Contract NO. 12-DVH-3
Building Automation Module

Addendum one (1)

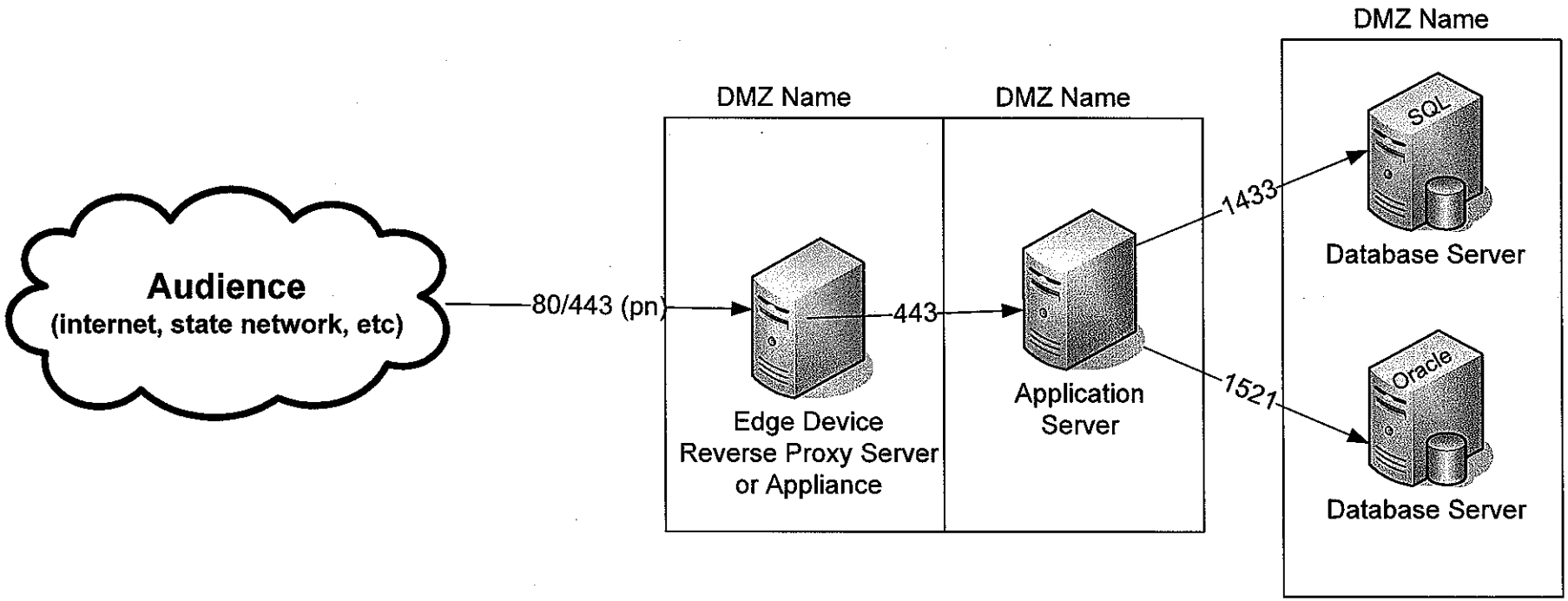
1) Remove (WEB based) on page 3 and all reference to WEB in the contract request.

2) Information need about the network systems at DVH you question will need to be directed to the following web site. http://dti.delaware.gov/information/standards-policies.shtml

3) Site visits will be November 1, 2011 at 2:00pm and on November 4, 2011 at 1:pm.

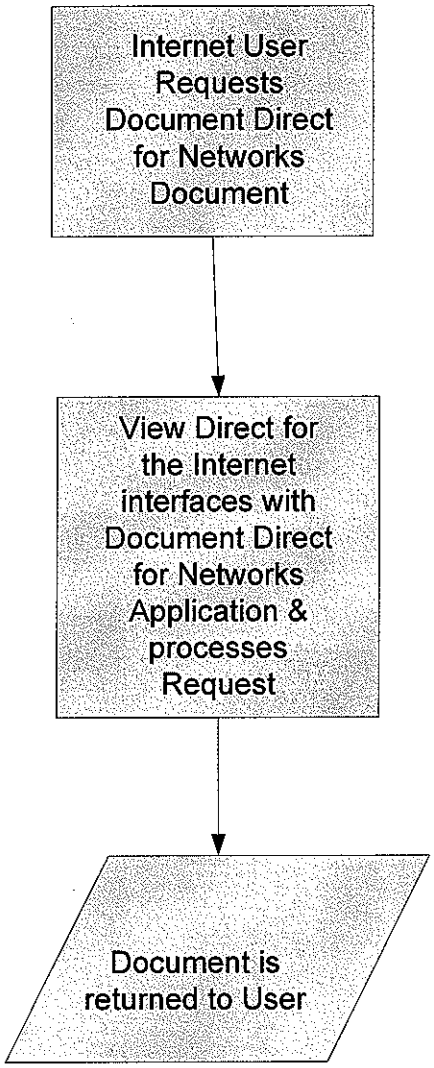
4) Page 17 item 3 (demonstrated ability) add the following lines,

Contractors will demonstrate the ability to communicate, load, down load files and information from the existing system.



Arrow indicates the direction of the connection initiation. For instance, in this case the application server is listening on port 443

End User Process Flow



This section gives an overview of the workflow processes starting with the end users. Many applications have multiple workflows with decision points and multiple diagrams to describe this is acceptable. This should include what type of data is being sent at each point.

