

7 F 7 1 R A

FORCED-AIR COOLED TETRODE

The NEC 7F71RA is a forced-air cooled tetrode designed for use as an amplifier in VHF-TV and FM transmitters. It features rugged coaxial ceramic-to-metal sealed construction suitable for cavity operation at high frequencies. The cathode consists of a mesh type thoriated tungsten filament. The novel technique, including photoetching process, are used throughout the fabrication of the mesh type grids.

With these modern constructions and new techniques being employed, the NEC 7F71RA has high transconductance essential for high gain and high efficient operation and assures long life and highly reliable operation. The anode, with the integral radiator, is capable of dissipating 3.5 kilowatts of power with moderate rate of air flow.

Maximum ratings apply at frequencies up to 250 MHz.

ELECTRICAL DATA:

GENERAL DATA:

Filament: Thoriated Tungsten

Voltage	4	volts $\pm 5\%$
Current	78	amps.
Maximum Starting Current	160	amps.
Minimum Heating Time	5	sec.

Transconductance (I _b =1.6 amps.)	72	millimohs
Amplification Factor, Grid No.2 to Grid No.1	10.5	

INTERELECTRODE CAPACITANCES:

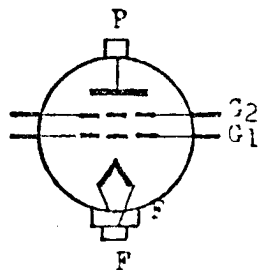
Grid No.1 to Plate	0.3	μF
Filament to Plate	0.04	μF
Grid No.1 to Filament	54	μF
Grid No.1 to Grid No.2	100	μF
Grid No.2 to Plate	14	μF
Frequency for Maximum Ratings	250	MHz

MECHANICAL DATA

Dimensions:

Maximum Overall Length	165	mm
Maximum Diameter	130	mm
Net weight (approx.)	2.7	kg

Terminal Connections:



- P : Plate
- G₂ : Grid No.2
- G₁ : Grid No.1
- F : Filament

MOUNTING POSITION: Vertical, anode up or down

Cooling:

To Plate: Forced air cooling required

Minimum air flow	4.5	m ³ /min.
Minimum static pressure	45	mm of water

To filament and grid seals: -

Adequate forced-air flow should be delivered uniformly around the circumference of each seal to limit the temperature below the maximum rating.

Minimum air flow	0.5 m ³ /min.
Maximum incoming air temperature	45 °C
Maximum radiator temperature	250 °C
Maximum seal temperature	250 °C

RF POWER AMPLIFIER-CLASS B TELEVISION

(Synchronizing peak level conditions per tube)

MAXIMUM RATINGS: Absolute Values

DC Plate Voltage	5,000 volts
DC Grid No.2 Voltage	1,000 volts
DC Grid No.1 Voltage	-500 volts
DC Plate Current	2.4 amps.
Plate Dissipation	3.5 kW
Grid No.2 Dissipation	50 watts
Grid No.1 Dissipation	20 watts

TYPICAL OPERATION: (in cathode drive circuit)

DC Plate Voltage	2,500	3,000	volts
DC Grid No.2 Voltage	500	500	volts
DC Grid No.1 Voltage	-40	-40	volts
Zero Signal DC Plate Current	0.5	0.5	amps.
Peak RF Grid No.1 to Cathode Voltage:			
Synchronizing peak level	44	60	volts

Pedestal level	34	47	Volts
DC Plate Current:			
Synchronizing peak level	1.11	1.6	amps.
Pedestal level	0.88	1.22	amps.
DC Grid No.2 Current:			
Synchronizing peak level	50	70	mA
Pedestal level	25	35	mA
DC Grid No.1 Current:			
Synchronizing peak level	10	70	mA
Pedestal level	0	17	mA
Driving Power (approx.):			
Synchronizing peak level	39	78	watts
Pedestal level	23	45	watts
Plate Power Output (approx.):			
Synchronizing peak level	1.36	2.72	kW
Pedestal level	0.8	1.6	kW
Frequency	220	220	MHz
Bandwidth (-1 dB)	7	7	MHz

RF POWER AMPLIFIER AND OSCILLATOR-CLASS C

TELEGRAPHY AND FM TELEPHONE

(Key-down condition per tube without modulation)

MAXIMUM RATINGS: (Absolute Value)

