List of equipments for the department of Anaesthesiology

Sl. No.	Name of Equipments
1	BIS Monitor
2	Ultrasound Machine (portable)
3	Defibrillator
4	Non Invasive cardiac support pump with defibrillator
5	Defibrillator with external pacemaker
6	Anaesthesia workstation
7	Transcuetaneous Nerve stimulator
8	Intubating LMA
9	Fast trach LMA
10	C Trach LMA
11	MRI compatible Anaesthesia machine
12	Resuscitation Kit
13	Jet Ventilator for Bronchoscopy
14	MRI compatible Vital sign monitor
15	Monitor stand
16	Cuff pressure monitor
17	Peripheral Nerve stimulator mapper and nerve locator
18	Transcuetaneous Electrical stimulators Table Top
19	Transcuetaneous Electrical stimulators Portable pocket type
20	Transport ventilator
21	Airway management system
22	PFT machine
23	Video Laryngoscope
24	12 Channel ECG machine
25	Naerve Mapper Locator stimulator
26	Peripheral Nerve Monitor
27	Patient simulator (Adult)
28	Laryngoscope with (Oxiport Machintosh blades) Size 1 to 4
29	Laryngoscope with (Miller blades) Size 00,0,0.5,1
30	Laryngoscope (Fiber optic laryngoscope blade) Machintosh type) size 1 to 4
31	Laryngoscope (Fiber optic laryngoscope blade) Miller type) size 0 to 1
32	Oxiport Miller blades Size 0,1,2
33	Style, fiberlite handle with light source
34	Style (Dr' Talwakar Directable)
35	Pin gauge oxygen regulator
36	Glucometer

BIS Monitor

	Specification
1	Advanced high end patient monitor having integrated non-invasive, invasive measurements & features suitable for Neonate, Pediatrics & Adult patients.
2	Monitor must have bright, highly visible minimum 15'' or more Colour TFT display with full touch screen facility.
3	Monitor must have the facility to display 14 or more waveform along with related numerical parameters on single screen.
4	Monitors should have facility to monitor ECG, SpO_2, NIBP, Respiration, dual temp and BIS upgradable to CO,AGM ,Mainstream ETCO2,IBP
5	Should have Arrhythmia detection including life threatening arrhythmias such as ASYSTOLE, VF, VT, EXT, TACHY, EXT BRADY, VPC RUN, V BRADY, SV TACHY, TACHYCARDIA, BRADYCARDIA, PAUSE, COUPLET, EARLY VPC, MULTIFORM, V RHYTHM, BIGEMINY, TRIGEMINY, FREQ VPC, VPC, IRREGULAR RR, PROLONGED RR as standard feature.
6	Should have event recall minimum up to 24 hours trend, graphical and tabular trends, including short trends drug dose calculations, alarm logs, Hemodynamics calculations & OxyCRG.
7	The monitor should have facility for enlarge numeric display for distance viewing with multiple layout of screen.
8	Monitors should have ST segment calculations with all latest arrhythmia detection & review facility.
10	Monitor should have facility to detect sudden critical blood circulation change occurs between periodic NIBP measurements.
11	Monitor should have facility to eliminate false arrhythmia alarms.
12	Should have full disclosure facility as standard. Monitor must have the time linked review function. Monitor must show the waveforms for the time when the arrhythmia occurred in case of arrhythmia recall.
13	Main stream EtCO2 measurement for both intubated and non-intubated patient with one sensor will be preferred.
14	Monitor should have detachable unit which can transfer the patient monitoring parameters, information like Patient information, Alarm Setting, Trend Graph, full disclosure for while in transfer from one monitor to other without losing acquired data.
15	Should have internal rechargeable battery capability for at least one hours or more operation along with battery charge indicator.
16	Monitor should have event review facility including NIBP.
17	Monitor should have audio/visible alarm with lamp glowing in different colours & should be visible from distance.
18	All monitors must be ready for Central monitoring station connection & interbed facility as standard feature.
21	Independent slave display connection at any point of time, second display always shows the monitoring screen while the main display can show any other parameter monitoring screen.
23	Monitor should be European CE Certified & US FDA.
24	Warranty : 2 years
25	Monitors should be supplied with following:
26	5/6 Leads ECG cable 1. No
27	Adult and paed Spo2 probe - 1 No. each
i.	NIBP cuff for Adult & Pediatrics 1 no each
ii.	Temp Probe - 2 no
iii.	Temp probe -2 (skin & endocavity one each)

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SPECIFICATION OF BIS MONITOR

1. PRODUCT DESCRIPTION:-

BIS Monitors: Directly monitors a patient's level of consciousness and helps clinicians determine and administer the precise amount of drug to meet the needs of each individual patient, providing significant benefits for patients and healthcare facilities.

BIS Sensors: Measures electrical activity in the brain and translates it into a number between 100 (wide awake) and zero (absence of brain electrical activity).

- BIS monitor for display of processed data and real time ECG wave forms.
- Should be of light wt. (<2kg)
- Should have battery backup.
- Should display – following data-Bispectral index

  EMG

  Signal quality index

  Suppression Ratio,

  BIS log & real time EEG waveform.

- Sensor automatically select the mode.
- Supply of sensor - (200 no)

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DESCRIPTION

HIGH END PORTABLE DIGITAL ULTRASONOGRAPHY MACHINE,

Should have compatible to regional Anesthesia.

Extended Pure Harmonic Detection (ExPHD)
Tissue Harmonic Echo by phase-modulation method is the standard specification. The system offers images of high accuracy by reducing unnecessary echoes without sacrificing sensitivity.

- Multi Frequency Imaging (MFI)
- A single probe can provide multiple transmission frequencies that can be selected according to the physique of the patient.
- Edge Enhancement Function
- Edges of tissues such as intimae of the carotid artery are emphasized to facilitate IMT measurement for an index of determining atherosclerosis.