Classification: Public/Confidential/Secret/Top Secret

Type of hardware
Operating System
Applications

Type of hardware
Operating System
Applications

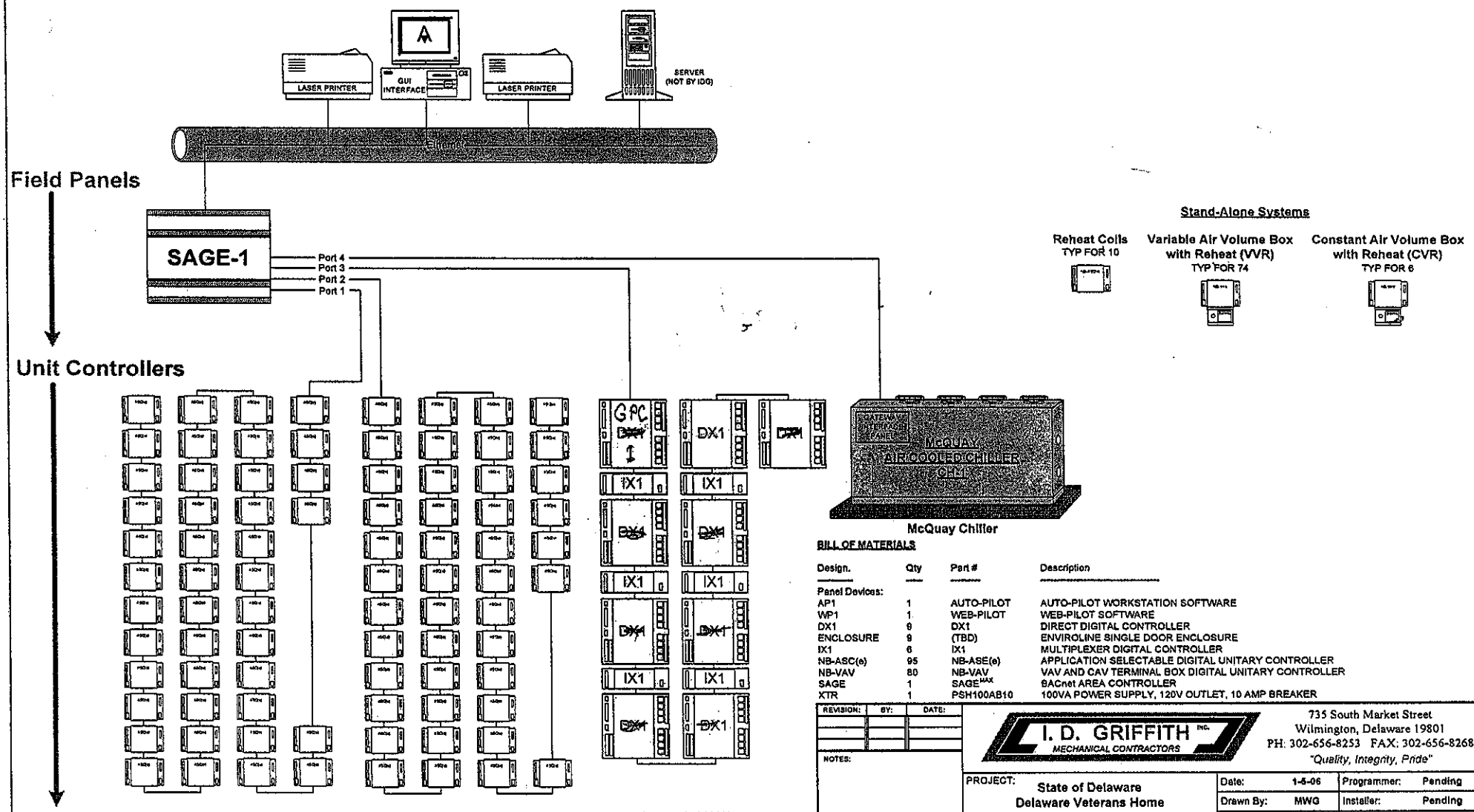
Type of hardware
Operating System
Applications

Type of hardware
Operating System
Applications

Type of hardware
Operating System
Applications

This drawing defines the actual physical environment the system will be using to operate. It should include what physical hardware, what operating system, and what applications are being used at each point. If DMZ's are shown in the network diagram, then firewall devices that define these DMZ's are assumed and do not have to be shown.

NETWORK ARCHITECTURE DIAGRAM



McQuay Chiller

BILL OF MATERIALS

Design.	Qty	Part #	Description
Panel Devices:			
AP1	1	AUTO-PILOT	AUTO-PILOT WORKSTATION SOFTWARE
WP1	1	WEB-PILOT	WEB-PILOT SOFTWARE
DX1	9	DX1	DIRECT DIGITAL CONTROLLER
ENCLOSURE	9	(TBD)	ENVIROLINE SINGLE DOOR ENCLOSURE
IX1	6	IX1	MULTIPLEXER DIGITAL CONTROLLER
NB-ASC(e)	95	NB-ASE(e)	APPLICATION SELECTABLE DIGITAL UNITARY CONTROLLER
NB-VAV	80	NB-VAV	VAV AND CAV TERMINAL BOX DIGITAL UNITARY CONTROLLER
SAGE	1	SAGE^{MAX}	BACnet AREA CONTROLLER
XTR	1	PSH100AB10	100VA POWER SUPPLY, 120V OUTLET, 10 AMP BREAKER

REVISION:	BY:	DATE:

NOTES:

I. D. GRIFFITH INC.
MECHANICAL CONTRACTORS
735 South Market Street
Wilmington, Delaware 19801
PH: 302-656-8253 FAX: 302-656-8268
"Quality, Integrity, Pride"

PROJECT: State of Delaware, Delaware Veterans Home, Milford, Delaware	Date: 1-5-06	Programmer: Pending	
	Drawn By: MWG	Installer: Pending	
	Scale: N/A	Installer: Pending	
Sales Engineer: Jim Yasik	Job No: Y-222	Drawing No: ATC-RISER	
Project Manager: Jim Yasik			

Mechanical Equipment Application/Sequence of Operation

Central Plant

- Chilled water system: The chiller will be enabled to operate anytime the outside air temperature is above 55 degrees (adjustable). The chilled water pump will run continuously. A chilled water bypass valve will modulate to maintain a differential pressure set point. The differential pressure sensor is located 2/3 downstream of the chilled water piping.

- Hot Water System: The BAS system issues an enable signal to the boiler control panel. The boiler control panel then controls the boilers staging and isolation valves. A separate training session (to be conducted by others) will be scheduled for the boiler control panel. The BAS system will enable the hot water pumps (in conjunction with the boiler control) and control the modulating hot water bypass valve to maintain a differential pressure set point. The differential pressure sensor is located 2/3 downstream of the hot water piping.

