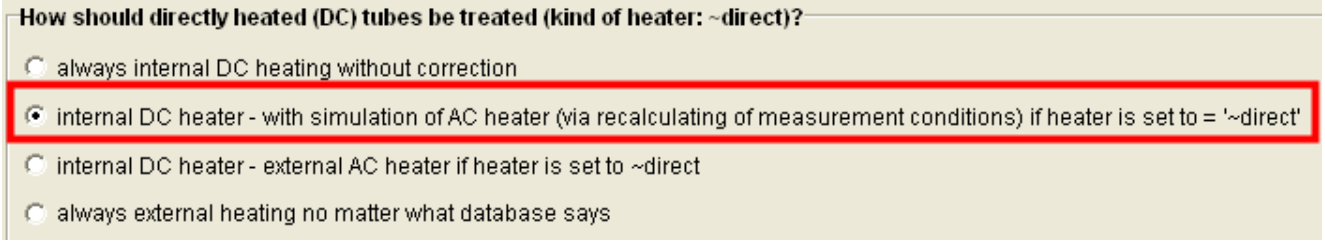
Tube heating with the RoeTest

Below is a summary what possibilities of tube heating are present with the RoeTest.
The heating source can be selected with the **Options** settings.

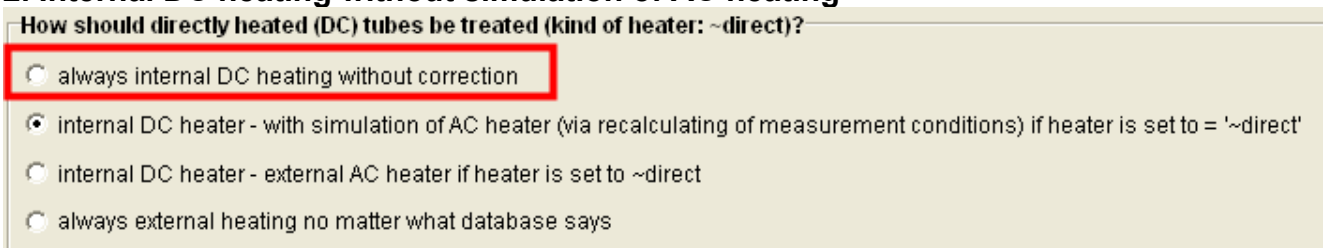
1. Internal DC heating with simulation of AC heating



This selection is recommended as default.

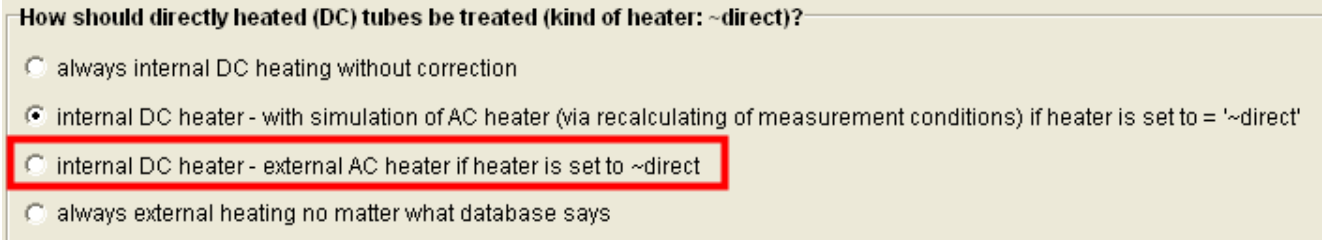
The internal DC source is always used. If an AC tube type is recognized (tube type ~indirect) a simulation of AC heating is used.

2. Internal DC heating without simulation of AC heating



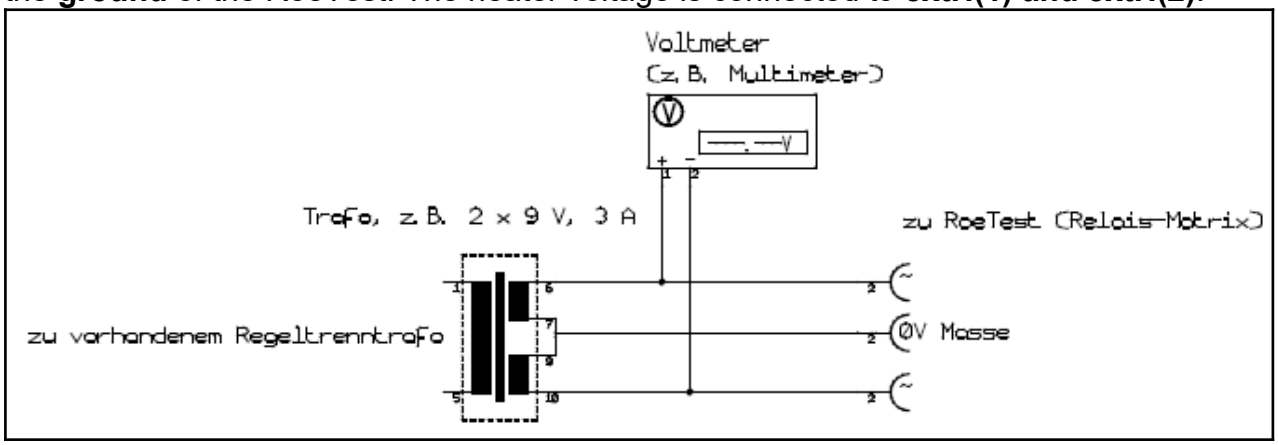
Same as 1. without simulation.

