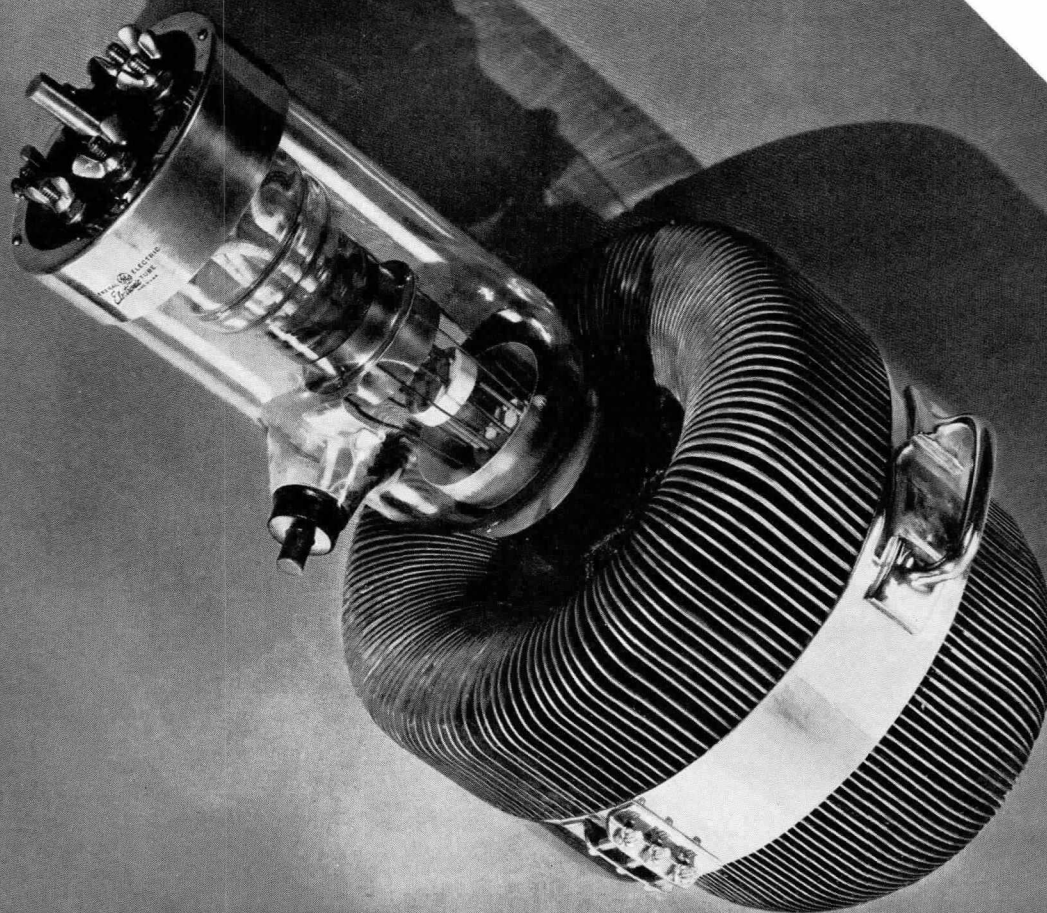




PLIOTRON

DESCRIPTION

The GL-893A-R is a three-electrode tube designed for use as a radio-frequency amplifier, oscillator, or class B modulator. The anode is

forced-air cooled and is capable of dissipating 20 kilowatts. The cathode is a pure-tungsten filament. Maximum ratings apply up to 5 megacycles.

◆ TECHNICAL INFORMATION

These data are for reference only. For design information refer to specifications.

