

SPECIAL QUALITY, SHOCK AND VIBRATION RESISTANT TETRODE, nuvistor type

### HEATING

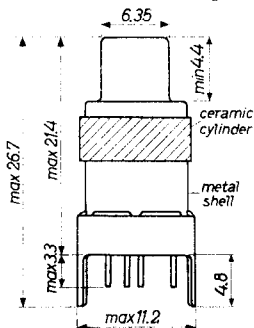
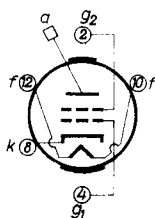
Indirect by A.C. or D.C.; parallel supply

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

Heater current  $I_f = 150 \text{ mA}$

Dimensions in mm

Base: TWELFAR 5 pin



### LIMITING VALUES (Absolute limits)

Anode voltage in cold condition	$V_{a0}$	= max.	330 V
Anode voltage	$V_a$	= max.	250 V
Anode dissipation	$W_a$	= max.	2.2 W
Grid No.2 voltage in cold condition	$V_{g20}$	= max.	330 V
Grid No.2 voltage	$V_{g2}$	= max.	110 V
Grid No.2 dissipation	$W_{g2}$	= max.	0.2 W
Negative grid No.1 voltage	$-V_{g1}$	= max.	55 V
Peak positive grid No.1 voltage	$+V_{g1 p}$	= max.	2 V
Grid No.1 current	$I_{g1}$	= max.	2 mA
External grid No.1 resistance with fixed bias	$R_{g1}$	= max.	0.5 M $\Omega$
External grid No.1 resistance with automatic bias	$R_{g1}$	= max.	1.0 M $\Omega$
Cathode current	$I_k$	= max.	20 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	$I_f = 150$	140-160 mA

Capacitances

	I	II
Anode to grid No.1	$C_{ag1} = 0.01$	0.009-0.011 pF
Grid No.1 to all other elements except anode	$C_{g1} = 6.5$	6.0-7.0 pF
Anode to all other elements except grid No.1	$C_a = 1.4$	1.2-1.6 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	$V_{ba} = 125$	V
Grid No.2 supply voltage	$V_{bg2} = 50$	V
Cathode resistor	$R_k = 68$	$\Omega$
Anode current	$I_a = 10$	8.5-11.5 mA
Grid No.2 current	$I_{g2} = 2.7$	1.8-3.6 mA
Internal resistance	$R_1 = 0.2$	M $\Omega$
Mutual conductance	$S = 10.6$	9.0-12.2 mA/V <sup>1</sup> )

Cut-off voltage

	I	II
Heater voltage	$V_f = 6.3$	V
Anode voltage	$V_a = 125$	V
Grid No.2 voltage	$V_{g2} = 50$	V
Anode current	$I_a = 10$	$\mu$ A
Negative grid No.1 bias	$-V_{g1} = 4.5$	V

<sup>1</sup>) Mutual conductance at underheating ( $V_f = 5.7$  V) = min. 8.0 mA/V

Decrease of mutual conductance by underheating  
( $V_f = 6.3$  V  $\rightarrow$  5.7 V) = max. 20 %

## CHARACTERISTICS (continued)

Grid current

		I	II
Heater voltage	$V_f$	= 6.3	V
Anode voltage	$V_a$	= 200	V
Grid No.2 voltage	$V_{g2}$	= 70	V
Grid No.1 supply voltage	$V_{bg1}$	= -1.6	V
Grid No.1 resistor	$R_{g1}$	= 0.5	MΩ
Negative grid No.1 current	$-I_{g1}$	=	< 0.1 μA

Insulation

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

		I	II
Heater voltage	$V_f$	= 6.3	V
Voltage between grid No.1 and all other elec- trodes + metal shell	$V_{g1-(a+g2+k+s)}$	= 100	V
Insulation resistance between grid No.1 and all other electrodes + metal shell	$R_{g1-(a+g2+k+s)}$	=	> 500 MΩ

		I	II
Heater voltage	$V_f$	= 6.3	V
Voltage between anode and all other elec- trodes + metal shell	$V_{a-(g2+g1+k+s)}$	= 300	V
Insulation resistance between anode and all other electrodes + metal shell	$R_{a-(g2+g1+k+s)}$	=	> 500 MΩ

		I	II
Heater voltage	$V_f$	= 6.3	V
Voltage between grid No.2 and all other elec- trodes + metal shell	$V_{g2-(a+g1+k+s)}$	= 100	V
Insulation resistance between grid No.2 and all other electrodes + metal shell	$R_{g2-(a+g1+k+s)}$	=	> 500 MΩ

## CHARACTERISTICS (continued)

Vibrational noise output

Heater voltage	$V_f = 6.3$	V
Anode supply voltage	$V_{ba} = 125$	V
Grid No.2 supply voltage	$V_{bg2} = 50$	V
Cathode resistor	$R_k = 68$	$\Omega$
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	$V_o =$	< 35 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**

	<b>5787</b>	
<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
5	FP	1999.12.30