



5553-B

# 5553-B IGNITRON

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

*For resistance-welding control*

## 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  $\mu$ sec

### Tube Voltage Drop:

At peak anode current of 13600 amperes. . . . . 36 volts  
At peak anode current of 1115 amperes . . . . . 17 volts

### Mechanical:

Operating Position. . . . .Vertical, flexible lead up

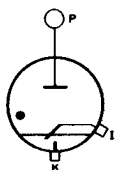
Maximum Overall Length (Including flexible lead). . . . . 31-3/8"

Maximum Radius (Including water connections). . . . . 4-11/16"

Weight. . . . . 21 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  $^{\circ}$ C  
Maximum outlet water temperature. . . . . 40  $^{\circ}$ C  
Minimum water flow. . . . . 3 gpm  
Maximum water-temperature rise. . . . . 9  $^{\circ}$ C  
Maximum pressure drop . . . . . 5.1 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 . . . . . 600 max. 600 max. volts  
Inverse . . . . . 600 max. 600 max. volts

5553-B



# 5553-B IGNITRON

## ANODE CURRENT:

|  |            |            |     |
|--|------------|------------|-----|
| Peak . . . . .   | 1140 max.  | 4000 max.  | amp |
| Average (Averaged over any interval of 6.25 seconds maximum) . . . . . | 190 max.   | 54 max.    | amp |
| Average (Averaged over any interval of 0.2 second maximum) . . . . .   | 190 max.   | 666 max.   | amp |
| Fault, for duration of 0.15 second maximum. . . . .                    | 50000 max. | 50000 max. | amp |

## RATING II

### PEAK ANODE VOLTAGE:

|                   |           |           |       |
|-------------------|-----------|-----------|-------|
| Forward . . . . . | 1200 max. | 1200 max. | volts |
| Inverse . . . . . | 1200 max. | 1200 max. | volts |

### ANODE CURRENT:

|  |            |            |     |
|--|------------|------------|-----|
| Peak . . . . .   | 840 max.   | 3000 max.  | amp |
| Average (Averaged over any interval of 6.25 seconds maximum) . . . . . | 140 max.   | 40 max.    | amp |
| Average (Averaged over any interval of 0.2 second maximum) . . . . .   | 140 max.   | 500 max.   | amp |
| Fault, for duration of 0.15 second maximum. . . . .                    | 37500 max. | 37500 max. | amp |

## RATING III

### PEAK ANODE VOLTAGE:

|                   |           |           |       |
|-------------------|-----------|-----------|-------|
| Forward . . . . . | 1500 max. | 1500 max. | volts |
| Inverse . . . . . | 1500 max. | 1500 max. | volts |

### ANODE CURRENT:

|  |            |            |     |
|--|------------|------------|-----|
| Peak . . . . .   | 672 max.   | 2400 max.  | amp |
| Average (Averaged over any interval of 6.25 seconds maximum) . . . . . | 112 max.   | 32 max.    | amp |
| Average (Averaged over any interval of 0.2 second maximum) . . . . .   | 112 max.   | 400 max.   | amp |
| Fault, for duration of 0.15 second maximum. . . . .                    | 30000 max. | 30000 max. | amp |

## RESISTANCE-WELDING-CONTROL SERVICE<sup>®</sup>

*Two Tubes in Inverse-Parallel Circuit*

### Maximum Ratings, Absolute-Maximum Values:

*For frequencies from 25 to 60 cps*

Ratings I-A and I-B Apply to Operation Either (1) Without Water-Saving Thermostat, or (2) With Water-Saving Thermostat Shunted by Auxiliary Contactor

### RATING I-A

|                               |           |           |       |
|-------------------------------|-----------|-----------|-------|
|                               | Column 1* | Column 2* |       |
| SUPPLY VOLTAGE (RMS). . . . . | 250 max.  | 250 max.  | volts |



5553-B

IGNITRON

5553-B

|  | Column<br>1* | Column<br>2* |     |
|--|--------------|--------------|-----|
| DEMAND POWER (During conduction) . . . . .                           | 800 max.     | 2400 max.    | kva |
| DUTY†. . . . .   | 24.6 max.    | 4.4 max.     | %   |
| ANODE CURRENT (Per tube):  |              |              |     |
| Peak. . . . .  | 4530 max.    | 13600 max.   | amp |
| Demand (RMS, during conduction)*. . . . .                            | 3200 max.    | 9600 max.    | amp |
| Average (Averaged over any interval of 11 seconds maximum)*. . . . . | 355 max.     | 192 max.     | amp |
| Fault, for duration of 0.15 second maximum. . . . .                  | 27000 max.   | 27000 max.   | amp |