Boiler Control –
preferred of instruments - standalone
monitored by - BAC.

Energy Recovery

- Energy Recovery Units: The Energy Recovery Units (ERU) conditions and provides minimum outside air to the fan coil units. An energy wheel (installed in the entering outside air plenum and exhaust air plenum) uses the exhaust air (leaving the building) to pre-heat or pre-cool the outside entering air depending on the season. Filter differential pressure switches (located across the filters) will indicate when the filters are dirty.
    - Summer Mode: In the summer mode the chilled water valve will modulate to maintain the discharge air temperature set point.
    - Winter Mode: In the winter mode the chilled water valve will be disabled, the hot water valve and humidifier will be enabled. The hot water valve will modulate to maintain discharge air temperature set point and the humidifier will modulate to maintain return air humidity set point. A humidity high limit control located in the supply duct will disable the humidifier if the humidity exceeds the high limit set point of 85%RH (adjustable). An electric pre-heater will modulate to maintain a minimum entering air temperature of 10 degrees entering the heat wheel.

  Safety: The unit will shutdown on a signal from the fire system shut down relay, smoke dampers interlock or low limit control cut-out (requires manual reset).

- Fan Coil Units: The fan coil units run continuously. The hot water and chilled water valves will modulate to maintain space temperature at set point as measure by the space temperature sensor. The fan coil unit(s) minimum outside air is provided by the ERU. Some fan coil unit controllers also control cabinet unit heaters (CUH). The CUH hot water valve will modulate to maintain space temperature at set point.

  Fan Coil Unit applications:
    - FCU (Standard): Two way hot water and chilled valves
    - FCU with Cabinet Unit Heater control: Two way hot water and chilled valves with additional cabinet unit hater space temperature sensor and two way hot water valve
    - FCU (end of corridor): Three way hot water and chilled valves
    - FCU (end of corridor with cabinet unit heater control): Three way hot water and chilled valves for FCU, space temperature sensor and two way hot water valve for cabinet unit heater

- Cabinet Unit Heaters.
    - (See Fan Coil Units Above)

Rooftop Units and Variable Air Volume (VAV) Terminal Units

- Rooftop Unit(s) 1, 3&4: Rooftop units (RTU) provide conditioned air at a constant pressure to the variable air volume (VAV) terminal units. Filter differential pressure switches (located across the filters) will indicate when the filters are dirty.

  - Pressure control: In the occupied mode the supply and return fan will run continuously. The supply fan will modulate to maintain supply static pressure (as measured by the static pressure sensor located 2/3 down duct) set point. The return fan will track the supply fan minus a predetermined value (adjustable).

  - Temperature Control
    - Cooling:
      - Mechanical cooling (chilled water): The chilled water valve will modulate to maintain discharge temperature set point (adjustable). The economizer damper will be set to a minimum position.
      - Cooling temperature reset: As the discharge air flow drops below the reset set point (adjustable) the supply air temperature set point will reset between 55 degrees and 63 degrees. When the outside humidity rises above 55%RH (adjustable) the cooling air temperature reset will be disabled.
      - Enthalpy Mode: When the outside air enthalpy is lower than the return air enthalpy the economizer dampers are placed in automatic to assist the chilled water valve and will modulate to maintain mixed air temperature set point.
      - Economizer Mode: When the outside air temperature is lower than 50 degrees (adjustable) the economizer dampers will modulate to maintain a mixed air temperature of 53 degrees (adjustable). In the economizer mode the chilled water valve is closed and disabled. The economizer dampers will maintain a minimum position in this mode.
      - Heating: The hot water valve will modulate to maintain discharge temperature set point of 50 degrees (adjustable). The economizer dampers will maintain a minimum position in this mode.

  Safety: The unit will shutdown on a signal from the fire system shut down relay, smoke dampers interlock or low limit control cut-out (requires manual reset).

- VAV Terminal Units (primary air is supplied from Rooftop Units

  Temperature Control: On a call for cooling (as sensed by the space temperature sensor) the damper will modulate open toward the maximum CFM in order to satisfy the cooling demand. On a call for heat (as sensed by the space temperature sensor) the damper will modulate closed toward the heating CFM and the hot water valve will modulate open in order to satisfy the heating demand.

Kitchen HAVC and Makeup Air Units

- Rooftop Unit-2: Rooftop unit (RTU) provide conditioned air at a constant volume. Filter differential pressure switches (located across the filters) will indicate when the filters are dirty.

Temperature Control

- Cooling:
  - Mechanical cooling (chilled water): The chilled water valve will modulate to maintain discharge temperature set point (adjustable). The economizer damper will be set to a minimum position.
  - Economizer Mode: When the outside air temperature is lower than 50 degrees (adjustable) the economizer dampers will modulate to maintain a mixed air temperature of 53 degrees (adjustable). In the economizer mode the chilled water valve is closed and disabled. The economizer dampers will maintain a minimum position in this mode.
  - Heating: The hot water valve will modulate to maintain discharge temperature set point of 50 degrees (adjustable). The economizer dampers will maintain a minimum position in this mode.

Safety: The unit will shutdown on a signal from the fire system shut down relay, smoke dampers interlock or low limit control cut-out (requires manual reset).

Modes of operation

- **1- Both Kitchen MUAFs and EF's are on:** Supply and return fans will operate at high speed, the kitchen damper will be closed, return and exhaust dampers will be open and the outside damper will be open to a setting of 6300 CFM.

- **2- Either Kitchen MUAF and EF is on:** Supply and return fans will operate at high speed, the kitchen damper will be open, return and exhaust dampers will be open and the outside damper will be open to a setting of 4400 CFM.

- **3- When no Kitchen MUAF and EF is on:** Supply and return fans will operate at low speed, the kitchen damper will be open, return and exhaust dampers will be open and the outside damper will be open to a setting of 2900 CFM.

- **4- Unoccupied Mode:** Supply and return fans will be off, the kitchen damper will be closed, return and exhaust dampers will be closed and the outside damper will be closed.

