



QUANTUM™ LX CONTROL PANEL

The most technologically advanced screw compressor control center in the world.

HARDWARE

The **Quantum™ LX** Control Panel incorporates hardware features & technology proven in millions of applications.

The high-speed, PC-based processor provides speed and processing capability far surpassing competitive micro-processor offerings. The 10.4" Active Color VGA Graphics Display, similar in design to those used on laptop computers, offers a high contrast, crisp clear display of compressor information and status with a superior viewing angle.

Additional Input/Output can be easily installed in the field. This provides flexibility for future engine room upgrades and changes. No longer will you be constrained by the manufacturer's limited I/O capability.

Three field-selectable serial communication ports allow you to choose from a combination of RS-422, RS-485, or RS-232 port configurations for external communications. Ethernet port allows Ethernet and Internet communications.

Additional Features

- **Circuit Breaker Protection for Main Power.**
- **UL, cUL, CE, and ISO 9001 Certifications**
- **Flexible Analog Inputs.** Setup is easily changed in the field to accept 0-5 volt, 1-5 volt, 4-20 mA or ICTD sensors and transmitters.
- **Long-Life, Easily Replaceable, Lithium Coin Cell Battery** for power backup to the time/date clock.
- **Communication Activity and Diagnostic Lamps** simplify troubleshooting and provide visual indication of proper component operation. Code readouts also appear on the display if an internal component problem is detected.
- **FLASH Setpoint Memory.** All setpoints are stored in FLASH memory which requires no battery backup. Setpoints can be field programmed within Frick® defined limits. A notice is displayed if setpoints are entered outside of the defined ranges.
- **Replaceable Input and Output Modules** with individual, replaceable fuses, *on-board tester*, and spare fuse.

SOFTWARE

• **Intuitive Operator Interface.** All of the **Quantum™ LX** control panel screens are user friendly, menu driven and easy to use and understand. Help screens and prompts are available should you experience difficulties in setup or monitoring of system information. Operation instruction can be accessed on-screen via the Help menu.

Form E90-020 SPC (APR 2006)

SPECIFICATIONS

File: EQUIPMENT MANUAL - Section 90
Replaces: E90-020 SPC (JUN 2005)
Dist: 1, 1a, 1b, 1c, 4a, 4b, 4c



- **Software Diagnostics.** Numerous diagnostic features have been incorporated to ease troubleshooting and identify component malfunctions. Diagnostic features include: sensor short/open, setpoint input out of sensing range, DC and AC power monitoring, and memory error sensing.
- **Multiple Capacity Controllers** provide application flexibility for auto setback control and control reset for changes in modes of operation.
- **Override Controls.** All safety and controller functions can be programmed to unload the compressor within maximum safety and control parameters.
- **On-screen Calibrations** for sensors, motor current, slide valve and slide stop with easy to understand graphics. Potentiometer tuning has been eliminated.
- **Shutdown Notification.** Display backlight flashes on shutdown to attract attention in noisy engine rooms.
- **Foreign Language Displays**
- **Selectable Pressure and Temperature Units**
- **Programmed Compressor Sequencing**
- **Optional Condenser Control**
- **Industry Standard Communication Protocols**
- **Real-Time and Historical x-y trending.** Selected data and selected time periods can be viewed in either an x-y trending chart or a tabular chart.
- **Ability to add analog inputs.** Can add any 0-5Vdc, 1-5Vdc, or 4-20mA sensor. A name and unit description can be entered to identify the input. The inputs have high and low alarm and shutdown setpoints.
- **Ability to add digital inputs.** A name can be entered to identify the input. Either an alarm or shutdown can be selected to occur when the input is de-energized. A selection can be made whether to monitor the input continuously or only when the compressor is running.



CONTROL PANEL SPECIFICATIONS

PANEL

| | |
|----------|--|
| Size | 18" (45.72 cm) W x 22" (55.88 cm) H x 10" (25.4) D |
| Weight | 75 lb (65.77 kg) (with all options installed) |
| Design | NEMA 4 (Type 4) |
| Material | Painted steel |
| Finish | Frick "sea blue" epoxy paint |

ENVIRONMENTAL

| | Operating | Storage |
|-----------------------------|---------------------------------|---------------------------------|
| Ambient Temperature | 32°F to 122°F 0°C to 50°C | -13°F to 140°F -25°C to 60°C |
| Humidity (noncondensing) | 0% to 90% | 0% to 90% |
| Vibration | 15 g's (14.7 m/s ²) | 15 g's (14.7 m/s) |
| RFI field strength immunity | 10v/m (20 MHz to 1ghz) | |
| EMI | complies with CE EMC directive | |

CERTIFICATIONS

| |
|--------------|
| UL/ cUL 508A |
| ISO9001 |
| CE (Europe) |

POWER

| | |
|------------------------|----------------------------------|
| USA voltage | 100 to 125 volts AC 47-63 Hz |
| International voltage* | 185 to 254 volts AC 47-63 Hz |
| Power loss | 16 millisecond maximum (1 cycle) |

* Requires change-out of plug-in relays and AC input modules to 230 volts AC type.

