RF POWER TRIODE

● Air cooled

QUICK REFERENCE DATA

Industrial RF oscillator, class-C

freq.	three phase	
	V_a	W_o
MHz	kV	kW
30	12	39
	10	31,3
	8	23,2

HEATING: direct; thoriated tungsten filament

Filament voltage	V_f	=	8	V
Filament current	I_f	=	130	A
Cold filament resistance	R_{fo}	=	0,006	Ω

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

The filament current must never exceed a peak value of 280 A at any time during the initial energizing schedule.

CAPACITANCES

Anode to all other elements except grid	C_a	=	0,9	pF
Grid to all other elements except anode	C_g	=	45	pF
Anode to grid	C_{ag}	=	23,5	pF

TYPICAL CHARACTERISTICS

Anode voltage	V_a	=	12	kV
Anode current	I_a	=	2	A
Mutual conductance	S	=	22	mA/V
Amplification factor	μ	=	21	

TEMPERATURE LIMIT (Absolute limit)

Temperature of all seals	max.	220	^{o}C

Table 1 Cooling characteristics

anode dissipation W_a kW	altitude h m	inlet temperature T_i °C	rate of flow q_{min} m³/min	pressure drop ΔP Pa*	outlet temperature T_o max °C
15	0	35	18,1	600	90
10	0	35	10,5	230	90
7	0	35	6,6	100	95
15	0	45	21,2	790	90
10	0	45	12,3	310	90
7	0	45	7,7	130	100
15	1500	35	21,7	730	90
10	1500	35	12,6	280	90
7	1500	35	7,9	120	100
15	3000	25	22,8	700	80
10	3000	25	13,2	270	80
7	3000	25	8,3	120	95

ACCESSORIES

Filament connectors	40662
Grid connector*	40663
Insulating pedestal	40648

The rounded side of the grid connector should face the anode. To ensure a uniform RF current distribution in the grid seal at frequencies higher than 4 MHz, the grid lead should be connected as shown below.
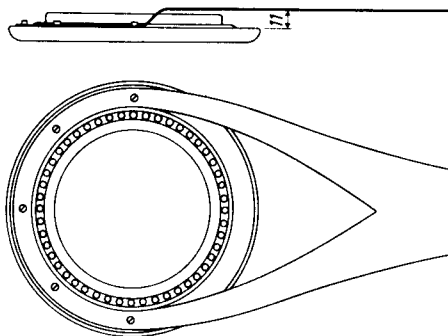

Fig. 1 Grid lead detail.

* 1 Pa ≈ 0,1 mm H_2O.