Usability

Stores , reviews and manages data efficiently in a digital environment

- Ultrasound images, measurement results, patient information and reports screen are stored and managed in the large-capacity built - in memory.
- USB memory port is equipped as a standard item ensuring efficient digital data management
- Built- in Cine Memory al lows the user to examine images easily using the search function.

Utility

Rapid startup and dedicated probes support efficient examination.

The system boots up quickly for emergency use.

- Optimum imaging setting for respective application can be switched at the touch of a button using the preset function.
- The large handle provided on the compact body makes the unit easy to carry.
- A selection of probes covering a wide range of applications from routine examination to intraoperative imaging of the abdomen for example.

Probe	Multi Frequency Convex Probe for whole Body	One
Probe	Multi Frequency Linear Probe for Cardiology	One

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Technical specification For Portable Colour Doppler Ultrasound Unit for Regional Nerve Blocks, Vascular Access in OT, ICU.

A state of art fully digital, compact portable Colour Doppler Ultrasound machine (weight <5 kg) is required with following technical features

1. Unit should be able to give very high image quality with advance technologies like compound imaging with at least 5 sights of lines for better cardiac contrast resolution, tissue differentiation and edge detection, equivalent to high end cart based systems. Please specify the technology.
2. System should be able to support speckle reduction imaging for better tissue differentiation and edge enhancement please specify the technology.
3. The system shall have the ability to enhance tissue margins and improve contrast resolution by reducing artifacts and improving visualization of texture patterns & needle tip within the image, please specify the technology.
4. System should have both online (Read) as well as offline(Write) zoom facility
5. Imaging modes of Real time 2D, Colour Doppler, Pulsed wave Doppler, Continuous wave Doppler, Power Doppler must be available on all cardiac transducers.
6. System must have fast start up to scanning in less than 30 seconds from off condition, for use in critical and emergency situations.
7. System should support transducer technologies like phased array, convex, linear, TEE etc.
8. Cine memory on all modes.
9. The system shall process a dynamic range that is at least 165db. The system must display at a maximum depth of 35 cm.
10. The system must have a dedicated cardiac calculation packages with PISA, TDI calculation packages, vascular calculations package.
11. The unit must be compact, portable and lightweight, weighing less then 5 kg.
12. Unit must be sturdy, resistant to breakage & damage on fall/ hit against the wall or hard surface for out of the hospital use.
13. Flat LCD/ TFT monitor of at least 10 inches with flicker free image.
14. Alphanumeric soft keys keyboard with easy access scans controls, facility to sanitize the system keyboard to avoid cross contamination.
15. The system must have the ability to function by AC/DC or battery power with the same degree of functionality, the battery life (run time) shall be al least 2 (Two) hours, this need to be demonstrated.
16. The system must have archive capability for storage and retrieval of images and clips.data.

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17. Data Ttansfer facility should be available as standard , to transfer images etc. easily onto another system/computer etc.
18. System should posses software for Enhanced Needle Visualization to track the needle clearly at steep angles during the procedures while maintaining striking image quality of the target structures and the surrounding anatomy with simple On/Off functionality. This Facility should be available on both High frequency Linear and Curvilnear probes for superficial as well as deeper blocks.
19. Unit must be sturdy, resistant to breakage & damage on fall/ hit against the wall or hard surface.
20. The system shall support the all DICOM functionality, Storage, Print, and Work List, also ready to connect to PACS.
21. The manufacture shall provide a loaner system in case of failure of system.
22. The equipment should be mountable on trolley & locking mechanism should be inbuilt into the trolley for safety & security of the system.
23. System configured application specific educational video tutorials should be provided as standard with the system.
24. System should have both European CE and US FDA quality certification.

Transducers to be supplied as standard

1. 6-13 MHz multi-frequency, broadband linear array transducer for vascular, nerve imaging with less then 40 mm size for vascular access, small parts, vascular, musculoskeletal Interscalene, Supraclavicular, Axillary, Musculocutaneous, Popliteal, Saphenous. Higher frequency will be preferred.
2. 2-5 MHz multi-frequency broadband curved array transducer for general purpose, abdominal, deep nerve access Specially Celiac , Sciatic nerve, Epidural, Subgluteal & abdominal applications
3. Mobile cart with transducer holder to be provided as standard with the system.

ESSENTIAL REQUIREMENT: The firm must have minimum number of 150 installations of the same model in India and Nepal, attach list of installations, and also provide performance certificates.

WARRANTY: The unit and transducers should be covered with comprehensive onsite warranty for five years commencing from the date of issue of installation certificate.

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Specifications for Defibrillator

1) The machine should have facility for ECG Monitoring, Defibrillation, external pacing & recorder.
2) The Defibrillator should strictly biphasic technology, having energy selection of up to 270 Joules.
3) It must be capable of monitoring ECG through ECG cables and both from Multi function electrodes and paddles.
4) The monitor must be 2 channel colour monitor with ECG as the first trace and an option of choosing EtCO2 or SpO2 as the second trace.
5) The machine should be able to defibrillate Adult, Paediatric patients.
6) The machine should have ECG waveform display on bright colour display along with other virtual numeric information.
7) The machine should have fast charging of 200J in 3 seconds
8) The machine should be compact, portable with built in rechargeable battery, weight of the total machine should not be more than 6.5Kgs.
9) The machine should have in built recorder of for printing ECG trace & stored information.
10) The machine should have capability for providing internal defibrillation shocks.
11) The machine should be upgradeable to vital sign parameter such as Mainstream EtCO2, SpO2.
12) The machine should have user selectable alarm settings.
13) After defibrillation, the ECG waveform must recover within 3 seconds for immediately checking the result of defibrillation.
14) The machine must have AED option with voice prompt.
15) The machine should work on mains as well as on rechargeable battery.
16) The machine should have fast battery charging of less than 3 hours for full charge.
17) It should have Data Card for patient data storage.
18) The machine should be supplied with all standard accessories.

