
Sterilizable bottom valve for harvesting/transferring	Included
pH sensor with cable	Included
DO sensor with cable	Included
Foam sensor with cable	Included
Temperature sensor Pt100	Included
Pressure sensor	Included
Weight measurement, load cell	Included
Double wall jacketed	Optional
Off-gass analysis	Optional
Microsparger	Optional
External CIP unit (more info in ePLUS® CIP datasheet)	Optional
Biomass sensor (permutivity)	Optional
DCO ₂ sensor	Optional
MFC for overlay gas (other than air)	Optional
3-way valves for overlay gases (other than air)	Optional
External pump for additional feeding	Optional
Harvest port for continuous / perfusion operation	Optional
Perfusion TFF based system (more info in eLAB® TFF datasheet)	Optional
Sanitary safety valve	Optional
Aseptic sampling device	Optional (SU solutions)
External balance	Optional

Technical specifications

Dimensions information	10L	20L	30L	50L
Dimensions (WxHxD) (m)	1.2 x 2.02 x 0.91			
Required door dimensions (m)	0.91 x 2.02 - full assembly 0.80 x 1.8 - sensor disassembly			
System weight (approx) (kg) microbial cellular	300 290	325 300	350 310	400 325

Utility requirements

Requirements	Condition	10L	20L	30L	50L
Process air	Max 2.5 barg, class 2 (ISO 8573)				
O ₂	Max 2.5 barg, prefiltered				
CO ₂	Max 2.5 barg, prefiltered. See flows in dedicated section				
N ₂	Max 2.5 barg, prefiltered				
Utility steam (Kg/h)	3 barg needed	6	12	18	30
Cooling water (°C/L/min)	2.0-4.0 barg	6-10°C 5 l/min	6-10°C 10 l/min	6-10°C 15 l/min	6-10°C 25 l/min
Clean steam (Kg/h)	1.5 barg needed	5	5	5	5
Tap water	3-4 barg				
CIP cleaning	0.5-2.5 barg 2.6 m ³ /h				
Instrument air	6-8 barg, controlled				
Power supply AUTOSIP version	3x phase, 1x neutral, 1x ground 400 VAC / 25 A				
Power supply external SIP version	3x phase, 1x neutral, 1x ground 400 VAC / 16 A				

Control system

Control tower	Integrated PLC controller, gassing system and pumps
Controller type	Industrial PLC
Non-product contact material	Stainless steel AISI 304
Product contact material	Stainless steel AISI 316L
Operation / Interface	Intouch screen / eSCADA
Communication	Ethernet
Interfaces	1x ethernet for local connection 1x WLAN connection 2x USB 2x ethernet for external devices 1x analogue output for external pump 4x modbus connections for process sensors 1x digital input for level/foam sensor 1x RTD connector for temperature sensor
Advanced software	Compatible with Qubicon and Lucullus

Culture vessel information

Features	10L	20L	30L	50L
H:D ratio	Microbial 3:1 / Cellular 2:1			
Total volume	12.5L	25L	37.5L	62.7L
Working volume	10L	20L	30L	50L

Minimum working volume	2L / 3.5L	3.7L / 5L	5L 8L	8L 11L
Process stirrer speed (rpm) MB/CC	0-1700 / 0-300	0-1350 / 0-250	0-1200 / 0-200	0-1000 / 0-180
Process stirrer speed (rpm) MB/CC (during sterilization)	1700 / 1500	1350 / 1200	1200 / 1000	1000 / 850
Process tip speed (m/s) MB / CC	5 1			
Motor type	Servomotor			
Motor power (kW) MB / CC	0.4 / 0.4	0.4 / 0.4	0.75 / 0.4	0.75 / 0.4
Impeller type MB / CC	6-blade rushton turbine / 3-pitched blade			
Number of impellers MB / CC	3 2			
Impeller to culture vessel diameter	0.3			
Lower port connections	4x 1-1/2" Tri-Clamp 1x hygienic connection for sampling			
Bottom	1x thermowell for Pt100 1x hygienic welded ferrule for pressure sensor 1x drain valve			
Upper port connections	1x 2" TC for lighting 1x for burst disk 1x sparger aeration 1x overlay aeration 4x 1-1/2" TC ports for hygienic addition valves 1x sight glass			
Lid ports	2x 1/2" TC for CIP ball entrance 1x 3/4" TC for exhaust 1x 1-1/2" TC for foam sensor 1x 1-1/2" TC for safety valve (optional) 1x 1/2" TC 1x stirrer connection			
Jacketed	1x 3/4" TC supply line 1x 3/4" TC return line			
Vessel design	0 - 3.5 barg @ 130°C			
Jacketed design	0 - 5 barg @ 150°C			
Product contact material	Stainless steel AISI 316L / Borosilicate glass / EPDM (FDA approved)			
Non-product contact material	Stainless steel AISI 304 minimum			
Surface finished (product contact)	Ra < 0.5 µm			

