

Comprehensive Controls

Comprehensive Controls is Carbonair's peerless in-house controls division

We say that because no other firm we know can match our knowledge of process requirements with controls know-how. Comprehensive Controls comprises in-house electrical engineers, programmers, technicians and process control instrumentation experts with many years of experience. This means you will receive a controls package that is ideally matched to your project's requirements.

Application Expertise

For over fifteen years we have been providing control panels and systems to industrial, municipal and government end-users in a wide range of applications, including:

- Contaminated groundwater pumping and treatment
- Soil vapor extraction and treatment
- Air sparging systems
- Water intake and booster pumping stations
- Water filtration/filter consoles and treatment
- Waste and stormwater pumping stations
- Wastewater treatment plant automation
- and related water processes.

Every control system we furnish is engineered to be flexible and expandable. Whether you choose to utilize conventional relay and timer-based logic or any of the major-manufacturer programmable logic controllers we are familiar with, your system can grow as your needs change.

Headquartered in Minneapolis, Minnesota, we have multiple locations at your service. We are big enough to handle virtually any control requirement, yet small enough to provide personalized service. We are responsive, too; able to provide quick submittal drawings and equipment shipment when needed.

Sound interesting? Give us a call when you need help with your next control project; you'll be glad you did!



Control Systems for Every Need

Whether you are looking for a small motor control panel with relay/timer logic or a computer-based supervisory control and data acquisition (SCADA) system, we have a control solution for you. Housed in rugged enclosures of suitable material and NEMA type, our control systems meet all specified job requirements, National Electric Code requirements as well as applicable industry and government standards.



Our enclosures meet or exceed your project requirements.

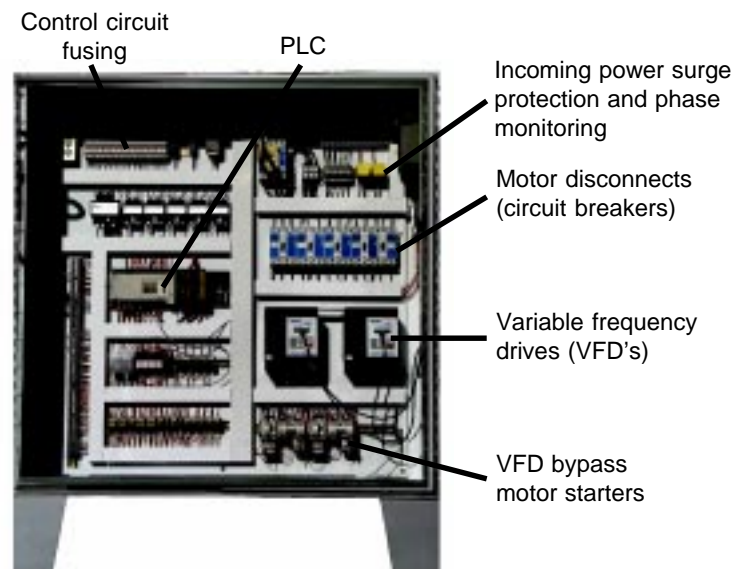
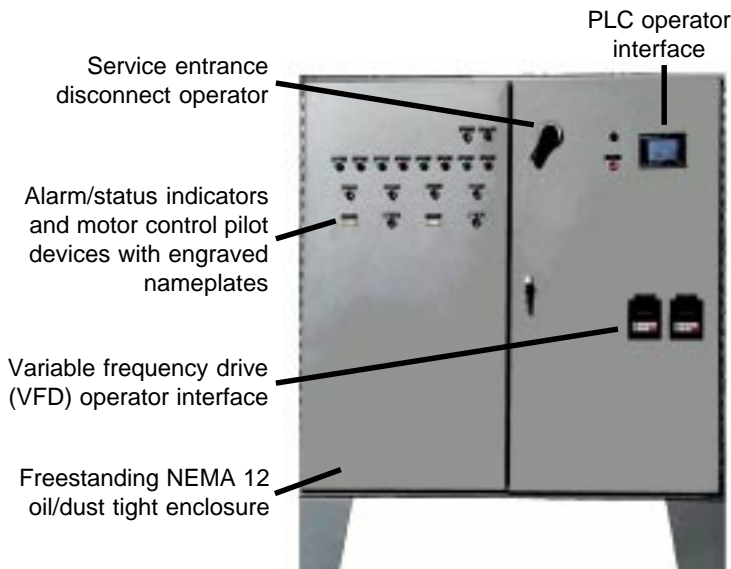
We furnish a broad range of control panels and systems, including:

