Amperex

YD1170/8666
YD1172/8668

RF Power Triodes

Triodes in metal-ceramic construction intended for use as industrial oscillators.
The YD1170 is forced-air cooled. The YD1172 has an integral helical water cooler.

GENERAL DATA

Electrical:

Filament-Thoriated Tungsten[Note 1]

Voltage	5.8	V
Current	130	A

Characteristics: measured at: V_a = 6 kV, I_a = 2 A

Amplification Factor	μ	30	
Transconductance	S	40	mA/V
Direct Interelectrode Capacities:			
Grid-Anode	C_{ag}	25	pF
Grid-Filament	C_{gf}	47	pF
Anode-Filament	C_{af}	.8	pF

Mechanical:

	YD1170/8666	YD1172/8668	
Overall Dimensions:			
Length	220	339	mm max
Diameter	158-160	115	mm max
Mounting Position			Vertical, with anode up or down
Cooling Type:	Air	Water	

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YD1170/8666,YD1172/8668

Cooling:
To obtain optimum life, the temperature of the seals and of the envelope should, under normal operating conditions, be kept below 200°C. To maintain these temperatures additional cooling may be necessary. At frequencies higher than about 4 MHz cooling of the seals becomes mandatory.

YD1170/8666 Table 1: Air cooling characteristics

anode + grid dissipation W_a+W_g kW	altitude h m	inlet temperature T_i °C	rate of flow q_{min} ℓ/min	pressure drop delta P Pa*	outlet temperature T_O °C
10	0	35	9.5	550	94
8	0	35	6.5	280	105
6	0	35	4.5	150	113
4	0	35	3.0	80	117
10	0	45	11.0	690	98
8	0	45	7.6	350	108
6	0	45	5.2	190	115
4	0	45	3.5	100	119
10	1500	35	11.4	630	94
8	1500	35	7.8	320	105
6	1500	35	5.5	170	113
4	1500	35	3.6	90	117
10	3000	25	12.0	620	90
8	3000	25	8.2	320	102
6	3000	25	5.7	170	111
4	3000	25	3.8	90	116

Absolute max. air inlet temperature T_i max 45 °C
Direction of air flow arbitrary
*1 Pa = 0.1 mm H_2O

Cooling:
To obtain optimum life, the temperature of the seals and of the envelope should, under normal operating conditions, be kept below 200°C. To maintain these temperatures additional cooling may be necessary. At frequencies higher than about 4 MHz cooling of the seals becomes mandatory.

YD1172/8668 Table 2: Water cooling characteristics

anode + grid dissipation W_a+W_g kW	inlet temperature T_i °C	rate of flow q_{min} ℓ/min	pressure drop delta P kPa**	outlet temperature T_O °C
10	20	6.0	25	46
	50	9.0	52	67
8	20	4.5	15	49
	50	6.7	31	69
6	20	3.0	7	53
	50	4.5	15	72

Absolute max. water inlet temperature T_i max 50 °C
Absolute max water pressure P max 600 kPa
**100 kPa = 1 at

LIMITING VALUES (Absolute maximum rating system)

Frequency for Full Ratings	f	up to	120	MHz
Anode Voltage	V_a	max.	7.2	kV
Anode Current	I_a	max.	4	A
Anode input power	W_{ia}	max.	24	kW
Anode dissipation	W_a	max.	10	kW
Grid voltage	$-V_g$	max.	1.5	kV
Grid current, on load	I_g	max.	1	A
Grid current, off load	I_g	max.	1.5	A
Grid dissipation	W_g	max.	350	W
Grid circuit resistance	R_g	max.	10	kΩ
Cathode current				
mean	I_k	max.	5	A
peak	I_{kp}	max.	25	A
Envelope Temperature	T_{env}	max.	240	°C
Peak filament starting current	I_{fp}	max.	800	A
Cold filament resistance	R_{fo}	max.	5.6	mΩ

