



872-A

872-A

## HALF-WAVE MERCURY-VAPOR RECTIFIER

## GENERAL DATA

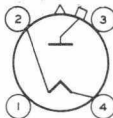
## Electrical:

|                                               | Min. | Av. | Max. |          |
|-----------------------------------------------|------|-----|------|----------|
| Filament, Coated:                             |      |     |      |          |
| Voltage. . . . .                              | 4.75 | 5   | 5.25 | ac volts |
| Current at 5 volts . . . . .                  | -    | 7.5 | 8    | amp      |
| Heating time at<br>rated voltage. . . . .     | 30   | -   | -    | sec      |
| Peak Tube Voltage<br>Drop (Approx.) . . . . . | -    | 10  | -    | volts    |

## Mechanical:

|                                              |                                                                 |
|----------------------------------------------|-----------------------------------------------------------------|
| Operating Position . . . . .                 | Vertical, base down                                             |
| Overall Length . . . . .                     | 8-1/4" $\pm$ 1/4"                                               |
| Maximum Diameter . . . . .                   | 2-5/16"                                                         |
| Weight (Approx.) . . . . .                   | 7 oz                                                            |
| Bulb . . . . .                               | T18                                                             |
| Cap. . . . .                                 | Medium (JETEC No.C1-5)                                          |
| Socket . . . . .                             | Johnson No.123-211, or equivalent                               |
| Base . . . . .                               | Medium-Metal-Shell Jumbo 4-Pin<br>with Bayonet (JETEC No.A4-29) |
| Basing Designation for BOTTOM VIEW . . . . . | 4AT                                                             |

Pin 1—No Con-  
nection  
Pin 2—Filament,  
Cathode  
Shield



Pin 3—No Con-  
nection  
Pin 4—Filament  
Cap—Anode

## 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* . . . . .   | 14 | °C |
| Full load† . . . . . | 19 | °C |

\* With 4.75 volts rms on filament, and no heat-conserving enclosure.

† With 5.25 volts rms on filament, average anode current = 1.25 amperes, and no heat-conserving enclosure.

← Indicates a change.

872-A



872-A

# HALF-WAVE MERCURY-VAPOR RECTIFIER

## HALF-WAVE RECTIFIER

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

Operating Condensed-Mercury-  
Temperature Range  
20° to 70° C      20° to 60° C

### PEAK INVERSE ANODE

VOLTAGE. . . . . 5000 max.      10000 max.      volts

### ANODE CURRENT:

Peak . . . . . 5 max.      5 max.      amp

Average# . . . . . 1.25 max.      1.25 max.      amp

Fault, for duration  
of 0.1 second maximum.      50 max.      50 max.      amp

• Operation at 40° ± 5° C is recommended.

# Averaged over any interval of 15 seconds maximum.

## OPERATING CONSIDERATIONS

Shields and rf filter circuits should be provided for the 872-A if it is subjected to extraneous high-frequency fields during operation. These fields tend to produce breakdown effects in mercury vapor and are detrimental to tube life and performance. When shields are used, special attention must be given to providing adequate ventilation and to maintaining normal condensed-mercury temperature. Rf filters are employed to prevent damage caused by rf currents which might otherwise be fed back into the rectifier tubes.

→ Indicates a change.



