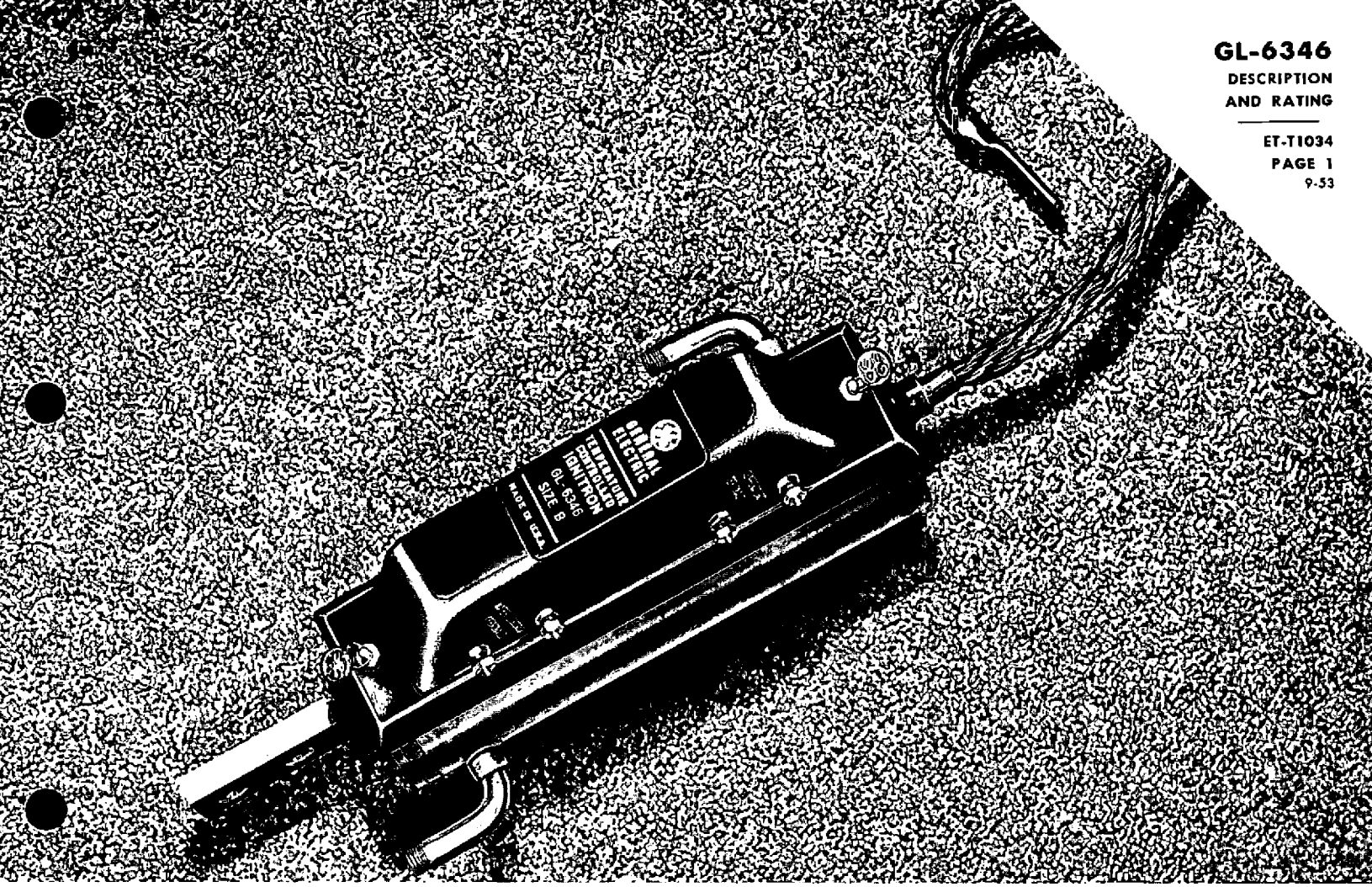


IGNITRON

Temperature Controlled

The GL-6346 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 600 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-5551/FG-271. 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 overtemperature 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-5551/FG-271 since the GL-6346, 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-6346 ignitron is equivalent to a 300-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 3400 peak amperes ..... 26 volts
Arc drop at 176 peak amperes ..... 13 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 ..... 3.6 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 ..... 1.0 gallons per minute

