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
GENERAL

Electrical
Cathode excitation—cyclic
Cathode spot starting—igniter
Number of electrodes
  Main anodes ........................................... 1
  Main cathodes ...................................... 1
  Igniters ............................................. 1
Arc drop at 5800 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 ........................................ 5 volts
  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 closed on temperature rise)
  Water-control switch—normally open
  (Contacts closed 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

[Diagram showing kilovolt-ampere vs average current rating 250 to 600 volts curve no. 1]
NOTES:
1. ENVELOPE IS AT CATHODE POTENTIAL.
2. THERMOSTAT COVER IS AN ELECTRICAL INSULATOR.