



15000-Watt Impedance Matching Networks Manual and Automatic

Coaxial Power Systems Ltd manufacture two styles of impedance matching network to link the load to the RF generator. The purpose of the network is to adjust the input impedance of the load to 50 Ohms so that maximum power is transferred from the generator, whose output impedance is 50 Ohms, to the load. The network must be installed as close a possible to the load. The best possible position, in a plasma application for example, would be to mount the network directly on the vacuum chamber with a direct connection to the electrode or magnetron.

Coaxial Power Systems Ltd. manufacture two types of network - Manual and Automatic

Manual Matching Network

The manual matching network consists of two adjustable vacuum capacitors and a fixed inductor, which are usually arranged as an "L" network. (The arrangement can be simply converted to a "Pi" network if required). Cranked knobs with built in turns counters are used to adjust the capacitors for minimum reflected power as displayed on the generator reflected power meter. When the reflected power is zero, the system is "tuned" and all of the power output of the generator is being fed to the load. The inductor is water cooled.



Automatic Matching Network

The automatic matching network is similar to the manual version except that servomotors drive the capacitors.

At the input of the network, a phase and magnitude detector determines the position of the capacitors. This information is transferred to the separate controller.

The controller then drives the servomotors to the positions, which give zero, or minimum reflected power.

The controller is ½ rack, 4U high and is usually fitted in the same enclosure as the generator.

Alternatively the controller may be fitted within a generator - the readouts and controls on the generator front panel.



The position of each variable capacitor is shown on a 3 1/2 digit LED meter. Automatic or Manual mode is switch selectable - in manual mode the servomotors are controlled by spring loaded switches.

The start position of the capacitors can be individually adjusted. When RF power is detected, the capacitors automatically adjust for minimum reflected power. When the RF is turned off, the motors drive the capacitors back to their original position. The start

positions are adjusted using potentiometers accessible via the controller front panel

Option: Model DCP-1 : Dark Space Bias Voltage Measurement and Control

A probe, installed inside the network, measures the d.c voltage (0 to 1999V) developed across the dark space in plasma applications such as sputtering and reactive ion etching. The voltage is converted to a 0 to 5V signal which can be fed back to the generator control system. The voltage is displayed on the loading capacitor position meter. Includes all necessary cables to link to any generator in the low power range manufactured by Coaxial Power Systems Ltd. **Note:** This option not available on manual networks

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General Specifications

Model MN15K –15,000-Watt Impedance Matching Network – Manual

Configuration	'L' or Pi. (supplied configured as 'L' network.)
Input impedance	50 ohms.
Input connector	EIA15/8" type.
Output impedance range	'L' network 0.5 - 20 ohms or 'Pi' network 10 - 200 ohms.
Output connection outlet	Phase shift 0 - +/- 160. Direct 'bolt on' Other types available - consult factory
Capacitors	Vacuum Capacitors.
Inductor	Water cooled fixed inductor
Capacitor Drives	Direct drive with 'turns' counter
Water In/Out Connectors	Brass, 10mm Swagelock fittings
Case Material	Chromated Aluminium
Style	Free Standing
Size	800mm(D) x 550mm(W) x 450mm(H)

Model AMN15K –15,000-Watt Impedance Matching Network – Automatic

Network	As manual version.
Tuning Detector	Phase and magnitude type fitted to rear of network case.
Controller	
Line input	85-265V AC 50/60Hz.
Control Input	Phase Magnitude RF present (RTB)
Control/Output	Motor and position drives for matching network. (Dark space bias voltage control - optional)
Front Panel Indicators	3.5 digit LED displays for a) Tuning capacitor position b) Loading capacitor position and dark space bias voltage if fitted
Front panel controls	Line ON/OFF. Manual/Automatic selection switch for each capacitor Drive switches (max/min) for each capacitor
Capacitor Re-sets	Capacitor re-set position potentiometer for each capacitor. RF input is automatically detected and switches out re-set positions of capacitors. When re-set is operating (i.e. no RF input) then capacitors can be pre-set to stop at any position within their range.
Size	1/2 rack mounting 4U high X 300mm deep. Front panel colour - RAL7035 light grey

Option (Only available on automatic versions)

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