

## 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 <sub>a</sub> (kV)	W <sub>o</sub> (kW)	V <sub>a</sub> (kV)	W <sub>o</sub> (kW)	V <sub>a</sub> (kV)	W <sub>o</sub> (kW)	V <sub>a</sub> (kV)	W <sub>o</sub> (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  $V_f = 12.6$  V  
 Filament current  $I_f = 160$  A

### CAPACITANCES

Grid to filament  $C_{gf} = 120$  pF  
 Anode to filament  $C_{af} = 1.4$  pF  
 Anode to grid  $C_{ag} = 50$  pF

### TYPICAL CHARACTERISTICS

Anode voltage  $V_a = 3$  kV  
 Anode current  $I_a = 1$  A  
 Amplification factor  $\mu = 58$   
 Mutual conductance  $S = 60$  mA/V

### TEMPERATURE LIMITS

Bulb temperature  $t = \text{max. } 220$  °C  
 Seal temperature  $t = \text{max. } 220$  °C

### COOLING

Cooling data for anode dissipation  $W_a = 60$  kW

Total dissipation to be transferred by cooling system

$(W_a + W_g + 0.8 W_f) = 63$  kW  
 equivalent to 900 kcal/min

Volume of produced vapour

at back flow water temperature of 20 °C 2.5 m<sup>3</sup>/min  
 at back flow water temperature of 90 °C 2.8 m<sup>3</sup>/min

**COOLING** (continued)

Amount of back flowing water

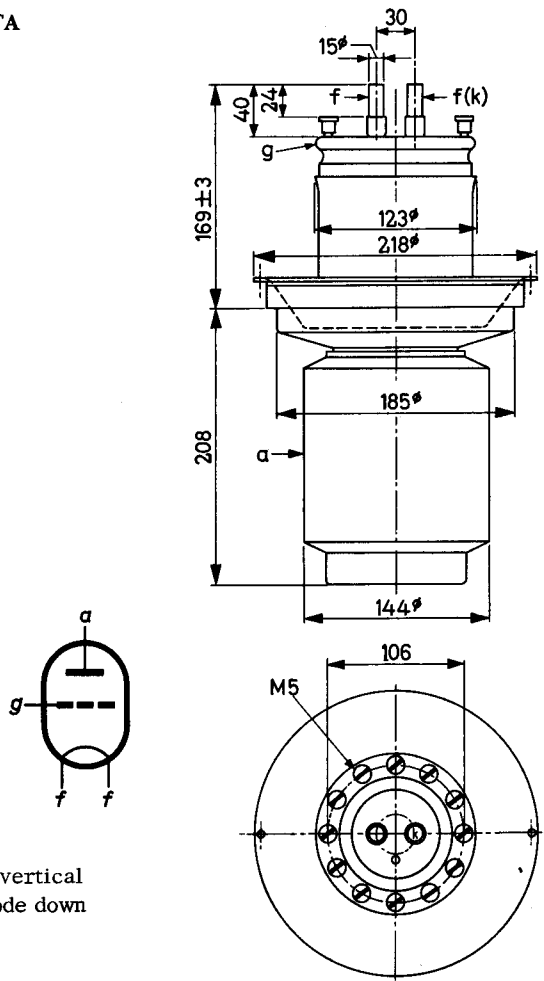
at back flow water temperature of 20 °C	1.5	l/min
at back flow water temperature of 90 °C	1.7	l/min

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	$\eta$	=	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	$W_{i_a}$	=	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	$\eta$	=	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 <sup>1)</sup>
Anode current	$I_a$	=	7.6	6.9	A
Grid current	$I_g$	=	3.1	3.1	A
Grid resistor	$R_g$	=	90	80	$\Omega$
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	$\eta$	=	79	79	%
Modulation depth	$m$	=	100	100	%
Modulation power	$W_{mod}$	=	41.8	34.5	kW

<sup>1)</sup> Partially obtained by the grid resistor and grid current.

