

**Minutes of the Pre- Bid Meeting**

**Supply, Delivery, Installation, Demonstration and Commissioning of Laboratory Equipment  
UWU/AHEAD/RA1/R3/FTS/GOODS/NCB/LE/04**

Tender No : UWU/AHEAD/RA1/R3/FTS/GOODS/NCB/LE/04

Date & Time : 23<sup>rd</sup> December 2020 & 1.00 p.m.

Venue : Admin Board Room

The Following decisions were made at the Pre Bid Meeting

At the Pre Bid Meeting following clarification were made against the bidders' questions

**Technical Specifications  
Supply, Delivery, Installation, Demonstration and Commissioning of Laboratory Equipment  
for  
Department of Biosystems Technology**

<b>Item No.</b>	<b>Item</b>	<b>Component Description</b>	<b>Minimum Specifications</b>	<b>Bidder's Response (Yes/No)</b>	<b>If "No" comment/s on the offer</b>
1	Shake incubator	Use	ORBITAL Shaking and incubation of variety of containers, flaks, tubes..etc.		
		Capacity	9 x 250 mL, 6 x 500 mL, 4 x 1,000mL or closest		

		Temperature range	RT to 60°C or closest with temperature increment of 0.5°C or smallest		
		Heating/cooling speed	5°C/min or better		
		Temperature uniformity	+/- 0.5°C or better		
		Speed range	30 to 400 rpm or closest with speed increment of 1 rpm with Soft start and smooth acceleration		
		Orbit	16 to 18 mm or closest		
		Timer	up to 9999 mins under fixed value control mode or better		
		Platform	Non-slip surface for shaking of variety of containers, Interchangeable flask clamps to suit different flask sizes		
		Electrical Requirements	230 V, 50 Hz		
		Material	Stainless Steel (SS304 or Better) Interior/Exterior or higher corrosion resist material		
		Warranty	Two years comprehensive warranty or better		
		Additional/optional features	Touchpad controls of speed and temperature with LED/LCD display		
			Predrilled standard tray (SS316) should be included, with clamps		
2	Rotary evaporator apparatus	Main Machine	Manual Lift / Vertical condenser		
		Rotating Speed	20-180 rpm/20-280 rpm (optional) Motor Power 60w or higher		
		Temperature Range	Up to 100 °C		
		Heating Bath	750w SS304 or better, corrosion resistant		
		Material Glasswares	Heat stable Glass, borosilicate (pyrex similar)		
		Material other parts	Stainless Steel (SS304 or Better SS) or chemical resist durable polymer		
		Dimensions (mm)	Aproximate 560L×320W×660H		

		Accessories	Variable vacuum pump noise free / maintain free , All Glasswares (including 3 round bottom flasks in different sizes per each units 100 ml,250 ml,500 ml)		
		Electrical Requirements	230 V, 50 Hz		
		Warranty	Two years comprehensive warranty or better		
3	Vortex mixture	Speed Range	0 - 2,850 rpm		
		Timer range	1min to 99 hours for better		
			usage General mixing of microplates, Circular orbiting orbit size 2-3 mm		
			Full set with cup head and 96 well microplate holders		
		Operating Modes	Manual (inbuild Touch LCD)		
		Ambient Operating Range	+4° to 65°C		
		Power supply	230V~, 50 Hz		
		Warranty	Two years comprehensive warranty or better		
4	Moisture analyzer / balance	Measuring method	Infrared heat drying mass measurement		
		Sample pan size (mm)	130 mm or close		
		Range of moisture content	0.01 % to 100.00 %		
		Measurement mode	Automatic or Timed halting modes, Rapid, Slow and Step drying modes, Predictive Measuring mode		
		Drying heater	Mid-wave infrared quartz heater		
		Moisture content minimum display	0.01%		
		Maximum sample capacity	120 g		
		Dimensions	W220 x D415 x H190 (mm) or close		
		Setting temperature range	30 °C to 200 °C (by 1 °C increments)		
		Accessories	Sample pan 2 pcs, sample pan stop, windbreak case, sample pan, handler 2 pcs, aluminum sheet 20 pcs, spoon, spatula or more accessories		

