

# RoeTest – Computer Tube Tester/ Tube Measuring System (c) - Helmut Weigl [www.roehrentest.de](http://www.roehrentest.de)

## Tube data (RoeTest.dbf)

After starting a list (Default: all tube types entered) will show:

The screenshot shows the 'RoeTest.dbf' database window. At the top, there is a search bar with 'RoeTest alle.dba' selected and a 'searching comparable tubes' button. Below the search bar are several tabs: 'Comparison list', 'heater', 'systems', 'typical ratings system 1', 'typical ratings system 2', 'typical ratings system 3', 'absolute max.ratings system 1', 'absolute max.ratings system 2', and 'absolute max.ratings system 3'. The main area contains a table with the following data:

index	designation	manufact	similar type	code	remarks	data checked	year
0	0,06D - Metal		A415			nein	
1	0,06DG - Metal		A441N			nein	
2	0,1 - USA		01A			nein	•
3	0,1A - USA		01A			nein	•
4	0,1AA - USA		01A			nein	•
5	0,6p2b russ				Daten?	nein	•
6	0.06		RE084			nein	
7	0.06D		RE084			nein	
8	0.06DG		RE074d			nein	
9	0/20	Mul				nein	•
10	0/20_UV	Mul				nein	•
11	0/40	Mul			V: Sendetriode	nein	•
12	00					nein	•
13	00A				= F-12A, CE200, UX200A, UX200, H, F12A, 412A, 412, 200A, 200,	nein	192x •
14	01					nein	•
15	012	Wst	WD12			nein	
16	012A - USA		12A			nein	•
17	01307		CK1			nein	
18	015/400		RE614			nein	•
19	01A		UX201A			nein	192x •
20	01AA					nein	•
21	01A_UV		UV201A			nein	•
22	01B					nein	•

At the bottom of the window, there is a status bar showing 'record: 0 22662 of 22668' and several buttons: 'print', 'new', 'delete record', 'edit', and 'OK'.

You can go through the list using the arrow keys or move it with the mouse and select a specific tube. The data for the respective tube can be edited when double clicking on the list or by pressing the button <bearbeiten>. To enter a new tube also press <bearbeiten> and then create a new data set.

With the button <DS löschen> the currently marked data set can be erased (Caution: there is no query for erasure; erasure is done immediately).

The contents of the list can be changed using the buttons above the list.

Selectable are:

