

CONTROLS

Quantum™ HD

Heavy Duty Performance In High Definition



Quantum™ HD Industrial Refrigeration Controller

Quantum HD with Unity Architecture

Quantum HD control panels make equipment management easy, from anywhere! Access any control, calibration or configuration value using on-screen touch control. With a large, high-contrast display, navigation and reading of the operating values and control settings is easy.

The Frick Quantum HD compressor controller has now been improved with the "Unity" software architecture, a Frick exclusive.



Quantum HD Touchscreen Control (Unity Architecture)

No other software architecture provides the field configurability or remote access options for the industrial refrigeration industry.

As the name implies, Unity brings all your system control into one cohesive unit, allowing you to view any Unity control from any other Unity controller that is on the same network. From a compressor panel, you can now view your condenser, vessel, evaporator, engine room or even another compressor control.

Simply the easiest-to-use, yet most powerful controller available today!

Smart Connectivity

Getting connected to your Quantum HD is easy. The patented Web-based remote access feature of the Quantum HD can provide access from any commonly networked computer in your facility.

Work with your information technology (IT) department to establish a virtual private network (VPN) for safe, secure remote access from any of your Web-enabled devices. Being in touch with your equipment is just that easy.

Independent, multi-user access means that more than one party can remotely access a Quantum HD at the same time without interfering with what the others are doing. This feature also keeps the local screen from being disturbed when someone is viewing it remotely. No other controller provides this level of access.

The Quantum HD Objectives

- Be the best industrial refrigeration controller in the world.
- Enhance the user experience.
- Provide peace of mind to the user and equipment owner.

Features and Benefits

- Logical/intuitive navigation – No control setpoint is more than three touches away; most are within two.
- High-contrast, easy-to-read display.
- Just like an Internet site, the Home screen is always one touch away.

Never Leave the Home Screen In Daily Operation

- Single-touch access to change the capacity control mode and setpoint.
- Single-touch access to change the mode for the compressor, capacity slide, volume slide and speed.
- Single-touch starting and stopping of the compressor.
- Single-touch manual control of the capacity slide, volume slide and speed.
- Single-touch access to the documentation and user-defined values screens.

- All pertinent operating data is on the Home screen.
- Up to 6 customer-selected operating values can be displayed on the Home screen.
- 3 primary navigation icons at the top of the screen, along with a straightforward menu, get you quickly to your destination.
- Login by PIN accommodates individual panel users.
- Heavy-duty industrial processor provides peace-of-mind performance.



Peace of Mind Through Performance

With Quantum HD, you get more than the most advanced, reliable controller on the market, you get the peace of mind that comes only from owning the leading brand in performance and engineering – Frick® Industrial Refrigeration.



The screenshot shows the Home screen of the Quantum HD controller. At the top, a green bar indicates 'Normal' status (10). Below it, a blue header displays 'Compressor' (1), IP address '192.168.0.135', and date/time '02/17/2016 - 13:36:51'. Navigation buttons for 'Home' (2), 'Alarms', and 'Menu' are on the right. The main area is divided into several sections: 'Package Operating Values' (8) with a table of pressure, temperature, and superheat; 'Capacity Management' (3) showing 'Mode 1' and a 'Setpoint' of 19.5 PSIG; 'System Operating Values' (7) with a 'Select' button; and a 'Compressor' (4) control panel showing 'Running' status, 'Capacity Slide' at 76.3%, 'Volume Slide' at 3.22, and 'Oil Pump' at 'Off'. Below the compressor panel are four sets of control buttons for 'Compressor', 'Capacity', 'Volume', and 'Speed' (6).

	Pressure	Temperature	Superheat
Suction	20.6 PSIG	16.2 °F	11.7 °F
Discharge	161.4 PSIG	168.0 °F	69.0 °F
Oil	152.6 PSIG	139.6 °F	
Separator		169.1 °F	
Filter Differential	4.3 PSI		

Motor Amps	85 AMPS		
Motor FLA	85.0 %	Motor Run Hours	0 HRS
Motor Kilowatts Est.	0 kW		

Economizer Pressure	54.3 PSIG
Leaving Process Temperature	32.8 °F
Entering Process Temperature	39.8 °F
System Discharge Pressure	151.2 PSIG

Never Leave the Home Screen!

