RF POWER TRIODE

Triode in metal-ceramic construction, intended for use as industrial oscillator.
The tube has an integral water cooler.

QUICK REFERENCE DATA

Oscillator output power ($W_o - W_{feedb}$), typical	W_{osc}		4,75 kW
Frequency for full ratings	f	max.	85 MHz

To be read in conjunction with "General Operational Recommendations".

RF CLASS C OSCILLATOR FOR INDUSTRIAL USE

OPERATING CONDITIONS

Frequency	f	160	27,12	27,12 MHz
Filament voltage	V_f	6,0	6,3	6,3 V
Oscillator output power ($W_o - W_{feedb}$)	W_{osc}	3,75	4,75	3,85 kW
Anode voltage	V_a	5	6	5 kV
Anode current	I_a	1	1	1 A
Anode input power	W_{ia}	5	6	5 kW
Anode dissipation	W_a	1,03	1,0	0,93 kW
Anode output power	W_o	3,97	5,0	4,07 kW
Anode efficiency	η_a	79,4	83,3	81,4 %
Oscillator efficiency	η_{osc}	75,0	79,1	77,0 %
Feedback ratio	V_{gp}/V_{ap}	19	17	19 %
Grid resistor	R_g	2,0	2,5	2,0 kΩ
Grid current, on load	I_g	260	250	260 mA
Grid voltage, negative	$-V_g$	520	625	520 V
Grid dissipation	W_g	80	90	80 W
Grid resistor dissipation	W_{Rg}	135	156	135 W

LIMITING VALUES (Absolute maximum rating system)

Frequency	f	up to	160	85 MHz
Anode voltage	V_a		6,0	7,2 kV
Anode current	I_a		1,1	1,1 A
Anode input power	W_{ia}		6,0	6,5 kW
Anode dissipation	W_a		2,5	2,5 kW
Grid voltage	$-V_g$		1	1 kV
Grid current, on load	I_g		280	280 mA
off load	I_g		400	400 mA
Grid dissipation	W_g		150	150 W
Grid circuit resistance	R_g		20	20 kΩ
Cathode current, mean	I_k		1,4	1,4 A
peak	I_{kp}		7,5	7,5 A
Envelope temperature	T_{env}		240	240 °C

HEATING: direct; thoriated tungsten filament

Filament voltage (< 120 MHz)	V_f	6,3 V
(> 120 MHz)	V_f	6,0 V
Filament current at V_f = 6,3 V	I_f	33 A

The filament is designed to accept temporary fluctuations of +5% and −10%.

It is extremely important that the filament be properly decoupled. This should be done so that the resonance of the circuit formed by the filament and the decoupling elements remain below the fundamental oscillator frequency. In grounded-grid circuits this resonance should be below the grid-cathode resonance. For further information please see Application Book "Tubes for RF Heating" or contact the manufacturer.

CAPACITANCES

Anode-to-filament	C_{af}	0,4 pF
Grid to filament	C_{gf}	17 pF
Anode to grid	C_{ag}	14 pF

CHARACTERISTICS measured at V_a = 2,0 kV, I_a = 0,5 A

Transconductance	S	10 mA/V
Amplification factor	μ	20

COOLING

To obtain optimum life, the temperature of the seals and of the envelope should, under normal operating conditions, be kept below 200 °C.

Table 1 Water cooling characteristics

anode + grid dissipation $W_a + W_g$ kW	inlet temperature T_i °C	rate of flow q_{min} l/min	pressure drop ΔP kPa*	outlet temperature T_o °C
1	20	0,9	5	40
	50	1,4	6	62
2	20	1,6	10	40
	50	2,8	15	61
3	20	2,2	14	40
	50	4,1	27	61

Absolute max. water inlet temperature	T_i	max.	50 °C
Absolute max. water pressure	P	max.	600 kPa

ACCESSORIES

Filament connector	type 40688
Filament/cathode connector	type 40689
Grid connector	type 40686