RF CLASS C OSCILLATOR FOR INDUSTRIAL USE
OPERATING CONDITIONS

Frequency	f	120	MHz
Oscillator output power (W_o-W_{feedb})	W_{osc}	15.4	kW
Anode Voltage	V_a	6	kV
Anode Current	I_a	3.4	A
Anode input power	W_{ia}	20.4	kW
Anode dissipation	W_a	4.3	kW
Anode output power	W_o	16.1	kW
Anode efficiency	n_a	78.9	%
Oscillator efficiency	n_{osc}	75.5	%
Feedback ratio	V_{gp}/V_{ap}	15.5	%
Grid resistor	R_g	500	Ω
Grid current, on load	I_g	920	mA
Grid voltage, negative	$-V_g$	460	V
Grid dissipation	W_g	280	W
Grid resistor dissipation	W_{Rg}	423	W

Notes

1. The filament is designed to accept temporary fluctuations of +5% and -10%. To ensure that the cathode temperature remains constant irrespective of the operating frequency, it may be necessary to reduce the filament voltage at higher frequencies. When doing so it must be borne in mind that the filament voltage-to-current ratio measured with only the filament voltage applied should remian constant under all operating conditions. It is extremely important that the filament be properly decoupled. This should be done so that the resonance of the circuit formed by the filament and the decoupling elements remain below the fundamental oscillator frequency. In grounded-grid circuits this resonance should be below the grid-cathode resonance.