Pumps

Control tower	4 integrated variable speed pumps
Pump head	For 1.6 mm wall thickness tubing. Bore: ID 0.8-4.8 mm
Speed	0.1 - 300 rpm
Flow rate (ml/min)	ID 0.8 mm - 10 ml/min ID 1.6 mm - 56 ml/min ID 2.4 mm - 111 ml/min ID 3.1 mm - 191 ml/min ID 4.8 mm - 366 ml/min

Sensors

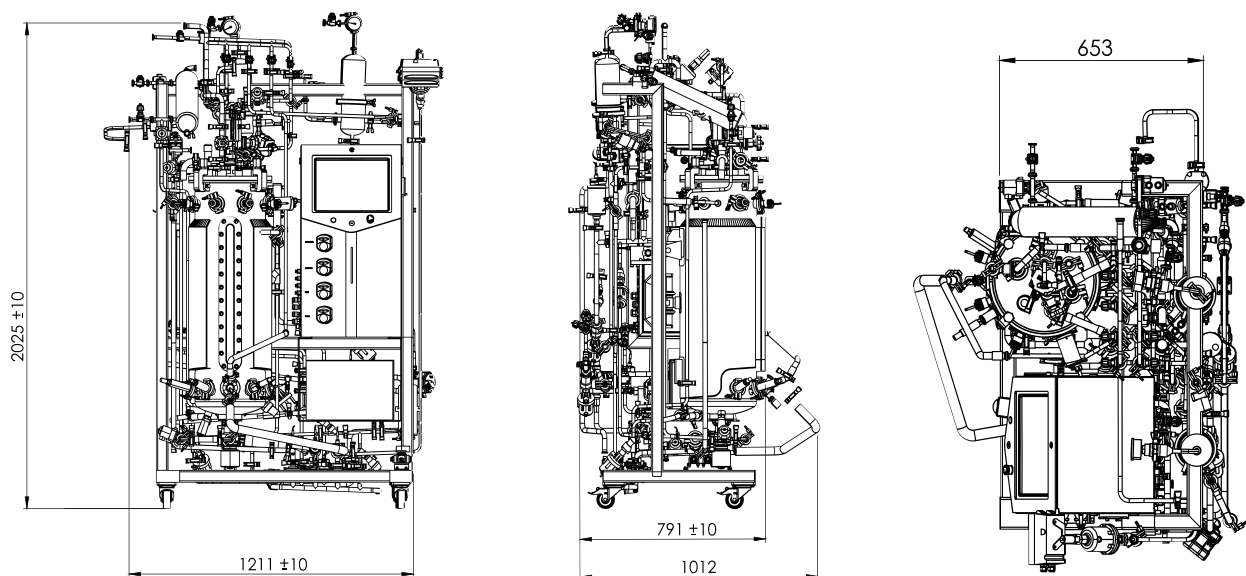
pH	Biocompatible (FDA) electrolyte filled 0 -14 pH
Dissolved O ₂	Optical DO sensor 0-300%-sat
pCO ₂	Solid-state NDIR measurement 0.5-100% vol 0-1000 mbar 7.5-1500 ppm
Total cell density	Abs. 860 nm 0-200 g/l CDW yeast 0-30000 NTU
Viable cell density	Permittivity measurement 0-700 pF/cm equivalent to 5-105 to 8-109 cells/ml (mammalian)

ORP (Redox)	ORP potential measured against reference -1500 mV to +1500 mV
Foam / level sensor	Conductive probe - sensitivity regulation, stainless steel ceramic isolated
Temperature sensors	Pt100 0-150°C
Pressure sensor	Ceramic measurement cell -1; 5 barg
Off-gas analyzer	Microbial: O ₂ 0.1-25% CO ₂ 0-25% Cellular: O ₂ 0-100% CO ₂ 0-25% Accuracy < +/-0.2% FS* +/- 3% value
External balance	Weight range: 0-60 Kg Accuracy: 0.1 g