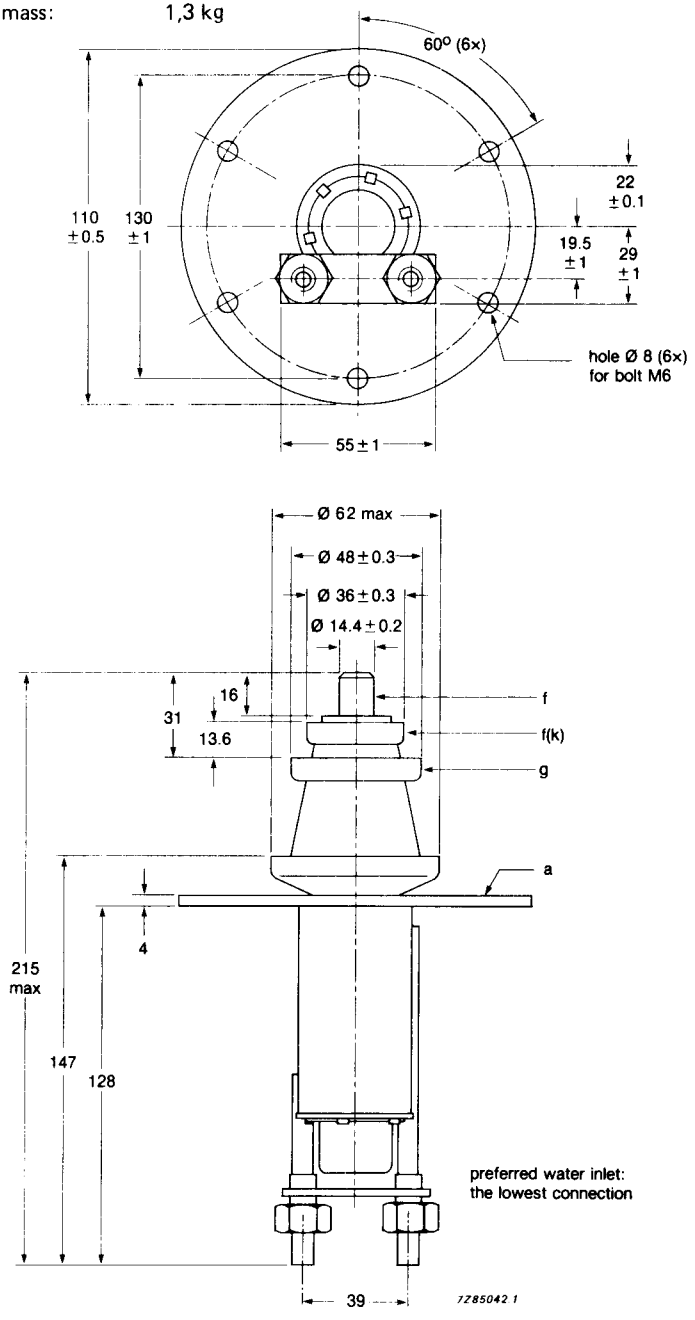
* 100 kPa ≈ 1 at

MECHANICAL DATA

Dimensions in mm

Mounting position: vertical with anode down

Net mass: 1,3 kg



Thread of water connections BSP 1/4 in.

Fig. 1 Mechanical outline.

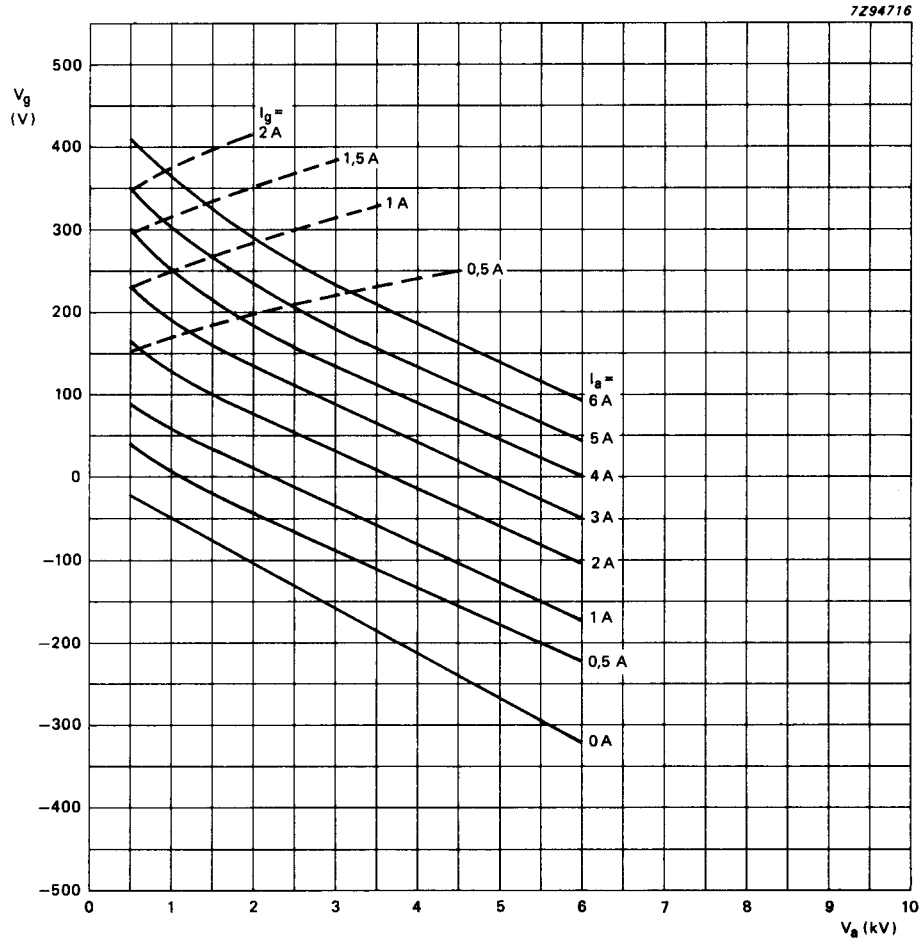


Fig. 2 Constant current characteristics.

PHILIPS

Data handbook

Electronic components and materials

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