GENERAL

Electrical Data	Minimum	Bogey	Maximum
Filament voltage (single-phase excitation)*§		20	21 volts
Filament current at bogey voltage			
(Single-phase excitation)*§	175	183	190 amperes
Filament starting current			
(Single-phase excitation)		...	275 amperes
Filament cold resistance			
(Single-phase excitation)		.0093	... ohm
Amplification factor, $I_b = 1.0$ amp, $E_c = -100$ v	28	34.5	41
Interelectrode capacitances			
Grid-plate	29.8	34	38.8 uuf
Grid-filament	39.5	48	56.5 uuf
Plate-filament	2.6	3.5	4.4 uuf

◆ Technical information completely revised.


Electronic
TUBE

GENERAL  ELECTRIC

Supersedes ETI-248 dated 8-46

TECHNICAL INFORMATION (CONT'D)

Mechanical Data

Mounting position	vertical
Type of cooling	forced-air
Maximum incoming air temperature	45 C
Required air flow on anode	
Plate dissipation—percent of rating	100 80 60
Air flow—cubic feet per minute	1800 1250 1000
Static pressure—inches water	1.05 0.56 0.38
Required air flow to stem*	2 CFM†
Maximum glass temperature	150 C
Net weight, approximate	230 pounds

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum ratings, absolute values

	CCS†	
D-c plate voltage	20,000 max	volts
Maximum signal d-c plate current†	4.0 max	amperes
Maximum signal plate input†	60 max	kilowatts
Plate dissipation	20 max	kilowatts

Typical operation

Unless otherwise specified,
values are for 2 tubes

	12,000	15,000	18,000	
D-c plate voltage				volts
D-c grid voltage	—260	—350	—450	volts
Peak a-f grid-to-grid voltage	1480	1560	1720	volts
Zero signal d-c plate current	0.8	0.8	0.8	amperes
Maximum signal d-c plate current	7.0	6.0	5.5	amperes
Effective load resistance, plate to plate	4000	6000	8000	ohms
Maximum signal driving power, approximate	220	190	140	watts
Maximum signal power output, approximate	52	60	70	kilowatts

RADIO-FREQUENCY POWER AMPLIFIER—CLASS B

Carrier conditions per tube for use with a maximum modulation factor of 1.0

Maximum ratings, absolute values

	CCS†	
D-c plate voltage	20,000 max	volts
D-c plate current	2.0 max	amperes
Plate input	32 max	kilowatts
Plate dissipation	20 max	kilowatts

Typical operation

	12,000	15,000	15,000	
D-c plate voltage				volts
D-c grid voltage	—250	—340	—340	volts
Peak r-f grid voltage	350	395	450	volts
D-c plate current	1.5	1.5	2.0	amperes
D-c grid current, approximate	35	30	50	milliamperes
Driving power, approximate	130	150	200	watts
Power output, approximate	6	7.5	10	kilowatts

PLATE-MODULATED RADIO-FREQUENCY POWER AMPLIFIER—CLASS C TELEPHONY

Carrier conditions per tube for use with a maximum modulation factor of 1.0

Maximum ratings, absolute values

	CCS†	
D-c plate voltage	12,000 max	volts
D-c grid voltage	—3000 max	volts
D-c plate current	2.0 max	amperes
D-c grid current	0.4 max	amperes
Plate input	24 max	kilowatts
Plate dissipation	12 max	kilowatts

Typical operation

	10,000	10,000	12,000	
D-c plate voltage				volts
D-c grid voltage	—800	—800	—1000	volts
Peak r-f grid voltage	1200	1280	1500	volts
D-c plate current	1.5	2.0	2.0	amperes
D-c grid current, approximate	0.10	0.16	0.14	amperes
Driving power, approximate	120	210	210	watts
Power output, approximate	11	15	18	kilowatts

TECHNICAL INFORMATION (CONT'D)

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

Key-down conditions per tube without amplitude modulation

Maximum ratings, absolute values	CCS†		
D-c plate voltage	20,000	max	volts
D-c grid voltage	—3000	max	volts
D-c plate current	4.0	max	amperes
D-c grid current	0.4	max	amperes
Plate input	70	max	kilowatts
Plate dissipation	20	max	kilowatts

