

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}	120	kW
Frequency for full ratings	f	max.	100 MHz

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

R.F. CLASS C OSCILLATOR FOR INDUSTRIAL USE

OPERATING CONDITIONS

Frequency	f	30	30	MHz
Oscillator output power ($W_o - W_{\text{feedb}}$)	W_{osc}	120	120	kW
Anode voltage	V_a	10	12	kV
Anode current	I_a	16.0	13.0	A
Anode input power	W_{ia}	160	156	kW
Anode dissipation	W_a	36.0	32.5	kW
Anode output power	W_o	124	123.5	kW
Anode efficiency	η_a	77.5	79.2	%
Oscillator efficiency	η_{osc}	75	77	%
Feedback ratio	$V_{\text{gp}}/V_{\text{ap}}$	12.8	11.6	%
Grid resistor	R_g	200	330	Ω
Grid current, on load	I_g	3.5	2.7	A
Grid voltage, negative	$-V_g$	700	891	V
Grid dissipation	W_g	1.5	1.1	kW
Grid resistor dissipation	W_{Rg}	2.45	2.4	kW

LIMITING VALUES (Absolute max. rating system)

Frequency for full ratings	f	up to	100	MHz
Anode voltage	V_a	max.	14.4	kV
Anode current	I_a	max.	18	A
Anode input power	W_{ia}	max.	220	kW
Anode dissipation	W_a	max.	80	kW
Grid voltage	$-V_g$	max.	2.0	kV
Grid current, on load	I_g	max.	4	A
off load	I_g	max.	5.5	A
Grid dissipation	W_g	max.	2.0	kW
Grid circuit resistance	R_g	max.	10	$k\Omega$
Cathode current, mean	I_k	max.	22	A
peak	I_{kp}	max.	100	A
Envelope temperature	t_{env}	max.	240	$^{\circ}C$

HEATING: direct; filament thoriated tungsten

Filament voltage	V_f		12.2	V
Filament current	I_f		255	A
Peak filament starting current	I_{fp}	max.	1500	A
Cold filament resistance	R_{fo}		5.3	$m\Omega$

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

CAPACITANCES

Anode to filament	C_{af}		2.7	pF
Grid to filament	C_{gf}		170	pF
Anode to grid	C_{ag}		55	pF

CHARACTERISTICS measured at $V_a = 10$ kV, $I_a = 8$ A

Transconductance	S		150	mA/V
Amplification factor	μ		30	

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 K735

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)
80	20	29	0.20	60
	35	48	0.51	59
60	20	16	0.08	75
	35	24	0.14	72
	50	45	0.45	70
40	20	10	0.04	80
	35	13.5	0.06	80
	50	20	0.10	80

Absolute max. water inlet temperature t_i max. 50 °C

Cooling of the seals can be accomplished by a low velocity air flow or by watercooling of the filament connectors. The cooling circuit of these accessories may be connected in series. A water flow of approximately 0.51/min. will be sufficient.

To obtain optimum life, the seal/anode temperature under continuously 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	K735	net weight	≈ 70	kg