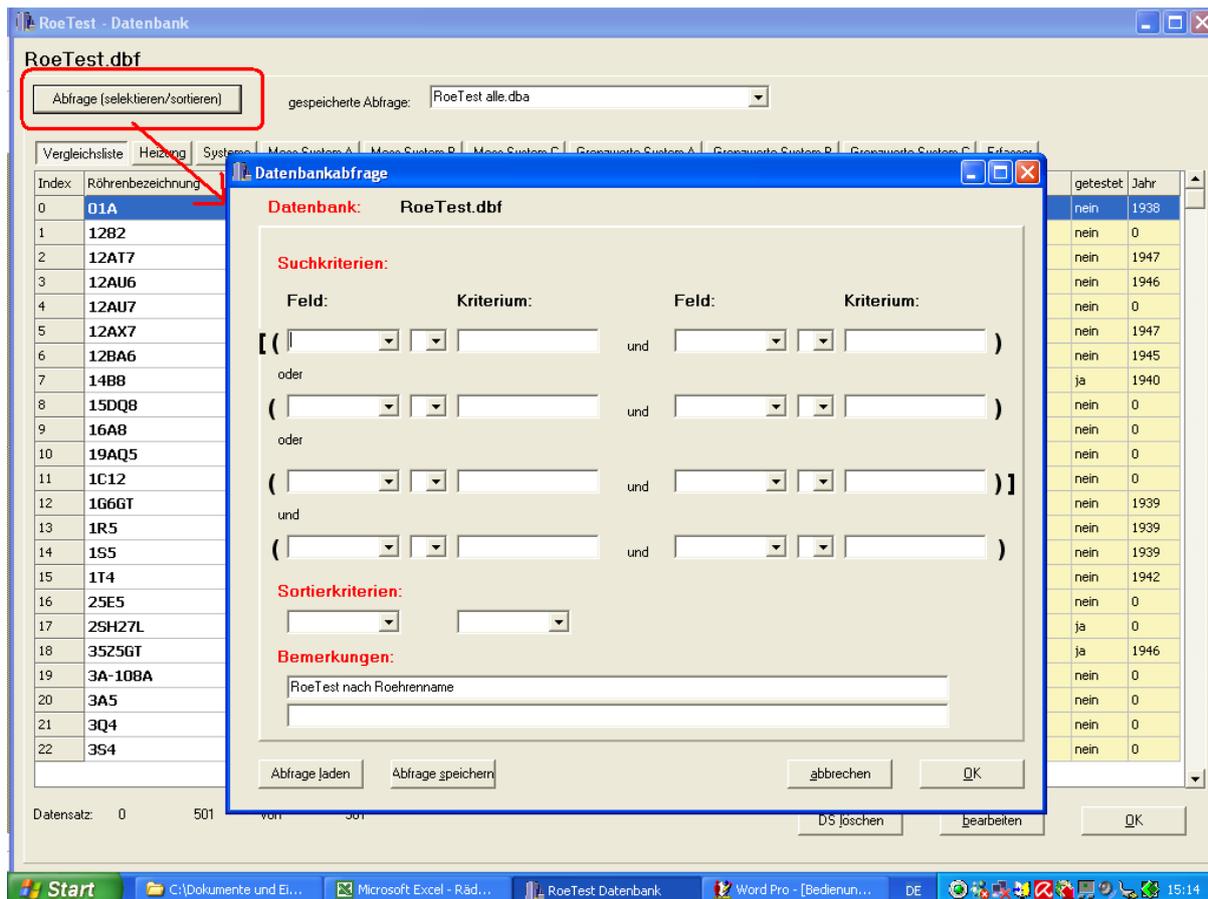
- Comparison list
- Heating
- Systems
- Measure data system A,B,C
- Limits system A,B,C
- Typeist

## Searching/Sorting:

There are 3 possibilities:

### 1) Search- and Sort mask

Press the button at the upper left < Abfrage selektieren/sortieren >.  
A search mask will be displayed:



Choose the search criteria from the drop down list, the operator (=, !(not), >, <) and the search value.

For character strings (as for example the tube's name) the **Wildcards** ? (denotes exactly one character) and \* (denotes any number of characters) are also allowed.

Example: Search all tubes "ECC":

Field=Name - Operator = - Search value "ECC\*"

