

FUNKE TUBE TESTER

The Modern Equipment for Counter and
Shop, designed for use by the non technical staff.

MODEL W 19

FUNKE TUBE TESTER / Model W 19.

A reliable Tube Tester which may be used without concentrating on the test. Considering the number of tube types on the market which increases from week to week it is necessary to know how to test each type or at least, to have all their data.

In many cases tubes are tested by untrained sales clerks or even by a member of the dealer's family. In our tube tester a test card (punched card) is used for each tube thus excluding any mistake and allowing the customer to control the dealer at the test.

These are the main features of our Tube Tester:

All currents and voltages needed for the test are available from the built-in power supply which is adjustable for 110, 125, 150, 220, 250 volt AC. The fuse of 1.0 amp. for 150, 220, 240 volt or of 1.5 amp. for 110 and 125 volt may be replaced from the front panel.

By the use of test cards (punched cards) mistakes and errors are not possible even for untrained people.

There is only one control switch with which all tests are made in the right sequence. All switch positions which are not needed for a special type or could cause errors are blocked automatically, thus making the device foolproof.

In the second switch position i. e. after the filament continuity test the tube receives the right filament voltage. Thus all short tests are made while the tube is heated. This feature is important since many shorts occur only when the tube is heated.

The main selector switch provides the right testing sequence automatically. There are not several push buttons to be pressed independently, therefore, no test can be forgotten, when turning the only switch, one makes one test after the other without being able to miss one. Thus, again the device is foolproof.

Mechanical faults (like burnt-out filaments, shorts or leakage) are shown by the meter which gives a deflection to the left, where the word „Fehler“ that is „Fault“ is marked. This is true for all mechanical faults. (In most of the other testers the indication is confusing, because during the filament continuity test a neon bulb is supposed to light and during the shorts tests, not to light if the tube is all right, in our tube tester the fault indication is always the same.) Again, our tube tester is foolproof.

Since for the short test a sensitive meter of 1000 ohm/volt is used even small insulation leakage is shown.

Amplifier tubes are checked with DC from the built-in power supply; it contains a high-vacuum full-wave rectifier which, in connection with a large filter condenser supplies a ripple-free DC. This feature is important since in tubes with several grids the shape of AC ripple may affect the indication.

Rectifier tubes are measured with AC from the built-in heavy transformer. The AC voltages used for this purpose are fixed at for instance 10V~, 30V~, 60V~ 100 Volt~ etc., and the right voltage is connected with the tube by the test card automatically.

In order to measure the amplifier tube two spots of the tube characteristic are measured, one with the bias of 0 volt and the other with the bias of -2 volt. The grids are connected with the DC power supply, the filament is fed with AC, just as it happens in the normal use of the tube, thus this measurement means a test of the gain.

The indication of the meter is interpreted by the reading of the test card; it gives the tolerances between which the tube is „Gut“ that is „good“, or „Noch brauchbar“ that is „weak“, or „Unbrauchbar“ that is „Bad“ (for foreign tubes the sign „?“ is used instead of „weak“ just as is usual in the country of origin of the tube).

W19 is not a plain „Emission-Tester“ but it really tests the tube performance. It is not designed in the way the cheap testers are where all grids and the plate are connected with each other and a low voltage, sometimes even only AC, between filament or cathode on one hand and all the other electrodes on the other hand gives a reading of something which has no meaning at all because it has nothing to do with the data of the tube or with its characteristic. This only gives an emission test but is no measurement while the Funke Tube Tester really measures two values of the characteristic, as mentioned before.

Twin tubes or other tubes with two or more complete systems, for instance a triode and hexode, are measured twice automatically, first one system and then the other.

During the measurement the tube doesn't need to be removed from the tube socket and put into another socket but remains in the one into which it has been put originally. That is true for tubes with one system as well as for tubes with two or even three systems.

48 different filament voltages are available starting from 0.7 volt and going up to 117 volt. These fixed voltages are arranged in such a way that all new values between 0.7 and 117 volt which may be used in the future are available with a tolerance which is small enough to grant exact measurement. The right filament voltage is provided automatically by the test card, thus here the device is foolproof again.

