CV6087

VALVE ELECTRONIC

ADMIRALTY SURFACE WEAPONS ESTABLISHMENT

Specification AD/CV.6087 Issue 1A dated 29th August 1962 To be read in conjunction with K1001	SECURITY Specification: Unclassified Valve: Unclassified

→ Indicates a change.

TYPE OF VALVE: Travelling Wave Amplifier complete in stowage case.

CATHODE: Indirectly heated

ENVELOPE: Packaged in a periodic magnetic focussing system.

PROTOTYPE: VX8506.

MARKING

See K1001/4.
See also page 5

BASE

Special. See page 5 ←

RATING

(All limiting values are absolute)

			Note
Heater Voltage	(V)	6.3±0.3	A
Heater Current	(A)	0.7	
Max. Heater/Cathode Voltage	(V)	10	
Max. Grid 1 Voltage (Negative)	(V)	200	B
Max. Grid 2 Voltage	(V)	450	B,C
Max. Grid 3 Voltage	(V)	450	B,C
Max. Helix Voltage	(V)	1600	B,C
Max. Helix Current	(μA)	100	C
Max. Collector Voltage	(V)	1700	B,C
Max. Collector Current	(μA)	600	C

CONNECTIONS

PIN LETTER	ELECTRODE	
A	Grid 2	g2
B	Helix	hel.
C	Grid 3	g3
D	Grid 1	g1
E	Cathode	k
F	Heater	h
G	Heater	h
H	Blank	

End Pin. Collector Col. ←

DIMENSIONS

See drawing on page 5

Typical Working Conditions

			Note
Grid 1 Voltage (Negative)	(V)	90	B,C
Grid 2 Voltage	(V)	170	B,C
Grid 3 Voltage	(V)	160	B,C
Helix Voltage	(V)	1300	B,C
Collector Voltage	(V)	1400	B,C
Helix Current	(μA)	30	C
Collector Current	(μA)	550	C
Frequency Range	(kMc/s)	7.0 to 11.5.	
Min. Small Signal Gain over the Frequency Range without adjustment.	(dB)	20	D
Min. Cold Attenuation Loss	(dB)	40	
Min. Working Saturated Power over the Frequency Range	(mW)	3	
Max. Noise Factor	(dB)	24	

MOUNTING POSITION

Any.

OPERATING TEMPERATURE

See Note F on Page 2. ←

WEIGHT

6½ lbs. ←

NOTES

A. The Cathode pre-heating time is five minutes.

B. These voltages are measured with respect to the cathode. The collector is insulated from the body of the valve. The valve may therefore be run with either the cathode or collector earthed.

NOTES (CONT'D)

C. The setting up procedure is as follows:-

(i) Switch on the heater and increase the voltage slowly to the correct value; wait for at least five minutes.

(ii) Switch on the H.T. voltages ensuring that the grid 2 is zero. Set the collector, helix (nominal) grid 3 and grid 1 voltages to the values indicated on the valve.

(iii) Increase the grid 2 voltage gradually until the collector current reaches the operating value marked on the valve.

The helix current which must not exceed 100 uA is to be minimised during this procedure by the adjustment of the grid 3 voltage.

(iv) Inject a signal at a frequency of 11.5 kMc/s and power level of -40 dBm into the input and adjust the helix voltage for maximum power output. Then add the small additional helix voltage marked on the valve. The focussing is then re-adjusted as for operation (iii) above.

(v) Finally adjust potentials of grid 2 and grid 3 to give minimum helix current at the collector current marked on the valve.

Switching Off

Reduce the collector current to zero by decreasing the grid 2 voltage. Switch off the H.T. and then the heater.

→ D. For input signals below -40 dBm.

→ E. A data sheet of the given normal operating conditions and setting-up procedure is supplied with each valve.

→ F. The valve is designed to work in an ambient temperature of 45°C. For operation at higher ambient temperatures, forced air cooling may be required.

→ G. The Joint Services Catalogue No. is:- 5960-99-037-2433.

CV6087

TESTS

To be performed in addition to those applicable in K1001.

Tests are to be performed in the specified order unless otherwise agreed with the Inspecting Authority.

Test conditions - unless otherwise stated:- (See Note C on page 2).