Characteristics for water cooling at rated minimum flow
- Water temperature rise, maximum ..... 4 C
- Pressure drop at 1 gallon per minute, maximum ..... 1.8 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	1200	1500	volts
Forward	500	1200	1500	volts
Maximum anode current				
Peak	700	600	480	amperes
Corresponding average	.....	5	4	amperes
Average	40	22.5	18	amperes
Corresponding peak	.....	135	108	amperes
Maximum averaging time	6	10	10	seconds
Ratio of average to peak current, maximum				
Averaging time 0.2 second	.....	0.166	0.166	
Ratio of fault to maximum peak current	12.5	12.5	12.5	
Maximum duration of fault current	0.15	0.15	0.15	seconds
Frequency range	50–60	50–60	50–60	cycles per second

Resistance-welding-control service*

Two tubes in inverse parallel, ratings per tube

Voltage range ..... 250 to 600 volts rms
Maximum demand ..... 600 kilovolt-amperes
- Average current at maximum demand ..... 30.2 amperes

Maximum average current ..... 56.0 amperes
- Demand at maximum average current ..... 200 kilovolt-amperes

Maximum averaging time at 250 volts rms ..... 18 seconds
Maximum averaging time at 600 volts rms ..... 7.5 seconds
Maximum peak fault current at 250 volts ..... 6720 amperes
Maximum peak fault current at 600 volts ..... 2800 amperes

TECHNICAL INFORMATION (CONT'D)

