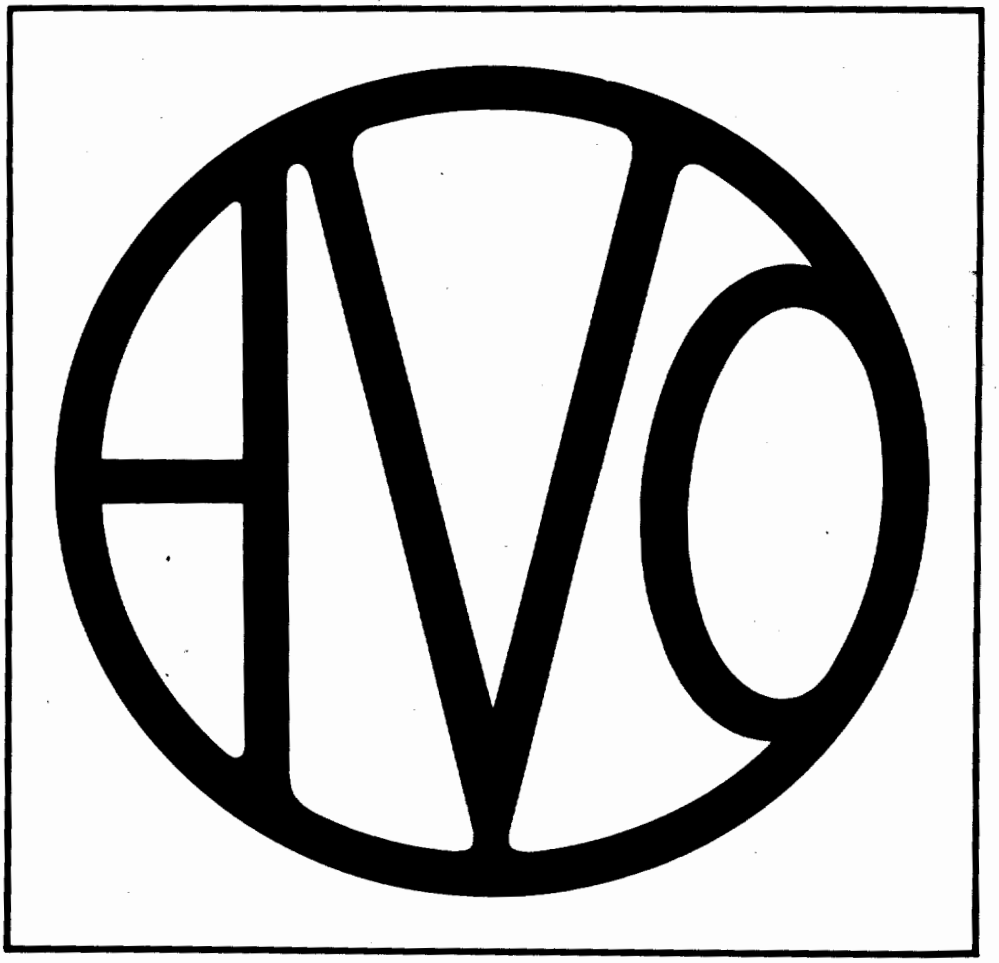


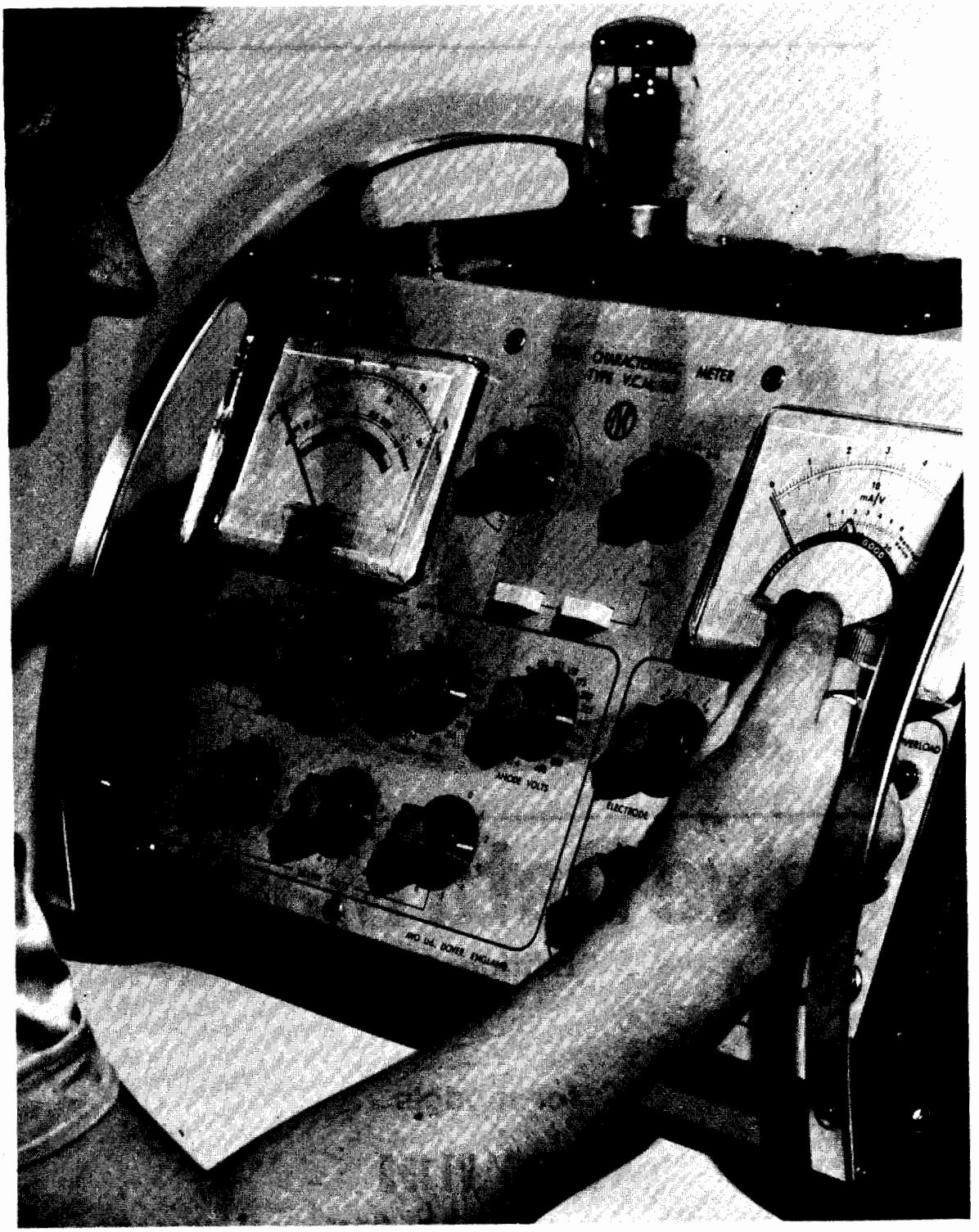
Valve Data Manual

Edition · 19

for models

CT 160 · VT 160

VCM mk 1 · VCM mk 2 · VCM mk 3 · VCM mk 4 · VCM 163


METER
mA/V
ANODE VOLTS
ELECTRODE
OVERLOAD

Contents

VALVE BASE ADAPTORS

If the valve base required does not appear on the Valve Holder Panel it is necessary to use an adaptor which plugs into an existing valve holder. These are supplied as follows:

No. 1. B7G and B8A*
No. 2. B9G
No. 3. B8B Loctal
No. 4. B3G
No. 5. Blank
No. 6. SM7 (SA7 Base)
No. 7. Noval*
No. 8. Continental 8 pin (F8)
No. 9. B7A
No. 10. 5AA and 7AA (Acorn Valves)
No. 11. B5A (5-pin flying lead)
No. 12. B9D*
No. 13. B10B*
No. 15. UX4 †
No. 16. UX5 †
No. 17. UX6 †
No. 18. UX7 †
No. 19. MO8 †
No. 20. B7 †

* Not required for VCM 163. † For VCM 163.