Vh (V)	Vcol. (V)	Icol. (μA)
6.3	Vhel + 100	550

	TEST	TEST CONDITIONS	AQL %	INSP. LEVEL	SYM-BOL	LIMITS MIN.	LIMITS MAX.	UNITS
a	Heater Current	No voltages except Vh. Note 1.		100%	Ih	0.5	0.7	A
b	Grid 2 Voltage	Note C on page 2.		100%	Vg2	-	250	V
c	Grid 3 Voltage	Note C on page 2.		100%	Vg3	-	400	V
d	Helix Voltage	Note C on page 2.		100%	Vhel	1150	1450	V
e	Helix Current	Note C on page 2.		100%	Ihel	-	50	μA
f	Grid 1 Current	Note C on page 2.		100%	Ig1	-	10	μA
g	Grid 2 Current	Note C on page 2.		100%	Ig2	-	10	μA
h	Grid 3 Current	Note C on page 2.		100%	Ig3	-	10	μA
j	Emission	Vh = 5.8V Note C on page 2. and Note 5 on page 4.		100%	ΔVg2		7%	V
k	Noise Factor	(i) at 7.5 kMc/s (ii) at 9.0 kMc/s (iii) at 11.5 kMc/s Note C on page 2 and Notes 3, 8, and 9 on page 4.		100%	N.F.	- - -	24 24 24	dB dB dB
l	Small Signal Gain	Note C on page 2 and Notes 4 and 8 on page 4.		100%	-	20	-	dB
m	Spurious Oscillations	ICol. = 575 μA Note 2 on page 4.		100%	-	No oscillations shall be detected.		
n	Working Saturated Output Power	Notes 7, 8 and 9 on page 4.	15	III	-	4	20	mW
p	Cold Attenuation	Notes 6 and 10 on page 4.	4	III	-	40	-	dB

NOTES

1. Read after two minutes.

2. The input waveguide is short circuited and the output waveguide mismatched to a v.s.w.r. of 10:1 at 9 kMc/s and then terminated in a matched crystal detector connected to the vertical deflection plates of a cathode ray oscilloscope (C.R.O.). The helix and collector voltages are swept at 50 c.p.s. by a waveform of 200 volts peak to peak amplitude and the focussing is re-adjusted as in Note C (iii) and (iv) for a minimum helix current which shall not be greater than 150 μA. A suitable voltage of the same phase and frequency as the sweep voltage is applied to the horizontal deflection plates of the C.R.O. The sensitivity of the system shall be such that the valve noise output shall be visible.

   Under these conditions no oscillations shall be detected.

3. The noise factor is measured at frequencies of 7.5, 9 and 11.5 kMc/s by comparing the noise with that from a standard noise source type CV2479 using an I.F. in the range 40-60 Mc/s with a bandwidth of 2 Mc.

4. Small signal gain shall be measured at frequencies of 7, 9 and 11.5 kMc/s.

5. After completion of tests (b) to (h), the heater voltage shall be reduced to 5.8V and the procedure shown in Note C (iii) and (iv) repeated. The change in Vg2 from the value recorded in test (b) shall not exceed the limit specified.

