

I/13521/2023

**File No: QA-11023/26/2022-QA-FSSAI**  
**Food Safety and Standards Authority of India**  
**(A statutory Authority established under the Food Safety and Standards Act, 2006)**  
**(Quality Assurance Division)**  
**FDA Bhawan, Kotla Road, New Delhi – 110002**

**Dated, the 27<sup>th</sup> October, 2023**

**CORRIGENDUM**

Reference is invited to the GeM Bid No. GEM/2023/B/3917994 Dated 09.10.2023 w.r.t. PROCUREMENT OF EQUIPMENT FOR NFL GHAZIABAD.

2. With the approval of the Competent Authority, some changes in the Specification Document under Technical Specifications of the GeM Bid have been incorporated which will form part of the GeM Bid. The revised Specification Document has been placed at **Annexure-I**.

3. Further, the Bid End Date/ Time and the Bid Opening Date/Time has been extended by 1 week i.e. upto 06-11-2023 16:00:00 and 06-11-2023 16:30:00 respectively.

4. All other terms and conditions of the RFP will remain the same.

**Enclosure:** As stated above.

Digitally Signed by  
Ravinder Kumar Narula  
Date: 27-10-2023 11:13:23  
Reason: Approved

**(Ravinder Kumar Narula)**  
**Assistant Director (QA)**

## 1- Water Purification System

**Application:** Ultrapure water purification system is required for purification of water and making it free of contaminants that interfere with microbiological analysis. An ultrapure water system is equipped with ultra-filters to remove endotoxins, DNase and RNase left over from bacteria destroyed by UV, resulting in extremely low total organic carbon (TOC) and having a resistance of up to 18.2 MΩ/cm

Specifications	Requirements
General	<ul style="list-style-type: none"> <li>• Compact, benchtop system for microbiology / molecular biology/LC-MS/MS grade water applications.</li> <li>• Should deliver ultra-pure product water by point of use dispenser with flexible dispenser, volumetric dispensing and auto shut off facility.</li> </ul>
Quality of water	<p>Should deliver Type I/Ultra– pure as per International specifications as follows:</p> <p><b>First Dispenser:</b></p> <ul style="list-style-type: none"> <li>• Electrical Resistivity Min. 18.2 MΩ/cm @ 25°C</li> <li>• Conductivity 0.055 μS/cm compensated to 25°C</li> <li>• TOC level (system with UV lamp) &lt;5ppb</li> <li>• Flow rate &gt; 1 lit / min</li> <li>• Bacteria &lt;1 CFU/100 ml</li> <li>• Particulates(size&gt;0.22μm) &lt;1/mL</li> <li>• Sodium (ppb)&lt; 1</li> <li>• Chloride (ppb) &lt; 1</li> <li>• Total Silica (ppb) &lt; 3</li> <li>• Pyrogens &lt;0.001 Eu/ml</li> <li>• RNases free, &lt;1pg/ml</li> <li>• DNases free, &lt;5 pg/ml</li> </ul> <p><b>Second Dispenser:</b></p> <p><b>0.22 micron filter as final filter at second dispenser: The 0.22 micron filter with automatic traceability in the system.</b> To deliver the water of following quality:</p> <ul style="list-style-type: none"> <li>• Electrical Resistivity Min. 18.2 MΩ/cm @ 25°C</li> <li>• TOC level (system with UV lamp) &lt;5ppb (μg/L)</li> <li>• Particles: No particles with size &gt; 0.22 μm,</li> <li>• Bacteria &lt;0.005 CFU/mL,</li> <li>• Flow rate drop-by-drop – 2 L/min</li> <li>• minimum Daily Volume required: 25 Lit</li> </ul>
System Requirement	<ul style="list-style-type: none"> <li>• Online TOC monitor should have a minimum detection limit of 1 ppb to 800 ppb or better.</li> <li>• Dual stage Polishing cartridge filled with nano size Ion exchange resins with Activated carbon.</li> <li>• Having environmentally friendly UV lamp ensures oxidation of organic contaminants emitting at 172 nm wavelength.</li> <li>• Dispenser should have dispensing accuracy which will allow adjusting meniscus of the vessel of desired volume to avoid ultrapure water wastage. Volumetric dispensing range: 20 ml to 10 L or better.</li> <li>• System must have manual dispensing, Volume controlled dispensing and time-controlled dispensing modes and have options to set favorite mode.</li> <li>• The delivery unit must be minimum 3 meter away from the main unit. The dispensing unit should have all the information of water quality and instrument performance.</li> <li>• To maintain the consistency of water quality, cartridges should be:- <ul style="list-style-type: none"> <li>▪ Easily replaceable without using any tools through system software guidance</li> <li>▪ Auto-traceability of product code/date of installation/lot No should be in built.</li> <li>▪ Ultra filtration filter should also have traceability, so that the exhaustion can be tracked.</li> <li>▪ Automatic alarms should be available well before exhaustion.</li> </ul> </li> </ul>