Whilst every care has been taken in the preparation of this manual to ensure that the data given is correct, the Company cannot accept any responsibility for damage caused to a valve under test, or the instrument, due to the inclusion of incorrect information.

Notes

This data manual is primarily intended for use with the *AVO* Valve Characteristic Meter VCM 163, the Valve Characteristic Meters Mk. 1, 2, 3 and 4, the *AVO* Valve Testers CT 160 and VT 160, but once the Selector Switch code is understood, the manual also forms a quick and convenient guide for general use.

The Instruction Book which accompanies the instrument should be thoroughly studied before the data contained in this manual is used.

Important:

In the interests of accuracy, it is not recommended that these instruments should be used with a constant voltage transformer, unless it is known that the 3rd and 5th harmonic content is of negligible proportion.

Abbreviations.

D, DD, DDD, Diodes and multiple diodes.

DT, DDT, DP. DDP. Valve with another electrode assembly in addition to the diode.

H Heptode or Hexode.

N Nonode.

O Octode.

P Pentode or Tetrode. **PP** Double Pentode or Double Tetrode.

T Triode. **TT** Double Triode. **TH** Triode Heptode or Triode Hexode.

TP Triode Pentode.

R Rectifier. **RR** Full-wave Rectifier.

TI Tuning Indicator (magic eye).

CCR Cold Cathode Rectifier.

† Appearing among ROLLER SELECTOR switch numbers, refers to third diodes in triple diodes. Refer to Working Instructions, Chapter 3, Section headed "Instruction for Testing Specific Valve Types" for full test procedure.

( ) Where brackets appear around stated heater voltage thus (5) it indicates that heater voltage given in Data columns has been uprated to allow for voltage drop at valve base, due to higher current taken by the particular valve.

Testing Wire ended (flying lead) Valves.

Wire-ended (flying lead) valves may be tested by inserting individual wires into appropriate electrode connections of a suitable valve holder in correct sequence.

Back Emission.

Alternative test figures are given for use when valves show signs of back emission from anode to G3. This phenomenon can be recognised by the anode current apparently decreasing as the valve heats up. Data to which this note refers is indicated thus "ξ".

Grid Bias.

When using *AVO* Characteristic Meter Mark I and II, to check valves requiring a bias of less than 1 volt, erroneous readings may be obtained due to the valve drawing grid current, which has the effect of reducing the grid bias voltage thus producing low mutual conductance readings. Users of these instruments are, therefore, advised to use the alternative data which has been supplied, which is indicated thus Ø.

iv

iv

iv

Internal Connection. (*).

When the symbol * appears among the Selector Switch set up figures, it indicates that an unknown electrode may be connected to this pin internally. To obtain the complete Selector Switch coding, test with an ohmmeter between pin marked * and all others. (The ohmmeter should be on a sufficiently low range to discriminate between a dead short and filament resistance). Dependent upon the electrode to which this pin is internally connected the correct code can be set up and normal test procedure followed.

Where the pin marked * is O.C. to all others	Set Roller to	0
" " " connected to	Cathode Set Roller to	1
" " " "	Heater – " " "	2
" " " "	Heater + " " "	3
" " " "	Grid " " "	4
" " " "	Screen " " "	5
" " " "	Anode 1 " " "	6
" " " "	Anode 2 " " "	7
" " " "	Diode Anode 1 Set Roller to	8
" " " "	Diode Anode 2 " " "	9

Tuning Indicators.

Special procedures are required for testing cathode ray tuning indicators, full details of which are given in the Operating Instructions of each instrument.

The screen grid switch is used to connect the target supply, and the voltage required is given in the Vg2 column of this data manual.

