



# Compressor Controller

## Distributed Capacity Control (DCC)

### FEATURES

The ability to network multiple compressors regardless of make and type.

Automated programming

Networks individual compressors as if they are a single step/variable load compressor.

Decreased average operating pressure.

### BENEFITS

Greater energy savings and lower operating costs.

Efficient use of energy.

Protection from unscheduled downtime due to compressor failure.

Only one unit varies pressure to meet plant demand.

An improvement to air compressor operating efficiency.

### Efficiency Through Networking

One of the main features of the Bay Compressor Controller system series is the ability to network multiple compressors. Through Bay Control's innovative design and engineering, the theory of distributed capacity control has become a reality that significantly improves the efficiency of your compressed air system.

### Why Have Distributed Capacity Control?

Generally speaking, compressors are most efficient when operating at full capacity. In multiple compressor installations, compressors rarely operate at full capacity, or peak efficiency.

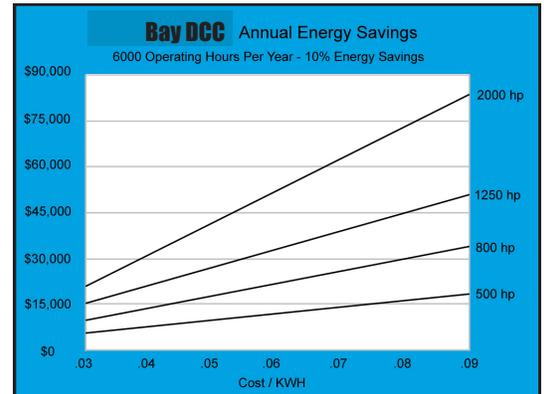
In a manually-controlled system, even when staged setpoints are optimized, all compressors on the system generally respond simultaneously to changes in demand. By operating independently, the compressors are constantly cycling up and down. This leads to large pressure variations for the system, which causes the average pressure to be excessively high. That wastes energy. In addition, this mode of operation results in periods during which several compressors are running at less than full capacity at the same time. Again, energy is used inefficiently. Even the most experienced team of operators cannot precisely control such a system so that supply is constantly in sync with demand.

### Networking Your Compressors

The Bay Compressor Controller system series takes multi-compressor systems to a new operation level. In addition to advanced capacity control of a single unit, the Bay Compressor Controller networks these individual compressors as if they were a single multi-step or variable load compressor. With this new generation of microprocessor-based controls, your compressors on this network are monitored and controlled simultaneously. (See other side for illustration.)

### How Distributed Capacity Control Works

With distributed capacity control, the object is to run the optimum number of compressors at full load, while allowing only one unit to step its load up and down to maintain pressure and meet plant demand.



**Chart A**

Our studies have shown these figures to be an accurate prediction of energy savings from Bay Compressor Controller's distributed compressor control. For information on other ways Bay Compressor Controller can save energy, please

With the network control system, each unit is listening to signals from the other units, but responds only to those messages specifically addressed to it. Each compressor is assigned a priority for supplying air to the plant. This means the units with the highest priority are the first to load up, and those with the lowest priority are the last. Consequently, the lowest priority compressor on the line will be doing most of the loading and unloading at one time.

The priorities are based on size and efficiency of each individual compressor relative to the others to best match the compressors on-line with the expected load changes typically encountered at the facility.

As plant demand decreases, lower priority compressors will sequentially unload to match the demand. If the compressors idle for an extended, user-programmed period of time, they will shut off automatically to conserve energy. Conversely, as the plant demand increases and exceeds the full load capabilities of the running compressors, the Bay Compressor Controller network will start up the next highest priority compressors in sequence to meet the increased demand. Time delays are programmed into the system so that machines do not unnecessarily turn on or shut down due to temporary changes in plant air load.





# Networked Efficiency

## WHO WE ARE...

Bay is an energy solutions company that provides products and services to a broad range of industrial, commercial, and government customers. We provide cost savings for our clients through increased energy efficiency, improved system management, better reliability, and reduced downtime. Founded in 1983, Bay provides over 1.8 terawatt-hours (1,800 million kilowatt-hours) of annual energy savings for our customers in 70 countries. Our headquarters and network operations center is located in Maumee, Ohio.

## OTHER PRODUCTS

**Bay Compressor Controller**  
Industry leading controls for all rotary screw, reciprocating, and centrifugal compressors.