Typical operation	CCS†		
D-c plate voltage	12,000	15,000	18,000 volts
D-c grid voltage	—800	—900	—1000 volts
Peak r-f grid voltage	1430	1520	1630 volts
D-c plate current	3.5	3.6	3.6 amperes
D-c grid current, approximate	0.26	0.25	0.21 amperes
Driving power, approximate	360	370	340 watts
Power output, approximate	30	40	50 kilowatts

*Air flow to be directed into stem through tubing in center of base. The flow stem-cooling air must continue for 5 minutes after removal of filament and plate power.

§See drawing Filament Connections and Excitation Circuits, K-8639686.

†CCS=Continuous Commercial Service.

‡Averaged over any audio-frequency cycle of sine-wave form.

πAt crest of audio-frequency cycle with modulation factor of 1.0.

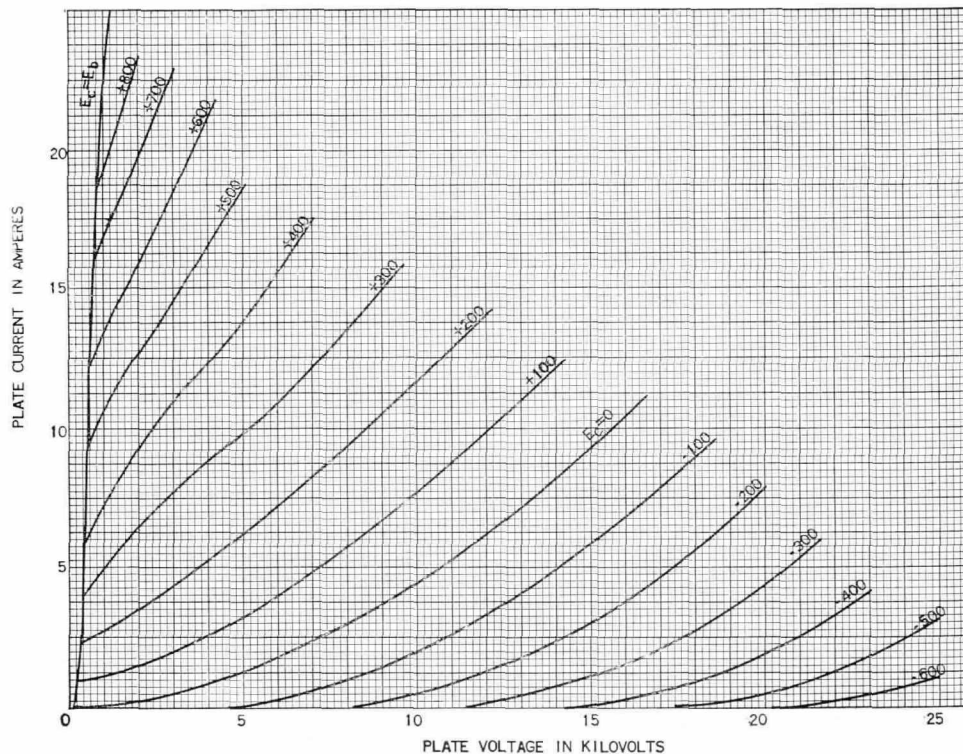
¶Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 percent of the carrier conditions.

Maximum ratings apply up to 5 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the

tabulation below (other maximum ratings are the same as shown above). Special attention should be given to adequate ventilation of the bulb at these frequencies.

