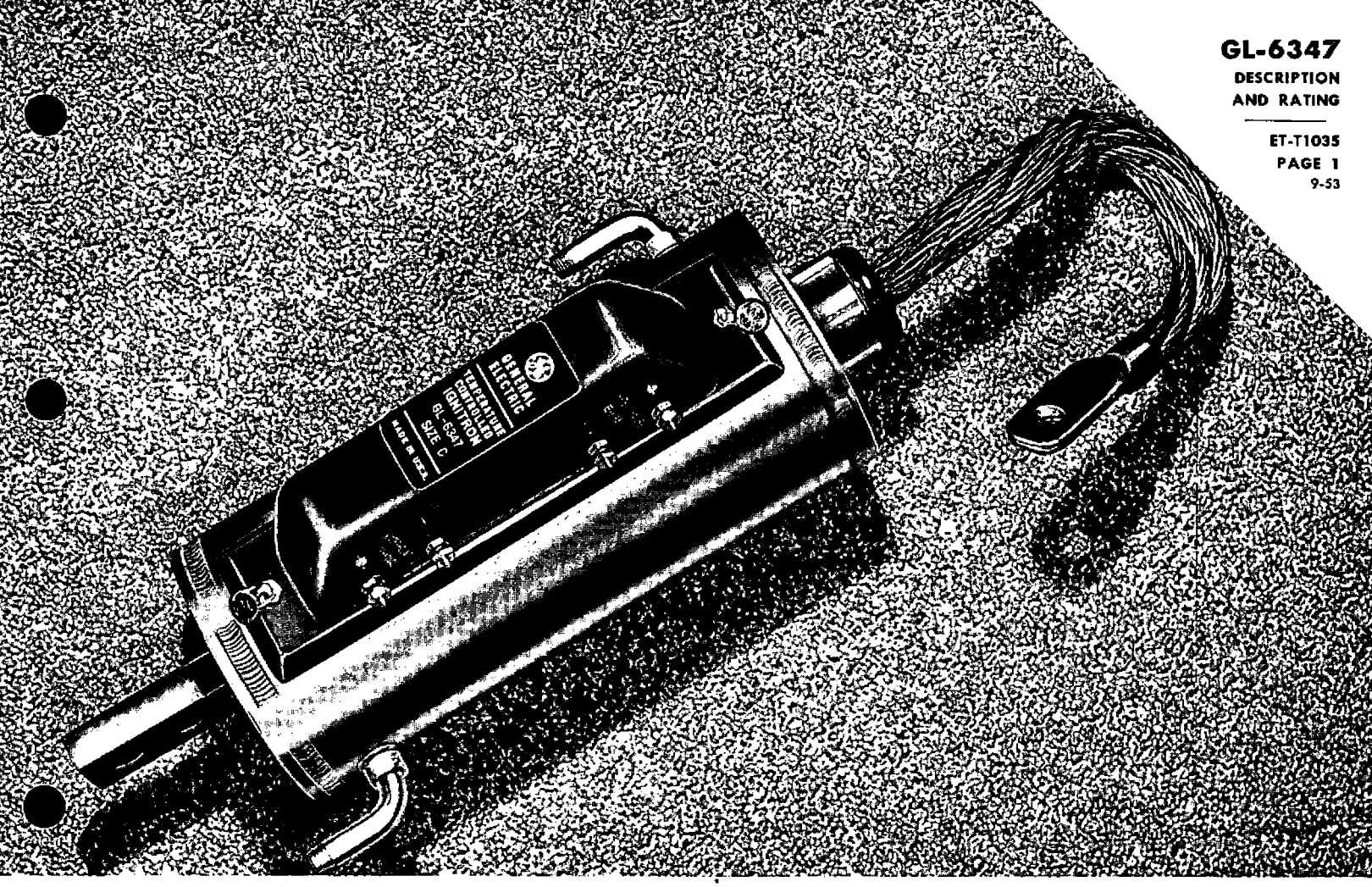


IGNITRON

Temperature Controlled

The GL-6347 ignitron is a sealed, stainless-steel-jacketed, water-cooled, mercury-pool tube especially suited to resistance-welding-control service. In this service two tubes in the inverse-parallel connection will control 1200 kilovolt-amperes at voltages of 250 to 600 volts over the frequency range of 25 to 60 cycles. The ability of this tube to carry very high peak currents for short periods makes it especially suited to such service.

Ease of installation, economical use of space, and reliability of operation are assured by design and construction features inherent in the steel-jacketed construction.

