Amperex

YD1150A, YD1150AFL, YD1152, YD1152FL

RF Power Triodes

The YD1150A, YD1150AFL, YD1152 and YD1152FL are RF power triodes of metal-ceramic construction intended for use as industrial oscillators. The YD1150AFL and YD1152FL have flying leads.

GENERAL DATA

		YD1150A YD1150AFL	YD1152 YD1152FL	
Electrical:				
Filament-Thoriated Tungsten				
Voltage		6.3[Note 1]	6.3	V[Notes 1 & 3]
Current		33	33	A
Characteristics: measured at: V_a = 20 kV, I_a =.5A				
Amplification Factor	μ	17	20	
Transconductance	S	10	10	mA/V
Direct Interelectrode Capacities:				
Grid-Anode	C_{ag}	12	14	pF
Grid-Filament	C_{gf}	15	17	pF
Anode-Filament	C_{af}	.4	.4	pF
Mechanical:		YD1150A YD1150AFL	YD1152 YD1152FL	
Overall Dimensions:				
Length		173	215	mm (max)
Diameter		122.8	100	mm (max)
Mounting Position		See outline drawings		
Cooling Type:		air	water	

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Cooling:
To obtain optimum life, the temperature of the seals/envelope should, under normal operating conditions, be kept below 200°C. A low velocity airflow may be required for cooling of the seals.

YD1150 & YD1150FL 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 kPa*	outlet temperature T_O °C
1	0	35	1.5	35	80
	0	45	1.9	50	81
1.5	0	35	2.7	83	70
	0	45	3.1	85	75
2.5	0	35	5.0	140	65
	0	45	5.4	160	73

* 1 Pa=0.1 mm H_20

YD1152 & YD1152FL 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
1	20	.9	5	40
	50	1.4	6	62
2	20	1.6	10	40
	50	2.8	15	61
3	20	2.2	14	40
	50	4.1	27	61

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	f	up to	85	MHz[Note 2]
Anode Voltage	V_a	max.	7.2	kV
Anode Current	I_a	max.	1.1	A
Anode input power	W_{Ia}	max.	6.5	kW
Anode dissipation	W_a	max.	2.5	kW
Grid voltage	$-V_g$	max.	1	kV
Grid current, on load	I_g	max.	250	mA
Grid current, off load	I_g	max.	350	mA
Grid dissipation	W_g	max.	140	W
Grid circuit resistance	R_g	max.	20	kΩ
Cathode current				
mean	I_k	max.	1.4	A
peak	I_{kp}	max.	7.5	A
Envelope Temperature	T_{env}	max.	240	°C

RF CLASS C OSCILLATOR FOR INDUSTRIAL USE
OPERATING CONDITIONS

Frequency	f	30	30	MHz
Oscillator output power (Wo-Wfeedb)	W_{osc}	4.7	3.8	kW
Anode Voltage	V_a	6	5	kV
Anode Current	I_a	1	1	A
Anode input power	W_{ia}	6	5	kW
Anode dissipation	W_a	1.1	1.0	kW
Anode output power	W_o	4.9	4.0	kW
Anode efficiency	n_a	81.5	80	%
Oscillator efficiency	n_{osc}	78	76	%
Feedback ratio	V_{gp}/V_{ap}	17.6	19.4	%
Grid resistor	R_g	3.1	2.75	kΩ
Grid current, on load	I_g	205	200	mA
Grid voltage, negative	$-V_g$	640	550	V
Grid dissipation	W_g	60	60	W
Grid resistor dissipation	W_{rg}	130	110	W

Notes section:

1. The filament is designed to accept temporary fluctuations of +5% and -10%
   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.
2. For operation above 85 MHz the tube manufacturer should be consulted.
3. Heating Filament Voltage (<120 Mhz) V_f 6.3 V
   Filament Voltage (>120 MHz) V_f 6.0 V

