

**TUNG-SOL****CATHODE RAY**

THE 178NP4 IS A DIRECT-VIEW PICTURE TUBE DESIGNED FOR TELEVISION APPLICATIONS. ITS FEATURES INCLUDE:

<b>ELECTROSTATIC FOCUS</b>	<b>ALUMINIZED SCREEN</b>
<b>UNIPOTENTIAL CATHODE</b>	<b>MAGNETIC DEFLECTION</b>
<b>GRAY FILTER FACEPLATE</b>	<b>EXTERNAL CONDUCTIVE COATING</b>
<b>RECTANGULAR GLASS CONSTRUCTION</b>	<b>14 5/16" X 11 1/8" RASTER SIZE</b>
<b>DOES NOT REQUIRE ION TRAP</b>	

**ELECTRICAL DATA**

FOCUSING METHOD		ELECTROSTATIC
DEFLECTING METHOD		MAGNETIC
DEFLECTION ANGLE (APPROX.):		
HORIZONTAL	85	DEGREES
VERTICAL	68	DEGREES
DIAGONAL	90	DEGREES
DIRECT INTERELECTRODE CAPACITANCES (APPROX.):		
CATHODE TO ALL OTHER ELECTRODES	5	$\mu\mu\text{f}$
GRID #1 TO ALL OTHER ELECTRODES	6	$\mu\mu\text{f}$
MAXIMUM EXTERNAL CONDUCTIVE COATING TO ANODE	1500	$\mu\mu\text{f}$
MINIMUM EXTERNAL CONDUCTIVE COATING TO ANODE	750	$\mu\mu\text{f}$

**OPTICAL DATA**

PHOSPHOR NUMBER	P-4
FLUORESCENT COLOR	WHITE
PHOSPHORESCENT COLOR	WHITE
PERSISTENCE	SHORT
FACEPLATE TRANSMISSION AT CENTER (APPROX.):	74 PERCENT

**RATINGS**

INTERPRETED ACCORDING TO DESIGN CENTER SYSTEM  
CATHODE DRIVE SERVICE

HEATER VOLTAGE	6.3	VOLTS
HEATER CURRENT	0.6	AMP.
MAXIMUM DC ANODE VOLTAGE*	18 000	VOLTS
MAXIMUM DC GRID #4 VOLTAGE	-500 TO +1000	VOLTS
MAXIMUM DC GRID #2 VOLTAGE	200	VOLTS
MAXIMUM GRID #1 VOLTAGE:		
DC NEGATIVE-BIAS VALUE	125	VOLTS
DC POSITIVE-BIAS VALUE	0	VOLTS
POSITIVE-PEAK VALUE	0	VOLTS
MAXIMUM DC PEAK HEATER-CATHODE VOLTAGE:		
HEATER NEGATIVE WITH RESPECT TO CATHODE		
DURING WARM-UP PERIOD NOT TO EXCEED 15 SECONDS	410	VOLTS
AFTER EQUIPMENT WARM-UP PERIOD	180	VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE	180	VOLTS
MAXIMUM GRID #1 CIRCUIT RESISTANCE	1.5	MEG OHMS

**TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS****CATHODE DRIVE<sup>A</sup>**

DC ANODE VOLTAGE	14 000	VOLTS
DC GRID #4 VOLTAGE	-50 TO +350	VOLTS
DC GRID #2 VOLTAGE	110	VOLTS
DC GRID #1 VOLTAGE <sup>B</sup>	-37 TO -50	VOLTS

<sup>A</sup> THIS TUBE MAY BE OPERATED IN GRID DRIVE IF DESIRED, WITH SOME LOSS IN EFFICIENCY. AVERAGE RASTER CUTOFF, USING DRIVE, MAY BE CALCULATED:  $Eg1c^2 = .502 Eg2^2 + 5.8$

<sup>B</sup> VISUAL EXTINCTION OF FOCUSED RASTER.

\* BRILLIANCE AND DEFINITION DECREASE WITH DECREASING ANODE VOLTAGE. IN GENERAL, ANODE VOLTAGE SHOULD NOT BE LESS THAN 12,000 VOLTS.

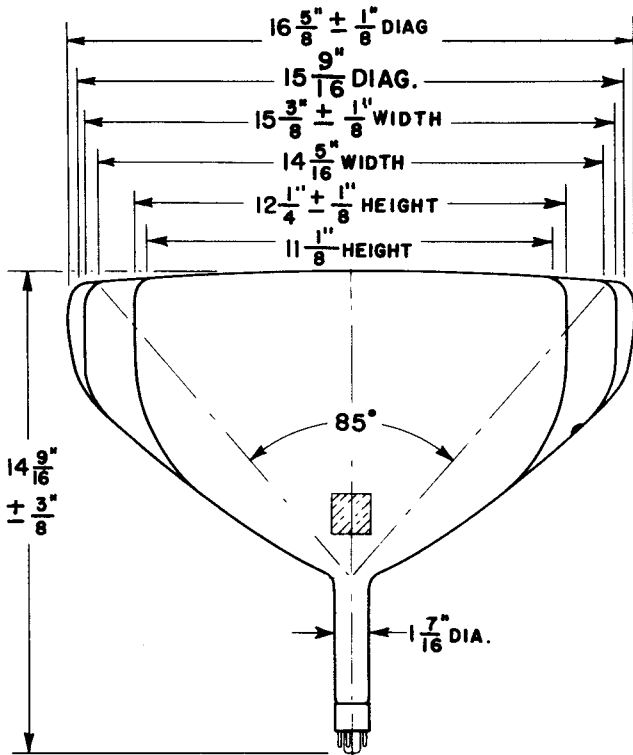
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**TUNG-SOL**

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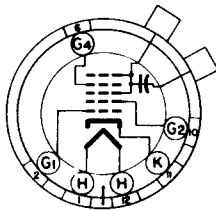
**MECHANICAL DATA**

OVERALL LENGTH	14 9/16 ± 3/8	INCHES
GREATEST DIMENSIONS OF BULB:		
DIAGONAL	16 5/8 ± 1/8	INCHES
WIDTH	15 3/8 ± 1/8	INCHES
HEIGHT	12 1/4 ± 1/8	INCHES
MIN. USEFUL SCREEN DIMENSIONS:		
DIAGONAL	15 9/16	INCHES
WIDTH	14 5/16	INCHES
HEIGHT	11 1/8	INCHES
BULB CONTACT	RECESSED SMALL CAVITY CAP	J1-21
BASE	SMALL SHELL DUODECAL 6 PIN	B6-63
BASING		12L
BULB CONTACT ALIGNMENT		
J1-21 CONTACT ALIGNS WITH PIN POSITION #6 ±30 DEGREES		



**PIN CONNECTIONS**

- PIN 1 - HEATER
- PIN 2 - GRID #1
- PIN 6 - GRID #4
- PIN 10 - GRID #2
- PIN 11 - CATHODE



- PIN 12 - HEATER
- ANODE CAP:
- GRID NO. 3
- GRID NO. 5

**BOTTOM VIEW**