

ANNEX 01: TECHNICAL SPECIFICATION

1. Portable Electric Suction Machine	
Quantity	5
Intended Use	The suction machine shall be a portable, electrically powered aspirator intended for removal of secretions, blood, and other body fluids during routine patient care, emergency treatment, bedside procedures, and minor surgical procedures in hospitals and healthcare facilities.
General Requirements	- The suction machine should be electrically powered and suitable for continuous clinical use. - The unit shall be compact, robust, and mounted on a mobile trolley with smooth-rolling castors for easy transportation. - The suction pump shall be oil-free, low-maintenance, and designed for quiet operation. - External surfaces shall be smooth, corrosion-resistant, and compatible with standard hospital cleaning and disinfection procedures.
Suction Performance	- The maximum adjustable vacuum shall be not less than -800 mmHg (approximately - 80 kPa). - The vacuum shall be continuously adjustable from zero to the maximum operating vacuum using an easily accessible vacuum regulator. - A clear analogue or digital vacuum gauge shall display suction pressure in mmHg, kPa, or both. - The free air flow rate shall be not less than 40 L/min.
Collection System	- The suction machine shall be supplied with two (2) reusable collection jars, each having a minimum capacity of 2 liters. - Collection jars shall be manufactured from durable, transparent, autoclavable material suitable for repeated clinical use. - Jar lids shall provide airtight sealing and be compatible with repeated cleaning and sterilization. - Tubing connections should be leak-resistant and easily replaceable.
Safety Features	Each collection jar shall incorporate an automatic overflow shut-off (float valve) to prevent fluid contamination of the pump.

	- The suction system shall include a hydrophobic bacterial/viral filter positioned between the collection jar and the pump to protect the equipment from contamination. - The bacterial/viral filter shall be easily replaceable and intended for single use unless otherwise specified by the manufacturer. - The suction system shall incorporate protection against accidental fluid ingress into the pump.
Noise Level	The operating noise level shall not exceed 55 dB(A) when measured under the manufacturer's specified test conditions.
Electrical Requirements	- The equipment shall operate on: ➤ 220–240 VAC ➤ 50 Hz - The unit shall be supplied with a 13 A UK Type G power plug.
Accessories	The following shall be supplied with each suction machine: - Two (2) autoclavable collection jars (minimum 2 L each) - Two (2) airtight jar lids - Two (2) rubber sealing rings/gaskets - Ten (10) compatible hydrophobic bacterial/viral filters - Patient suction tubing - Connecting tubing - Mobile trolley with castors - Power cord - All accessories required for immediate clinical operation The supplier shall provide a complete list of supplied accessories with manufacturer part numbers.
Standards and Regulatory Compliance	- The offered product shall be CE marked under the European Medical Device Regulation (EU MDR) or approved/cleared by a recognized regulatory authority such as the US FDA. - The manufacturer shall maintain an ISO 13485-certified Quality Management System. - The equipment shall comply with applicable IEC 60601 series medical electrical safety standards. - The equipment shall be supplied new and unused.

Documentation	The supplier shall provide the following documentation in English: ➤ User Manual ➤ Technical/Service Manual ➤ Preventive Maintenance Manual ➤ Product brochure or technical datasheet ➤ Spare parts list with manufacturer part numbers ➤ Manufacturer's Declaration of Conformity or equivalent regulatory documentation
Training	• The supplier shall provide user orientation covering: ➤ Safe operation ➤ Cleaning and disinfection ➤ Replacement of filters and collection jars ➤ Routine preventive maintenance • Basic maintenance guidance shall be provided to biomedical personnel if requested.
Warranty	• The suction machine shall be covered by a minimum comprehensive warranty of (24) months from the date of delivery and acceptance by the purchaser. • The warranty shall cover defects in materials and workmanship, including: ○ Suction pump ○ Vacuum regulator ○ Vacuum gauge ○ Electrical components ○ Trolley • Consumable items such as bacterial filters, tubing, and rubber seals may be excluded from warranty coverage unless defective at delivery. • During the warranty period, defective equipment shall be repaired or replaced at no additional cost for the purchaser.