-

- **5- Morning Warm-up Mode:** If the outside air temperature is lees than 45 degrees (adjustable) and MUAF's are off. The unit will start in warm-up mode twenty minutes before occupancy. Supply and return fans will operate in high speed. Chilled water valve will be closed and the economizer and kitchen damper will be closed.

- **6- Cool Down Mode:** When the outside air temperature is greater than 85 degrees the RTU will start up in the cool down mode twenty minutes prior to occupancy. During cool down the economizer dampers will be closed, the kitchen damper will be open, the supply and return fans will run at high speed. The chilled water valve will modulate to maintain return air temperature at 72 degrees.

- **7- Night Setback Mode:** Unit is in night setback mode and MUAF's are off. The Supply fan is off. The chilled water and reheat valves will be closed between night setback temperature range of 65 degrees and 85 degrees. Reheat zones will be indexed to 65degrees heating set point and 85 degrees cooling set point. The RTU fan will cycle on low speed to maintain night setback temperatures and the economized dampers will stay closed. When the outside air temperature falls below 50 degrees the supply and return fans will run continuously and the kitchen damper will be open.

Building Automation Control System (BAS)

- Architecture
  - Systems distributed network and communications structure
- Control Components
  - Workstation Auto-Pilot Graphics Software
    - Monitoring
    - Alarming
    - Trending
  - Host Panel
    - SAGE-1 (equipment)
      - Fan Coil Units
      - Rooftop Units
      - Energy Recovery Units
      - Hot Water System
      - Chilled Water System
      - Kitchen Make-up Air Units and Exhaust Fans
    - SAGE-2 (equipment)
      - VAV Terminal Units
  - Controllers
    - NB_GPC (used on RTU's, ERU's, Hot water and Chilled Water System)
      - IOX Expansion Modules (Input/Output module)
      - FI1 Expansion Cards (Universal Input)
    - NB-ASCe (used on Fan Coil Units)
    - NB-VAVra (used on VAV Terminal Units)
  - Auto-Matrix thermostats and Space Temperature Sensors
    - SBC-STAT3
    - SBC-STAT2
    - SBC-STAT1
- End Devices (Sensors, valves, switches, etc)
  - Belimo Valves ~~4-20ma~~. 2-10VDC
  - Belimo Actuators ~~4-20ma~~. 2-10VDC
  - Siemans Valves 0-10vdc. (FCU's & VAV's)
  - Static high-pressure cut-out (manual reset)
  - Low Limit Thermostat (manual reset)
  - Humidity high-limit cut-out (manual setting)
  - Current sensing switches (adjustable)
  - Filter differential pressure switches (adjustable)
  - Temperature/humidity and pressure sensors
    - Current (4-20ma)
    - Voltage (0-10vdc)
    - Thermister (10K ohm)

System Tour

- Mechanical Equipment Room
- Rooftop Equipment (Rooftop Units and Energy Recovery Units)
- Penthouse Equipment (Fan Coil Units)
- VAV Terminal Units, Cabinet Unit Heaters, Reheat Coils, VVR (Isolation Room Units)
- Isolation Rooms Pressure Monitoring/Alarming
- Kitchen Make-up Air Units and Exhaust Fans

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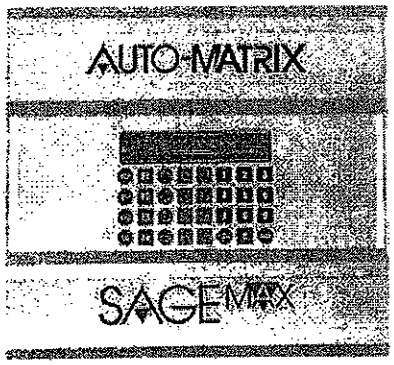
SMART BUILDING SOLUTIONS®

SageMax



Details

If your application requires stand-alone monitoring and control, or operation in a network—whether a small local network or a large high-performance LAN such as Ethernet—SAGEMAX is the perfect solution. By combining multitasking, real-time operating systems with high-performance microcomputer technology, SAGEMAX is designed to satisfy today's complex communication, monitoring, and control demands. These area controllers are the ultimate in high speed, multi-user, intelligent building control and information systems.

Built on the success of previous American Auto-Matrix ® (AAM) systems, SAGEMAX allows multiple operators to interact with each area controller. These sophisticated area controllers can support numerous user interfaces such as advanced color graphics hosts like Auto-Pilot™, simple video terminals, or easy-to-use menu selections. SAGEMAX's internal menu systems can be presented in many different languages, are easily adapted to new ones, and can provide password protection for a list of known users to prevent unauthorized access.

Features

- UL listed 916, Enclosed Energy Management Equipment
- UL recognized 873,Temperature Indicating, and Regulating Equipment
- Complies with FCC rules Part 15, Class B Computing Device
- Supports up to 512 direct digital controllers
- Compatible with American Auto-Matrix family of products
- PHP and PUP support
- Multiple protocol
- Object-oriented database, programming, and communications
- Multitasking and multiuser capabilities
- Rich control programming language with floating-point, real-time control, and extensive report generation features
- Flexible control programming through object-oriented internetworking
- Reliable high-speed communications over twisted-pair (EIA-485) and/or Ethernet
- Compact, rugged enclosure; lightweight aluminum cover and steel base with conduit knockouts

Additional Information

SageMax Data Sheet (Low Res) (High Res)

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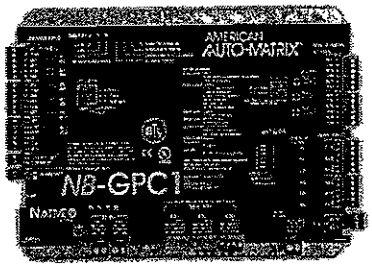
Unitary Controllers > Native Controllers > NB-GPC1

NB-GPC1



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AAM has over 30 BTL listed controls.

Detail

As the ultimate Native Series® controller, the NB-GPC1 offers complete stand-alone control as well as full peer-to-peer capabilities with other devices on the same physical BACnet® MS/TP network. The flexibility of inputs, outputs and programmable capabilities allows the NB-GPC1 to be used in a wide variety of applications, including large built up air handling units, central plant control, multiple boilers, optimization, pump control, and load shedding algorithms to name a few. The NB-GPC1 complies with ANSI/ASHRAE Standard 135 BACnet and is BTL listed.