This tube is identical in ratings and characteristics to the GL-5552/FG-235-A. 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. An over-temperature switch is included to remove power from the ignitron when its temperature exceeds a safe value. In applications where the cooling water flows through two tubes in series, this tube can be used with the GL-5552/FG-235-A since the GL-6347, in the position nearer the water drain where it receives the warmer water, can control the flow to both under normal conditions.

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. The GL-6347 ignitron is equivalent to a 600-ampere magnetic contactor.

from RTMA release #1242,
Sept. 25, 1953

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 6800 peak amperes	28	volts
Arc drop at 440 peak amperes	14	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—metal

Net weight	8	pounds

Thermal

Type of cooling—water

Inlet water temperature, minimum	10	C
Inlet water temperature, maximum	30	C
Water flow, minimum, solenoid water valve open	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	4.5	pounds per square inch

MAXIMUM RATINGS AND TYPICAL OPERATION

Power-rectifier service, intermittent duty

Ratings are for zero phase-control angle—see curve for details.

Maximum peak anode voltage		
Inverse	500	volts
Forward	500	volts
Maximum anode current		
Peak	1600	amperes
Average	100	amperes
Maximum averaging time	6	seconds
Fault	6000	amperes
Maximum duration of fault current	0.15	second
Frequency range	25–60	cycles per second

Resistance-welding-control service*

Two tubes in inverse parallel, ratings per tube

Voltage range	250 to 600	volts rms
Maximum demand	1200	kilovolt-amperes
Average current at maximum demand	75.6	amperes
Maximum average current	140	amperes
Demand at maximum average current	400	kilovolt-amperes
Maximum averaging time at 600 volts rms	5.8	seconds
Maximum averaging time at 250 volts rms	14.0	seconds
Maximum peak fault current at 250 volts	13450	amperes
Maximum peak fault current at 600 volts	5600	amperes

TECHNICAL INFORMATION (CONT'D)

MAXIMUM RATING AND TYPICAL OPERATION (Cont'd)

Ignitor

Maximum voltage
Positive—anode voltage
Negative . . . . . 5 volts
Maximum current
Peak . . . . . 100 amperes
Root mean square . . . . . 10 amperes
Average . . . . . 1 ampere
Maximum averaging time . . . . . 5 seconds

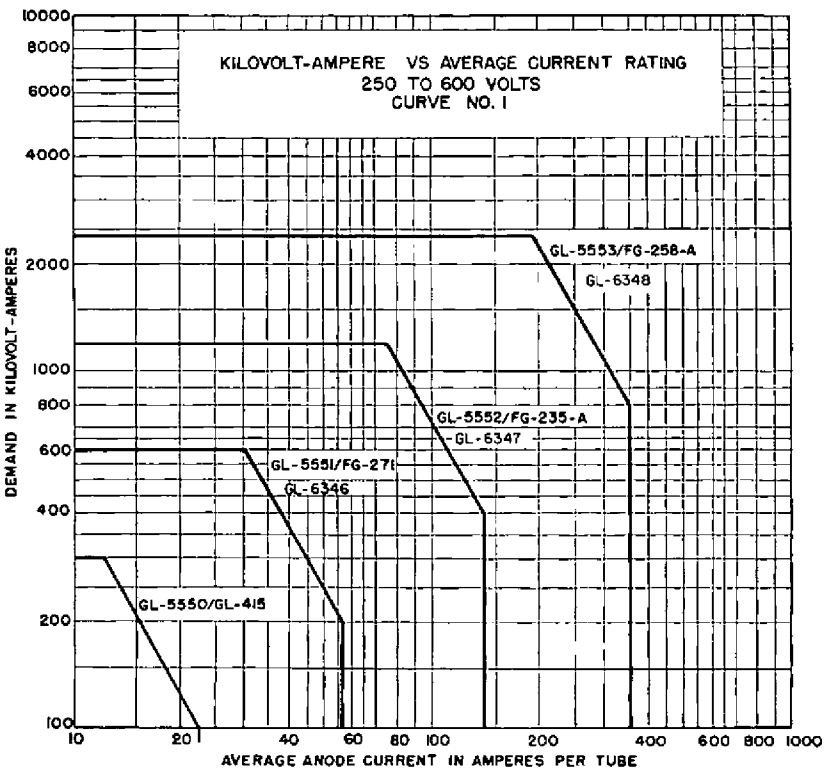
Temperature-control-switch ratings†

Maximum voltage . . . . . 575 volts
Maximum current . . . . . 3 amperes
Maximum potential of tube water cylinder
Above ground . . . . . 1500 volts peak
Switch-contact arrangement
Over-temperature switch—normally closed
(Contacts open on temperature rise)
Water-control switch—normally open
(Contacts close on temperature rise)

