

TRIPLE DIODE-TRIODE

Triple diode-triode intended for F.M. and A.M. signal detection and A.F. signal amplification.

QUICK REFERENCE DATA

Triode section

Anode current	I_a	0.8	mA
Transconductance	S	1.45	mA/V
Amplification factor	μ	70	-

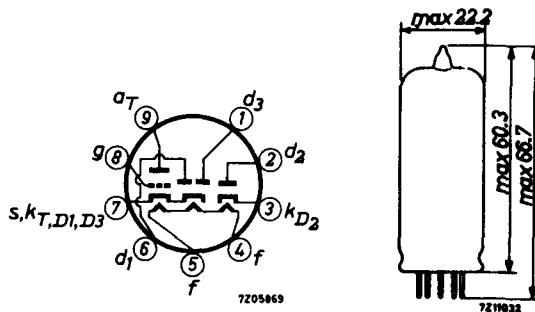
HEATING: Indirect by A.C. or D.C.; parallel supply

Heater voltage	V_f	6.3	V
Heater current	I_f	480	mA

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval



CAPACITANCESTriode section

Grid to all except anode	$C_{g(a)}$	1.9	pF
Anode to all except grid	$C_{a(g)}$	1.4	pF
Anode to grid	C_{ag}	2.0	pF
Grid to heater	C_{gf}	max. 0.04	pF

Diode sections

Diode No.1 to all	C_{d1}	0.8	pF
Diode No.2 to all	C_{d2}	4.8	pF
Diode No.3 to all	C_{d3}	4.8	pF
Cathode (D_2) to all	C_{kD_2}	4.9	pF
Diode No.1 to heater	C_{d1f}	max. 0.25	pF
Diode No.3 to heater	C_{d3f}	max. 0.2	pF
Cathode (D_2) to heater	C_{kD_2f}	2.5	pF

Between triode and diode sections

Anode to diode No.1	C_{ad1}	max. 0.12	pF
Anode to diode No.3	C_{ad3}	max. 0.1	pF
Anode to cathode (D_2)	C_{akD_2}	max. 0.01	pF
Grid to diode No.1	C_{gd1}	max. 0.07	pF
Grid to diode No.3	C_{gd3}	max. 0.02	pF
Grid to cathode (D_2)	C_{gkD_2}	max. 0.005	pF

TYPICAL CHARACTERISTICS Triode section

Anode voltage	V_a	100	250	V
Grid voltage	V_g	-1	-3	V
Anode current	I_a	0.8	1.0	mA
Transconductance	S	1.45	1.4	mA/V
Amplification factor	μ	70	70	-
Internal resistance	R_i	48	50	k Ω

OPERATING CHARACTERISTICS

Triode section as RC coupled A.F. amplifier

Grid resistor $R_g = 10 \text{ M}\Omega$

Supply voltage	V_b	250	250	250	200	200	200	V
Anode resistor	R_a	220	100	47	220	100	47	$\text{k}\Omega$
Grid resistor next stage	$R_{g'}$	0.68	0.33	0.15	0.68	0.33	0.15	$\text{M}\Omega$
Anode current	I_a	0.76	1.40	2.20	0.56	1.00	1.60	mA
Voltage gain	V_o/V_i	54	47	36	53	44	34	-

Distortion:

at output voltage $V_o = 3 \text{ V}_{\text{RMS}}$	d_{tot}	0.2	0.25	0.3	0.3	0.4	0.5	%
at output voltage $V_o = 5 \text{ V}_{\text{RMS}}$	d_{tot}	0.25	0.5	0.6	0.4	0.6	0.9	%
at output voltage $V_o = 8 \text{ V}_{\text{RMS}}$	d_{tot}	0.6	0.8	1.0	0.9	1.0	1.5	%