Frequency	5	12	25 megacycles
Percentage of maximum rated plate			
Voltage and plate input			
Class B r-f	100	86	74 percent
Class C plate modulated	100	81	65 percent
Class C unmodulated			
Percentage of maximum rated plate voltage	100	81	65 percent
Percentage of maximum rated plate input	100	75	50 percent

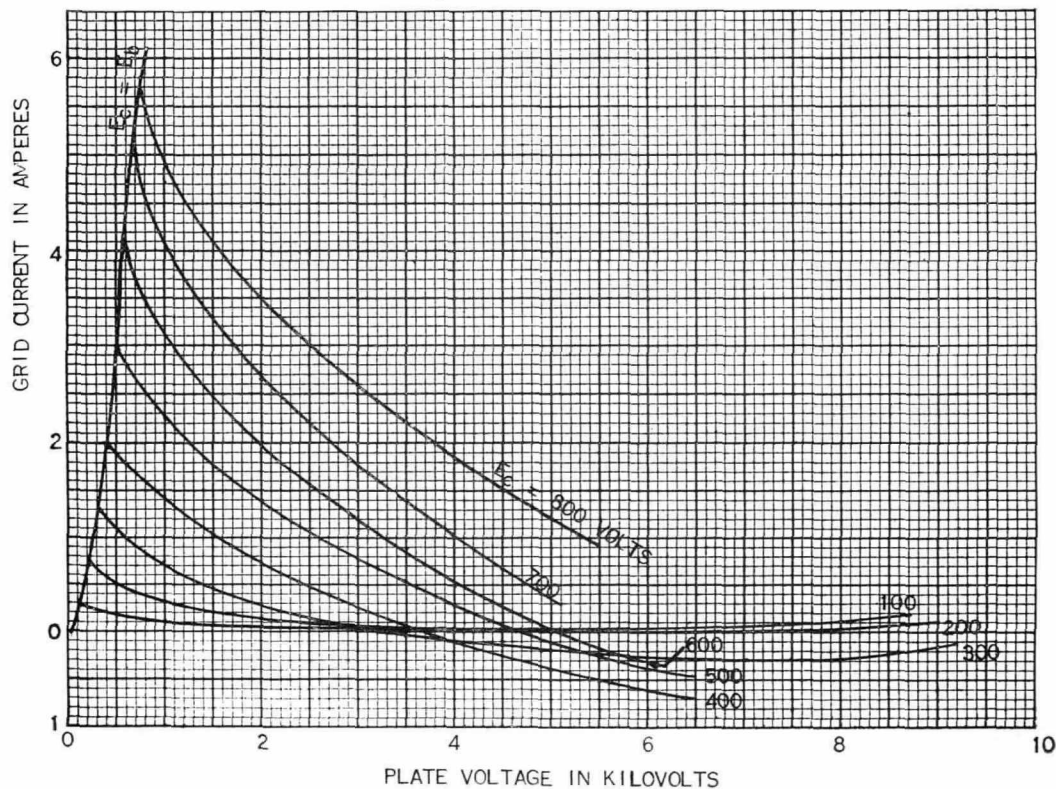
■ GL-893A-R AVERAGE PLATE CHARACTERISTIC
 $E_f = 20$ VOLTS A-C