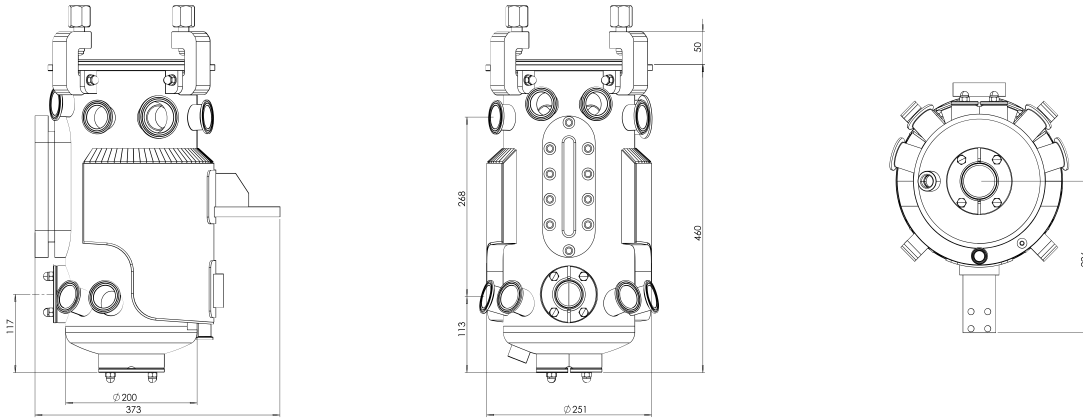
Gas system - Culture vessel

Features	10L	20L	30L	50L
Number of MFCs	Up to 4 different gases			
Air aeration (NL/min) microbial / cellular	0-20 / 0-10	0-40 / 0-20	0-60 / 0-30	0-80 / 0-50
O ₂ addition (NL/min) microbial / cellular	0-20 / 0-5	0-40 / 0-10	0-60 / 0-15	0-80 / 0-25
N ₂ addition (NL/min) microbial / cellular	0-10 / 0-5	0-20 / 0-10	0-30 / 0-15	0-50 / 0-25
CO ₂ addition (NL/min) microbial / cellular	0-5 / 0-5	0-10 / 0-10	0-15 / 0-15	0-25 / 0-25
Mass flow controller	Factory calibration with air and corrected for each gass			
Flow range	From 0 NL/min up to 20-80 NL/min			
Accuracy	+/- (4% MV +1.25% FS)			
Maximum operating presure	2.5 barg			
Gas inlet / outlet	Sterile gas filtration with filter cartridges (0.2 µm)			

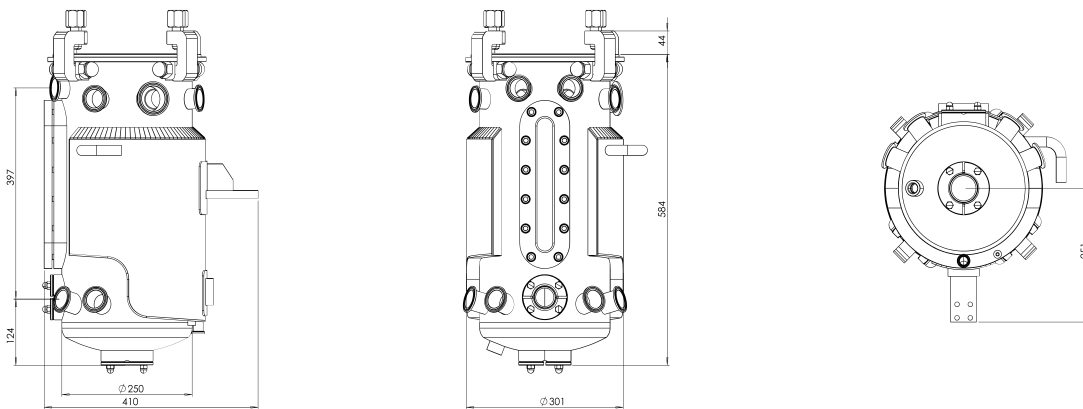
ePILOT Bioreactor (measurements in mm)