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Technical Specifications ofdefibrillator cum monitor with external pacing

1. The machine should have facility for ECG Monitoring, defibrillation, external pacing (transcuteneous) & recorder.
2. The Defibrillator should be Biphasic technology, having energy selection up to maximum 200 joules in AED as well as in manual mode.
3. It must be capable of monitoring ECG through ECG cables, Multi function electrodes and paddles through multifunction single cable.
4. The machine should be able to defibrillate Adult, Pediatric patients.
5. The machine should have ECG waveform display on bright high resolution display.
6. The machine should be compact, portable with inbuilt rechargeable battery. The machine should not be more than 7 Kgs with battery and paddles.
7. The machine should have in built recorder printing ECG trace & stored information.
8. The machine should have a facility of External non-invasing pacing with 40 ms pulse width
9. It should have ability to measure chest compression rate and depth in real time with visual feedback on screen with rate and depth indicator.
10. The machine should have user selectable alarm settings.
11. . The machine should work on mains as well as on rechargeable battery
12. The unit should be supplied with Adult and inbuilt pediatric external paddles The machine should have facility to increase/decrease energy selection on paddles as well as on unit .The unit should also have facility to give print out of ECG and shock instantly from paddles.
13. The charging time should be less than 7 secs at maximum energy
14. The unit should be supplied with following accessories /items unit
    a) Battery -1 nos
    b) 3-Lead ECG cable - 1 nos
    c) External defibrillator paddles (pediatric inbuilt in adult)- 1 nos
    d) Multi Function Defibrillator & Monitoring padz/gel sheets - 200 nos
    e) Reusable CPR feedback sensor/or similar product reused at least on 90 patients – 4 nos

15.The unit should have facility to monitor
A)ETC02,
B) NIBP ,
C) SPO2

Also the unit should be upgradable to 12 lead ECG monitoring if required

16. The unit should be U.S FDA approved.

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Specifications for Defibrillator

1) The machine should have facility for ECG Monitoring, Defibrillation,

2) The Defibrillator should strictly biphasic technology, having energy selection of up to 270 Joules.

3) It must be capable of monitoring ECG through ECG cables and both from Multi function electrodes and paddles.

4) The monitor must be 2 channel colour monitor with ECG as the first trace and an option of choosing EtCO2 or SpO2 as the second trace.

5) The machine should be able to defibrillate Adult, Paediatric patients.

6) The machine should have ECG waveform display on bright colour display along with other virtual numeric information.

7) The machine should have fast charging of 200J in 3 seconds

8) The machine should be compact, portable with built in rechargeable battery, weight of the total machine should not be more than 6.5 Kgs.

9) The machine should have in built recorder of for printing ECG trace & stored information.

10) The machine should have capability for providing internal defibrillation shocks.

11) The machine should be upgradeable to vital sign parameter such as Mainstream EtCO2, SpO2.

12) The machine should have user selectable alarm settings.

13) After defibrillation, the ECG waveform must recover within 3 seconds for immediately checking the result of defibrillation.

14) The machine should work on mains as well as on rechargeable battery.

15) The machine should have fast battery charging of less than 3 hours for full charge.

16) The machine should be supplied with all standard accessories.

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Technical Specification for: Non-Invasive Cardiac Support Pump Integrated with Defibrillator

1. The unit should produce consistent chest compressions with no interruptions.
2. It should be easy to use for in- hospital and out of hospital during Emergency mainly during transportation.
3. It should be able to provide both 30:2 OR continuous compressions, user selectable by simple pressing of button for switching to either mode.
4. Should be able to provide uniform distribution of load on chest by circumferential compression of chest.
5. The chest compression band should have an ability to do high quality compressions.
6. It should have ability to automatically determine the patient compliance (automatically measures size and resistance of each patient chest) and produce compression force accordingly.
7. It should have facility to provide chest compression to patient even when patient is inclined and being transported from staircase at 45 degree.
8. The CPR device should be battery operated with an extremely simple user interface.
9. It should have a LCD back-lit screen display to show compression modes and battery charge status.
10. The battery should be able to provide continuous compression for a minimum 20 minutes when fully charged.
11. The system should be provided with three (03) lithium ion rechargeable batteries, one (01) battery charger and three (03) LifeBand (load distributing bands).
12. The unit should come with an integrated defibrillator for providing synchronized shock while the device is working i.e. without interrupting the compressions.
13. The defibrillator should have ability to measure chest compression rate and depth in real time and provide both visual and optional audible feedbacks.
14. The defibrillator should be rugged and tough with easy to read tri-mode display in any environment

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15. The defibrillator should have ability that all CPR data can be recorded and reviewed by using software specially designed for doing this. (If needed, necessary software should be provided.)

16. The defibrillator should have ability to filter out CPR artifacts and allowing person to see organized rhythms without interrupting chest compression.

17. The Defibrillator should have facility for ECG Monitoring, defibrillation, rectilinear external pacing (transcutaneous) & recorder.

18. Should be supplied with 5 pair of multifunction pads.

19. The Defibrillator should have rectilinear biphasic technology, having energy selection of 1-200 joules.

20. The Defibrillator should have charging time of unit should be less than 7 Seconds to the maximum energy.

21. The defibrillator should have the option to upgrade to EtCO2, SpO2, NIBP and 12 leads ECG.

22. The cost of all spares/accessories and consumables (including those required for up-gradation) should be mentioned in the financial bid.

23. Complete unit, including defibrillator should be US FDA approved.

24. The whole equipment (excluding load distributing bands and pacing pads) will be under comprehensive warranty. No other exclusions will be entertained.

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Specification of AED

- The Unit should be Bi-Phasic with maximum 200J energy level.

  - Energy Settings should confer with Latest AHA/ERC guidelines; The device should be U.S.A FDA approved and should be in accordance with ILCOR -ECC/ AHA-2010 guidelines.

- The unit must include an LCD that is capable of displaying text prompts & ECG on screen.
- The unit should be capable of showing CPR feedback in real time with both visual and audible prompts on CPR rate and depth.

- Should be compact, light weight, portable and easy to carry. The unit weight should not be more than 3.2 kgs preferable with handle to carry it easily.