K-69087-72A99
 ■ Drawing revised

4-27-49

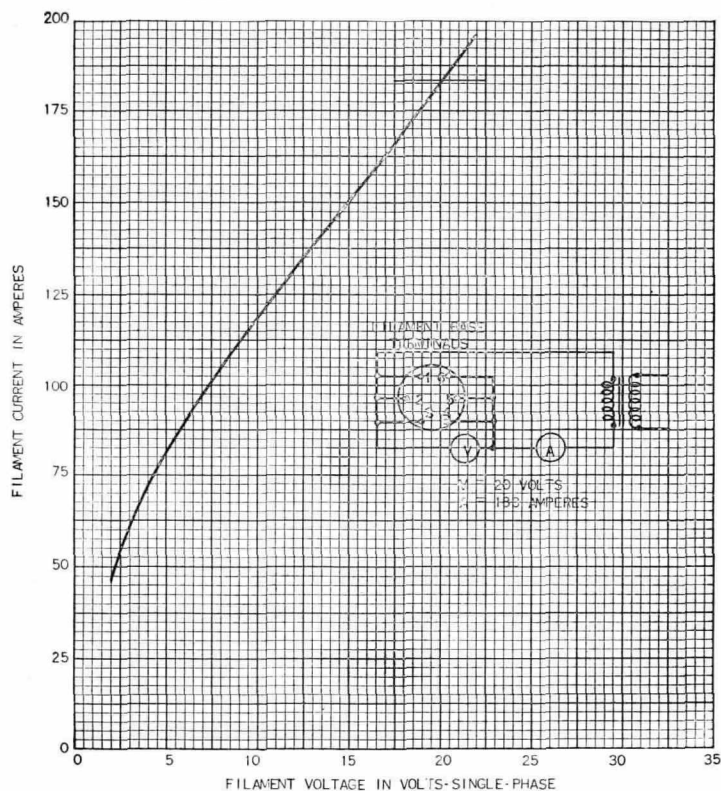
■ GL-893A-R GRID-PLATE TRANSFER CHARACTERISTIC
 $E_f = 20$ VOLTS A-C