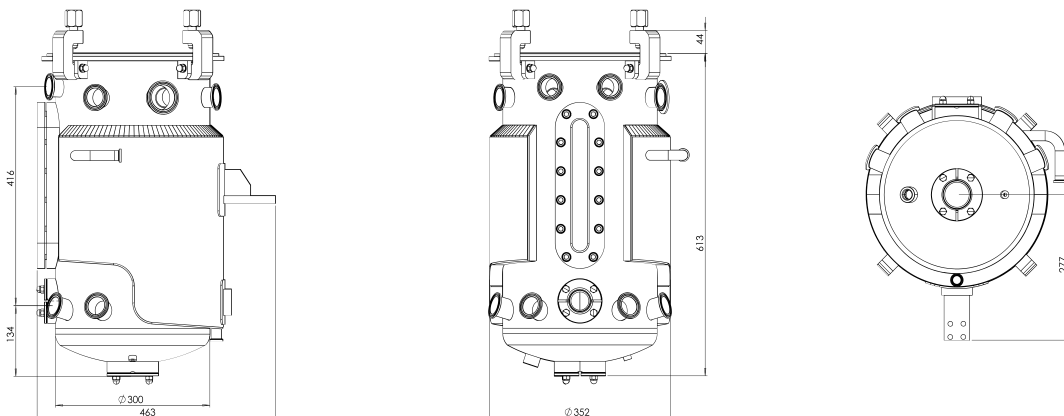
Cell culture vessel 10L (measurements in mm)



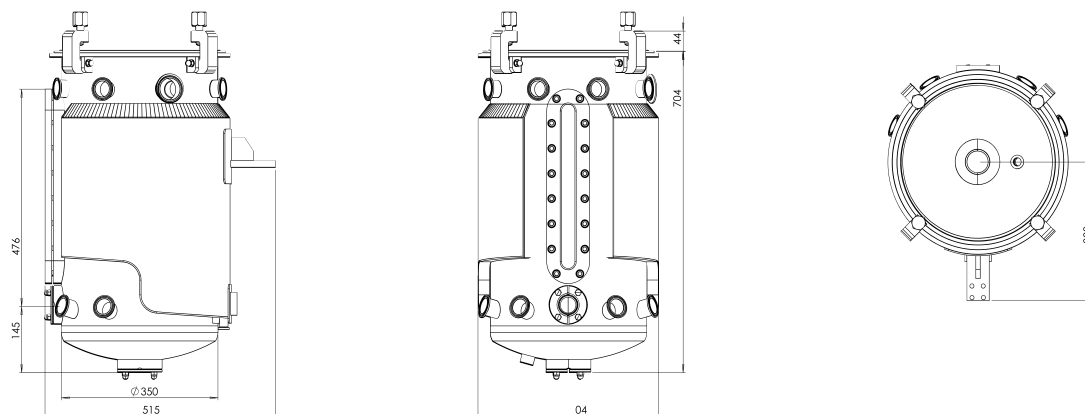
Cell culture vessel 20L (measurements in mm)



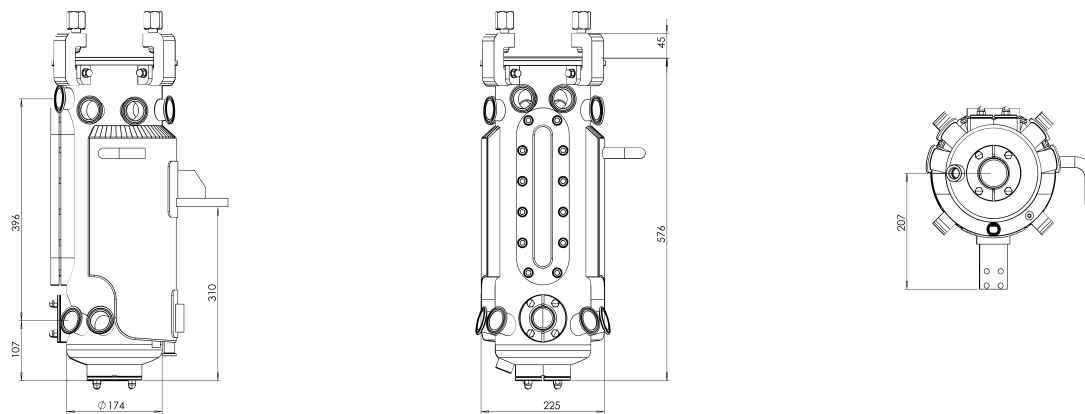
Cell culture vessel 30L (measurements in mm)