- The unit should include an easily identifiable on/off switch.

- The unit should have airworthiness certification.

- Should be able to operate under following environmental conditions :-

  (a) Temperature - Operating: 0° - 50° C.

  (b) Humidity - Operating: 12 % to 90% relative, non-condensing.

  (c) Altitude - Operating: -100 to 15,000 feet or above.

  - The unit Should hold following test reports /certifications :-

    a) Mil Std 810 F
    b) Ingress protection 55
    c) E.N- 60601-1
    d) IEC-60601-1-2
    e) One meter drop test

- The unit should have ability to record data to an internal memory and to upload the same to a computer via wireless mode.

- The unit comes with **CODE READY indicator on the front of the device** which ensures daily maintenance/automatic self test by device of its own.

- The unit should come with lithium batteries with minimum capability to deliver minimum 300 shocks. These batteries must offer minimum a five year shelf-life too.

- The unit must detect the use of pediatric pads and automatically adjust the arrhythmia analysis processing for a pediatric patient and must invoke specific pediatric Joule settings.

- Cost of battery should be quoted along with price bid and same will be considered to decide the lowest bidder .

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Vaporizer:- provision to connect two vaporizers at a time with interlocking facility. One Isoflurane and one Sevoflurane vaporizer should be supplied with the machine. Vaporizers flow should be temperature, and pressure compensated and maintenance free for a minimum of 05 years.

Integrated anaesthesia ventilator

- It should have an integrated colour TFT screen of at least 8" size for display of ventilation parameters
- Microprocessor based, electronically controlled and pneumatically driven should not require change of bellows for adult and infants.
- It should have following features.
  a) Modes – VCV, PCV,
  b) Tidal volume range 20 ml to 1500ml.
  c) Adjustable breath rate 4-80 bpm, I:E. ratio 3:1 to 1:9.9
- It should have a spirometery measurement of I/E ratio, Tidal vol, min volume, Peak, Plateau & PEEP pressure FiO2,
- Alarms should have audiovisual display of alarm messages for tidal volume, minute volume, inspiratory O2 concentration, audio power supply fail alarm, fails to cycle warning, airway pressure alarms for high and low pressures, Apnoea alarm.
- In built battery backup facility for up to a min. of one hour.
- Self –diagnostic facility to check the overall system including ventilator for leakage.

Anaesthesia Workstation

The Anaesthesia work station system should consist of:

Anaesthesia machine with two vaporizers, integrated anaesthesia ventilator and closed Breathing system

Anaesthesia machine with vaporizers:

- Rigid construction and design with standard frame mounted on antistatic twin castor wheels with front brakes and full length side rails on both sides of the frame to facilitate mounting of accessories/monitors.
- Gas specific (pin indexed) Yokes – one for oxygen, and one for nitrous oxide to accommodate 5-liter water capacity cylinders.
- Provision to connect oxygen, air & nitrous oxide directly to system with non interchangeable pipeline supply inlet for each gas & separate pressure gauges for each gas on front of the machine.
- Flow meter assy with dual cascading rotameter for O_2 & N_2O, single for Air.
- Auxiliary fresh gas outlet with ISO type 22mm & 15mm & connector for using with open circuit/bains cicuit.

Safety features should include:

- Automatic Cutoff of Nitrous by Oxygen Pressure failure along with hypoxic guard for linear regulation of minimum O_2 concentration at 25% volume.
- Oxygen flush, which is able to deliver at least 30-70 liters per minute of Oxygen.
- Air/N_2O interlock for enabling or disabling air or N_2O & activating as per requirement.
- Oxygen failure alarm.
- Bi-stable change over switch from closed circuit to open circuit & vise-versa.

Integrated breathing system should include

- Single canister integrated circle absorber with unidirectional insp. & exp. Valves free from Gravity and sticking and airway pressure relief valves along with integrated ascending bellow unit.
- It should not have multiple tubing connection from anaesthesia machine & closed circuit system.
- It should have facility for changing the sodalime inter-operatively with sodalime capacity of about 900 gms.
- Fully integrated Circle absorber system for adult as well as pediatric patient category with the same bellow unit.
- It should have an autoclavable base block & should not require any tools when dismantled for cleaning & sterilization.

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TECHNICAL SPECIFICATION

TRANSCUETANEOUS NERVE STIMULATOR

The unit should have the following specifications:

1. Output Channels: 4 independent
2. Current type: Asymmetrical biphasic pulsed current, Symmetrical biphasic pulsed current
3. Phase duration Asymmetrical biphasic pulsed current: 10-200 µs
4. Phase duration Symmetrical biphasic pulsed current: 10-1000 µs
5. Pulse frequency: 1-200 Hz
6. Frequency modulation: 0-180 Hz
7. Surge programme: OFF-SYNC-ASYNC-PEMS
8. Amplitude: 0-140 mA
9. Pre-Programmed Protocols: 39
10. Memory Position: 100
11. Treatment time: 0-60 min
12. The equipment should have International Safety Standards (Imported) CE/TUV.
13. The equipment should be supplied with Standard Accessories, Pen Electrode & Trolley.