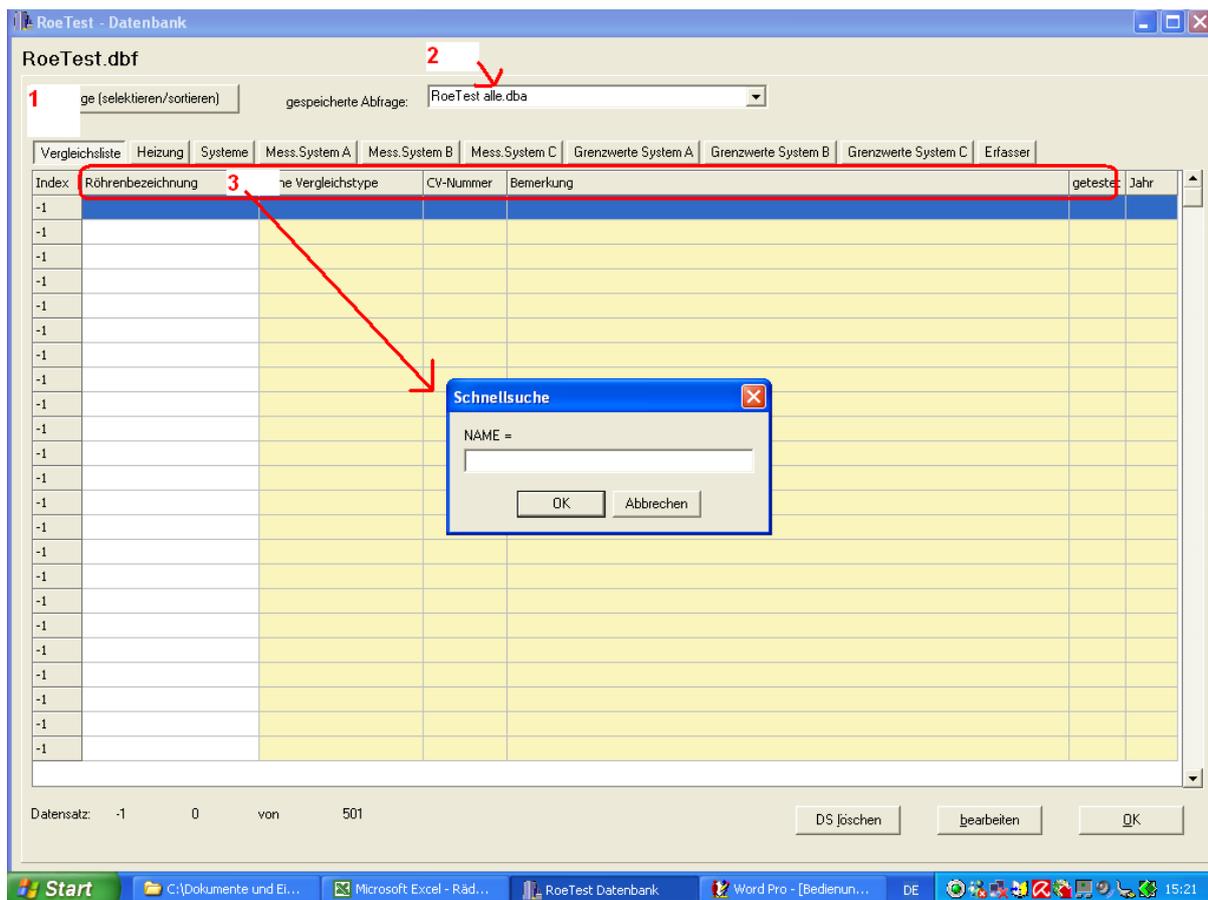
As you can see in the mask you can combine up to 8 criteria (with and/or).

Sorting of the list can be done using the sort criteria.

If you need some specific searches/sorts often you can store the created query and reuse it later.

## 2) Using stored Search-/Sort queries

When starting the database all previously stored Search-/Sort queries are loaded. The stored queries are at the upper middle (drop down field).



## 3) Quick search

Quick search is possible by **double clicking at the column caption line**:

Search is done using one criterion. Sorting is always performed using the tube description.

## Editing the data:

The data for the respective tube can be edited by double clicking on the list or clicking the button <bearbeiten>. To enter a new tube also click the <bearbeiten> button and then create a new data set. The input mask will show up:

The screenshot displays the 'RoeTest Datenbank - tube data' application window. The main form is divided into several sections:

- Tube Designation:** 'PL519' with a 'K' button.
- Manufacturer:** A dropdown menu.
- See similar type:** A text input field.
- Philips code:** A text input field.
- Market introduction year:** '1970'.
- Heater Section:**
  - heater voltage [V]: 40,00
  - Heater current [A]: 0,300
  - heater type: indirekt
  - Heater cold resistance (ohms): 20,60
  - control: radio buttons for voltage and current control.
- General data:**
  - data checked/verified:
  - Origin of data: Philips Datenblatt
  - Data filed by: H. Weigl
  - Data changed or new:  (check if data changes should be used and transferred for updating purposes)
  - Data changed by: H. Weigl
  - remarks about changes: A text area.
- Pin Assignment Table:**