2. Vital Signs Monitor with Mobile Stand	
Quantity	5
Intended Use	The vital signs monitor shall be a portable, multiparameter monitor intended for routine monitoring of adult and pediatric patients in hospitals and healthcare facilities. The monitor shall measure non-invasive blood pressure (NIBP), oxygen saturation (SpO ₂), pulse rate, and body temperature.
General Requirements	- The monitor shall provide fast, accurate, and continuous or spot-check measurement of patient vital signs. - The display shall be a clear, high-resolution color LCD or TFT screen displaying numerical values, waveforms (where applicable), alarm status, battery status, and operating menus. - The display size should be not less than 6 inches. - The monitor shall be lightweight, portable, and mounted on a stable mobile stand. - The enclosure shall be durable, easy to clean, and resistant to routine hospital disinfectants. - The monitor shall be suitable for use with adult and pediatric patients.
Battery	- The monitor shall incorporate an internal rechargeable battery. - Battery operating time shall be not less than 4 hours under normal monitoring conditions (or the manufacturer's standard operating specification if greater). - Battery charging status and remaining capacity shall be displayed.
Measured Parameters	A. Oxygen Saturation (SpO₂) - The monitor shall provide continuous and spot-check measurement of functional oxygen saturation (SpO₂). - Display shall include: - Numeric SpO₂ value - Pulse rate - Plethysmographic waveform - Measurement range: 0–100% SpO₂ - Accuracy: ±2% within the range 70–100% SpO₂
	B. Pulse Rate

	• Pulse rate shall be derived from the SpO₂ sensor. • Measurement range: ➤ 30–250 beats/minute (bpm) or wider. • Accuracy: ➤ ±2 bpm or better. C. Temperature • Temperature measurement shall be provided using skin, axillary, or tympanic probes, as supported by the manufacturer. • Measurement range: ➤ 30–45 °C (or wider as specified by the manufacturer). • Accuracy: ➤ ±0.2 °C or better within the clinical measurement range. D. Non-Invasive Blood Pressure (NIBP) • The monitor shall provide automatic, manual, and interval NIBP measurements. • Measurement ranges shall include adult and pediatric patients: ➤ Systolic: 30–255 mmHg ➤ Diastolic: 15–220 mmHg ➤ Mean Arterial Pressure (MAP): 20–235 mmHg • Measurement accuracy: • ±3 mmHg or better.
Alarm System	• The monitor shall provide audible and visual alarms for, at minimum: ➤ Low SpO₂ ➤ High and low pulse rate ➤ High and low NIBP limits ➤ Probe disconnected or sensor fault ➤ Low battery ➤ Technical malfunction • Alarm limits shall be user-adjustable. ➤ Alarm priority and behavior shall comply with IEC 60601-1-8 or equivalent alarm standards.

Mobile Stand	- The monitor shall be supplied with a dedicated mobile stand incorporating: ➤ Stable base ➤ Minimum five swivel castors ➤ At least two lockable wheels ➤ Cable management provision ➤ Accessory basket or storage shelf (preferred)
Accessories	Each monitor shall be supplied with the following as a minimum: ➤ One (1) SpO₂ patient cable ➤ One (1) reusable adult SpO₂ sensor ➤ One (1) reusable pediatric SpO₂ sensor ➤ One (1) temperature probe suitable for the supplied measurement method ➤ One (1) adult NIBP cuff (Large) ➤ One (1) adult NIBP cuff (Extra Large) ➤ One (1) pediatric NIBP cuff ➤ NIBP hose ➤ Rechargeable battery (installed) ➤ Power cord with 13 A UK Type G plug ➤ Mobile stand ➤ All accessories required for immediate clinical operation
Electrical Requirements	- Power supply: ➤ 220–240 VAC ➤ 50 Hz - Equipment shall be supplied with a 13 A UK Type G power plug.
Standards and Regulatory Compliance	- The offered product shall be CE marked under the European Medical Device Regulation (EU MDR) or approved/cleared by one recognized regulatory authority such as the US FDA. - The equipment shall comply with: ○ IEC 60601-1 (Medical Electrical Equipment – General Safety) ○ IEC 60601-1-2 (Electromagnetic Compatibility) ○ IEC 60601-1-8 (Alarm Systems) - The manufacturer shall maintain an ISO 13485-certified Quality Management System. - The equipment shall be supplied new and unused.