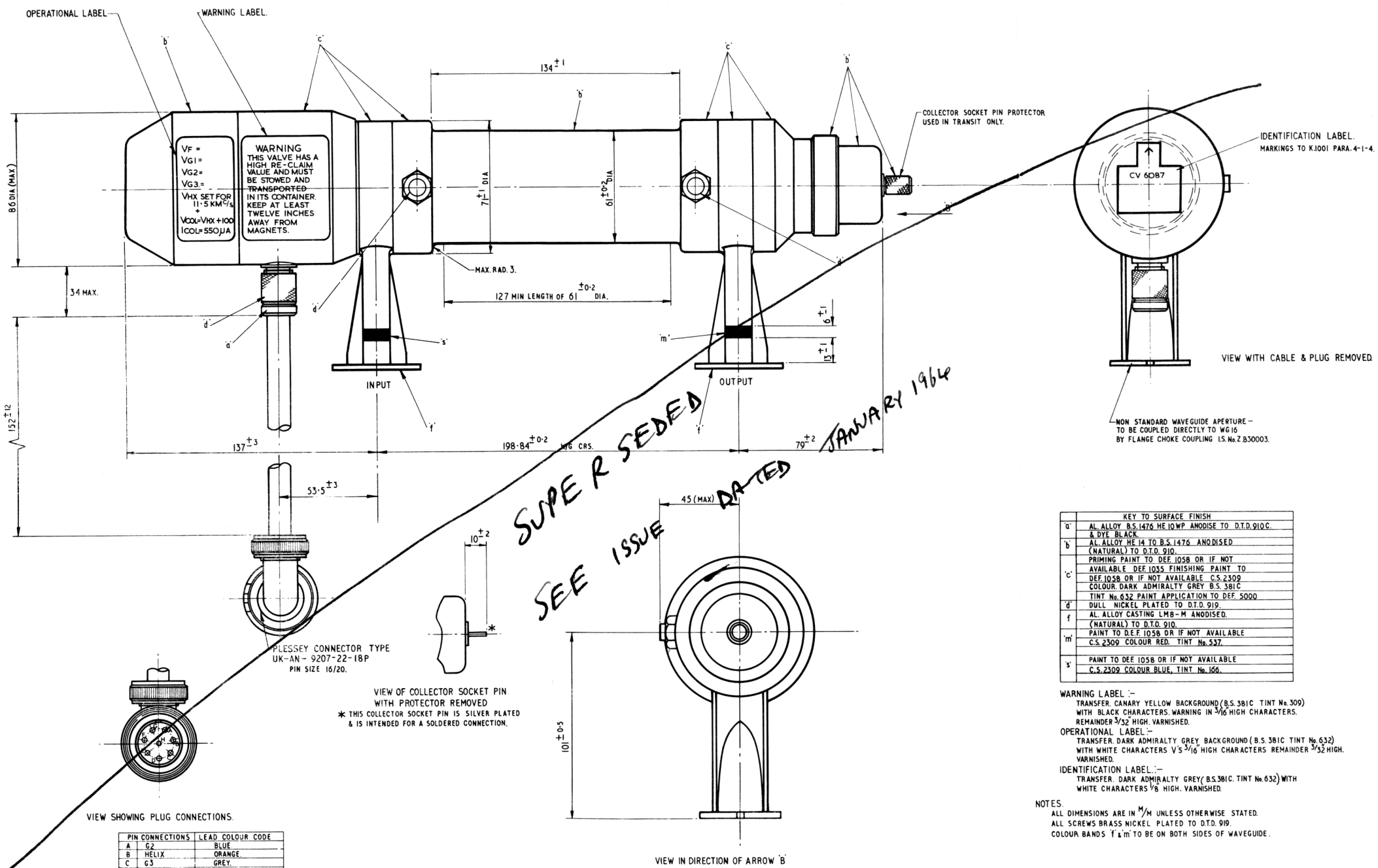
6. The cold attenuation shall be measured at a frequency of 9 kMc/s.

7. Carry out the procedure as in Note C on page 2 and then, (at a frequency of 9 kMc/s) increase the input power until no further increase in output power is observed. This maximum is the working saturated output power.

⟶ 8. At Type Approval only, these measurements shall be made at intervals of 100 Mc/s over the band 7.0 to 11.5 kMc/s.

⟶ 9. Values of Noise Factor and Saturated Power Output measured below 7.5 kMc/s will be recorded for information only.

⟶ 10. At Type Approval only, the Cold Attenuation shall be measured at intervals of 400 Mc/s over the band 7.0 to 11.5 kMc/s.



PIN	CONNECTIONS	LEAD COLOUR CODE
A	G2	BLUE.
B	HELIX	ORANGE.
C	G3	GREY.
D	G1	GREEN.
E	CATHODE	YELLOW
F	HEATER	BROWN.
G	HEATER	BROWN.
H	NOT USED	——