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Additional requirements	<ul style="list-style-type: none"> <li>• System should be installed without any tubings or wires noticed for GLP purpose.</li> </ul>
Storage	System should come with an inbuilt storage system of <b>minimum 25 L</b> to store consistently high-quality pure water for prolonged period and prevent Contamination by ambient air.
Feed water	<ul style="list-style-type: none"> <li>• Should have separate feed water (Potable tap water) specific purification cartridge and application specific <b>polishing Cartridge</b></li> <li>• <b>A separate pre-filtration unit must be supplied along with system.</b></li> </ul>
Control display	<ul style="list-style-type: none"> <li>• Should have calibrated meters for continuous monitoring and display of water quality parameters: Product water resistivity / conductivity both compensated and non-compensated mode, product water temperature,</li> <li>• Alarms for product water resistivity greater or below set point</li> <li>• Should have display for maintenance: sanitization/exchange purification cartridges/activation of fast flush/ depressurization / air purge etc.</li> </ul>
Validation	<ul style="list-style-type: none"> <li>• For validation vendor should having its own capability with their own company trained service engineer to perform validation. No third part validation will be entertained. One validation at the time of installation should be done by company personnel.</li> </ul>
Operating manuals, service manuals, other manuals	<ul style="list-style-type: none"> <li>• Should provide: -</li> <li>• User, technical and maintenance manuals in English language</li> <li>• List of equipment and procedures required for local calibration and routine maintenance</li> <li>• Service and operation manuals to be provided advanced maintenance tasks documentation, if any documentation, if any.</li> </ul>
Training	<ul style="list-style-type: none"> <li>• The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications</li> </ul>
<b>Accessories and Consumables</b>	<ul style="list-style-type: none"> <li>• All cartridges, filters, pump or any such item which is/ are essential for Installation and functioning/ operating the equipment <b>has to be supplied for Three Years for trouble free working.</b></li> </ul>
UPS	<ul style="list-style-type: none"> <li>• UPS/Stabilizer as required for functioning of the equipment</li> </ul>
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>• Should be FDA/CE/BIS approved product.</li> <li>• Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent IS/ International Standard)</li> <li>• All suppliers must submit a copy of catalogue showing technical specifications.</li> </ul>
Warranty	<b>Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.</b>
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument

## 2- Muffle Furnace

Specification	Requirements
Inside Chamber Volume	<ul style="list-style-type: none"> <li>15 L or better</li> <li>With lift door with hot surface facing away from the operator and swing aside door at the front</li> </ul>
Furnace construction	<ul style="list-style-type: none"> <li>Double shell steel case with cooling fan to keep outside case cool</li> <li>High purity alumina fiber insulation for max. energy saving</li> </ul>
Temperature Range	1100 °C or better
Temperature accuracy	+/- 2.0 °C or better
Heating element	The chamber section should be heated by Kanthal A-1 resistive wire heating elements
Heating rate	The furnace should be of fast heating type with the maximum attainable temperature should reach as a ramp function in less than one hour.
Thermocouple	Pt. Pt. Rh. Thyristor controller will be provided along with the furnace to measure the temperature with Recrystallized alumina sheath & connecting holder complete set.
Temperature Control	<ul style="list-style-type: none"> <li>PID automatic and programmable power control with necessary safety features.</li> <li>Over-temperature limiter with adjustable cut-out temperature for thermal protection</li> </ul>
Cooling Fan/ Air Circulation	Attached with Furnace, provided inside the control unit to protect
Maximum power	Up to 8 KW
Accessories to be supplied	Al <sub>2</sub> O <sub>3</sub> Sample Plate            1 pcs Al <sub>2</sub> O <sub>3</sub> Furnace Door Block    1 pcs Protection Glove                2 pairs Crucible Clip                      1 pair Crucibles                            6 pcs
Other	Should have the option to connect exhaust gas hood, N2 gas inlet purging and temperature output terminal.
Operating manuals, service manuals, other manuals	Should provide: - <ul style="list-style-type: none"> <li>User, technical and maintenance manuals in English language</li> <li>List of equipment and procedures required for local calibration and routine maintenance</li> <li>Service and operation manuals to be provided advanced maintenance tasks documentation, if any.</li> </ul>
Training	The supplier will have to carry out successful Installation at the laboratory premises (where ever the system has to be installed)
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>Should be FDA/CE/BIS approved product.</li> <li>Electrical safety conforms to the standards for electrical safety IEC 60601-General requirements (or equivalent IS/ International Standard)</li> <li>All suppliers must submit a copy of catalogue showing technical specifications.</li> </ul>
Warranty	Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.

