

WATER COOLED INDUSTRIAL R.F. POWER TRIODE

QUICK REFERENCE DATA		
Industrial R.F. oscillator class C		
Freq. (MHz)	Three phase	
	V _a (kV)	W _o (kW)
30	12	29.0
	10	23.3
	8	17.9

HEATING: direct; filament thoriated tungsten

Filament voltage	V _f = 8.0 V	+ 5 % -10 %
Filament current	I _f = 98 A	
Cold filament resistance	R _{fo} = 0.008 Ω	

The filament current must never exceed a peak value of 210 A instantaneously at any time during the initial energizing schedule

CAPACITANCES

Anode to all other elements except grid	C _a = 0.4 pF
Grid to all other elements except anode	C _g = 37 pF
Anode to grid	C _{ag} = 30 pF

TYPICAL CHARACTERISTICS

Anode voltage	V _a = 12 kV
Anode current	I _a = 2 A
Amplification factor	μ = 34
Mutual conductance	S = 20 mA/V

TEMPERATURE LIMIT (Absolute limit)

Seal temperature = max. 220 °C

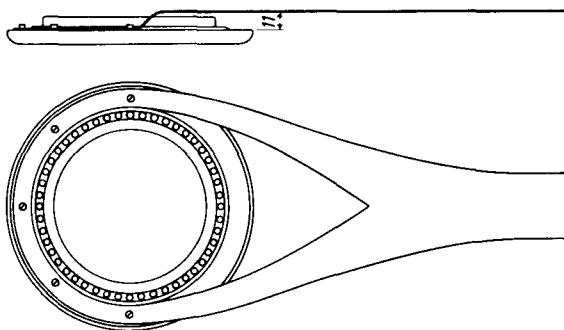
Generally a low velocity air flow to the seals is required

WATER COOLING CHARACTERISTICS

 $t_i = \text{max. } 50\text{ }^{\circ}\text{C}$

W_a (kW)	t_i ($^{\circ}\text{C}$)	$q_{\min}^{1)}$ (l/min)	P_i (atm.)
5	20	6	0.02
	50	15	0.22
10	20	11	0.1
	50	25	0.7
15	20	16	0.25
	50	37	1.3
20	20	22	0.5
	50	49	2.3

To ensure a uniform R.F. current distribution in the grid seal especially at frequencies higher than 4 MHz, the grid lead should be connected as shown below.



¹⁾ At inlet temperatures between 20 and 50 $^{\circ}\text{C}$ the required quantity of water can be found by proportional interpolation

MECHANICAL DATA

Net weight of the tube : 2.8 kg

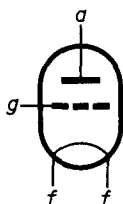
Net weight of water jacket: 2.1 kg

Filament connectors
with cable : 40662

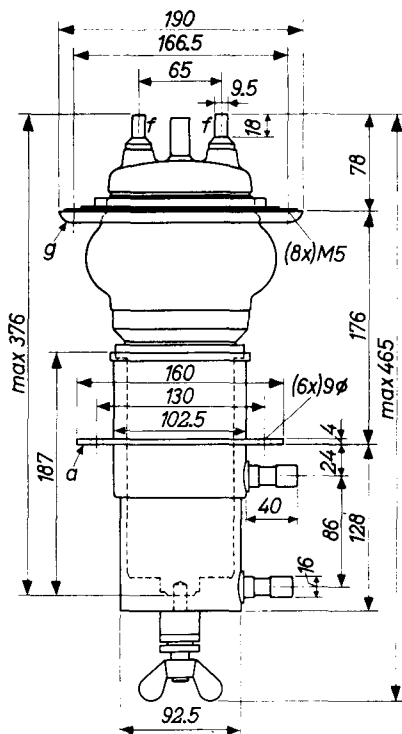
Grid connector : 40663

Water jacket : K717

→ O-ring large : 2622 080 30895
 small : 2622 080 30736



Dimensions in mm



Tube with grid connector
and water jacket

Mounting position: vertical with anode down

R.F. CLASS C OSCILLATOR FOR INDUSTRIAL USE with anode voltage from three-phase half-wave rectifier without filter

