

**SPECIAL QUALITY, SHOCK AND VIBRATION RESISTANT TRIODE, nuvistor type**

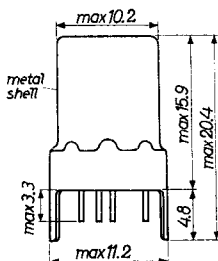
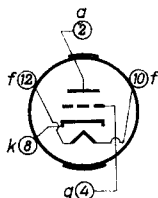
**HEATING** Indirect by A.C. or D.C.; parallel supply

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	$+V_{gp} = \text{max. } 4 \text{ V}$
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	$V_{kfp} = \text{max. } 100 \text{ V}$
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 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	$V_{ba} = 75$		V
Cathode resistor	$R_k = 100$		$\Omega$
Anode current	$I_a = 10.5$	9.0-12.5	mA
Internal resistance	$R_1 = 3.0$		k $\Omega$
Amplification factor	$\mu = 35$		
Mutual conductance	$S = 11.5$	10-13	mA/V <sup>1)</sup>

	I	II	
Heater voltage	$V_f = 6.3$		V
Anode voltage	$V_a = 40$		V
Grid resistor	$R_g = 0.5$		M $\Omega$ 2)
Anode current	$I_a = 6.8$		mA
Internal resistance	$R_1 = 3.2$		k $\Omega$
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 $\Omega$ 2)
Anode current	$I_a = 2.8$		mA
Internal resistance	$R_1 = 4.4$		k $\Omega$
Amplification factor	$\mu = 31$		
Mutual conductance	$S = 7$		mA/V

<sup>1)</sup> 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%

<sup>2)</sup> 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	$\mu\text{A}$
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	$\text{M}\Omega$
Negative grid current	$-I_g$	=	< 0.1 $\mu\text{A}$ <sup>1)</sup>

Insulation

		I	II
Heater voltage	$V_f$	= 6.3	V
Voltage between heater and cathode	$V_{kf}$	= 100	V <sup>2)</sup>
Heater to cathode current	$I_{kf}$	=	< 5 $\mu\text{A}$

		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 $\text{M}\Omega$

		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 $\text{M}\Omega$

1) Metal shell connected to earth

2) 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	$\Omega$
Cathode capacitor	$C_k =$	1000	$\mu F$
Anode resistor	$R_a =$	2	$k\Omega$
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 <sup>1)</sup>

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

Vibration resistance: 2.5 g <sup>1)</sup>

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

<sup>1)</sup> 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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<b>page</b>	<b>sheet</b>	<b>date</b>
1	1	1962.07.07
2	2	1962.07.07
3	3	1962.07.07
4	4	1962.07.07
	FP	1999.03.27