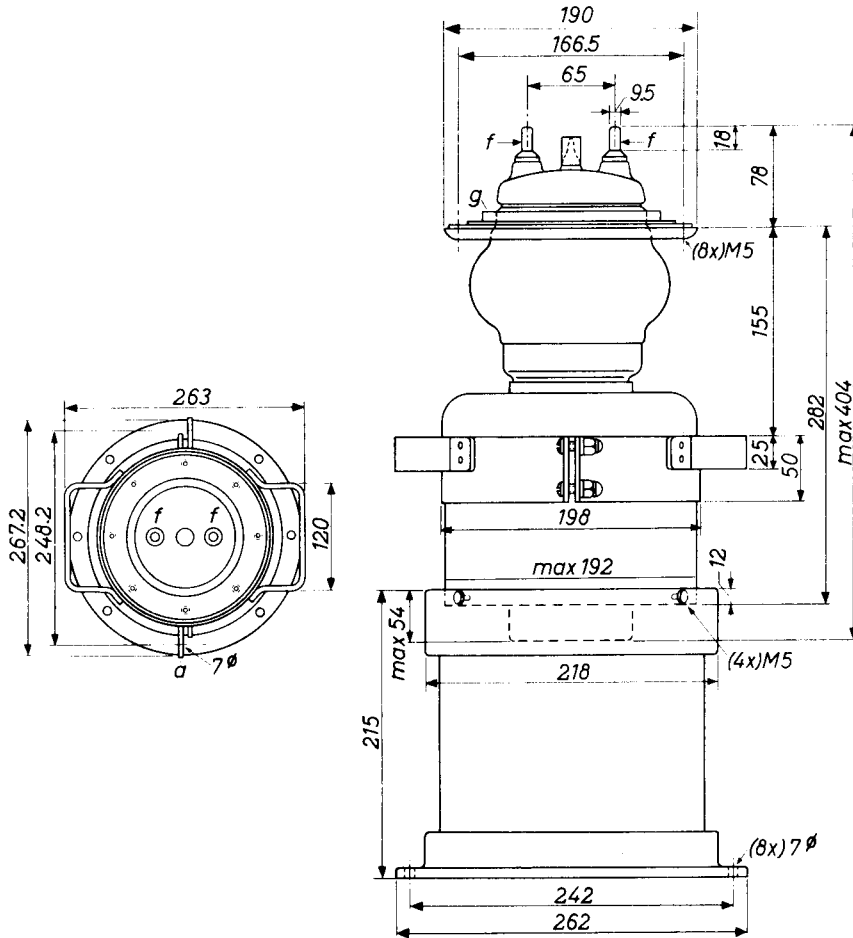**MECHANICAL DATA**   Dimensions in mm

Fig. 2 Mechanical outline.

Mounting position	:	vertical
Net mass of the tube	:	approx. 16,1 kg
Net mass of pedestal	:	7,15 kg

RF CLASS-C OSCILLATOR FOR INDUSTRIAL USE with anode voltage from three-phase rectifier without filter.

LIMITING VALUES (Absolute maximum rating system)

Frequency	f	up to	30	MHz
Anode voltage	V_a	max.	13	kV
Anode current	I_a	max.	5	A
Anode dissipation	W_a	max.	15*	kW
Anode input power	W_{ia}	max.	60	kW
Negative grid voltage	$-V_g$	max.	2	kV
Grid current, on load	I_g	max.	1,5	A
Grid current, off load	I_g	max.	2,0	A
Grid circuit resistance	R_g	max.	10	kΩ

OPERATING CONDITIONS

Frequency	f	30	30	30	MHz
Anode voltage	V_a	12	10	8	kV
Anode current, on load	I_a	4,5	4,5	4,5	A
Anode current, off load	I_a	0,65	0,63	0,62	A
Grid current, on load	I_g	0,9	0,9	0,9	A
Grid current, off load	I_g	1,22	1,3	1,35	A
Grid resistor	R_g	1100	1000	900	Ω
Load resistance	$R_{a\sim}$	1450	1100	800	Ω
Feedback ratio under loaded conditions	$V_{g\sim}/V_{a\sim}$	16	19	24	%
Anode input power	W_{ia}	54	45	36	kW
Anode dissipation	W_a	15	13,7	12,8	kW
Output power	W_o	39	31,3	23,2	kW
Efficiency	η	72,5	70	64,5	%
Output power in the load**	W_ℓ	30	25	18	kW

* TBW12/38: W_a max. = 20 kW (for intermittent service see Fig. 3).
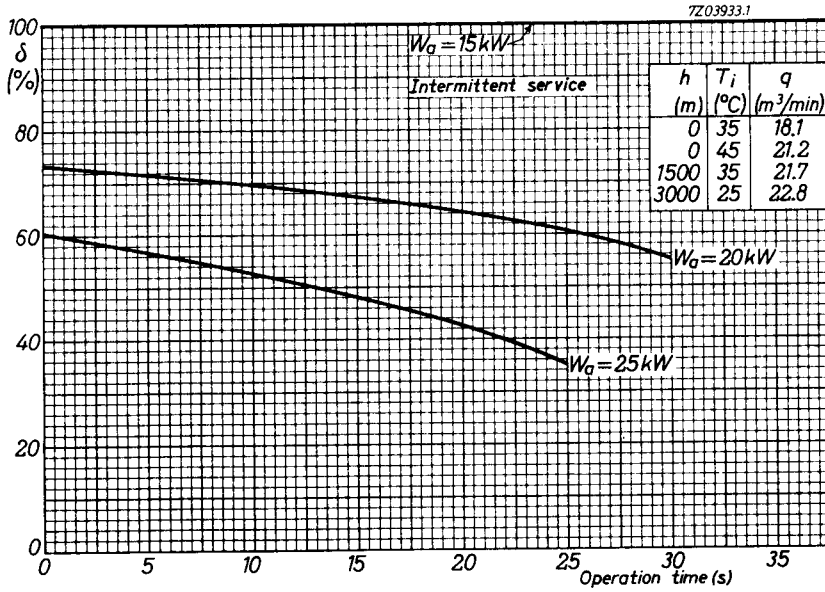** Useful power in the load, measured in a circuit having an efficiency of about 85%.

