

**TECHNICAL SPECIFICATIONS OF ECG MACHINES**  
**FOR PROGRAMMATIC MANAGEMENT OF DRUG RESISTANT TB UNDER**  
**REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME**

**A. PREAMBLE**

This guidance is provided in regard to the requirements that should be considered when procuring ECG machines for monitoring of patients being treated either with the shorter treatment regimen (STR) or the new drugs for drug-resistant TB treatment, including Bedaquiline and Delamanid under Programmatic Management of Drug Resistant TB (PMDT).

The ECG machine can be 1/3/6 channel; however, it should fulfil all the requirements as per Technical Specifications given below:

**B. TECHNICAL SPECIFICATIONS**

S. No.	Features	Technical Specifications & Operational/Functional Requirements
1	Size & Weight	<ul style="list-style-type: none"> <li>• Sturdy &amp; light weight machine &lt;5kg,</li> <li>• Should be compact</li> <li>• Should have carry handle for portability</li> </ul>
2	Power Supply	<ul style="list-style-type: none"> <li>• Compatibility with mains 220-240 V (normal), 50/60 Hz power supply</li> <li>• High performance Li-ion rechargeable battery with built-in charger. -Equipment should have sufficient battery backup for taking minimum 100 ECGs without AC power.</li> <li>• Digital filtering to remove interference from power line, muscle tremor etc.</li> </ul>
3	ECG recording	ECG recording with 12 leads a. Standard Leads (the limb leads or bipolar Limb leads: I, II & III) b. Augmented Limb Leads- (aVL, aVR and aVF) c. Chest Leads ( the unipolar or V leads)- from V <sub>1</sub> to V <sub>6</sub> Simultaneous acquisition from 12 leads Recording speed selection of 25 mm/ sec and 50 mm/ sec with facility for speed selection Automatic adjustment of baseline for optimal recording Should have different filters like Baseline Filter, EMG Filter & AC Filter Multiple operating modes -automatic, manual and rhythm -Common Mode Rejection Ratio >90dB

4	Built-in ECG Parameters measurement and interpretation	-Built-in ECG auto-measurement including: HR, P-R interval, P-Duration, QRS duration, Q-T interval, Q-TcF (Friedericia), P Axis, QRS Axis, T Axis, R(V5), S(V1), R(V5)+S(V1) <b>-QTcF interval reading/ measurement should also be available with Limb leads alone .</b>
5	Printing and Communication	-High-resolution thermal printing array system -Built in printer should work with standard universal thermal printer paper
6	Standard Accessories	The machine should be supplied with <ul style="list-style-type: none"> <li>power cord , patient cable, user manual and warranty card, Operation Manual with user demonstration video CD, interpretation manual &amp; 10 thermal recording paper rolls , 5 bottles of jelly,</li> </ul> Two sets each of : <ul style="list-style-type: none"> <li>patient cable</li> <li>chest electrodes – Both adult and paediatric (2 sets each)</li> <li>limb electrodes – Both adult and paediatric (2 sets each)</li> </ul>
7	Safety Profile	Should be provided with terminal for good earth connection to preclude electric disturbances while recording- -Must have a safety certificate or valid detailed electrical and functional safety test report from a recognised competent authority -Copy of the certificate / test report shall be produced along with the technical bid.
8	Installation & Training	The firm should install the instrument at the designated location and provide one-day training/ demonstration of operation of ECG machine.
9	Warranty	- performance warranty of at-least one year from date of installation + additional two years comprehensive warranty, -In case of breakdown of the machine, the supplier shall make the machine functional by repair (including replacement of parts) free of cost at the user site, within 3 (three) days of the receipt of complaint, or replace the machine (if necessary).
10	After Sales Services	-The suppliers should have adequate after sales service facilities covering all districts of the country. -They should have infrastructure and trained manpower to attend to any complaints within 3 days of receipt of complaints