



869-B

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HALF-WAVE MERCURY-VAPOR RECTIFIER

GENERAL DATA

Electrical:

Filamentary Cathode, Coated:

Voltage $5 \pm 5\%$ ac volts

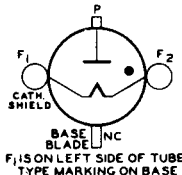
Current 19 amperes

Minimum Heating Time
at Rated Voltage . . . 60 seconds

Peak Tube Voltage
Drop (Approx.) 15 volts

Mechanical:

Terminal Connections:



F₁ - Filament,
Cathode Shield
(Anode Return)

F₂ - Filament
Cap - Anode

Mounting Position Vertical with filament end down

Overall Length $14-1/4" \pm 3/16"$

Maximum Diameter $5-1/8"$

Bulb GT-40

Cap Skirted Large { JETEC No. C1-9
RCA No. 3905

Base { JETEC No. A3-20
RCA No. 3502

Temperature Control:

Heating—When the ambient temperature is so low that the normal rise of condensed-mercury temperature above the ambient temperature will not bring the condensed-mercury temperature up to the minimum value of the operating ranges specified under *Maximum Ratings*, some form of heat-conserving enclosure or auxiliary heater will be required.

Cooling—When the operating conditions are such that the maximum value of the operating condensed-mercury temperature range is exceeded, provision should be made for forced-air cooling sufficient to prevent exceeding the maximum value.

Temperature Rise of Condensed Mercury to Equilibrium
Above Ambient Temperature (Approx.):*

No Load	15	°C
Full Load	20	°C

HALF-WAVE RECTIFIER—In-Phase Operation*

Maximum Ratings, Absolute Values: For supply frequency of 60 cps

Operating Condensed-Mercury
Temperature Range

30° to 60°C 30° to 50°C 30° to 40°C

PEAK INVERSE ANODE VOLTAGE	10000 max.	15000 max.	20000 max.	volts
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*: See next page.



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	Operating Condensed-Mercury Temperature Range			
	30° to 60°C	30° to 50°C	30° to 40°C	
ANODE CURRENT:				
Peak	10 max.	10 max.	10 max.	amp
Average**	2.5 max.	2.5 max.	2.5 max.	amp
Fault, for dura- tion of 0.1 second max.	• 100 max.	• 100 max.	• 100 max.	amp

HALF-WAVE RECTIFIER—Quadrature Operation**

Maximum Ratings, Absolute Values: For supply frequency of 60 cps

	Operating Condensed-Mercury Temperature Range			
	30° to 60°C	30° to 50°C	30° to 40°C	
PEAK INVERSE ANODE VOLTAGE				
	10000 max.	15000 max.	20000 max.	volts
ANODE CURRENT:				
Peak	20 max.	20 max.	10 max.	amp
Average**	5 max.	5 max.	2.5 max.	amp
Fault, for dura- tion of 0.1 second max.	• 100 max.	• 100 max.	• 100 max.	amp

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Filament Current	1	-	21	amp
Critical Anode Voltage	2	-	100	volts
Peak Tube Voltage Drop	3	-	17	volts

Note 1: With 5 volts rms on filament.

Note 2: With 4.75 volts rms on filament, and condensed-mercury temperature at 30°C.

Note 3: With 5 volts rms on filament, condensed-mercury temperature of 35°±5°C, peak anode current of 50 amperes provided by half-cycle pulse from a 60-cps sine wave and recurring approximately once a second. Tube drop is measured by an oscilloscope connected between anode and center tap of filament transformer.

* With filament volts = 4.75 and no heat-conserving enclosure.

• Filament voltage in phase with anode voltage.

•• Filament voltage out of phase (60° to 120°) with anode voltage.

** Averaged over any period of 30 seconds maximum.

OPERATING NOTES

X-Ray Warning. X-rays are produced when the 869-B is operated with a peak inverse anode voltage above 16000 volts (absolute value). These rays can constitute a health hazard unless the tube is adequately shielded for x-ray radiation.



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For Circuit Figures, see Front of this Section