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LMA

Particulars
LMA Classic Size 1
LMA Classic Size 1 1/2
LMA Classic Size 2
LMA Classic Size 2 1/2
LMA Classic Size 3
LMA Classic Size 4
LMA Classic Size 5
LMA Classic Size 6
LMA Cuff Deflator Size 3-4
LMA Cuff Deflator Size 5
LMA Unique Size 1
LMA Unique Size 1 1/2
LMA Unique Size 2
LMA Unique Size 2 1/2
LMA Unique Size 3
LMA Unique Size 4
LMA Unique Size 5
LMA Fastrach Size 3
LMA Fastrach Size 4
LMA Fastrach Size 5
LMA Fastrach Stabiliser Rod
LMA Fastrach ETT 6.0 mm
LMA Fastrach ETT 6.5 mm
LMA Fastrach ETT 7.0mm
LMA Fastrach ETT 7.5mm
LMA Fastrach ETT 8.0 mm
LMA Proseal Size 1.5
LMA ProSeal Size 2
LMA ProSeal Size 2 1/2
LMA ProSeal Size 3
LMA ProSeal Size 4
LMA ProSeal Size 5
LMA ProSeal Cuff Deflator
LMA ProSeal Introducer (1-2 1/2)
LMA ProSeal Introducer (3-5)
LMA CTrach Kit
LMA CTrach Kit SU ETT
LMA CTrach Viewer
LMA Carlton Sureflo TM Size 3
LMA Carlton Sureflo TM Size 4
LMA Carlton Sureflo TM Size 5

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LMA CTrach Training Kit Sz 4
LMA Flexible Size : 3.0
LMA Flexible Size : 4.0
LMA MANIQUINE
LMA Supreme Second Seal
LMA Unique 2

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Specifications for MRI Compatible Anesthesia System

Should be made entirely from non-ferrous metals & can be used safely up to the 1000 gauss line

System should be a 3 gas system and pneumatically operated.

System should have 2 station selectatec back bar.

Should have cascading type flow meters for O2, N2O and Air.

Should be capable of wall, trolley or rail mounted.

Should have Air/N20 interlock.

Should have knock-resistant Rota meter control guards.

Should have pressure gauges for cylinders & pipelines

The ventilator should be MRI compatible.

Should have Volume Control Ventilation.

Should have a minimum Tidal Volume of 50 ml.

Should have Inspiratory time of: 0.25 to 3.0 seconds and Expiratory time: 0.5 to 6.0 seconds

System should have a flow rate of: 0.2 to 6.0 Lpm.

Should have a pressure relief of: 20 to 80 cm H2O

The ventilator should be mounted on the trolley securely.

Should be supplied with a Circle absorber and it should be securely mounted.

System should be supplied with oxygen monitor

System should comply with international safety standards like IEC 60601-2-13, and BS EN 60601-1

The complete equipment should have certified by CE & US FDA.

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Specification of Emergency Resuscitation Kit

Dimension	:	60cm x 44cm (Approx)
Weight	:	16 Kg.
Mode	:	Pneumatically Controlled Time Cycled
Tidal Volume	:	200 CC to 1200 CC (Approx)
Breathing Frequency	:	8 to 30 BPM
I:E Ratio	:	1:1 to 1:7
Regulator Pressure	:	60 PSI
Pneumatic Suction	:	190 mm of Hg (Approx)
Foot Operated Suction:		Spring Loaded Piston cylinder type 600 mm of Hg (Approx)
100% Oxygen Delivery	:	1 to 10 LPM
Cylinder	:	1.7 Ltrs. Water Capacity Bull Nose Oxygen Cylinder
O2 Refilling Rod	:	Bull Nose Type with Pressure Gauge
Expiratory Valve	:	Open Venturi Type without any moving parts
Carrying case	:	Blow Moulded with compartments for accessories, Drugs & Medicines etc.

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Specification of Jet ventilator for Bronchoscopy

- Comprises: 2 mtrs.
- High Pressure Tubing,
- Thumb Valve control
- Three Luer Lock Needles.

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Specification of MRI Compatible Vital Signs Monitor that is equipped with –

- NIBP
- ECG
- SPO_2
- $ETCO_2$

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Specification of Transcutaneous electrical stimulator

- Pocket Size
- Variable Amplitude
- Rectangular Variable Pulse
- Power Supply 6V DC (4 AA type dry cells)
- Max battery life time 160 hrs
- Max output voltage 65V at 1 KOhm load
- Pulse frequency range, 2 to 50 Hz $\pm$ 20%
- Pulse width duration, 400 microsecond $\pm$ 20%
- Max output current, 15 MA (RMS) at 500 ohms

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EMERGENCY TRANSPORT/INTRA HOSPITAL TRANSPORT VENTILATOR

Should be microprocessor based Ventilator for use in Emergency Transport / Intra Hospital Transport Ventilator.should be european CE or FDA approved
It Should be less than 5 Kgs
It should be minimum 8" Colour Touch Screen.
Preferably have Automatic pre-selection of ventilation parameters with the setting of the Ideal Body Weight (IBW) of the patient (infants and adults)
It should have facility to monitor ETCO2 (Optional)
It should have volume control and pressure control ventilation .
It should have the following modes:
(A)VCV, (A)PCV, SIMV, PSV,
PSV/NIV, CPAP
It should have the following setting parameters:

Patient categories	Adult / Infant
Tidal volume	20 to 2000 mL
Frequency	1 to 60 Bpm
PEEP	0 to 20 cmH2 O
FiO2	21 to 100 %
I:E ratio	10 to 50 % of total time
Inspiratory time	0.3 to 5 s
Inspiratory flow rate trigger	OFF, 0.5 to 10 l/min
Inspiratory pressure	5 to 60 cmH2O
Pressure Support	5 to 60 cmH2O
Rise time	50 to 120 cmH2 O/s
P.max	80 cmH2O
P.limit	90 cmH2O
Expiratory Trigger	10 to 90% of peak flow
Peak Flow	5 to 150 l/min in volumandric mode 230 1/min in spotances mode
Inspiratory pause	0 to 15 s
Expiratory pause	0 to 15 s

It should have the following alarms adjust by users:
High pressure, VTi low/high, MVi low/high,
MVe low/high, VTe low/high,
Frequency low/high,
FiO2 low/high and CO2 low/high (optional)
It should have the following Specific alarms
Disconnection, expiratory obstruction,
flow sensor, power supply, battery, gas
inlet and patient pre-oxygenation
It should have User configurable Apena/backup ventilation settings
It should have the following measured parameters:
Expired minute volume (MVe)
Expired tidal volume (VTe)

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Insufflated minute volume (MVi)
Insufflated tidal volume (VTi)
Frequency (f)
Peak airway pressure (Ppeak)
Positive expiratory pressure (PEEP)
Mean airways pressure (Pmean)
Plateau Pressure (Pplat)
Leak index
Ti/Ttot
I:E ratio
FiO2
etCO2 (optional)

