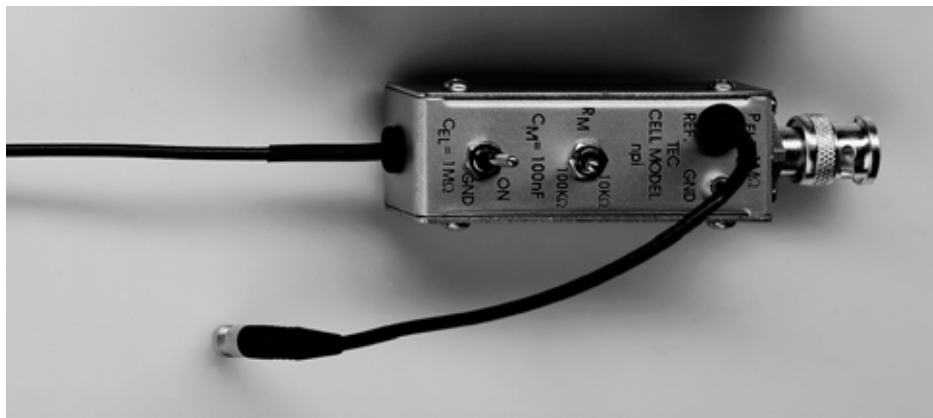


OPERATING INSTRUCTIONS AND
SYSTEM DESCRIPTION FOR THE
PASSIVE CELL MODEL

FOR TWO ELECTRODE
VOLTAGE CLAMP AMPLIFIERS



VERSION 2.3
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1. Introduction

The cell model is designed to be used to check the function of a TEC amplifier either

1. just after unpacking to see whether the instrument has been damaged during transport or
2. to train personnel in using the instrument or
3. in case of trouble to check which part of the setup does not work correctly e.g. to find out whether the amplifier is broken or if something is wrong with the electrodes or holders etc.

This cell model consist only of passive elements i.e. resistors that simulate the resistance of the cell membrane and the electrodes and a capacitance that represents the capacitance of the cell membrane. A switch allows to simulate two different conditions of the cell (see Figure 1 and Figure 2). A second switch permits grounding the current electrode.

2. Cell Model Description

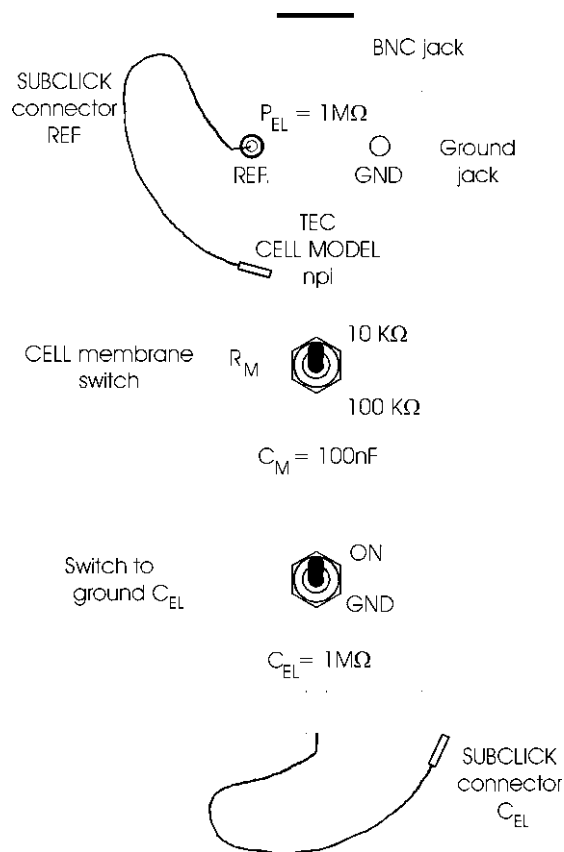


Figure 1: TEC passive cell model

- P_{EL} : connector for the potential electrode, resistance: $1\text{ M}\Omega$
- GND : ground connector
- $REF.$: connector for the reference electrode
- R_M : switch for cell membrane representing a membrane resistance of either $10\text{ k}\Omega$ or $100\text{ k}\Omega$
- C_M : membrane capacitance of 100 nF
- GND switch: switch to ground the current electrode (switch position: GND , for details see below)
- C_{EL} : connector for the current electrode, resistance: $1\text{ M}\Omega$