		Power requirements	~230 V 50 Hz		
		Warranty	Two years comprehensive warranty or better		
5	Autoclave	Capacity	35- 50 L		
		Sterilization Temperature	134°C		
		Sterilization Pressure	0.22 Mpa or better		
		Timer Range	0-99 min or better		
		Heat average	~ ±0.1 C		
		Chamber materials	SS304 or better		
		Display Type	Digital touch is prefer, with presure and temperature readings and adjust		
		Other features	Stainless steel with two stainless steel sterilizing baskets,		
			User friendly and automatic shutdown with beep sound as sterilization completes		
			Digital display with touch keypad, Auto discharge of cool air and steam		
		Accessories	Sterilization box 10, tray / <b>SS</b>		
		Power supply	230V~, 50 Hz		
		Warranty	Two years comprehensive warranty or better		
		6	Laminar floor	Usage	working spaces for 3 person <b>6 ft or higher length</b>
Door	Tempered glasses or safer materials (Automatic control more preferred)				
Airflow Speed	Control Speed Controller (Three Step Speed Controller) Auto				
Cabinet	Stainless Steel SS 304 (SS 316 to contact surfaces) or better solutions				
Blower	High efficient centrifugal type with lifetime lubricated bearings				
Work Table	304 Stainless Steel (optional 316 grade)				
Light	High intensity, low wattage >800 lux				

		Standard Accessories	Air/gas cock and mains power socket (16A) 3 or		
		Other Accessories	Microprocessor LCD Controller - Digital display for air flow rate - Cabinets and drawers at the bottom - Gauges Pressure (Statics Pressure Mano-Mater) - Magnahelic Gauge (for filter pressure) - U. V. Germicidal Tube in work area - Electronic Filter choke alarm		
		Power supply	230V~, 50 Hz		
		Warranty	Two years comprehensive warranty or better		
7	Hot air oven with separators	Capacity (L)	Around 100		
		Temp.Range	RT to ~400°C or close		
		Temp. Precision	0.1 °C or better		
		Temp. Fluctuation	0.5 °C or better		
		Timing Range	1~9999min		
		Shelves No	4 pcs or higher		
		Door	Tempered glass or safty transparent method		
		Materials	SS 304 or better corrosion resist (316SS prefered)		
		Display	Touch LCD to control, set temperature, on time inside temperature, time		
		Application	Hot air sterilizer is used to sterilize small surgical instrument, glass, petri dishes etc		
			Adjustable sterilization time.		
			Over-temperature alarm.		
			Top air outlet with adjustable air volume.		
			Heating up fast,forced-airconvection, fast sterilization.		
			High precision microprocessor temperature control;		

			Fan inside, fully sealed inside, no air circulation with external air, temperature rise fast.		
		Power supply	230V~, 50 Hz		
		Warranty	Two years comprehensive warranty or better		
8	Distilled water plant	Capacity	4L/ hr or higher		
			Cabinet structure with glass aparators stock tank ~ 5L or better		
		Water type	Regular water		
		Water consumption	1:10		
		Material Glasswares	Heat stable Glass, borosilicate (pyrex similar)		
		Watwer tank	sensor to automatic control of water level and auto resatart with level decrease		
		other features			
			silica sheathed heater		
			all contact point with water shold be borosilicate glass		
			safety cut off for overheat when there is water supply issue		
			automatic cut off of water with power down and auto start with power resume		
			Power supply	230V~, 50 Hz	
	Warranty	Two years comprehensive warranty or better			
9	Homogenizer	Material	Stainless steel SS304 or better SS or durable polymer		
		Range of Speed	300-30,000 rpm		
		Speed Display	Yes		
		Capacity (H2O)	5L (or above)		
			Include a stand SS 304 or better		
		Power supply	230V~, 50 Hz		

