

VAPOUR COOLED R.F. INDUSTRIAL TRIODE

Vapour cooled triode of metal-ceramic construction intended for use as an industrial oscillator.

QUICK REFERENCE DATA

Oscillator output power ($W_o - W_{\text{feedb}}$), typical	W_{osc}	240	kW
Frequency for full ratings	f max.	100	MHz

To be read in conjunction with "General Recommendations Transmitting tubes, Tubes for R.F. heating."

R.F. CLASS C OSCILLATOR FOR INDUSTRIAL USE

OPERATING CONDITIONS

Frequency	f	30	MHz
Oscillator output power ($W_o - W_{\text{feedb}}$)	W_{osc}	240	kW
Anode voltage	V_a	14	kV
Anode current	I_a	23.5	A
Anode input power	W_{ia}	329	kW
Anode dissipation	W_a	81.5	kW
Anode output power	W_o	247.5	kW
Anode efficiency	η_a	75.2	%
Oscillator efficiency	η_{osc}	73	%
Feedback ratio	V_{gp}/V_{ap}	10.4	%
Grid resistor	R_g	135	Ω
Grid current, on load	I_g	6	A
Grid voltage, negative	$-V_g$	810	V
Grid dissipation	W_g	2.6	kW
Grid resistor dissipation	W_{Rg}	4.86	kW

LIMITING VALUES (Absolute max. rating system)

Frequency for full ratings	f	up to	100	MHz ¹⁾
Anode voltage	V _a	max.	16.8	kV
Anode current	I _a	max.	25	A
Anode input power	W _{ia}	max.	375	kW
Anode dissipation	W _a	max.	120	kW
Grid voltage	-V _g	max.	2	kV
Grid current, on load	I _g	max.	7	A
off load	I _g	max.	8.5	A
Grid dissipation	W _g	max.	3.0	kW
Grid circuit resistance	R _g	max.	10	kΩ
Cathode current, mean	I _k	max.	31	A
peak	I _{kp}	max.	175	A
Envelope temperature	t _{env}	max.	240	°C

HEATING : direct; filament thoriated tungsten

Filament voltage	V _f		12.6	V
Filament current	I _f		380	A
Peak filament starting current	I _{fsp}	max.	2000	A
Cold filament resistance	R _{fo}		3.6	mΩ

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

CAPACITANCES

Anode to filament	C _{af}		3.0	pF
Grid to filament	C _{gf}		185	pF
Anode to grid	C _{ag}		60	pF

CHARACTERISTICS measured at V_a = 14 kV, I_a = 10 A

Transconductance	S		190	mA/V
Amplification factor	μ		41	

1) When the tubes are to be used at frequencies above 30 MHz the manufacturer should be consulted for more detailed information.

COOLING

See also cooling curves

With integrated boiler condenser type K733

Anode + grid dissipation $W_a + W_g$ (kW)	Inlet temperature t_i (°C)	Rate of flow q min (l/min)	Pressure drop P_i (atm)	Outlet temperature t_o (°C)
120	20	59	0.84	50
80	20	29	0.20	61
	35	48	0.51	61
40	20	10	0.04	81
	35	13.5	0.06	81
	50	20	0.10	81

At frequencies below 4 MHz cooling of the metal-ceramic seals can be accomplished by a low-velocity air flow, or by watercooling of the filament connectors. A water flow of approximately 0.5 l/min will be sufficient. At frequencies above 4 MHz it is recommended to cool the seals by means of an air flow of approximately 4 m³/min from a 50 mm diameter nozzle placed at a distance of 250 mm from the tube header.

To obtain optimum life, the seal/envelope temperature under continuous loaded conditions should be kept at or below 200 °C.

ACCESSORIES

Filament connector	type	40695	net weight	710	g
Filament/cathode connector	type	40696	net weight	860	g
Filament cables (both required)	type	40716	net weight	975	g
	and type	40717	net weight	980	g
Grid connector	type	40694	net weight	270	g
Boiler condenser	type	K733	net weight ≈	70	kg

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