VALVE ELECTRONIC CV4120

Specification MOA/CV 4120
Issue 1A Dated 1st April 1965
To be read in conjunction with K1001, BS448 and BS1409

SECURITY	
Specification	Valve
Unclassified	Unclassified

Type of Valve - Reliable low noise r.f. triode

Envelope - Glass - Unmetallised
Cathode - Indirectly Heated
Prototype - E2975

MARKING

See K1001/4

BASE

B7G

RATINGS AND CHARACTERISTICS

(Absolute non-simultaneous)

			NOTE
Heater Voltage	(V)	6.3	
Heater current	(A)	0.37	
Max. Anode Voltage	(V)	200	
Max. Grid current	(mA)	3	
Max. Negative Grid Voltage	(V)	20	
Max. Cathode Current	(mA)	20	
Max. Bulb temperature	(°C)	180	
Max. Heater-Cathode Voltage	(V)	100	
Max. Grid Resistance			
Fixed Bias	(M.ohms)	0.1	
Auto Bias	(M.ohms)	0.5	
Mutual Conductance	(mA/V)	14	A.B.
Anode Impedance	(ohms)	4150	A
Amplification Factor		52	A
Noise Factor, nominal	(dB)	1.4	C
Max. Accn. (Continuous operation)	(g)	2.5	
Max. Shock (Short Duration)	(g)	500	

CONNECTIONS

1	-	Grid
2	-	Cathode
3	-	Heater
4	-	Heater
5	-	No Connection
6	-	Internally connected
7	-	Anode

DIMENSIONS

See ~~K1001/A1/D4~~ BS448/B7G-1 size Ref 602

~~A - 45.1~~ Overall A

~~A - 38~~ Seated height (mm)

B - ~~19~~ Diameter (mm)

C Overall length mm

MOUNTING POSITION

Any

NOTES

A. Measured at V_a (b) = 180v. R_a = 3.3 Kohm R_k = 68 ohms I_a = 15.5 mA

B. Measured in a mutual conductance bridge, maximum frequency 1000 c/s, max input signal to grid 0.1v r.m.s.

C. Measured at 45 Mc/s under approved conditions.

D. Measured at 1 Mc/s with valve and socket fully screened.

E. JOINT SERVICE CAT No: 5960-99-037-3662.

To be performed in addition to those tests applicable in K1001

TEST CONDITIONS

Unless otherwise stated

V_h	V_a(b)	R_L	R_k
6.3V	180V	3.3kohms.	68 ohms.

K1001	TEST	TEST CONDITIONS	AQL %	Insp. Level	Sym-bol	LIMITS Min.	LIMITS Bogey	LIMITS Max.	Units
	GROUP A								
	Insulation	$V_{a\text{-all}}$ = -100V		100%	R	50	-	-	M
		V_g-all = -20V		100%	R	20	-	-	M
	Reverse grid current	V_g = -1.0V R_g = 500K max.		100%	I_g	-	-	0.7	µA
	GROUP B	Combined AQL	4.0						
	Heater Current		0.65	II	I_h	0.33	0.37	0.41	A
	Heater Cathode leakage current	V_{hk} ± 100V	0.65	II	I_{hk}	-	-	10.0	µA
	Anode Current (1)		0.65	II	I_a	12.0	15.5	19.0	mA
	Mutual Conductance.	Note 1	0.65	II	gm	10.5	14.0	17.5	mA/V
	Anode Current (2)	V_g = -4.0V	0.65	II	I_a	-	-	2.6	mA
	Noise Factor	Frequency = 45Mc/s. R_k = 68 ohms. ± 5% Note 2	2.5	Code G	NF	-	1.4	1.75	dB
	GROUP C								
	Vibration Noise	$V_{a(b)}$ = 160V R_L = 2K R_k = 68 ohms. C_k = 100 µF R_g = 1K C_c = 0.1 µF	2.5	Code D	V_a A.C	-	-	10.0	mV

TESTS (Cont'd)

K1001	Test	TEST CONDITIONS	AQL %	Insp. Level	Sym-bol	LIMITS Min.	LIMITS Bogey	LIMITS Max.	Units
	GROUP D								
	Amplification Factor		6.5	IA	μ	36	52	68	
	Capacitance	Measured on a 1 Mc/s bridge with valve mounted in a fully screened socket. Valve shielded. Notch	6.5	IA	Cge)	~~2.65~~ ~~2.3~~	~~3.30~~ ~~2.9~~	~~3.96~~ ~~3.5~~	pF
					Cae)	~~0.13~~	~~0.16~~	~~0.19~~	pF
					Cag)	~~0.8~~	1.1	1.4	pF
					Cae	0.61	0.76	0.91	pF
					Cag	0.70	0.85	1.00	pF
	GROUP E								
7.2	Base Strain	No voltages	6.5	IA					
	Fatigue	V_h = 6.9V switched 1 min. on, 3 mins. off. V_a = 0 Min. pk. accel = 5 g. Duration 30, 39, 30 hours.		Code D					
	Post Fatigue	Combined AQL	10.0						
	Vibration Noise	Note 3			V_aAC	-	-	20	mV
	Heater Cathode Leakage current	V_{hk} ± 100V			I_{hk}	-	-	20	μA
	Reverse Grid Current	V_g = -1.0V R_g = 500K max.			I_g	-	-	1.4	μA
	Mutual Conductance	Note 1			g_m	10	-	-	mA/V
	GROUP F								
	Life Test	V_h = 6.3V $V_{a(b)}$ = 180V R_L = 3.3K R_K=68ohms. V_{hk} = 50V rms. 50 c/s.							
	Stability Life Test								
	Change in mutual conductance.		10.0	Code D	g_m	-	-	10	%