MAXIMUM RATINGS 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

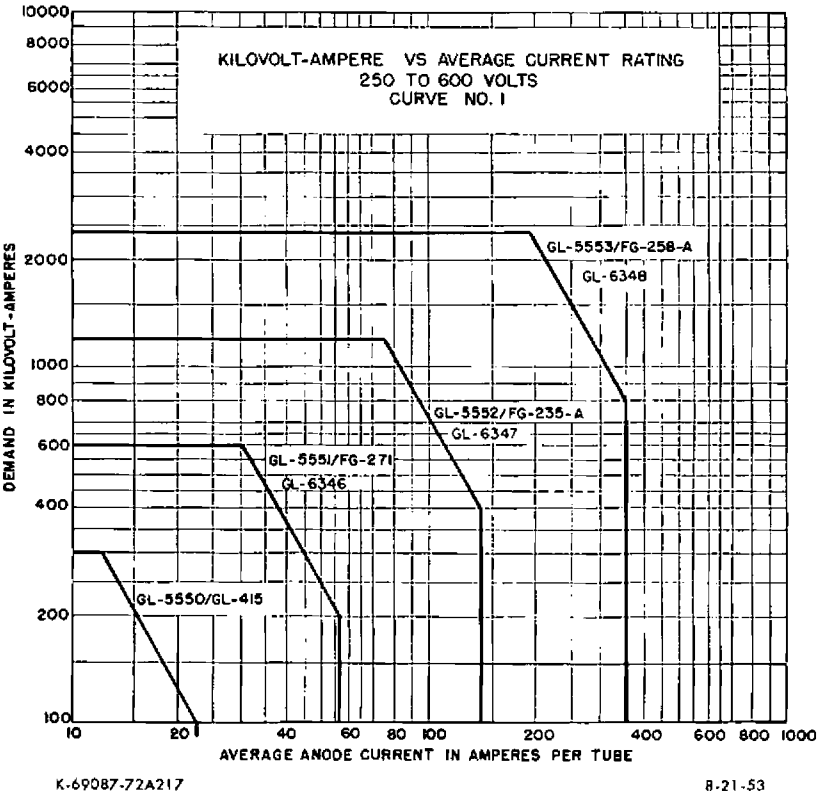
Temperature-control-switch ratings†

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



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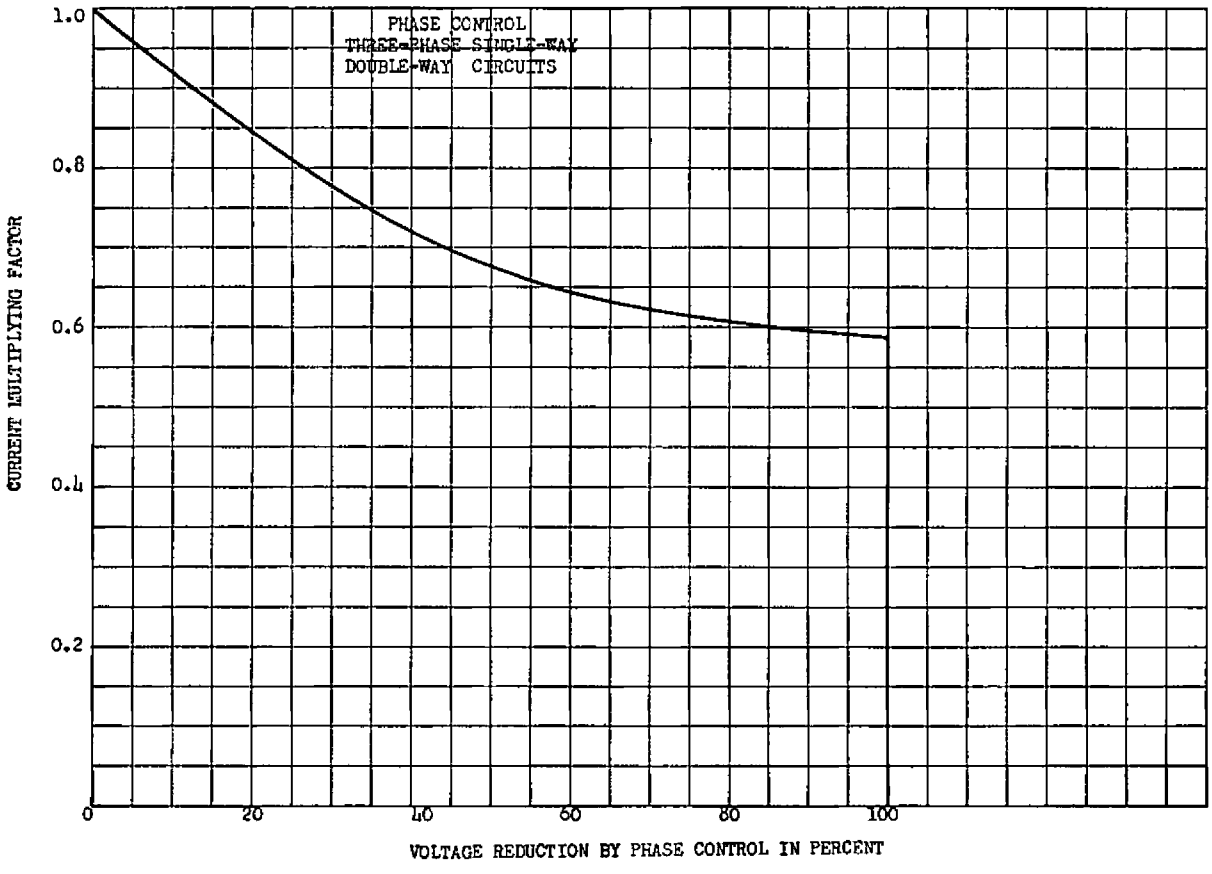