		Warranty	Two years comprehensive warranty or better		
10	pH meters (with Conductivity, ORP and Dissolved Oxygen Benchtop Meters)	Digital pH Range	0.00 to 14.00 units or better		
		Usage	pH, Conductivity, ORP and Dissolved Oxygen and other features are preferred		
		<b>Iron selective electrode (Option)</b>			
		Probe	pH probes with ISFET technology is highly preferred than glass probes		
		Temperature Range	32.0 to 212 °F (0 to 100 °C)		
		pH Resolution	0.01 units		
		Temperature Resolution	0.2 °F (0.1 °C)		
		pH Accuracy	~0.1 or better		
		Temperature Accuracy	±0.6 °F (±0.3 °C)		
		ATC Probe	Thermistor, 10k $\omega$ at 25 °C		
		pH Calibration Temperature	32.0 to 140.0 °F (0.0 to 60 °C)		
		Battery Life	200 hours or greater (low battery indicator)		
		Size	0.9x7.4x1.8 inch (23x188x46mm)		
		Weight	3.7oz (105g)		
		Warranty	Two years comprehensive warranty or better		
<b>Accessories</b>	<b>Standard solutions for all measurement is compulsory</b>				
11	Digital balance	Weighing Capacity	0-500 g or higher range		
		Display Type	Digital		
		Balance Type	Electronic		
		Accuracy	0.001-1%		
		Operating Temperature	5°C-35°C		
		Pan Size (mm)	Approx 80 x 3.1		
		Warranty	Two years comprehensive warranty or better		
12	Deep Freezer	Temperature	-40°C -RT		
		Capacity	<b>Aprox. 550 L or close</b>		

		Dimensions (mm)	Approx 650 x 580 x 900		
		Design configuration	Vertical		
		Outer cabinet	SS 304 or better / corrosion free Polymer coated AL		
		Inner chamber	Stainless steel		
		Door	solid door made of SS 304 or better / corrosion free Polymer		
		Handle	With door lock arrangement		
		Sensor	Pt100 RTD sensor		
		Shelves	3, 4, 5 Made of SS wire mesh		
			Steel storage racks <ul style="list-style-type: none"> <li>• Three (03) Stainless steel/aluminum racks fitting with the chambers (one for each freezer chambers) that can hold 12-15 standard size cryoboxes Polymer Cryoboxes</li> <li>• Thirty (30) cryoboxes each hold 25 (or higher) for storage of 1.0 to 2.0ml internally and externally threaded cryogenic vials with lid. Grid numbers on the box-lid for easy identification of sample vials</li> </ul>		
		Alarm	Audiovisual alarm for high / low set points		
		Warranty	Two years comprehensive warranty or better		
13	Hot plate (Heating Mantle) with magnetic stir	Stirrer Speed	60-1500 RPM		
		Stirring Capacity	250 mL		
		Temperature Range	RT-380°C		
		Temperature uniformity on the plate	±3°C		
		Dimensions mm (W x D x H)	approx. 225x215x115		
		Diameter of working plate mm	(Approx) 140x180		
		Working surface material	Aluminum alloy		



		Power Consumption	aprox. 500W		
		Fault indication	Outputs sound signal and turns off the heating		
		Warranty	Two years comprehensive warranty or better		
14	Hot plate (Heating Mantle) with magnetic stir	Stirrer Speed	60-1500 RPM		
		Stirring Capacity	500 mL		
		Temperature Range	RT-380°C		
		Temperature uniformity on the plate	±3°C		
		Dimensions mm (W x D x H)	(approx.) 380x320x70		
		Diameter of working plate mm	(Approx) 320x320		
		Working surface material	Aluminum alloy		
		Power Consumption	aprox. 500W or better		
		Fault indication	Outputs sound signal and turns off the heating		
		Warranty	Two years comprehensive warranty or better		
15	Hot plate (Heating Mantle) with magnetic stir	Stirrer Speed	60-1500 RPM		
		Stirring Capacity	1-2 L		
		Temperature Range	RT-380°C		
		Temperature uniformity on the plate	±3°C		
		Dimensions mm (W x D x H)	(approx.)490x320x70 lower		
		Diameter of working plate mm	(Approx) 400x300 respectively		
		Working surface material	Aluminum alloy		
		Power Consumption	aprox. 500W or better		
		Fault indication	Outputs sound signal and turns off the heating		
		Warranty	Two years comprehensive warranty or better		

