

CONTROLS

# Quantum™ HD.

Heavy Duty Performance In High Definition.



**Frick**®

BY JOHNSON CONTROLS

# The Quantum™ HD Industrial Refrigeration Controller. Technology. Performance. Peace of Mind.

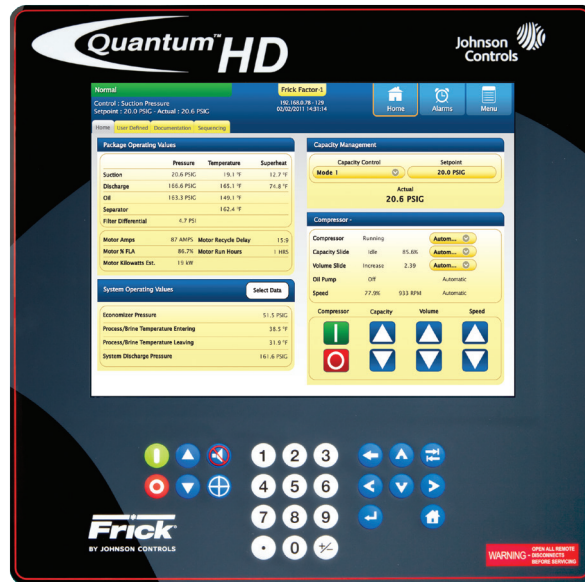
## The Quantum HD Objectives.

- To create the best industrial refrigeration controller in the world.
- To enhance the user experience.
- To provide peace of mind to the user and to the equipment owner.

## The User Experience.

The large high-definition display provides easy reading of operating values and control settings.

Access any control, calibration or configuration value using the on-screen touch control or the keypad. It's your choice.



Quantum HD touch-screen control

## Peace of Mind Through Performance.

With the new 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® by Johnson Controls.

## Get Quantum HD.

### Get Connected and Take Control.

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. Never be out of touch with your equipment.

## Independent, Multiuser Access.

Independent, multiuser access means that more than one party can remotely access the 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.

## Never leave the Home screen for your 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.

- Login by PIN allows the panel to accommodate individual users.

## Familiar Hardware

Except for the keypad and display, the Quantum HD uses the same familiar hardware as the current Quantum™ LX control panel. This minimizes the troubleshooting learning curve often associated with new products, and reduces inventory levels of replacement parts.

## Quantum HD.

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

- Logical/intuitive navigation – No control setpoint is more than three touches away, and most are within two.
- High-definition, easy-to-read display.
- Just like an Internet site, the Home screen is always one touch away.
- All pertinent operating data is on the Home screen.
- Up to 6 system operating values selected by the user 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.
- Heavy-duty industrial processor provides peace-of-mind performance.





### 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 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. The full array of 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**, if the package is in **Warning**, or if it is in a **Shutdown**.

Making the Best Even Better.

# Quantum H<sup>TM</sup>

Normal

Control : Suction Pressure  
Setpoint : 20.0 PSIG - Actual : 20.6 PSIG

Home

User Defined

Documentation

Sequencing

## Package Operating Values

	Pressure	Temperature
Suction	20.6 PSIG	
Discharge	166.6 PSIG	
Oil Separator	163.3 PSIG	
Filter Differential	4.7 PSI	
Motor Amps	87 AMPS	Motor
Motor % FLA	86.7%	Motor
Motor Kilowatts Est.	1.9 kW	

## System Operating Values

Compressor Pressure	
Oil/Brine Temperature	
Brine Temperature	
Charge Pressure	



Frick Factor-1  
192.168.0.78 - 129  
02/02/2011 14:31:14

Home Alarms Menu

Capacity Management  
Capacity Control

Mode 1

Actual  
20.6 PSIG

Setpoint  
20.0 PSIG

Compressor

Running 85.0%

Idle 2.0%

Capacity Slide

Increase

Volume Slide

Off

Oil Pump

On

Speed

Change



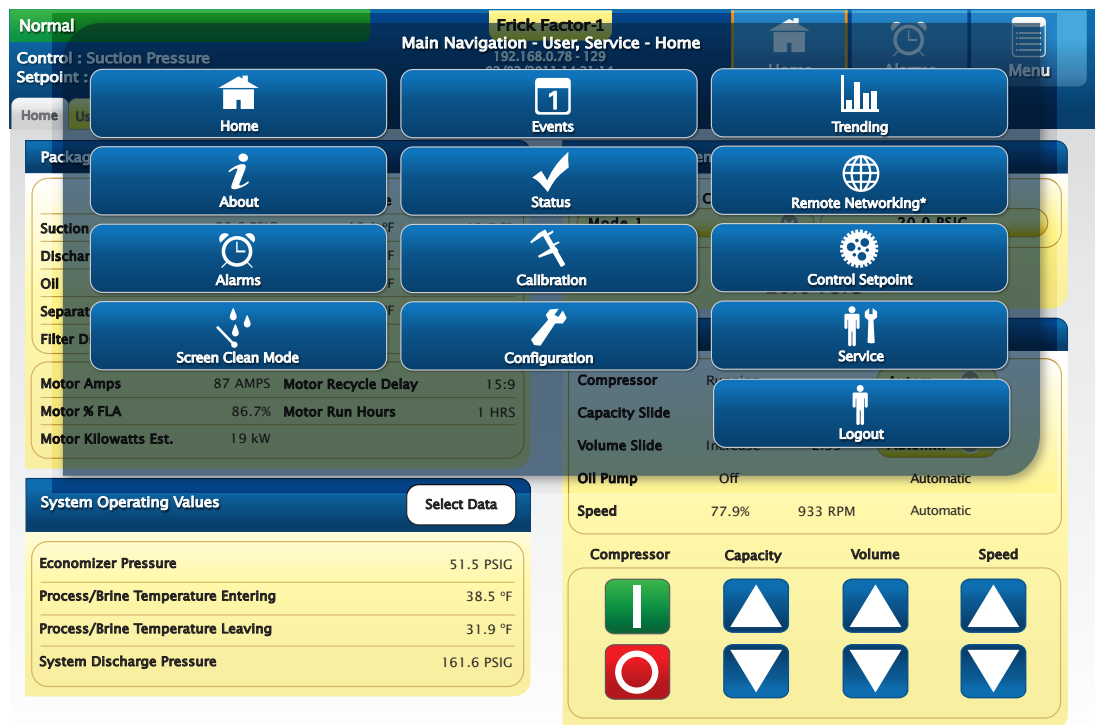
Introducing the next generation of Quantum control.

