1300 Sumner Avenue, Cleveland, OH 44115
P: 216-241-7333 F: 216-241-0105
E: cagi@cagi.org
URL: WWW.CAGI.ORG

CAGI
Compressed Air & Gas Institute

FAQs

Frequently Asked Questions – System Controls

There are several different ways to control an individual compressor to match output to demand. In single compressor installations, some are better at handling part-load conditions better than others. Many newer compressors can be switched from one to the other through their on board controller. Others (e.g. modulation, variable speed, and rotor length adjustment) require different mechanical and electric configurations.

Below are answers to frequently asked questions that help simplify descriptions of the types of controls in use today on contact cooled rotary screw compressors:

Q: What do we mean by dual control, also known as online/offline?

A: Operates fixed speed compressors at "full load" and "idle mode" via a minimum/maximum pressure switch plus a timer to switch from idle to full stop. Pressure band and timer values are preset to match system requirements. There are several variations of this method that apply additional timing and logic to further reduce idle time.

Q: What is variable frequency speed control?

A: Air flow is controlled to maintain a specified discharge pressure by controlling electrical frequency (and therefore speed of the drive motor) in response to a pressure signal at the compressor discharge. This is the most advanced and energy-efficient type of compressor control.

Q: What do we mean by modulation control?

A: This is the process of regulating air delivery using a proportional inlet valve to regulate flow and provide a constant output pressure in response to a pressure signal from the compressor discharge. Prior to variable speed/frequency drive, it was a popular method for ensuring part load control.

Q: I have heard about rotor length adjustment, what does that mean?

A: There are constant speed compressors available with valves along the length of the air-end that regulate the compression volume output in response to a pressure signal from the compressor discharge. This is also called geometry control. This is accomplished by progressively opening or closing internal bypass ports on the air end. Like modulation, this was more popular prior to the widespread use of variable frequency drives.

Note that variable speed, modulation, and rotor length adjustment controls can be very effective in maintaining steady discharge pressures in <u>single</u> compressor applications, but systems with multiple units of any type (or mix of types) can experience wide system pressure swings unless all units are controlled together.

CAGI is the leading organization representing manufacturers of compressed air system equipment, including air compressors, blowers, pneumatic tools, and air and drying and filtration equipment. This document is for information purposes and should not be used as a substitute for instructions from individual manufacturers. Always consult with individual manufacturers for specific instructions regarding their equipment.

CAGI, its members and participants in its activities, assume no responsibility, obligation or liability to anyone for any loss or damages in connection with the use, completeness, interpretation of, or reliance upon this document.