

VAPOUR COOLED R.F. POWER TRIODE

QUICK REFERENCE DATA								
Frequency (MHz)	C telegraphy		C anode mod.		RF class B		AF class B Two tubes	
	V _a (kV)	W _o (kW)	V _a (kV)	W _o (kW)	V _a (kV)	W _o (kW)	V _a (kV)	W _o (kW)
10	15	120			15	110	12	78
30	12	90	11	66	12	110	10	78

HEATING: direct by A.C. or D.C.; filament thoriated tungsten

Filament voltage $V_f = 12.6 \text{ V}$

Filament current $I_f = 160 \text{ A}$

CAPACITANCES

Grid to filament $C_{gf} = 120 \text{ pF}$

Anode to filament $C_{af} = 1.4 \text{ pF}$

Anode to grid $C_{ag} = 50 \text{ pF}$

TYPICAL CHARACTERISTICS

Anode voltage $V_a = 3 \text{ kV}$

Anode current $I_a = 1 \text{ A}$

Amplification factor $\mu = 58$

Mutual conductance $S = 60 \text{ mA/V}$

TEMPERATURE LIMITS

Bulb temperature $t = \text{max. } 220 \text{ }^\circ\text{C}$

Seal temperature $t = \text{max. } 220 \text{ }^\circ\text{C}$

COOLING

Cooling data for anode dissipation $W_a = 60 \text{ kW}$

Total dissipation to be transferred by cooling system

$(W_a + W_g + 0.8 W_f) = 63 \text{ kW}$

equivalent to 900 kcal/min

Volume of produced vapour

at back flow water temperature of $20 \text{ }^\circ\text{C}$ $2.5 \text{ m}^3/\text{min}$

at back flow water temperature of $90 \text{ }^\circ\text{C}$ $2.8 \text{ m}^3/\text{min}$

COOLING (continued)

Amount of back flowing water

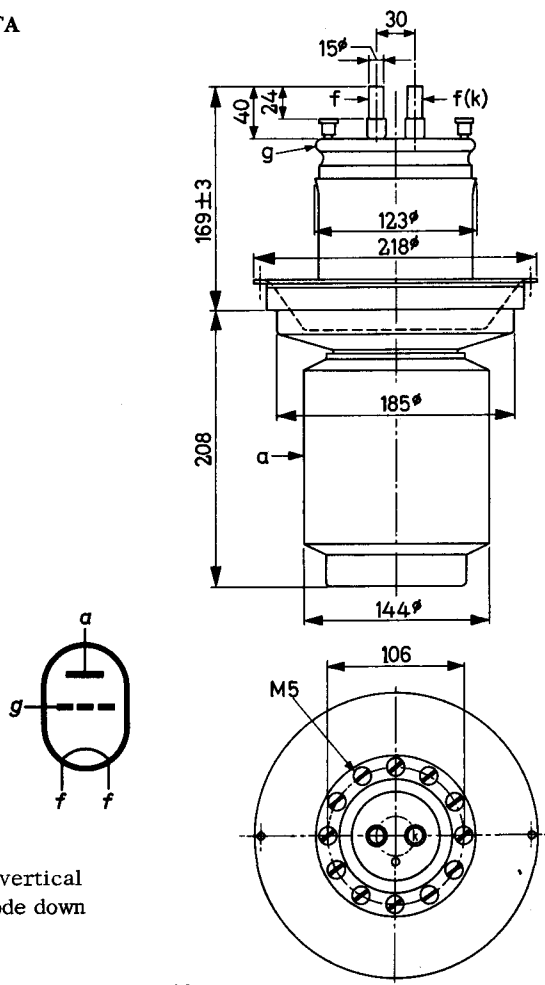
at back flow water temperature of 20 °C	1.5	l/min
at back flow water temperature of 90 °C	1.7	l/min

At frequencies higher than 10 MHz a low velocity air flow should be directed to the grid and filament seals.

