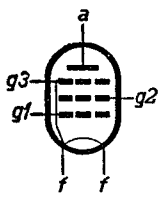
KL 4 Output pentode



The KL 4 is an output valve using a relatively small filament current (0.15 A). The sensitivity is very high, only a small input voltage being required for full excitation; with 135 V on anode and screen the KL 4 will deliver 0.47 W, with 11.2 % distortion. This valve is suitable for use only in balanced output stages operating without grid current; the quality of reproduction is then excellent and the output obtainable at the above-mentioned anode and screen voltage is approximately 0.8 W.

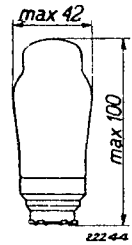


Fig. 1
Dimensions in mm.

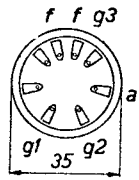


Fig. 2
Arrangement of electrodes and base connections.

FILAMENT RATINGS

Heating: direct by battery; parallel supply.

Filament voltage	V_f = 2.0 V
Filament current	I_f = 0.150 A

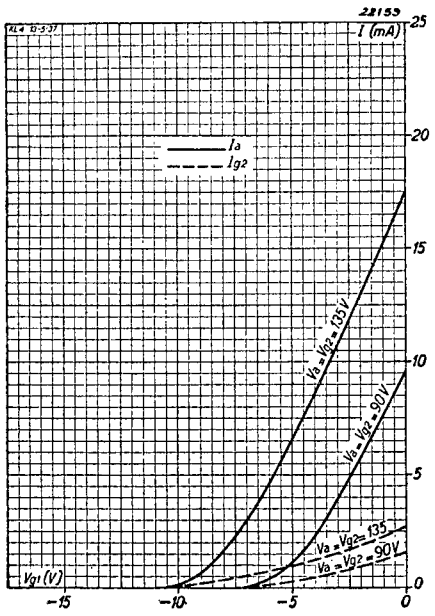


Fig. 3
Anode and screen-grid current as functions of the grid bias, with $Va = Vg_2 = 135$ and 90 V.

OPERATING DATA

Anode voltage		
V_a	= 90	135 V
Screen-grid voltage		
V_{g2}	= 90	135 V
Grid bias		
V_{g1}	= —2.6	—5 V
Anode current		
I_a	= 4.7	7 mA
Screen-grid current		
I_{g2}	= 0.8	1.1 mA
Mutual conductance		
S	= 1.8	2.1 mA/V
Internal resistance		
R_i	= 150,000	130,000 ohms
Load resistor		
R_a	= 19,000	19,000 ohms
Output power (10 % dist)		
W_o	= 0.16	0.44 W
Alternating input voltage		
V_i	= 1.9	3.3 V_{eff}

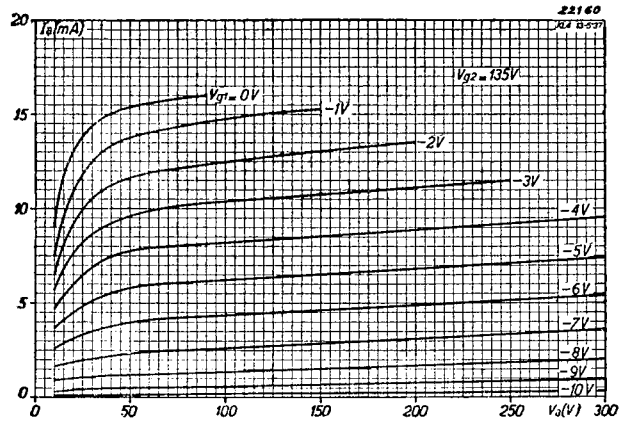


Fig. 4
Anode current as a function of the anode voltage, with grid bias as parameter, at a screen voltage of 135 V.

MAXIMUM RATINGS

V_a	= max. 135 V	W_{g2} (W_o = max)	= max. 0.30 W
W_a	= max. 1 W	I_k	= max. 10 mA
V_{g2}	= max. 135 V	R_{g1}	= max. 1 M ohm
W_{g2} ($V_i = 0$)	= max. 0.15 W	V_{g1} ($I_{g1} = +0.3$ μA)	= max. —0.2 V

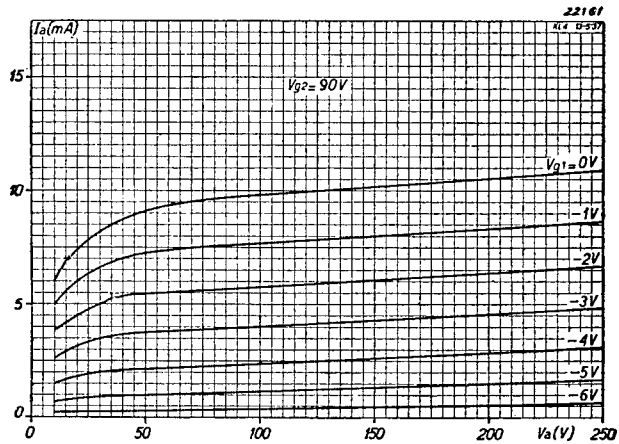


Fig. 5
Anode current as a function of the anode voltage, with grid bias as parameter, for a screen voltage of 90 V.

