

GL-7998 COAXIAL IGNITRON

GL-7998

ET-T1674

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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

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

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.

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 Averaging Time	
Maximum Demand	1800† Kilovolt-Amperes	At 250 Volts RMS	9.5 Seconds
Corresponding Average Current	113.5 Amperes	At 500 Volts RMS	7.1 Seconds
Maximum Average Current	210 Amperes	Maximum Peak Fault Current	
Corresponding Demand	600 Kilovolt-Amperes	At 250 Volts	20,040 Amperes
		At 600 Volts	8400 Amperes
		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 Volts	Current	0.166 0.166
Maximum Anode Current		Maximum Average Time	0.2 0.2 Seconds
Peak	2250 1800 Amperes	Ratio of Fault to Maximum Peak	
Corresponding Average	30 24 Amperes	Current	12.5 12.5
Average	105 84 Amperes	Maximum Duration of Fault	
Corresponding Peak	630 502 Amperes	Current	0.15 0.15 Seconds
Maximum Averaging Time	6.25 6.25 Seconds	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		Positive—Anode Voltage	
Current	100 Microseconds	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.