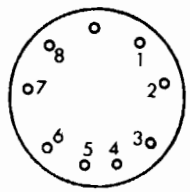
An external anode load resistor is required and should be connected between the Anode Link terminals on the valve holder panel, after removing the shorting bar. The value of the anode load resistor required for the particular indicator under test is given in the †Ra column.

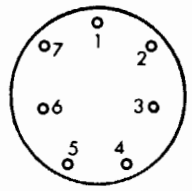
At the approximate bias given in the table the triode section should be at cut-off and the "eye" fully closed. On reducing the grid bias to zero the "eye" should open fully and the anode current should be approximately that given in the table. In the case of double sensitivity indicators giving multiple images corresponding to the different sensitivities, two sets of data (wherever possible) are given, the first set relating to the sensitive indication.

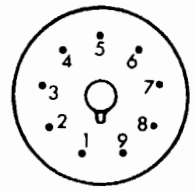
v
v
v

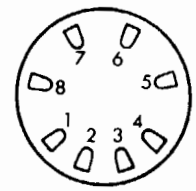
DIAGRAM OF STANDARD PIN CONNECTIONS

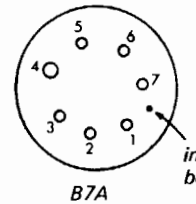
(viewed from underside of base)


British Nine Pin (B9)

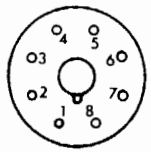

British Seven Pin (B7)

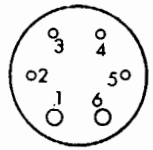

B9G

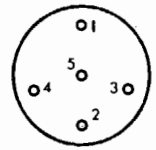

'P' Type Base (8 SC)

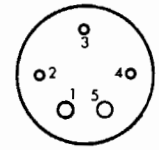


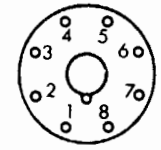
B7A

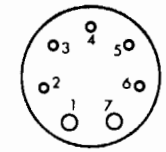

International Octal (A08)

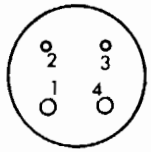

American Six Pin (UX6)

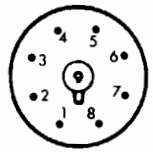

British 4/5 Pin (B5 & 4)


American 5 pin (UX5)

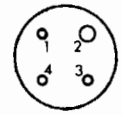

Mazda Octal (M08)

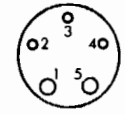

American Small 7 Pin (SM7)

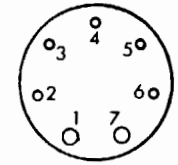

American Four Pin (UX4)

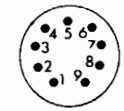

American Loctal (B8B or B8G)

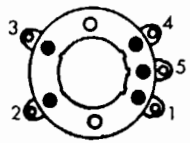

Sub Miniature
8 Pin (B8D)

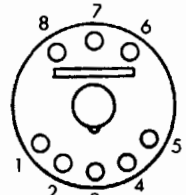

Hivac Four Pin (SM4)


Hivac Five Pin (SM5)

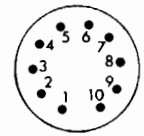

American 7 Pin (UX7)


B9D


5AA & 7AA
(Acorn Valve)


F8


B8A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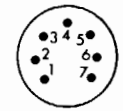
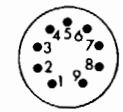
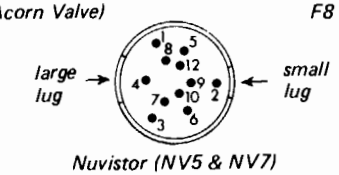

B7G

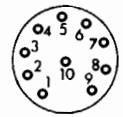

B9A

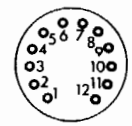

B3G

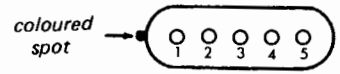

B5B



Nuvistor (NV5 & NV7)


