

Annexure 'A' Patient Monitor

Sr. No.	Technical Specifications	Final Amendments from the technical committee
3	It should be capable of monitoring ECG. Two invasive blood pressure, noninvasive blood pressure, oxygen saturation (SpO2), perfusion index, dual temperature, end-tidal carbon dioxide, and continuous cardiac output (invasive and non-invasive method).	It should be capable of monitoring ECG. Two invasive blood pressure, noninvasive blood pressure, oxygen saturation (SpO2), perfusion index, dual temperature, end-tidal carbon dioxide, and continuous cardiac output (non-invasive method without using additional consumables)
4	The monitor should have a 15-inch color TFT/LCD display.	The monitor should have a 15-inch color TFT/LCD display.
5	The monitor should have a display of 12 or more curves at a given time.	The monitor should have a display of 14 or more curves at a given time.
8	Trend data and full disclosure of waveforms should be 48 hours or more.	Trend data and full disclosure of waveforms should be 72 hours or more.
10	Monitors should have the facility to store and display the last 48 hours or more full disclosure of waveforms.	Trend data and full disclosure of waveforms should be 72 hours or more.
ECG monitoring:		
Pt. 3	Accuracy of +2 beat/min.	Accuracy of +2 beat/min.
Pt 6	Should have the facility to monitor and analyze 12 lead ECG with the optional facility to derive additional six leads of the back (V7, V8, V9) and right chest (V3R, V4R, V5R).	Should have the facility to monitor and analyze 12 lead ECG with the optional facility to derive additional six leads of the back (V7, V8, V9) and right chest (V3R, V4R, V5R).
Pt 7	Should have arrhythmia monitoring facility for up to 20 arrhythmia types. It should store and display the no. of arrhythmias that occurred in the last 48 hours with the ECG segment.	Should have arrhythmia monitoring facility for atleast 23 arrhythmia types. It should store and display the no. of arrhythmias that occurred in the last 48 hours with the ECG segment on monitor.

8	Heart rate measured ranges 20- 300 or more beats/min.	Heart rate measured ranges 20- 300 or more beats/min.
Pulse Oximeter (SpO2)		
Pt. 1	Should provide a digital value of the arterial oxygen saturation as well as diagnostic plethysmograph pulse waveform, perfusion index display.	Should provide a digital value of the arterial oxygen saturation as well as diagnostic plethysmograph pulse waveform, perfusion index display
Pt. 2	2. Measurement range 0% to 100% +/-2% (80-100%) accuracy.	Measurement range 0% to 100% +/- 3% (70-100%) accuracy.
Pt. 4	Should provide the clinical data/reports in support of the accuracy of SpO2 in low perfusion.	Should provide the clinical data/reports in support of the accuracy of SpO2 in low perfusion.
		Perfusion Index PI
EtCO2 monitoring:		
1	Should use infrared absorption technique.	Should use infrared absorption technique.
2	Mode: Mainstream/microstream.	Mode: Mainstream for intubated and non-intubated patient
4	Range EtCO2: 0-99 mm Hg.	Range EtCO2: (0mmHg-150mmHg)
5	Accuracy: + 2 mmHg at normal readings.	Accuracy: + 2 mmHg at normal readings.
Invasive pressure monitoring:		

1	Should have the ability to measure and display a minimum of two or more invasive pressure values with waveforms.	Should have the ability to measure and display a minimum of two or more invasive pressure values with waveforms.
4	Measuring range: 0 to 300 mm Hg.	Measuring range: 0 to 300 mm Hg.
Non-Invasive blood pressure (NIBP) monitoring:		
1	Range: 0-280 mm Hg for adults and 0-200 Pediatric.	Range: 0-280 mm Hg for adults and 0-200 Pediatric.
4	Should have dual-tube air hose and be able to measure NiBP in less than 30 seconds.	Should have dual-tube air hose and be able to measure NiBP in less than 30 seconds.
5	Should be able to measure BP automatically on its own in case there is any sudden change in patient's blood pressure.	Should be able to measure BP automatically on its own in case there is any sudden change in patient's blood pressure.
Continuous Cardiac Output monitoring:		
1	Should have technology to measure non-invasive/minimal invasive continuous cardiac output monitoring.	Should have technology to measure non-invasive continuous cardiac output monitoring (without using additional consumables).

