

Control Unit for Critical Potential Tubes (115 V, 50/60 Hz) Control Unit for Critical Potential Tubes (230 V, 50/60 Hz)

1000633 (115 V, 50/60 Hz)
1008506 (230 V, 50/60 Hz)

Instruction manual

01/14 ALF



- 1 Output for accelerating voltage
- 2 Input for picoamp amplifier
- 3 Terminal panel for multimeter
- 4 Terminal panel for oscilloscope or data logger
- 5 Output voltage control panel

1. Safety instructions

The control unit for critical potential tubes conforms to the safety stipulations for electrical measuring, control and laboratory instruments as specified in DIN EN 61010 part 1. It is intended for use in dry rooms suitable for the operation of electrical equipment.

Safe operation of the equipment can be assured as long as it is used as stipulated. However, safety cannot be guaranteed if the equipment is used incorrectly or handled without due care and attention.

If it may be assumed that the equipment may no longer be operated safely (e.g. in the event of visible damage), it must be taken out of use immediately.

2. Description

The control unit is designed for the operation of S-series critical potential tubes filled with helium (1000620) or neon (1000621).

The equipment outputs a saw-tooth waveform with a frequency of 20 Hz to be used as the accelerating voltage at the anode of such tubes. This voltage is galvanically isolated from the operational earth of the device. This means that an additional voltage supply of the user's choice, such as a battery, can also be connected between the anode and the collector electrode. The initial and final voltages of the saw-tooth generator can be adjusted continuously between 0 and 60 V. This makes it possible to observe a specific section of the curve more accurately.

With the help of the built-in picoamp amplifier, it

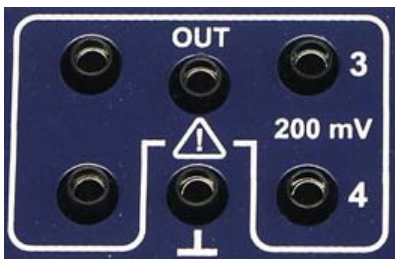
is possible to trace the curve for the collector current on an oscilloscope. The in-built SLOW function allowing for a lower frequency (1/6 Hz approx.) enables recording of this characteristic with the aid of a slower measuring interface or an XY plotter.

The equipment with the order number 1000633 includes a plug-in power supply for a mains voltage of 115 V ($\pm 10\%$), whereas the one with order number 1008506 includes one for 230 V ($\pm 10\%$).

2. Controls



Output 1 is designed to supply the saw-tooth accelerating voltage V_A . The initial voltage is set using knob 4 and the final voltage is set via knob 3.



To set the desired parameters for the saw-tooth voltage, a multimeter can be connected into circuit. The voltage measured between socket 3 and ground (V_A MAX) or socket 4 and ground (V_A MIN) is smaller than the actual voltage by a factor of 1000.



The collector current I_C (pA) is fed to the equipment via socket 2 (BNC socket). When amplified by the built-in picoamp amplifier, the current can be measured via the terminals of an oscilloscope/data logger in the form of an equivalent voltage (1 V/nA).

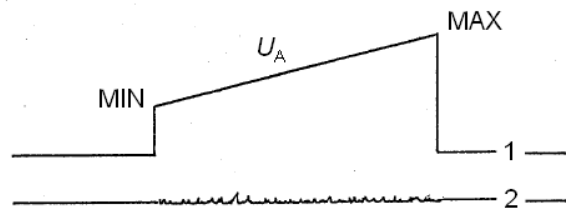


To display the collector current as a function of the accelerating voltage, the XY mode of the oscilloscope can be used. You can record the relevant voltages at 20 Hz by connecting the scope to the FAST output.

The SLOW output allows values to be output at lower frequency using a slow interface or an XY plotter. The output is provided by means of a built-in sampling method by pressing the SLOW RUN button.

When the SLOW function is activated the LED will light up in green. When it finishes, the LED will turn back to red.

In both cases, the output for the saw-tooth voltage is taken from socket 1 (Y deflection) and the output from the measuring amplifier is from output 2 (X deflection).



