

DESCRIPTION AND RATING

TEMPERATURE-CONTROLLED IGNITRON GL-6511

The GL-6511 ignitron is a sealed, stainless-steel jacketed, water-cooled mercury-pool tube for control of frequency-changer resistance welders. This method of resistance welding converts three-phase 60-cycle power to single-phase power at four to twelve cycles per second. A particular advantage of this method is the appreciable reduction of kilovolt-ampere demand from that required in single-phase welding, with consequent saving in the amount of power required. In addition, the three-phase circuit balances the power load and makes possible improved results in welding aluminum, magnesium, and their alloys.

This tube is identical in ratings and characteristics to the GL-5822. Mechanically, it has the additional feature of an integral temperature-control device with protective features. The control includes a switch which operates a solenoid valve in the water-supply line to the tube in response to increasing and decreasing tube temperature, thus maintaining the amount of cooling water to the minimum required by the operating conditions. It also includes an over-temperature switch which may be used to remove power from the ignitron when its temperature exceeds a safe value.

This new construction prevents excessive condensation over the external parts of the tube under conditions of high humidity. Another advantage is the appreciable saving in maintenance costs over tubes of the old design since this control feature, in addition to greatly reducing the amount of water required, eliminates the necessity for such safety devices as water-flow relays, water over-temperature relays, and water-pressure interlocks required with the older design tubes. In applications where the cooling water flows through three tubes in series, this tube can be used with the GL-5822 since the GL-6511, in the position nearer the water drain where it receives the warmer water, can control the flow to all under normal conditions.

TECHNICAL INFORMATION

GENERAL

Electrical

Cathode Excitation - Cyclic		
Cathode Spot Starting - Ignitor		
Number of Electrodes		
Main Anodes	1	
Main Cathodes	1	
Ignitors	1	
Arc Drop at 1500 Peak Amperes	25	Volts
Cathode Excitation Requirements		
Ignitor Voltage Required to Fire	200	Volts
Ignitor Current Required to Fire	30	Amperes
Starting Time at Required Voltage or Current	100	Microseconds

Mechanical

Envelope Material - Stainless Steel		
Net Weight	8.4	Pounds

G E N E R A L E L E C T R I C C O M P A N Y

Thermal

Type of Cooling - Water

Inlet Water Temperature, minimum	10	C
Inlet Water Temperature, maximum	30	C
Water Flow, minimum		
At No Load	0.5	Gallons per Minute
At Continuous Rated Average Current	1.5	Gallons per Minute
Characteristics for Water Cooling at Rated Minimum Flow		
Water Temperature Rise, maximum	6	C
Pressure Drop at 1.5 Gallons per Minute, maximum	5	Pounds per Square Inch

MAXIMUM RATINGS AND TYPICAL OPERATION

Maximum Peak Anode Voltage			
Inverse	1200	1500	Volts
Forward	1200	1500	Volts
Maximum Anode Current*			
Peak	1500	1200	Amperes
Corresponding Average	20	16	Amperes
Average	70	56	Amperes
Corresponding Peak	420	336	Amperes
Maximum Averaging Time	6.25	6.25	Seconds
Ratio of Average to Peak Current	0.166	0.166	
Maximum Averaging Time	0.2	0.2	Seconds
Ratio of Fault to Peak Current	12.5	1.25	
Maximum Duration of Fault Current	0.15	0.15	Seconds
Frequency Range	50-60	50-60	Cycles per Second

Ignitor

Maximum Voltage			
Positive - Anode Voltage			
Negative		5	Volts
Maximum Current			
Peak		100	Amperes
Root Mean Square		10	Amperes
Average		1	Amperes
Maximum Averaging Time		5	Seconds

Temperature-Control-Switch Ratings †

Maximum Voltage	575	Volts
Maximum Current		
Over-Temperature Switch	6	Amperes
Water-Control Switch	1.5	Amperes

