

## OPEN TENDER

Quotations are invited from reputed firms/dealers for the purchase of following instruments under HEC Project entitled “Development of lignocellulosic biomass for better pulping and efficient conversion to fermentable sugars and ethanol through genetic engineering”. The quotations may be sent to Director (Purchase), Forman Christian College (A Chartered University), Ferozpur Road, Lahore 54600. (“Quotations for HEC Biofuel Project’ should be mentioned on the envelope). Last date for the submission of quotations is February 25, 2011.

### GRADIENT THERMAL CYCLER

Sample capacity	96 x 0.2 ml tubes or 96-well PCR plate
Speed of ramping	Up to 2.5°C/sec
Temperature range	4–100°C
Temperature accuracy	±0.5°C of programmed target at 90°C, NIST-traceable
Temperature uniformity	±0.5°C well-to-well within 30 sec of arrival at 90°C
Input power	100–150 VAC, 50–60 Hz; 220–240 VAC, 50–60 Hz; 670 W maximum
Ports	1 USB
Memory	99 typical programs
<b>Gradient</b>	
Gradient accuracy	±0.5°C of programmed target at end rows, NIST-traceable
Row uniformity temperature	±0.5°C well-to-well (within row) within 30 sec of reaching target
Gradient range	30–99°C
Temperature differential range	1–25°C

### CENTRIFUGE REFRIGERATED

Timer	10 sec - 11 h 59 min
Display	LCD
Time increments [sec]	10; 1
Short run	+
Continuous run	+
Speed increments [rpm]	100; 1
actual values	+
g-force increments [x g]	10; 1
Temperature increments [°C]	1
Auto lid open, switchable	+, +
Acoustic signal, switchable	+, +
Optical display stillstand	+
Stillstand cooling	+
All rotors pre programmed	+
Control unit lockable	+
Power consumption [W]	720
Max. capacity [ml]	4 x 120
Rotors	50 ml tube, 250 ml
Max. speed [rpm]	15300
Min. speed [rpm]	100
Max. acceleration [sec]	22
Max. deceleration [sec]	18
Temperature setting range [°C]	-10°C - +40°C (PK)

Min. rotor temperature  
at 23°C ambient temperature < 4°C

## ULTRA PURE WATER SYSTEM

### Ultrapure Water Quality

Parameter	Value
Resistivity *	18.2 MΩ.cm @ 25 °C
TOC **	≤ 5 ppb (µg/L)
Pyrogens (endotoxins)	< 0.001 Eu/mL (pyrogen-free)
RNases	< 0.01 ng/mL (RNase-free)
DNases	< 4 pg/mL (DNase-free)
Microorganisms	< 0.1 cfu/ml
Particulates > 0.22 µm	< 1 particulate / mL
Flow rate	Adjustable from trigger: from 50 mL /min up to 2 L/min
Manual dispense flow rate	Adjustable between 50 and 2000 mL/min
Ions rejection	97 to 98% with new RO cartridge
Organics Rejection	> 99 % for MW > 200 Dalton
Particulates & Bacteria Rejection	> 99%

### PIPETTES (3 sets)

Gilson micropipette

Volume Adjustable

0.5-10 µl

10-100 µl

20-200 µl

100-1000µl

Piston Stainless steel

PVDF handle

## INCUBATOR SHAKER

### Technical Data

Mechanical Shaking mode:	orbital
Amplitude:	25 mm or 50 mm
Drive:	brushless motor with triple eccentric bearing
Drive control:	Microprocessor controlled
Shaking Speed Range:	40 to 400rpm
Indication:	alphanumeric LCD
Speed accuracy:	±1% of max. value

### Temperature

Temperature range:	ambient +8°C to +70°C
with cooling:	ambient -10°C to +70°C

### Trays

Recommended trays:	6 x 2L conical flasks
Mounting:	Stainless steel clamps of different sizes (250ml, 500ml, 1000ml), Spring-clip snap mechanism
Programming Parameters:	Speed, temperature, illumination (optional)
Operating Environment Safety class:	IP 21
Admissible temperature:	from +10°C to +45°C with cooling mode
Relative humidity:	from 10% to 90%, not condensing

Electrical Power supply: 230 V/50 Hz  
 Heating capacity: 650 W  
 Cooling capacity: 500 W

## WATER BATH SHAKER

<b>Temperature</b>	Range	5°C above ambient (or coolant temperatures using optional cooling coil), to 100°C
	Accuracy	± 0.1°C
	Heaters	Low watt-density, silicone rubber mat heater with high-temperature safety thermostat cut off
<b>Shaking</b>	Range	25 to 400 rpm with 1/2" (1.3 cm) diameter circular orbit
	Control	± 1 rpm
	Drive Mechanism	Triple-eccentric counterbalanced drive in cast-iron housing with 9 permanently lubricated ball bearings. Solid-state brushless D.C. motor
	Timer	Programmable shaking periods from 0.1 hr. to 99.9 hrs. Triggers audible alarm and energizes status light at end of period. Can be deactivated for continuous operation
<b>Alarms</b>	Audible & Visible	Indicate when speed deviates more than 5 rpm or temperature more than 1°C from setpoint, and when timer operation has expired. Also signals low-water level condition.
<b>LED Display</b>		Indicates speed in increments of 1 rpm, temperature in 0.1°C, running time in 0.1 hrs., and alarm conditions.
<b>Safety</b>		Acceleration circuit prevents sudden starts/stops, minimizing both splashing & mechanical damage. Safety shuts off temperature when high-temperature limit is exceeded
<b>Bath</b>		Deep-drawn, stainless-steel, seamless bath with radius corners. Adjustable level control from 0.5" to 3" above shaker platform. Water-in and drain lines with shut-off valves and overflow line provided.
<b>Automatic Filling</b>		Bath automatically refillable to a volume of 15 L; requires connection to water inlet line
<b>Setpoint Retention</b>		All setpoints and operating status are retained by non-volatile memory. Automatic restart after power is restored (indicated by flashing display)
<b>Ambient Conditions</b>		Temperature: 0 - 60°C. Humidity: 90% non-condensing
<b>Electric Power supply</b>		230 V/50 Hz
<b>Capacity</b>		6 X 500ml conical flask
<b>Stainless steel Clamps</b>		2 x 2L, 2 x 1 L, 3 x 500ml, 3 x 250 ml

## GEL DOCUMENTATION SYSTEM

Camera: GelCam 310 Camera

Darkroom:

- Built-in computer with USB ports
- Wide access door with UV safety shutoff
- Gel viewing window
- Sliding tray for transilluminator

Epi white illumination  
Emission Filters  
EtBr Red 570-640nm

Software:

Transilluminators: Select from FirstLight or Benchtop Transilluminators  
Windows 2000 SP4, Windows XP Pro SP2

### **Main Features**

Fluorescent and colorimetric imaging  
New high resolution 2.0 GelCam 310 CCD camera  
Touch screen technology and built in computer for fast, easy imaging  
Front mounted USB port for saving images  
Transfer images via network or FTP  
Modular design - add additional emission filters, epi UV lights, white light plate or UV converter plates to maximize gel fluorescence capabilities  
New optional white light LED plate plugs into the darkroom for uniform white light illumination; convenient storage pocket on the darkroom  
EtBr Filter fits in the slide-out tray under the camera for easy access

### **Software Interface**

Capture, view, save and print images:

See a LIVE preview of gels, plates and colonies  
SNAP (capture) the image  
SAVE the image in TIFF (8, 12 or 16-bit), BMP or JPEG file formats  
PRINT to any digital printer  
Set the TIME/DATE, exposure warnings and integration times

### **Transillumination**

To use the transilluminator, slide the transilluminator out on the sliding tray and place samples on the filter surface  
Photo shows the FirstLight Uniform UV illuminator  
To fluoresce samples in the 460-470nm range, place the optional Visi-Blue Plate over the transilluminator surface  
To visualize coomassie blue and silver stained samples, place the optional UV to White Light Converter Plate on top of the transilluminator

### **Epi Illumination**

Add UV lamps for overhead UV illumination  
Four watt UV lamp with 254 and 365nm UV - Model UVGL-25  
Position lamps on two sides of the darkroom for uniform illumination

### **POWER SUPPLY (Two sets)**

Output range (programmable)	10–300 V, fully adjustable in 1 V steps 4–400 mA, fully adjustable in 1 mA steps 75 W (maximum)
Type of output	Constant voltage or constant current with automatic crossover
Output terminals	4 pair recessed banana jacks in parallel
Timer	1–999 min, fully adjustable
Pause/resume function	Yes
Display	3-digit LED
Operating conditions	0–40°C; 0–95% humidity (noncondensing)

Safety features	No-load detection; sudden load change detection; overload/short-circuit detection; overvoltage protection
Input protection	Fuse on both hot and neutral
Input power (actual)	220 VAC, 50/60 Hz,