LIMITING VALUES (Absolute maximum rating system)
(Frequency for full ratings f max 85 MHz)

Frequency	f	up to	160	85	MHz
Anode Voltage	V_a	max.	6.0	7.2	kV
Anode Current	I_a	max.	1.1	1.1	A
Anode input power	W_{Ia}	max.	6.0	6.5	kW
Anode dissipation	W_a	max.	2.5	2.5	kW
Grid voltage	$-V_g$	max.	1	1	kV
Grid current, on load	I_g	max.	280	280	mA
Grid current, off load	I_g	max.	400	400	mA
Grid dissipation	W_g	max.	150	150	W
Grid circuit resistance	R_g	max.	20	20	kΩ
Cathode current					
mean	I_k	max.	1.4	1.4	A
peak	I_{kp}	max.	7.5	7.5	A
Envelope Temperature	T_{env}	max.	240	240	°C

RF CLASS C OSCILLATOR FOR INDUSTRIAL USE
OPERATING CONDITIONS

Frequency	f	160	27.12	27.12	MHz
Filament Voltage	Vf	6.0	6.3	6.3	V
Oscillator output power (Wo-Wfeedb)	W_{osc}	3.75	4.75	3.85	kW
Anode Voltage	V_a	5	6	5	kV
Anode Current	I_a	1	1	1	A
Anode input power	W_{ia}	5	6	5	kW
Anode dissipation	W_a	1.03	1.0	.93	kW
Anode output power	W_o	3.97	5.0	4.07	kW
Anode efficiency	n_a	79.4	83.3	81.4	%
Oscillator efficiency	n_{osc}	75.0	79.1	77.0	%
Feedback ratio	V_{gp}/V_{ap}	19	17	19	%
Grid resistor	R_g	2.0	2.5	2.0	kΩ
Grid current, on load	I_g	260	250	260	mA
Grid voltage, negative	$-V_g$	520	625	520	V
Grid dissipation	W_g	80	90	80	W
Grid resistor dissipation	W_{rg}	135	156	135	W

