WATER-COOLED, STEEL-JACKETED, MERCURY-POOL-CATHODE
TYPE HAVING MOUNTING PLATE FOR THERMOSTATIC CONTROL

For intermittent rectifier and frequency-changer welder service

GENERAL DATA

Electrical:
Cathode Excitation.............................................. Cyclic
Cathode-Spot Starting......................................... By Ignitor
Minimum Requirements for Cathode Excitation:
  Peak ignitor voltage required to fire............. 200 volts
  Peak ignitor current required to fire............ 30 amp
  Starting time at required voltage or current...... 100 µsec
Tube Voltage Drop:
  At peak anode current of 1500 amperes........... 25 volts

Mechanical:
Operating Position.............................................. Vertical, flexible lead up
Maximum Overall Length (Including flexible lead)........ 27-1/4"
Maximum Radius (Including water connections)........... 3-5/8"
Weight............................................................. 8.25 lbs

Terminal Connections (See Dimensional Outline):

P – Anode
  Terminal (Flexible lead)
K – Cathode
  Terminal (Bar opposite anode terminal)
I – Ignitor
  Terminal (Within jacket skirt at cathode end)

Cooling:
Type................................................................. Water
Minimum inlet water temperature............................. 10 °C
Maximum outlet water temperature............................ 35 °C
Minimum water flow............................................... 1.5 gpm
Maximum water-temperature rise.............................. 6 °C
Maximum pressure drop.......................................... 5 psi

INTERMITTENT RECTIFIER SERVICE
and
FREQUENCY-CHANGER WELDER SERVICE

Maximum Ratings, Absolute-Maximum Values:
For zero phase-control angle and frequencies from 50 to 60 cps

RATING I

PEAK ANODE VOLTAGE:
  Forward....................................................... 1200 max. volts
  Inverse....................................................... 1200 max. volts
## ANODE CURRENT:

<table>
<thead>
<tr>
<th>Category</th>
<th>Peak</th>
<th>Average (Averaged over any 6.25 seconds maximum)</th>
<th>Average (Averaged over any 0.2 seconds maximum)</th>
<th>Fault, for duration of 0.15 second maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak max.</td>
<td>420</td>
<td>70</td>
<td>70</td>
<td>18750</td>
</tr>
<tr>
<td>1500 max.</td>
<td></td>
<td>20</td>
<td>250</td>
<td>18750</td>
</tr>
</tbody>
</table>

## RATING II

<table>
<thead>
<tr>
<th>Category</th>
<th>Peak</th>
<th>Average (Averaged over any 6.25 seconds maximum)</th>
<th>Average (Averaged over any 0.2 seconds maximum)</th>
<th>Fault, for duration of 0.15 second maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANODE VOLTAGE</td>
<td>1500</td>
<td>1500</td>
<td>1500</td>
<td>15000</td>
</tr>
<tr>
<td>1500 max.</td>
<td></td>
<td>1500</td>
<td>1500</td>
<td>15000</td>
</tr>
</tbody>
</table>

## IGNITOR

### Maximum Ratings, Absolute-Maximum Values:

<table>
<thead>
<tr>
<th>Category</th>
<th>Peak</th>
<th>Average (Averaged over any interval of 5 seconds maximum)</th>
<th>RMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEAK IGNITOR VOLTAGE</td>
<td></td>
<td>Equal to anode volts</td>
<td>10 max.</td>
</tr>
<tr>
<td>Positive</td>
<td>5 max.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>100 max.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## OPERATING CONSIDERATIONS

The 5822-A is equipped with a mounting plate for mounting a thermostatic control calibrated either for controlling the flow of cooling water through the water jacket, or for protection of the ignitron against overheating.

When the cooling water is circulated successively through the water jackets of two or more ignitrons, the water-saving thermostat, if used, should be mounted on the ignitron connected directly to the water supply.

The water-saving thermostat, which has normally open contacts, is calibrated to close a circuit energizing a solenoid valve in the water-supply line and thus permit water...
flow to start when the temperature of the thermostat mounting plate exceeds approximately 350°C. Because of the lag between the heating of the igniton envelope and the functioning of the water-saving thermostat to start water flow through the water jackets, the igniton may overheat before the flow of cooling water starts.

Such overheating can be prevented by the use of an auxiliary contactor shunted across the contacts of the water-saving thermostat and actuated by the welding-control switch. The contactor causes the solenoid valve in the water-supply line to open as soon as welding current flows.

When a protective thermostat is used, it should be mounted on an igniton from which the cooling water discharges into the drain. The protective thermostat is calibrated to open a set of normally closed contacts at a jacket temperature of approximately 520°C. The opening of these contacts causes a protective device to function. This device may be a relay opening the ignitor firing controls, or preferably, a circuit breaker which removes power from the ignitrons.

Care must be taken to insure that the water jacket of each igniton is completely filled before power is applied. Tube operation with a partially filled water jacket may cause abnormal heating of the tube envelope with resultant arc-back which impairs tube life. It is also necessary to arrange the cooling system so as to prevent any draining of the water jackets when the flow of water ceases.
NOTE 1: MAY BE SLOTTED.
NOTE 2: DASHED POSITION AT MANUFACTURER'S OPTION.

RATING CHART
FREQUENCY-CHANGER WELDER SERVICE

<table>
<thead>
<tr>
<th>CURVE</th>
<th>PEAK ANODE VOLTS FORWARD OR INVERSE</th>
<th>MAXIMUM AVERAGING TIME—SECONDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1200</td>
<td>6.25</td>
</tr>
<tr>
<td>B</td>
<td>1500</td>
<td>6.25</td>
</tr>
</tbody>
</table>

Q.5-SECOND WELDING TIME
6.25-SECONDS WELDING TIME

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY