

Power Tester - Helmut Weigl

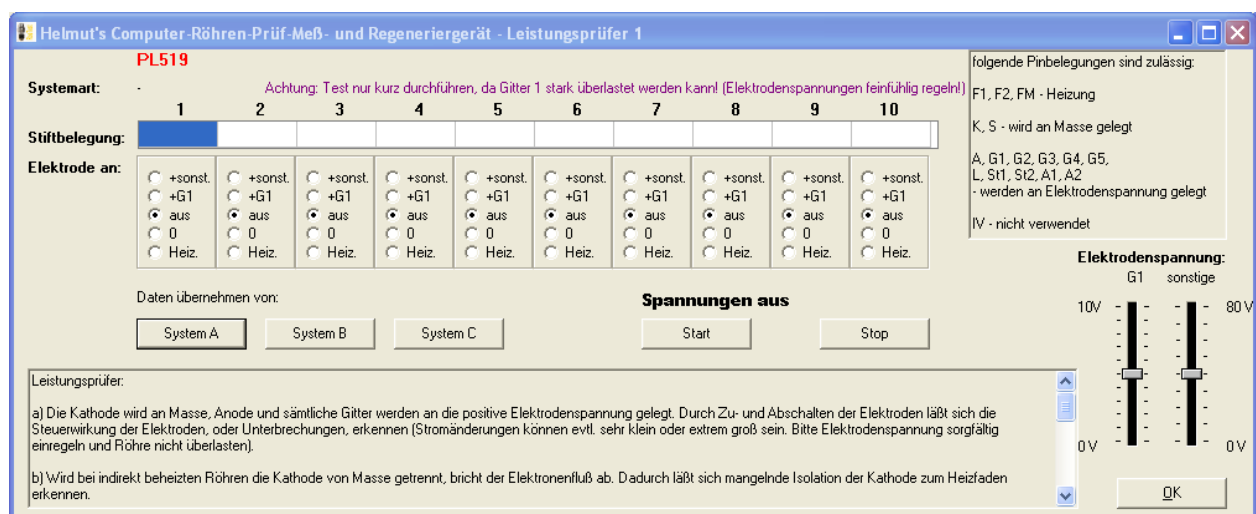
The majority of tube testing devices are either power testers or static tube measuring devices. Only the second type allows to make precise measurements. The RoeTest is also a static tube measuring device.

But there are nevertheless some cases when power testers are required. For example to find out the the socket assignment of an unknown tube.

The software of the RoeTest offers modes that allows to use it as a power tester too. Starting with software version 3.0.0.0 there are 2 modes available:

- 1 Power Tester 1
- 1 Power Tester 2

Power Tester 1: (low resistance)

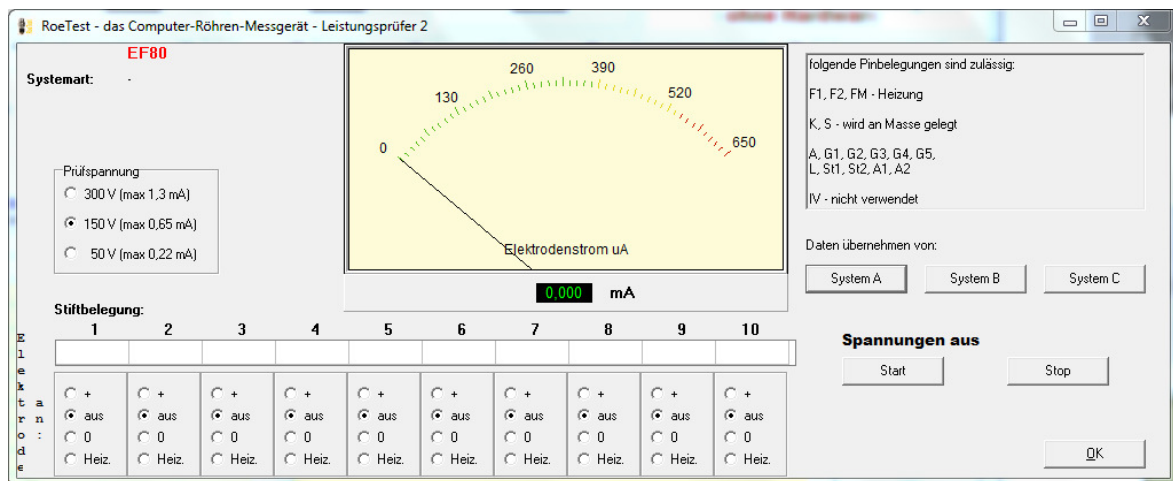


Each socket pin can alternatively be assigned to the heater supply, 0V, positive voltage G1 or to positive voltage “sonst.”; it can also be left unconnected. There are two slides to control the level of the voltages. Using the buttons <System A> (B,C) allows to import the socket connection scheme of the currently loaded tube data.

Caution: The tubes are tested using very low resistance. The voltages (especially G1) must be adjusted with the slides so that the the tube will not be overloaded by to the currents. The slide for G1 has been added to allow to control the voltage (and current through the electrode) independently from the voltages of the other electrodes.

The degree of freedom with the adjustments implies that you have to be careful not to generate short circuits or over currents that could damage the tube. There is no tube specific over current limiting in power test mode compared to the automatic test modes. In extreme cases however the RoeTest will shut down due to internal over current limiting to protect itself.

Power Tester 2: (high resistance)



To be able to test the tube also with low currents – in contrast to power test mode 1 – the power test mode 2 has been created. In this mode two resistors (normally used for testing tuning eyes) are inserted in series between the RoeTest and the electrodes. The resistors are connected in parallel ($2 \times 470\text{kohm} = \text{ca. } 235\text{ kohm}$). Even in the case of a short circuit only a very small current can flow. The test voltages are selectable from 50V, 150V and 300V. Voltages and currents should be not dangerous even for susceptible tubes (the resistors in series will drop the voltage). There is hardly a chance to endanger the tube (but the heating voltage must be connected properly and must not be connected to other electrodes). To ease the readability of the currents (only the tendency is meaningful, not the absolute value) a large analogue measuring instrument display is used.

What can be tested using a power tester? (Examples)

For all the examples the following applies: Heat the tube. The heater connections are not switched.

1. Finding the cathode(s):
 - Connect all electrodes to a positive supply.
 - Connect one tube pin after the other to 0V. If the pin is a cathode a current will flow.
2. Testing the insulation between heater and cathode:
 - Connect all electrodes to a positive supply
 - There may not flow a current (only with indirectly heated tubes)
3. Finding out which pins belong to a specific cathode:
 - Connect first cathode to 0V, connect all other electrodes to the positive supply
 - Connect pin after pin to 0V, if the current drops, this electrode belongs to the cathode
 - Keep the found pin connected to 0V and continue with the other electrodes....
4. Finding out the arrangement of the electrodes
 - Connect all electrodes to 0V.
 - Connect pin after pin (a single pin only) to the positive supply. The electrode that is nearest to the cathode (G1) has the largest current.

When identifying the electrodes please consider the following:

- Tube pins may be internally connected
- Compound tubes have several systems; the grids of two systems may be connected to a single tube pin.
- There are compound tubes with one or more cathodes
- There might be a small amount of current even when the pin is connected to a shield (S) (an example is the EF80)
- With pentodes G3 may be internally connected to K
- It is advisable to use the power tester 2 with unknown tubes where the position of G1 is also unknown. This will avoid to endanger the tube due to over currents