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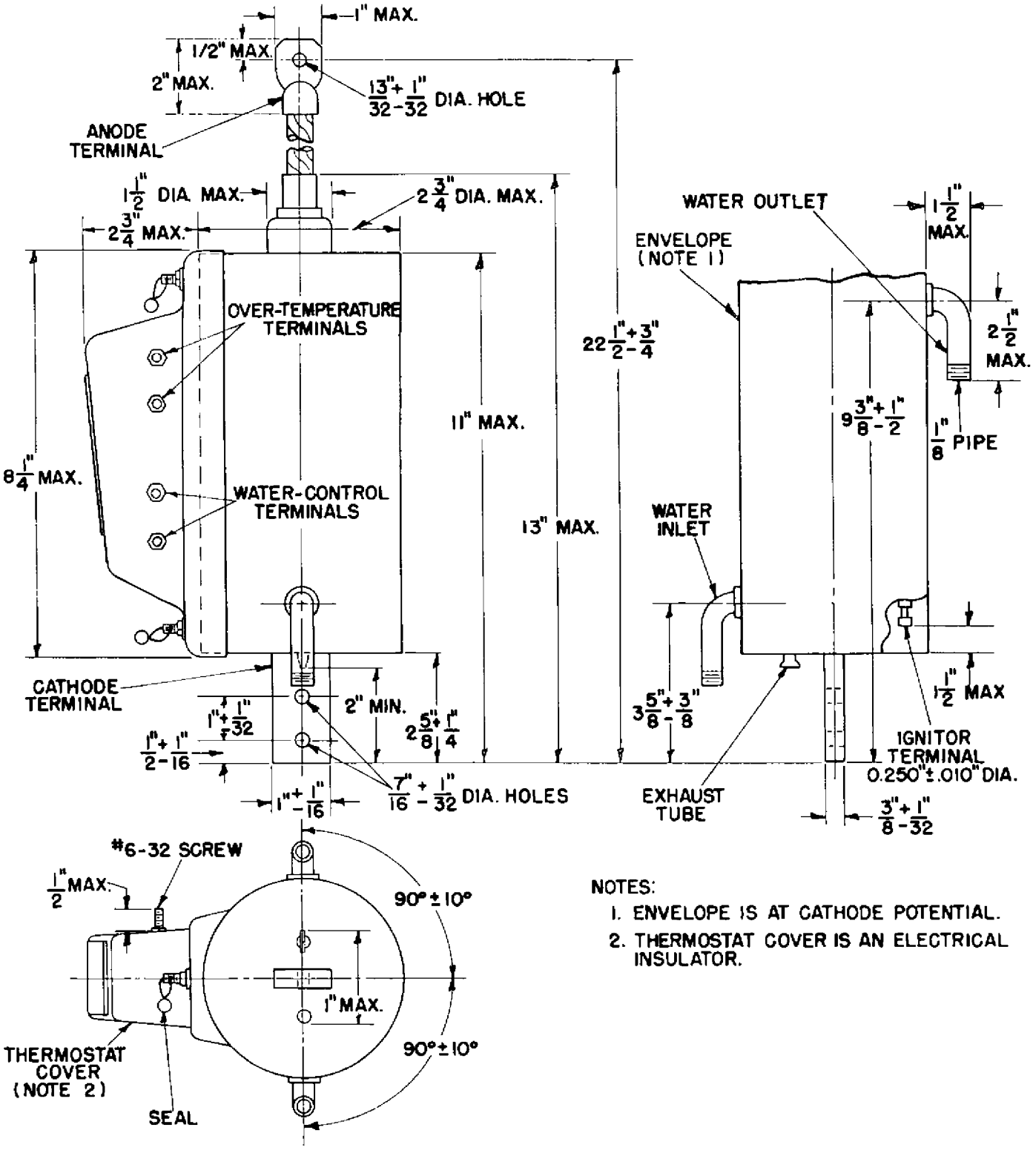

NOTES:

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

TUBE DEPARTMENT

GENERAL ELECTRIC

Schenectady 5, N. Y.

9-53 (15M)