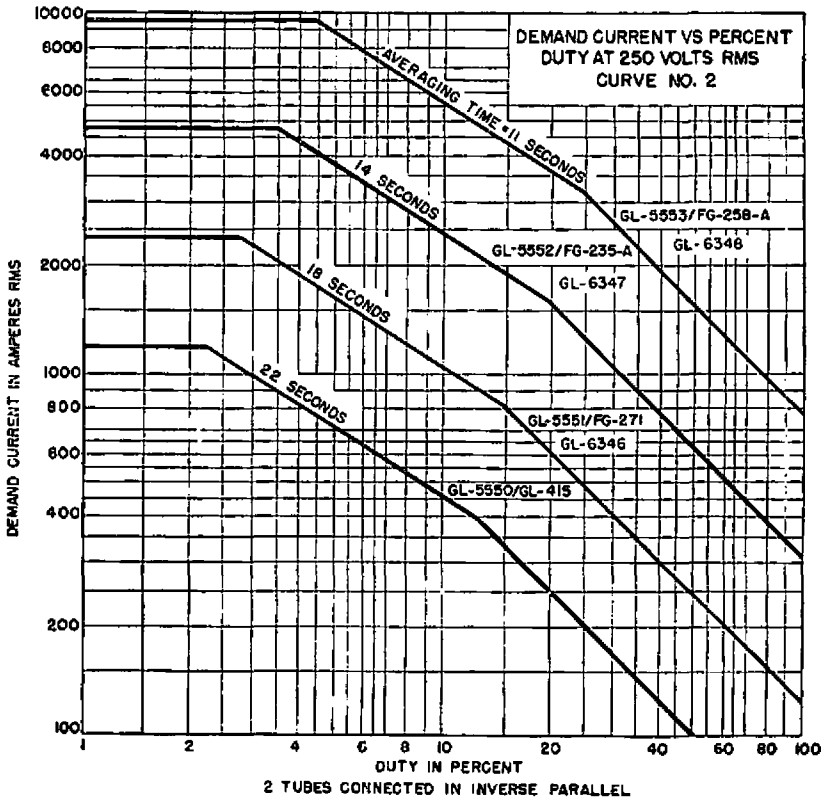
* RMS demand voltage, current, and kilovolt-ampere demand are all on the basis of full-cycle conduction (no phase delay) regardless of whether or not phase control is used. For voltages below the minimum, the minimum-voltage current rating applies. With the use of log-log paper straight-line interpolation between tabulated points may be used for other detailed ratings of: Demand kva vs average anode current. Maximum averaging time vs anode voltage.

† Suitable fuses should be provided in the switch circuits to prevent a power arc should a ground occur in the switch or wiring.

CURVES K-69087-72A217, K-69087-72A218, AND K-69087-72A219
DO NOT APPLY FOR INTERMITTENT-RECTIFIER SERVICE



K-69087-72A217 8-21-53



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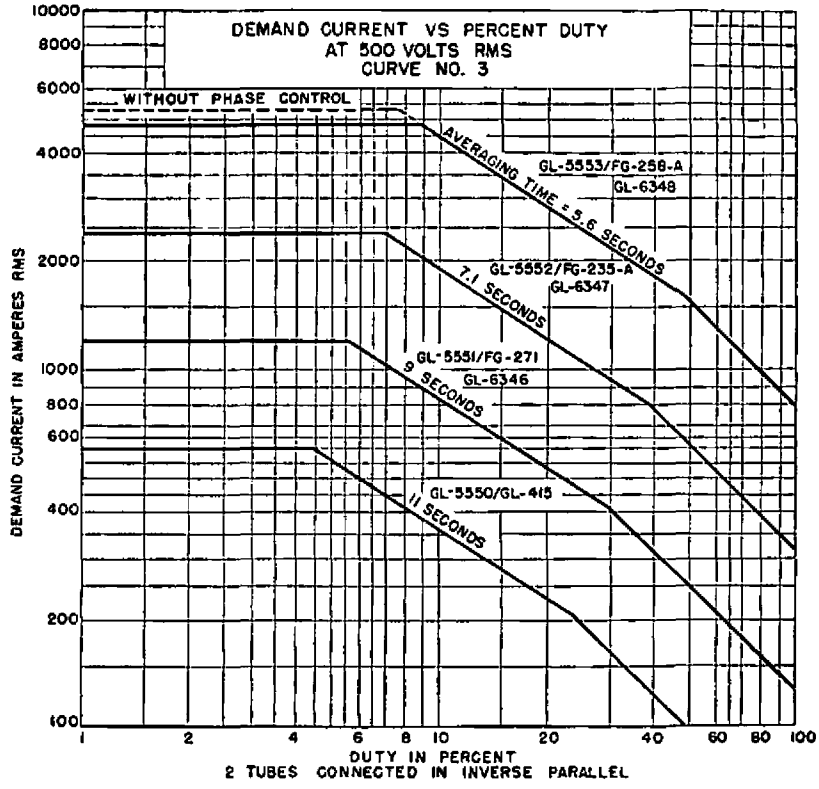