	System 1	System 2	System 3
pin 1:	G1		
pin 2:	G3		
pin 3:	G2		
pin 4:	F1		
pin 5:	F2		
pin 6:	G2		
pin 7:	G3		
pin 8:	G1		
pin 9:	K		
pin 10:	A		
- Base/Socket Information:**
  - Diagram: 8 x 36° 1.27p B9D
  - length of bulb [mm]: 116,0
  - diameter of bulb [mm]: 39,7
  - weight [g]: 85
  - Model: Magnoval B9D
- Remarks about tube:** help on tube types: V: Horizontalendstufe und Hochspannungserzeugung in Farbfernsehempfängern typ.Wert aus Kennlinie entnommen
- Navigation:** new, duplicate, print datasheet, abort, store

## Explanation of the data:

At the upper left there is the tube description. Right below there is a cross reference to a comparable tube type. If a comparable type is given the data have to be entered at the comparable type. This is required as the RoeTest uses the data of the comparable type. Below is for your information the CV-number.

Below that are the data for heating:

- Heater voltage
- Heater current
- Heater type (indirect, direct, ~direct or none) - see also chapter AC heating -
- Automatic control, here you can select if either a voltage controlled (for parallel heated tubes, e.g. E-tubes) or current controlled (series heated tubes, e.g. P-tubes) automatic control shall be used.

At the upper right::

Per tube up to 3 systems are possible. If a tube has more than 3 systems a

second tube must be created (example EABC80, EABC80b).

Below: Selection tabs:

a) Base assignment with base picture

b) typical values:

The typical values are taken from tube tables, tube data sheets or in individual cases determined by trying. Please keep in mind that there are some tube types (for example heptodes) where different connections are possible. For this reason more tube types, for example “heptode 2” are attached. The tube pins can individually be connected to the voltage sources. In special cases for example G2 and G4 are connected.

Measurement grid current:

	System 1	System 2	System 3
Röhren-(System)art:	Pentode	-	- lg1_mess
<b>typische Werte:</b> S2 +1 UA / L [V] *)	170,0	0,0	0,0
S3 -1 UG1 [V] *)	-2,00	0,00	Ug1 [-V] -3,00
S4 +2 UG2/An/Stn [V] *)	170,0	0,0	0,0
S5 -2 UG3/G40kt. [V] *)	0,0	0,0	0,0
UG4/G5 [V] *)		= Stiftzuordnung gen	renart
IAL Soll [mA]:	10,000	0,000	Ig>=[µA] 1,000
IG2/An Soll [mA]:	2,500	0,000	Ig>=[µA] 2,000
S [mAV]:	7,40	0,00	0,00

Sockelbeleg. typische Werte Grenzwerte

This usually occurs at the specified operating point (in the example above at  $U_{g1} = -2$  V. This does not work for some tubes. Some tubes also have higher grid currents. For these exceptional cases, different information can be set (see above outlined in red).

c) Limits.

d) miscellaneous:

The RoeTest is largely automated. To be able to manually override the automatic there is also the field “Ausnahmen” (exceptions). Here you can manually enter the heater voltage range, abort when exceeding a certain heater current (possibly needed for tubes with high heater inrush current) and the starting voltage for the G1-characteristic curve.

The field “Regeneriermodus” uses the data from the file “Regeneri.dbf” and is provided for the regeneration mode of the RoeTest.

#### e) Info

Here internet addresses can be entered. **If there is no entry in internetaddress2,** [www.radiomuseum.org](http://www.radiomuseum.org) with the respective tube description is selected.

This will of course work only if the tube has the same description as in the RM.  
It is also possible to add any data to the data set here – see below.