The **Home** screen of the Quantum HD controller is designed to provide normal day-to-day operation without the user leaving the Home screen. Above, in clockwise order, are the high points of the Home screen.

The Home screen header, including the package status bar, panel name, IP address, date and time, as well as the three primary navigation buttons, is always present. Only the content below the header changes as you navigate the Quantum HD controller.

- 1 The user-defined panel name, IP address, date and time are clearly illustrated.
- 2 Simply touch one of these three **Quick Navigation Buttons** to initiate the easy-to-follow, intuitive navigation. The active button is outlined. The Home screen is never more than a single touch away.
- 3 The **Capacity Management** window illustrates the current mode, setpoint and actual value. It also provides the operator the ability to easily and quickly select from up to four capacity control modes, as well as quickly change the capacity control setpoint.
- 4 The **Compressor** window provides the status, position and mode for the compressor, capacity slide, volume slide, oil pump and Variable Speed Drive (if used).
- 5 Easily change the mode of the compressor, capacity slide and volume slide. If used, the Variable Speed Drive mode will match the capacity slide mode.
- 6 Manual control of the capacity slide, volume slide and speed is accomplished by simply touching and holding the Up ▲ arrow to load or increase, or the Down ▼ arrow to unload or decrease. Manually starting and stopping the compressor is just as easy.
- 7 Select up to 6 **System Operating Values** from the **User-Defined** screen to be displayed on the Home screen. All analog values can be selected and viewed on the User-Defined screen.
- 8 The standard **Package Operating Values** are prominently displayed for easy interpretation.
- 9 The capacity control channel, setpoint, and actual value are clearly displayed adjacent to the package status bar.
- 10 The **Package Status** bar is color-coded, letting you know at a glance if the operation is **Normal**, or if the package is in **Warning** or **Shutdown**.

Quantum™ HD

Normal

Control : Suction Pressure
Setpoint : 19.5 PSIG - Actual : 20.6 PSIG

Home

User Defined

Package Operating Values

	Pressure	Temperature	Superheat
Suction	20.6 PSIG	16.2 °F	11.7
Discharge	161.4 PSIG	168.0 °F	6
Oil	152.6 PSIG	139.6 °F	
Separator	4.3 PSI	169.1 °F	
Filter Differential			
Motor Amps	85 AMPS		Motor Run H
Motor FLA	85.0 %		
Motor Kilowatts Est.	0 kW		

System Operating Values

Economizer Pressure
Leaving Process Temperature
Entering Process Temperature
System Discharge Pressure

Compressor
192.168.0.135
02/17/2016 - 13:36:51

Home Alarms

Capacity Management

Setpoint
19.5 PSIG

20.6 PSIG

Capacity Control
Mode 1

Actual

Running

Manual
Automatic
Automatic

Automatic

Compressor

Compressor	Running	76.3%
Capacity Slide	Idle	3.22
Volume Slide	Increase	
Oil Pump	Off	
Speed	100.0%	0 RPM

Capacity
Volume
Speed

Compressor
Capacity
Volume
Speed

Select...