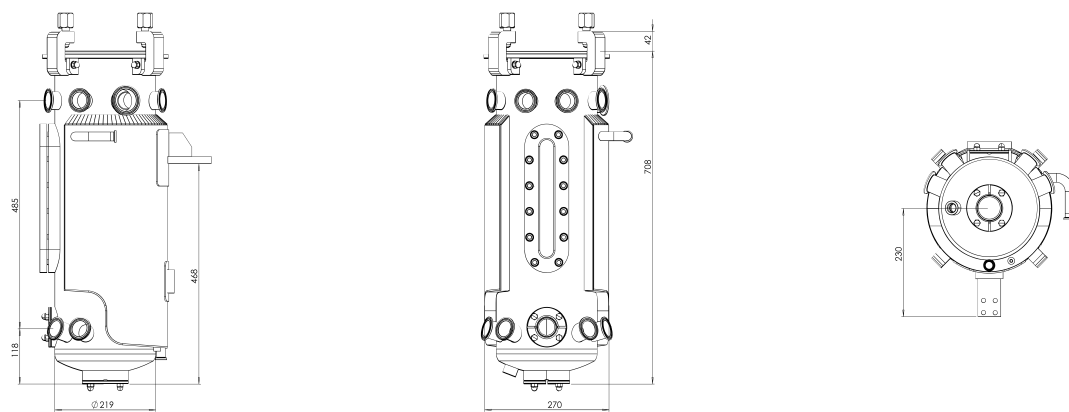
Cell culture vessel 50L (measurements in mm)



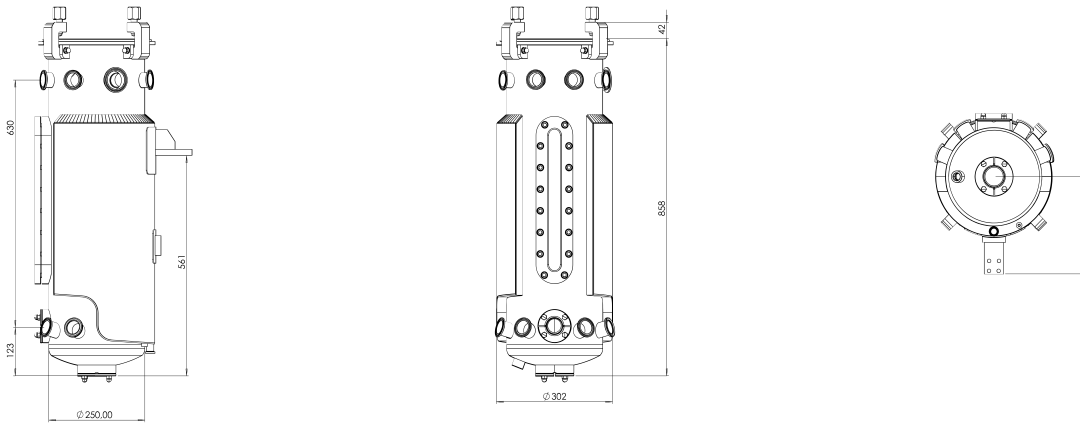
Microbial vessel 10L (measurements in mm)



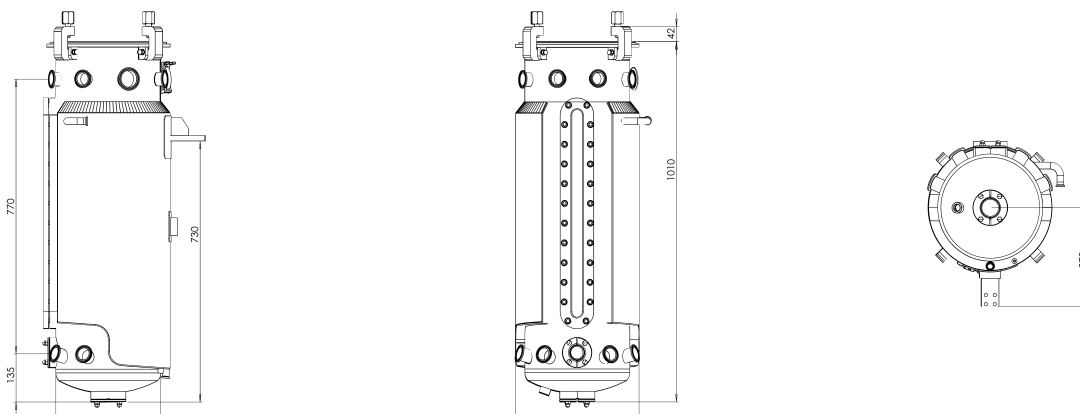
Microbial vessel 20L (measurements in mm)



Microbial vessel 30L (measurements in mm)



Microbial vessel 50L (measurements in mm)



Partnerships



Regulation



Do you need more information?
We are here to help you

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