YD1170/8666, YD1172/8668
Figure 1 - Constant Current Characteristics

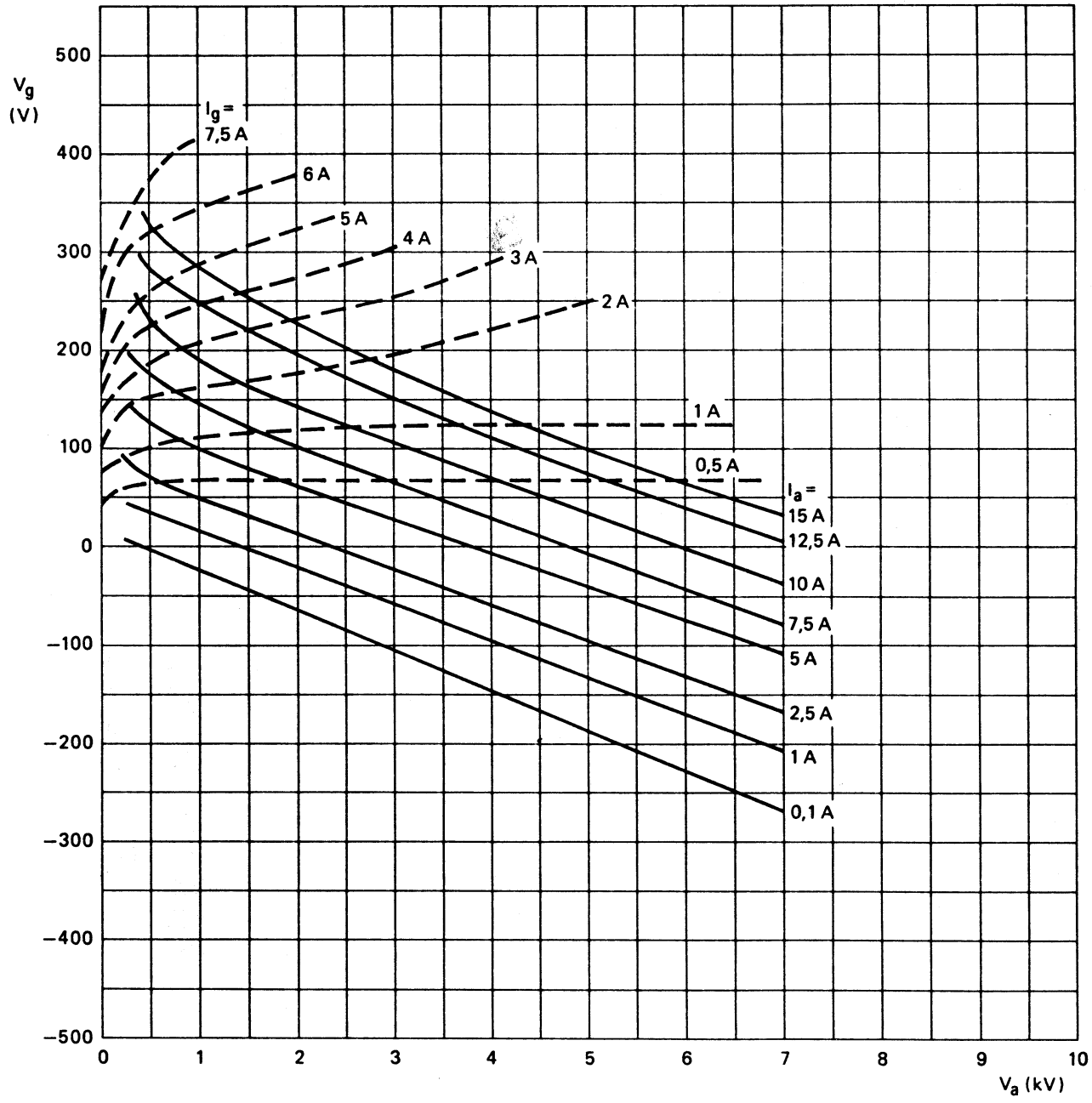
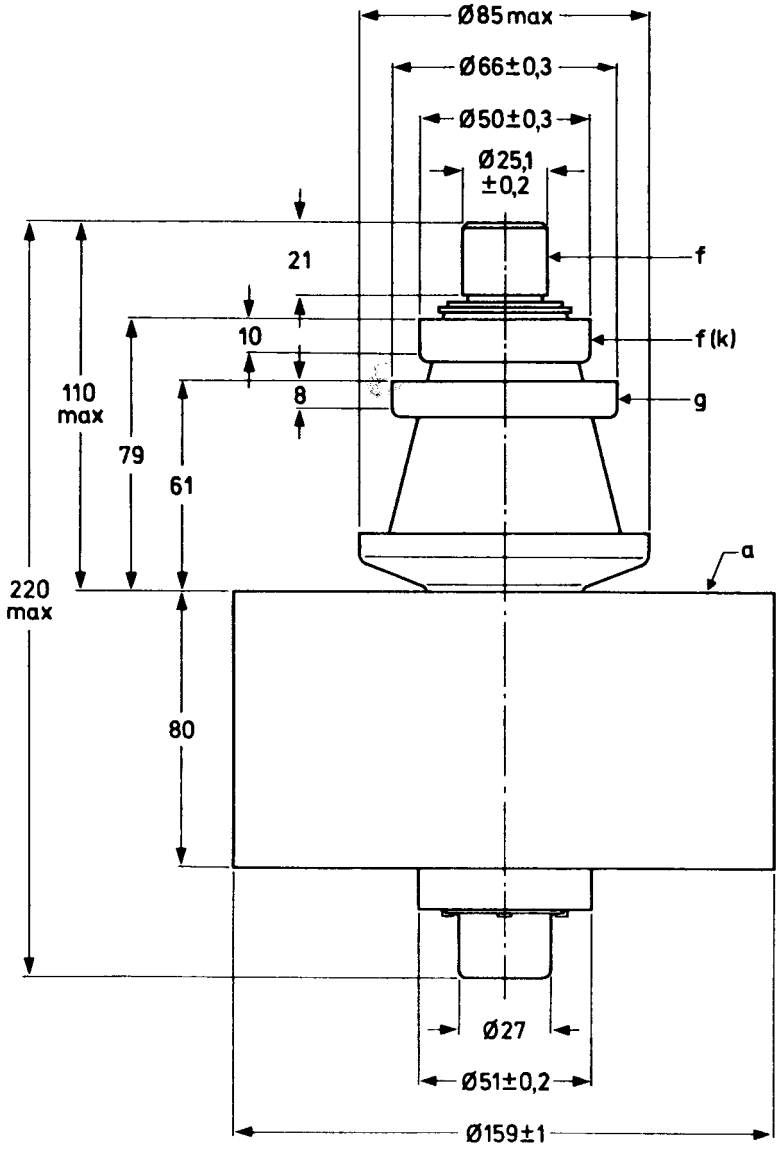