Features

- Standalone or networked operation
- Inputs and output updated up to 10 times per second
- Easy configuration and firmware updates via NBPro software package
- User defined custom programming
- Battery-backed real time clock and memory
- Self-diagnostic circuits and LED indicators for power, I/O, network, processor, troubleshooting and HAO indication
- 12 on-board Universal Inputs, expandable to 24 using STATbus modules
- 1 on-board Digital Input, expandable to 8 using STATbus modules
- 6 on-board Analog Outputs, expandable to 12 using STATbus modules
- 6 on-board Digital Outputs, expandable to 12 using STATbus modules

Additional Information

NB-GPC1 Data Sheet (Low Res) (High Res)

NB-GPC1 Protocol Implementation Conformance Statement (PICS)

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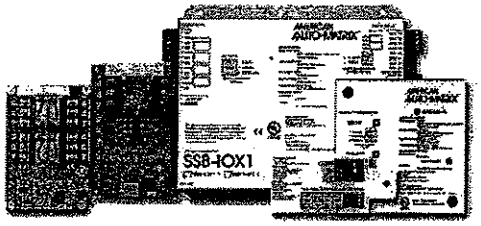
Unitary Controls >Statbus Expansion Modules

Statbus Expansion Modules



Details

STATbus is American Auto-Matrix's innovative sensor networking technology. STATbus is an open-topology network protocol that allows flexible connection of up to thirteen I/O devices per channel using a single non-polar, twisted pair cable. This provides unprecedented flexibility in the installation and wiring of I/O devices to the controller. Substantial saving can be realized in both wiring and installation costs as compared to conventional sensors. Also, STATbus uses digital communications signals, giving it a higher level of noise immunity than conventional, analog sensors.

Statbus Devices

- The IOXx-x devices offer the most efficient method of maximizing the I/O capabilities of GPC controllers.
- Designed to fit in a standard 2x4 junction box, the SSB-FI1 provides a single remote universal input point designed to digitize any passive sensor such as an RTD, thermistor, etc
- The SSB-UI1, AO1, and DI1 modules provides excitation power for devices such as CO and CO2 sensors, pressure sensors, etc.
- Relays on the SSB-DO1 and SSB-DO2 allow switching up to 250 VAC/DC at up to 10A.
- The SSB-DO1-I and the SSB-DO2-I also provide dry contact inputs for function status monitoring.

Additional Information

Statbus Expansion Modules Data Sheet (Low Res) (High Res)

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Heat Recovery Unit #2 Serving QUAD A & B FCU'S

0.0 °F
0.0 %RH
Pre-Filter Normal
Final Filter Normal
Inlet Air Temp 0.0 °F
Preheat Temp 0.0 °F
CW Valve 0.0 % Open
Low Limit Normal
Supply Temp 0.0 °F
Humidity Limit Field Device set@85%
Electric Heat
Supply Fan
Energy Wheel
CLOSED
Outside Air Damper
HW Valve 0.0 % Open
Freezepump
Exhaust Filter Normal
Exhaust Air Temp 0.0 °F
Return Air Temp 0.0 °F
Return Air Humidity 0.0 %RH
Exhaust Air Damper
Exhaust Fan
Duct Detector

System MODE Info.
0.0 °F SUMMER Setpt. set@80
0.0 °F WINTER Setpt. set@65
Summer MODE

Electric Heat Control
0.0 °F Preheat Setpt. set@55
0.0 % Output
Summer Disabled

Humidifier Control (Locked Out in Summer Mode)
Summer MODE
Humidifier Binary Control(OAT)
0.0 °F Enable Setpt. set@50
0.0 °F Deadband
Disabled Status
Humidifier Analog Control(RAH)
0.0 %Rh RH Setpt. set@60%
0.0 % Output

Freezepump Control
0.0 °F Setpoint set@40
0.0 °F Deadband
Enabled Permissive

System MODE Control
0.0 °F S/W Setpoint set@58
0.0 °F S/W Deadband
Summer MODE

Schedule Mode
Unoccupied
19 : 00 Warmup
19 : 00 Occupied
19 : 00 Unnoccupied
19 : 00 Night Setback

Note: Warmup/Occupied must be the same time as well as Unoccupied/Night Setback

Winter Supply Air Temperature RESET on Outside Air Temp
Supply Setpt. 0.0 °F
HW V/V CS 0.0 °F
0.0 °F Start Reset @OAT
0.0 °F Reset Limit
0.0 °F MAX Reset Amt

Exhaust Fan Starter Panel
OFF

Heat Wheel Starter Panel
OFF

Previous
Main
A Wing
D Wing
B Wing
C Wing
RTU #4
ERU #1
ERU #2
RTU #2
RTU #3
RTU #1

Job Name:
Equipment: ERU-1
Equip Location Quad C&D (FCU's)
Date:

Controller Type: GPC1
Controller Serial: 1000654 (B1)
Controller ID/SAGE#/SAGE Port:
Technician:

CTLR PRG: NONE

Stat Bus	Device	Serial Number	IO Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #	Notes:
			AO1	HWV	2-10	VDC		0-100	PCT				ABB VFD		
			AO2	CWV	2-10	VDC		0-100	PCT				ABB VFD		
			AO3	ELEC-HT	0-10	VDC									
			AO4	HUMIDIFIER	0-10	VDC		0-100	PCT				Belimo		
			AO5	Spare				0-100	PCT				Belimo		
			AO6	Spare				0-100	PCT				Belimo		
	IOX-1		AO7												
	IOX-1		AO8												
			AO9												
			AO10												
			AO11												
			AO12												
			UI01	OAT	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-0	???????
			UI02	OAH	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-1	???????
			UI03	Wheel Inlet Tmep	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-2	???????
			UI04	PHT-SAT	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-3	???????
			UI05	LLT	DIG	COS		-30-230	DEGF				ACI	10K-AN-A-1'	
			UI06	SAT	4-20	Ma		-40-240	DEGF				ACI	TTK1K-A-12'	
			UI07	EAT	Th	Ma		40-240	DEGF				ACI	TT1K-D-18"	
			UI08	RAT	Th	Ma		0-27600	CFM				Ebtron	GTA-116F/D	
			UI09	RAH	4-20	Ma		0-109600	CFM				Ebtron	GTA-116-P	
			UI10	SAF-ST	DIG	COS		0-27600	CFM				Ebtron	GTA-116F/D	
			UI11	EF8-ST	DIG	COS		0-5	INWC				SETRA	264	
			UI12	Wheel-ST	DIG	COS		0=Off 1=On					Hawkeye	708	
1	IOX1-1	167772391	UI13	FRZ PUMP-ST	DIG	COS		0=Off 1=On					Hawkeye	708	
1	IOX1-1	167772391	UI14	PFLT-ST	DIG	COS		0-100	PCT				ABB		
1	IOX1-1	167772391	UI15	FFLT-ST	DIG	COS		0-100	PCT				ABB		
1	IOX1-1	167772391	UI16	EFLT-ST	DIG	COS		0=Off 1=On					Hawkeye	800	
2	FI1-1	67111339	UI17	S/W Changeover	FI1			0=Disable 1=Auto							
3	FI1-2	67111084	UI18	CWV Lockout	FI1			0=Disable 1=Auto							
			UI19												
			UI20												
			UI21												
			UI22												
			UI23												
			UI24												
			DI1												
			DI2												
			DI3												
			DI4												
			DI5												
			DI6												
			DI7												
			DI8												
			DO1	SAF/RAF-EN				0=Stop 1=Start							
			DO2	EWHEEL-SS				0=Stop 1=Start							
			DO3					0=Stop 1=Start							
			DO4	HUMIDIFIER EN				0=Disable 1=Enable					RIB Relay	RIBU1C	
			DO5	SW CHANGEOVER				0=Disable 1=Enable							
			DO6	FREEZE PUMP-SS											
			DO7												
			DO8												
			DO9												
			DO10												
			DO11												
			DO12												

Notes: DO7 CWV Lockout ???????

Job Name:
Equipment: ERU-2
Equip Location: Quad A&B (FCU's)
Date:

Controller Type: GPC1
Controller Serial: 1000655 (82)
Controller ID/SAGE#/SAGE Port:
Technician:

CTLR PRG: NONE

Stat Bus	Device	Serial Number	IO Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #	Notes:
			AO1	HWV	2-10	VDC		0-100	PCT				ABB VFD		
			AO2	CWV	2-10	VDC		0-100	PCT				ABB VFD		
			AO3	ELEC-HT	0-10	VDC									
			AO4	HUMIDIFIER	0-10	VDC		0-100	PCT				Belimo		
			AO5	Spare				0-100	PCT				Belimo		
			AO6	Spare				0-100	PCT				Belimo		
			AO7												
			AO8												
			AO9												
			AO10												
			AO11												
			AO12												
			UI01	OAT	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-0	???????
			UI02	OAH	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-1	???????
			UI03	Wheel Inlet Tmep	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-2	???????
			UI04	PHT-SAT	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-3	???????
			UI05	LLT	DIG	COS		-30-230	DEGF				ACI	10K-AN-A-1'	
			UI06	SAT	4-20	Ma		-40-240	DEGF				ACI	TTK1K-A-12'	
			UI07	EAT	Th	Ma		40-240	DEGF				ACI	TT1K-D-18"	
			UI08	RAT	Th	Ma		0-27600	CFM				Ebtron	GTA-116F/D	
			UI09	RAH	4-20	Ma		0-189600	CFM				Ebtron	GTA-116-P	
			UI10	SAF-ST	DIG	COS		0-27600	CFM				Ebtron	GTA-116F/D	
			UI11	EF8-ST	DIG	COS		0-5	INWC				SETRA	264	
			UI12	Wheel-ST	DIG	COS		0=Off 1=On					Hawkeye	708	
1	IOX1-1	67772398	UI13	FRZ PUMP-ST	DIG	COS		0=Off 1=On					Hawkeye	708	
1	IOX1-1	67772398	UI14	PFLT-ST	DIG	COS		0-100	PCT				ABB		
1	IOX1-1	67772398	UI15	FFLT-ST	DIG	COS		0-100	PCT				ABB		
1	IOX1-1	67772398	UI16	EFLT-ST	DIG	COS		0=Off 1=On					Hawkeye	800	
2	FI1-1	67111450	UI17	S/W Changeover	FI1			0=Disable 1=Auto							
3	FI1-2	67111180	UI18	CWV Lockout	FI1			0=Disable 1=Auto							
			UI19												
			UI20												
			UI21												
			UI22												
			UI23												
			UI24												
			DI1												
			DI2												
			DI3												
			DI4												
			DI5												
			DI6												
			DI7												
			DI8												
			DO1	SAF/RAF-EN				0=Stop 1=Start							
			DO2	EWHEEL-SS				0=Stop 1=Start							
			DO3					0=Stop 1=Start							
			DO4	HUMIDIFIER EN				0=Disable 1=Enable					RIB Relay	RIBU1C	
			DO5	SW CHANGEOVER				0=Disable 1=Enable							
			DO6	FREEZE PUMP-SS											
			DO7												
			DO8												
			DO9												
			DO10												
			DO11												
			DO12												

Notes: DO7 CWV Lockout ???????