3. Internal DC heating fur DC tube types, external AC heating for AC tube types (only up to hardware V9)

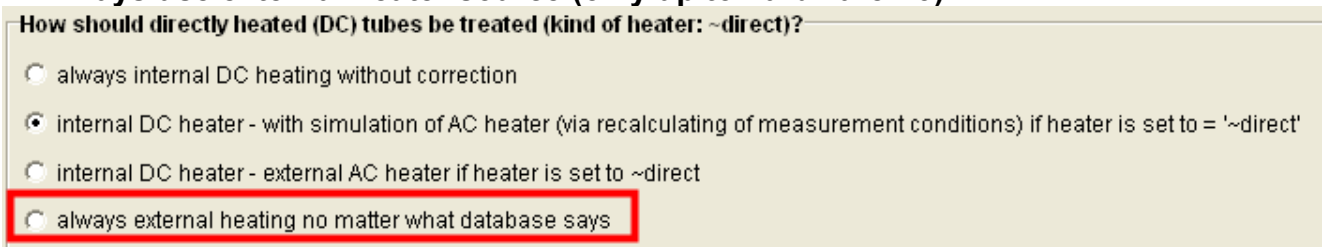


For tubes with heating type “~indirect” an external heater voltage must be connected to the banana jacks extH(1) and extH(2) (only hardware up to V9). Ground has to be connected to the mid point of the external heater source. The external heating voltage is switched to the rails H and G3 (for this reason it is not possible to use the G3 voltage source for this type of tubes).

Suggestion for an external AC heating source. The mid point must be connected to the **ground** of the RoeTest. The heater voltage is connected to **extH(1) and extH(2)**.



4. Always use external heater source (only up to hardware V9)



For “~direct” heated tube the statements for 3. apply.
For “indirect” or “direct” heated tubes an external DC voltage has to be connected to the banana jacks **ground and extH(1)**.

The selections 3. and 4. are normally not needed. These possibilities are only present for experimenting.

Please do not connect an external heating source exceeding 5A to the banana jacks of the RoeTest. The boards and the relays are not designed for that.

Special cases: (all hardware versions)

1. Tubes with large heater currents (exceeding the possibilities of the RoeTest)
For those tubes an external DC heating source must be used. This heater source is not connected to the jacks of the RoeTest but **directly to the tube sockets**.
Please note: The extern power supply must be ground free (Pin 'F1' of the tube would be connected with RoeTest ground about the relays).

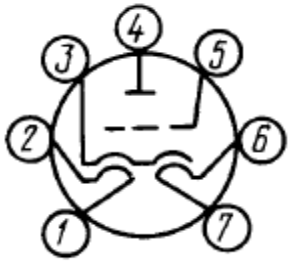
To avoid that the RoeTest also switches the internal heater supply I defined additional tube types:

- Diode ext H. DC
- Triode ext H. DC
- Tetrode ext H. DC
- Pentode ext H. DC

With this tube types pin "F2" will not be switched to the rails and to heater card. So the same sockets can be used as for internally heated tubes. For the filament you can mount banana jacks into the respective socket box. The selections from the heating options are not used in this case and need not be changed.

Examples, see
https://www.roehrentest.de/gu81_EN.pdf
https://www.roehrentest.de/SRS455_6155_EN.pdf
https://www.roehrentest.de/833_Bericht.pdf

2. 6C33C (lat. 6s33s russ)



This tube has two separate filaments. When the filaments are connected in series you need a heater voltage source of 12.6V at 3.3A. The RoeTest can supply this. One only has to arrange that pins 1 + 7 are connected to get the filament series connection. This can be done by software (no external connection needed).
I created a separate tube type "Triode FM" for that. For this type is defined that the pins named "FM" are connected to rail 5 (normally G3) which is not needed here. In the tube data the type "Triode FM" is selected. Pin 1=FM, Pin 7=FM, Pin 2=F1, Pin 6=F2. The flow of the current is now as follows:

- From the heater supply board to the H rail via relay board 6 to pin 6
- through the right side filament to pin 7 and via relay board 7 to rail G3(= unused rail)
- from rail G3 via relay board 1 to pin 1
- through the left side filament to pin 2 and then via relay board 2 to ground

Note: A filament test is not possible with this connection scheme.