DISPLAY

| | |
|-----------|---|
| Format | 640 x 480 pixels VGA |
| Type | Color active matrix TFT (Thin Film Transistor) LCD (Liquid Crystal Display) |
| Colors | 256 simultaneous colors from 256,000 color palette |
| Size | 10.4" (26.42 cm) diagonal display area |
| Luminance | 60 minimum, 70 typical cd/m ² |
| Backlight | CCFT (Cold Cathode Fluorescent Tube) 10,000 hour on time. |

KEYPAD

| | |
|----------|---|
| Material | Lexan |
| Switches | 24.69 oz (700 gram) trip force stainless steel snap domes |
| Misc. | RFI protected, UV protected, Scratch resistant |

INPUT/OUTPUT MODULES

| | | | |
|--------|-----------------------------|---------|---------------------|
| Input | USA voltage | IACM-5 | 90 to 140 volts AC |
| Input | International voltage | IACM-5A | 180 to 280 volts AC |
| Output | USA & International voltage | OACM-5 | 24 to 280 volts AC |

ANALOG INPUT CHANNELS

| CHANNEL | INPUT |
|-----------------------|--|
| Channels 1 through 13 | 0-5 volt DC 1-5 volt DC 4-20 ma. ICTD (Integrated Circuit Temperature Device) AD590 |
| Channels 14 & 15 | 0-5 volt DC 1-5 volt DC 4-20 ma. ICTD (Integrated Circuit Temperature Device) AD590 0 to 1,000 ohm potentiometer |
| Channel 16 | 0-5 volt DC 1-5 volt DC 4-20 ma. ICTD (Integrated Circuit Temperature Device) AD590 0-50 ma. AC or DC |

ANALOG OUTPUT CHANNELS

| CHANNEL | OUTPUT |
|----------------------|--------------------|
| Channels 1 through 8 | 4-20 ma., 0-20 ma. |

TEMPERATURE SENSOR (ICTD)

| | |
|--------------------|---|
| Device | AD590J |
| Range | -67°F to 302°F (-55°C to 150°C) |
| Output | 1 uA/ °Kelvin |
| Excitation Voltage | 4 to 30 volts DC |
| Accuracy | +/- 5.0°C over specified temperature range. |

PRESSURE SENSOR

| | |
|-------------------------------|---|
| Device | Signal-conditioned silicon strain gauge |
| Material | 100% stainless steel welded parts. |
| Physical | 2X over pressure (200 PSI device) 1.5X over pressure (500 PSI device) 10X burst pressure (200 PSI device) 5X burst pressure (500 PSI device) |
| Suction pressure | 200 PSIA range: 29.9" hg to 185.7 PSI |
| Discharge pressure | 500 PSIA range: 29.9" hg to 485.7 PSI |
| Oil pressure | |
| Oil filter pressure | |
| Output (all) | 1-5 volt DC |
| Compensated temperature range | 30° F to 185°F (-1°C to 85°C) |
| Operating temperature range | -40°F to 185°F (-40°C to 85°C) |
| Excitation voltage | 9 to 30 volts DC |
| Accuracy | +/- 0.8% FS |



POWER SUPPLY

| | | |
|------------------------------|---|------------------------------|
| Input power (Auto detect) | 90 to 125 volts AC 185 to 264 volts AC | 47-63 Hz 47-63 Hz |
| Output power | 75 watts continuous, 110 watts peak | |
| DC Supplies | +5 volt DC 8 amp max. +12 volt DC 2.5 amp max. -12 volt DC 1 amp max. +24 volt DC 2.5 amp max. | (V1) (V4) (V3) (V2) |
| Other | AC line quality monitoring and reporting. | |
| Type | Switching | |