Supply voltage	V_b	170	170	170	100	100	100	V
Anode resistor	R_a	220	100	47	220	100	47	$\text{k}\Omega$
Grid resistor next stage	$R_{g'}$	0.68	0.33	0.15	0.68	0.33	0.15	$\text{M}\Omega$
Anode current	I_a	0.46	0.82	1.25	0.21	0.35	0.52	mA
Voltage gain	V_o/V_i	51	42	32	44	35	26	-

Distortion:

at output voltage $V_o = 3 \text{ V}_{\text{RMS}}$	d_{tot}	0.4	0.5	0.6	1.0	1.3	2.0	%
at output voltage $V_o = 5 \text{ V}_{\text{RMS}}$	d_{tot}	0.5	0.8	1.1	1.7	2.3	4.3	%
at output voltage $V_o = 8 \text{ V}_{\text{RMS}}$	d_{tot}	1.1	1.3	2.0	-	-	-	%

TYPICAL CHARACTERISTICS Diode sections

Internal resistance diode No.1 Diode voltage $V_{d1} = +10$ V	R_{iD1}	5 k Ω
Internal resistance diode No.2 Diode voltage $V_{d2} = +5$ V	R_{iD2}	200 Ω
Internal resistance diode No.3 Diode voltage $V_{d3} = +5$ V	R_{iD3}	200 Ω
Ratio between R_{iD2} and R_{iD3}	R_{iD2}/R_{iD3}	min. 0.67 max. 1.5

MICROPHONY Triode section

No special precautions against microphony are required in circuits where the input voltage is min. 10 mV for 50 mW output of the output tube at frequencies higher than 800 Hz. At lower frequencies the sensitivity may be increased according to figure 1.

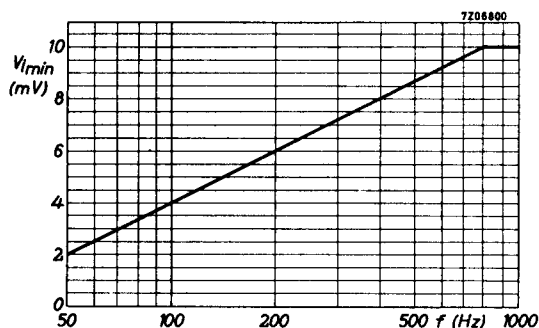


fig. 1

LIMITING VALUES (Design centre rating system)Triode section

Anode voltage	V_{a0}	max. 550 V
	V_a	max. 300 V
Anode dissipation	W_a	max. 1 W
Cathode current	I_k	max. 5 mA
Grid resistor	R_g	max. 3 M Ω
Grid resistor (grid current bias)	R_g	max. 22 M Ω
Cathode to heater voltage	V_{kf}	max. 150 V

Diode sections

Diode No.1 voltage, peak negative	$-V_{d1p}$	max. 350 V
Diode No.2 voltage, peak negative	$-V_{d2p}$	max. 350 V
Diode No.3 voltage, peak negative	$-V_{d3p}$	max. 350 V
Diode No.1 current:		
D.C. component	I_{d1}	max. 1 mA
peak	I_{d1p}	max. 6 mA
Diode No.2 current:		
D.C. component	I_{d2}	max. 10 mA
peak	I_{d2p}	max. 75 mA
Diode No.3 current:		
D.C. component	I_{d3}	max. 10 mA
peak	I_{d3p}	max. 75 mA
Cathode (D ₂) to heater voltage	$V_{kD2/f}$	max. 150 V

DOUBLE DIODE

Double diode with separate cathodes.

HEATING: Indirect by A.C. or D.C.; series or parallel supply

Heater voltage

V_f 6.3 V

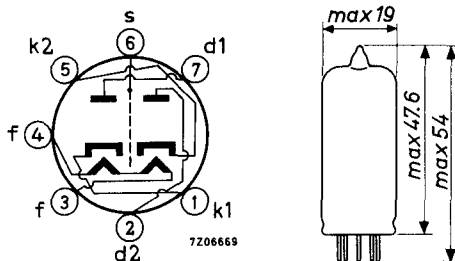
Heater current

I_f 300 mA

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Miniature



For further data
please refer to type EAA91

DOUBLE DIODE-TRIODE

Double diode-triode. Triode intended for use as A.F. amplifier.