It should work with high pressure oxygen (centralised Pipe line) and Low Pressure Oxygen (Flow mete
It should have built in battery back up for 4 hours

It Should have the following standards:

NF EN ISO 14971:2001 and A1:2003	
CEI 60601-1:2000 and its appendices	
CEI 60601-1-2:2007	
CEI 60601-2-12:2001	
NF EN 794-3:1998, A1:2005 A2:2009	
NF EN 1789: 2010 section 6.3 and 6.4	
Air ambulance (helicopter and airplane)	EN13718-1 (including the RTCA DO160G)

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Air way Management Model

- The model should provide the training on airway maintenance and practicing the removal of foreign objects from the airway with forceps.
- The model should be made of silicon rubber and should have similar appearance like an adult human being.
- It should have facility for clearing the air way with endotracheal tubes, laryngeal mask, EGTA and combination tubes.
- It should have facility for inserting Trans nasal Airway.
- In the model trainee should practice the opening of larynx with laryngoscope, removing of foreign objects with forceps and endotracheal aspiration.
- It should be possible to elevate the submaxila for mouth opening.
- Oral cavity and larynx structure should be life like.
- When air blown into esophagus, stomach should be dilated.
- Respiration sound should be hearable with stethoscope.
- When excessive pressure is put on front teeth, it should generate a caution sound.
- The main unit should be supplied with the storage case.

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Technical Specification for Airway Management Set:~

Airway Management Equipment:

- Difficult Airway Management Kit including Retromolarscope (Adult) with intubation set.
- Flexible Fibreoptic Bronchoscopy system
- Frova Intubating Introducers (with rapi-fit adapters) Size: G12591, G13307.
- LMA Classic (reusable) all sizes (1, 1.5, 2, 2.5, 3, 4, 5) – **5 each**.
- *Fast Trach LMA - sizes 3, 4, 5 – **2 each**.
- Jet Ventilation Kit (Manujet III) complete kit with injector and catheter.
- LMA Flexible (Reusable) sizes (3, 4, 5) – **3 each**.
- *LMA-C-Trach- complete with visualizing facility. – **1 No**.
- LMA Supreme Second Seal – **5 Nos**.
- Laryngeal Tube (LT) (Reusable Silicon) Size : 1.2, 2.5, 3, 4, 5, 6, 6.5 – **2 each**.
- Microlaryngeal Surgery Tube (all sizes) – **5 Nos. each**.
- Gastro-Laryngeal Tube – **2 Nos**.
- Mannekin for Fibreoptic Intubation / Bronchoscopy training.
- Proseal Laryngeal Mask Airway (Reusable) sizes (3, 4, 5) – **20 Nos**.
- *Hornburger Tongue Depressor for LMA Anaesthesia in Operations like Adenotomy. – **1 No**.
- *SLIPA (Stream Liner of Laryngeal Airway) – **3 Nos**.
- Combitube. All sizes – **(1 each)**
- *Igel 2 set of All sizes
- *COBRA (Pharyngeal Express) All sizes – **2 Nos. each**.
- *Truview EVO2 Laryngoscope with Trueview Premier Intubation Kit. – **1 No**.
- *UPSHER Laryngscope for difficult intubation. – **1 No**.
- Gum Elastic Bougie. (Paediatrics – **5 Nos.** & Adult – **10 Nos.**)
- Lighted Stylet for Intubation. – **Two Nos.** (with 30 spare bulbs / light source).
- Light Wand for Oral Tracheal. – **Two Nos.** (with 30 spare bulbs / light source).
- *Cook Airway Exchanger Catheter. – **5 Nos**.
- Miller Laryngoscope Blades with fibreoptic light. – **5 Nos**.
- Mackintosh Reclination Blade with fibreoptic light. – **2 Nos**.
- *McCoy Laryngoscope. – **1 Nos**.

- *Polio Laryngoscope. – **1 No**.

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- Introducer for difficult intubation for single use, sterile-lumen-design, Universal Connector included, rigid pre-formed tip, graduation marks, (Sizes: 14, Length – 65 cm for ET tube > 5.0 mm – **2 Box**.
- ET Tube Stylet for single use, sterile-core made of metal, malleable (maintains curvature) flexible pre-formed tip, graduation marks, (Sizes : 8, 12, 14, Length – 40, 65, 65 cm for ET tube > 3.5, 5.0, 6.0 mm – **5 Box each**.
- Tube Exchanger for extubation and exchange for Endotracheal Tubes for single use, sterile-lumen-design, universal Connector included, graduation marks, (Sizes : 11, 14, 19, Length – 80 cm for ET tube > 4.0, 5.0, 7.0 mm – **2 Box each**.
- Intubation Catheter for fibreotically assisted intubation for single use, sterile-lumen-design, universal Connector included, graduation marks, (Sizes : 19, Length – 56 cm for ET tube < 4.0 – **5 Box each**.
- Cook Ventilating Bougie (Single use) – **10 Nos**.
- Cook's Retrograte Intubation Set – **10 Nos**.
- Cricothyroidotomy instrument Set – **1 Nos.**
- Case

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Technical Specification for Pulmonary Function Testing [PFT Machine (Advanced)] :~

1 Description of Function :

1.1 Pulmonary function tests are a broad range of tests that are usually done in a health care provider's office or a specialized facility. They measure how well the lungs take in and exhale air and how efficiently they transfer oxygen into the blood.

2 Operational Requirements :

2.1 System should be supplied complete with printer.

3 Technical Specifications :

3.1 1. The following tests should be performed by the PFT Equipment.

a. It should measure :

FEV, FVC, PEF, SVC, FEV %, MMEF, PIF, MVV, FRC, 1 1

RV, TLC, FET, ERV, IRV, PiMAX / PeMAX

b. DLCO, BRONCHIAL PROVOCATION TEST.