- Motor control panels (with and without power equipment)
- Motor control centers (MCC's)
- Variable speed drives and control systems
- Electromechanical relay/timer-based control panels
- Programmable controller-based panels and systems (with and without operator interface devices)
- Telemetry systems (radio, phone line, Internet)
- Computer-based SCADA systems
- Turnkey control and instrumentation packages

Comprehensive Control systems combine selected process control elements with motor control, protective, alarm and monitoring equipment. Our systems can be electromechanical or microprocessor based, with the client's preference and ease of use in mind. Each panel is custom designed, incorporating job-specific options such as hazardous location barriers and telemetry equipment. Of course, all control panels and systems are thoroughly tested prior to shipment. Most replacement and spare parts are available for immediate shipment. All systems are furnished with complete documentation including AutoCAD©-generated wiring diagrams. We also can furnish enclosure door and inner panel layouts, dimensional drawings, parts lists and operating instructions.



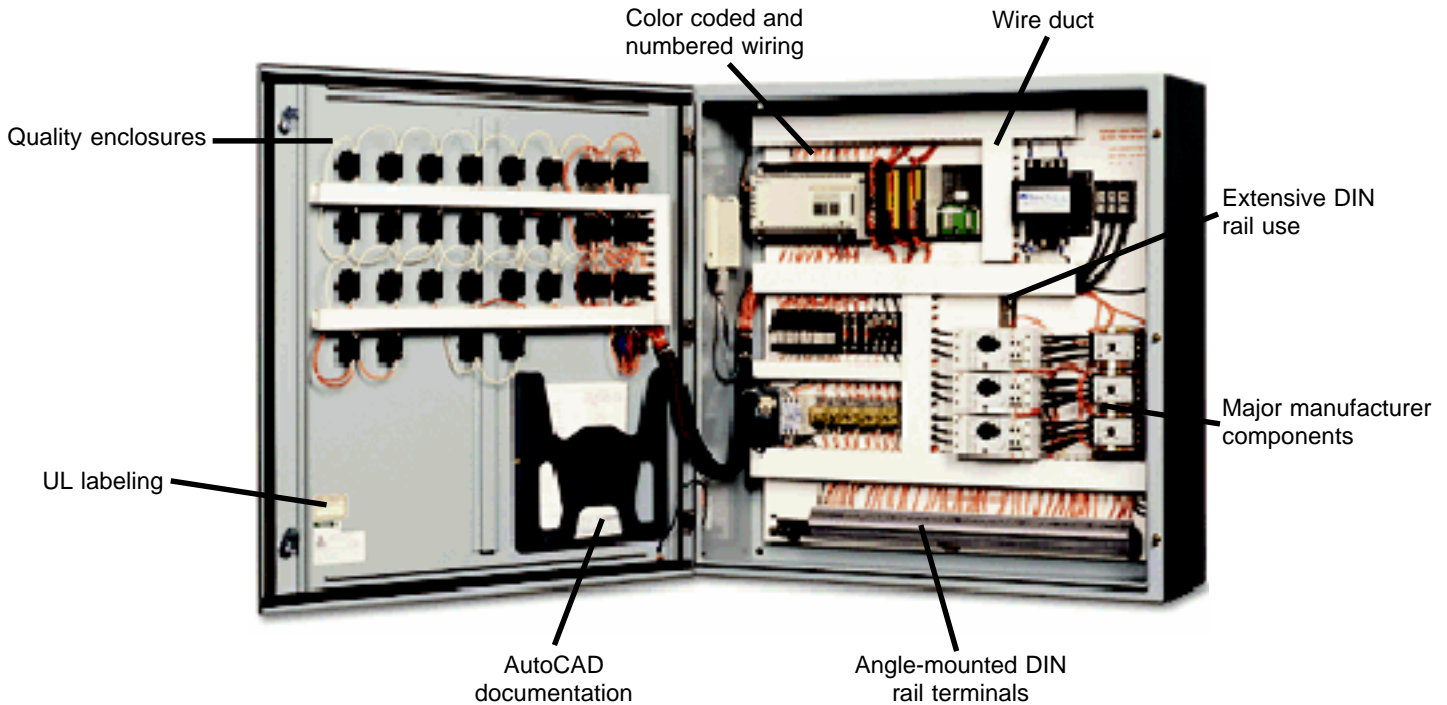
In addition to motor control panels, motor control centers can be furnished as part of the control package.