RATING I-B

|   | Column<br>1* | Column<br>2* |       |
|---|--------------|--------------|-------|
| SUPPLY VOLTAGE (RMS). . . . .   | 600 max.     | 600 max.     | volts |
| DEMAND POWER (During conduction) . . . . .                            | 800 max.     | 2400 max.    | kva   |
| DUTY†. . . . .  | 59 max.      | 10.7 max.    | %     |
| ANODE CURRENT (Per tube):   |              |              |       |
| Peak. . . . .   | 1890 max.    | 5660 max.    | amp   |
| Demand (RMS, during conduction)*. . . . .                             | 1330 max.    | 4000 max.    | amp   |
| Average (Averaged over any interval of 4.6 seconds maximum)*. . . . . | 355 max.     | 192 max.     | amp   |
| Fault, for duration of 0.15 second maximum. . . . .                   | 11200 max.   | 11200 max.   | amp   |

Ratings II-A and II-B Apply to Operation with Water-Saving Thermostat Not Shunted by Auxiliary Contactor

RATING II-A

|  | Column<br>1* | Column<br>2* |       |
|--|--------------|--------------|-------|
| SUPPLY VOLTAGE (RMS). . . . .  | 250 max.     | 250 max.     | volts |
| DEMAND POWER (During conduction) . . . . .                             | 800 max.     | 2400 max.    | kva   |
| DUTY†. . . . .   | 12.2 max.    | 2.2 max.     | %     |
| ANODE CURRENT (Per tube):  |              |              |       |
| Peak. . . . .  | 4530 max.    | 13600 max.   | amp   |
| Demand (RMS, during conduction)*. . . . .                              | 3200 max.    | 9600 max.    | amp   |
| Average (Averaged over any interval of 22.4 seconds maximum)*. . . . . | 175 max.     | 96 max.      | amp   |
| Fault, for duration of 0.15 second maximum. . . . .                    | 27000 max.   | 27000 max.   | amp   |

⊙, ●, †, \*, #: See next page.



# 5553-B IGNITRON

## RATING II-B

|  | Column<br>1* | Column<br>2* |       |
|--|--------------|--------------|-------|
| SUPPLY VOLTAGE (RMS) . . . . .   | 600 max.     | 600 max.     | volts |
| DEMAND POWER (During<br>conduction) . . . . .                                  | 800 max.     | 2400 max.    | kva   |
| DUTY† . . . . .  | 29 max.      | 5.3 max.     | %     |
| ANODE CURRENT (Per tube):  |              |              |       |
| Peak . . . . .   | 1890 max.    | 5660 max.    | amp   |
| Demand (RMS, during<br>conduction)* . . . . .                                  | 1330 max.    | 4000 max.    | amp   |
| Average (Averaged over any<br>interval of 9.4 sec-<br>onds maximum)* . . . . . | 175 max.     | 96 max.      | amp   |
| Fault, for duration of 0.15<br>second maximum . . . . .                        | 11200 max.   | 11200 max.   | amp   |

## IGNITOR

### Maximum Ratings, Absolute-Maximum Values:

#### PEAK IGNITOR VOLTAGE:

|                    |                |       |
|--------------------|----------------|-------|
| Positive . . . . . | Equal to anode | volts |
| Negative . . . . . | 5 max.         | volts |

#### IGNITOR CURRENT:

|  |          |     |
|--|----------|-----|
| Peak . . . . .   | 100 max. | amp |
| Average (Averaged over any interval<br>of 5 seconds maximum) . . . . . | 1 max.   | amp |
| RMS . . . . .  | 10 max.  | amp |

\* RMS voltage, current, and demand kva are on the basis of full-cycle conduction (no phase delay) regardless of whether or not phase control is used.

† Defined as (cycles "on")/(cycles "on" + cycles "off") during the specified averaging time.

‡ For supply voltages between 250 volts and 600 volts, duty is proportional to supply voltage. For supply voltages lower than 250 volts, the values for 250 volts apply.

\* Column 1 represents operation at maximum average anode current; Column 2 represents operation at maximum demand power.

\* For supply voltages between 250 volts and 600 volts, demand anode current and averaging time are each inversely proportional to supply voltage. For supply voltages lower than 250 volts, the values for 250 volts apply.