Documentation	The supplier shall provide the following documentation in English: ➤ User Manual ➤ Technical/Service Manual ➤ Preventive Maintenance Manual ➤ Product brochure or technical datasheet ➤ Spare parts list with manufacturer part numbers ➤ Manufacturer's Declaration of Conformity or equivalent regulatory documentation
Training	• The supplier shall provide basic user training covering: ➤ Device operation ➤ Alarm management ➤ Cleaning and disinfection ➤ Routine preventive maintenance • Basic maintenance orientation shall be provided to biomedical personnel if requested.
Warranty	• The vital signs monitor shall be covered by a minimum comprehensive warranty of twenty-four (24) months from the date of delivery and acceptance by the purchaser. ➤ The warranty shall cover defects in materials and workmanship, including: ➤ Main monitor ➤ Display ➤ Internal battery (subject to the manufacturer's standard battery warranty) ➤ NIBP module ➤ SpO₂ module ➤ Temperature module ➤ Internal electronics • Consumable accessories (such as cuffs, probes, or cables) shall be covered against manufacturing defects at delivery and during the warranty period in accordance with the manufacturer's warranty terms. • During the warranty period, defective equipment shall be repaired or replaced at no additional cost to the purchaser.

3. Infusion Pump	
Quantity	20
Delivery Rate	Volume preselection: 0.1- 99.99 ml in increments of 0.01ml 100.0 - 999.0 ml in increments of 0.1ml 1000 – 99999 ml in increments of 1ml
Bolus parameters	- Bolus volumes: 0.1 – 99.9/500ml - Bolus delivery rate: 1 – 999ml/h - Interval times: max 99h 59min
KVO-rate	- Delivery rate $\geq$ 10 ml/h: KVO-rate 3 ml/h - Delivery rate $<$ 10 ml/h: KVO-rate 1 ml/h - Delivery rate $<$ 1 ml/h: KVO-rate = set rate (default setting 0.1ml/h)
Function spectrum	- Delivery volume pre-setting: 0.1-9999.9ml - Time pre-selection: max 99h 59min - Automatic calculation of the delivery rate: based on volume and time pre-selection - Dose calculation: automatic calculation of the delivery rate, ml/h based on the entry of the drug concentration in conjunction with the desired dosage, selectable in microgram, mg, IE, mmol, body weight and time-based, e.g.mg/kg/min - Standby pause: max 24h, set values remain stored - History: times-based storage of 350 actions for therapy analysis
Display	- Delivery rate, current infusion, infused volume/time, dose - Mains / Battery operation, battery capacity
Safety system	- Deactivation of drip control in conjunction with volume pre-selection - Flow clamp: prevent free flow when pump door is open - Air detector: Minimizes the risk of air detection - Selectable occlusion alarm pressure setting: 0.6/1.2bar - Date lock: keys are blocked - Visual and acoustic alarms with interruption of pump operation: signals delivery failure in case of system defects, pressure alarm, stand-by alarm, battery alarm - Staff call connection
History Protocol	3000 last history entries 100 events for system diagnose

Mains/Battery operation	• Voltage 230V AC – 50Hz • Battery operating time: Minimum 10 h
Warranty	• Minimum 12months
Standards	• Must comply with CE standards
Accessories	• Original Administration sets for the pump model – 500pcs for each unit • Provide user and technical manuals