<b>3- Chiller Circulator (-20 °C)</b>	
<b>Specification</b>	<b>Requirements</b>
General	High efficiency refrigerant chiller circulator with two circulation systems
Working temperature	- 20 °C to ambient temperature or higher
Temperature Accuracy	+/- 2.0 °C or better
Display and setting	LED Digital splash-proof keypad with temperature display and setting, Pressure display
Internal temperature sensor	Pt100 or thermocouple sensor
Temperature setting & Temperature display resolution	0.1°C
Tank capacity	Stainless steel tank with minimum capacity of 7 litres
Refrigerant	<b>R-134</b> or equivalent, CFC free refrigerant
Circulating Pump	Flow rate (max)- 10 L/min or more
Noise level, (dB max)	≤ 70
Training	The supplier will have to carry out successful Installation at the laboratory premises (where ever the system has to be installed)
UPS	UPS/Stabilizer as required for functioning of the equipment
Operating manuals, service manuals, other manuals	Should provide: - <ul style="list-style-type: none"> <li>• User, technical and maintenance manuals in English language</li> <li>• List of equipment and procedures required for local calibration and routine maintenance</li> </ul> Service and operation manuals to be provided advanced maintenance tasks documentation, if any.
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>• Should be FDA/CE/BIS approved product.</li> <li>• Electrical safety conforms to the standards for electrical safety IEC 60601-General requirements (or equivalent IS/ International Standard)</li> <li>• All suppliers must submit a copy of catalogue showing technical specifications.</li> </ul>
Warranty	Minimum three years comprehensive onsite warranty with one Preventive Maintenance and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.

## 4- Analytical Balance (Type-I)

Specification	Requirement
Capacity	220 g
Readability	0.1 mg (0.0001 gm)
Repeatability (Standard deviation)	±0.1 mg
Linearity	±0.2 mg or better
Response time	Less than 10 sec
Stabilization (typical and fast)	Approx. 4.0 sec
Tare facility	Yes
Calibration (internal)	<ul style="list-style-type: none"> <li>Fully automatic, time/temperature controlled internal calibration</li> <li>Should be capable to adjust itself</li> <li>Must be provided with calibration certificate by an agency accredited by NABL or with traceable to International Standard.</li> </ul>
Balance levelling	Balance should indicate immediately as & when it is required to be levelled and Should have the facility for <b>Glass level indicator with air bubble for centering or automatic motorized levelling.</b>
Weight Box traceable to international standards	<ol style="list-style-type: none"> <li>1 mg - 200 g, E2 (1 no)</li> <li>Accuracy class acc. to OIML R111: E2</li> <li>Nominal mass value: 1 mg to 200 g. Up to 500 mg as wire weights</li> <li>Susceptibility: 0.002 – 0.004</li> <li>Material: special steel, non-magnetizable, density 8.0 g/cm<sup>3</sup>, highly corrosion-resistant, knob weights highly polished and laser marked, in wooden case.</li> </ol>
Operational requirements	<ul style="list-style-type: none"> <li>Digital display: Backlit display with <b>touch screen operation</b> along with accessibility to date and time etc. <b>Touch screen with graphical user interface with Mixing, Components, Statistics, Conversion built in functions.</b></li> <li>To have inner adjustable draft shield</li> <li>Glass draft shield with flexible configuration for left/right hand operation</li> <li>Weighing with automatic and manual start and provision for data interface the manufacturer to provide the specification data needed to facilitate calculation of uncertainty</li> <li>Availability of USB Ports for data transfer</li> <li><b>Printer has to be provided with the balance</b></li> </ul>
Environmental factors	<ul style="list-style-type: none"> <li>Safety for electromagnetic compatibility</li> <li>Permanent shock absorption facility</li> <li>Capacity of operating in temperature range <b>5 deg C to 45 deg C storage and Shipping -10 deg C to 60 deg C</b> and relative humidity of 80%</li> </ul>
Training	The supplier to carry out successful Installation at the laboratory premises (where ever the system has to be installed) and provide on-site comprehensive training for a minimum of two scientific personnel operating the system till customer satisfaction
Back-up rechargeable battery	Back-up battery for use of equipment during power shut down.
Operating manuals, service manuals, other manuals	<p>Should provide: -</p> <ul style="list-style-type: none"> <li>User, technical and maintenance manuals in English language</li> <li>List of equipment and procedures required for local calibration and routine maintenance</li> </ul> <p>Service and operation manuals to be provided advanced maintenance tasks documentation, if any.</p>
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>Should be FDA/CE/BIS approved product.</li> <li>Electrical safety conforms to the standards for electrical safety IEC 60601-General requirements (or equivalent IS/ International Standard)</li> <li>All suppliers must submit a copy of catalogue showing technical specifications.</li> </ul>

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Warranty

Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.

## 5- Analytical Balance (Type-II) – Semi Micro Balance

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1.	Capacity	60   120   220 gram
2.	Readability	0.01   0.02   0.05 mg
3.	Repeatability	0.01 mg
4.	Linearity Deviation	0.15 mg or better
5.	Sensitivity offset, Nominal load	0.2 mg or better
6.	Minimum Weight (k=2, U=1%)	Minimum weight as per OIML R 76: - 5 mg or better
7.	Minimum Weight (according to USP)	20 mg
8.	Stablization Time	< 2 Sec
9.	Weighing Pan	70 X 70 mm or better. Weighing Cell should be at the back side and Linkage between weighing cell and pan should be at the level above that of weighing pan
10.	Draft Shield	Balance should be provided with motorized Glass Draft Shield
11.	Antistatic Solutions	Balance should be capable of attaching antistatic kit to remove static charge on filter paper, flask or tare container
12.	Status indicator Light	Balance should have Light indication for various status of balance like stability, level state of the balance, minimum weight, tolerance state and test and adjustment state.
13.	Display	4.3 inch capacitive color touch screen/touch pad or better
14.	Hands free Operation	Balance should be upgradable to attach sensors for hands free operation for auto door opening.
15.	Cleaning	Balance pan parts should be easily removable for cleaning purpose
16.	Method Library	Balance should store and allow user to access methods (including sample series and tolerances)
17.	USB Data Storage	Balance should have USB port to connect USB storage device to export data.
18.	User Management	Balance should be configurable with user with password for administrative controls.
19.	Internal Adjustment	Time and Temperature based adjustment with internal weights
20.	Level Adjustment Guide	Balance should provide level warning in case of out of level and should not allow user to add result to protocol if balance is not levelled. Graphical level bubble should be provided for leveling
21.	Assured Weighing Quality	Balance should be configurable to set reminder for calibration and calibration of test weight. It should be possible to block the balance if balance is not calibrated.
22.	Data Input	Balance should have provision to attached barcode reader and define content of barcode so that data can be captured from barcode reader
23.	Operating manuals, service manuals, other manuals	Should provide: - <ul style="list-style-type: none"> <li>User, technical and maintenance manuals in English language</li> <li>List of equipment and procedures required for local calibration and routine maintenance</li> </ul> Service and operation manuals to be provided advanced maintenance tasks documentation, if any.
24.	Recommendations or Warnings	Any warning signs would be adequately displayed
25.	Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>Should be FDA/CE/BIS approved product.</li> <li>Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent IS/ International Standard).</li> </ul>



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- All suppliers must submit a copy of catalogue showing technical specifications

26. Warranty

Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.