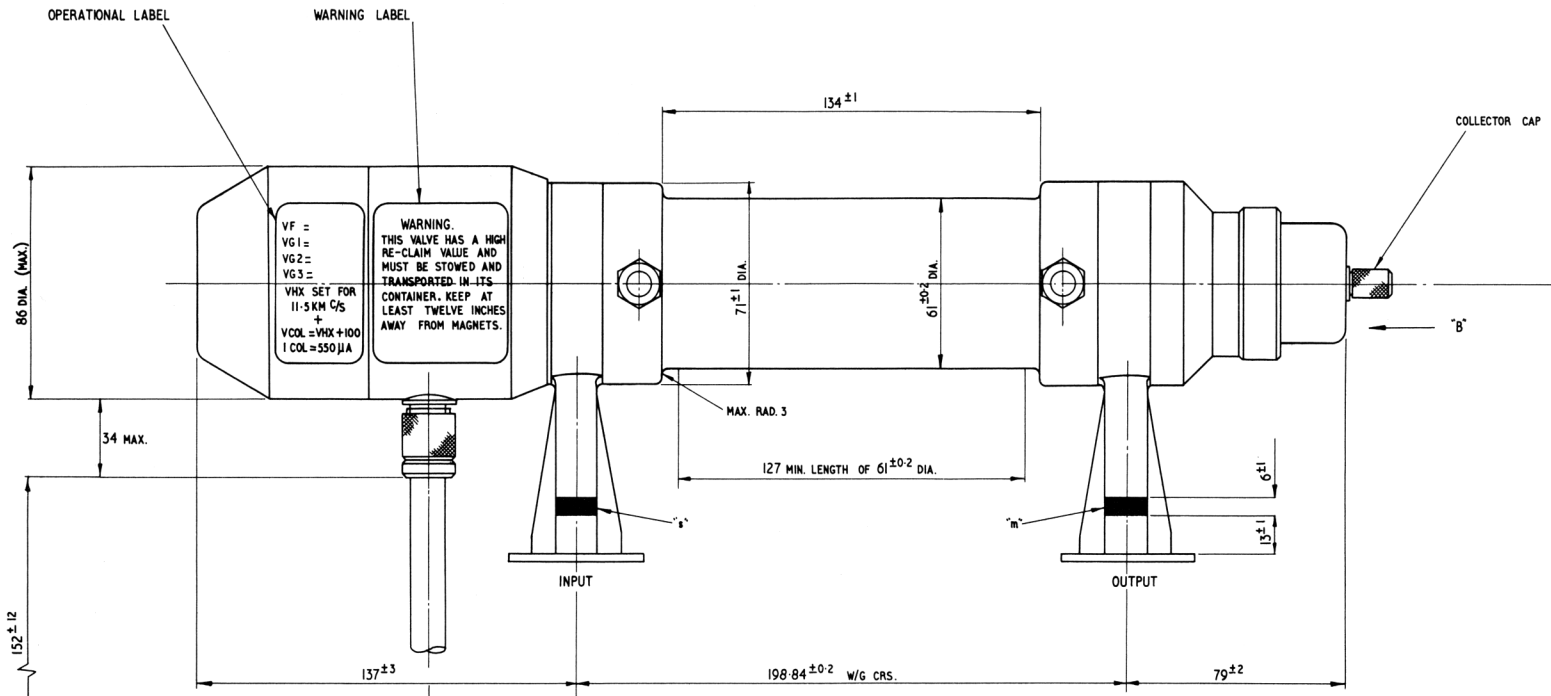
	KEY TO SURFACE FINISH
'a'	AL. ALLOY B.S.1476 HE 10 WP ANODISE TO D.T.D. 910C. & DYE BLACK.
'b'	AL. ALLOY HE 14 TO B.S. 1476 ANODISED (NATURAL) TO D.T.D. 910.
'c'	PRIMING PAINT TO DEF 1058 OR IF NOT AVAILABLE DEF 1035 FINISHING PAINT TO DEF 1058 OR IF NOT AVAILABLE C.S. 2309 COLOUR DARK ADMIRALTY GREY B.S. 381C TINT No. 632 PAINT APPLICATION TO DEF. 5000
'd'	DULL NICKEL PLATED TO D.T.D. 919.
'f'	AL. ALLOY CASTING LM8-M ANODISED. (NATURAL) TO D.T.D. 910.
'm'	PAINT TO D.E.F. 1058 OR IF NOT AVAILABLE C.S. 2309 COLOUR RED. TINT No. 537.
's'	PAINT TO DEF 1058 OR IF NOT AVAILABLE C.S. 2309 COLOUR BLUE. TINT No. 166.

WARNING LABEL :–
TRANSFER. CANARY YELLOW BACKGROUND (B.S. 381C TINT No. 309) WITH BLACK CHARACTERS. WARNING IN 3/16" HIGH CHARACTERS. REMAINDER 3/32" HIGH. VARNISHED.

OPERATIONAL LABEL :–
TRANSFER. DARK ADMIRALTY GREY BACKGROUND (B.S. 381C TINT No. 632) WITH WHITE CHARACTERS V's 3/16" HIGH CHARACTERS REMAINDER 3/32" HIGH. VARNISHED.

IDENTIFICATION LABEL :–
TRANSFER. DARK ADMIRALTY GREY (B.S. 381C. TINT No. 632) WITH WHITE CHARACTERS 1/8" HIGH. VARNISHED.

NOTES.
ALL DIMENSIONS ARE IN M/M UNLESS OTHERWISE STATED.
ALL SCREWS BRASS NICKEL PLATED TO D.T.D. 919.
COLOUR BANDS 'f' & 'm' TO BE ON BOTH SIDES OF WAVEGUIDE.



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A	G2	BLUE
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F	HEATER	BROWN
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H	NOT USED	—

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COLOUR BANDS 'm' & 's' TO BE ON BOTH SIDES OF WAVEGUIDE.

OUTLINE DRAWING

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION AD/CV6087 ISSUE 1A DATED 29th AUGUST, 1962.

AMENDMENT NO. 1

Page 5. Remove and destroy existing Page 5 and substitute new Page 5 attached hereto.

T.V.C. for A.S.W.E.

January, 1964.

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