4. Forced-Air Patient Body-Warming System	
Quantity	3
Scope	The equipment shall be a reusable forced-air patient warming system designed to provide controlled thermal management and reduce/prevent inadvertent perioperative hypothermia in patients. The system shall consist of a warming unit/blower and compatible disposable or reusable patient warming blankets designed to distribute temperature-controlled air over or around the patient's body.
Operating Principle	• The system shall use forced-air convection technology for patient warming. • Ambient air shall be drawn into the warming unit, filtered, heated to the selected temperature, and delivered through a flexible hose to the patient's warming blanket. • The blanket shall distribute warm air uniformly over the intended patient area. • The system shall provide controlled airflow and temperature to maintain the selected warming condition.
Warming Unit	The warming unit shall have the following minimum features: • Microprocessor-controlled or equivalent electronic temperature regulation. • Multiple selectable temperature settings suitable for clinical patient warming. • Adjustable airflow suitable for effective distribution through the warming blanket. • Clear visual indication of selected operating temperature and/or operating status. • Automatic monitoring of outlet air temperature. • Over-temperature protection with automatic shutdown or reduction of heating output. • Audible and/or visual alarm for abnormal operating conditions.

	• Automatic fault detection and indication. • Rapid warm-up from ambient conditions. • Continuous operation suitable for extended clinical use. • Suitable carrying handle and/or mounting provision for use with an IV pole, trolley, or other hospital equipment.
Temperature Control	The system shall provide controlled warm-air delivery with selectable temperature levels. Typical selectable ranges may include: • Low/comfort warming: approximately 32–34°C • Medium warming: approximately 36–38°C • High warming: approximately 40–43°C The actual temperature settings shall be manufacturer-defined and shall incorporate appropriate safety limits to prevent excessive patient exposure.
Patient Warming Blankets	The system shall be compatible with patient warming blankets designed for different clinical applications, including: • Full-body warming. • Upper-body warming. • Lower-body warming. • Pediatric/small-patient applications, where applicable. The blankets shall: • Provide even distribution of warm air. • Be designed to minimize cold spots. • Incorporate suitable patient access areas for clinical procedures. • Allow connection to the warming hose without significant air leakage. • Be made from soft, patient-safe, and clinically suitable materials. • Be available as disposable and/or reusable versions as applicable. • Include appropriate means of securing the blanket to prevent unintended movement.
Air Delivery System	• Flexible delivery hose shall connect securely between the warming unit and blanket. • Hose shall be resistant to kinking during normal use. • Airflow shall be distributed throughout the blanket to provide substantially uniform warming. • The connection shall be designed to prevent accidental disconnection during normal operation.

	The system shall include appropriate safeguards against blocked or restricted airflow.
Safety Features	The system shall incorporate, as a minimum: - Independent or redundant over-temperature protection where appropriate. - Automatic thermal cut-out in case of excessive temperature. - Continuous temperature monitoring. - Fault/alarm indication. - Protection against abnormal airflow conditions. - Electrical protection against overload and short circuits. - Patient-contact surfaces/materials suitable for clinical use. - Design features to reduce the risk of thermal injury, including prevention of excessive localized heat concentration.
Electrical Requirements	- Power supply: 220–240 VAC, 50 Hz with UK type plug. - Power consumption shall be suitable for standard hospital electrical outlets. - Equipment shall incorporate appropriate electrical insulation and protective grounding. - The system shall comply with applicable medical electrical equipment safety requirements.
User Interface	The control panel shall be simple and suitable for use by trained clinical personnel and shall provide: - ON/OFF control. - Temperature selection. - Operating status indication. - Alarm/fault indication. - Clear identification of the selected warming level. - Controls designed to minimize accidental changes during operation.
Filtration	- The air intake shall incorporate a replaceable or serviceable filter. - The filtration system shall reduce ingress of dust and particulate matter into the air delivery system. - Filter replacement/service requirements shall be clearly specified by the manufacturer.
Construction	Housing shall be made from durable, impact-resistant materials suitable for hospital environments.