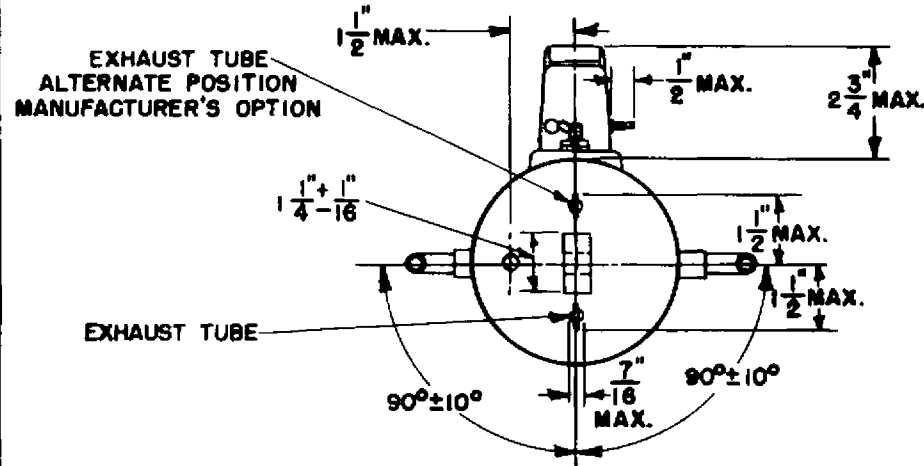
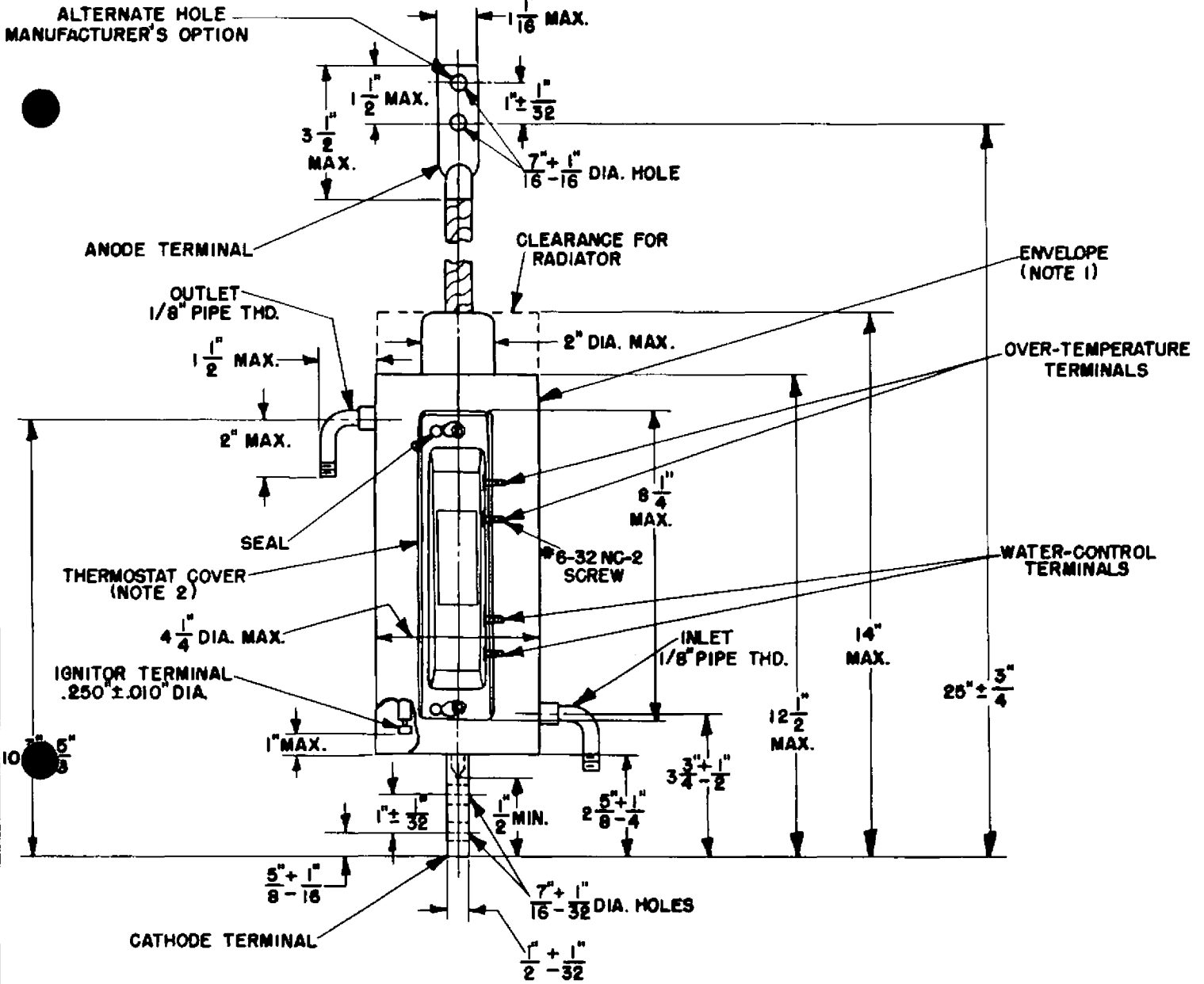
Temperature-Control-Switch Ratings † (Cont'd)

Maximum Peak Potential of Tube Water Cylinder (Above Switch Circuit)	1500	Volts
Switch-Contact Arrangement		
Over-Temperature-Switch - Normally Closed (Contacts Open on Temperature Rise)		
Water-Control Switch - Normally Open (Contacts Close on Temperature Rise)		

- * Straight line interpolation on log-log paper is allowed between corresponding points. Ratings are for zero phase-control angle.
- † Suitable fuses should be provided in the switch circuits to prevent a power arc, should a ground occur in the switch or wiring.

November 11, 1954

TUBE DEPARTMENT
GENERAL ELECTRIC COMPANY
SCHENECTADY 5, NEW YORK



OUTLINE GL-6511

- NOTES:
1. ENVELOPE IS AT CATHODE POTENTIAL.
 2. THERMOSTAT COVER IS AN ELECTRICAL INSULATOR.

7 45
5 15
9'

MADE BY: *A. Lath...* Nov. 3-1951... ASSIGNED & INSPECTED BY: *Nov. 3, 51...* VN-7274

GENERAL ELECTRIC
ELECTRONICS DIVISION

TUBE DEPARTMENT

K-69087-72A674

SHEET No.....CONT. ON SHEET.....

PRINTS TO

REVISIONS

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