16	Ultra Sonicaters - Probe	Power Rating	Aprox. 700 watts		
		Frequency	High frequency operation, >50 KHz, and more frequency operations		
		Programmability	10 memories plus sequencing		
		Programmable Timer	Aprox. 72 hour		
		Adjustable Pulse On/Off	1 second to 24 hours		
		Other features	Generator Converter, 1/2" (13mm) diameter probe, Power cable, Converter cable, Wrench set		
		Power	220-240 V AC, 50-60 Hz		
		Dimensions	mm (W x L x H) (approx)240*140*100 - Different sizes of probes		
			Power adjustable amplitude control (40% - 100%)		
			Backlight LCD display		
			Digital timer,		
			Optional heating up to 60 deg.C, Auto alarm function, Memory function		
			Warranty	Two years comprehensive warranty or better	
17	Ultra Sonicaters - bath	Usage	dispersion of solid in to solutions / cleaning of test tubes, optical lenses and various instruments		
		Frequency	20-200 kHz variable or higher frequency range		
		Programmability	10 memories plus sequencing		
		Programmable Timer	~24 hour		
			1 second to 24 hours		
		Tank capacity	~3L Material SS304 or better		
			Heating facility should be available with Temperature up to 60°C		
			Power adjustable amplitude control (40% - 100%)		
			Backlight LCD display		
			Auto alarm function, Memory function		

		Warranty	Two years comprehensive warranty or better		
18	Thermo flasks	Type	Vacuum		
		Capacity	1 L or more		
			100% Stainless Steel 304 SS or better corrosion free.		
			Simple cylindrical appearance - Powder coating with light colors - colors should not high intense		
			Store hot or cold beverages for long hours		
		Warranty	one year comprehensive warranty or better		
19	UV Vis Spectrophotometer	Optical System mandatory option	Both transmittance and reflectance of Solid and Liquid samples		
		Light source	Halogen lamp, Deuterium lamp or better		
		Wavelength range	165 to 3300 nm or close ~ +/- 0.1 or better		
		Photometric accuracy	+/-0.0015 Abs (0 to 0.5 Abs) or better		
		Monochromator	grating-grating type or better option		
		Scanning speed	up to ~3000 nm/min (from ~1nm minimum) / and Quick survey scanning		
		Detector	nGaAS /PMT and PbS detectors or better to detect all range		
		Photometric range	-4~4 Abs or better range		
		Other Special features	Nitrogen gas purging for both the optical and the sample compartment is required		
		Accessories	Necessary accessories and Sample Holders for Absolute Reflectance measurements Absorption measurements Solid samples (medium size) measurements Liquid sample measurements Powder samples measurements Micro Sample Holder Inert gas Purge Box and flow control		

			1 cm × 1 cm liquid sample valves (50 Plastic/ 4 Quartz), Micro drop sample holders 50.		
		Display	LCD color touch screen (can be used to control without PC)		
		Standard programs	Abs/%T meter, Quantitative analysis, Spectrum measurement, Time course measurement, Fixed wavelength measurement, Validation, Two wavelength time course measurement		
		Special Software	For Color Calculation, Film Thickness, Solar Radiation, and ultra-violet protection Factor Calculation Measures: Bitterness, Color, Polyphenols, and Diacetyl Content or similar Software UV-Vis Water Analysis		
		PC	Suitable higher performance PC or Tablet to control the machine		
		UPS	30 min or better backup		
		Warranty	Two years comprehensive warranty or better		
20	Pycnometer	Material	Borosilicate glass 3.3		
		measuring range of thermometer	10- 35° C		
		calibrate at 20° C			
		capacities	10 ml With stopper cap"		
		lateral capillarytube with glass cap on ground joint			
		minimal thermal expansion good chemical resistance			

		high resistance to thermal shocks			
		DIN 12809 certifications or similar			
		Warranty	2years		
21	Pycnometer	Material	Borosilicate glass 3.3		
		measuring range of thermometer 10- 35° C			
		calibrate at 20° C			
		capacities	25 ml With stopper cap"		
		lateral capillarytube with glass cap on ground joint			
		minimal thermal expansion good chemical resistance			
		DIN 12809 certifications or similar			
		high resistance to thermal shocks			
		Warranty	2years		
22	Specific Gravity Hydrometer	Material	Boro Silicate		
		sub divisions	0.001 g /cm <sup>3</sup>		
		reference temperature	20 °C		
		paper scale, shot weighted			
		medium surface tension	1000-1500 g/cm <sup>3</sup>		