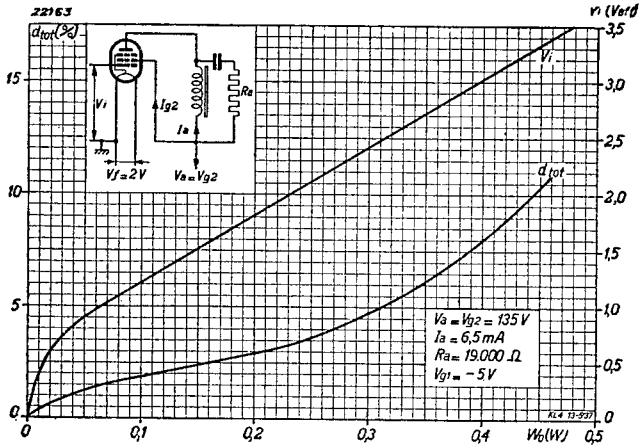


Fig. 6
Alternating grid voltage Vi and total distortion of the KL 4 as functions of the output power, on $Va = Vg = 135$V.

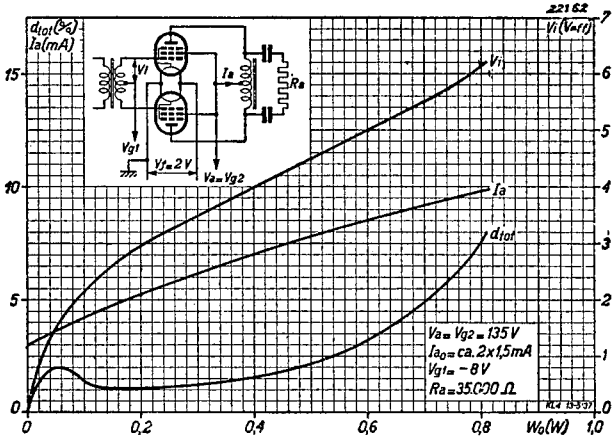


Fig. 7
Alternating grid voltage Vi, total distortion and combined anode current as functions of the output power of two KL 4 valves in a balanced circuit operating without grid current ($Va = Vg_2 = 135$ V).

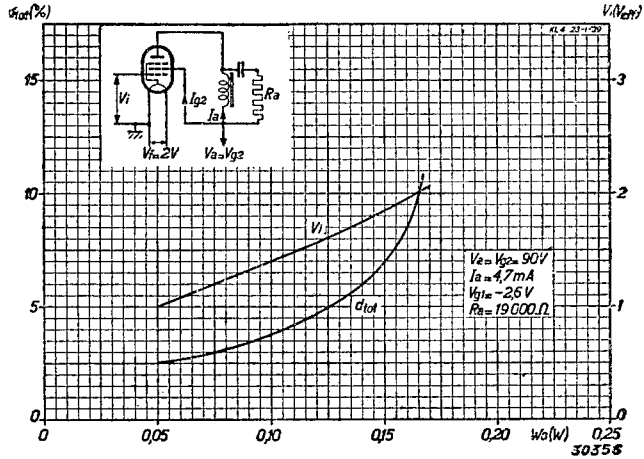


Fig. 8
Alternating grid voltage Vi and total distortion of the KL 4 as functions of the output power with $Va = Vg_2 = 90$ V.

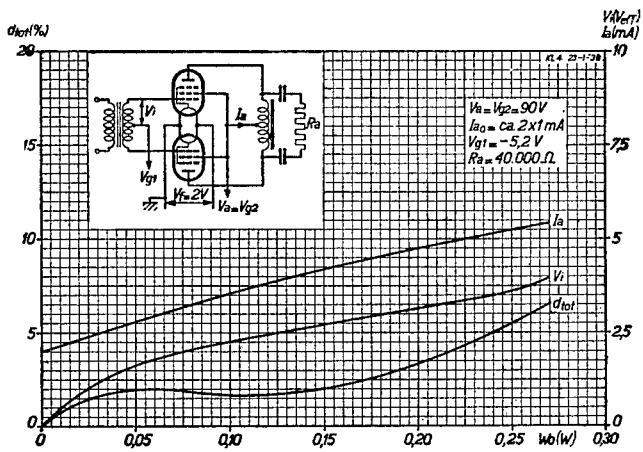


Fig. 9
Alternating grid voltage Vi, total distortion and combined anode current as functions of the output power of two KL 4 valves in a balanced circuit operating without grid current ($Va = Vg_2 = 90$ V).