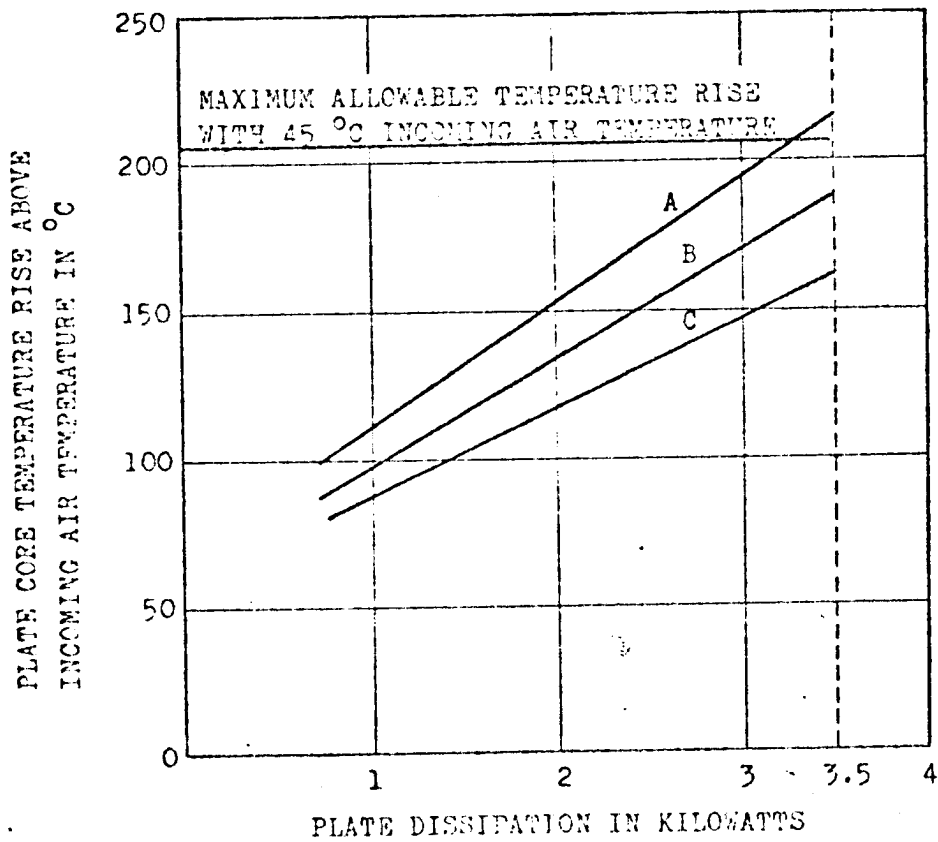
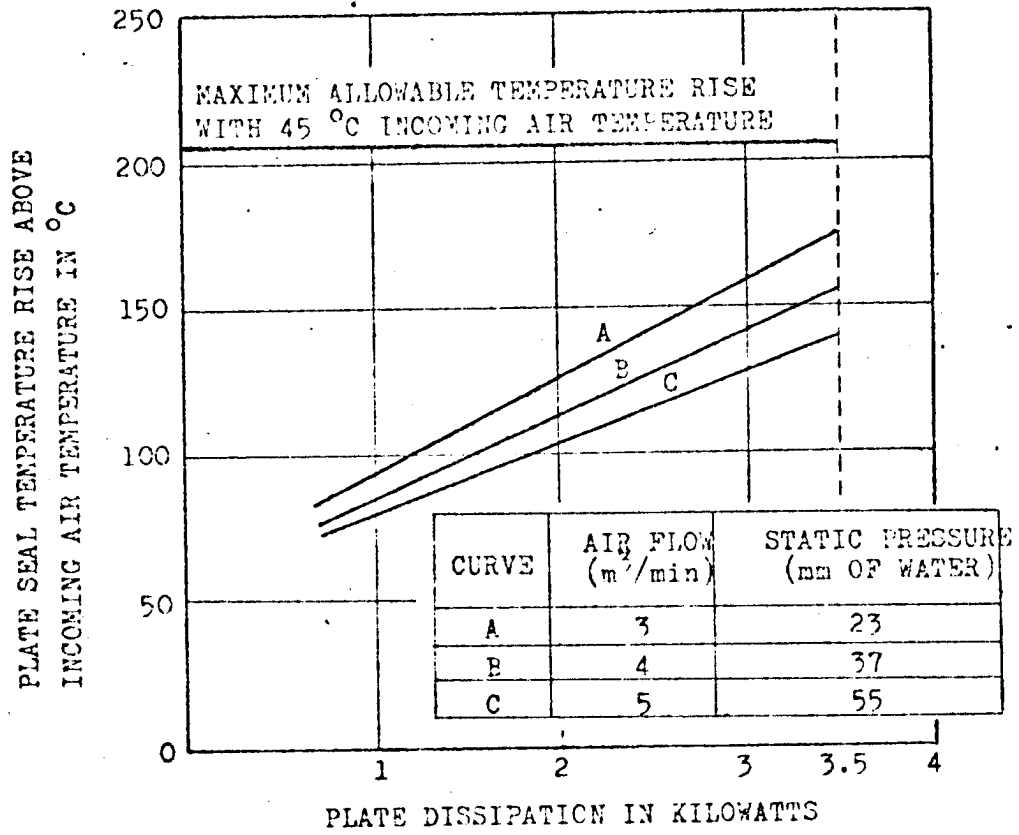
DC Plate Voltage	5,000	volts
DC Grid No.2 Voltage	1,000	volts
DC Grid No.1 Voltage	-500	volts

