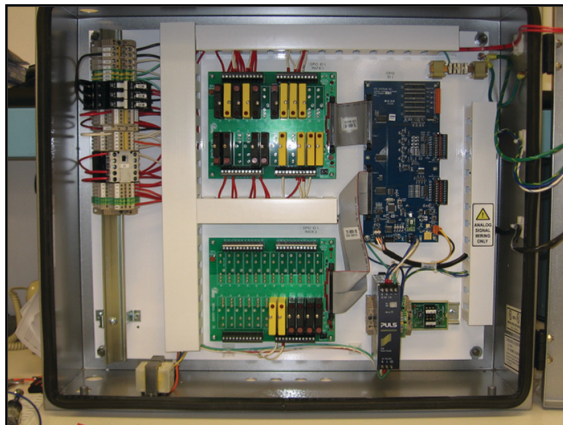


GForce™ Microprocessor Control Panel Retrofit Program

Continuing Innovation

GEA FES, Inc., builds on its quarter century long tradition of innovation by continuing to enhance the GForce™ control panel to replace existing controls for most screw, reciprocating, rotary, and centrifugal compressors. The GForce™ Panel, arguably the most operator-friendly, practical, and easy-to-use control panel in the industry, can control the following compressors:

- Grasso, Mycom, Howden, Dunham-Bush, Kobe, Sullair, Frick, Sabroe and Stal twin screw compressors
- Vilter and Hall single screw compressors
- Grasso, Vilter, Mycom, Sabroe and Frick/York single and compound reciprocating and Fuller rotary compressors
- Carrier and York centrifugal compressors



Panel interior - backplate with I/O Interface Board, I/O Racks, and Power Supply

Reliable

Built on an industrial processor hardware platform suitable for tough environments and utilizing proven core operating system software, the GForce™ Panel is meeting the reliability required by the Industry. Obsolescence is not a concern—the GForce™ panel design allows for future replacement of a malfunctioning processor with a newer processor that is available, extending the panel's useful life.

The GForce™ Panel's operating application software was developed directly from the FES Micro-III panel, providing functionality that has been well-tested and proven reliable since the mid 1990's.

This panel meets the same environmental specifications as previous GEA FES microprocessor-based control panels dating to the early 1980's, thus a "computer" environment is not required. Design operating conditions are +32°F to +122°F (0°C to +50°C) with 0-95% relative humidity (non-condensing). An optional panel heater is available for colder environments.

The GForce™ Panel screen is weather and chemical resistant, and can withstand a high-speed impact from a blunt object.

The panel's I/O Interface Board, with its own microprocessor, was custom-designed by GEA FES for direct interface to field devices. Three levels of "watchdog" protection are designed into the hardware and software to ensure that the compressor is only driven when the panel is working properly. The GForce™ processor accesses all field devices via robust RS485/Modbus communications, a very reliable means for reading the state of the inputs and directing the outputs.



The panel's I/O Racks use widely-available modules with fuse and LED indicator; modules with integral H-O-A toggle switches are an option. Each I/O Rack includes a fuse tester and space for spare fuses.

Secure

The GForce™ panel has 3 levels of security—Basic, User, and Service—each with increased capabilities and each accessible via unique password entry.

Multiple Enclosure Sizes & Types

Various panel sizes and enclosure materials are available; all are designed and built to meet UL/cUL 508A, Type 4 or 4X rating. An option for UL approved Class 1, Div II, Group B/C/D Hazardous Location is also available.

Compatibility

The GForce™ panel supports Modbus/TCP/IP industry standard protocols as well as AB Ethernet IP for providing access to a MicroLINK SCADA System, a PLC, the plant's DCS, or any other supervisory system and an optional GComm Interface is available for integrating a GForce™ panel into an existing FES ComMENT network.

Other Refrigeration System Functions

For small systems, a single GForce™ Screw, Centrifugal, or Recip Retrofit Panel configured to monitor and control one compressor can also be configured to sequence other compressors, control and monitor another reciprocating compressor, maintain head pressure, maintain evaporator zone temperatures, as well as control vessel/pump packages, provide chiller control, and monitor refrigerant leak detectors.

Easy to Operate & View

The GForce™ Control Panel display is clear, crisp, and easy to view. Utilizing a large 15" diagonal, full 32-bit-color, LCD display with 1024 x 768 pixel resolution and a 120° viewing angle, the GForce™ provides extremely fine resolution and color variations, making even very detailed screens appear with superior clarity.