MECHANICAL DATA

Net weight: 17 kg

Dimensions in mm



Mounting position: vertical
with anode down

ACCESSORIES

Vapour cooling system	K728
Filament connectors with cable	40670
Grid connector	40671

R.F. CLASS C TELEGRAPHY or F.M. TELEPHONY

LIMITING VALUES (Absolute limits)

Frequency	f	up to	10	up to	30	MHz
Anode voltage	V_a	= max.	16	max.	12.5	kV
Anode dissipation	W_a	= max.	60	max.	60	kW
Negative grid voltage	$-V_g$	= max.	1000	max.	1000	V
Grid dissipation	W_g	= max.	1.3	max.	1.3	kW
Anode current	I_a	= max.	13	max.	13	A
Grid current	I_g	= max.	3.3	max.	3.3	A

OPERATING CONDITIONS

Frequency	f	=	10	30	30	30	MHz
Anode voltage	V_a	=	15	12	10	8	kV
Grid voltage	V_g	=	-600	-550	-500	-450	V
Anode current	I_a	=	9.75	9.25	9.0	8.75	A
Grid current	I_g	=	2.2	2.2	2.1	1.85	A
Peak grid driving voltage	V_{gp}	=	1000	940	875	810	V
Grid driving power	W_{dr}	=	2.1	1.9	1.7	1.55	kW
Anode input power	W_{ia}	=	146	111	90	70	kW
Anode dissipation	W_a	=	26	21	18	15	kW
Output power	W_o	=	120	90	72	55	kW
Efficiency	η	=	82	81	80	78.5	%

R.F. CLASS B AMPLIFIER
LIMITING VALUES (Absolute limits)

Frequency	f	up to	10	up to	30	MHz
Anode voltage	V_a	= max.	16	max.	12.5	kV
Anode dissipation	W_a	= max.	60	max.	60	kW
Negative grid voltage	$-V_g$	= max.	1000	max.	1000	V
Grid dissipation	W_g	= max.	1.3	max.	1.3	kW
Anode current	I_a	= max.	13	max.	13	A
Grid current	I_g	= max.	3.3	max.	3.3	A

OPERATING CONDITIONS

Frequency	f	=	10	10	30	30	MHz
Anode voltage	V_a	=	15	15	12	12	kV
Grid voltage	V_g	=	-260	-260	-210	-210	V
Anode current	I_a	=	10.1	7.75	12.7	9.85	A
Grid current	I_g	=	2.0	1.3	3.0	1.9	A
Peak grid driving voltage	V_{gp}	=	600	520	650	520	V
Grid driving power	W_{dr}	=	1080	610	1770	880	W
Anode input power	W_{ia}	=	151	116.3	153	118	kW
Anode dissipation	W_a	=	41	31.3	43	33	kW
Output power	W_o	=	110	85	110	85	kW
Efficiency	η	=	73	73	72	72	%

R.F. CLASS C ANODE MODULATION

LIMITING VALUES (Absolute limits)

Frequency	f	up to	30	MHz
Anode voltage	V_a	= max.	11.5	kV
Anode dissipation	W_a	= max.	30	kW
Negative grid voltage	$-V_g$	= max.	1000	V
Grid dissipation	W_g	= max.	1.3	kW
Anode current	I_a	= max.	9	A
Grid current	I_g	= max.	3.3	A

OPERATING CONDITIONS

Frequency	f	=	30	30	MHz
Anode voltage	V_a	=	11	10	kV
Grid voltage	V_g	=	-480	-440	V ¹⁾
Anode current	I_a	=	7.6	6.9	A
Grid current	I_g	=	3.1	3.1	A
Grid resistor	R_g	=	90	80	Ω
Peak grid driving voltage	V_{gp}	=	880	810	V
Grid driving power	W_{dr}	=	2.7	2.4	kW
Anode input power	W_{i_a}	=	83.6	69	kW
Anode dissipation	W_a	=	17.6	14	kW
Output power	W_o	=	66	55	kW
Efficiency	η	=	79	79	%
Modulation depth	m	=	100	100	%
Modulation power	W_{mod}	=	41.8	34.5	kW

¹⁾ Partially obtained by the grid resistor and grid current.