<b>6- Ultra Low Temperature Vertical Deep Freezer</b>	
<b>Specification</b>	<b>Requirements</b>
Type	Vertical
Interior	Full stainless steel which can be easily cleaned and eliminates any possibility of rusting
Position of Door	Front
Type of Insulation	PUF plus Vacuum insulation panel
Frost Free	Yes
Capacity	Capacity: 100 L or higher with minimum 5 racks that can be adjusted for storage flexibility
Type of Cooling	Direct
Castor	Heavy Duty Lockable
Shelves/ Drawers	Sealed 5-7 pullout drawers / shelves of different sizes that can be adjusted for storage flexibility
Material of Chamber Interior	Stainless steel, preferably 304 grades
Material of Chamber Exterior	Stainless steel, preferably 304 grades
Door Material	Stainless steel, preferably 304 grades
Temperature Range	- 40 °C to - 80 °C or better
Temperature Uniformity in Degree Celsius	±3 °C or less
Temperature Stability of System in Degree Celsius	±3 °C
High Quality Door Seals	Yes
Lockable Outer and Inner Lids	Yes
Control	Fully programmable microprocessor controlled with membrane keypad
Display	Easy to read, LED control panel and alarm status with integrated diagnostics
Acoustic Safety alarms	Should be equipped with alarms for <ul style="list-style-type: none"> <li>• High/Low Temp</li> <li>• Hot Condenser</li> <li>• Power Failure</li> <li>• High/Low Voltage</li> <li>• Sensor Error</li> <li>• High Ambient Temp</li> <li>• Door Ajar</li> </ul>
Temperature History	Data logger for temperature and temperature history which can be downloaded via a USB port Yes
Should Have Battery Back Up for The Display and Security Lock for The Display	Yes
Refrigerants	CFC-Free, HCFC-Free non inflammable refrigerants at ambient temperatures and atmospheric pressure
CO <sub>2</sub> cylinder should be supplied with freezer for backup	Yes (Optional)
Accessories	Stainless steel racks – at least 5 racks, Rack Holders – to hold the required racks given, Cryo boxes- 2

Operating manuals, service manuals, other manuals	Should provide <ul style="list-style-type: none"> <li>• User, technical and maintenance manuals in English language</li> <li>• List of equipment and procedures required for local calibration and routine maintenance</li> <li>• Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.</li> </ul>
Warranty of stabilizer in years	3 Year
Warranty of compressor in years	10 years or more
Voltage Stabiliser	Stabilizer as required for functioning of the equipment
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>• Should be FDA/CE/BIS approved product.</li> <li>• Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent IS/ International Standard)</li> <li>• All suppliers must submit a copy of catalogue showing technical specifications.</li> </ul>
Warranty	Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.

<b>7- Incubator (Peltier based)</b>	
<b>Specification</b>	<b>Requirements</b>
Type	Compact table top model CFC free, low vibration, with cooler equipped with energy saving peltier based heating and cooling.
System	Forced Convection
Capacity	Capacity: 100 L or higher
Material of Chamber Interior	Stainless steel, preferably 304 grades with atleast two rack holders
Material of Chamber Exterior	Stainless steel, preferably 304 grades
Door Material	fully insulated stainless steel door with proper locking system
Temperature Range	0 °C to 60 °C or better
Temperature Uniformity in Degree Celsius	± 0.5 °C or better
Heating /Cooling	Peltier element based for less energy consumption
Control	Fully programmable microprocessor controlled with membrane keypad and eye level control panel
Display	Easy to read, LED control panel and alarm status with integrated diagnostics
Temperature History	Data logger for temperature and temperature history which can be downloaded via a USB port Yes
Accessories	Stainless steel racks
Warranty of stabilizer in years	3 Year
Voltage Stabiliser	Stabilizer as required for functioning of the equipment
Operating manuals, service manuals, other manuals	<p>Should provide: -</p> <ul style="list-style-type: none"> <li>• User, technical and maintenance manuals in English language</li> <li>• List of equipment and procedures required for local calibration and routine maintenance</li> </ul> <p>Service and operation manuals to be provided advanced maintenance tasks documentation, if any.</p>
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>• Should be FDA/CE/BIS approved product.</li> <li>• Electrical safety conforms to the standards for electrical safety IEC 60601-General requirements (or equivalent IS/ International Standard)</li> <li>• All suppliers must submit a copy of catalogue showing technical specifications.</li> </ul>
Warranty	Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.

<b>8- Laboratory Grinding Mill</b>	
<b>Specifications</b>	<b>Requirements</b>
General	Cyclone type bench top sample mill (Lab scale).
Grinding speed	Micro switch- based system with Three high grinding speed (10000/12000/14000 rpm) for the grinding of samples like grains, seeds, cereals, hard boiled confectionery etc.
Grinding principle	Impact
Grinding ring	Aluminum
Sample volume	Should be able to grind samples with different moisture levels i.e. from 10% or less to 15%
Feed Size	<10 mm
Final Fineness	<250µm
Rotor Peripheral Speed	50/62/93 m/s
Sample composition	Should be able to grind samples with up to 15% moisture and/or fat content up to 20
Final particle size	Should have capability to grind sample size of up to 10 mm or more; Should have grinding rate of ≥4g/sec Should have provision for adjustable particle size; Should be supplied with Screen sieves for 0.5 mm, 2 mm, 1 mm, 0.8mm(Stainless Steel Grinding Ring with CrWFe Coating , should be provided for defined particle size There should be no/ minimum thermal degradation of the sample during grinding
Noise level	Low noise level of ≤80 dBA
Accessories	Sample bottles 250 ml and seal Accessory to enable pouring of samples into the milling zone Dust collection accessories Seal kit Minimum 50 sample bottles Adapter for Connection of Vacuum Cleaner
Power requirements	230 V / 50 Hz – 230V/60Hz
Operating manuals, service manuals, other manuals	Should provide: - <ul style="list-style-type: none"> <li>• User, technical and maintenance manuals in English language</li> <li>• List of equipment and procedures required for local calibration and routine maintenance</li> </ul> Service and operation manuals to be provided advanced maintenance tasks documentation, if any.
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>• Should be FDA/CE/BIS approved product.</li> <li>• Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent IS/ International Standard)</li> <li>• All suppliers must submit a copy of catalogue showing technical specifications.</li> </ul>
Warranty	Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.

9- Homogenizer/ Grinder	
<b>Application:</b> A homogenizer is used for the proper mixing and comminution of the food sample to obtain a homogenous mixture prior to analysis	
Specifications	Requirement
General	It should be macerating and homogenizing of a variety of high moisture, high-fat and fibrous samples such as meat, fish, fruit, vegetables, prepared foods frozen meals, etc. Should allow frozen food samples to be homogenized in a short period of time, providing more.
Motor	Powerful 1500 rpm single phase motor or better
Bowl	It Should have 5 L or better, stainless steel bowl.
Sample capacity	0.1 – 3 kg sample capacity for homogenization
Mode	Pulse mode for frozen food applications
Blades	Blades should be multi-purpose stainless steel micro teeth blades as per standard SS316. Extra stainless-steel bowls and smooth blade cutter should be provided (01 Set).
Safety	A magnetic safety switch should be available from being operated without the transparent cover in the locked position.
Power supply	230V/50Hz, single phase with inbuilt/external protection for high/low voltage.
Voltage Stabilizer	Supplied with a suitable voltage stabilizer
Operating manuals, service manuals, other manuals	Should provide: - <ul style="list-style-type: none"> <li>• User, technical and maintenance manuals in English language</li> <li>• List of equipment and procedures required for local calibration and routine maintenance</li> </ul> Service and operation manuals to be provided advanced maintenance tasks documentation, if any.
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>• Should be FDA/CE/BIS approved product.</li> <li>• Electrical safety conforms to the standards for electrical safety IEC 60601-General requirements (or equivalent IS/ International Standard)</li> <li>• All suppliers must submit a copy of catalogue showing technical specifications.</li> </ul>
Warranty	Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.

<b>10- Nitrogen Evaporator</b>	
<b>Requirements</b>	<b>Specifications</b>
<b>General</b>	<ul style="list-style-type: none"> <li>A bench top work station Microprocessor based, High speed, small volume workstation to accommodate 50 tubes of different capacity (2 mL to 30 mL), through Gas vortex shearing action for evaporation.</li> <li>Each 10- position row can work independently Closed system with exhaust facility</li> </ul> All racks to be supplied
<b>Operation</b>	<ul style="list-style-type: none"> <li>Simultaneous automated concentration of multiple samples and unattended operation, automatic gas shut off and operational diagnostics</li> </ul>
Display	LED/LCD
Pressure display	Bar/PSI/KPA unit selection
Keypad	Soft touch operation
Thermostatic water bath	<ul style="list-style-type: none"> <li>Temperature range ambient to 90°C or better</li> <li>Temperature Accuracy: +/-2 °C</li> </ul>
Gas Regulator and Gauge Range	0 to 30 psi.
Accessories	<ul style="list-style-type: none"> <li>Evaporation tubes- 500 Nos (100 each of 2 mL, 5mL, 10mL, 20mL and 30 mL)</li> <li>Rack type- one for each holding minimum volume of tubes 2 mL, 5mL, 10mL, 20mL and 30 mL)</li> <li>Gas connection tubes – 20 mtr.</li> <li>Power cable – 1No</li> </ul>
Power requirements	230 V / 50 Hz – 230V/60Hz
Operating manuals, service manuals, other manuals	Should provide: - <ul style="list-style-type: none"> <li>User, technical and maintenance manuals in English language</li> <li>List of equipment and procedures required for local calibration and routine maintenance</li> </ul> Service and operation manuals to be provided advanced maintenance tasks documentation, if any.
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>Should be FDA/CE/BIS approved product.</li> <li>Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent IS / International Standard).</li> </ul> All suppliers must submit a copy of catalogue showing technical specifications.
Warranty	<b>Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.</b>

## 11- Microwave Digestion System

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**Application:** Microwave digestion is a common technique used for elemental analysis. It is used to digest the food samples.

