

SPECIAL QUALITY, SHOCK AND VIBRATION RESISTANT TRIODE,
nuvistor type

HEATING

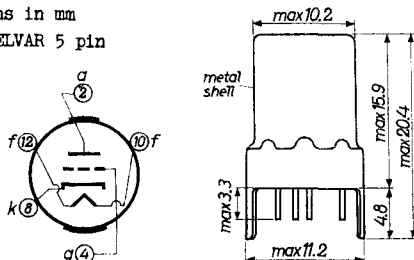
Indirect by A.C. or D.C.; parallel supply

Heater voltage $V_f = 6.3 \text{ V}$

Heater current $I_f = 135 \text{ mA}$

Dimensions in mm

Base: TWELVAR 5 pin



LIMITING VALUES (Absolute limits)

Anode voltage in cold condition	$V_{a0} = \text{max. } 330 \text{ V}$
Anode voltage	$V_a = \text{max. } 110 \text{ V}$
Anode dissipation	$W_a = \text{max. } 1 \text{ W}$
Negative grid voltage	$-V_g = \text{max. } 55 \text{ V}$
Peak positive grid voltage	$+V_{g_p} = \text{max. } 4 \text{ V}$
Grid current	$I_g = \text{max. } 2 \text{ mA}$
External grid resistance with fixed bias	$R_g = \text{max. } 0.5 \text{ M}\Omega$
External grid resistance with automatic bias	$R_g = \text{max. } 1 \text{ M}\Omega$
Cathode current	$I_k = \text{max. } 15 \text{ mA}$
Peak voltage between heater and cathode	$V_{kf_p} = \text{max. } 100 \text{ V}$
Shell temperature	$t_{\text{bulb}} = \text{max. } 150 \text{ }^\circ\text{C}$
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 ele- ments 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	$V_{ba} = 75$	V
Cathode resistor	$R_k = 100$	Ω
Anode current	$I_a = 10.5$	9.0-12.5 mA
Internal resistance	$R_1 = 3.0$	k Ω
Amplification factor	$\mu = 35$	
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	$R_g = 0.5$	M Ω ²⁾
Anode current	$I_a = 6.8$	mA
Internal resistance	$R_1 = 3.2$	k Ω
Amplification factor	$\mu = 35$	
Mutual conductance	$S = 11$	mA/V

	I	II
Heater voltage	$V_f = 6.3$	V
Anode voltage	$V_a = 26.5$	V
Grid resistor	$R_g = 0.5$	M Ω ²⁾
Anode current	$I_a = 2.8$	mA
Internal resistance	$R_1 = 4.4$	k Ω
Amplification factor	$\mu = 31$	
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 $\rightarrow$ 5.7 V) = max. 15%

²⁾ Grid current biasing

CHARACTERISTICS (continued)Cut-off voltage

		I	II
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

Grid current

		I	II
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	$M\Omega$
Negative grid current	$-I_g$	=	< 0.1 μA ¹⁾

Insulation

		I	II
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 $M\Omega$

		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 $M\Omega$

¹⁾ Metal shell connected to earth²⁾ Both polarities

CHARACTERISTICS (continued)Vibrational noise output

		I	II
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	k Ω
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



	7586	
page	sheet	date
1	1	1962.07.07
2	2	1962.07.07
3	3	1962.07.07
4	4	1962.07.07
	FP	1999.03.27