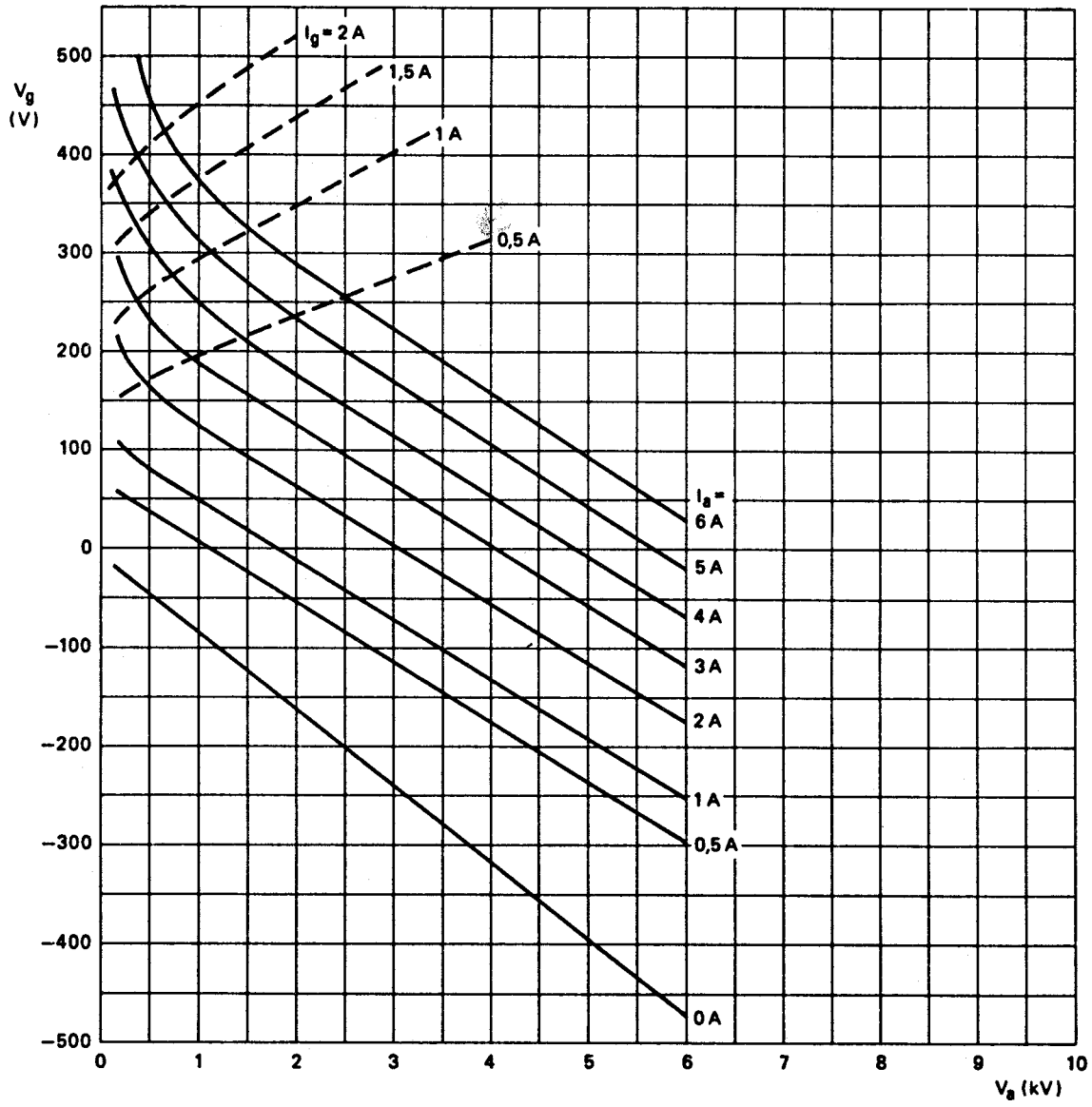


Figure 1 - Constant Current Characteristics