## **VERTICAL GEL ELECTROPHORESIS SYSTEM (two sets)**

(0.5mm) complete system,  
system includes electrode module,  
electrophoresis tank,  
casting module/2 set,  
glass plate Rectangular & notched (10 × 10.5 cm),  
0.5mm spacer /4 pcs,  
0.5mm 10 teeth comb/2 pcs,  
One-gel gate, Alignment card, Glass plate separator, instruction manual

## **ICE MACHINE**

Flake ice machine specification:

daily output (kg/24h)	400
Bin capacity (kg)	300
Ref.capacity (kcal/h)	1880
Evaporating Temperature	-20°C
Total power (kW)	2.7
Power supply	3p/380v/50Hz
Flake ice thickness(mm)	1.8-2.5
Cooling mode	air cooling

## **COOLING WATER BATH**

Fuzzy-supported PID microprocessor controller with integrated auto-diagnostic system with fault indication

Solid state switching unit

2 Pt100 sensors Class A in 4-wire-circuit, mutually monitoring and taking over the performance at the same temperature value

Digital timer from 1 min. up to 999 hours for:

Digital display (LED) of all set parameters, such as temperature and alarm values (0,1 °C resolution) as well as time values

Calibration facility on controller

Audible and visual alarm at program end and as input acknowledgement as well as in case of low liquid level; heating is switched off automatically

### **Over Temperature Protection**

In case of over-temperature due to failure, the heating switch off at approx. 10 °C above the set temperature

Independently working, electronic over-temperature controller TWW protection

resolution of display and setting accuracy: 0,1 °C below 99,9 °C, 1 °C above 100 °C

Mechanical temperature limiter TB protection class 1 switching the heating off at approx. 30 °C above max. temperature of the bath

### **Stainless Steel Casing**

Corrosion resistant

Easy-to-clean interior, made of stainless steel,

Corrosion-proof large-area heating on three sides

**Temperature Range**

From +10 °C (however, at least 15 °C above ambient ) up to +95 °C

**Voltage**

230 V (+/- 10%), 50 Hz

**LIQUID NITROGEN CONTAINER (Two numbers)**

Capacity ltr	20.5
Static Evaporation Loss Rate ltr/day	0.1
Static Holding Time day	211
Working Time day	132
Total Height mm	695
Overall Diameter mm	380
Neck Tube Diameter mm	51

**ELECTROPORATOR (BACTERIA AND YEAST)****Product Feature**

User friendly, one button control  
 Programmable voltage and optimized, fixed pulse time  
 Preadjusted voltages for the most frequent applications  
 Integrated cuvette holders  
 Electronic safety circuit

**Technical Specification**

Pulse Voltage	200-2500V
Pulse form	exponentially diminishing,
Timer constants	5ms (nominal)
Resistance	600
Capacitor	10uF
Special feature	electronic safety

**FERMENTOR**

Vessel Volume	Total Capacity	10 Liters
	Working Volume	~6.0 Liters
Vessel Construction	Aspect Ratio	3:1
	Fabrication	ASME/CE certified 20 Ra internal finish & 35 Ra external
Controller	Control Station	Controls 1 vessel with 32 control loops. Stores 10 recipes & 8 process variables for trend graphing. Includes an industrial touchscreen monitor / user interface, 3 built-in pumps, and connections for all utilities & communications signals
Temperature	Heat & Sterilization	Electric heaters & automatic sterilization control, capable of achieving temp. rises of ~ 1°C/min.
	Range & Control	Culture temperature 5°C to 80°C, displayed in 0.1°C increments using Platinum RTD probe
Agitation	Drive	Top magnetic drive with single mechanical seal. Digital display in 1 RPM increments
	Range & Control	50 - 1,000 RPM, ±1 at 100 RPM ; ± 2 at 500 RPM ; ± 5 at 1,000 RPM
	Impellers	Two six-bladed Rushton impellers on 7.0 & 14L systems; three impellers on 19.5L systems

Exhaust	Baffles Condenser & Filter	Four 316L removable, stainless steel baffles Stainless-steel exhaust condenser on headplate. 1.2μ disposable depth filter; 0.2μ absolute option
Aeration	Gas System	Standard: 1 Thermal Mass Flow Controller (TMFC) with 0.5 to 25 SLPM flow rate and built in four-gas control (4 solenoid valves).
pH	Gas Inlet Sensor	Ring sparger is provided with 0.2μ absolute disposable filter for use as a sparger or overlay Option of one or two gel pH probe(s) with digital display in 0.01 increments
Range & Control		