



INDUSTRIAL REFRIGERATION

Form 090.070-SPC (MAR 2016)

SPECIFICATIONS

File: EQUIPMENT MANUAL - Section 90
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Dist: 1, 1a, 1b, 1c, 4a, 4b, 4c

QUANTUM™ HD UNITY SYSTEM CONTROLLER

The Quantum™ HD Unity System Controller is the economical control solution for cold storage and similar processes.

HARDWARE

The Quantum™ HD Unity System Controller incorporates hardware features and technology proven in millions of applications.

The high-speed, PC-based processor provides speed and processing capability far surpassing competitive microprocessor offerings. The High Contrast Touch Display offers a crisp clear 15" display of system information and status with a superior viewing angle.

Additional Input/Output can be easily installed in the field. This provides flexibility for future system 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, 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 only.
- **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 Johnson Controls 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 fuse tester, and spare fuse.

SOFTWARE

• **Intuitive Operator Interface** All of the Quantum™ HD Unity controller screens are user friendly, menu driven and easy to use and understand. The straight-forward menu design keeps you on track.

• **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** Warning and Shutdown notifications appear on screen along with individual Warning and Shutdown digital outputs to energize external audible or visual devices.

• **Selectable Pressure and Temperature Units**

• **Industry Standard Communication Protocols**

• **Historical x-y trending** Selected data and selected time periods are viewed in either an x-y trending chart format or a complete System Data download in Excel format can be done to a USB device.

• **Ability to add analog inputs** add 0-5Vdc, 1-5Vdc, 4-20mA/0-20 mA or ICTD sensor. A name and unit description can be entered to identify the input. The inputs have high and low alarm and shutdown setpoints if required.

• **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	48" W x 72" H x 20" D
Weight	625 lbs (with all options installed)
Design	NEMA 12
Material	Painted steel
Finish	Light Gray RAL 7035

Q5 PROCESSOR	
CPU	Intel Atom N270
Core Speed	1.6 GHZ
Memory Type	Single Channel, DDR2 SO-DIMM 400/533 MHz
Memory Capacity	2.0 GB

DISPLAY	
Format	1024 x 768 pixels, XGA
Type	Color active matrix TFT (Thin Film Transistor) LCD (Liquid Crystal Display)
Colors	256 simultaneous colors from 256,000 color palette
Size	15" (38.10 cm) diagonal display area
Luminance	60 minimum, 70 typical cd/m ²
Backlight	LED 50,000 hour on time.

KEYPAD	
Material	Touchscreen Overlay
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 & Int'l voltage	OACM-5	24 to 280 volts AC

ANALOG INPUT CHANNELS	
Channel	Input
Channels 1 through 24	0-5 volt DC
	1-5 volt DC
	0-10 volt DC
	2-10 volt DC
	0-20 mA
	4-20 mA
	ICTD (Integrated Circuit Temp. Device)

ANALOG OUTPUT CHANNELS	
Channel	Output
Channels 1 through 8	4-20 ma., 0-20 ma.

POWER SUPPLY	
Input power (Auto detect)	90 to 125 volts AC, 47-63 Hz 185 to 264 volts AC, 47-63 Hz
DC Supplies	+5 volt DC 5 amp max. 25 Watts +12 volt DC 6 amp max. 72 Watts +24 volt DC 3 amp max. 72 Watts
Other	AC line quality monitoring and reporting
Type	Switching

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 max. (1 cycle)
KAIC Rating**	5 kA

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

** Higher ratings available upon request.

POWER SUPPLY SETTINGS			
Supply	Minimum setting	Recommended Setting	Maximum setting
+5 volts DC (V1) adjustable	5.00 volts DC	5.20 volts DC	5.25 volts DC
+12 volts DC (V4) adjustable	11.76 volts DC	12.12 Volts DC	12.24 volts DC
+24 volts DC (V2) adjustable	22.80 volts DC	24.50 volts DC	26.40 volts DC

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)
Range	0-200 PSIA (29.9" hg to 185.3 PSIG) 0-500 PSIA (29.9" hg to 485.3 PSIG) *Sensor range dependent upon application *Can also accept sensor of different ranges
Output (all)	1-5 volt DC
Compensated Temp. Range	30° F to 185°F (-1°C to 85°C)
Operating Temp. Range	-40°F to 185°F (-40°C to 85°C)
Excitation Voltage	9 to 30 volts DC
Accuracy	+/- 0.8% FS

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 temp. range

ENVIRONMENTAL		
	Operating	Storage
Ambient Temperature	-40°F to 122°F* -40°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	

SUPPORTED WEB BROWSERS
Google Chrome (current version)
Firefox (current version)
Internet Explorer (current version)
Safari (current version)

CERTIFICATIONS
UL / cUL 508A
ISO9001

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

COMMUNICATIONS INTERFACE		
Port	Type	Protocol / Usage
Com-1 *	RS - 422/485	Frick #, \$ Allen-Bradley® DF1 (applicable to Com-1, Com-2, & Com-3)
Com-2 *	RS - 422/485	MODBUS ASCII (applicable to Com-1, Com-2, & Com-3)
Com-3 *	RS - 485	MODBUS RTU (applicable to Com-1, Com-2, & Com-3)
Ethernet	RJ-45	MODBUS TCP, Allen-Bradley Ethernet I/P, HTTP, Compressor Sequencing

*May require additional hardware.

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

March 2016 Form Revisions

p.1 – Updated with new enclosure image

– New Frick Industrial Refrigeration logo added throughout

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