QUICK REFERENCE DATA

Triode section

Anode current	I_a	1.0	mA
Transconductance	S	1.2	mA/V
Amplification factor	μ	70	-

HEATING: Indirect by A.C. or D.C.; parallel supply

Heater voltage

V_f 6.3 V

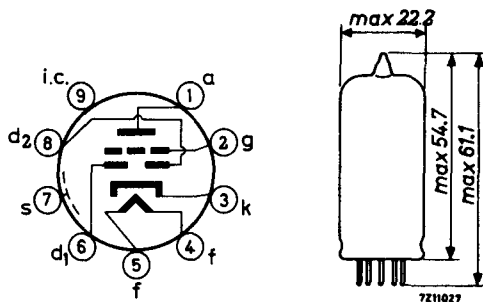
Heater current

I_f 230 mA

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval



CAPACITANCESTriode section

Grid to all except anode	$C_{g(a)}$	2.3	pF
Anode to all except grid	$C_{a(g)}$	2.3	pF
Anode to grid	C_{ag}	1.2	pF
Grid to heater	C_{gf}	max. 0.05	pF

Diode sections

Diode No. 1 to all	C_{d1}	0.9	pF
Diode No. 2 to all	C_{d2}	0.9	pF
Diode No. 1 to diode No. 2	C_{d1d2}	max. 0.2	pF
Diode No. 1 to heater	C_{d1f}	max. 0.25	pF
Diode No. 2 to heater	C_{d2f}	max. 0.05	pF

Between diode and triode sections

Diode No. 1 to grid	C_{d1g}	max. 0.007	pF
Diode No. 2 to grid	C_{d2g}	max. 0.007	pF
Diode No. 1 to anode	C_{d1a}	max. 0.005	pF
Diode No. 2 to anode	C_{d2a}	max. 0.010	pF

TYPICAL CHARACTERISTICSTriode section

Anode voltage	V_a	250	V
Grid voltage	V_g	-3	V
Anode current	I_a	1.0	mA
Transconductance	S	1.2	mA/V
Amplification factor	μ	70	-
Internal resistance	R_i	58	k Ω
Equivalent noise resistance (A.F.)	R_{eq}	max. 150	k Ω

OPERATING CHARACTERISTICS

Triode section as A.F. amplifier, circuit Fig.1

Supply voltage	V_b	250	250	250	250	V
Anode resistor	R_a	0.22	0.1	0.22	0.1	M Ω
Cathode resistor	R_k	1.8	1.2	0	0	k Ω
Grid resistor	R_g	1	1	22	22	M Ω
Grid resistor next stage	$R_{g'}$	0.68	0.33	0.68	0.33	M Ω
Anode current	I_a	0.70	1.15	0.76	1.40	mA
Voltage gain	V_o/V_i	51	43	52	44	-

Distortion:

at output voltage $V_o = 5 \text{ VRMS}$	d_{tot}	0.55	0.6	0.5	0.7	%
at output voltage $V_o = 10 \text{ VRMS}$	d_{tot}	0.9	1.1	0.8	0.9	%

Microphony

No special precautions against microphony are required in circuits where the input voltage is min. 10 mV for 50 mW output of the output tube.

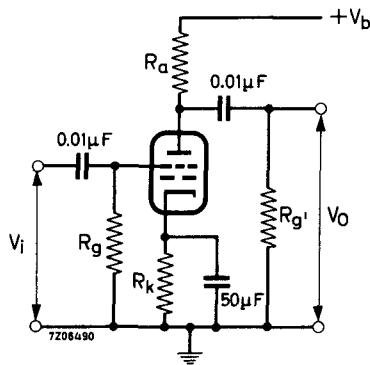


fig. 1