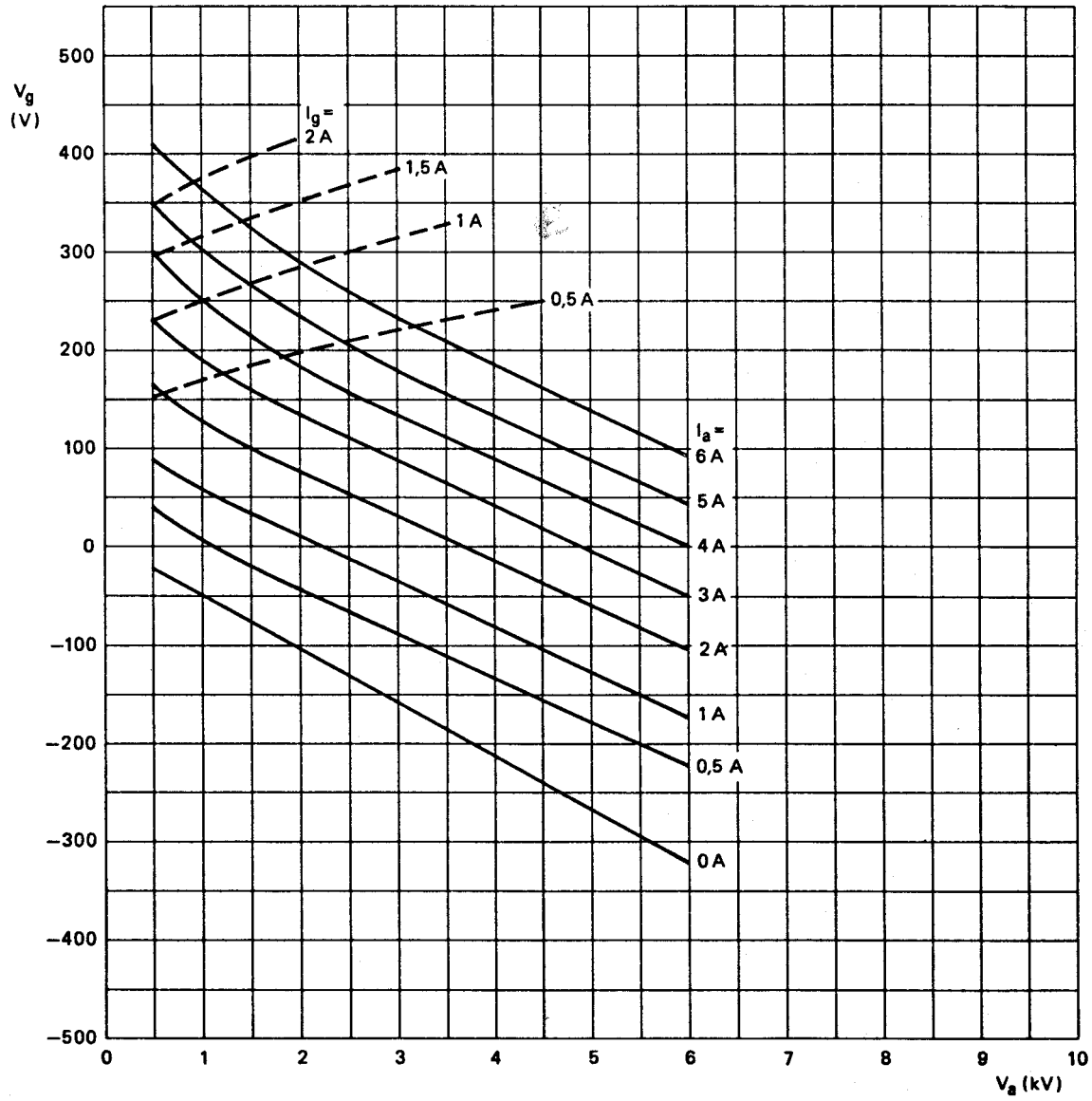
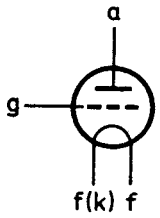
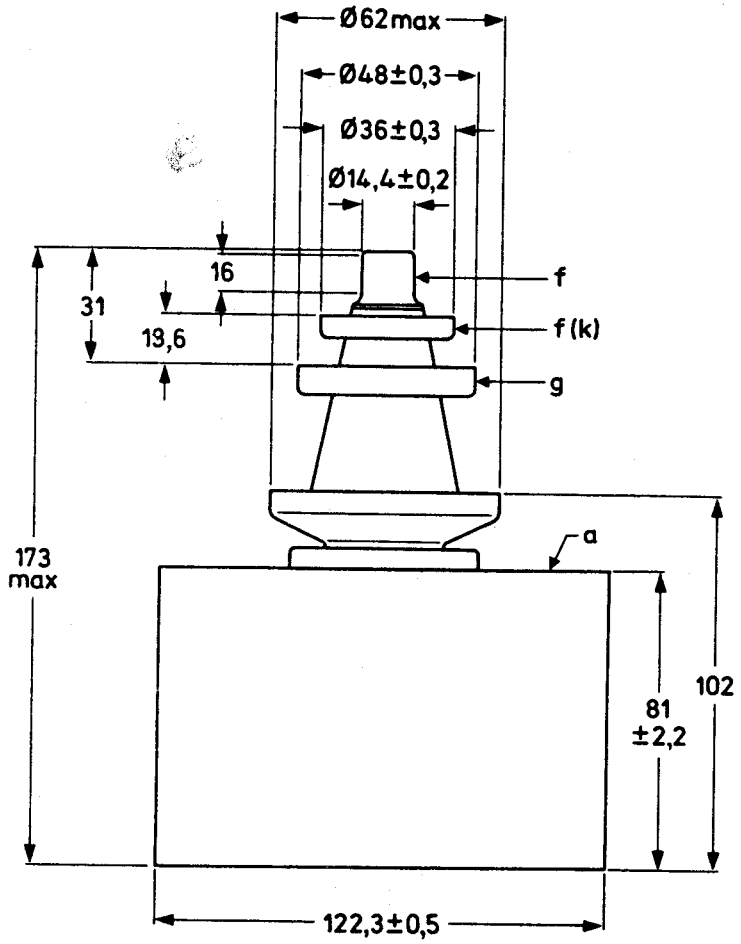