There are 11 plate voltages: 10V DC, 30V DC, 60V DC, 100V DC, 150V DC and 200 V DC and 10 V AC, 30V AC, 60 V AC and 100 V AC. The right voltages are also provided automatically by means of the test card (punched card), thus, the device is foolproof again.

Screen grid voltages have to be DC voltages, there are five fixed values: 10V DC, 30V DC, 60V DC, 100V DC and 150V DC. These values are sufficient for testing all tubes with more than one grid. The right voltage is provided automatically by the test card (punched card), the device is foolproof again.

There are no control knobs which have to be adjusted to the correct value, but all plate and screen and auxiliary voltages are provided for at fixed values and connected automatically by the test card. Since there is nothing to adjust manually no mistake is possible, again the device is foolproof.

Voltage regulator tubes guarantee that no line voltage change will affect the measurements. The voltage regulator tube GR 150 A has proved its reliability since 1935, furthermore we supply only specimens with the smallest possible tolerances.

Noisy tubes will also be found easily by connecting a speaker to special terminals provided for this purpose. If tubes where noise is not be harmful (such as diodes or rectifiers) are checked these terminals are disconnected automatically. The device is foolproof again.

The vacuum measurement is performed automatically by turning the main selector switch into the corresponding position, if tubes where a vacuum test has no meaning (rectifiers, gas-filled tubes, relaxation oscillator tubes) are tested the corresponding position of the selector switch doesn't make any connection, the device is foolproof again.

The meter has many ranges: 1mA, 2.5mA, 10mA, 25mA, 50mA, 100mA, 250mA. 10V DC, 150V DC, 250V DC. The right range is also connected automatically by the test card (punched card).

All normal tube sockets are provided, partly as combined sockets of special design, partly by change of the original socket in such a way that the tube can be put in and taken out easily. When testing a tube it is more important that this can be done without difficulty than in a receiver or transmitter where the tube has to be prevented from coming loose.

The following sockets are built in: the European socket, the prongless 5-electrode socket, the prongless 8-electrode socket, the hexode socket (also called the 7 prong European socket), the European and American octal socket, the loctal socket (also called the key-tube socket or press-glass tube socket), the metal tube socket, the Marconi socket (also called the British socket), the American sockets with 4-pins, 5-pins, 6-pins, 7-pins small (for instance for the 2A7, 6B7, 6F7), 7-pins medium (for instance for the 6A6, 6E6, 2B6), the miniature tube socket, the Rimlock socket, the Noval socket, (also called the pico tube socket), the sockets Siemens with 5-pins, 7-pins and 9-pins (also called the post tube socket), for the former German army tubes only the 3795 socket for the RV 12 P 2000 tube and some more frequently used army tubes (32 test cards are provided). Adapters and test cards for other tubes can be supplied upon request. There is also ample free space on the tube tester W 19 for building in future new sockets.

The tube tester W 19 allows very many tubes to be checked, not only German tubes but also European and American ones. Even obsolete as well as the newest types can be checked, and for types still to come new test cards will always be available. The upper limit is tubes with 50 watt plate dissipation.

More than 1000 test cards are supplied with the tube tester which permit the testing of several 1000 different tubes. The necessity for so many cards is caused by the wide differences in tube design. It is just the tubes which are used only occasionally which puzzle the dealer and the serviceman most, because he cannot find their data elsewhere.

Each test card is not only designed for use in the tube tester but it contains also all technical data and information on the tube. There one finds the typical ratings, plate voltage as well as screen grid voltage, control grid bias, plate current, screen grid current, plate resistance, mutual conductance, amplification factor, load resistance self-bias resistor, base connections etc. etc. i. e. all information that the serviceman needs for repair work. The maximum ratings are also given, such as maximum currents, maximum voltages, maximum dissipation, maximum control grid resistor, maximum heater-cathode voltage etc. etc. which the serviceman may need for replacement purposes.

All information necessary for testing, i. e. the number of the card and the tests which are to be made (for instance: that there are two systems to be checked) are printed at the top right-hand corner. When only testing a tube, one needs not pay attention to any other data. Thus, all the test cards together represent a complete tube file.