CIRCUIT	MAX. TRANS. SEC. VOLTS (RMS)	APPROX. DC OUTPUT VOLTS TO FILTER	MAX. DC OUTPUT AMPERES	MAX. DC OUTPUT KW TO FILTER		
	E	E_{av}	I_{av}	P_{dc}		
Fig. 1 Half-Wave Single-Phase In-Phase Operation	14000 [□]	6300	2.5	16		
	10600 [▲]	4700	2.5	12		
	7000 [*]	3100	2.5	8		
Fig. 2 Full-Wave Single-Phase In-Phase Operation	7000 [□]	6300	5.0	32		
	5300 [▲]	4700	5.0	24		
	3500 [*]	3100	5.0	16		
Fig. 3 Series Single-Phase In-Phase Operation	14000 [□]	12700	5.0	64		
	10600 [▲]	9500	5.0	48		
	7000 [*]	6300	5.0	32		
Fig. 4 Half-Wave Three-Phase In-Phase Operation	8100 [□]	9500	7.5	72		
	6100 [▲]	7100	7.5	54		
	4000 [*]	4700	7.5	36		
Fig. 5 Parallel Three-Phase Quadrature Operation	8100 [□]	9500	15.0	143		
	6100 [▲]	7100	30.0	215		
	4000 [*]	4700	30.0	143		
Fig. 6 Series Three-Phase Quadrature Operation	8100 [□]	19000	7.5	143		
	6100 [▲]	14200	15.0	215		
	4000 [*]	9500	15.0	143		
Fig. 7 Half-Wave Four-Phase Quadrature Operation	7000 [□] 5300 [▲] 3500 [*]	9000 6700 4500	Resis- tive Load	Induc- tive Load	Resis- tive Load	Induc- tive Load
			9.0	10.0	81	90
			18.0	20.0	121	135
			18.0	20.0	81	90
Fig. 8 Half-Wave Six-Phase Quadrature Operation	7000 [□] 5300 [▲] 3500 [*]	9500 7100 4700	Resis- tive Load	Induc- tive Load	Resis- tive Load	Induc- tive Load
			9.5	10.0	91	96
			19.0	20.0	136	143
			19.0	20.0	91	96

□ For maximum peak inverse anode voltage of 20000 volts, and condensed mercury-temperature range of 30° to 40°C.

▲ For maximum peak inverse anode voltage of 15000 volts, and condensed mercury-temperature range of 30° to 50°C.

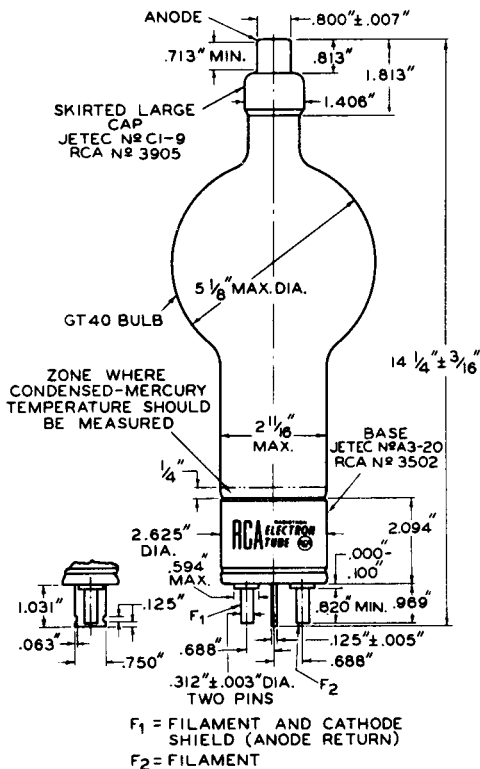
* For maximum peak inverse anode voltage of 10000 volts, and condensed mercury-temperature range of 30° to 60°C.

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92CM-4330R4

NOV. 1, 1952

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

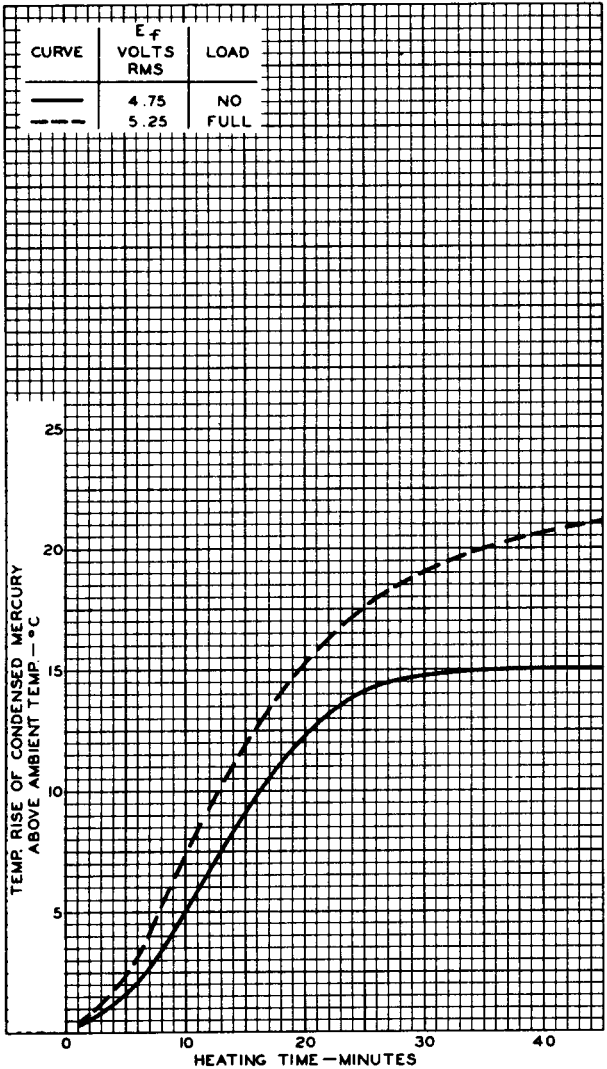
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RATE OF RISE OF COND.-MERCURY TEMPERATURE



APRIL 12, 1951

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7634