		Certification	DIN 12791 or similar			
		length	with thermomter 29 cm			
		thermometer range (0 to 35° C)				
		Warranty	2 years or more			
23	laboratory constant temperature Incubator	Material	Stainless steel inner Container, foursquare semicircle transition			
		Capacity	230 L approximate			
		Temperature control	RT +5 -80 °C			
		Temperature fluctuation	± 0.5 °C			
		time range	1- 9999 minutes temperature resolution- 0.1 ° C			
		consumption	700 W , power suuplly 220 v ± 10 % , 50/60 hz/ Auto restart with power failures			
		Internal size	60* 50*75 cm			
		exterior size	73*67* 122 cm			
		removable shelf for conveninet cleaning				
		Independent temperature safety device, which auto breaks off when over temperature limits to ensure experiment run safely				
		Door with wide hollow tempered glass observation window, adjustable air-tight buckle lock and silicon rubber seal				

		Warranty	2 years or more			
24	Table mounted Moisture analyzer	Readability	0.001 g or 0.01 %			
		Reproducibility	0.002 g / 0.05 %			
		Pan volume	90 g or close			
		weighing units	weighing, % moisture, % solids, % moisture on dry basis, % solids on dry basis			
		establishment time	4 seconds			
		internal memory	up to 99 test results or 49 programmable user settings			
		calibration	Automatic			
		Heating source	400 W halogen heaters, 50- 160 °C			
		Drying Programs	standard programs, 1 step, or upto 3 temperature setting ramps			
		Display	large, backlight display with 24 mm size digits			
		49 internal storage spaces fo automatic storage of complete drying process				
		Automatic test run after closing of the lid				
		Warranty	3 years			
25	Digital Refractometer	measuring range	0 to 85 % Brix,0 - 80 °C			

		resolution -	0.1 % brix, 0.1° C			
		Accuracy	± 0.2 % brix, ± 0.3 °C			
		Battery type-	1*9 V battery			
		Dimensions	192*102*67 mm			
		Temperature	automatic from 10 to 40° C			
		water proof protection				
		Dual level LCD for sugar content in % brix and temperature				
		Easy calibration with distilled or deionized water				
		Stainless steel sample well				
		warranty	1 year			
26	Portable PH meter	FET technology for Probe is preferred				
		single device should contain probe and the machine (Not separate probes connections)				
		Preferred to have conductivity measurements or any other options				
		PH Range	0.00 to 14.00			
		PH resolution	0.01			
		pH Accuracy	± 0.02			
		automatic buffer recognition	4.00,7.00,9.22, 10.00 ( with manual override)			



		pH calibration	user selectable 1 or 2 point			
		mV range	±19999 mV			
		mV resolution	1 mV			
		mV Accuracy	±1 mV			
		Temperature range	(-10 to 105 °C)			
		Temperature resolution	0.1 °C			
		Temperature accuracy	±0.5° C			
		ATC/manual range	0-100° C			
		Connector	BNC			
		Digital display with back-light brightness				
		power	Li-ion batteries rechargeble with adaptor			
		Battery Life	500 hours typical			
		Size	(L*W*D)175*75*35 mm			
		warranty	2 year or more			
27	IR Thermometer (-33° C to +500° C)	for touchless measurements of the surface temperature				
		with laser visor				
		measurement duration	1 second			

		measurement range	(-) 33° C to (+) 500° C or higher		
		Dysplay	digital / Background illumination		
		Accuracy	2 % from measuremnt value or $\pm 2$ °C		
		switchable °c to °F			
		ratio measurement distance/ spot size	11:1		
		power	Li-ion batteries rechargeble with adaptor		
		Battery Life	500 hours typical		
		display of curret temperature, highest temperature			
		warranty	2 years or more		
28	Food Grade Thermocouple	Temperature Range -	50 ° Cto +150° C		
		resolution	0.1 °C		
		accuracy	$\pm 0.4$ °C		
		Battery	3 *1.5 V AAA batteries		
		Dimensions	152* 58*30 mm		
		Kit includes	meter, penetration probe (HI 765 PWL), Batteries		
		water proof thin casing			
		quick response			

		Stainless steel penetration probe with 1 m cable			
		CAL Check feature at start up to check the calibration status			
		Hold Function to freeze readings on the LCD			
		warranty	1 year or more		
29	Plastic desiccators	Material	Thick perforated polypropylene disk with a big hole in the centre for ease in lifting		
		Flange	340 mm ( o.d)		
		Internal diameter	300 mm		
		polymeric material on the flanges to make it air tight			
		separator to keep water absorbant material			
		warranty	1 year or more		
30	Vaccum desiccators	Material	Polypropylene/ polycarbonate		
		Transparent polycarbonate bottom			
		I.d	300 mm		
		Flange	340 mm ( o.d)		
		Capacity	Hold 740 mm Hg for 24 hours without greasing		
		Internal groove on the flange to hold silcon rubber O-ring			

		Polyprpylene stopcock fitted with Lubricating PTEF plug			
		PTEF plug works in 3 ways	vaccum creation, shutting off, vacuum releasing		
		warranty	1 year		
31	Colorimeter (portable)	Application	analysis of food or other liquid samples for their color		
		accuracy:	$\pm 0.5\%$ at 4% transmittance, $\pm 0.005$ at 0.3 AU		
		resolution:	0.001 AU		
		Power:	Rechargeable Preferred (life time for more than 2days)		
		Size:	Portable		
		operating temperature:	0-40 °C, 85 % R.H		
		Sample tubes:	1cm*1 cm		
		operating wave lengths:	450,500,550,575,600,650 nm or more options		
		choices	100+ test		
		warranty:	2 years or more comprehensive		
32	Titratable acidity measuring burettes	Material	Boro silicate glass 3.3		
		capacity	100 ml		

		Capacity	100mL		
		Divisions	0.20mL		
		O.D./Height	17/830mm		
		Stopcock	0.20mm durable polymer		
		Well legible numbers and shortline graduation			
		high resistance to thermal shocks			
		in compliance with DIN EN ISO385 / according to ASTM E 287-02 standard)or similar			
33	Burette holders	stand and parts	Corrosion proof polymer / powder coat (epoxy) aluminum or SS304		
		with clamp and stand			
		Holder Material	stainless steel and Rubber roller grip		
34	Glass Beaker, 250ml	Material	Boro silicate glass 3.3		
		Capacity	250ml		
		Height	Aprox. 90mm		
		Outer Dimension	Aprox. 68mm		
		Graduation Range	0-1750ml / 200-25ml		
		Graduation Interval	25ml		

		Accuracy	±5%		
		Autoclavable	Yes		
		Upper Extreme Temp	490°C (914°F)		
		Upper Working Temp	230°C (446°F)		
		Lower Working Temp	-230°C (-382°F)		
		Max. Thermal Shock	160°C (320°F)		
35	Glass Pipette Graduated, 25ml	Material	Borosilicate glass		
		Capacity	25ml		
		Tolerance	+/-0.10mL		
		Graduations	0.1ml		
		O.D. / Height	13mm / 455mm		
36	Glass Pipette Graduated, 10ml	Material	Borosilicate glass		
		Capacity	10ml		
		Tolerance	+/-0.03ml		
		Graduations	0.1ml		
		O.D. / Height	10mm / 370mm		
37		Material	Plastic / durable chemical resist polymer		

	Pipette fillers (universal model)	Suitable for filling and dispensing from all standard pipettes			
		Capacity 25 ml			
		free continuous and accurate full delivery according to DIN and german weights and measures regulation.			
		Delivery time is not influenced by piston pressure or similar effects.			
		Resistant to dry sterilization up to 160 or steam sterilization up to 3 bar			
		Color	different colors		
38	White tiles ( Acid proof)	Material	Porcelain		
		Size	12cm* 12 cm		
		Color	white		
		Unglazed, highly resistance to acid & alkalies			
		Water Absorption	<0.1		
		Thickness	7mm		
39	Measuring cylinders 500 ml	Capacity	500mL / 17oz.		
		Material	Polypropylene PP		
		Transparency	Translucent		
		Graduation Range	10 - 500mL		
		Graduation Interval	10mL		

		Autoclavable	Yes		
		Melting Point	338°F (170°C)		
		Upper Extreme Temp	275°F (135°C)		
		Lower Working Temp	32°F (0°C)		
40	13 A sunk boxes	Material	PVC		
		13 A sunk boxes with white color twin sockets			
41	Glass Funnel, 90mm	Material	Borosilicate Glass		
		Diameter	3.5" (90mm)		
		StemHeight	3.5"		
		Stem diameter	0.31" (8mm)		
42	Bioreactor – 2L	Type of culture	Microbial		
		Mode of Operation	Continuous		
		Culture vessel	Autoclavable, single walled with round bottom		
		Control Tower	2L		
		Footprint bench surface (W+H+D):	200 x 495 x 300 mm		
		Power supply	100 to 240 VAC 50/60Hz, 8 A		
		Operating Temperature	0 °C – 60 °C or close		



