

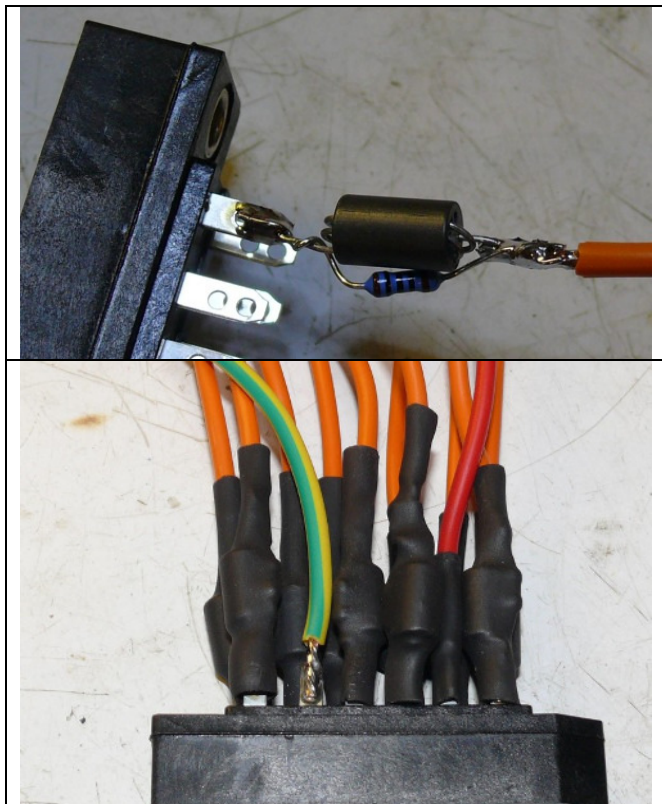
**Tendency to Oscillate:** - revised 30.09.2014

Mounting many tube sockets into a tube measuring device inevitably leads to bulky wiring and long wires. There may be crosstalk in the wiring and oscillation of the tube.

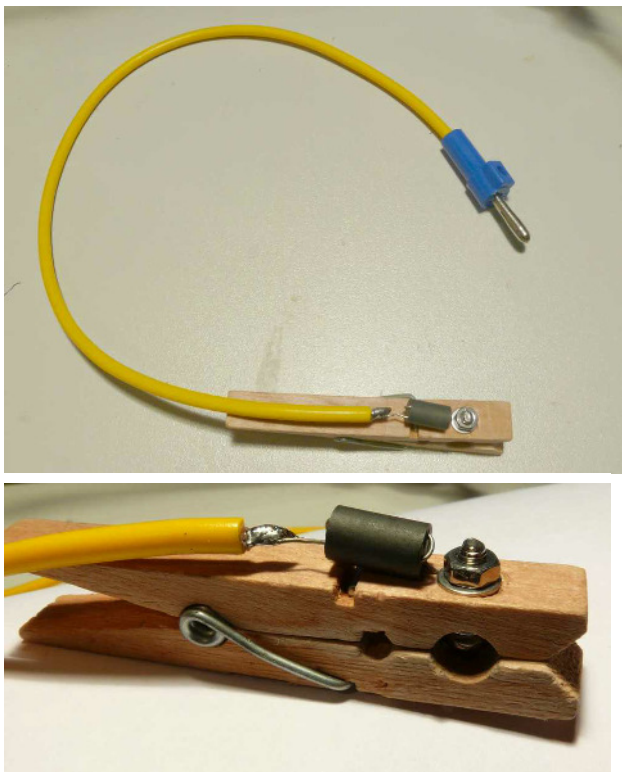
Some tube types have a tendency to oscillate. This only applies to a small fraction of tube types. These tubes often have **high transconductance at a large anode current**. Oscillation mostly occurs when a certain anode- or screen grid current is exceeded. Oscillations often can be recognized by rising or falling grid voltage or fluctuations of anode- and screen grid current. When oscillation occurs measuring must be stopped immediately. **Oscillations at high power can damage the RoeTest**. For this reason the software has a built in oscillation detection algorithm. It recognizes over voltages generated by oscillations and switches off the measuring.

**There are some simple measures to solve this problem:**

1. Keep all wires short. Connection of the MOS-Fets can be done directly at the board. On the board the affected lines are as short as possible. The connection to the socket boxes can be done using only a few cm of cable.
2. Ferrite beads at the socket box connector: In the newest devices I built in attenuators from a VHF-choke and a 100 Ohm resistor (in parallel) direct at the socket box connectors. The ferrite beads must be insulated against each other using shrinkable tubing to avoid short circuits.



3. Do not mount tube sockets to the device but use adapter boxes instead (= shorter wires).
4. Only one socket per adapter box. Thus there are only short wires to the socket box connector. Normally you do not need additional ferrite beads in the socket box.
5. If there is a tube that nevertheless tends to oscillate one can mount an additional ferrite bead direct at the socket at the anode connector (only).
6. Critical are horizontal line output tubes with external anode cap. In this case a VHF-choke (with 100 Ohm in parallel) directly at the anode connector works wonders. I built from a clothespin (an alligator clip will do as well), a VHF-choke and a piece of measuring wire a special connector cable:



Tubes like PL36 and PL504 could thus be measured without any problems.

Persistent example: Faulty EL41:

This tube oscillated despite of the built in ferrite beads.

The solution was to build an intermediate adapter. The G1 feed cable was connected via a 3k Ohm series resistor. The anode feed cable was connected with a VHF-choke and the screen grid feed cable was equipped with ferrite beads. Heater and cathode were just connected through. So this tube could also be measured without problems.