

COMPRESSOR CONTROL PROS AND CONS

Control	Pros	Cons
Start/Stop	<ul style="list-style-type: none"> • Simple control using only a pressure switch • Motor and compressor operate only when needed, saving energy • Good for small compressors (10 hp or less) 	<ul style="list-style-type: none"> • Frequent, full load starting wears down motor and compressor • Requires higher than normal compression to build storage, increasing energy use • Relatively “loose” pressure control, ranging as high as 35 psi • Limited to small units
Load/Unload	<ul style="list-style-type: none"> • Motor and compressor run continuously, reducing wear • Tighter range of pressure control (approximately 10 psi) • Provided adequate storage, offers energy efficient control of both rotary screw and double acting reciprocating compressors 	<ul style="list-style-type: none"> • Improperly applied, “short cycles” cause premature wear and failure, and minimal or no power savings • Proper bleed down time and storage capacity required for lubricant injected rotary units to achieve energy savings and prevent lubricant foaming
Modulating	<ul style="list-style-type: none"> • Motor and compressor run continuously, reducing wear • Tighter range of pressure control (10 psi) • Steadily progressive capacity control to match demand 	<ul style="list-style-type: none"> • Inefficient at lower loads (lubricant injected rotary units limited to 40% – 60% capacity, centrifugal units limited by potential surge and can require discharge blow-off) • Pressure ratios increase as inlet pressure is throttled
Dual/ Auto Dual	<ul style="list-style-type: none"> • Combines features of modulating, load/unload, and start/stop • Shuts down lubricant injected rotary units when unloaded for pre-set duration • Better selects operating mode for small reciprocating units 	<ul style="list-style-type: none"> • Over-run timer must be set to limit premature starting and wasted energy
Variable Displacement (Turn/Spiral or Poppet Valve)	<ul style="list-style-type: none"> • Energy-efficient control scheme • Matches displacement to demand without reducing inlet pressure or increasing ratios of compression 	<ul style="list-style-type: none"> • Modest initial cost • Generally available for 50hp or larger units
Variable Speed	<ul style="list-style-type: none"> • Energy-efficient and precise control • Varies rotating speed of compressor, since displacement is directly proportional to speed of rotation 	<ul style="list-style-type: none"> • Relatively high initial cost • Reduced full load efficiency • Efficiency of rotary screw units drops at lower speed • Unsuitable for centrifugals
Multiple Compressor Control	<ul style="list-style-type: none"> • Saves energy by allowing systems to shut down individual units that are not needed • Saves compressor wear by alternating units to be shut down • Microprocessor type sequencers limit modulating control to one unit, optimizing efficiency 	<ul style="list-style-type: none"> • Adds complexity to control • Use is generally limited to compressor type and make produced by manufacturer of controls • Some solutions may have relatively high initial cost.