A10


A12



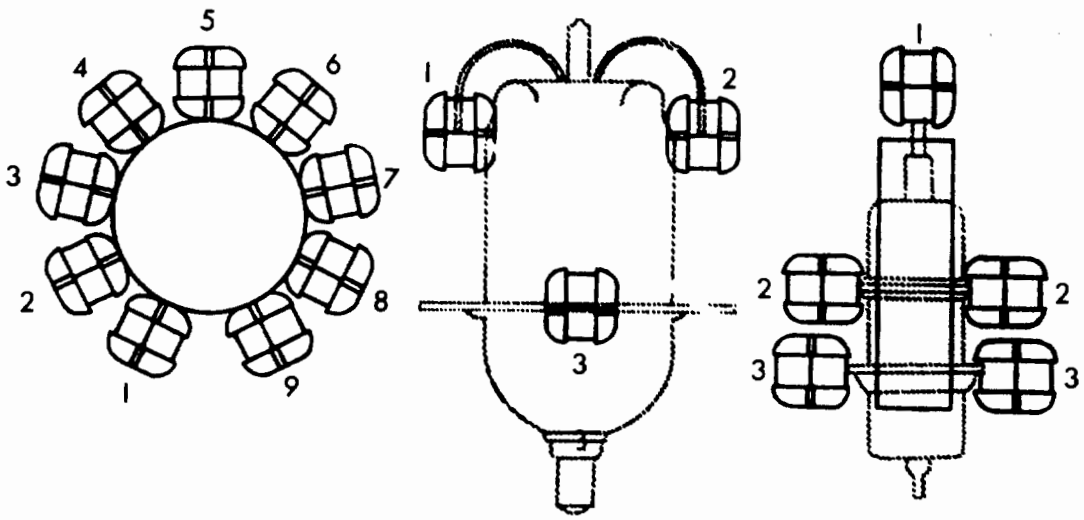
B5A

SPECIAL SOCKETS

for connection of flying-lead and side-pin valves

VALVE TESTERS CT 160 and VT 160 ONLY

(bases are viewed from top of valve panel)



Three special sockets fitted to the valveholder panel of
Valve Testers CT 160 and VT 160 only.

Insulation Testing.

The manufacturers of certain specialised types of valve, e.g. VHF types, thyratrons etc., limit the maximum applied inter-electrode voltage to very low values; these restrictions apply with the valve either hot or cold.

In these *AVO* Characteristic Meters, the peak value of the applied insulation potential is 150V; whilst this is perfectly satisfactory for the vast majority of valves listed, users are advised to check with the manufacturers' data sheets when special types are to be tested.

The majority of valves listed in the *AVO* Valve Data Manual are not subjected to this limitation, but where valve data is not given, care should be exercised. Where valves are subject to this limitation they are indicated thus □.

Low Anode Impedance Triodes.

It has come to our notice that a number of valves included in the Valve Data Manual which, when tested, produce low anode currents, a typical example being the 6080 valve.

These valves have moderately high mutual conductance coupled with a very low Ra. In the case of the 6080 this is in the order of 250 ohms. Ideally, when testing this type of valve, the source impedance should be negligible. Unfortunately, with the Valve Characteristic Meter, the source impedance is in the order of 200 ohms, most of which is due to the anode current measuring circuit. Under normal conditions this impedance is negligible when compared with the anode impedance of the valve under test; when these low impedance types are being tested, the valve is effectively being tested under dynamic conditions. Whilst we appreciate the difficulties with this drawback, we feel it is still acceptable, bearing in mind that the instrument will adequately test some 5000 ordinary valve types.

One suggestion for easing this difficulty is that a valve is selected which, when tested under d.c. conditions, meets the manufacturers' specifications. This valve should then be used under the same conditions in the Valve Characteristic Meter and the variation in anode currents and mutual conductance should then be noted and used as a guide when testing valves of the same type.

Since only manufacturers' data is included in this publication, anode current and mutual conductance figures have been omitted and the valve has been indicated thus △.