2. Predicted value- depends upon national preference.

3. Multi window lay out.

4. Configurable print out format.

5. Real time flow volume and volume time traces.

6. Overlaying of previous test curves for comparison.

7. Open & Closed flow / volume loop test technique possible.

8. Powerful search capability.

9. Storage – 1000 patients' tests including flow / volume loops and volume time curves.

10. Should have networking support.

4 System Configuration Accessories, Spares and Consumables :

None.

5 Environmental Factors :

5.1 Shall meet IEC-60601-1-2:2001 (Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility or should comply with 89/366/EEC; EMC-directive.

5.2 The unit shall be capable of operating continuously in ambient temperature of 20 – 30 deg C and relative humidity of 15 – 90%.

5.3 The unit shall be capable of being stored continuously in ambient temperature of 0 – 50 deg C and relative humidity of 15 – 90%.

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6 **Power Supply :**

6.1 Power input to be 220-240VAC, 50Hz fitted with Indian plug.

6.2 UPS of suitable rating with voltage regulation, spike protection and maintenance free batteries for 60 minutes back up.

7 **Standards, Safety and Training :**

7.1 Should be FDA, CE, UL or BIS approved product.

7.2 Manufacturer should have ISO certification for quality standards.

7.3 Comprehensive training for lab staff and support services till familiarity with the system.

7.4 Comprehensive warranty for 5 years and 5 years CMC after warranty including UPS.

7.5 Electrical safety conforms to standards for electrical safety IEC 60601-1 (Or Equivalent international / national standard) General requirement for Electrical safety of Medical Equipment.

8 **Documentation :**

8.1 User / Technical / Maintenance manuals to be supplied in English.

8.2 List of important spare parts and accessories with their part number and costing.

8.3 Certificate of calibration and inspection.

8.4 Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital technician and company service engineer should be clearly spelt out.

8.5 Compliance Report to be submitted in a tabulated and point wise manner clearly mentioning the page / para number of original catalogue / data sheet. Any point, if not substantiated with authenticated catalogue / manual, will not be considered.

8.6 List of Equipments available for providing calibration and routine Preventive Maintenance Support as per manufacturer documentation in service / technical manual.

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Video Laryngoscope

Specification

- It should be very portable and light weight device
- It should have option to mount the display on top of the blade
- It should have OLED display
- Minimum display size should be 6.1cm (Diagonal)
- It can be a battery- operated device and minimum operation time should be 90min
- It should have channeled and without channeled blade option
- Camera should be equipped anti fog and CMOS technology
- Minimum camera resolution should be 640X480VGA
- It should be equipped with computerized power management system
- It should have video output port

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Videolaryngoscope

Laryngoscope required with video illumination to visualize and document the operational area on screen. It should consist of following features:

- Required is Macintosh blades with closed European Metal finish size2, 3 and 4 with integrated camera chip and LED light illumination for obtaining more than 50000 Lux of brightness.
- One special blade for difficult intubation with device for introduction of suction catheter for size 16-18 Fr., angle of view should be approx 80 degree.
- One miller size 0 & 1 blade should present in the set.
- Screen 7inch or more in size for display with feature control buttons on the screen with composite output for connecting to a big screen.
- Automatic/ manual white balance facility should be available
- Documentation of Video & still images should be possible on data card or USB drive with JPEG and MPEG4 format which can be easily transferred to the computer/laptop. Documented videos & still images should be easily recalled on the monitor
- Magill forceps for foreign body removal and for assisting nasal intubation.
- Safety bag or box for screen to be provided
- IV Stand for positioning the monitor , with tray for laryngoscopes should be provided
- Accessories like protection cap, tray for cleaning and sterilization of blades (at least two blades at a time) should be provided
- Blades and connection cable should be fully immersible in disinfecting solution

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Multi Channel ECG Machine-12 Channels

1 Description of Function
1.1 ECG Machine is primary equipment to record ECG Signal in various configurations. 12 channels with interpretation are required for recording and analyzing the waveforms with a special software.

2 Operational Requirements
2.1 The ECG Machine should be able to acquire all 12 Leads simultaneously and interpret them

3 Technical Specifications
3.1 Should acquire simultaneous 12 lead ECG for both adult and pediatric patients
3.2 Should have Real time display of ECG waveforms with signal quality indication for each lead
3.3 Should have Artifact, AC, and low and high pass frequency filters.
3.4 Should have a storage memory of at least 40 ECGs with easy transfer by optional modem and data card.
3.5 Should have full screen preview of ECG report for quality assessment checks prior to print.
3.6 Should have interpretation facility of the amplitudes, durations and morphologies of ECG waveforms and associated rhythm for adult and pediatric patients
3.7 Should have alphanumeric Keyboard for patient data
Entry. (virtual or hard keys)
3.8 Should have High resolution (200 dpix500dpi on 25 mm/sec speed) digital array A4 size printer
3.9 Should have report formats of 3 x4; 6 x2, Rhythm for up to 12 selected leads; 12 Lead Extended measurements, 1 minute of continuous waveform data for 1 selected lead.
3.10 Should have battery capacity of at least 30 ECGs or 30 minutes of continuous rhythm recording on single charge
3.11 Should be able to be connected to HIS /LAN/Wireless LAN(OPTIONAL)
3.12 Should display ECG on LCD/TFT Display.
3.13 USB Support (optional) for Storage on external portable memories.
3.14 Minimum 150 ECG Storage in Floppy or flash memory or any better device.

4 System Configuration Accessories, spares and consumables
4.1 ECG Machine 12 Leads with Interpretation - 01
4.2 Patient Cable -02
4.3 Chest Electrodes Adult-(set of six) -02 sets.
4.4 Chest Electrodes Paediatric-(set of six) -02 sets
4.5 Limb Electrodes(set of 4)- 02 sets
4.6 Thermal Paper A4 Size for 500 patients

5 Environmental factors
5.1 The unit shall be capable of being stored continuously in ambient temperature of 0 -50deg C and relative humidity of 15-90%
5.2 The unit shall be capable of operating continuously in ambient temperature of 10 -40deg C and relative humidity of 15-90%
5.3 Shall meet IEC-60601-1-2:2001(Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility. or should comply with 89/366/EEC; EMC-directive.

