# NL-1051 IGNITRON


## Size B
## 56 Amperes dc

**National Ignitron NL-1051** is a metal, water-cooled, mercury pool tube designed especially for welder control and similar AC control applications. Its rating is approximately equivalent to a 300 ampere magnetic contactor. **NL-1051** utilizes a thermostat mount brazed to an all-copper cooling system that provides exceptional cooling efficiency. The inner can, copper cooling coil, and thermostat mount being brazed together in a single unit assures a rugged, dependable, and adjustment free temperature control system that operates directly on inner can temperature.

## TECHNICAL INFORMATION

**AC Control Applications** — Ratings are based on full-cycle conduction (no phase delay) regardless of whether or not phase control is used, on frequencies from 25 to 60 cycles, and any voltage between 250 and 600 volts rms. Ratings are for two tubes in inverse parallel.

| | |
|---|---|
| [1]Maximum demand — kva | 600 |
| [1]Corresponding maximum average anode current per tube — amps DC | 30.2 |
| [1]Maximum average anode current per tube — amps DC | 56 |
| [1]Corresponding maximum demand — kva | 200 |

| | |
|---|---|
| [1]Maximum averaging time — seconds | |
| at 600 volts rms | 11.25 |
| at 250 volts rms | 27 |
| Maximum surge current — peak amps | 280% of max. rms. demand current |

**[2]Rectifier Applications**— Ratings are based on intermittent duty, on no phase delay, and on frequencies from 50 to 60 cycles. When phase control is used, current ratings are reduced as per phase control current rating curve. Values are for one tube.

| | | | |
|---|---|---|---|
| Maximum peak anode voltage — volts | 500 | 1200 | 1500 |
| Maximum peak anode current — amps | 700 | 600 | 480 |
| Corresponding average current—amps DC | — | 5 | 4 |
| Maximum average anode current — amps DC | 40 | 22.5 | 18 |
| Corresponding peak current — amps | — | 135 | 108 |

| | | | |
|---|---|---|---|
| Maximum averaging time, sec. | 6 | 10 | 10 |
| Max. ratio of average to peak current, maximum averaging time 0.2 seconds | — | .166 | .166 |
| Ratio of fault to max. peak current | 12.5 | 12.5 | 12.5 |
| Maximum duration time of surge current — sec. | .15 | .15 | .15 |

**Ignition Requirements** — (Same for both applications.)

**Ignitor Voltage**

| | |
|---|---|
| Maximum instantaneous allowed, ignitor positive | anode voltage |
| [3]Maximum instantaneous required, ignitor positive — volts | 200 |
| Maximum instantaneous allowed, ignitor negative — volts | 5 |

**Ignitor Current**

| | |
|---|---|
| Maximum instantaneous allowed — amperes | 100 |
| [3]Maximum instantaneous required — amperes | 30 |
| Maximum rms allowed — amperes | 10 |
| Maximum average allowed — ampere | 1 |
| [3]Ignitor ignition time maximum — microseconds | 100 |
| Ignitor current max. averaging time — seconds | 5 |

**Cooling Requirements** — (Same for both applications.)

| | |
|---|---|
| Type of cooling | Water |
| Minimum inlet water temperature, °C | 0 |
| Maximum cooling system temperature (measured at thermostat mount). °C | |
| Rectifier applications | 45 |
| AC control applications | |
| At 600 volts rms | 45 |
| At 500 volts rms | 50 |
| At 250 volts rms | 55 |

Water flow may be reduced at light loads if cooling system temperature (measured at thermostat mount) is maintained within limits.

Typical cooling requirements at 500 volts rms operation for AC control applications.

| Inlet Water Temp. °C | 100% Load Water flow required G.P.M. | 100% Load Pressure drop per tube lbs. per sq. in. | 50% Load Water flow required G.P.M. | 50% Load Pressure drop per tube lbs. per sq. in. |
|---|---|---|---|---|
| 15 | 1/4 | .4 | 1/16 | .1 |
| 30 | 1/2 | .75 | 1/8 | .2 |
| 40 | 1-1/2 | 3.0 | 1/4 | .4 |

More water is required at 600 volts to maintain cooling system temperature within limits and less at 250 volts.

| | |
|---|---|
| Water temperature rise at 1 G.P.M., full load, °C | 2 |
| Approximate temperature rise inlet water to thermostat, °C | 4 |

## GENERAL CHARACTERISTICS

| | |
|---|---|
| Number of Anodes | 1 |
| Number of Ignitors | 1 |
| Mounting Position | Vertical |
| Peak arc drop at 3400 peak amps — approx. volts | 26 |
| Peak arc drop at 176 peak amps. — approx. volts | 13 |
| Net weight — lbs. | 4½ |
| Approx. shipping weight — lbs. | 7 |

[1]Using log-log paper, straight line interpolation of RMS Demand Current vs. Average Anode Current and Maximum Averaging Time vs. Anode Voltage may be used to determine intermediate ratings.

[2]Using log-log paper, straight line interpolation of Peak Anode Current vs. Average Anode Current may be used to determine intermediate ratings. See curves for details.

[3]Ignition will occur if either maximum required instantaneous potential is applied or maximum required instantaneous current flows for the rated maximum ignitor ignition time.

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GENEVA, ILLINOIS, U. S. A.