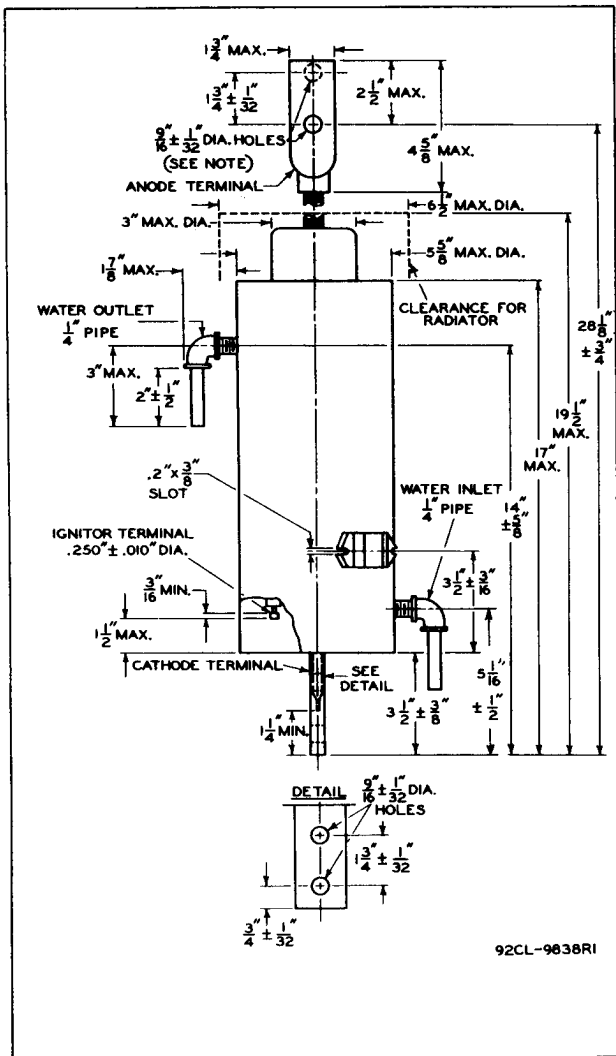
**OPERATING CONSIDERATIONS**  
for the 5553-B are the same as  
those shown for Type 5551-A



5553-B

IGNITRON

5553-B



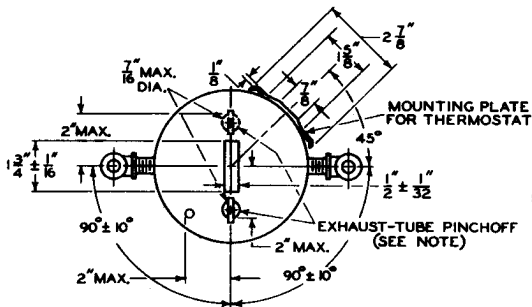
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5553-B



# 5553-B IGNITRON

BOTTOM VIEW



NOTE: DASHED POSITION AT MANUFACTURER'S OPTION.

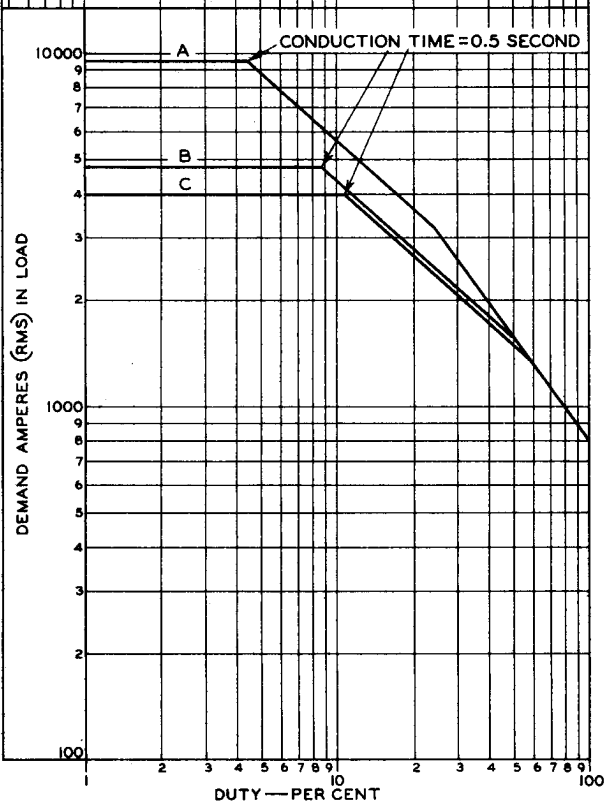


5553-B

# 5553-B RATING CHART RESISTANCE-WELDING-CONTROL SERVICE

TWO TUBES CONNECTED IN INVERSE PARALLEL.  
NO WATER-SAVING THERMOSTAT, OR WATER-SAVING THERMOSTAT SHUNTED BY AUXILIARY CONTACTOR.  
PROTECTIVE THERMOSTAT OPTIONAL.