K-69087-72A288
 ■ Drawing revised

4-25-49

■ GL-893A-R AVERAGE FILAMENT CHARACTERISTIC
SINGLE-PHASE CONNECTION
COLD RESISTANCE = 0.0093 OHM

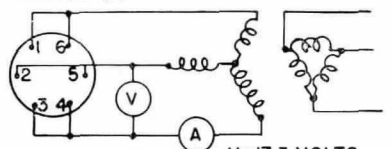


K-69087-72A267
Drawing revised

4-25-49

GL-893A-R FILAMENT CONNECTIONS

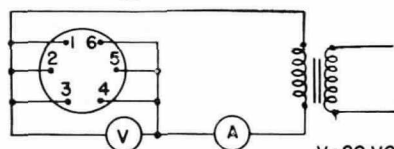
FILAMENT BASE TERMINALS



V = 17.3 VOLTS
A = 122 AMPERES

THREE-PHASE A-C FILAMENT EXCITATION

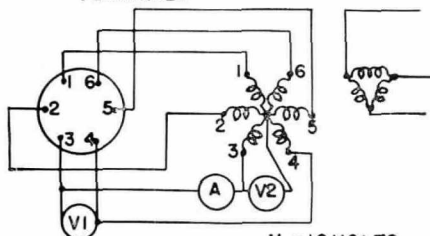
FILAMENT BASE TERMINALS