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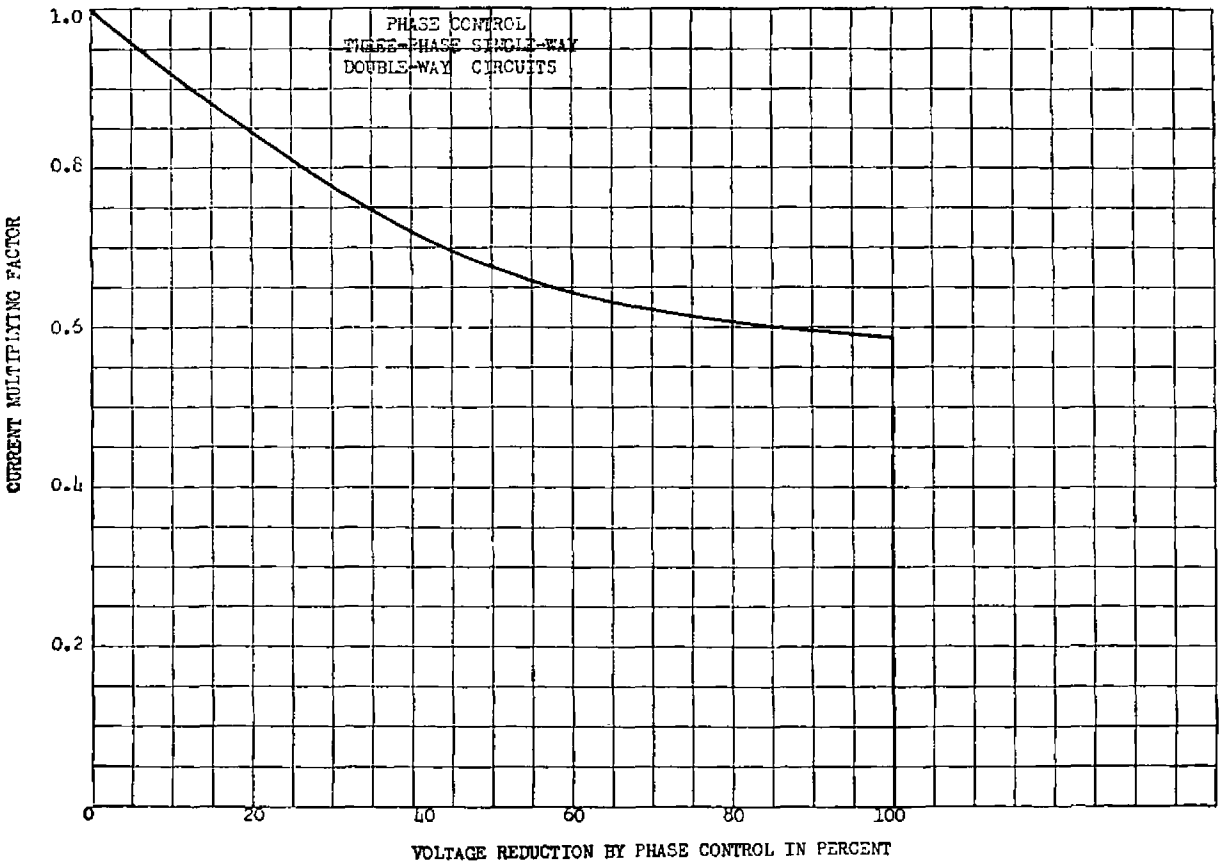