POWER SUPPLY SETTINGS:

| Supply | Minimum setting | Recommended Setting | Maximum setting |
|-----------------------------|-----------------|---------------------|-----------------|
| +5 volts DC (V1) adjustable | 5.00 volts DC | 5.10 volts DC | 5.25 volts DC |
| +12 volts DC (V4) fixed | 11.76 volts DC | 12.00 Volts DC | 12.24 volts DC |
| -12 volts DC (V3) fixed | -11.64 volts DC | -12.00 volts DC | -12.36 volts DC |
| +24 volts DC (V2) fixed | 22.80 volts DC | 24.00 volts DC | 26.40 volts DC |

COMMUNICATIONS INTERFACE

| Port | Type | Protocol / Usage |
|----------|--------|---|
| Com-1 * | RS-485 | Frick #, \$ Allen-Bradley® DF1 |
| Com-2 * | RS-422 | MODBUS ASCII |
| Com-3 * | RS-232 | MODBUS RTU Status Communication |
| Ethernet | RJ-45 | MODBUS TCP, HTTP, E-mail, Compressor Sequencing |

*May require additional hardware.

MISC.

| | |
|-------|--|
| Relay | Plug-in type; 120 volt AC; 3-pole; 10 amp contacts |
|-------|--|

FIELD WIRING

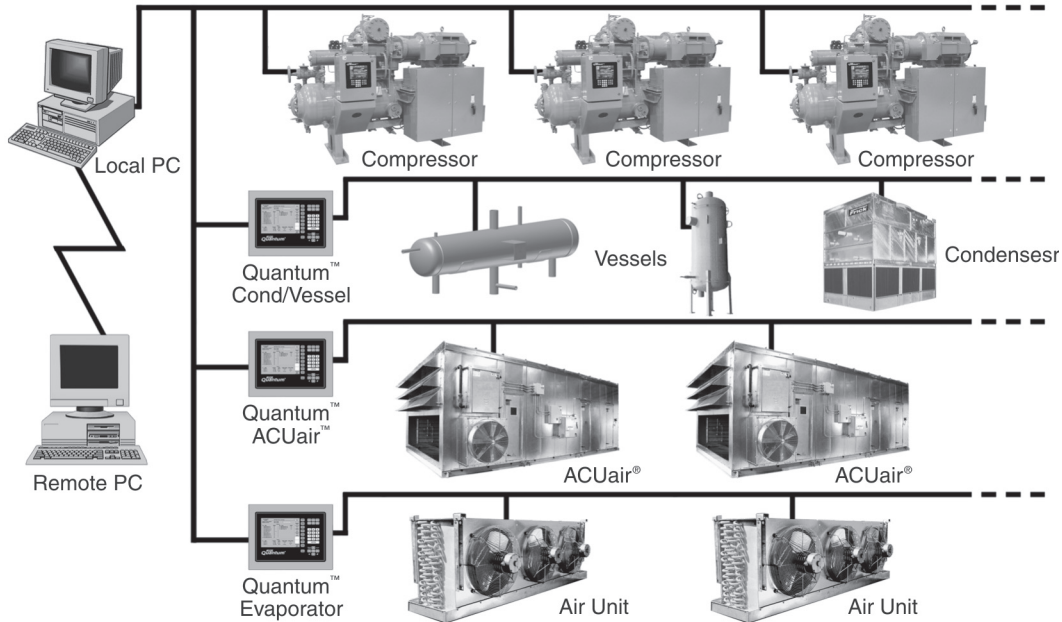
| | |
|-----------------------------------|--|
| AC wiring (40 volts and above) | All AC wiring must enter on the right hand side of the enclosure or bottom right side. Top entry is not permitted. Predrilled conduit holes are provided. |
| DC wiring (40 volts and below) | All DC wiring must enter on the left hand side of the enclosure or bottom left side. Top entry is not permitted. Predrilled conduit holes are provided. |



Q-NET™ network technology...

Make the Connection with **QUANTUM™**!

Take full advantage of Q-NET™ technology with all Frick® products!



System integration is what we do...

- Q-NET™ ... supports open-protocols for your SCADA system (i.e. Allen Bradley DF1 and Modbus ASCII)
- Q-NET™ ... connects for local or remote access
- Q-NET™ ... can be applied to both new and existing systems

Q-NET™ means precise control 24 hours a day, seven days a week

Q-NET™ distributed architecture means faster, easier, economical installations

Q-NET™ delivers increased operating efficiency and lowers energy costs

Now available on Frick's ACUair® hygienic air handlers, condensers, screw compressors, evaporators, and refrigerant vessels, too.

You can't beat the system when it's all **Frick!**

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