Figure 2 - Mechanical Outline **YD1170/8666**
*Dimensions in mm



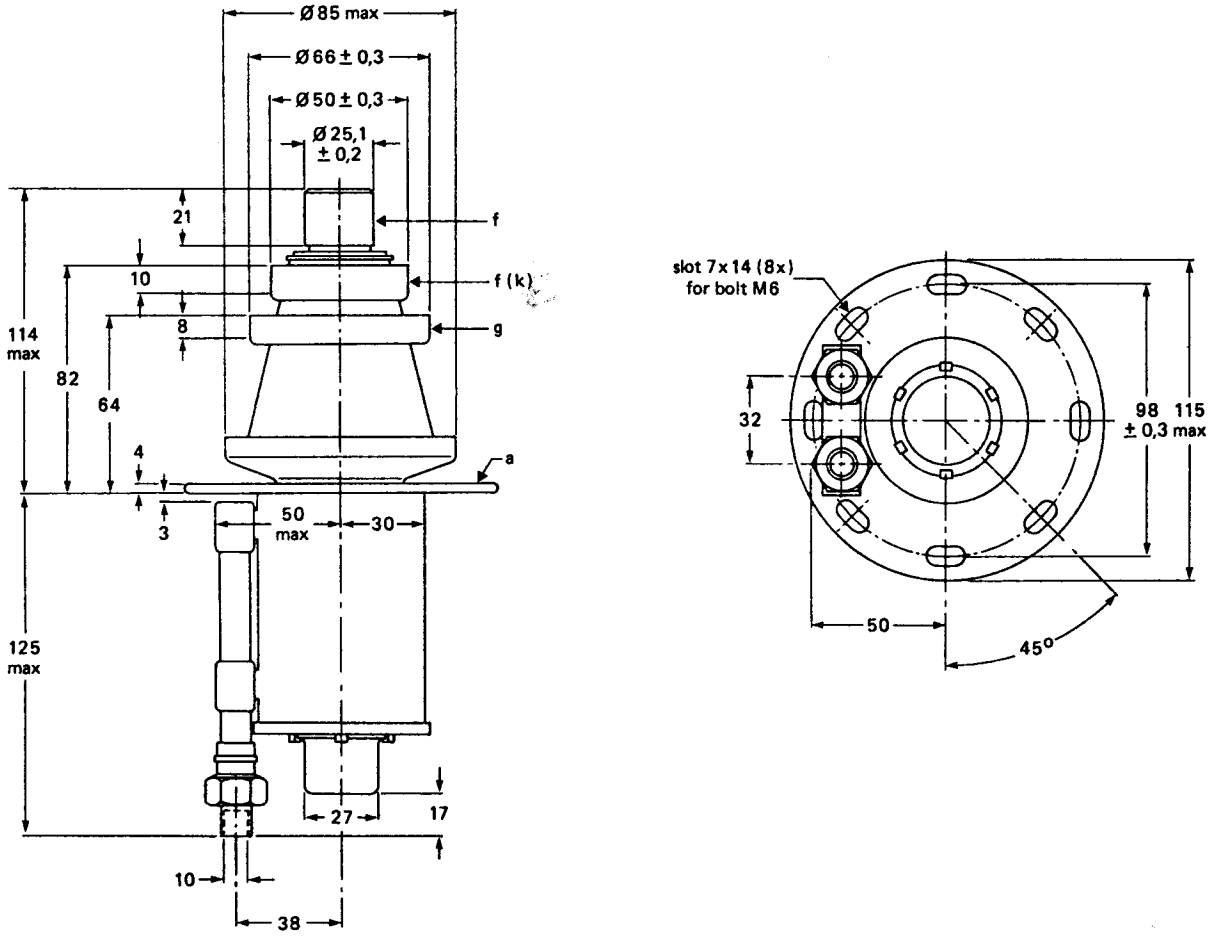
MECHANICAL DATA:
Net Mass: 7 kg

ACCESSORIES:

Filament connector with cable	type 40692A
Filament/cathode connector with cable	type 40693A
Grid connector	
f ≤ 4 MHz	type 40690
f > 4 MHz	type 40691
Insulating pedestal	type 40654

*Note: All dimensions for reference only.

Figure 3 - Mechanical Outline
*Dimensions in mm



MECHANICAL DATA:
Net Mass: 1.85 kg
Preferred water inlet the lowest connection.

ACCESSORIES:

Filament connector with cable	type 40692A
Filament/cathode connector with cable	type 40693A
Grid connector	
f ≤ 4 MHz	type 40690
f > 4 MHz	type 40691

Thread of water connections BSP 3/8 in.

Note: All dimensions for reference only.

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