DC Plate Current	1.8 amps.
Plate Dissipation	3.5 kW
Grid No.2 Dissipation	50 watts
Grid No.1 Dissipation	20 watts

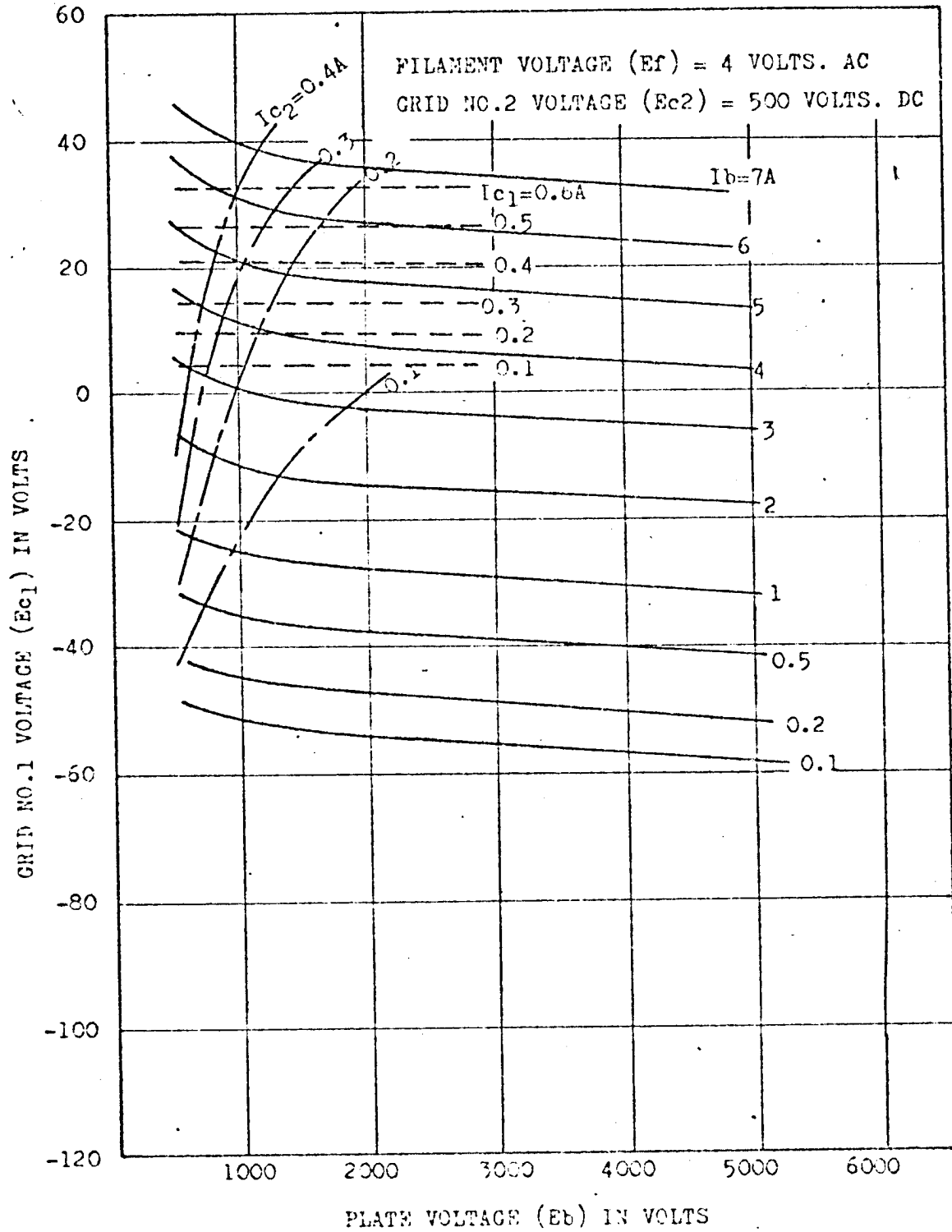
TYPICAL OPERATION: (in grid drive circuit)