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#### e) Picture

For tube pictures see below

## Entering new tubes (in the input mask):

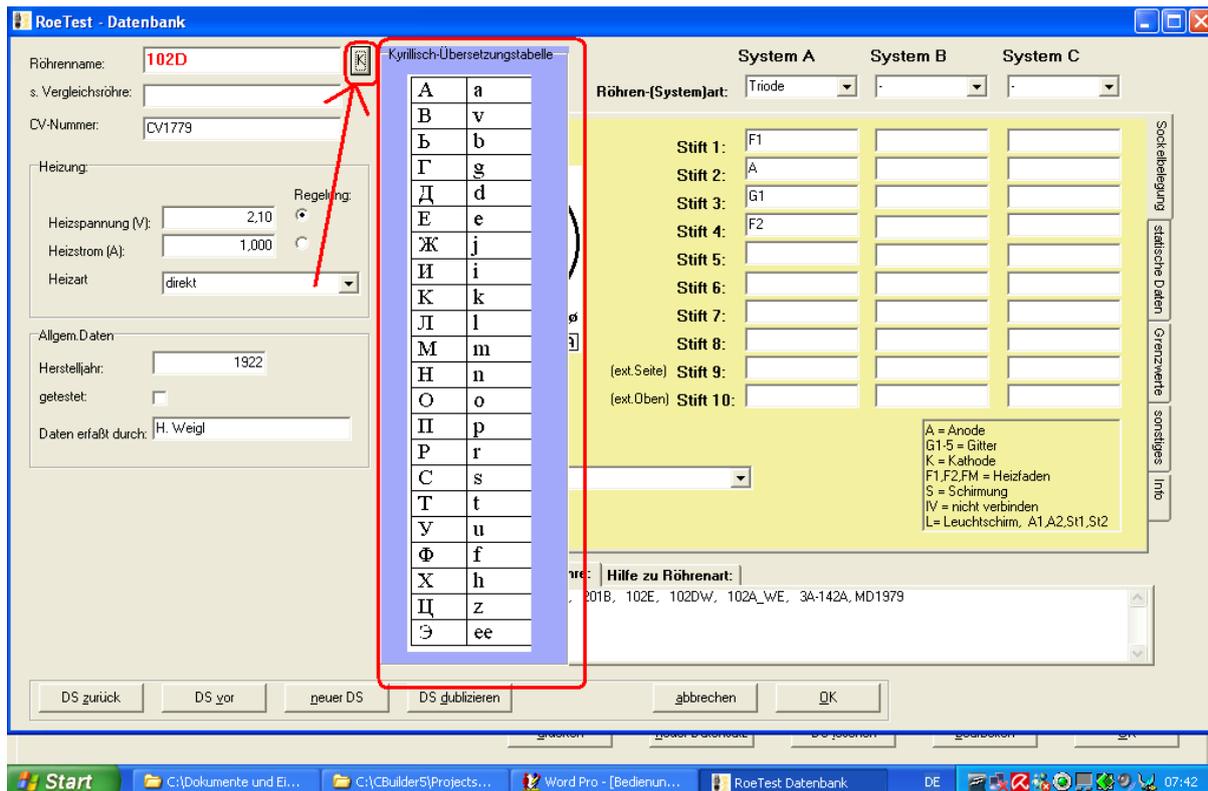
tube designation:

- Each tube must be given a different name. Example: EF80
- Up to 30 letters, numbers and special characters are permitted
- If there are several tubes with the same name or different designs, they can be designated with an addition (e.g. "6E5 USSR" or "6E5 American"). There should be a space between the main name (6E5) and the additional name
- Sometimes there are completely different tubes that have the same name. E.g. VT105, which is created as "VT105 USA" and "VT105\_TKD". The manufacturer's name is appended with an underscore.  
Background: Tube pictures can be stored in the ..\roetest\tubepictures folder. The images must have the same name as the tube (example EF80 ... EF80.jpg, VT105\_TKD ... VT105\_TKD.jpg). If the software does not find an image with the complete tube name, it searches up to the first space in the tube name (example "VT105 USA", here an image with the name "VT105 USA" would first be searched for. If none is found, it searches for "VT105.jpg" wanted).
- It is possible to create several data sets with different operating points for tubes. The original data record retains the short name. Further data sets are explained in the tube name. Example:  
EL34  
EL34 Ua=550,UG2=300,Ug1=-25  
EL34 Ua=450,Ug1=-40,Triodemod  
Between "EL34" and the explanatory designation must be consistent again  
There are spaces