		Motor drive	Maintenance free, Quiet direct drive 150 W, 1100 rpm		
		Integrated Pumps:	"Quantity 3, Controller Fixed speed (regulated on off) Speed 43 rpm Pump head Watson Marlow 114, Fast Load pump head"		
		Probes and Controllers:	"Temperature, separate sensor Temperature control 0 – 40°C Display resolution 0.1°C Temperature integrated in pH probe Temperature control 0 – 60°C Display resolution 0.1°C pH probe, reusable Combination electrode, digital communication with Control Tower Range: 2 – 12 pH Display resolution: 0.01 pH Foam, alternative level Electrical conductivity sensor, stainless steel, ceramic insulated"		
		Glass culture Vessel:	Material Borosilicate glass, stainless steel AISI 316L, EPDM Total volume [L] 1.6 Working volume: [L] 0.4–1 Cover ports 19 mm   12 mm   6 mm : 3   2   6 Space requirements [W + H + D in mm]: 200 + 540 + 270 [W + H + D in inches]: 7.9 + 21 + 10.6		
		Display	Touch screen 10.1' Tablet to control and monitor		

		Accessories	All accessories to control and run the bio reactor should be supply and mention with the brochures		
		Warranty	2 years comprehensive or more		
43	Bioreactor - 5L	Type of culture	Microbial		
		Mode of Operation	Continuous		
		Culture vessel	Autoclavable, single walled with round bottom		
		Control Tower	5L		
		Footprint bench surface (W+H+D):	200 x 495 x 300 mm		
		Power supply	100 to 240 VAC 50/60Hz, 8 A		
		Operating Temperature	0 °C – 60 °C or close		
		Motor drive	Maintenance free, Quiet direct drive 150 W, 1100 rpm		
		Integrated Pumps	"Quantity 3, Controller Fixed speed (regulated on/off) Speed 43 rpm Pump head Watson Marlow 114, Fast Load pump head"		
		Probes and Controllers	"Temperature, separate sensor Temperature control 0 – 40°C Display resolution 0.1°C Temperature integrated in pH probe Temperature control 0 – 60°C Display resolution 0.1°C pH probe, reusable Combination electrode, digital communication with Control Tower Range: 2 – 12 pH Display resolution: 0.01 pH"		

			Foam, alternative level Electrical conductivity sensor, stainless steel, ceramic insulated"		
		Glass culture Vessel	"Material Borosilicate glass, stainless steel AISI 316L, EPDM Total volume [L] 1.6 Working volume: [L] 0.4–1 Cover ports 19 mm   12 mm   6 mm : 3   2   6 Space requirements [W + H + D in mm]: 200 + 540 + 270 [W + H + D in inches]: 7.9 + 21 + 10.6"		
		Display	Touch screen 10.1' Tablet to control and monitor		
		Accessories	All accessories to control and run the bio reactor should be supply and mention with the brochures		
		Warranty	2 years comprehensive or more		
44	Small auto clave vessal - 200ml	Material	Stainless steel.304L		
		Chamber material	PTFE lined		
		Volume	200ml		
		Safe temperature	220 degree centigrade		
		Working pressure	3 Mpa or more		
		Tempe heating and cooling speed	5 degree centigrade / min		
		Application	Break down the refractory material quickly / Hydrothermal Treatment		
45	Small auto clave vessal - 500ml	Material	Stainless steel.304L		
		Chamber material	PTFE lined 5mm thickness		
		Volume	500ml		
		Safe temperature	220 degree centigrade		
		Working pressure	3 Mpa or more		

		Tempe heating and cooling speed	5 degree centigrade / min			
		Application	Break down the refractory material quickly / Hydrothermal Treatment			
46	Carbon, Hydrogen, Nitrogen, Sulphur, Oxygen (CHNSO) Analyzer	Application	Fully Automatic Computer controlled rapid determination of Carbon, Hydrogen, Nitrogen, Sulphur and Oxygen Analysis			
		Flash Combustion design with oxidation & reduction process (Double Furnace) with Chromatographic separation by column or equivalent system will be preferable.				
		Furnace:	Two Independent furnaces			
			Facility should be there to use the same furnace for oxygen determination (by pyrolysis) & CHNS as per the application requirement. Facility should be there to use the same furnace for solid / liquid samples as per the application requirement.			
		Separation:	Suitable column or equivalent technique as per the need of food applications.			
		Detectors:	Thermal Conductivity Detector or laterest			
		Automation of Furnace:	Automated switchover (computer controlled) from the left channel (furnace) to the right channel (furnace) or vice-versa. No manual intervention should be needed.			
		Autosampler:	" Solid Samples: Autosampler with 30 or more samples capability			
		Analysis range: (approximately mentioned values or better)	C = 0.01% to 100 %, H = 0.01% to 100 %, N= 0.01% to 100 %, S = 0.01% to 100 % O = 0.01% to 100 %			
		Sample Size:	0.1 Mg to 500 Mg or more depending upon sample nature. Provision for direct Injection of Liquid Samples for high sensitivity.			

			The system must be able to operate one or more elements such as N, C, H, S and O analysis in a single mode.			
		Micro Balance:	Compatible Micro-balance capable of direct transferring the data to the analyzer			
			Weighing Range: 1000 mg or more			
			Readability: 0.01 mg or more			
			Tarring range: full scale			
			Typical settling time: < 9 sec			
		Computer & Printer / software	Branded Computer: i7, 1 TB Hard Disk, 16 GB RAM, Printer - all license software and OS to operate			
		UPS	10 KVA capacity with 60 Min back up.			
		Accessories	Gas cylinders (47 litre capacity): Argon, Helium Oxygen with applicable regulators			
			Accessories to take every measurements as mentioned above should be supplied			
		Consumables:	Consumables needed for 1000 sample analyses should be included in the offer.			
		Other features	Facility to upgrade to Isotopic Ratio mass Spectrometer for analysis of C H N & S Isotopes.			
		Warranty	For Furnace 10 years or better under standard operating conditions			
			3 years or more comprehensive			
47	Simultaneous Thermogravimetry – Differential Scanning Calorimetry (STA/TG-DSC)	<b>Temperature furnace</b>				
		Temperature range	RT to 1600 °C or higher range			
		Heating rate	0.02 to 100 K/min or better			
		Temperature accuracy	± 0.3 K or close			
		Furnace temperature resolution	0.01 K or close			
		Heating time	10 min (RT to 1100 °C) or close			

		Cooling time	20 min (1100 to 100 °C) or faster		
		<b>Balance and Sensor</b>			
		Weighing range	Lower than 250 mg to 1 g or higher		
		Thermogravimetric resolution	0.03 µg		
		Crucible volume	Up to 900 µL		
		Weighing accuracy	0.005% or close		
		Weighing precision	0.01% or better		
		<b>DSC</b>			
		Heat Flow Range	± 400 mW or close or better		
		"Hold Time	0 - 999 min, hour		
		Noise level	10µW or better		
		Vacuum-tight	10 <sup>-4</sup> mbar (10 <sup>-2</sup> Pa) or close		
		Gas control	All-Built-in mass flow controllers		
		Gas atmospheres	Inert, oxidizing and vacuum (accessories should be supplied to carryout)		
		Software and Control	Should be supply higher performance PC (or tablet preferred) to run the Instrument		
			"Software (Combined analysis: Comparison and/or evaluation of STA, DSC, TGA measurements in a single presentation) "		
		Upgradable to (Optional feature)	"Connection to an FT-IR via transfer line Coupling to a GC-MS via transfer line"		
		Accessories (Mandatory)	"Sample Pans (alumina-5, platinum-2, aluminum-100 and quartz-2), Crucibles and Plates Other all accessories should be supplied to run a sample with full characteristics reading"		
		Warranty	3 years Comprehensive or more		
47.2	Automatic sample changer (TG-DSC)	available for 10 crucible or more			
		Auto sample for this item will be awarded for the supplier of item 47			

Chairman  
Procurement Committee,  
Uva Wellassa University