

A.F. DOUBLE TRIODE

Double triode intended for use as A.F. amplifier.

QUICK REFERENCE DATA (each unit)			
Anode current	I_a	10.5	mA
Transconductance	S	2.2	mA/V
Amplification factor	μ	17	-

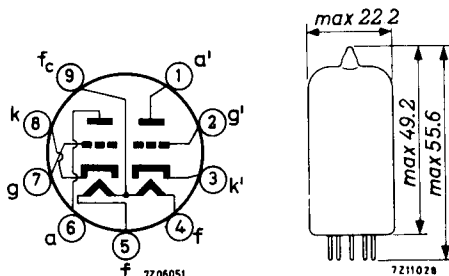
HEATING: Indirect by A.C. or D.C.; series or parallel supply

Heater voltage	V_f	6.3	12.6	V
Heater current	I_f	300	150	mA
		pins 9-(4+5)		pins 4-5

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval



REMARK

With V_f applied to pins 4+5 and 9 and the centre tap of the heater transformer connected to earth, the more favourable triode section of the tube with regard to hum is the section connected to pins 6, 7 and 8.

CAPACITANCES

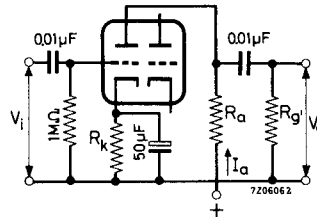
Grid to all except anode	$C_{g(a)}$	1.8	pF
	$C_{g'(a')}$	1.8	pF
Anode to all except grid	$C_{a(g)}$	0.37	pF
	$C_{a'(g')}$	0.25	pF
Anode to grid	C_{ag}	1.5	pF
	$C_{a'g'}$	1.5	pF
Grid to heater	C_{gf}	max. 0.135	pF
	$C_{g'f}$	max. 0.135	pF
Anode to anode	$C_{aa'}$	max. 1.1	pF
Anode to grid other unit	$C_{ag'}$	max. 0.11	pF
Grid to anode other unit	$C_{ga'}$	max. 0.06	pF
Grid to grid	$C_{gg'}$	max. 0.010	pF

TYPICAL CHARACTERISTICS

Anode voltage	V_a	100	250	V
Grid voltage	V_g	0	-8.5	V
Anode current	I_a	11.8	10.5	mA
Transconductance	S	3.1	2.2	mA/V
Amplification factor	μ	19.5	17	-
Internal resistance	R_i	6.25	7.7	k Ω

OPERATING CHARACTERISTICS

As A.F. amplifier, one unit



Supply voltage	V_b	100	150	200	250	300	350	400	V
Anode resistor	R_a	47	47	47	47	47	47	47	k Ω
Grid resistor next stage	$R_{g'}$	150	150	150	150	150	150	150	k Ω
Cathode resistor	R_k	1.2	1.2	1.2	1.2	1.2	1.2	1.2	k Ω
Anode current	I_a	1.20	1.82	2.41	3.02	3.65	4.30	5.00	mA
Voltage gain	V_o/V_i	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-

Output voltage ($I_g = 0.3 \mu A$)	V_o	11	18	26	34	43	51	59	V_{RMS}
Total distortion	d_{tot}	5.6	6.1	6.3	6.4	6.5	6.6	6.7	%

Supply voltage	V_b	100	150	200	250	300	350	400	V
Anode resistor	R_a	100	100	100	100	100	100	100	k Ω
Grid resistor next stage	$R_{g'}$	330	330	330	330	330	330	330	k Ω
Cathode resistor	R_k	2.2	2.2	2.2	2.2	2.2	2.2	2.2	k Ω
Anode current	I_a	0.66	0.98	1.30	1.63	1.97	2.30	2.62	mA
Voltage gain	V_o/V_i	14	14	14	14	14	14	14	-

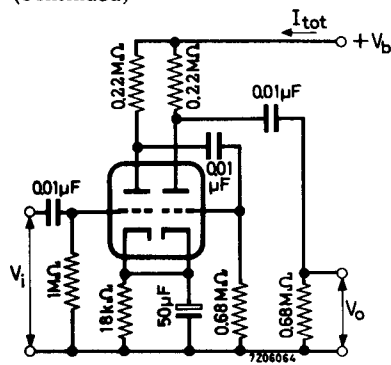
Output voltage ($I_g = 0.3 \mu A$)	V_o	10	17	25	32	41	49	57	V_{RMS}
Total distortion	d_{tot}	4.8	5.6	5.8	5.9	6.0	6.1	6.2	%

Supply voltage	V_b	100	150	200	250	300	350	400	V
Anode resistor	R_a	220	220	220	220	220	220	220	k Ω
Grid resistor next stage	$R_{g'}$	680	680	680	680	680	680	680	k Ω
Cathode resistor	R_k	3.9	3.9	3.9	3.9	3.9	3.9	3.9	k Ω
Anode current	I_a	0.33	0.50	0.66	0.82	0.98	1.16	1.31	mA
Voltage gain	V_o/V_i	14.5	14.5	14.5	14.5	14.5	14.5	14.5	-

Output voltage ($I_g = 0.3 \mu A$)	V_o	8	15	22	28	36	43	50	V_{RMS}
Total distortion	d_{tot}	4.0	4.4	4.7	4.8	4.9	5.0	5.1	%

