## CLAIMS

What is claimed is:

1. A matching network for a radio frequency (RF) power delivery system, comprising:

at least one variable tuning element; and

a stepper motor configured to displace the variable tuning element,

wherein the stepper motor is further configured to adjust the variable tuning element so that each adjustment of the stepper motor is a number of steps that causes a constant change in a reactance of the matching network, wherein a first adjustment includes a first number of steps and a second adjustment includes a second number of steps, and the first number of steps and the second number of steps are different.

2. The matching network of claim 1 wherein the variable tuning element is configured to be adjusted within predetermined bands of adjustment in accordance with a change in reactance of the matching network with respect to the change in position and the predetermined bands define adjustment increments that result in the constant change in the reactance of the matching network for each adjustment.

3. The matching network of claim 2 wherein each band defines a predetermined number of turns of the stepper motor.

4. The matching network of claim 2 wherein a correction model is assigned to the matching network, wherein for a predetermined reactance of the matching network, a position correction is applied in accordance with the predetermined reactance.

5. The matching network of claim 1 wherein a correction model is applied to the matching network, wherein for a predetermined position of the variable tuning element, a position correction is applied to the predetermined position.

6. The matching network of claim 5 wherein the correction model is determined in accordance with a least squares approximation of a difference between a measured reactance and a predefined reactance for the matching network for selected positions of the variable tuning element.

7. The matching network of claim 1 wherein the variable tuning element comprises a capacitor disposed in one of a tuning leg or a load leg of the matching network.

8. A matching network system for a radio frequency (RF) power delivery system, comprising:

a matching network having a variable tuning element, the matching network configured to introduce a variable impedance between a RF power generator and a load;

a stepper motor configured to adjust a position of the variable tuning element wherein the stepper motor is configured to adjust the variable tuning element so that each adjustment is a number of steps that results in a constant change in reactance of the matching network, wherein a first adjustment includes a first number of steps and a second adjustment includes a second number of steps, and the first number of steps and the second number of steps are different; and

a controller configured to communicate with the matching network, the controller configured to receive the position of the stepper motor, the controller configured to compare the position with a stored, predetermined position, the controller configured to generate a position correction and applying the position correction to the position.

9. The matching network of claim 8 wherein the constant change in reactance steps is determined by defining predetermined bands of adjustment in accordance with the constant change in reactance of the matching network and assigning positions in accordance with the constant change in reactance.

10. The matching network of claim 8 wherein the position correction is predetermined in accordance with a least squares approximation of a difference between a measured reactance and a predefined reactance for the matching network for selected positions of the variable tuning element.

11. A control system for a matching network, comprising:

a processor; and

a memory, wherein the memory stores instructions executable by the processor are configured to:

adjust a stepper motor to displace a variable tuning element,

wherein adjusting the stepper motor at least one of:

adjusting the variable tuning element according to an adjustment of the stepper motor that is a number of steps causing a constant change in a reactance of the matching network; wherein a first adjustment includes a first number of steps and a second adjustment includes a second number of steps, and the first number of steps and the second number of steps are different; or

defining a correction model for the matching network, wherein for a predetermined reactance of the matching network, a position correction is applied in accordance with the predetermined reactance.

12. The matching network of claim 11 wherein the instructions are further configured to, when adjusting the variable tuning element according to the adjustment step of the stepper motor, adjust the variable tuning element within predetermined bands of adjustment in accordance with a change in reactance with respect to the change in position and the predetermined bands define adjustment increments that result in the constant change in the reactance of the matching network for each adjustment step.

13. The matching network of claim 12 wherein the instructions are further configured to define for each band a predetermined number of turns of the stepper motor.

14. The matching network of claim 11 wherein the variable tuning element is a capacitor disposed in one of a tuning leg or a load leg of the matching network.

15. A method for adjusting a matching network, comprising:

providing a stepper motor and adjusting the stepper motor to displacing a variable tuning element; and

determining a position of the variable tuning element according to at least one of:

each adjustment of the stepper motor is a number of steps that causes a constant change in a reactance of the matching network

wherein a first adjustment includes a first number of steps and a second adjustment includes a second number of steps, and the first number of steps and the second number of steps are different.

16. The method of claim 15 wherein when adjusting the variable tuning element so that each adjustment step of the stepper motor causes the constant change in the reactance of the matching network, adjusting the variable tuning element within predetermined bands of adjustment in accordance with a change in reactance with respect to the change in position, where the predetermined bands define adjustment increments that result in the constant change in the reactance for each step of adjustment.

17. The method of claim 16 wherein each band defines a predetermined number of turns of the stepper motor.

18. The method of claim 15 wherein the variable tuning element is a capacitor disposed in one of a tuning leg or a load leg of the matching network.

19. The method of claim 15 wherein the correction model is determined in accordance with a least squares approximation of a difference between a measured reactance and a predefined reactance for the matching network for selected positions of the variable tuning element.