MATERIALS SCIENCE, INC.
Vacuum & Thin Film Technology

Model ATN-10-A2 Automatic Impedance Matching Network

- **700 watt 13.56 MHz**
- **Ultra-Fast and Repeatable Tuning Control**
- **Exclusive Use of Vacuum Capacitors allows Long Output Cable Lengths over a Wider Range of Conditions than Standard Units**
- **Silver Plated Conductors and Inductors**
- **Precise Servo Motor Action**
- **Capacitor Position Pre-set Capability – Allows Faster Response Time to Predictable Conditions**
- **Automatic and Manual Modes Using Local and Remote Control**
- **Analog and RS-232 Communication Capability**
- **19" 1/2" Rack Mount**
- **Air Cooled**
- **CE, CSA and UL Compliant**

Description

The ATN-10-A2 automatic impedance matching network compliments 13.56 MHz RF power supplies rated up to 700 watts. Together, they provide an integrated RF power delivery and control system. The matching network contains only vacuum capacitors, resulting in a much broader impedance matching range and the use of very long output power cables compared to conventional units that use air variable capacitors. The ATN-10 is an "L" network configuration which gives the matching network direct coupling to the plasma effect. This is the most efficient tuning method for power transfer in RF.

A separate 1/2 rack self-contained power supply and servomotor control unit is provided. It also supplies DC voltage for the fan on the matching network. The front panel has controls for both manual and automatic modes. It also provides ignition preset potentiometers for efficient lighting and tuning of the sputtering source plasma load.

Both the phase and magnitude detectors are contained within the matching network. The phase detector controls the tuning capacitor or series portion of the "L" network. The magnitude detector controls the shunt capacitor or load portion of the network. Both detectors operate simultaneously to transform the impedance of the load to maintain 50 ohms in the transmission line. In essence, when the detectors are sampling 50 ohms in the transmission line, the positive and negative error signals that the detector generates for driving the servo system should be virtually zero. The polarity of the error signal will determine the direction in which the servo motor will travel. This combined with the proper gain will ensure the proper tuning sequences.

Specifications

	Automatic Impedance Matching Network
Power Rating	700 watts
RF Output Connector	Female HN Coaxial Cable Connector Standard (N type or stud optional)
RF Input Connector	Female N Connector from Power Supply
Network Controller Connector	15 pin female D type EMI/RFI filtered
Circuit Topology	“L” network configuration using only vacuum capacitors
Output Impedance	Wide range. Will match sputtering source over entire normal pressure range of operation.
Output Cable (sold separately)	RG-393 cable with Male HN Coaxial Connectors both ends recommended.
Size	8.5" wide x 5.00" high x 15.00" deep (21.6 cm x 12.7 cm x 38.1 cm). Connectors add an additional 1” (2.54 cm) to overall length.
Weight	Nominal 12 pounds (5.4 kg)
	Automatic Impedance Matching Network Controller-Power Supply
AC Mains Input	100-240 VAC, Single Phase, 50/60 Hz, 2A maximum
AC Mains Input Connector	IEC-320C-14 EMI filtered
Size	9.50" wide (with supplied rack mounting ears) x 1.75" high x 9.75" deep (4.45 cm x 21.59 cm x 24.77 cm)
Matching Network Connector	15 pin female D type EMI/RFI filtered (10' signal control cable with male connectors on both ends supplied)
Load and Tune Control	Manual or automatic via the front panel or remote control.
Remote Analog Control Connector	25 pin D type EMI/RFI filtered
DC Bias Circuit	Optional – Measures developed DC voltage
Weight	Nominal 3 pounds (1.36 kg)

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