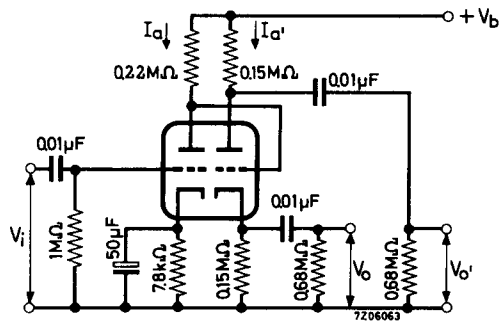
OPERATING CHARACTERISTICS (continued)

Two sections in cascade



Supply voltage	V_b	250	350	V
Total current	I_{tot}	1.66	2.33	mA
Voltage gain	V_o/V_i	178	178	-
Output voltage ($I_g = 0.3 \mu A$)	V_o	15	25	V_{RMS}
Total distortion	d_{tot}	2	2	%

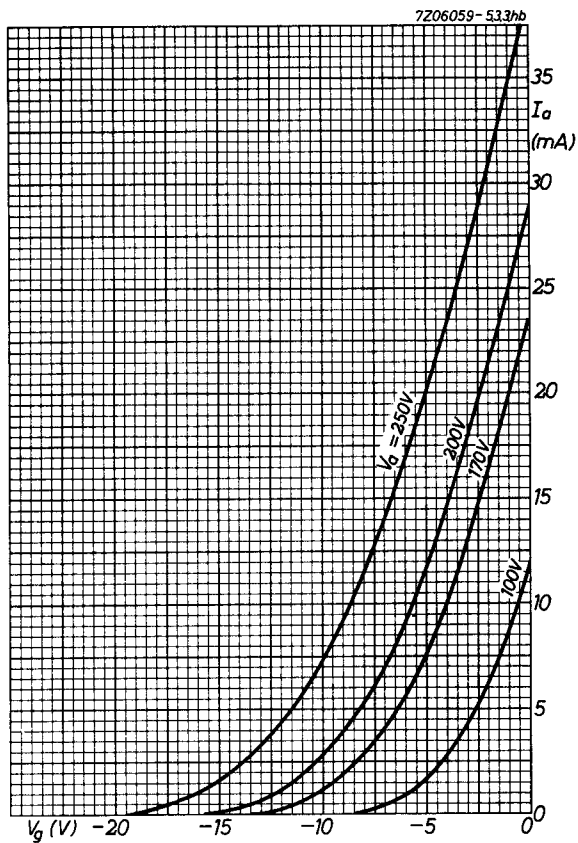
As phase inverter

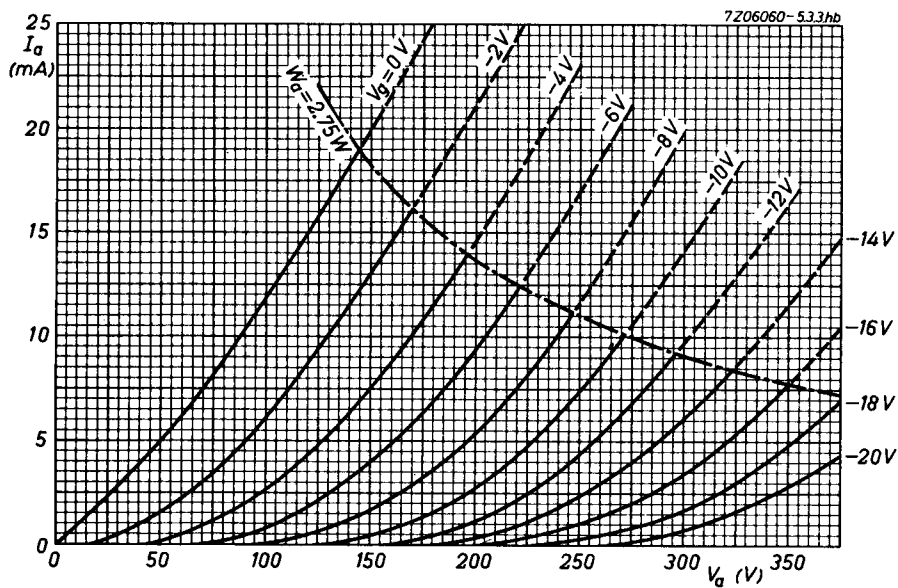


Supply voltage	V_b	250	350	V
Anode current	I_a	0.70	1.00	mA
Anode current	$I_{a'}$	0.68	0.93	mA
Voltage gain	V_o/V_i	11	11	-
Output voltage ($I_g = 0.3 \mu A$)	V_o	15	24	V_{RMS}
Total distortion	d_{tot}	1	1	%

REMARK

This tube can be used without precautions against microphony in equipment in which $V_i \geq 10$ mV for an output of 50 mW of the output tube (or $V_i \geq 100$ mV for 5 W output) provided that the average acceleration of the tube is not greater than indicated in the section "Microphonic effect" of the "Application Directions". When the centre tap of the heater transformer has been earthed, $R_g \leq 0.3 \text{ M}\Omega$ and R_k is sufficiently decoupled, the disturbance level for hum and noise will then be better than 60 dB below 100 mV.





PHILIPS

Data handbook



**Electronic
components
and materials**

ECC82

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1	1	1969.12
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