872-A

872-A

## HALF-WAVE MERCURY-VAPOR RECTIFIER

For Circuit Figures, see Front of this Section

| CIRCUIT                                                   | MAX.<br>TRANS.<br>SEC.<br>VOLTS<br>(RMS)<br>$E$ | APPROX.<br>DC<br>OUTPUT<br>VOLTS<br>TO FILTER<br>$E_{av}$ | MAX.<br>DC<br>OUTPUT<br>AMPERES<br>$I_{av}$ | MAX.<br>DC<br>OUTPUT<br>KW<br>TO FILTER<br>$P_{dc}$ |
|-----------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------|---------------------------------------------|-----------------------------------------------------|
| Fig. 1<br>Half-Wave<br>Single-Phase<br>In-Phase Operation | 7000 $\square$<br>3500 $\blacktriangle$         | 3200<br>1600                                              | 1.25<br>1.25                                | 4<br>2                                              |
| Fig. 2<br>Full-Wave<br>Single-Phase<br>In-Phase Operation | 3500 $\square$<br>1700 $\blacktriangle$         | 3200<br>1600                                              | 2.5<br>2.5                                  | 8<br>4                                              |
| Fig. 3<br>Series<br>Single-Phase<br>In-Phase Operation    | 7000 $\square$<br>3500 $\blacktriangle$         | 6400<br>3200                                              | 2.5<br>2.5                                  | 16<br>8                                             |
| Fig. 4<br>Half-Wave<br>Three-Phase<br>In-Phase Operation  | 4000 $\square$<br>2000 $\blacktriangle$         | 4800<br>2400                                              | 3.75<br>3.75                                | 18<br>9                                             |
| Fig. 5<br>Parallel<br>Three-Phase<br>Quadrature Operation | 4000 $\square$<br>2000 $\blacktriangle$         | 4800<br>2400                                              | 7.5<br>7.5                                  | 36<br>18                                            |
| Fig. 6<br>Series<br>Three-Phase<br>Quadrature Operation   | 4000 $\square$<br>2000 $\blacktriangle$         | 9600<br>4800                                              | 3.75<br>3.75                                | 36<br>18                                            |
| Fig. 7<br>Half-Wave<br>Four-Phase<br>Quadrature Operation | 3500 $\square$<br>1700 $\blacktriangle$         | 4500<br>2250                                              | Resis-<br>tive<br>Load<br>4.5<br>4.5        | Induc-<br>tive<br>Load<br>5<br>5                    |
| Fig. 8<br>Half-Wave<br>Six-Phase<br>Quadrature Operation  | 3500 $\square$<br>1700 $\blacktriangle$         | 4800<br>2400                                              | Resis-<br>tive<br>Load<br>4.75<br>4.75      | Induc-<br>tive<br>Load<br>5<br>5                    |

$\square$  For maximum peak inverse anode voltage of 10000 volts and condensed-mercury-temperature range of 20° to 60° C.

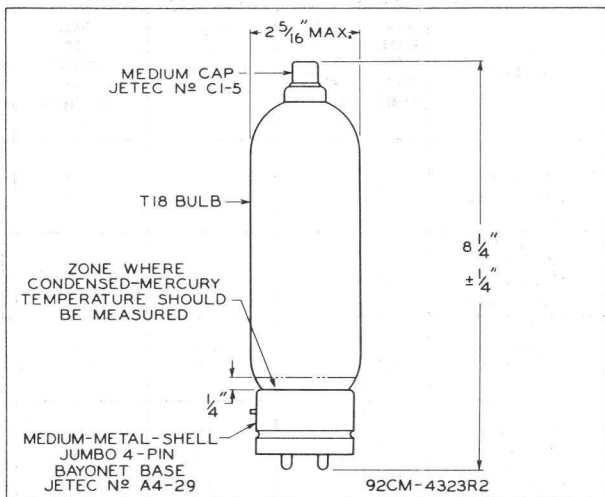
$\blacktriangle$  For maximum peak inverse anode voltage of 5000 volts and condensed-mercury-temperature range of 20° to 70° C.

872-A

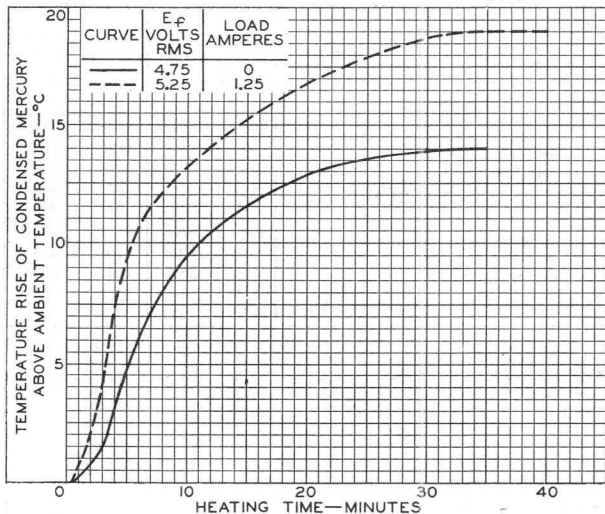


872-A

# HALF-WAVE MERCURY-VAPOR RECTIFIER



## RATE OF RISE OF CONDENSED-MERCURY TEMPERATURE



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CS-9029