

# GL-7998 COAXIAL IGNITRON

## FREQUENCY-CHANGER WELDER SERVICE 2250 AMPERES PEAK

The GL-7998 is a sealed, stainless-steel-jacketed, water-cooled ignitron for use in electronic-contactor and resistance-welding-control service, both single-phase and three-phase. It is a coaxial-design version of the GL-7681.

In AC-control service two tubes in an inverse-parallel connection will control 1800 kilovolt-amperes at 440 to 600 volts RMS, 25 to 60 cycles. In frequency-changer welder service six tubes will control 2250 amperes peak at 1200 volts inverse.

In the coaxial construction current flows through the

## AC-CONTROL SERVICE 1800 KILOVOLT-AMPERES

tube from anode to cathode, then up the tube wall to a coaxial cathode terminal at the top. This current flow provides a magnetic shield which eliminates the arc deflection that the high peak currents possible with this tube might cause in standard design ignitrons.

A thermostat mounting plate thermally coupled to the mercury-condensing surface of the tube facilitates attachment of a thermostat to provide either protection against excessive temperature or temperature control through regulation of the water flow.

Electrical	
Electrodes	
Anodes .....	1
Cathodes .....	1
Ignitors .....	1
Deionization Baffles .....	1
Arc Drop	
At 5000 Amperes Peak .....	30 Volts
At 500 Amperes Peak .....	16 Volts
Mechanical	
Envelope—Stainless Steel	
Mounting—Vertical, Anode Terminal Up	
Net Weight, approximate .....	15 Pounds

Thermal	
Cooling—Liquid. If other than water is used, correct for conductivity, specific heat and viscosity.	
Inlet Water Temperature, minimum ..	6 C
Outlet Water Temperature, maximum ..	45 C
Water Flow, minimum	
At Continuous Rated Average Current .....	2.0 Gallons per Minute
At no Load .....	0
Note: Flow at intermediate loads may be decreased to an amount proportional to load. Water flow should be continued for 30 minutes after load is removed.	
Water Cooling Characteristics at Rated Minimum Flow	
Water Temperature Rise at Maximum Current .....	9 C
Water Pressure Drop, maximum ..	5 Pounds per Square Inch

### AC-Control Service\*

Two Tubes in Inverse Parallel, Ratings per Tube			
Voltage .....	440-600	Volts RMS	
Maximum Demand .....	1800†	Kilovolt-Amperes	Maximum Averaging Time
Corresponding Average Current .....	113.5	Amperes	At 250 Volts RMS .....
Maximum Average Current .....	210	Amperes	At 500 Volts RMS .....
Corresponding Demand .....	600	Kilovolt-Amperes	Maximum Peak Fault Current
			At 250 Volts .....
			At 600 Volts .....
			Frequency Range .....
			25-60 Cycles per second

### Frequency-Changer-Welder Service

Ratings are for zero phase-control angle

Maximum Peak Anode Voltage			Ratio of Average to Peak	
Inverse and Forward .....	1200	1500	Current .....	0.166 0.166
Maximum Anode Current			Maximum Average Time ..	0.2 0.2 Seconds
Peak .....	2250	1800	Ratio of Fault to Maximum Peak	
Corresponding Average ..	30	24	Current .....	12.5 12.5
Average .....	105	84	Maximum Duration of Fault	
Corresponding Peak .....	630	502	Current .....	0.15 0.15 Seconds
Maximum Averaging Time ..	6.25	6.25	Frequency Range .....	50-60 50-60 Cycles per second

### Cathode Excitation Requirements

Ignitor Voltage Required to Fire ..	200	Volts	Ignitor	
Ignitor Current Required to Fire ..	30	Amperes	Maximum Voltage	
Starting Time at Required Voltage or Current .....	100	Microseconds	Positive—Anode Voltage	
			Negative .....	5 Volts
			Maximum Current	
			Peak .....	100 Amperes
			RMS .....	10 Amperes
			Average .....	1 Ampere
			Maximum Averaging Time ..	5 Seconds

\* 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. Straight-line interpolation on log-log paper is allowed between corresponding points.

† Maximum demand current for 250 volts RMS is 4800 amperes. For voltages between 250 and 500 use proportional values between 4800 and 3600 amperes.

