R.F. POWER TRIODE

TYS4-500

R.F. power triode in silica envelope, and rated for an anode dissipation of 500W. Primarily intended as a self-excited oscillator in r.f. heating equipment, but also as an r.f. amplifier in transmitting or industrial equipment.

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS – TRANSMITTING VALVES which precede this section of the handbook.

FILAMENT

Thoriated tungsten, suitable for a.c. or d.c. operation

V_f	10	V
I_f (approx.)	10	A

MOUNTING POSITION

Vertical, filament leads downwards

CAPACITANCES

c_{a-g}	10	pF
c_{g-f}	7.5	pF
c_{a-f}	1.5	pF

CHARACTERISTICS (measured at V_a = 2.0kV, I_a = 250mA)

g_m	6.0	mA/V
μ	24	
r_a	4.0	kΩ

LIMITING VALUES (absolute ratings)

*$V_{a(d.c.)}$ max. (with natural cooling of seals)	4.0	kV
p_a max.	500	W
I_k max.	750	mA
$i_{k(pk)}$ max.	3.0	A
I_g max. (at p_a max.)	100	mA
I_g max. (at 25% of p_a max.)	130	mA
R_{g-f} max.	10	kΩ
Temperature of central area of anode (at p_a max.)	870	°C
Max. temperature of metal-to-glass seals	260	°C
f max. (at V_a max. and natural cooling)	30	Mc/s

*This figure may be allowed to rise to 4.5kV to cover temporary excesses due to the regulation resistance of the equipment, etc.

MAXIMUM OPERATING CONDITIONS AS CLASS "C" AMPLIFIER WITH NATURAL COOLING

This assumes complete protection for the valve against overload of the anode and/or grid and against inefficiency due to under-drive, etc.

f	15	Mc/s
V_a	4.0	kV
V_g	−310	V
I_a	500	mA
I_g	75	mA
η	75	%
P_{out}	1.5	kW
P_a	500	W
P_{load} ($\eta_{transfer}$ = 80%)	1.2	kW

DIELECTRIC HEATER WITH PROTECTION

Operating conditions for a dielectric heater employing single-phase, full-wave rectification (unsmoothed) for the anode supply and incorporating the maximum protection for the valve against overload, under-drive and inefficient operation.

f	18	Mc/s
V_{tr}	4,000–0–4,000	V
V_a	3.59	kV
P_{in}	1.79	kW
I_a	404	mA
R_{g-f}	4.5	kΩ
I_g	68	mA
P_a (at η = 73%)	485	W
P_{out} (less P_{drive})	1.25	kW
P_{load} ($\eta_{transfer}$ = 80%)	1.0	kW

This condition leaves a 3% tolerance on anode dissipation.

DIELECTRIC HEATER WITHOUT PROTECTION

Recommended operating condition for a dielectric heater employing single-phase, full-wave rectification (unsmoothed) for the anode supply, natural cooling of the oscillator valve and an over-current circuit-breaker as the sole protection.

f	18	Mc/s
V_{tr}	4,000–0–4,000	V
V_a	3.59	kV
P_{in}	1.2	kW
I_a	270	mA
R_{g-f}	4.5	kΩ
I_g	75	mA
P_a (at η = 73%)	322	W
P_{out} (less P_{drive})	828	W
P_{load} ($\eta_{transfer}$ = 80%)	660	W

INDUCTION HEATER

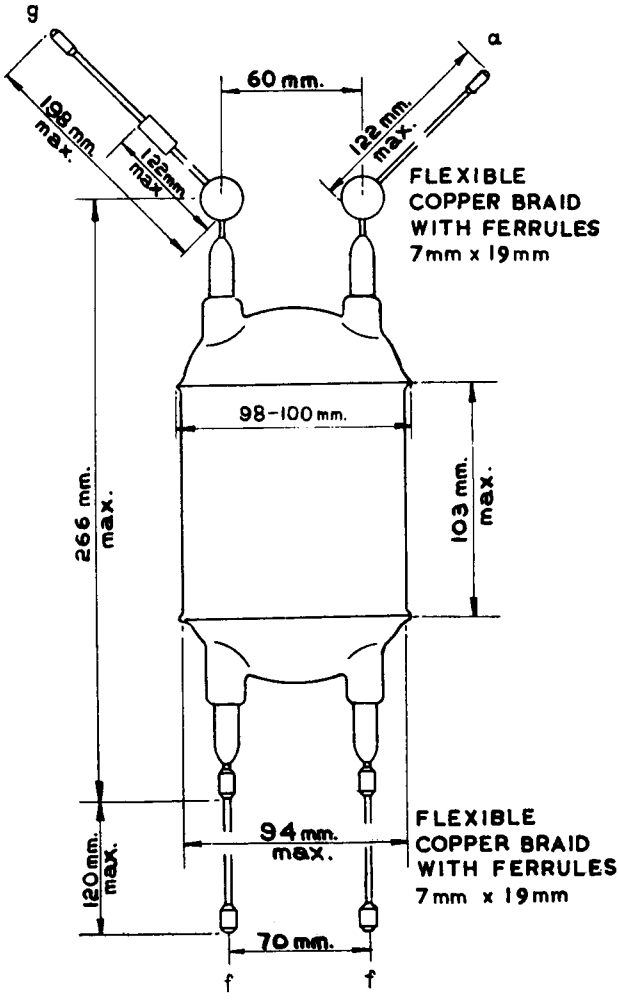
Maximum rated operating conditions, at the peak of the work cycle, for an induction heater employing single-phase, full-wave rectification for the anode supply.