Figure 2 - Constant Current Characteristics

Figure 3 - Mechanical Outline
*Dimensions in mm





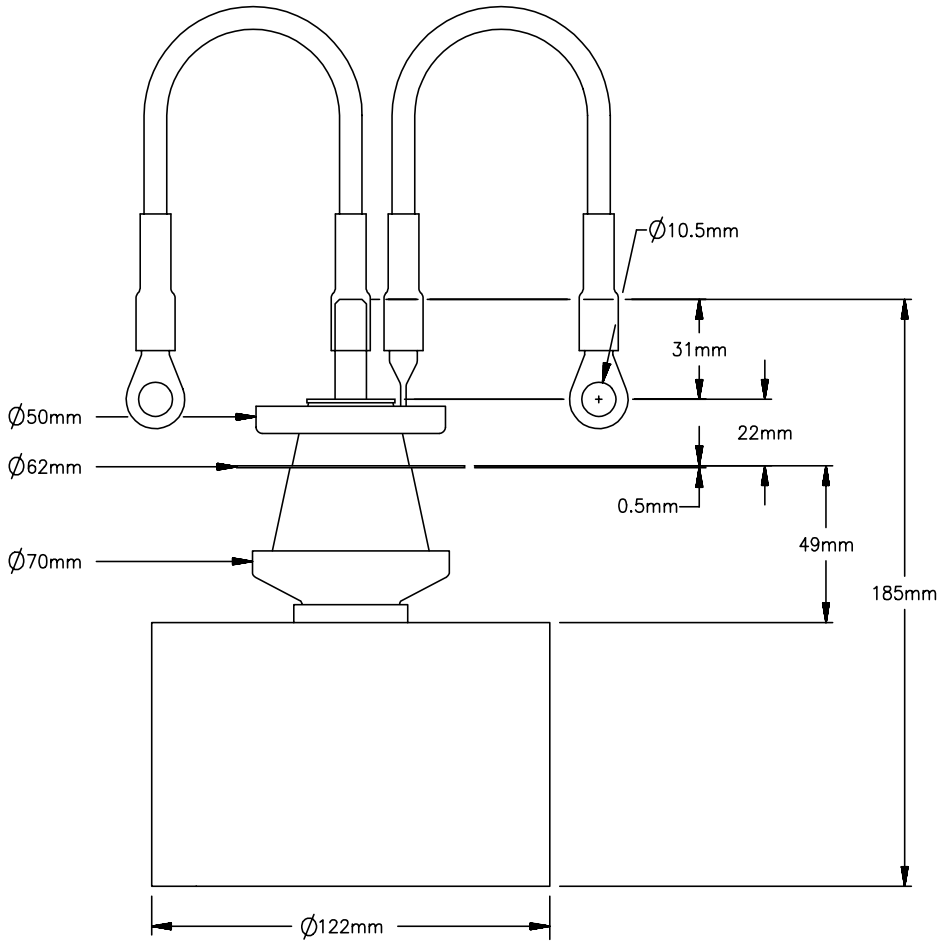
MECHANICAL DATA:
Net Mass: 2.6 KG
Mounting Position: Vertical with anode up or down

