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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NATIONAL ELECTRONICS, INC.
GENEVA, ILLINOIS, U. S. A.

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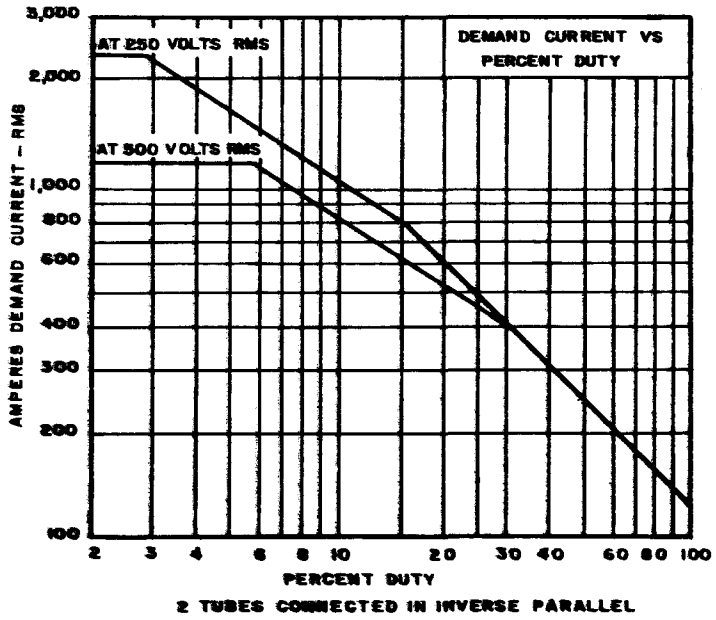

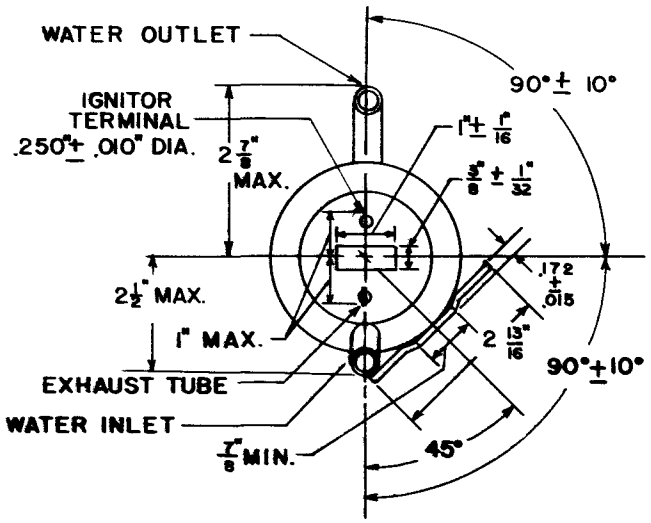

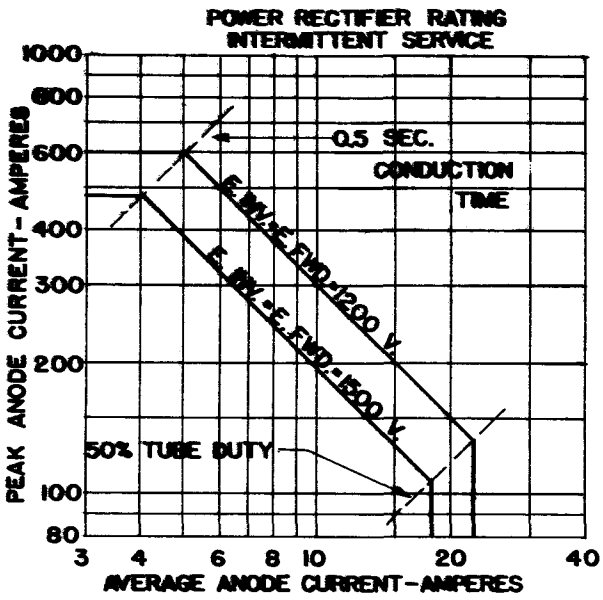

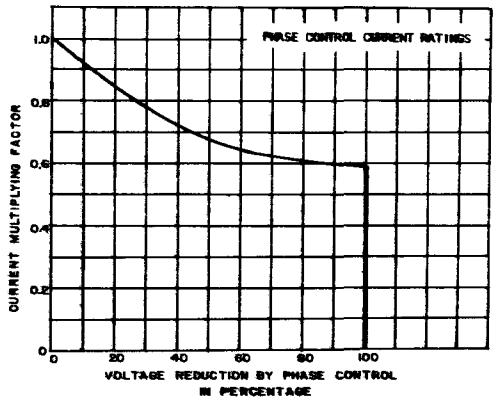

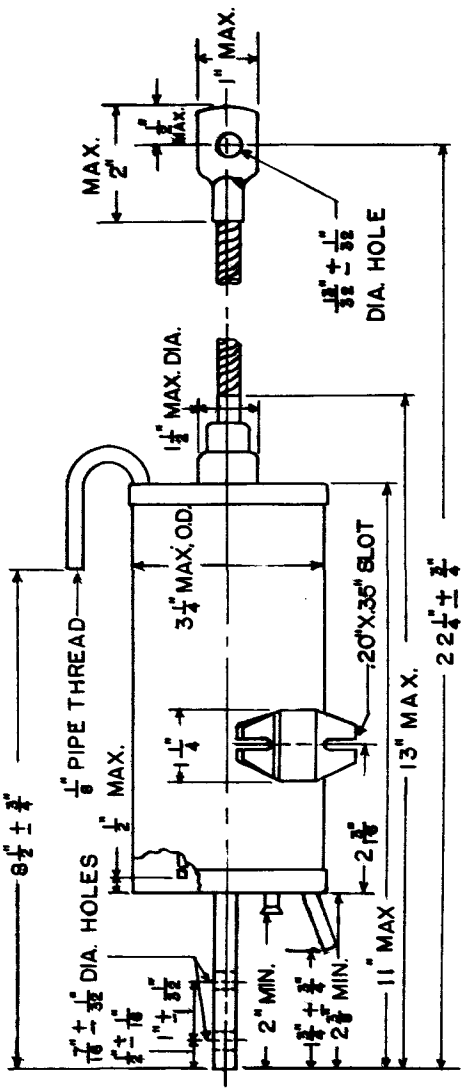

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