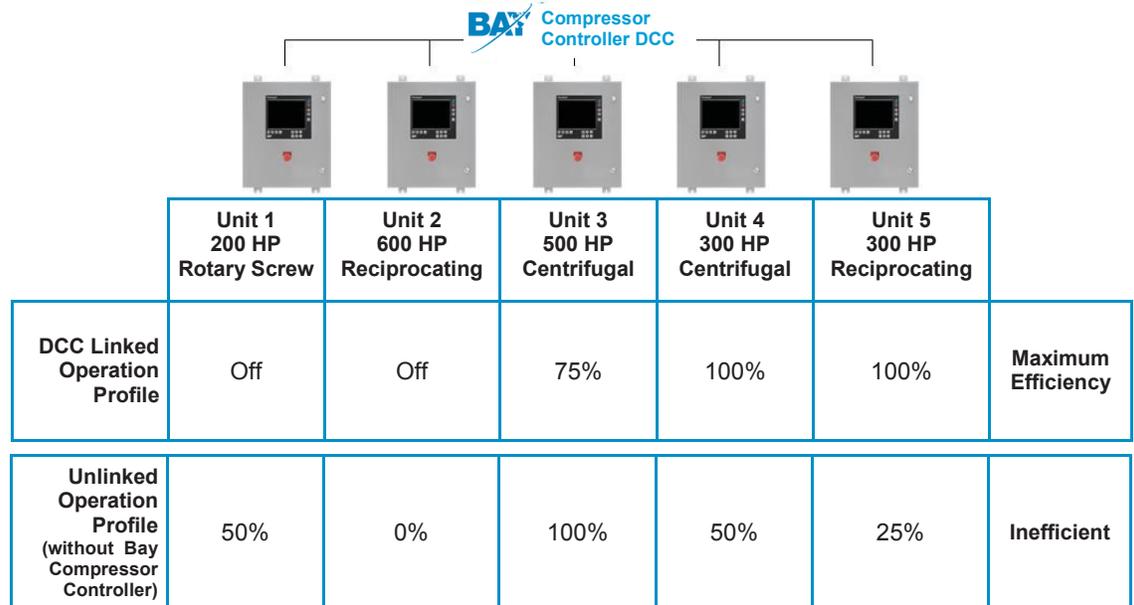
**BayWatch®**  
Web-based hosted monitoring and alerting system for single and multi-plant applications.

**BayView® Server**  
Full featured, HMI/SCADA system for air compressors controlled by the Bay Compressor Controller.

**BayView® Scheduler**  
Advanced scheduling system, automating compressor schedules and operating conditions.

**BayView® 20/20**  
Customizable HMI/SCADA system for integrating varying plant systems.

**Custom Controls**  
Advanced customized control systems for cooling towers, dryers, and other industrial applications.



In addition, the system is programmed to have the next compressor in line take over if the lead unit becomes disabled or is taken offline. Besides maintaining the efficiency of distributed capacity control, this feature helps protect you from unscheduled downtime due to compressor failure.

### Distributed Capacity Control Beats Sequencers

Several companies have come out with *sequencer* control systems that tout the advantages of distributed capacity control. A closer look reveals that this is not the case.

While sequencers utilize a *network* philosophy by connecting machines together with control, they do not possess the accuracy of the Bay Compressor Controller's Distributed Capacity Control. Sequencers require an incremental change in pressure to occur before the next compressor in the sequence will load or unload.

For example, if the sequencer waits for the pressure to increase 5 psi before it will unload a compressor, then a four compressor system will allow pressure to vary a minimum of 20 psi. This is less efficient than the Bay Compressor Controller, so a sequencer system will maintain a higher average pressure than Distributed Capacity Control. In addition, sequencers have specific paths and compressor order to follow.

With the Bay Compressor Controller, each compressor has the ability to lead or follow and change with system demand. Simply stated, Distributed Capacity Control leads to greater energy savings and operating cost reductions.

### Networking Different Compressors

Networking different styles and brands of compressors is not a problem with the Bay Compressor Controller and its distributed capacity control programming. For example, the Bay Compressor Controller on a reciprocating compressor will communicate flawlessly with the Bay Compressor Controller on a centrifugal compressor.

### The Bottom Line

The ability to precisely control compressor capacity results in decreasing the average operating pressure, and optimizes the efficiency of the system. In bottom-line terms, you save energy and lower your operating costs. (Illustrated in chart A).

### The Bay Compressor Controller is the Answer to Energy Savings

By incorporating advanced technology with superior engineering, Distributed Capacity Control will change the way you look at compressed air operation. The Bay Compressor Controller gives you the ability to improve your operating efficiency, and protect your company's wallet.



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