The GForce™ display is also a resistive touch screen with active touch areas clearly indicated. The screen can sense a stylus or a bare, oil-covered, or even gloved finger.

Navigating from screen to screen is so easy it quickly becomes intuitive. A touch of the Suction Pressure Display area near the compressor's suction inlet will bring up a screen with all Suction Pressure parameters—control, alarm & shutdown. Access of all panel information is only one or two touches away!

Easy to Maintain & Update

Many different tasks can be done at the panel while the compressor is running—parameter access; viewing on-screen drawings and manuals; maintenance log and schedule entries; viewing historical trend data and alarm history; etc.

The GForce™ Maintenance Schedule lists tasks with time interval between service operations, time stamping when service is done, and tracking of time remaining until due. The GForce™ Maintenance Log provides a date & time-stamped log of activities and notes for the next shift personnel to view.

Any USB Flash Memory Device plugged into a GForce™ Panel's USB port is the means for transferring data to and from the panel. Transfer capabilities are simple and versatile—operating program, parameters, historical trend data, alarm history, maintenance records—all can be transferred from the GForce™ memory and archived or used for analysis. Manuals and drawings, even a User's document or picture (SOP's, equipment service photos, etc.) can be loaded into the panel's memory and viewed on the panel display. Program updates are easy—the update is e-mailed from GEA FES and transferred to the GForce™ processor in the field through this same USB port.

The GForce™ can even create its own record document of current operating status and adjustable panel settings, useful for startup records.

Easy to Support

The GForce™ Panel has a minimal number of components and a minimal number of connections between them, making troubleshooting & repair easier. When trouble-shooting a problem, the technician can quickly view alarm annunciations, diagnostic utility screens, on-screen manuals, drawings, parts lists, User documents, and "Rx-Trend" status of all analog and digital signals 10 minutes prior to shutdown. All historical trend data can be e-mailed to Others for diagnosis. Records of repairs and updates can even be logged into the panel's own User-customized, date-stamped Maintenance Log.

Easy Ethernet Communications and E-mail Capability

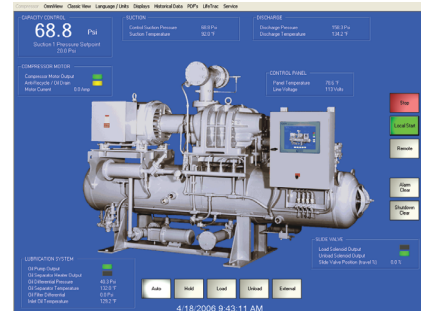
The GForce™ Ethernet port makes the panel easily compatible with outside communications. Through a secure Ethernet network, a remote User is able to view and access the panel as if standing right in front of it; the software for viewing from a PC is free and every GForce™ panel can be used to view any other GForce™ panel on the network.

Each panel can also send out its own e-mail/text alarm and shutdown messages complete with Rx-Trend history data attached.

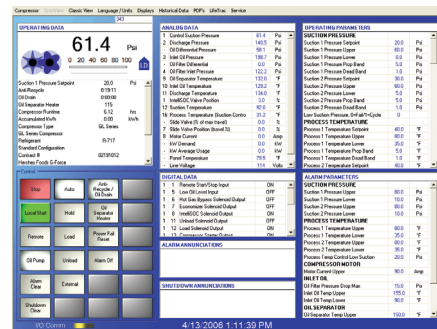
A dedicated network can be built using only a standard Ethernet switch and CAT5 cable running to each GForce™ panel and remote viewing computer. It's as simple as that!

View it Your Way!--

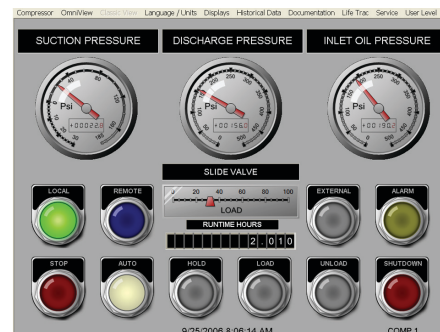
The GForce™ panel is flexible. Each operator can view the compressor the way he/she likes to see it with a choice of three main operating screens, and a choice of 5 standard languages.



- The Compressor View shows a graphical representation of the compressor and system components.



- The OmniView displays everything you want to know about the compressor on a single screen; change a parameter and watch the effect without switching screens.



- The Classic View, a favorite of seasoned refrigeration personnel; shows gauges, meters, lamps and pushbuttons typical of an electro-mechanical panel.

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