| CURVE | RMS ANODE-SUPPLY VOLTS | MAXIMUM AVERAGING TIME—SECONDS |
|-------|------------------------|--------------------------------|
| A     | 250                    | 11                             |
| B     | 500                    | 9.2                            |
| C     | 600                    | 4.6                            |



ELECTRON TUBE DIVISION

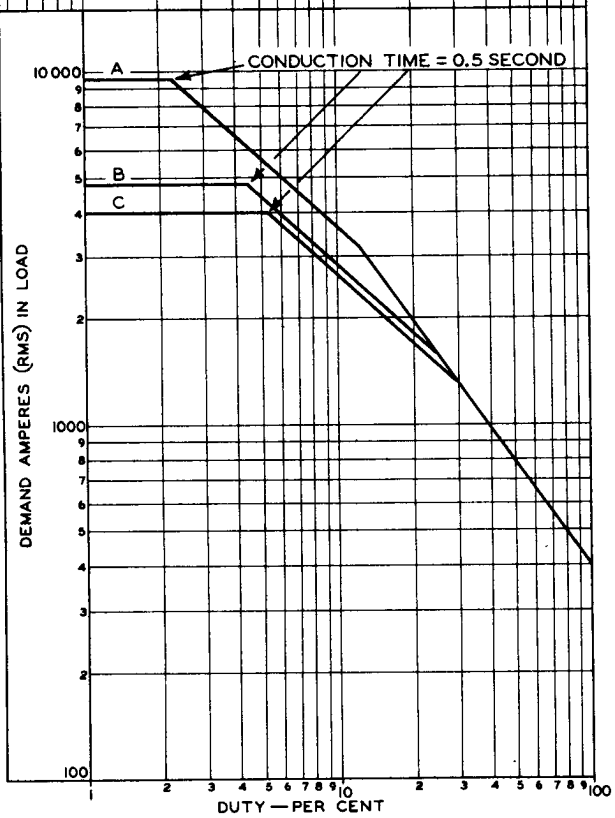
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5553-B



**5553-B**  
**RATING CHART**  
**RESISTANCE-WELDING-CONTROL SERVICE**

| TWO TUBES CONNECTED IN INVERSE PARALLEL.<br>WATER-SAVING THERMOSTAT WITHOUT<br>AUXILIARY CONTACTOR.<br>PROTECTIVE THERMOSTAT OPTIONAL. |                        |                                |
|--|------------------------|--------------------------------|
| CURVE  | RMS ANODE-SUPPLY VOLTS | MAXIMUM AVERAGING TIME-SECONDS |
| A  | 250                    | 22.4                           |
| B  | 500                    | 18.8                           |
| C  | 600                    | 9.4                            |





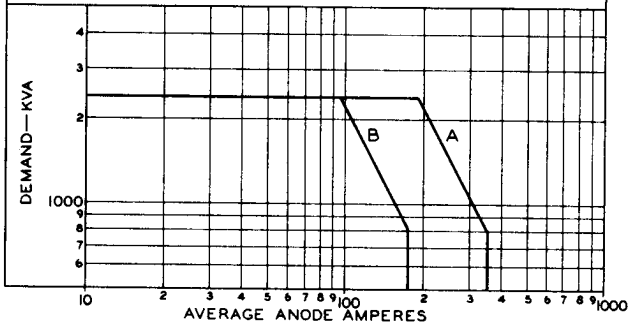


5553-B

5553-B

**RATING CHARTS**  
**RESISTANCE-WELDING-CONTROL SERVICE**

TWO TUBES CONNECTED IN INVERSE PARALLEL.  
RMS ANODE-SUPPLY VOLTS = 250 TO 600  
CURVE A: NO WATER-SAVING THERMOSTAT, OR WATER-SAVING THERMOSTAT SHUNTED BY AUXILIARY CONTACTOR.  
CURVE B: WATER-SAVING THERMOSTAT WITHOUT AUXILIARY CONTACTOR.



92CS-9825

**FREQUENCY-CHANGER WELDER SERVICE**

| CURVE | PEAK ANODE VOLTS FORWARD OR INVERSE | MAXIMUM AVERAGING TIME—SECONDS |
|-------|-------------------------------------|--------------------------------|
| A     | 600                                 | 6.25                           |
| B     | 1200                                | 6.25                           |
| C     | 1500                                | 6.25                           |