Requirement	Specification
General	The instrument should have a superior pressure venting which is not temperature dependent so as to prevent any loss of volatile metals and should have homogeneous microwave field to avoid sample burning
System	<p>Microwave digestion system should have temperature and pressure control mechanism.</p> <p>The system should be software controlled. Different types of rotors available for the digestion of the different type samples should also be quoted.</p> <p>Necessary consumables and maintenance parts should also be quoted to run instrument trouble free</p>
Instrument Design	<p>The system should be a standalone work station and should have</p> <ul style="list-style-type: none"> <li>• The System should have the feature of simply choose a method and it automatically recognizes the vessel type, counts the vessels and determines all of the parameters necessary for a fast, complete digestion</li> <li>• Should have provision that user can set the desired parameters for digestion</li> <li>• Should have Automatic Microwave power application depending on the load</li> <li>• Auto sensing of temperature and pressure inside the vessel</li> <li>• Be capable of processing different amounts of samples (from 0.3 g up to 1 g per vessel/) in the same run assuring the same conditions of temperature and pressure</li> </ul>
Display	<p>The Instrument should have the high-resolution, colour touch screen, acid resistant, LED/LCD screen should serve as controller and display</p> <p>Should provide training videos for sample preparation vessel assembly, system use, and maintenance</p> <p>Should have Data management – Easy access to stored methods, real-time data and results of past runs</p> <p>Should be able to display the detailed methods, graphs of temperature and power against time and temperature of individual vessels.</p>
Interlocks	The system should have good interlocking system for safety and cavity door.
Rotor & Vessel Assembly	<p>High pressure and high temperature rotor with at least 20 PTFE vessels, work station &amp; with/ without torque wrench.</p> <p>Vessels on the rotor should be segmented for easy use.</p> <p>Maximum Temperature capacity of vessel up to 300 °C</p> <p>Working Pressure capacity of vessel up to 35 bar or more. The maximum pressure capacity of vessel shall be 80 bar or better</p> <p>Vessel volume: The capacity of 50 ml and <b>and above</b> offered vessels to be provided should be able to handle volumes as minimum as 3 ml, 10 ml, 15 ml &amp; 25ml</p> <p>Vessel Material- PTFE-TFM</p> <p>Every vessel must have a vent-and-reseal spring to safely release the pressure in case of overpressure.</p> <p>Burst-disk membrane or self-releasing / continuous venting device are not suitable due to very low performance.</p>