Quantum™ HD.

Press the Menu key to view the straightforward menu selections of the Quantum HD.

- **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.
- **Remote Networking** – Allows all panels that are networked to be accessed from any one panel on the network.
- **Alarms** – Takes the operator to the Alarms screen to view and/or clear any current or historical Warnings or Shutdowns.
- **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** – Provide a condensed list of options also found in configuration that may need adjustment from time to time.
- **Clean Screen Mode** – Deactivates the screen for cleaning.
- **Configuration** – Provides access to the setup of the panel package and all options. Once things are set in configuration, they may never or rarely need to be revisited.
- **Service** – Provides access to manual oil pump control, maintenance schedule, communications testing, Ethernet diagnostics and setpoints saving.
- **Logout** – Provides a one-touch logout process before leaving 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, making the Quantum HD as close to a programmable logic controller (PLC) as you can get without the additional cost.

### A few of these standard features are:

- Compressor sequencing (three suction levels with up to eight compressors per level).
- Condenser control (with floating-head pressure control).
- Programmable 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.
- Programmable 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).

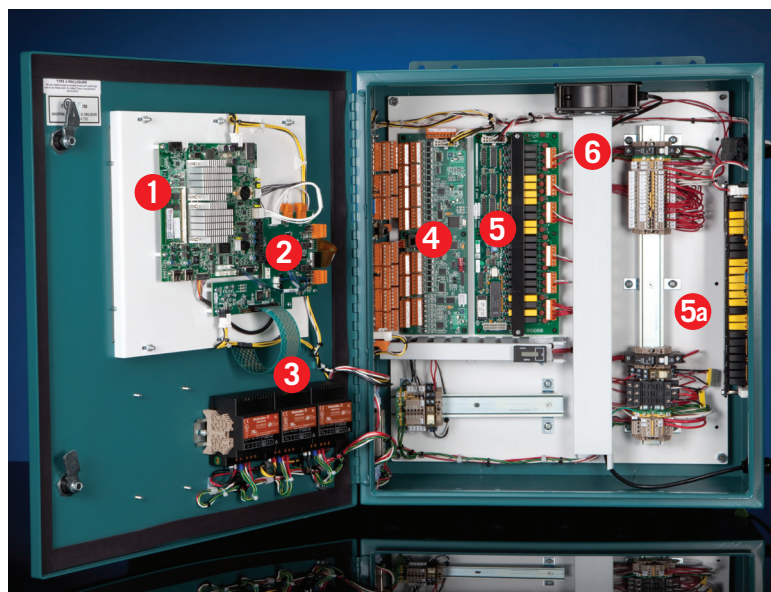
**Ethernet Protocols** – Modbus TCP and Allen-Bradley Ethernet/IP.

## 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 less stressful. All components of the Quantum HD can be individually replaced. There are no multi-component kits.

### Major components inside the enclosure are...

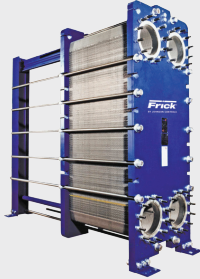
- 1 The high-speed and robust Intel Atom-based Q5 processor board.
- 2 The interface board serially connects the processor to central control systems, DBS motor starter or Vyper™ Variable Speed Drive (VSD), as well as the analog and digital I/O boards.
- 3 Individual power supplies with adjustment (+5vdc,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



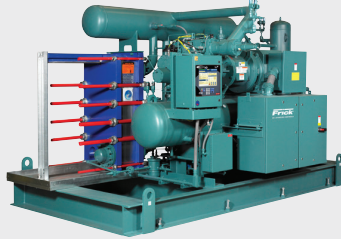
- 4 Analog boards 1 and 2 receive and output analog signals (24 inputs and 8 outputs per board).
- 5 Digital boards 1 and 2 provide 24 digital points of control per board. Each point has a standard configuration, but can be reconfigured in the field, if necessary.
- 5a
- 6 Internal circulation fan, optional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