V = 20 VOLTS
A = 183 AMPERES

SINGLE-PHASE A-C FILAMENT EXCITATION

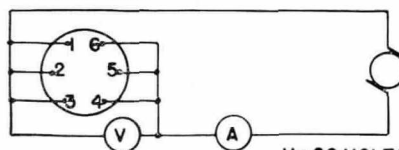
FILAMENT BASE TERMINALS



V₁ = 10 VOLTS
V₂ = 10 VOLTS
A = 61 AMPERES

SIX-PHASE A-C FILAMENT EXCITATION

FILAMENT BASE TERMINALS



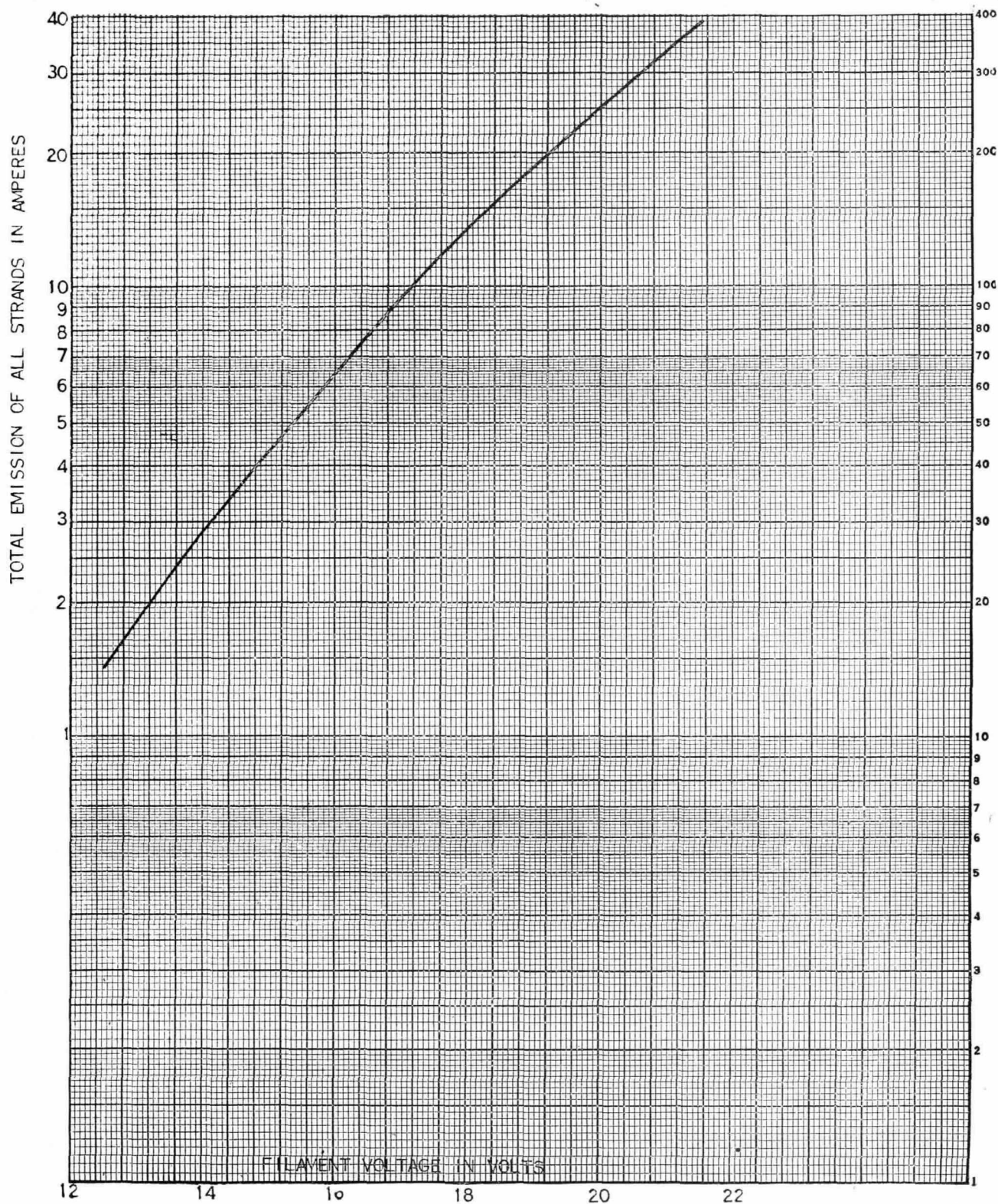
V = 20 VOLTS
A = 183 AMPERES

D-C FILAMENT EXCITATION

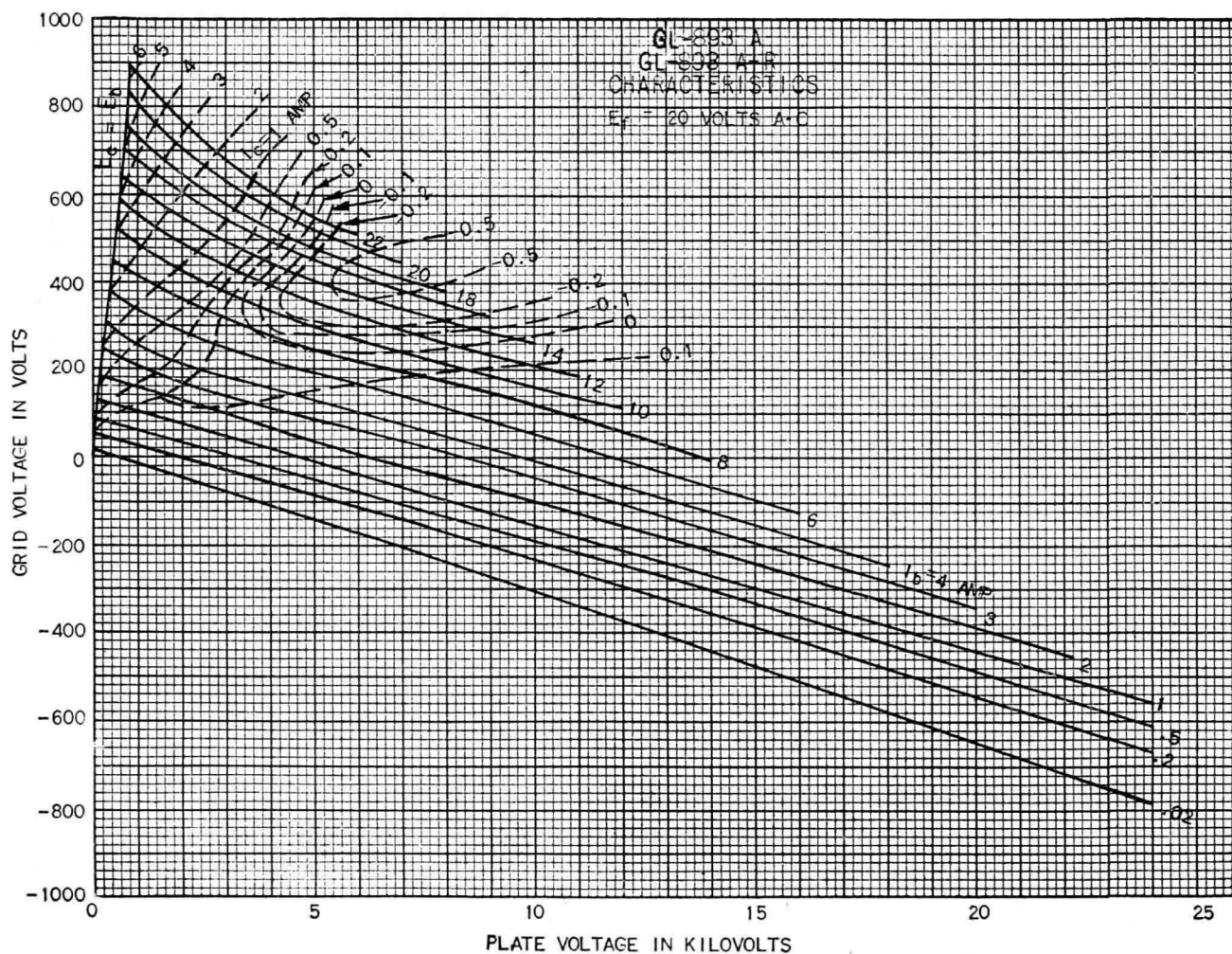
NOTE: TERMINALS MUST BE CONNECTED IN
CORRECT PHASE RELATION AS SHOWN