DC Plate Voltage	3,500 volts
DC Grid No.2 Voltage	500 volts
DC Grid No.1 Voltage	-150 volts
Peak RF Grid No.1 Voltage	185 volts
DC Plate Current	1.3 amps.
DC Grid No.2 Current	70 mA
DC Grid No.1 Current	85 mA
Driving Power (approx.)	16 watts
Plate Power Output (approx.)	3.1 kW

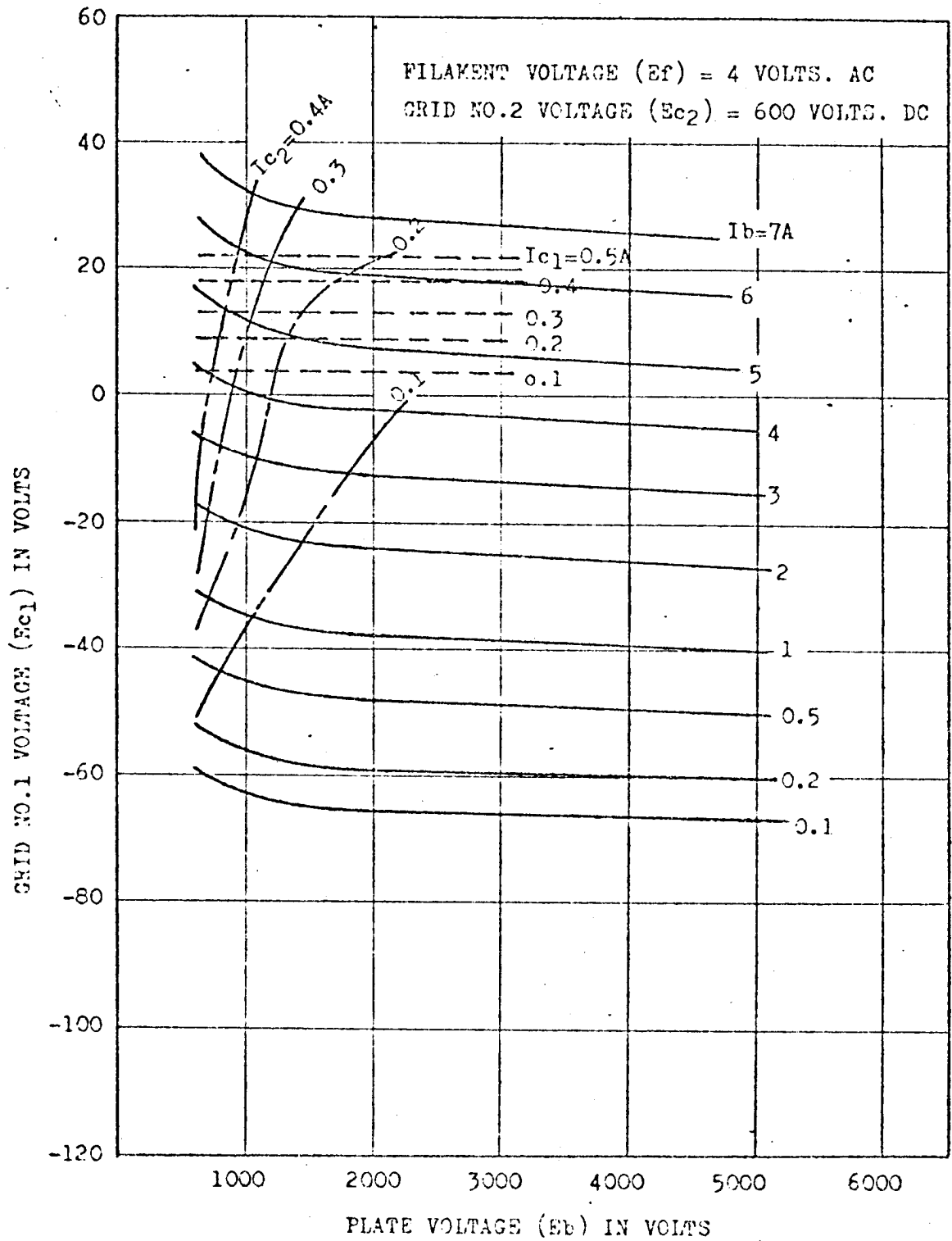