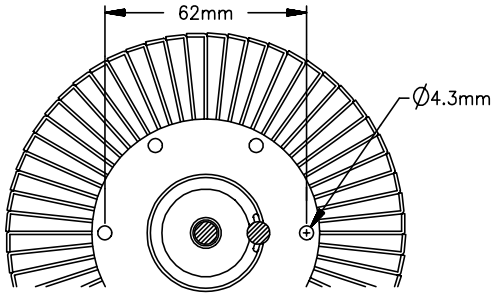
ACCESSORIES:

Filament Connector	Type 40688
Filament/Cathode Connector	Type 40689
Grid Connector	Type 40686
Insulating Pedestal	Type 40630

*Note: All dimensions for reference only.

Figure 4 - Mechanical Outline
*Dimensions in mm



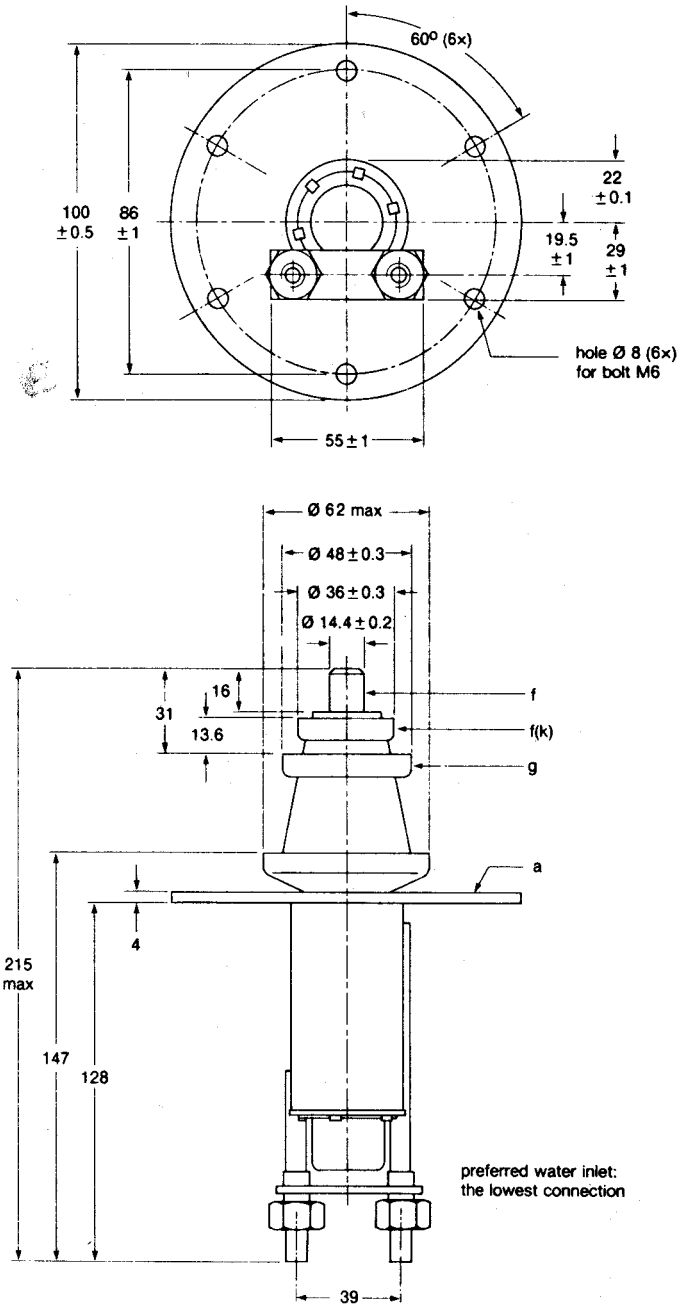


MECHANICAL DATA:
Net Mass: 2.7 KG
Mounting Position:
Vertical with anode up or down

ACCESSORIES:
Insulating Pedestal 40630

*Note: All dimensions for reference only.

