SPECIAL QUALITY, SHOCK AND VIBRATION RESISTANT TRIODE, nuvistor type

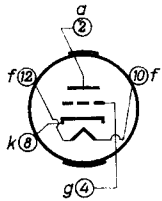
HEATING Indirect by A.C. or D.C.; parallel supply

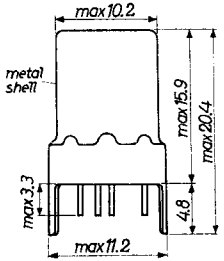
Heater voltage V_f = 6.3 V

Heater current I_f = 135 mA

Dimensions in mm

Base: TWELVAR 5 pin





LIMITING VALUES (Absolute limits)

Anode voltage in cold condition	V_{a_o}	= max. 330 V
Anode voltage	V_a	= max. 110 V
Anode dissipation	W_a	= max. 1 W
Negative grid voltage	$-V_g$	= max. 55 V
Peak positive grid voltage	$+V_{g_p}$	= max. 4 V
Grid current	I_g	= max. 2 mA
External grid resistance with fixed bias	R_g	= max. 0.5 MΩ
External grid resistance with automatic bias	R_g	= max. 1 MΩ
Cathode current	I_k	= max. 15 mA
Peak voltage between heater and cathode	V_{kf_p}	= max. 100 V
Shell temperature	t_{bulb}	= max. 150 °C
Altitude		any

CHARACTERISTICS

Column I: Setting of the tube and average measuring results of new tubes

II: Characteristics range values for equipment design

Heater current		I	II
Heater voltage	V_f =	6.3	V
Heater current	I_f =	135	125-145 mA

CHARACTERISTICS (continued)

Capacitances

			I	II	
Grid to all other elements except anode	C_g	=	4.2	3.8-4.6	pF
Anode to all other elements except grid	C_a	=	1.6	1.4-1.8	pF
Anode to grid	C_{ag}	=	2.2	1.8-2.6	pF
Anode to cathode	C_{ak}	=	0.26	0.20-0.32	pF
Cathode to heater	C_{kf}	=	1.4	1.1-1.7	pF

Typical characteristics

			I	II	
Heater voltage	V_f	=	6.3		V
Anode supply voltage	V_{b_a}	=	75		V
Cathode resistor	R_k	=	100		Ω
Anode current	I_a	=	10.5	9.0-12.5	mA
Internal resistance	R_i	=	3.0		kΩ
Amplification factor	μ	=	35		
Mutual conductance	S	=	11.5	10-13	mA/V[1]

			I	II	
Heater voltage	V_f	=	6.3		V
Anode voltage	V_a	=	40		V
Grid resistor	R_g	=	0.5		MΩ [2]
Anode current	I_a	=	6.8		mA
Internal resistance	R_i	=	3.2		kΩ
Amplification factor	μ	=	35		
Mutual conductance	S	=	11		mA/V

			I	II	
Heater voltage	V_f	=	6.3		V
Anode voltage	V_a	=	26.5		V
Grid resistor	R_g	=	0.5		MΩ [2]
Anode current	I_a	=	2.8		mA
Internal resistance	R_i	=	4.4		kΩ
Amplification factor	μ	=	31		
Mutual conductance	S	=	7		mA/V

[1]) Mutual conductance at underheating (V_f = 5.7 V) = min. 9.0 mA/V

Decrease of mutual conductance by underheating (V_f = 6.3 V→5.7 V) = max. 15%

[2]) Grid current biasing

CHARACTERISTICS (continued)

			I	II	
Cut-off voltage					
Heater voltage	V_f	=	6.3		V
Anode voltage	V_a	=	75		V
Anode current	I_a	=	10		µA
Negative grid bias	$-V_g$	=	7		V

			I	II	
Grid current					
Heater voltage	V_f	=	6.3		V
Anode voltage	V_a	=	80		V
Grid supply voltage	V_{bg}	=	-1.2		V
Grid resistor	R_g	=	0.5		MΩ
Negative grid current	$-I_g$	=		< 0.1 µA[1]	

			I	II	
Insulation					
Heater voltage	V_f	=	6.3		V
Voltage between heater and cathode	V_{kf}	=	100		V [2]
Heater to cathode current	I_{kf}	=		< 5 µA	

			I	II	
Heater voltage	V_f	=	6.3		V
Voltage between grid and cathode + anode + metal shell	$V_{g-(a+k+s)}$	=	100		V
Insulation resistance between grid and cathode + anode + metal shell	$R_{g-(a+k+s)}$	=		> 1000	MΩ

			I	II	
Heater voltage	V_f	=	6.3		V
Voltage between anode and cathode + grid + metal shell	$V_{a-(g+k+s)}$	=	300		V
Insulation resistance between anode and cathode + grid + metal shell	$R_{a-(g+k+s)}$	=		> 1000	MΩ

[1]) Metal shell connected to earth

[2]) Both polarities

CHARACTERISTICS (continued)

			I	II
Vibrational noise output				
Heater voltage	V_f	=	6.3	V
Anode supply voltage	V_{ba}	=	75	V
Cathode resistor	R_k	=	100	Ω
Cathode capacitor	C_k	=	1000	μF
Anode resistor	R_a	=	2	kΩ
Vibrational acceleration	a	=	1	g
Vibrational frequency	f	=	50-6000	c/s
Noise output	V_o	=		< 25 mV
Vibrational frequency	f	=	6-15	kc/s
Noise output	V_o	=		< 500 mV

Shock resistance: 1000 g [1])

20 shocks as produced by the NRL impact machine, lifting the hammer over an angle of 60 °

Vibration resistance: 2.5 g [1])

Vibrational acceleration of 2.5 g during 48 hours at a frequency of 60 c/s

[1]) The specified conditions are test conditions for evaluation of the ruggedness of the tube and should not be interpreted as suitable operating conditions

PHILIPS

Electronic Tube

HANDBOOK

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