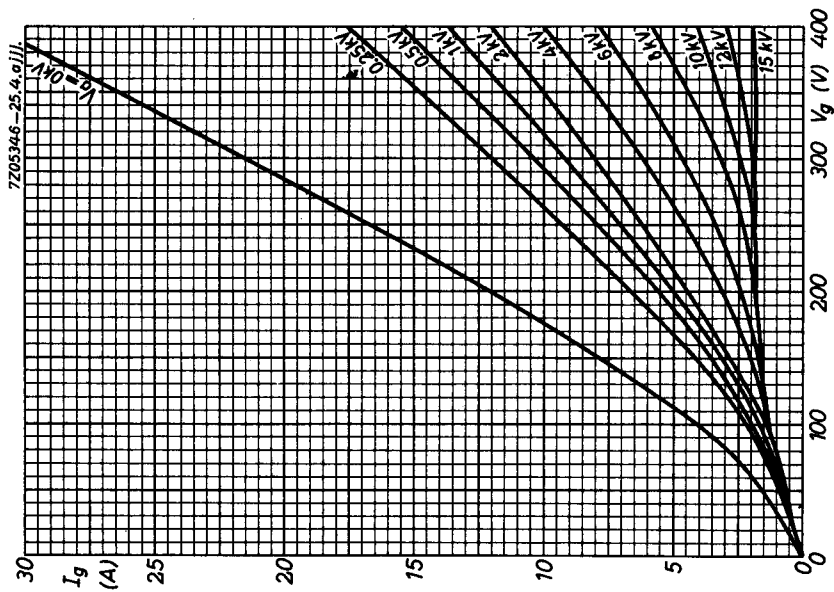
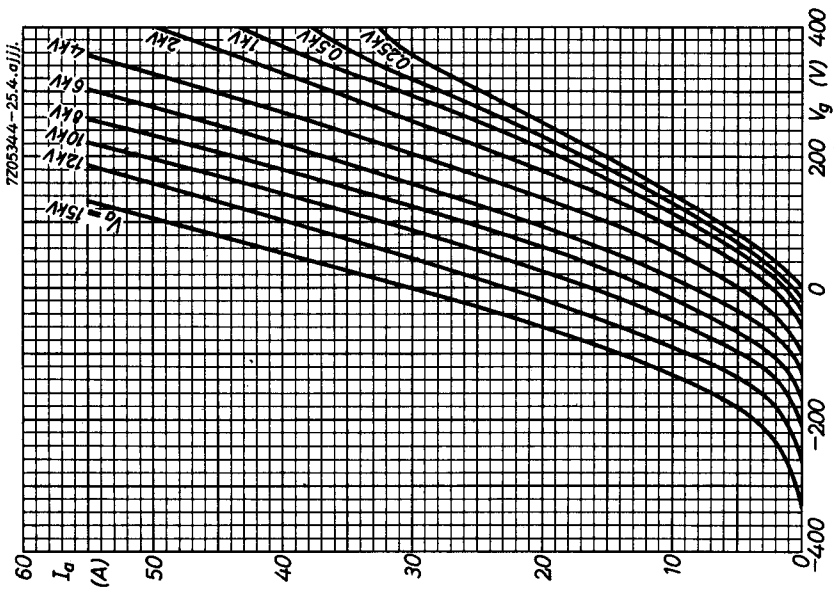
A.F. CLASS B AMPLIFIER AND MODULATOR

