

Motor Speed Control

Rheostat wiring examples

Type of Control	Type of Motor	General Characteristics of Control	Circuit Diagram
I. Series Rheostat	D.C. Series or Shunt D.C. Permanent Magnet Universal A.C. Series A.C. Repulsion A.C. Shaded Pole	<ul style="list-style-type: none"> Most used for fractional H.P. appliances, A.C. or Universal, where the load is constant or variations in speed with load are unimportant. Speed will vary widely with the load. 50% reduction of full load speed is maximum used on larger motors—more on smaller motors—depends on type of load. 	
II. Armature Shunt Rheostat	D.C. Series A.C. Series Universal	<ul style="list-style-type: none"> Reduces speed but maintains torque. Speed will vary less widely with the load than with Series Control. 50% reduction of full load speed is maximum used on larger motors—more on smaller motors—depends on type of load. 	
III. Combined Armature Shunt and Series Rheostats	D.C. Series A.C. Series Universal	<ul style="list-style-type: none"> Widest speed range—maintains torque—useful where load varies. Speed will remain fairly constant regardless of load. Range of five to one or more is possible depending on type of load. 	
IV. Rotor Series Rheostats	A.C. Polyphase Wound Rotor	<ul style="list-style-type: none"> Standard method for wound rotor motors—also used on single-phase type. Speed will vary with the load. 50% reduction in speed is the maximum generally used. Greater reduction is possible. 	
V. Field Rheostat	D.C. Shunt	<ul style="list-style-type: none"> Most used type for integral H.P. industrial applications. Speed remains fairly constant at any load. Speed <i>increases</i> with added resistance. Range depends on motor design. Field must <i>never</i> be opened. 	
VI. Armature Series Rheostat	D.C. Shunt	<ul style="list-style-type: none"> Used to lower speed. Speed will vary with load. Speed decreases as resistance is added. 50% maximum on larger motors. 	
VII. Combined Field and Armature Series Rheostats	D.C. Shunt	<ul style="list-style-type: none"> Used for widest speed range. Speed variation with load depending on position of control. Speed range depends on motor design. 	
VIII. Auto-transformer with Tap Switch	Special A.C. Capacitor Motor	<ul style="list-style-type: none"> Used for fan type duty or other low starting torque, constant type of loads. Speed will vary with load. Speed range depends on motor design. 	