■ GL-893A-R

AVERAGE FILAMENT EMISSION CHARACTERISTIC
SINGLE-PHASE FILAMENT CONNECTION



■ GL-893A-R
CHARACTERISTICS
 $E_f = 20$ VOLTS A-C



K-69087-72A286
■ Drawing revised

4-25-49

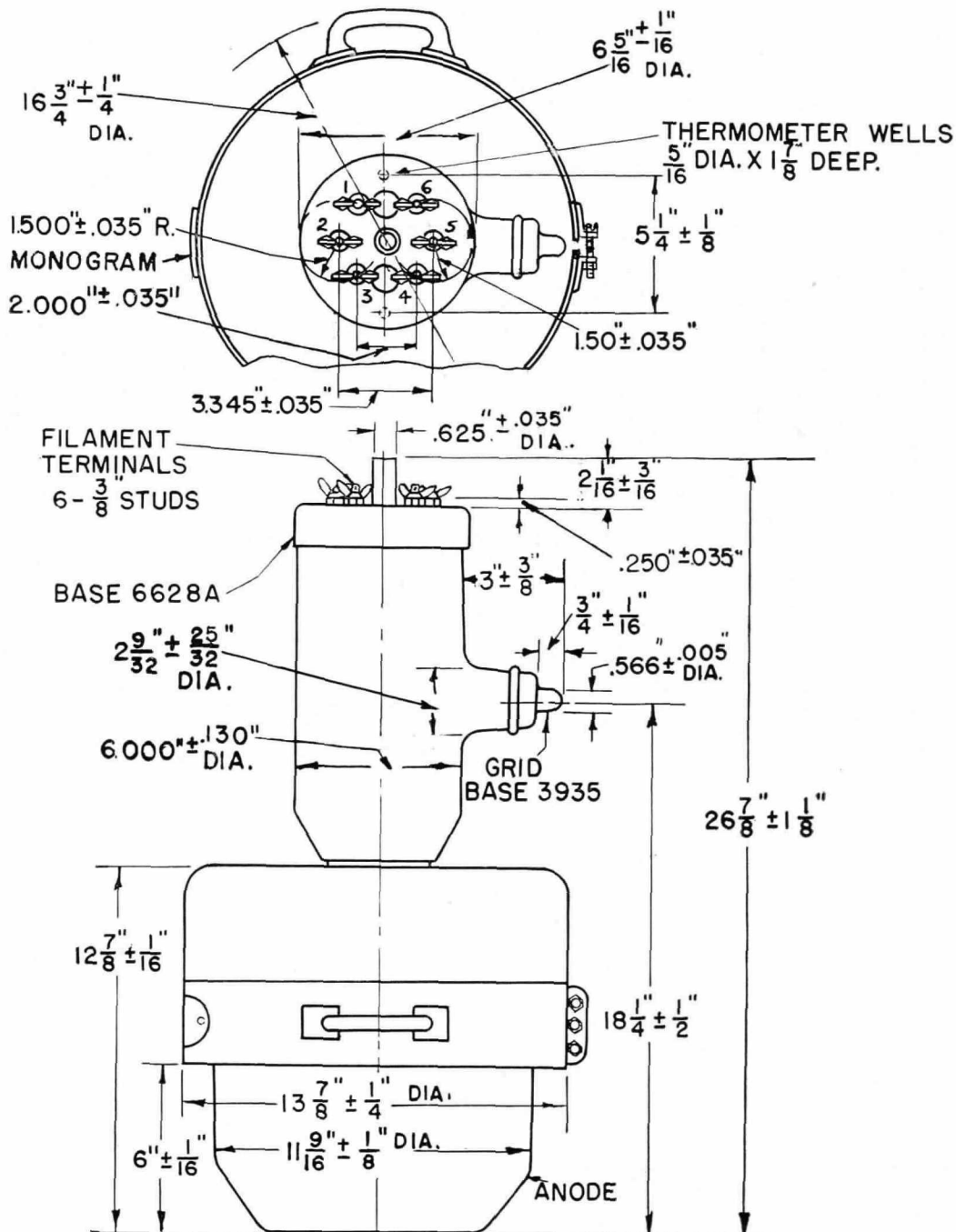
GL-893A-R

ETI-248A

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GL-893A-R OUTLINE



K-6966982

■ Drawing revised

1-31-47

Tube Divisions, Electronics Department

GENERAL ELECTRIC

Schenectady, N. Y.