Panels can be furnished as complete integrated packages, with control, alarm/status monitoring and motor starting/power equipment.

Quality Materials and Workmanship

Check out all of the standard features in the panel shown here. We believe you'll see the quality difference in Comprehensive Controls.



A long list of control system options are available, including:

- UL labeling
- Hazardous area circuit extensions
- Instrumentation packages
- Alarm dialers and data loggers
- Power equipment (service entrance rated disconnect switches, motor starting equipment, panelboards/load centers, variable frequency drives)
- Enclosures of various materials (stainless steel, fiberglass, aluminum), NEMA designations (3, 4X, 12, etc.) and mounting methods (freestanding, wall mount, etc.).



Superior Service

Our strong, regionally-based field service force is capable of responding quickly to your needs anywhere in the United States. We can service virtually any control system, whether furnished by Carbonair or by others. Our field service capabilities include:

- System start-up and operator training
- Control and Instrumentation maintenance
- Emergency repair and troubleshooting
- Control updates, retrofits and replacements
- PLC/HMI programming and service

Our licensed electricians can inter-wire the control panels with process equipment and instrumentation in a factory-assembled skid, building or trailer; we even provide turnkey installed systems.



Advanced Capabilities

Our **advanced control capabilities** set us apart from our peers. Comprehensive Controls has experience in applying and programming virtually every major manufacturer programmable logic controller (PLC) and operator interface. We also have worked with many Human-Machine Interface (HMI) supervisory control and data acquisition (SCADA) software packages.

The **operator interface** (OI) is your link to the controlled process via the PLC. OI options abound, from a simple display with keypad to advanced color touchscreens. At Comprehensive Controls, we have experience with many OI devices and take care to match your project's requirements with a suitable unit. We then configure the OI and its associated software to make it easy to operate.



Operator interface options abound, from the simple to advanced.

A variety of **remote communications options** can be incorporated into our systems. Supported communications mediums include:

- Dedicated, leased, voice-grade telephone lines
- Conventional dial-up telephone lines (including the Internet)
- Licensed or unlicensed (spread spectrum) radios
- Fiber optic and hardwire cable.

Communications requirements can range from simple data collection to remote control and intricate alarm handling sequences. For example, alarms can be reported as a voice message, or sent to a pager, computer, fax machine or an e-mail address on the Internet.

The majority of the PLC-based systems we furnish are provided with a modem. This allows us to perform remote troubleshooting and file uploads for program changes and additions.

We often provide control engineering and design/build assistance. Electrical one-line, P&ID, enclosure detail and functional block diagrams can all be provided. We also furnish suggested specifications and cost estimates. All of these documents can be e-mailed for your convenience.

To receive application assistance, request a quotation or place an order please call us; we're ready to serve you.



SCADA displays portray monitored information in easy to understand graphical depictions.

SCADA systems with industry-standard communications and **HMI software packages** provide comprehensive local and remote site control and monitoring. Graphic displays, alarm and event logging, reports, process control and data logging functions are configured to your project's specific requirements. As is the case with OI devices, we configure HMI software packages with ease of use and operator comprehension in mind.

For basic alarm and event monitoring, control and analog monitoring, we can furnish **RCAM**, our cost-effective, Windows PC-based software package.



HMI-based SCADA provides complete system control and monitoring of local and remote facilities at your fingertips.

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