K-69087-72A513

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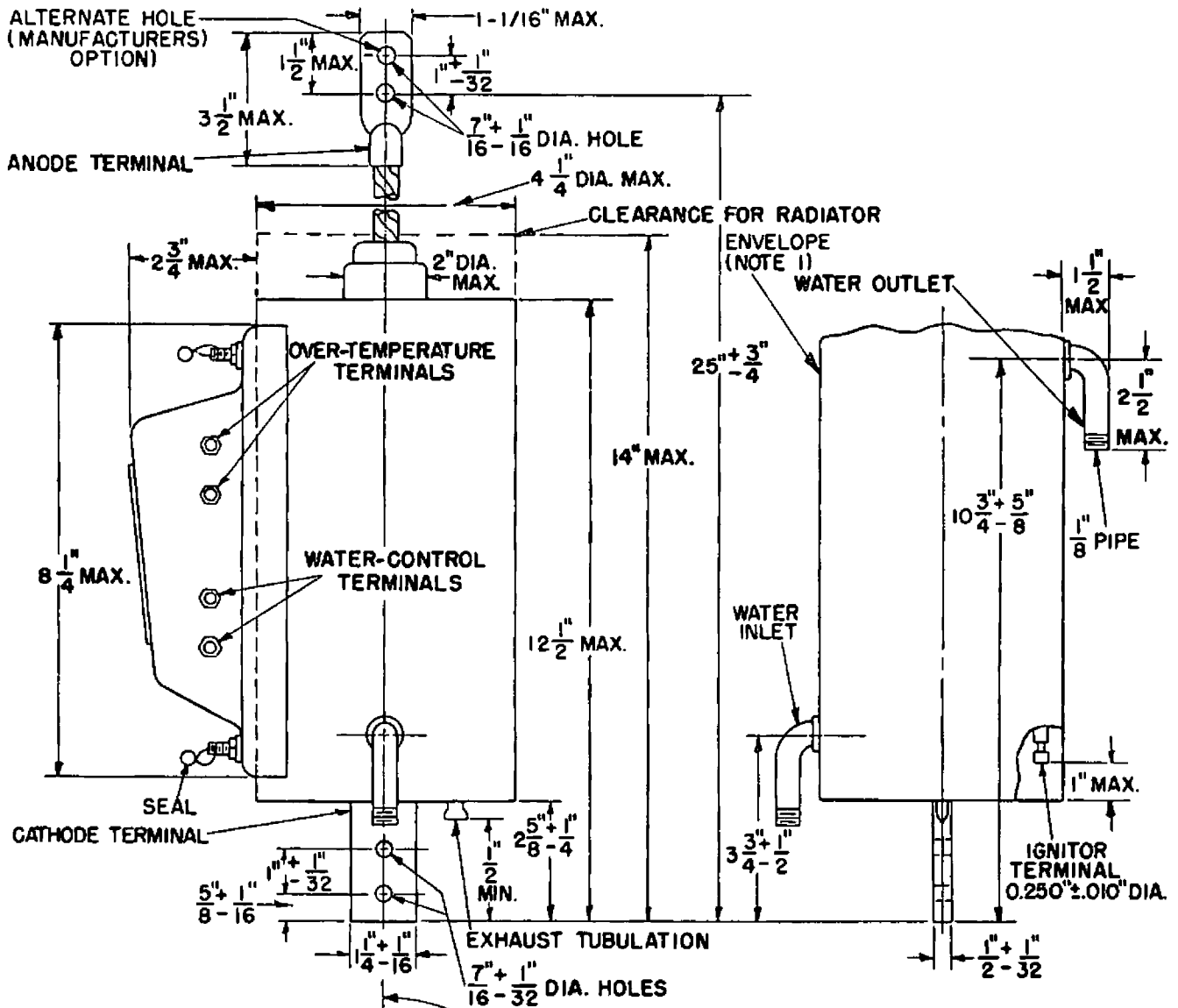

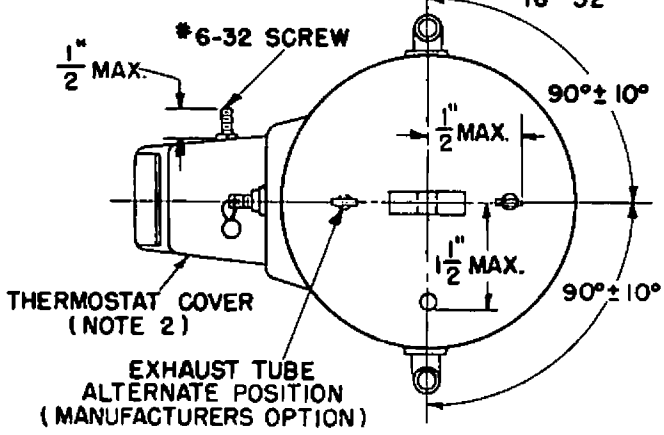

NOTES:

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

N-22017AZ

8-21-53

TUBE DEPARTMENT

GENERAL ELECTRIC

Schenectady 5, N. Y.