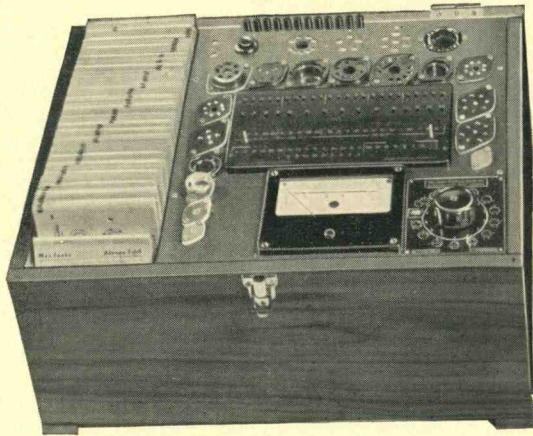
The tube tester is of universal use in the shop for it can also be used as an ohmmeter with four ranges for resistors from 0.1 ohm to 5 megohm, for these measurements four special test cards make the right connections automatically, as a leakage tester for electrolyts of all sizes and working voltages by means of another 14 test cards, as a DC current and voltage meter, as continuity and short tester, etc.

The tube tester is contained in a polished walnut case with removable lid. Inside the cover is a list of the European Standard and American tubes. The same list on cardboard is also supplied together with the tube tester. Other tube and punched card lists on Telefunken, Valvo, Philips, Tungram, Siemens, Tekade, tubes etc. are shown in the book which contains information on the test cards.

SUMMARY:

The Tube Tester W 19 is the most useful device for a fast check in the shop where untrained people are in charge of it, frequently even diverted by customers annoying questions. The Tube Tester W 19 takes care of this unpleasant situation because there is nothing to be adjusted or thought about, a test card (punched card) is simply put on top of the device, some plugs are placed in the open holes and the only knob is turned through all its 13 positions, no mistake can be made.

For research and test work in a laboratory where there is no rush and one is able to concentrate on the work using tube characteristics etc. there are special tube testers on the market where all voltages and currents may be adjusted to any suitable value, but those testers are much more expensive and can be handled by trained technicians only, however, even then errors may occur which are impossible when using the Tube Tester W 19.



View of the Tube Tester W19 without a Test Card in Place (Led removed).
View with Test Card see page 1

The complete Tube Tester with all accessories, such as built-in Rectifier Tube AZ 12, Voltage Regulator Tube GR 150 DA, two Cables for External Electrode Connections, 1000 Test Result Stickers, more than 1100 Test Cards and Special Cards,

Price _____

Size: appr. $445 \times 350 \times 240$ mm, that is „ $18 \times 14 \times 9\frac{1}{2}$ “;
Weight: appr. 14.5 kg, that is 32 lbs. complete with all cards etc.

The Test Cards may also be supplied separately at a price of _____ each.

1 pad of 1000 Test Result Stickers _____

Design is subject to change without notice.
All quotations without obligation.

How to use the Tube Tester W 19?

Very simple!

TEST PREPARATION:

From the tube lists one chooses the corresponding test card and puts it on the pins of the tester, then plugs are placed in all holes of the card and everything necessary is connected in the right way automatically, then the tube is put in the socket marked by an arrow on the card.

TESTING:

The only selector switch is turned through all positions. In the first 10 positions the tube is tested with regard to mechanical faults. If there is something wrong (filament burnt-out, short or leakage) the meter will point to „Fehler“ (that is „Fault“), then the tube cannot be used, thus, the test is finished. If there is nothing wrong the tube is tested electrically in position 12. The reading of the card states the limits of the meter indication between which the tube is to be considered as „good“, as „weak“ or as „bad“. If more tests are necessary a notice at the right top corner of the card will say so, for many tubes this notice reads:

In position 13 is to
prove to control grid.

Then one turns to pos. 13 and if the meter indication goes back the tube is all right and the noise test can be made. In pos. 14 the vacuum is checked.

Test cards for full-wave rectifiers containing 2 Systems have the remark:

2. System is measurable
in position 11

Then one goes back to pos. 11 and checks whether the second system is „good“ or „weak“ or „bad“, Even then no mistake is possible for in this case the switch is blocked automatically and cannot be turned to pos. 13. Thus the test is finished.

Finally the selector switch is turned back to position „Aus“, that is „Off“ and a test result sticker is put on the tested tube. (1000 stickers are supplied with the Tube Tester W 19).