Amalk 2

CV4120

TESTS (Cont'd)

K1001	TEST	TEST CONDITIONS	AQL %	Insp. Level	Sym-bol	LIMITS Min.	LIMITS Bogey	LIMITS Max.	Units
	GROUP F Cont'd								
AV1/53	Intermittent Life Test	See above	combined AQL 10.0	Code D					
	Life Test end point (500 hrs.)								
	Inoperatives								
	Heater cathode leakage current	V_{hk} ± 100V			I_{hk}	-	-	35	µA
	Reverse grid current	V_g = -1.0V R_g = 500K max.			I_g	-	-	1.0	µA
	Mutual conductance				g_m	8.0	~~Record~~		mA/V
	Average change of mutual conductance				g_m		Record 20		%
	Noise Factor	Freq. = 45 Mc/s RK = 68 ohms ± 5%			NF		~~Record~~ 2		dB
	Life Test end point (1000 hrs)								
	Noise Factor	Freq = 45 Mc/s RK = 68 ohms ± 5%	10.0		NF	~~To be recorded~~ and agreed later. 2			dB
	GROUP G								
A1X/2.5	Electrical retest after 14 days holding period.			100%					
	Inoperatives		0.5						
	Reverse grid current	V_g = -1.0V R_g = 500K max.	0.5		I_g			1.2	µA

NOTES

1. Measured with a mutual conductance bridge or any approved method.
2. To be measured under approved conditions R_L = 3.3K $V_{a(b)}$ = 180V
3. The conditions specified for the vibration noise test in Group C shall apply.
4. Connections:

Test	H.P.	L.P.	E
cge	1	2, 3, 4, 5, 6, C	7
cke	7	2, 3, 4, 5, 6, C	1
cgk	7	1	2, 3, 4, 5, 6, C

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOA/CV4120 ISSUE 1A DATED 1st APRIL 1965

AMENDMENT NO. 1

Page 1. 'Box' headed "DIMENSIONS"

Delete the existing information and substitute the following:-

See B.S. 448/B7G/2.1

Size Ref. No. 2

		Min.	Max.
A	Seated height (m.m.)	-	47.5
B	Diameter (m.m.)	16.0	19.0
C	Overall Length (m.m.)	-	54.5

June 1965
N.229229

T.V.C. for R.R.E.

19/5/65

ELECTRONIC VALVE SPECIFICATIONS.

SPECIFICATION MOA/CV4120 ISSUE 1A DATED 1st APRIL, 1965.

AMENDMENT NO. 2.

1. Page 3. Group D. Capacitance

(i) In column headed 'Test Conditions' insert "Note 4".

(ii) Limits, delete existing limits and substitute the following:-

	Min	Bogey	Max.
Cge	2.65	3.30	3.96
Cae	0.61	0.76	0.91
Cag	0.70	0.85	1.00

2. Page 4. Notes. Add new note 4 as follows:-

4. Connections.

Test	H.P.	L.P.	E.
Cge	1	2,3,4,5,6,C.	7
Cae	7	2,3,4,5,6,C.	1
Cag	7	1	2,3,4,5,6,C

September, 1965.

T.V.C. for R.R.E.

N.319494

15/6.

ELECTRONIC VALVE SPECIFICATIONS.

SPECIFICATION MOA/CV4120, ISSUE 1A DATED 1st April 1965.

AMENDMENT No. 3

1. Page 4 Intermittent Life Test.

(i) Against "Code D" in column headed 'AQL%' insert "Combined AQL 10.0%"

(ii) Mutual Conductance. In the 'Limits' column delete 'Record' and in 'Limits Min' column insert "8.0" and 'Units' column "mA/V".

(iii) Average Change of Mutual Conductance. In the "Limits" column delete "Record" and in 'Limits Max' column insert "20%".

(iv) Noise Factor. In the "Limits" column delete 'Record' and in 'Limits Max' column insert '2dB'.

2. Page 4. Life Test End Point

Against 'Noise Factor' in column headed "AQL%" insert "10.0". In the Limits column delete "To be recorded and agreed later" and in the 'Limits Max' column insert "2.2dB".

October 1966

N. 445219

TVC. for RRE.