

TESTERS, VALVE, AVO

TECHNICAL HANDBOOK - DATA SUMMARY

Note: This regulation supersedes Tels Y 800, Issue 1, dated 20 Mar 50 and Tels Y 810, Issue 1, dated 4 Feb 54.

TESTER, VALVE, AVO, NO 1

PURPOSE

To test standard British and American valves for emission, mutual conductance, heater continuity, cathode-heater insulation when hot and inter-electrode insulation when cold.

DESCRIPTION

The tester consists of a main unit and a subsidiary unit, connected together by a nine-core cable. The main unit contains the power supplies, selector switches and indicating meter. The subsidiary unit contains 12 types of valve holder, a rotary selector switch and an auto-transformer.

PHYSICAL DATA

	Main unit	Subsidiary unit
Weight:	13.1/2 lb (6.1kg)	4.1/2 lb (2.1kg)
Length:	10.1/4 in.	10.1/4 in.
Height:	5 in. overall	2.1/2 in. overall
Width:	8.1/4 in.	8.1/4 in.

PERFORMANCE

The voltages which can be applied to a valve under test are:-

Anode: from 12V in seven steps to 250V

Screen: from 60V in seven steps to 250V

Heater: from 2V in fourteen steps to 40V or from 0.28V to 5.6V

POWER REQUIREMENTS AND CONSUMPTION

200 - 250V, 50c/s single-phase, a.c. supply  
Consumption 20VA approximately.

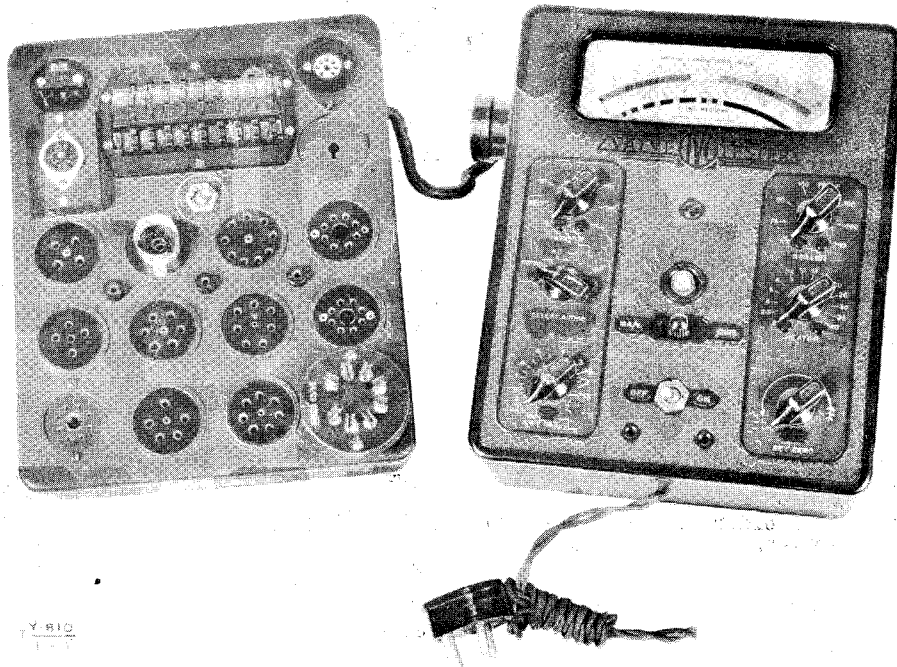
PART NUMBERS

Complete instrument	WY 0030
Tester	WY 0161
Valve panel	WY 0160

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Distribution - Class 930. Code No 6

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Y 810

Fig 1 - Tester, valve, Avo, No 1

**TESTER, VALVE, AVO, NO 3**

**PURPOSE**

To test standard British and American valves under conditions corresponding precisely to any desired set of d.c. electrode voltages. Checks on inter-electrode insulation and heater continuity can be made with the valve cold or at working temperature.

**DESCRIPTION**

The tester is built into a case enabling any normal valve to be plugged into the valve holder panel and a variety of tests applied as detailed below. A polarised relay is incorporated which prevents damage to the instrument due to overloading the h. t. circuits. It will, in most cases, save the heater of a valve to which the h. t. or screen voltage has been inadvertently applied. Operation of the cut-out is shown by failure of the meter illumination. Heater voltages up to 126V are available.

**PHYSICAL DATA**

Weight: 34 lb (15.4kg)      Depth: 12.1/2 in.  
Height: 18 in.              Width: 13 in.

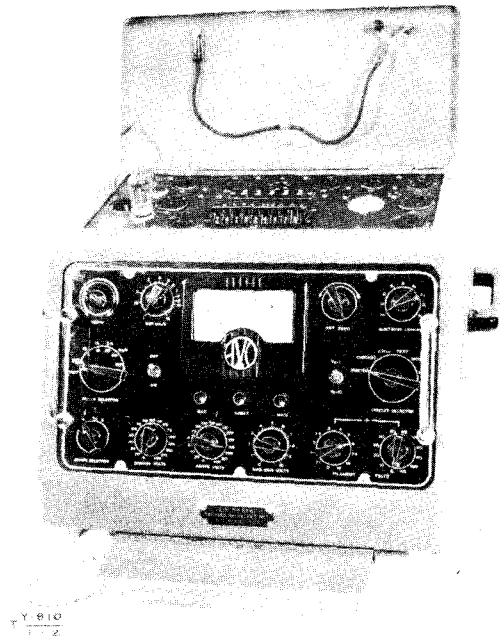
**APPLIED TESTS**

Inter-electrode insulation and heater continuity:-

Faulty insulation between valve electrodes with heater hot or cold is shown on the resistance scale of the meter, the electrodes between which break down occurs being directly indicated.