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Should provide continuous CO, CI, SV, SVV, and SVR & SVRI if CVP is measured simultaneously.

Should provide continuous CO, CI, SV, SVV, and SVR & SVRI if CVP is measured simultaneously.





3	Should have the facility of displaying hemodynamic parameters like Co/CI, PPV/CVP in trend graph based on Forrester classification	Should have the facility of displaying hemodynamic parameters like Co/CI, PPV/CVP in trend graph based on Forrester classification
Electroencephalograph (EEG) monitoring (Optional):		
1	Should have the facility of raw 8 channel EEG monitoring with related digital value.	Should have the facility of raw 8 channel EEG monitoring with related digital value.
2	Should have the facility to display EEG waveform in amplitude EEG (aEEG) trend graph for easy identification of neurological events (e.g. seizures, burst suppression, etc).	Should have the facility to display EEG waveform in amplitude EEG (aEEG) trend graph for easy identification of neurological events (e.g. seizures, burst suppression, etc).
3	Should have aEEG trend graph for at least 2 channel for easy Bi-parietal comparison.	Should have aEEG TREND GRAPH FOR AT LEAST 4 CHANNEL FOR EASY.

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4	Should have the facility to display processed EEG in the form of CSA (compressed spectral analysis) and DSA (Density spectral analysis).	Should have the facility to display processed EEG in the form of CSA (compressed spectral analysis) and DSA (Density spectral analysis).
Others:		
1	Should be upgradable to integrated NMT, BIS, 4-CH EEG, and AGM monitoring.	Should be upgradable to integrated NMT, BIS and AGM monitoring.
2	Interchangeable module should be able to transfer all connected parameters (ECG, SpO2, NIBP, two IBP and two temperatures) on a patient without disconnecting the cables/accessories to another bedside monitor.	Transport Monitor of 5.5 Inches should be able to transfer all connected parameters (ECG, SpO2, NIBP, two IBP and two temperatures) on a patient without disconnecting the cables/accessories to another bedside monitor. (optional) Monitor should have Emergency Transport module wherein it can be used during patient transfer and can be plugged into main unit again. Specifications of Transport Module - Should have screen size of 5" or more - Should have battery backup of atleast 6 hours or more
3	Should have event recall minimum up to 48 hours Trend, graphical and tabular trends, alarm logs and able to take the printout using a network printer.	Trend data and full disclosure of waveforms should be 72 hours or more able to take the printout using a network printer.
4	Should display the latest trend graph of at least 10 minutes on the main screen along with real-time waveform and numerical values.	Should display the latest trend graph of at least 10 minutes on the main screen along with real-time waveform and numerical values.

6	Monitor should have the" facility to give print commands directly to a network printer.	Monitor should have the" facility to give print commands directly to a network printer.
7	Monitor should be HL7 compliant and able to connect to Hospital Information System.	Monitor should be able to connect to Hospital Information System directly or through CNS System.
Pt 8	The unit should be US FDA approved or European CE approved product.	The unit should be US FDA approved or European CE approved product.
Central Nursing Station (Optional):		
4	Should store data of minimum 72 hours and full disclosure of minimum 8 waveforms.	Should store data of minimum 72 hours and full disclosure of minimum 8 waveforms.
5	Should be upgradeable to 24 or more beds.	Should be upgradeable to 64 or more beds.
Few Points To Be Added For Better Diagnosis and Patient care		
		Invasive Pressure Monitoring: PPV and SPV should be there.
		Unit should have CDSCO certificate
		Monitor should have an internal rechargeable battery for at least 2 or more hours operation.

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