15J12
FORCED AIR COOLED TRIODE
Directly heated

TENTATIVE

GENERAL

The 15J12 is a forced air cooled triode which has a directly heated thoriated tungsten filament. It is intended for use in r.f. heating equipment.

RATING

Filament Voltage	V_f	6·3	V
Filament Current	I_f	32·5	A
Maximum Anode Voltage	$V_{a(max)}$	7·0	kV
Maximum Anode Dissipation	$P_{a(max)}$	1·3	kW
Minimum Air Flow for Maximum Anode Dissipation		60	ft^3/min
Maximum Peak Cathode Current	$i_{k(pk)max}$	4·0	A
Maximum Operating Frequency at Full Rating	f_{max}	60	Mc/s

INTER-ELECTRODE CAPACITANCES

Anode/Grid	c_{a-g}	11	pF
Grid/Filament	c_{g-f}	13	pF
Anode/Filament	c_{a-f}	0·6	pF

CHARACTERISTICS

Anode Voltage	V_a	4·0	kV
Anode Current	I_a	190	mA
Mutual Conductance	gm	5·1	mA/V
Amplification Factor	μ	22	

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TYPICAL OPERATION—Maximum operating conditions per valve

Class B1 audio amplifier—push-pull operation

Anode Voltage	V_a	6·0	kV
Anode Current R.M.S.	$I_{a(r.m.s.)}$	0·6	A
Power Input	P_{in}	2·2	kW
Power Output	P_{out}	0·9	kW
Anode Dissipation	P_a	1·3	kW
Anode Efficiency		40	%
Negative Grid Bias Voltage	V_g	−225	V
Peak Signal Voltage	$V_{sig(pk)}$	225	V

TYPICAL OPERATION—Maximum operating conditions

Class C—single phase full wave (no smoothing)

		Mean	R.M.S.	Peak	
Anode Voltage	V_a	3·8	4·25	6·0	kV
Negative Grid Bias Voltage	V_g	−80			V
Positive Grid Voltage	V_{sig}	154			V
Grid Resistance	R_g	0·7			kΩ
Mean Anode Current	$I_{a(av)}$	730			mA
Mean Grid Current	$I_{g(av)}$	120			mA
Peak Cathode Current	$i_{k(pk)}$	2·5	2·8	4·0	A
Peak Anode Current	$i_{a(pk)}$	1·9			A
Peak Grid Current	$i_{g(pk)}$	0·6			A
Anode Dissipation	P_a	1·3			kW
Grid Drive Power		30			W
Grid Dissipation	P_g	20			W
Anode Efficiency		61			%
Power Output (amplifier)	P_{out}	2·1			kW
Power Output (oscillator) at 100% Transfer Efficiency	P_{out}	2·1			kW
Power Output (oscillator) at 85% Transfer Efficiency	P_{out}	1·8			kW

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TYPICAL OPERATION—Maximum operating conditions

Class C—3-phase rectified or d.c.

Anode Voltage	V_a	4·0	5·0	6·0	kV
Negative Grid Bias Voltage	V_g	−140	−220	−300	V
Positive Grid Voltage	V_{sig}	270	270	270	V
Grid Resistance	R_g	553	982	1400	Ω
Mean Anode Current	$I_{a(av)}$	1068	993	930	mA
Mean Grid Current	$I_{g(av)}$	253	224	204	mA
Peak Cathode Current	$i_{k(pk)}$	4·0	4·0	4·0	A
Peak Anode Current	$i_{a(pk)}$	3·0	3·0	3·0	A
Peak Grid Current	$i_{g(pk)}$	1·0	1·0	1·0	A
Anode Dissipation	P_a	1·3	1·3	1·3	kW
Grid Drive Power		104	100	108	W
Grid Dissipation	P_g	60	50	48	W
Anode Efficiency		69	73	76	%
Power Output (amplifier)	P_{out}	2·9	3·6	4·2	kW
Power Output (oscillator) at 100% Transfer Efficiency	P_{out}	2·8	3·5	4·1	kW
Power Output (oscillator) at 85% Transfer Efficiency	P_{out}	2·4	3·0	3·5	kW

DIMENSIONS

Maximum Overall Length	200	mm
Maximum Diameter	102	mm

MOUNTING POSITION—Vertical, anode upwards

ANODE—External

BASE—Special

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OPERATING INSTRUCTIONS

Installation

The valve should be mounted vertically with anode upwards. Connections should always make good electrical contact to prevent overheating of pins and seals, particularly by r.f. current.

It is essential that connection be made to both grid pins when running at higher frequencies, to reduce current taken by each pin.

The valve must be protected against excessive vibration and shock.

Cooling

A minimum forced air blast of 60 cu.ft/min, directed horizontally at the anode, is required when running this valve.

At higher frequencies, etc. a low velocity air blast directed on to the filament and grid pins is recommended.

Operation

The operating data list conditions for maximum output for respective classes of service at the relevant anode voltage.

Linear interpolation between anode voltage steps is admissible. As these conditions utilize some or all of the maximum valve ratings, close control of conditions has to be maintained. In Class C self oscillator service precautions should be taken against excessive mains voltage variations. Current overload trips should be included in anode and grid circuits as well as an under current trip in the grid circuit.

In industrial r.f. heating it is not usual that all precautions can be taken, and under these conditions some reductions in operating conditions have to be made so that widely fluctuating loads, poor h.t. regulation, and mains variations can be accommodated. Each type of variation brings its own problems and no set rules are practicable.

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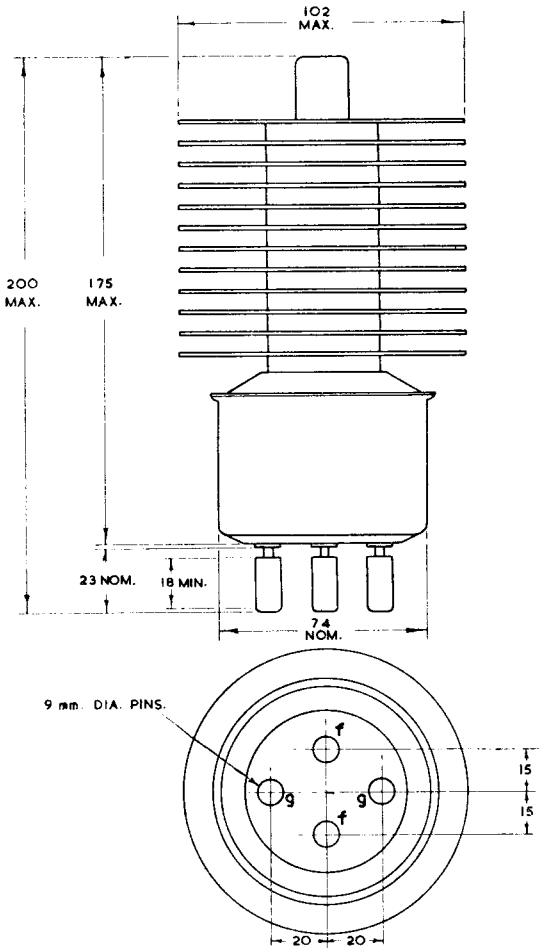

All dimensions in mm.

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