## Cyrillic characters:

It is not possible to directly enter cyrillic characters for russian tubes. These characters must first be converted to latin letters (for a taxonomy see [www.radiomuseum.org](http://www.radiomuseum.org)). I have marked russian tubes with the extension "russ".

To avoid the need to remember the translation table I have added the table to several masks. The table can be opened and closed everywhere where the button <K> is present for example:



The data are automatically stored when the input mask is closed using the <ok> button (and also when scrolling for- or backwards...). When the button <abbrechen> is pressed no storing is done.

## More data:

Also important is the field "getestet".(tested). If this field is set to "ja" (yes) all entered tube data already have been tested. If this field is set to "nein" (no) the tube data are untested.

Further data like “erfasst durch”, “Herstelljahr” (= first year of production), CV-number, “Ufk”... are not required for measuring and serve as additional information only.

### General remarks:

**When entering tube data to the file RoeTest.dbf proceed as follows:**

1. Normally the data are taken from a tube table
2. For some tubes/tube systems (especially diodes) there are no entries in the tube tables regarding the anode current. Example EABC80 – diode: There is no data for the diode current at a given voltage. As a possible solution find a complete data sheet with characteristic curves. Then a point on the characteristic curve is searched that is within the limits and the static data are entered this way.
3. If there is also no data sheet with characteristic curves available you can only try. Test as many good tubes as possible and enter the mean value as nominal value in the data (for this test the manual mode is suitable; it allows to freely adjust the voltages).
4. If the data from the tube table exceeds the possible maximum voltages of the RoeTest you have to proceed as described in step 2. (find a lower voltage in the characteristic curve).
5. Tubes heated directly using AC current: As the RoeTest “only” offers DC currents / voltages only DC heating is possible. Values from the data sheet for AC heating cannot be used. If no DC data can be found either an external AC heater current source can be connected or the AC heating can be simulated using DC (recommended).

Peculiarities:

Heater voltage – Middle tap:

For tubes with a center tap at the filament (FM) there are two possibilities for heating. The filaments can be connected in series or in parallel. In the tube data base the data shall be entered uniformly. **The filaments must be connected in series.** F1 is connected to ground, F2 gets the positive supply voltage. FM remains unconnected. Example DL92: Series 2.8 V and 0.05 mA (and not in parallel 1.4 V and 0.1 A). Reason: For tube testing the both cases of connection are possible. But when identifying tubes a problem arises as there are two possibilities to take into account.

Glow stabilizers:

These are actually no tubes. The RoeTest gives you the possibility to test them. When entering data the following has to be considered:

<b>Data field</b>	<b>enter:</b>
Base assignment	A, K
Heater type	none
System type	Stabi
Measuring conditions:	
A (V)	Nominal voltage
ASoll (mA)	Current at nominal voltage
Limits :	
A (V)	max. ignition voltage
IK (mA)	max. allowed continuous current

## Tube pictures

RoeTest Datenbank - tube data

tube's designation:  K

manufacturer:  Telefunken, Berlin

System 1 System 2 System 3  
type of tube system:  - -

see similar type:

Philips code:

Market introduction year:

heater:  
heater voltage [V]:  control:    
Heater current [A]:   
heater type:   
Heater cold resistance (ohms)

General data  
data checked/verified:   
Origin of data:   
Data filed by:   
Data changed or new:  (check if data changes should be used and transferred for updating purposes)  
Data changed by:   
remarks about changes:

base/pins | typical ratings | max. ratings | misc. | info | Picture

optimum size: 481\*353, filename = tubename.jpg (replace "/" with "-")

remarks about tube:  help on tube types:

Navigation dataset

A picture may be attached for each tube in the database:

Example:

RoeTest is installed in the directory `c:\roetest`

Then you need to create the following sub directory:

**`c:\roetest\tubepictures\`**

Now you can simply store tube pictures as ".jpg" to this directory. The picture will be shown if its description is the same as the tube's description. In the above hardcopy that would be "EL803.jpg". Only exception: Slashes in the descriptions must be replaced with hyphens (-).

Exception: If the tube has an additional designation, e.g. "EF80 Ua=120V", the tube name is taken into account up to the first space. In the example, an image labeled "EF80.jpg" would be displayed.

A vertical resolution of 353 pixel is sufficient. Large pictures will be shrunk but use more storage. Smaller pictures will be expanded. This will give a blurred display. Smaller pictures should therefore be avoided

Due to copyright reasons pictures are not included. You can take pictures of your own tubes or download them from the internet for free (but those pictures may not be redistributed).

## File appendix data

Appendix data may be added to the data sets (for example data sheets, pictures, explanations, company history ...). All type of files are possible (for example pdf, Word, Excel,...).

A file attachment can be started with the Windows associated program for the file name extension with a mouse click. Removing the attachment is done by marking it and pressing the button <delete>.

<hinzufügen> With this button any file can be selected and attached to the data set. It is also possible to add attachments by dragging files from the Windows explorer to the database form using the mouse.

Note:

The attachments are stored to the following location:

RoeTest directory\\Dokumente\\Tube description\\

The file attachments remains untouched when updating to an actual database version.

Special feature:

If you create a file attachment with the name "**remarks.pdf**", then this PDF file will be automatically opened in the measurement software as soon as you load the tube data for it.

Comment field:

tube's designation: **EL34 Ua=450,Ug1=-40, Triodemod K**

manufacturer: ---

see similar type: \_\_\_\_\_

Philips code: \_\_\_\_\_

Market introduction year: 1949

heater: heater voltage [V]: 6,30 control:  heater current [A]: 1,500  heater type: indirekt Heater cold resistance (ohms): 0,00

General data data checked/verified:  Origin of data: \_\_\_\_\_ Data filed by: BMK Data changed or new:  (check if data changes should be used and transferred for updating purposes) Data changed by: BMK remarks about changes: \_\_\_\_\_

System 1 System 2 System 3  
type of tube system: Triode - -

base/socket: pin 1: A pin 2: F1 pin 3: A pin 4: A pin 5: G1 pin 6: pin 7: F2 pin 8: K pin 9: pin 10: length of bulb [mm]: 111,0 diameter of bulb [mm]: 38,0 weight [g]: 0

length of bulb [mm]: 111,0  
diameter of bulb [mm]: 38,0  
weight [g]: 0

Okta1 K8A

remarks about tube: help on tube types:  
= 6p27s russ, CV1741, 6CA7,  
I: Rg1max=700K

Navigation dataset print datasheet abort store

First line: comparison tubes = 6p27s russ, CV1741, 6CA7

V: intended use

I: Info, test instructions

everything after that is displayed in green font in the message window

COM Data in Data out heatsink

status heater testing for shorts static data vacuum curves remarks

I:lg1 ist ein extern hinzugefügter HF-Wechselstrom, welcher durch die Röhre gleichgerichtet wird.  
Rg1 und Ig1 sind dem Datenblatt der Röhre entnommen.  
Stift 6 = Steuergitter: Pinzuordnung G1<->G3.  
Stift 4 = Oszillatorgitter: Rg1=100kOhm, Ig1=250µA

Check tube data for consistency

and is displayed in manual mode and manual mode with resistor:

Ih [V] 0,05

I:lg1 ist ein extern hinzugefügter HF-Wechselstrom, welcher durch die Röhre gleichgerichtet wird.  
Rg1 und Ig1 sind dem Datenblatt der Röhre entnommen.