f	450	kc/s
V_{tr}	4,000–0–4 000	V
V_a	3.59	kV
P_{in}	1.64	kW
I_a	370	mA
R_{g-f}	4.5	kΩ
I_g	70	mA
P_a (at $\eta = 75\%$)	410	W
P_{out} (less P_{drive})	1.23	kW
P_{load} ($\eta_{transfer} = 77\%$)	950	W

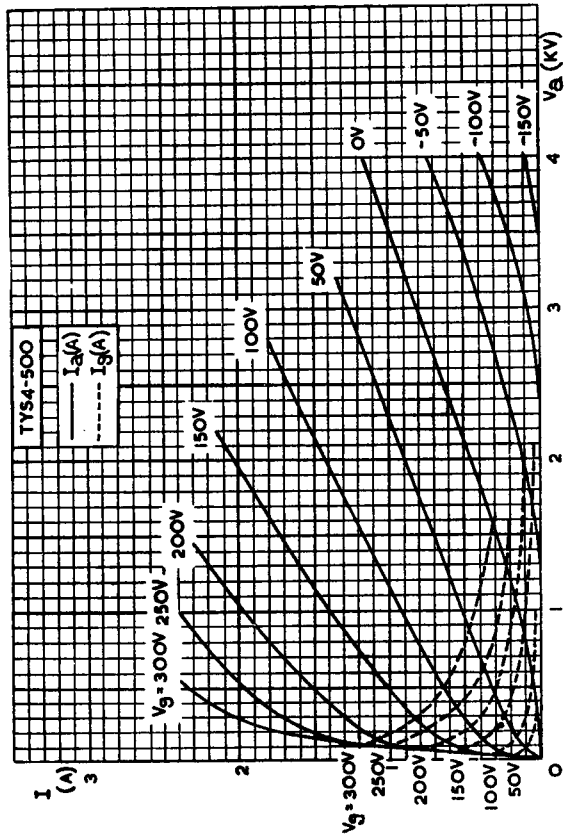
This condition makes an allowance in the anode dissipation for the supply voltage being 5% high and for an unwitting overload of 10% occurring concurrently.

WEIGHT

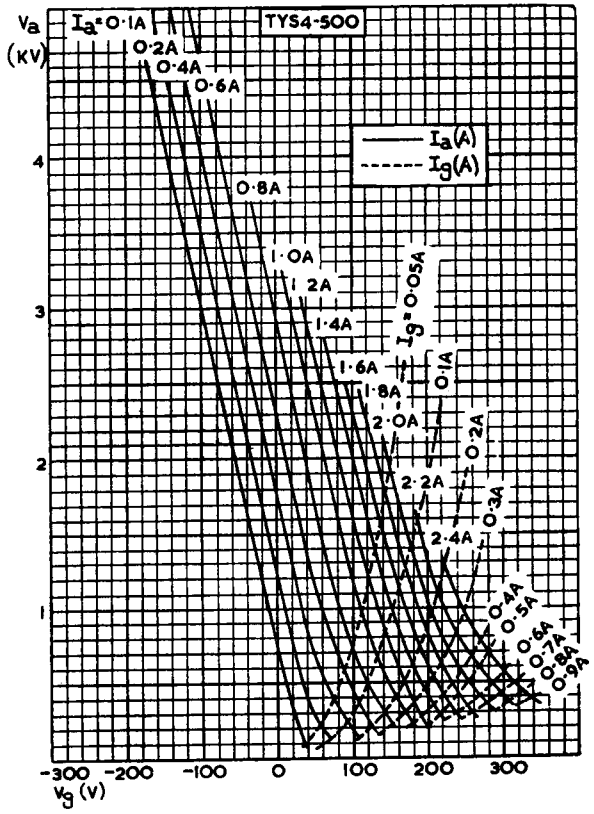
Valve only	1 lb	3 oz
	525	g


g
a
60 mm.
198 mm. max.
122 mm. max.
122 mm. max.
FLEXIBLE COPPER BRAID WITH FERRULES 7mm x 19mm
98-100 mm.
266 mm. max.
103 mm. max.
94 mm. max.
120 mm. max.
FLEXIBLE COPPER BRAID WITH FERRULES 7mm x 19mm
70 mm.
f
f

TYS4-500



ANODE AND GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH GRID VOLTAGE AS PARAMETER



CONSTANT CURRENT CURVES