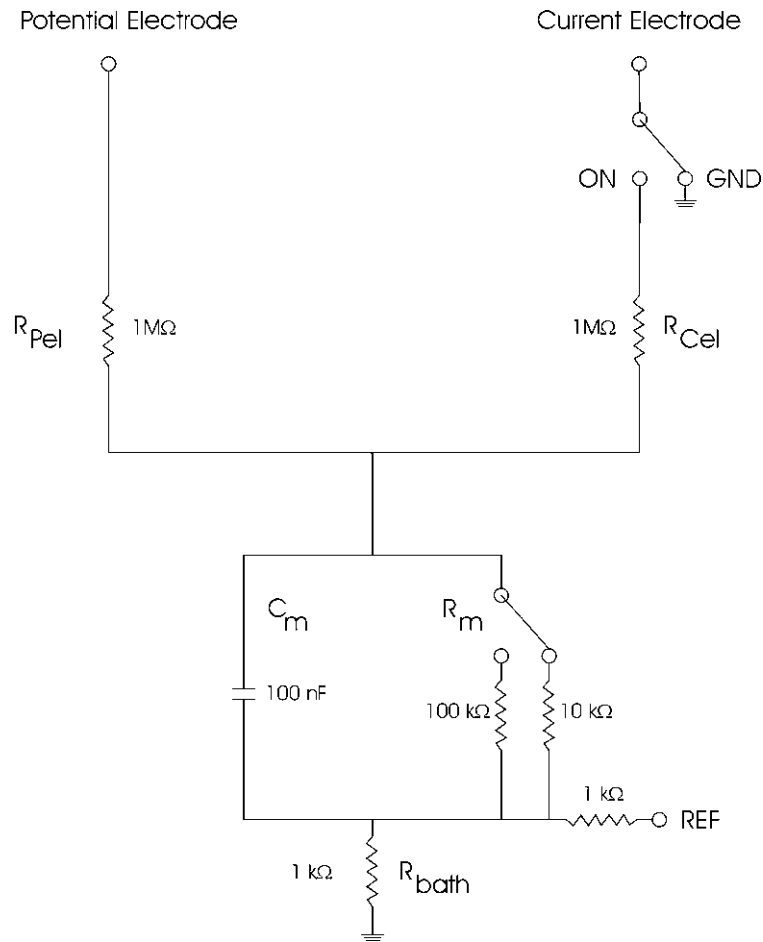


Figure 2: schematic diagram of the TEC passive cell model

3. Connections and Operation

3.1. *Checking the configuration with the cell model*

- Turn POWER switch of the amplifier off.
- Connect the BNC jack of the cell model to the BNC connector at the potential headstage.
- Connect the SUBCLICK connector REF. to the REF. connector at the potential headstage.
- Connect the SUBCLICK connector C_{EL} to the plug at the current headstage.
- Switch the CELL membrane switch (see Figure 1) to the desired position.
- Set the GND switch (see Figure 1) to ON.
- Turn all controls at the amplifier to low values (less than 1), the OFFSET in the range of 5, the OSCILLATION SHUTOFF in the DISABLED position, and the VC OUTPUT LIMITER (not TEC-03X) in the OFF position.
- Turn POWER switch of the amplifier on.

Now you can adjust the amplifier and apply test pulses to the cell model. Connection to the BNC- and SUBCLICK connector respectively gives access to the cell via a potential and current electrode with 1 M Ω resistance. In the upper position the R_M switch simulates a cell membrane with a resistance of 10 k Ω . In the lower position a cell membrane with 100 k Ω is simulated. The membrane capacitance is always 100 nF.