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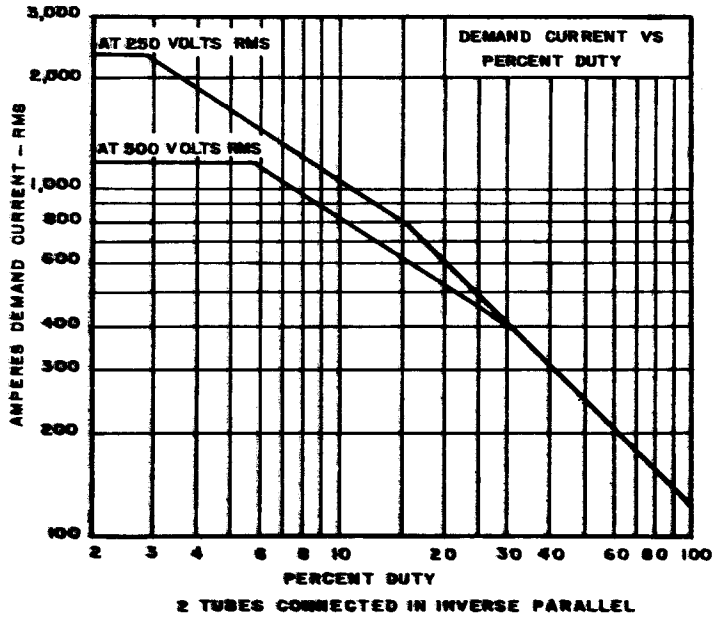


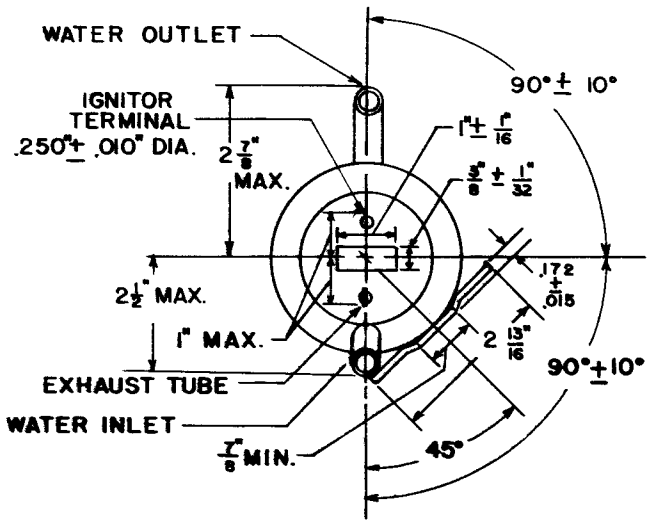


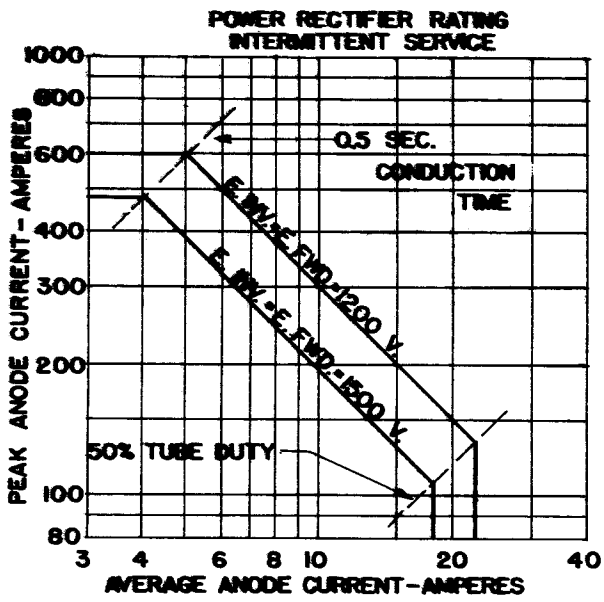


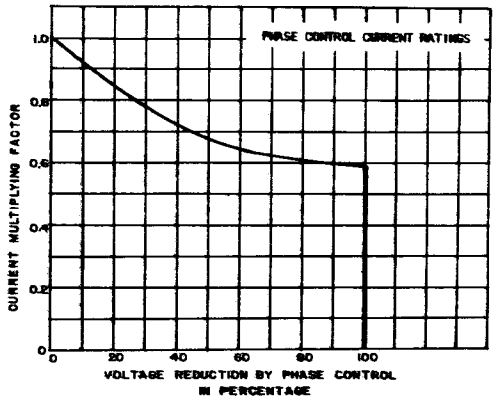


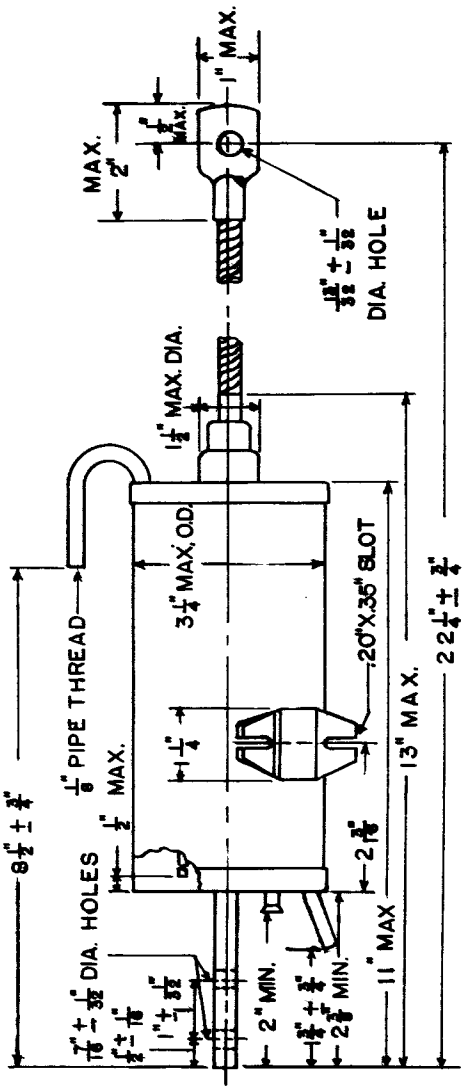



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