Breakdown of cathode or filament to other electrodes.

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**Fig 2 - Tester, valve, Avo No 3**

**Cathode/heater insulation:-**

Cathode/heater insulation is measured with the heater hot.

**Valve characteristics:-**

The anode current of a valve can be measured at anode voltages from 20 to 400V, in sixteen steps, screen voltages from 20 to 300V, in sixteen steps, and with any value of negative grid bias to -100V. Complete  $\mu\text{a}/\text{Va}$ ,  $\mu\text{a}/\text{Vs}$ , characteristics can therefore be drawn. Similar characteristics can be taken for screen current. Amplification factor and anode a.c. resistance may be derived. Direct measurement of mutual conductance in  $\text{mA}/\text{V}$  at any available electrode voltages. Mutual conductance comparison tests with the rated figure, on a coloured 'good/bad' scale. Press button 'gas' test shows the presence of grid current, the value in  $\mu\text{A}$  being computed in terms of anode current change. Four meter ranges are provided, i.e. 2.5mA, 10mA, 25mA and 100mA respectively, and similar ranges of mutual conductance in  $\text{mA}/\text{V}$ .

**Rectifying valves:-**

Tested under full load conditions with  $8\mu\text{F}$  reservoir condenser. Current loads of 5mA, 15mA, 30mA, 60mA and 120mA are available for each anode, the efficiency of the rectifier at these load conditions being directly shown on a 'good/bad' scale. A d.c. load condition of 1mA is used when signal diodes are under test. A removable link in the anode circuit allows the use of external metering,

the testing of valves under load conditions or the adaptation of the equipment to test specialized, non-standard types of valve not catered for in normal circuit arrangements.

**POWER SUPPLIES AND CONSUMPTION**

Supplies: 100 - 130V ) 50/60c/s  
200 - 250V ) single phase a.c.

Consumption: 60VA

**VALVES**

V1, CV 1078

**PART NUMBERS**

Instrument Z4/ZD 00236

Equipment Z4/ZD 00286

**TESTER, VALVE, AVO, CT160**

**PURPOSE**

To test standard British and American valves and valves of disc seal and flying lead types under conditions corresponding precisely to any desired set of d.c. electrode voltages. To give a rapid diagnosis of the conditions of a valve on a 'good/bad' basis.

**DESCRIPTION**

The instrument is housed in a robust metal suitcase. It is readily portable and showerproof. In the lower half, a metal panel is fitted on which is mounted the

power supplies and the majority of the controls. The upper part, or lid, houses the valve holder panel and a rotary selector switch. A relay is incorporated which prevents damage to the instrument due to an inadvertent overload of the h.t. circuits. Both visual and audible warning is given when the 'cut-out' operates. Two eleven-position switches provide combinations of voltages for anode and screen electrodes, 20 - 400V for anode, 20 - 300V for screen. Variable bias from 0 - 40V and 32 heater voltages from 0.625V to 117V are available. The instrument is supplied with a mains input lead and two 14 inch 'wander' leads, for use with the nine-socket terminal board.

**PHYSICAL DATA**

Weight: 24 lb (10.89kg)      Depth: 11.1/2 in.  
Height: 10 in.                      Width: 15.1/2 in.

**TEST APPLIED BY INSTRUMENT**

Direct meter indication of heater continuity, insulation resistance between individual electrodes, with the valve cold, or between heater strapped to cathode and all the other electrodes strapped together, with the valve hot. Direct meter indication of cathode to heater insulation, with the valve hot. Direct indication of anode current and mutual conductance at pre-determined combination of h.t. and g.b. voltages. Measurement of control grid current directly in  $\mu A$ .



Fig 3 - Tester, valve, Avometer - CT 160

Rectifiers, both half and full wave, tested under reservoir capacitor conditions and switched d.c. loads from 5m/A to 120m/A are available. A suitable d.c. load can also be selected for signal diodes on test. A coloured scale gives direct indication of valve 'goodness' when 'batch' testing. Valve characteristic curves can be drawn over a range of applied electrode voltages, and data thus determined. By the use of the removable links in the anode circuits of the instrument, valves can be tested under load conditions. In the same way external metering can be used to read the required anode currents or the instrument adapted for making tests on specialized, non-standard types of valve not catered for in normal circuit arrangements.

**POWER REQUIREMENTS**

105 - 120V )  
175 - 250V ) 50 - 500c/s a.c. single phase  
Adjustments can be made every 5V.

**POWER CONSUMPTION**

50VA (maximum)

**VALVES**

V1, V2 CV 140

**PART NO**

ZD 02172