Magnetron	<p>Dual Magnetron system with rotating microwave diffuser for homogenous microwave power distribution in the cavity.</p> <p>Microwave frequency should be 2450 MHz and installed power should be 1900W minimum (two magnetrons minimum 950 W each) and should provide the temperature needed (300 °C) for difficult samples</p>
Microwave Cavity	<p>The cavity should be made of non-magnetic Rugged high-grade 316 solid steel cavity/ stainless-steel housing with PTFE plasma coating applied at 350 °C for corrosion resistance.</p> <p>Also, all hardware should have 5-layer protective coating for the resistance from acid, alkali and corrosive gases.</p> <p>The Cavity should be constructed with</p> <p>The vessel assembly during a run should be visible from outside</p>
Hardware & Safety	<ol style="list-style-type: none"> <li>a. Instrument should have adequate safety coatings on housing to prevent any corrosion in the cavity. Additional multiple ports on the side walls of the microwave cavity</li> <li>b. Protected against acids and solvents with polymer coating on both inner and outer surfaces</li> <li>c. Self-resealing pressure responsive and explosion resistant door to ensure</li> <li>d. maximum safety even in case of overpressure release</li> <li>e. Door completely made of 18/8 stainless steel with <b>glass window or sighting provision</b>.</li> <li>f. Independent door safety interlocks to prevent microwave emission</li> <li>g. Built-in exhaust system located above the microwave cavity and separated from the electronics to prevent corrosion</li> <li>h. Magnetron protection from reflected microwave power</li> <li>i. Continuous and <b>software-controlled</b> microwave emission at all power levels</li> </ol>
Sensors	<ol style="list-style-type: none"> <li>1. Temp sensor should be integrated in the system for monitoring &amp; controlling each vessel and cavity temp. Temperature of each vessel should be displayed</li> <li>2. The software should automatically reduce the microwave power in case of over temperature avoiding sample loss</li> <li>3. Automatic Pressure control: should have a pressure sensor/ mechanical pressure control/ <b>pressure monitoring on the control panel</b> which has a total capability of up to 500psi automatically control the pressure. It should be possible to remove the pressure device at a high pressure. The Vessels should act as self-regulators of pressure</li> </ol>
Control: User interface	<p>Software must allow the user to edit, save and run multistep unlimited number of methods (minimum 2000) with atleast 20GB on board / built in memory for storage of data</p> <p>The software must control all parameter online and display temperature, time and power directly on the terminal/computer.</p> <p>The control terminal should have high resolution LED/LCD Acid Resistant display (<b>minimum 6.5 inch Touch screen</b>).</p> <p>Should have provision for manual programming storage apart from pre-installed program. Continuous display of temperature and power inside the reaction vessels is required</p>
Output	<p><b>Suitable ports may be provided</b> for connecting PC balance and service check</p>
Operating manuals, service manuals, other manuals	<p>Should provide: -</p> <ul style="list-style-type: none"> <li>• User, technical and maintenance manuals in English language</li> <li>• List of equipment and procedures required for local calibration and routine maintenance</li> </ul> <p>Service and operation manuals to be provided advanced maintenance tasks documentation, if any.</p>
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>• Should be FDA/CE/BIS approved product.</li> <li>• Electrical safety conforms to the standards for electrical safety IEC 60601-</li> </ul>

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	General requirements (or equivalent IS/ International Standard) <ul style="list-style-type: none"><li>All suppliers must submit a copy of catalogue showing technical specifications.</li></ul>
Warranty	Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument

## 12- Circulating Water Bath

Requirement	Specifications
Description of function	Gentle water circulation to achieve uniform temperature
Body	Epoxy Powder Coated exterior made with corrosive resistant stainless steel interior chamber. Interior: Made of Stainless steel (SS 304)
Capacity	10-15 Litres
Temperature Range	Working temperature range from +20°C to +99.9 °C
Resolution	±0.1°C
Temperature uniformity/	Temperature uniformity @ 37°C maintained at different places of water bath.
Temperature Stability	±0.2 °C
Maintenance	Convenient bath drains to easily clean and maintain bath
Top cover	Lift-up bath cover
Alarms	Audible alarms for Dry-running protection and over temperature
Safety features	<ul style="list-style-type: none"> <li>Self-diagnosis function (Heater defective, Sensor defective, Set value abnormal, SSR short circuit and Overheat protector) Warning buzzer and alarm lamp, Over current, short circuit breaker, Heater no-load operation prevention device</li> </ul>
Display	<ul style="list-style-type: none"> <li>Bright LED-Display with cutting-edge microprocessor technology with PID temperature control.</li> </ul>
Timers	Optimize scheduling with auto-on and auto-off timers
Accessories	<ul style="list-style-type: none"> <li>Stainless Steel / Polypropylene Test tube rack for 15-21 tubes of 23-25 mm and 25 -60 tubes of 12-16 diameter(each) 1no each</li> <li>Spring Tray / racks for Erlenmeyer flasks (250 and 500 mL) and beakers</li> </ul>
Operating manuals, service manuals, other manuals	<p>Should provide:-</p> <p>Calibration certificate for temperature from ISO/IEC 17025 certified laboratory.</p> <p>User, technical and maintenance manuals in English language</p> <p>List of procedures required for local calibration and routine maintenance service and operation manuals to be provided Advanced maintenance tasks documentation, if any.</p>
Supplier/ Manufacturer	<ul style="list-style-type: none"> <li>Should be FDA/CE/BIS approved product.</li> <li>Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent IS or International Standard)</li> </ul> <p>All suppliers must submit a copy of catalogue showing technical specifications.</p>
Warranty	<p>Minimum three years comprehensive onsite warranty with two Preventive Maintenance services and unlimited breakdown services and equipment calibration from the date of installation and commissioning every year. Warranty to be provided by OEM/Manufacturer.</p>