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P.T.O

Item No. 101 Nerve Mapper/Locator/Stimulator

1. Should be suitable to identify peripheral nerves and giving percutaneous stimulation in neuro muscular block.
2. Should have a percutaneous monopolar/ bipolar stimulating handle for localization of nerves without puncturing the nerve which should be autoclavable.
3. Should have selectable stimulation intensity ranging from0-60mA in steps 0.1mA
4. and stimulation impulse width from 0.3ms,0.5ms and1.0ms
5. Should continuously measure& display actual current passing through the patient and selected current.
6. Should have pause function to interrupt stimulation without delivering impulses test function
7. Should allow switching between invasive and percutaneous nerve stimulations
8. Should automatically switch off with a acoustic warning if not operated over a period of 20 mins
9. Should have LCD display for stimulation current, impulse pattern, pulse width, impulse amplitude.
10. Should have analog and digital display of selected current and actual current.
11. Should have membrane touch pads for choosing stimulation function
12. Should be small (pocket size) & light weight.

Should be supplied complete with

- Adapter with extension cable
- Percutaneous Stimulating Handle
- Plexus Cannula with Thin polymer insulation coating (Teflon coating not desirable) 22G,24G, 25G - 10 nos. each
- 9 volt rechargeable battery with charger

The system should be USA FDA / European CE approved

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Peripheral

Specification for Nerve Stimulator

- Should be suitable to identify peripheral nerves and giving percutaneous stimulation in neuro muscular block.
- Should have a percutaneous bipolar stimulating handle for localization of nerves without puncturing the nerve which should be autoclavable.
- Should offer various stimulation patterns like TOF, DBS ,

  Should offer Tetanus Twitch with 50/100Hz
- Should have selectable stimulation intensity ranging from 0-60mA in steps 0.1mA

  and stimulation impulse width from 0.1ms,0.3ms,0.5ms and1.0ms
- Should have a setup switch.
- Should continuously measure& display actual current passing through the patient and selected current.
- Should have pause function to interrupt stimulation without delivering impulses

  test function
- Should automatically switch off with a acoustic warning if not operated over a period of 20 mins
- Should have LCD display for stimulation current, impulse pattern, pulse width, impulse amplitude.
- Should have analog and digital display of selected current and actual current.
- Should have membrane touch pads for choosing stimulation function
- Should be small (pocket size) & light weight.

Should be supplied complete with

- Adapter with extension cable
- Percutaneous Bipolar Stimulating Handle
- Switch Box for switching between invasive and percutaneous nerve stimulations
- Plexus Cannula with Thin polymer insulation coating (Teflon coating not desirable)

  22G, 24G, 25G - 05 nos. each
- 9 volt rechargeable battery with charger

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Patient Simulator- Adult

- The model should provide the advanced life support training such as airway management, IV injection, defibrillation practice and ECG monitoring for both treatment during transportation and at hospital.
- The model should be able to practice different airway occluded methods such as by depressing the tongue, chin and upper jaw lifting and by head rotation.
- It should be able to practice for endotracheal intubation, insertion of laryngeal mask and esophagus closing tube.
- Both right & left lung and the fork of trachea should be structured in such a way that side lung intubation and chest swelling should confirm airway management.
- Life like IV injection and infusion should be possible
- The model should have built-in arrhythmia simulator for defibrillation training.
- It should have wireless remote control and ECG waveforms can be operated with the selection of up to 15 types of ECG waveform.
- Its remote control should have different settings for all the parameters.
- During cardiac massage, mixed ECG along with cardiac massage waveform should be displayed on the monitor.
- It should work on rechargeable battery and charger should be provided.

Delivery Contents:

- 1 Main body
- 1 Battery charger
- 1 Arrhythmia simulator
- 1 silicone spray
- 1 bottle of Simulated blood
- 1 lung bag (right and left)

1 set blood vessels tube

■ Characteristics

1. Airway Management

• The airway is occluded by depressing the tongue, and the airway can be secured by chin lifting,
upper jaw lifting and head recurvation methods.
• Endotracheal intubation and insertion of laryngeal mask, esophagus closing tube, laryngeal tube
and two-way tube can be practiced.
• With the valve on the esophagus, it is possible to confirm if the stomach is filled with air due to
excessive pressure.
• The fork of trachea, and both right and left lung is structured, therefore one side lung intubation
can be confirmed with the swelling of the chest. The sound of respiration can be also confirmed
at the lung and directly on the collarbone and axilla by using a stethoscope.

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2. Intravenous injection and infusion

• A very lifelike sensation can be experienced, and back flow can be confirmed. (Since the unique structure simulates venous pressure, a liquid bag is not necessary

3. Defibrillation, Electrocardiogram(ECG) monitoring

• Defibrillation training can be practiced by using the built-in arrhythmia simulator. ECG waveform can be operated by the wireless infrared remote control system.

• 15 kinds of ECG waveforms and 7kinds of additional waveforms can be selected. The heart rates of ECG are variable in stages by using remote controller, and various combinations can be selected.

• While performing cardiac massage with over 3.5cm of compression depth, the waveform of cardiac massage can be mixed with ECG.

• Power supply is battery-based and can be used in continual operation for approximately 10hours on a single charge.

• Since the common carotid artery which synchronized with the ECG waveforms can be touched and only a common carotid artery can also be stopped. PEA and, VT with pulse and pulseless VT can be simulated.

• Percutaneous pacing can be performed, and threshold value can be also set up.

• The number of times for defibrillation can be set up (maximum 9 times). Thereby, the scenario recovering from VF to Sinus Rhythm at the 3rd times of defibrillation can be set up easily.

• VF can set up three kinds. (VF,VFfine,VF veryfine)

• Torsades de Pointes waveform can be set up.

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