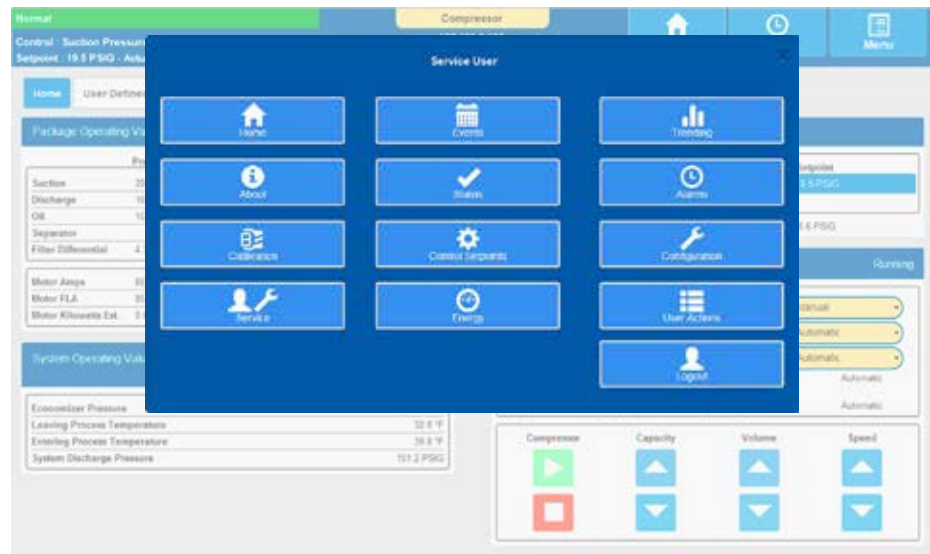
54.3 PSIG
32.8 °F
39.8 °F
151.2 PSIG

The Quantum™ HD User Menu

Press Menu. View straightforward selections.

- **Home** – Returns the operator to the Home screen.
- **Events** – Gives access to the event log.
- **Trending** – Press this button to view real-time and historical trending of selected analog points.
- **About** – Illustrates the version of software for the processor, interface, analog and digital boards.
- **Status** – Shows the status of the analog and digital boards, as well as all active serial communication ports and DBS starter or Vyper™ Variable Speed Drive, if used.
- **Alarms** – Takes the operator to the Alarms screen to view and clear any current alarms or view historical alarms. Freeze data for a specific alarm is also accessible on this page.
- **Calibration** – Provides access to calibrate all active analog points. The sensor type and range are configured in "Analog I/O" field of configuration.
- **Control Setpoints** – Provides a condensed list of options also found in configuration that may need adjustment from time to time.

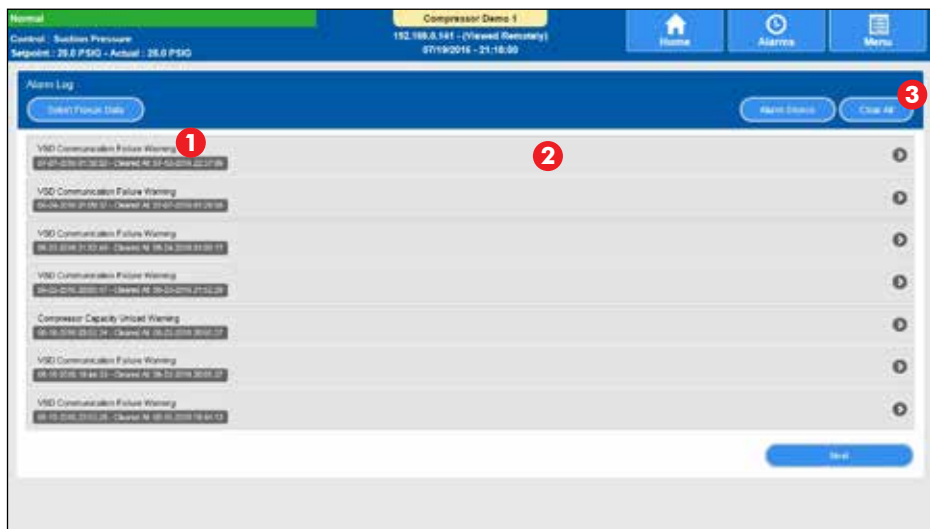
- **Configuration** – Provides access to the setup of the panel, package and all options. Once things are set in configuration, they will rarely, if ever, be changed.
- **Service** – Provides access to manual oil pump control, maintenance schedule, communications testing, Ethernet diagnostics and software maintenance.



- **Energy** – Displays energy profile.
- **User Actions** – Displays the recent actions of users.
- **Clean Screen Mode** – Deactivates touchscreen for cleaning.
- **Logout** – A one-touch logout process to leave the panel.

Alarm Screen

- 1 Each alarm is clearly noted by description, date and time.
- 2 Simply press anywhere on the alarm message bar to see the freeze display of all pertinent information at the point of alarm.
- 3 Clear all active alarms that are corrected by pressing the "Clear All" button.





Quantum™ HD. Far Ahead in Features.

The Single-Program Platform

We've listened to our customers in order to provide a single operating program that towers over the features of other controllers in our industry. For almost every situation, the Quantum HD has a built-in solution. The Quantum HD is as close as you can get to a programmable logic controller (PLC), at a fraction of the cost.