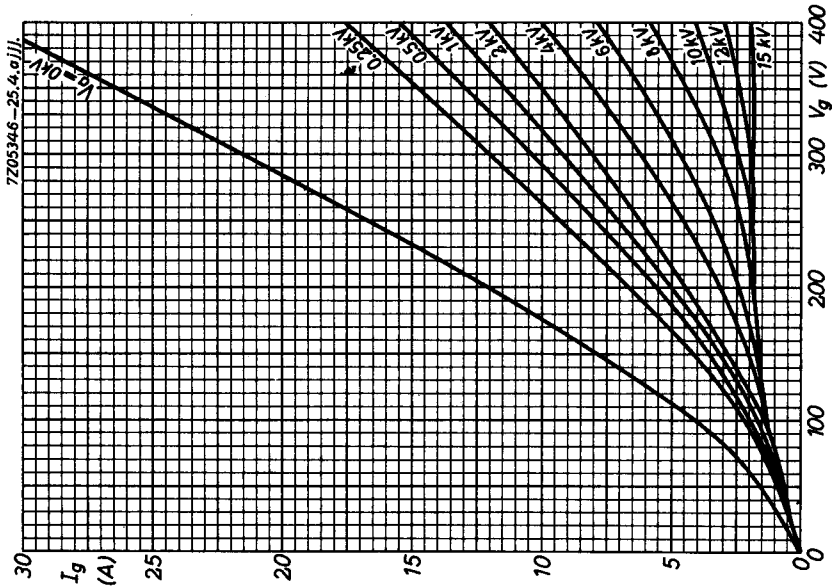
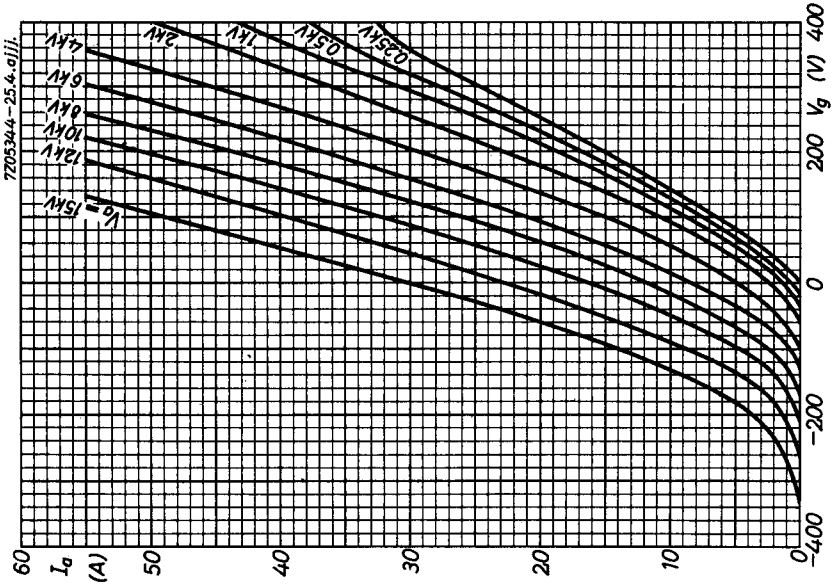
**A.F. CLASS B AMPLIFIER AND MODULATOR**

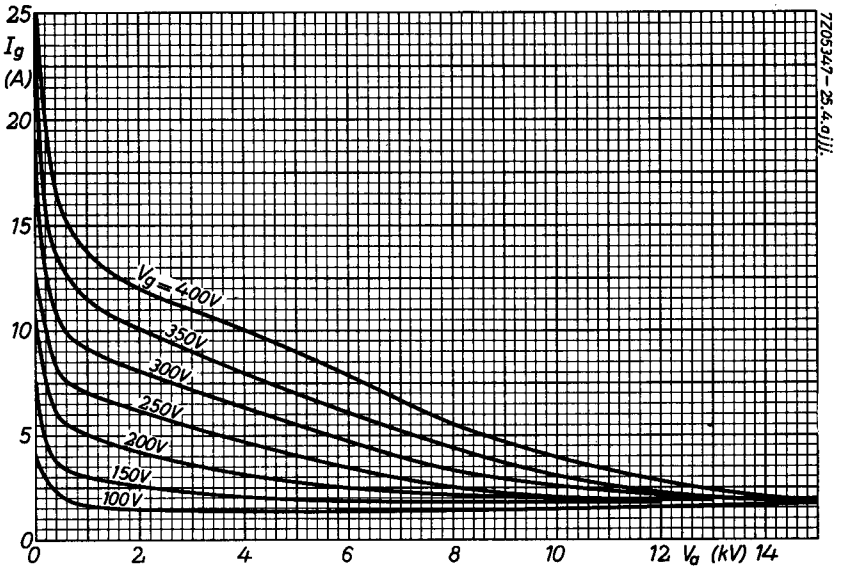
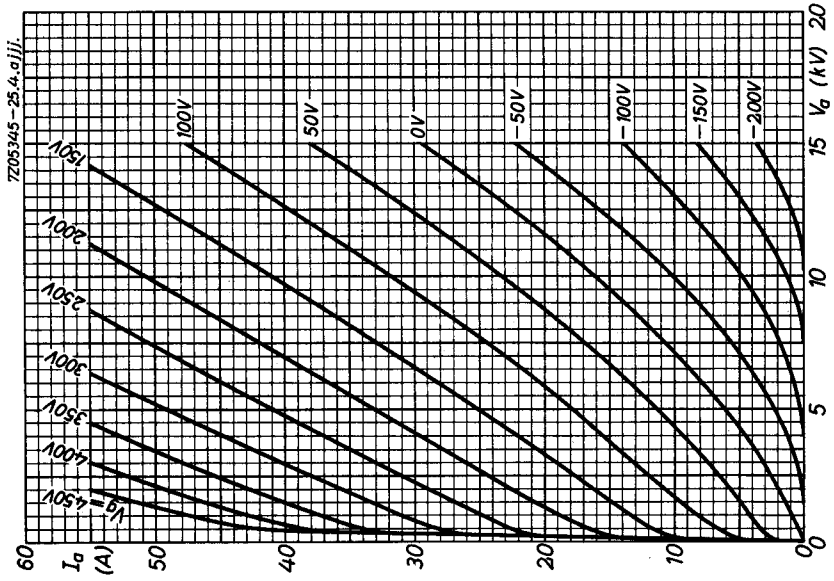
**LIMITING VALUES (Absolute limits)**

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	$\Omega$
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	$\eta$	=	-      68.5	-      68	%







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