PLATE DISSIPATION VS PLATE SEAL AND PLATE CORE TEMPERATURE CHARACTERISTICS



CONSTANT CURRENT CHARACTERISTICS

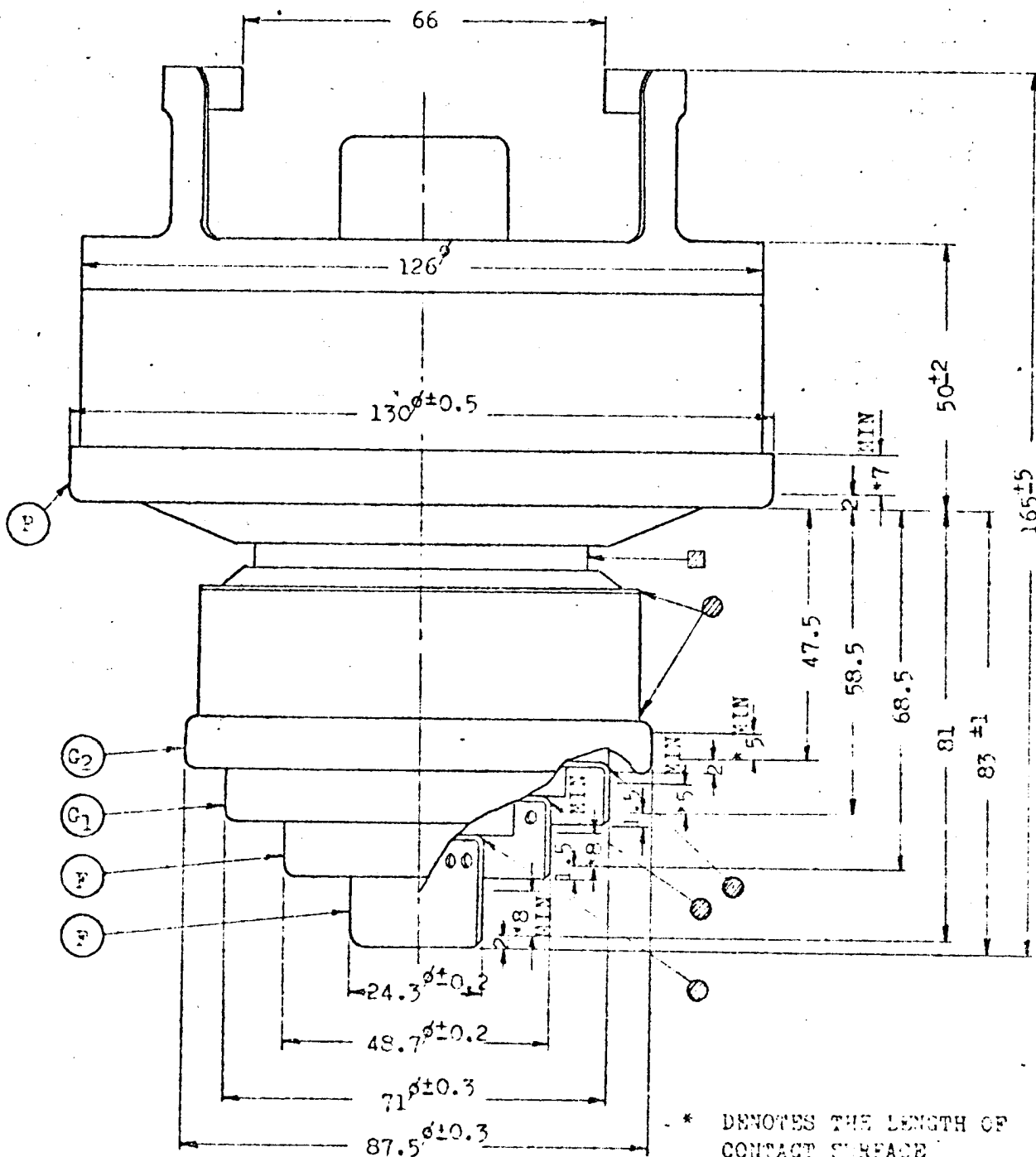


CONSTANT CURRENT CHARACTERISTICS



OUTLINE DRAWING

UNIT : mm



* DENOTES THE LENGTH OF CONTACT SURFACE

■ PLATE CORE TEMPERATURE MEASUREMENT POINT

○ SPRL. TEMPERATURE MEASUREMENT POINT