Standard Features:

- Compressor sequencing (three suction levels with up to eight compressors per level)
- Condenser control (with floating-head pressure control)
- Configurable digital output control (based on analog value)
- Timed digital outputs (time of day or compressor run time)
- Additional digital and analog inputs (monitoring only or with high and low safeties)
- Real-time and historical trending
- Bearing vibration and temperature monitoring
- Eight proportional and integral control loops (modulating control based on analog input value)
- Superheat control
- Retransmitting outputs (retransmits an analog input value to an external device)
- Kilowatt monitoring and trending
- Preventive maintenance schedule
- Capacity control mode scheduling
- Input module capacity mode select
- Selectable analog input signal
- Configurable analog value range
- Software and hardware diagnostics

NOTE: Some features may require additional hardware.

Integrate Your Quantum HD

Using the following communications protocols, the Quantum HD is easily integrated with nearly any master device used in our industry. The Quantum HD provides three serial ports and one Ethernet communication port.

Serial Protocols – Frick® ASCII, Modbus ASCII, Modbus RTU and Allen-Bradley® DF1 (full- and half-duplex)

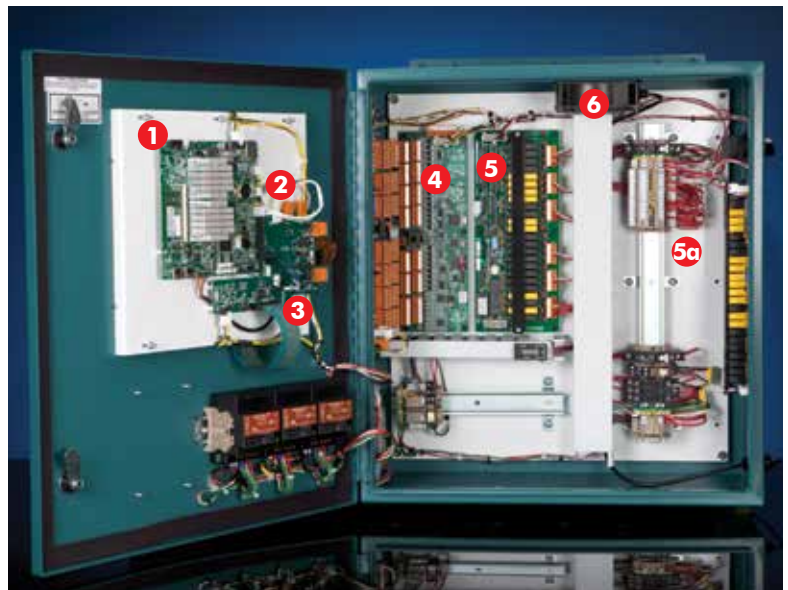
Ethernet Protocols – Modbus TCP and Allen-Bradley Ethernet/IP

Ease of Service

We understand how stressful service work can be. We've designed the Quantum HD to provide open access to all test points, diagnostic LEDs, adjustment points and jumpers to make things easier than the competition. All components of the Quantum HD can be individually replaced. There are no multi-component kits.

Major Interior Components:

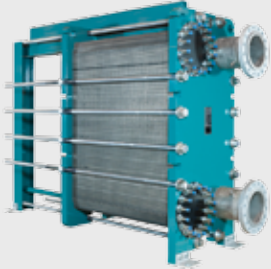
- 1 The high-speed and robust Intel Atom-based Q5 processor board.
- 2 The interface board serially connects the processor to central control systems, DBS motor starter or Vyper™ Variable Speed Drive (VSD), as well as the analog and digital I/O boards.
- 3 Individual power supplies with adjustment (+5vdc, +12vdc and 24vdc).



- 4 Analog boards 1 and 2 receive and output analog signals (24 inputs and 8 outputs per board).
- 5 Digital boards 1 and 2 provide 24 digital points of control per board. Each point has a standard configuration, but can be reconfigured in the field, if necessary.
- 5a
- 6 Internal circulation fan, optional for high ambient temperatures, provides continuous airflow across internal components, keeping them within their operating temperature range.

Single Source Industrial Refrigeration Solutions !

Heat Exchangers



Packaged Equipment



Hygienic Air Units



Vessels



Controls



Evaporators



Compressors



Condensers



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