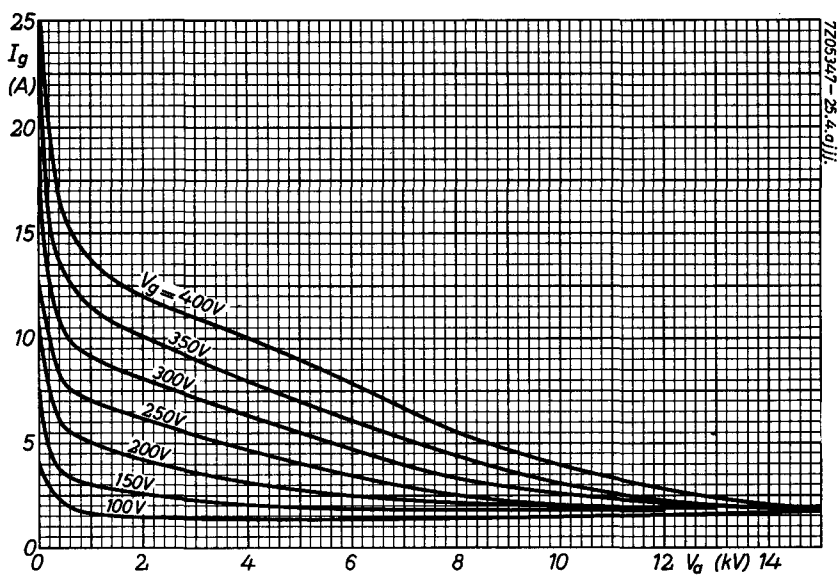
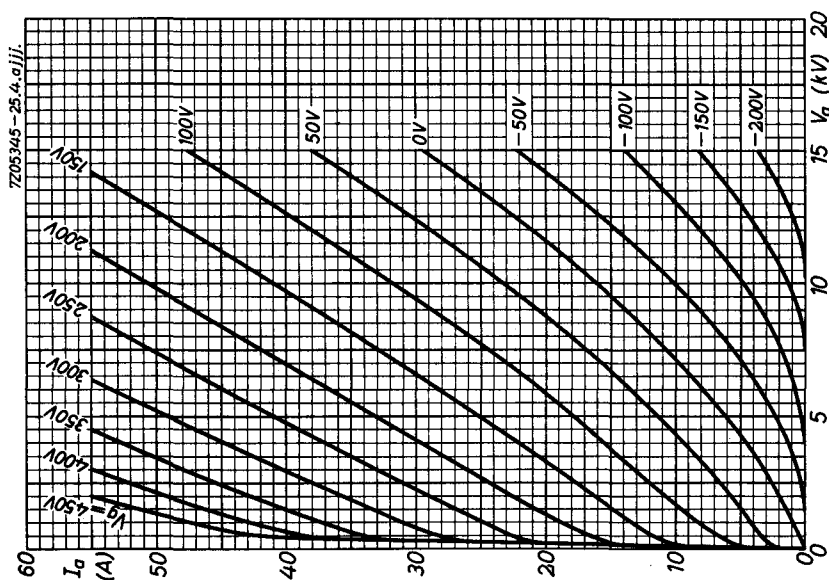
LIMITING VALUES (Absolute limits)

Anode voltage	V_a	=	max.	12	kV
Anode dissipation	W_a	=	max.	60	kW
Negative grid voltage	$-V_g$	=	max.	1000	V
Grid dissipation	W_g	=	max.	1.3	kW
Anode current	I_a	=	max.	13	A
Grid current	I_g	=	max.	3.3	A

OPERATING CONDITIONS (two tubes in push-pull)

Anode voltage	V_a	=	12	10	kV
Grid voltage	V_g	=	-205	-170	V
Load resistance	$R_{aa\sim}$	=	2720	1810	Ω
Peak grid driving voltage	V_{ggp}	=	0 710	0 710	V
Anode current	I_a	=	2x0.4 2x4.75	2x0.4 2x5.75	A
Average grid current	I_g	=	0 2x0.45	0 2x0.72	A
Peak grid current	I_{gp}	=	0 2x2.9	0 2x4.0	A
Grid driving power	W_{dr}	=	0 2x150	0 2x235	W
Anode input power	W_{i_a}	=	2x4.0 2x57	2x4.0 2x57.5	kW
Anode dissipation	W_a	=	2x4.0 2x18	2x4.0 2x18.5	kW
Output power	W_o	=	0 78	0 78	kW
Efficiency	η	=	- 68.5	- 68	%





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