Figure 5 - Mechanical Outline
*Dimensions in mm



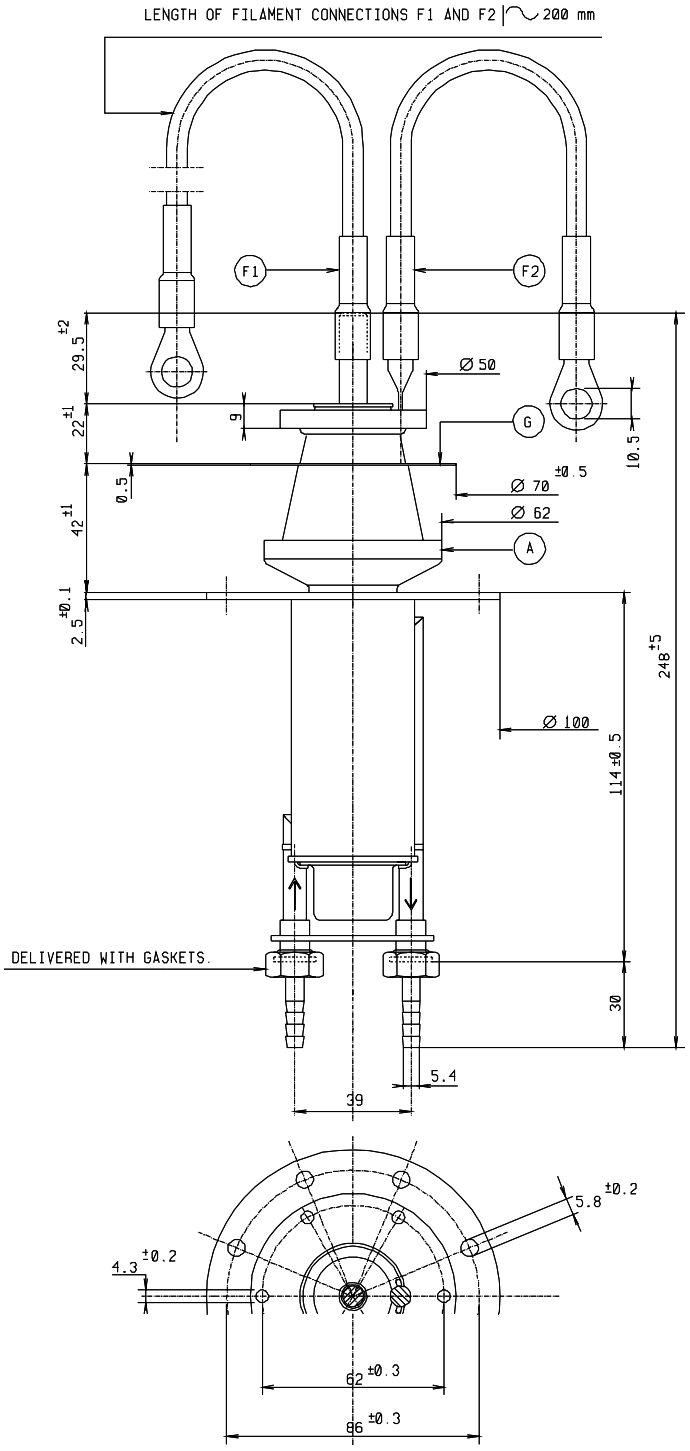
MECHANICAL DATA:
Net Mass: 1.3 KG
Mounting Position: Vertical with anode down

ACCESSORIES:

Filament Connector	Type 40688
Filament/Cathode Connector	Type 40689
Grid Connector	Type 40686

*Note: All dimensions for reference only.

Figure 6 - Mechanical Outline
*Dimensions in mm



MECHANICAL DATA:
Net Mass: 1.4 KG
Mounting Position:
Vertical with anode down

*Note: All dimensions for reference only.

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