	• External surfaces shall be smooth and easy to clean and disinfect. • The unit shall be resistant to commonly used hospital cleaning agents, subject to the manufacturer's specified cleaning procedure. • The design shall minimize areas where dust, fluids, or contaminants can accumulate.
Performance Requirements	The system shall: • Provide consistent and controlled warm-air delivery. • Reach the selected operating temperature within a reasonable period. • Maintain the selected temperature within the specified control tolerance. • Provide adequate airflow for the connected warming blanket. • Operate continuously without unacceptable reduction in warming performance. • Maintain safe operation in the event of sensor, airflow, or temperature abnormalities.
Clinical Use	The system shall be suitable for use in clinical areas including, but not limited to: • Operating theatres. • Dialysis department. • Intensive care units. • Emergency departments. • Procedure rooms. • Patient wards where active warming is clinically indicated.
Maintenance	• The equipment shall require routine preventive maintenance according to the manufacturer's recommended schedule. • The air filter shall be replaceable/serviceable. • Electrical safety and temperature-control functions shall be capable of periodic inspection and testing. • Maintenance procedures shall be documented in the service manual.
Documentation	The supplier shall provide: • User/operating manual. • Service and maintenance manual. • Technical specifications. • Electrical safety information. • Cleaning and disinfection instructions. • Recommended preventive maintenance schedule. • Calibration/testing information, where applicable. • Warranty documentation.

	List of available accessories and consumables
Standards and Regulatory Compliance	The equipment shall comply with the latest applicable editions of relevant international standards and regulatory requirements for medical electrical equipment, including applicable requirements for: • Basic safety and essential performance of medical electrical equipment. • Electromagnetic compatibility. • Medical device risk management. • Biocompatibility of patient-contacting materials, where applicable. • Electrical safety. • Applicable local medical-device regulatory requirements.
Accessories	The complete system shall be supplied with, as a minimum: • Forced-air warming unit. • Flexible air delivery hose. • Appropriate patient warming blanket(s). • Air filter(s), as applicable. • Mounting/carrying accessories. • Power cable. • User operating manual.
Warranty	The equipment shall be supplied with a minimum 24-month warranty covering manufacturing defects, parts, and workmanship from the date of installation or acceptance, whichever is applicable.
Supplier Requirements	The supplier shall provide installation, commissioning, basic user training, and technical support. Availability of spare parts and service support shall be ensured for the expected operational life of the equipment.

5. Microprocessor-Controlled Bench-Top Centrifuge	
Quantity	2
Intended Use	The centrifuge is intended for routine laboratory centrifugation of biological and clinical samples and for the preparation of cell suspensions.
Basic Technical Specifications	• It should be Microprocessor Controlled with large Display of time, speed and error with buttons. • Operation to change from RPM/RCF setting should be present.

	• Bench top centrifuge machine should be provided with Swing rotor. • Should have built in speedometer, variable speed control, lid locking and braking device. • Should be Maintenance free & brushless motor drive with frequency drive, low noise level less than 58dB at Max speed. • Rotor and centrifuge Chamber should be made of chemical resistant and rust -free (stainless steel) and easy to clean. • Should have automatic door opening with emergency lid lock release facility. • Should have tube Capacity for Swing-out Rotor: 7x15ml tubes x 4 buckets • Total capacity of all bucket not less than 420 ml • Should have speed Accuracy: $\pm 1\text{rpm}$ or $\pm 1 \times g$ • Speed output should be stable even under fluctuating voltage conditions. • Profile selection: Should have at least 3 user selectable acceleration & deceleration profiles • It should have an option to store user defined program /minimum of 10 program. • Should have Gas hinge to prevent door falling. • Should have lid safety interlock. • Centrifuge should be Noiseless and vibration free • Should work on Power Supply of 220V 50 Hz, AC fitted with UK plug. • Should have USER ADJUSTABLE SETTINGS: Speed 4500–5000 rpm. • Should have digital control of timing up to 60min • The unit should be supplied with specific rotor, all required adaptors, bucket, • Supplier should provide minimum 2 years of warranty.
Displayed parameters	• Digital display of speed, timing • Rotor Imbalance detection
Accessories	• All standard/necessary accessories must be supplied along with the unit.