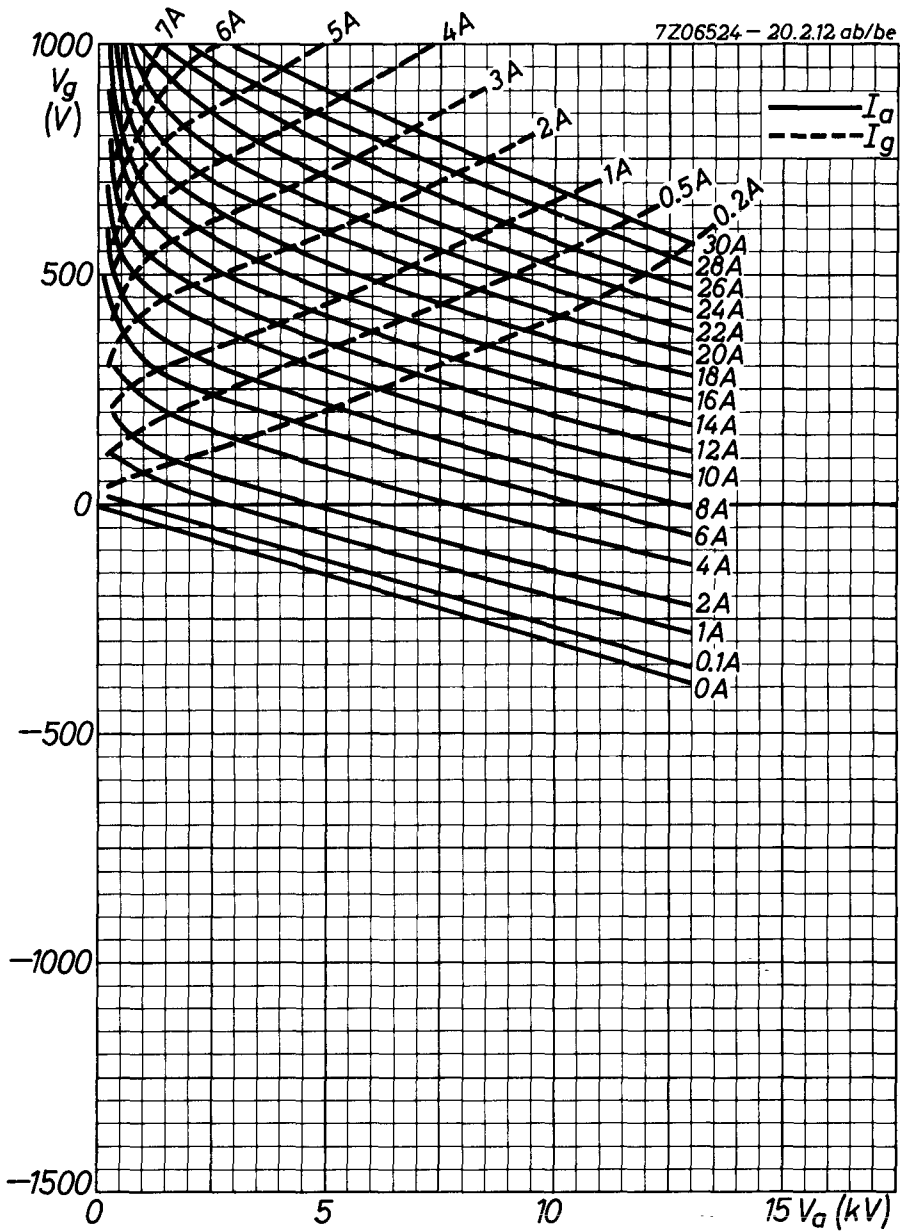
LIMITING VALUES (Absolute limits)

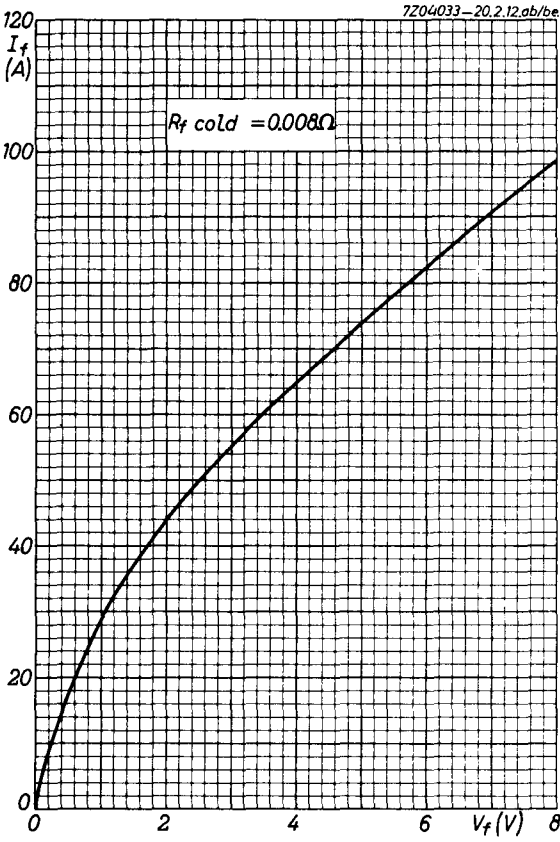
Frequency	f	up to	30	MHz
Anode voltage	V_a	= max.	13	kV
Anode current	I_a	= max.	4.8	A
Anode dissipation	W_a	= max.	20	kW
Anode input power	W_{ia}	= max.	60	kW
Negative grid voltage	$-V_g$	= max.	1500	V
Grid current	I_g	= max.	0.8	A
Grid circuit resistance	R_g	= max.	10	k Ω

OPERATING CONDITIONS

Frequency	f	=	30	30	30	MHz
Transformer voltage	V_{tr}	=	8.9	7.4	6.0	kV
Anode voltage	V_a	=	12	10	8	kV
Anode current, loaded	I_a	=	3.2	3.2	3.2	A
Anode current, unloaded	I_a	=	0.52	0.50	0.48	A
Grid current, loaded	I_g	=	0.50	0.50	0.50	A
Grid current, unloaded	I_g	=	0.74	0.77	0.80	A
Grid resistor	R_g	=	2.0	1.6	1.1	k Ω
Load resistance	$R_{a\sim}$	=	1800	1450	1100	Ω
Feedback ratio under loaded conditions	$V_{g\sim}/V_{a\sim}$	=	16	17	19	%
Anode input power	W_{ia}	=	38.4	32.0	25.6	kW
Anode dissipation	W_a	=	9.4	8.7	7.7	kW
Output power	W_o	=	29.0	23.3	17.9	kW
Efficiency	η	=	75.5	72.5	70	%
Output power in the load	W_{ℓ}	=	25	20	15.5	kW ¹⁾

¹⁾ Useful power in the load measured in a circuit having an efficiency of 90%





PHILIPS

Data handbook



**Electronic
components
and materials**

TBW12/25

page	sheet	date
1	1	1967.09
2	2	1967.09
3	3	1971.09
4	4	1967.09
5	A	1967.09
6	B	1967.09
7	FP	1999.08.10