3. Technical data

| | |
|----------------------|---|
| Supply voltage: | 12 V AC |
| Current measurement: | 1 V/nA, BNC |
| Output voltage: | 0 - 60 V/20 Hz, sawtooth |
| Measurement output: | Socket 1: 0 - 1 V, proportional to output voltage Socket 2: 0 - 1 V, proportional to collector current I_C |
| Operating modes: | FAST: measurement output 20 Hz SLOW: measurement output 1/6 Hz |
| Dimensions: | 170x105x45 mm approx. |

4. Operation

- Connect the control unit to its plug-in power supply. The socket for it is on the base of the equipment.

- Connect the control unit into the circuit for the critical potential tube.
- In order to set up and carry out the critical potential tube experiments correctly, read the tube's instruction manual first.
- Plug the power supply into the mains. The LED will light up in red.

5. Disposal

- Should the equipment need to be scrapped, it must not be disposed of in normal household waste. Local regulations for the disposal of electrical equipment should be observed.

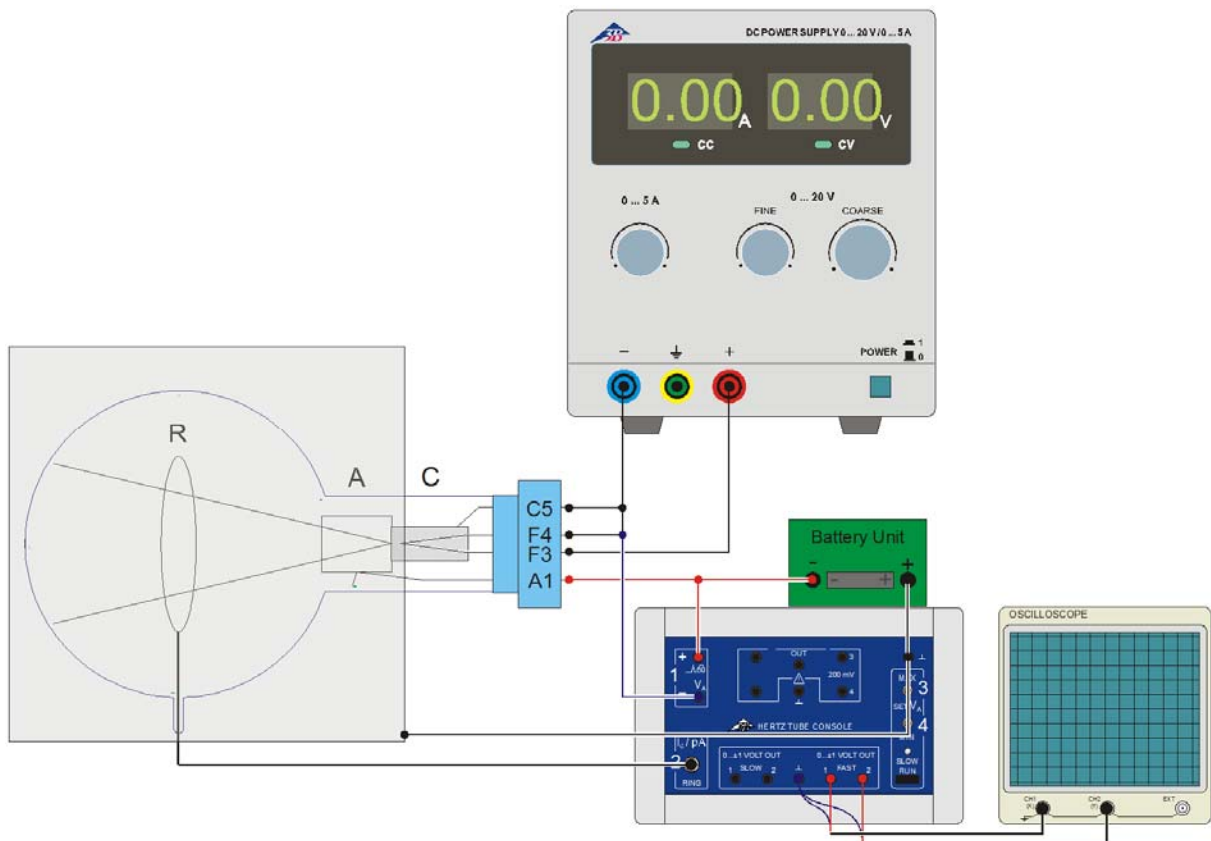
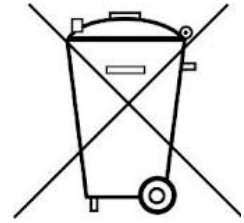


Fig. 1 Circuit for critical potential tube