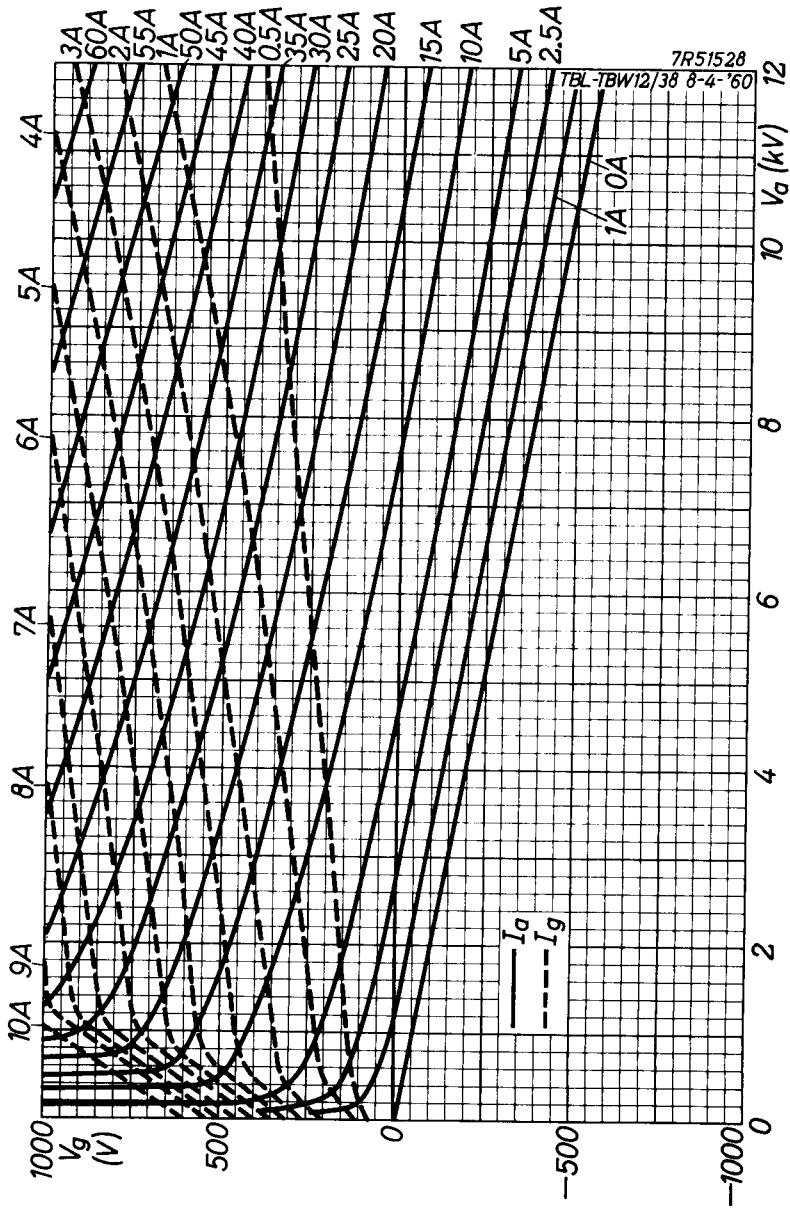Fig. 3 Intermittent service. Limits of anode dissipation and cooling.

Fig 4 Constant current characteristics.

PHILIPS

Data handbook

PHILIPS Electronic
components
and materials

TBL12/38

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