ROOFTOP UNIT#1 Serving Quad C&D Vavls

0.0 °F
0.0 %RH
Outside Air Flow
0.0 CFM
Mixed Air Temp
0.0 °F
Normal
Pre-Filter
Low Limit
Normal
Heating Coil Temp
0.0 °F
Heating Coil
Cooling Coil
SF VFD Control/Info
0.0 % CMD
0.0 % FdBck
0.0 CFM
Final Filter
Normal
0.00 "wc
0.00 "wc
Static Set Point
Static
0.0 °F
Supply Air Temp
Supply Air Flow
0.0 %
0.0 % Open
Outside Air Damper
Return Damper
0.0 % Clsd
Relief Damper
0.0 % Open
Return Air Flow
RF VFD Control/Info
0.0 % CMD
0.0 % FdBck
0.0 CFM
HW Valve
Freezepump
0.0 °F
0.0 %
0.0 °F
0.0 %
CW Valve
Return Air Humidity
0.0 %RH
Return Air Temp
0.0 °F
Return Fan
Freezepump Control
0.0 °F Setpoint
0.0 °F Deadband
Enabled
Enthalpy Values
Outside Air
0.0 btu/#
Return Air
0.0 btu/#
O.A. Values are from Mech Rm Controller
Supply Air Temperature Reset Lockout Parameters
OA Humidity 0.0 %Rh
Reset Setpt. 0.0 %Rh
Reset DB 0.0 %Rh
Supply Air Temperature RESET on Outside Air Temp
Reset Parameters Enabled
Supply Setpt 0.0 °F
CW Vlv CS 0.0 °F
Damp. CS 0.0 °F
0.0 °F Start Reset @OAT
0.0 °F Reset Limit
0.0 °F MAX Reset Amt.
Economizer Changeover Setpoint
0.0 °F Econ Setpt.(OAT)
0.0 °F Econ. Deadband
Lockout CW Valve
Damper Econ. Control
Enabled Dry Bulb
Disabled Enth.Flag
VFD Tracking Control
0.0 % Supply Fan Signal
0.0 % Return Fan Signal
0.0 % Return Fan Adjust
Warmup 19 : 00
Occupied 19 : 00
Unnocc. 19 : 00
Nt. Setback 19 : 00
Unoccupied
Schedule
Exh Fan #8
Disabled
Off
Previous
Main
A Wing
D Wing
B Wing
C Wing
RTU #3
ERU #1
ERU #2
RTU #2
RTU #4
RTU #1

Job Name:
Equipment: RTU-1
Equip Location: Quad C&D (VAV's)
Date:

Controller Type: GPC1
Controller Serial: 1000269(77)
CTLR ID/SAGE#/SAGE Port: ID 77 / Sage-1 / Port-3
Technician:

CTLR PRG: (1)RVFD SIG, (2)DPRCTL, (3)RTU DPR

Stat Bus	Device	Serial Number	IO Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #	Notes:
			AO1	SVFD	4-20	Ma		0-100	PCT				ABB VFD		
			AO2	RVFD	4-20	Ma		0-100	PCT				ABB VFD		
			AO3	SPARE											
			AO4	OAD	2-10	VDC		0-100	PCT						
			AO5	RAD/EAD	2-10	VDC		0-100	PCT				Belimo		
			AO6	HWV	2-10	VDC		0-100	PCT				Belimo		
1	IOX-1	167772390	AO7	CWV	2-10	VDC		0-100	PCT				Belimo		
	IOX-1		AO8												
			AO9												
			AO10												
			AO11												
			AO12												
			UI01	OAT	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-0	
			UI02	OAH	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-1	
			UI03	RAT	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-2	
			UI04	RAH	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-3	
			UI05	MAT	Th	Res		-30-230	DEGF				ACI	10K-AN-A-1'	
			UI06	PH-SAT	4-20	Ma		-40-240	DEGF				ACI	TTK1K-A-12'	
			UI07	SAT	4-20	Ma		40-240	DEGF				ACI	TT1K-D-18"	
			UI08	RA-CFM	4-20	Ma		0-27600	CFM				Ebtron	GTA-116F/D	
			UI09	OA-CFM	4-20	Ma		0-189600	CFM				Ebtron	GTA-116-P	
			UI10	SA-CFM	4-20	Ma		0-27600	CFM				Ebtron	GTA-116F/D	
			UI11	SASP	4-20	Ma		0-5	INWC				SETRA	264	
			UI12	SAF-ST	CC	COS		0=Off 1=On					Hawkeye	708	
1	IOX1-1	167772390	UI13	RAF-ST	CC	COS		0=Off 1=On					Hawkeye	708	
1	IOX1-1	167772390	UI14	SVFD-FBK	4-20	Ma		0-100	PCT				ABB		
1	IOX1-1	167772390	UI15	RVFD-FBK	4-20	Ma		0-100	PCT				ABB		
1	IOX1-1	167772390	UI16	FR2 PUMP-ST	CS	COS		0=Off 1=On					Hawkeye	800	
2	IOX1-2	167772393	UI17	EF8-ST	CS	COS		0=Off 1=On					Hawkeye	800	
2	IOX1-2	167772393	UI18	PFLT-ST	DPS	COS		0=Clean 1=Dirty					Dwyer	1910-1	
2	IOX1-2	167772393	UI19	FFLT-ST	DPS	COS		0=Clean 1=Dirty					Dwyer	1910-1	
2	IOX1-2	167772393	UI20	LLT	CC	COS		0=Normal 1=Alarm					Johnson	A70HA-1(2)	
3	FI1-1	67111521	UI21	ECON-ST	FI1	COS		0=Disable 1=Auto							
3	FI1-2	67111013	UI22	CWV-LOCKOUT	FI1	COS		0=Disable 1=Auto							
			UI23												
			UI24												
			DI1												
			DI2												
			DI3												
			DI4												
			DI5												
			DI6												
			DI7												
			DI8												
			DO1	SVFD/RVFD-SS											
			DO2	EF8-SS				0=Stop 1=Start							
			DO3	FREEZE PUMP-SS				0=Stop 1=Start							
			DO4	ENTHALPY/ECON ENABLE-ST				0=Stop 1=Start					RIB Relay	RIBU1C	
			DO5	ECON-ST (CWV LOCKOUT)				0=Disable 1=Enable							
			DO6					0=Disable 1=Enable							
			DO7												
			DO8												
			DO9												
			DO10	CLG STPT RESET LOCKOUT (ON OAH)											
			DO11	ECON FLAG				(PSEUDO)							
			DO12	ENTH FLAG				(PSEUDO)							
								(PSEUDO)							

Notes:

KITCHEN MAKEUP AIR UNITS

0.0 °F

0.0 %RH

1A DISABLED

1B DISABLED

1A

CLEAN

DISABLED

DISABLED

0.0 °F

0.0 °F

Outside Air Damper

Filter

Gas Heater

Supply Fan

Supply Air Temp

1B

CLEAN

DISABLED

DISABLED

0.0 °F

0.0 °F

Outside Air Damper

Filter

Gas Heater

Supply Fan

Supply Air Temp

Local Hood Switch Status 1A

EXHAUST FAN OFF EXHAUST FAN

SUPPLY FAN OFF SUPPLY FAN

HEAT OFF HEAT

Heater Failure S.Fan Lockout

SF LOCKOUT-NORMAL

Local Hood Switch Status 1B

EXHAUST FAN OFF EXHAUST FAN

SUPPLY FAN OFF SUPPLY FAN

HEAT OFF HEAT

Heater Failure S.Fan Lockout

SF LOCKOUT-NORMAL

Previous

Main

A Wing

D Wing

B Wing

C Wing

RTU #4

ERU #1

ERU #2

RTU #2

RTU #3

RTU #1

Job Name:
Equipment: Kitchen MUA & EF's (Works with RTU-2)
Equip Location
Date: GPC, IOX, FI1
CHECKOUT INFORMATION:

KMUA / Laundry

Controller Type
Controller Serial: 1000704 (83)
Controller ID/SAGE#/SAGE Port: ID 83 / Sage-1 / Port-3
Technician:

Device	Serial Number	Hardware Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #
		AO1	Loading Dock CUH	0-10	VDC		0-100	PCT					
		AO2											
		AO3											
		AO4											
		AO5											
		AO6											
		AO7											
		AO8											
		AO9											
		AO10											
		AO11											
		AO12											
		UI01	MUA1 SAF-ST										
		UI02	MAUA1 EF-ST				0=Off 1=On						
		UI03	MUA1 FLT-ST				0=Off 1=On						
		UI04	MUA1 SAT				0=Clean 1=Dirty						
		UI05	MUA1 SAF-SW				-30-230						
		UI06	MUA1 EF-SW				0=Stop 1=Start						
		UI07	MUA1 HEAT-SW				0=Stop 1=Start						
		UI08	MUA2 SAF-ST				0=Stop 1=Start						
		UI09	MUA2 EF-ST				0=Off 1=On						
		UI10	MAU2 FLT-ST				0=Off 1=On						
		UI11	MAU2 SAT				0=Clean 1=Dirty						
		UI12	MUA2 SAF-SW				-30-230						
IOX-1	167772407	UI13	MAU2 EF-SW				0=Stop 1=Start						
IOX-1	167772407	UI14	MAU2 HEAT-SW				0=Stop 1=Start						
IOX-1	167772407	UI15	Dryer Status (Relay)				0=Stop 1=Start						
IOX-1	167772407	UI16	Laundry Damper End Sw				0=Off 1=On						
FI1	67111520	UI17	Loading Dock Temp				0=Closed 1=Open						
		UI18	KMUA1 Shutdown Alarm (Psuedo)				-30-230						
		UI19	KMUA2 Shutdown Alarm (Psuedo)				0=Normal 1=Alarm						
		UI20	Spare				0=Normal 1=Alarm						
		UI21	Spare										
		UI22	Spare										
		UI23	Spare										
		UI24	Spare										
GPC		DI1											
IOX		DI2			OI A/B								
		DI3											
		DI4											
		DI5											
		DI6											
		DI7											
		DI8											
		DO1	KMUA-1 FAN LOCKOUT				0=Normal 1=Lockout						
		DO2	KMUA-2 FAN LOCKOUT				0=Normal 1=Lockout						
		DO3	MUA2 SAF-CMD>(IOX1-UI8)				0=Off 1=On			(DO of Kit IOX is Hardwired to input of RTU IOX-2 UI8)			
		DO4	MUA2 EF- CMD>(IOX1-UI9)				0=Off 1=On			(DO of Kit IOX is Hardwired to input of RTU IOX-2 UI9)			
		DO5	MUA1 SAF-CMD>(IOX1-UI1)				0=Off 1=On			(DO of Kit IOX is Hardwired to input of RTU IOX-2 UI1)			
		DO6	MUA1 EF- CMD>(IOX1-UI2)				0=Off 1=On			(DO of Kit IOX is Hardwired to input of RTU IOX-2 UI2)			
		DO7											
		DO8											
		DO9											
		DO10											
		DO11											
		DO12											

Job Name:
Equipment: RTU-2
Equip Location
Date:
CHECKOUT INFORMATION: RTU-GPC, RTU-IOX1, RTU-IOX2, Reheat-IOX3 Loc in Quad A & (KMUAF GPC not on this sheet)

Controller Type
Controller Serial: 1000657(78)
Controller ID/SAGE#/SAGE Port: ID 78 / Sage-1 / Port-3

Device	Serial Number	Hardware Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK			Manufacture	Location
		AO1	RAD/EAD	2-10	VDC		0-100	PCT					
		AO2	OAD	2-10	VDC		0-100	PCT					
		AO3	SPARE										
		AO4	HWV	2-10	VDC		0-100	PCT					
		AO5	CWV	2-10	VDC		0-100	PCT					
		AO6	Spare										
IOX-2	167772414	AO7	RH8-HWV										
IOX-2	167772414	AO8	RH9-HWV										
IOX-3	167772409	AO9	RH10-HWV										
IOX-3	167772409	AO10	RH11-HWV										
		AO11	Spare										
		AO12	Spare										
		UI01	OAT	Th	Res		-30-230	DEGF					
		UI02	OAH	4-20	Ma		0-100	%RH					
		UI03	PFLT-ST	DPS	COS		0=Clean 1=Dirty						
		UI04	PH-SAT	4-20	Ma		-40-240	DEGF					
		UI05	SAT	4-20	Ma		40-240	DEGF					
		UI06	RAT	Th	Res		-30-230	DEGF					
		UI07	RAH	4-20	Ma		0-100	%RH					
		UI08	OA-CFM	4-20	Ma			CFM					
		UI09	MAT	Th	Res		-30-230	DEGF					
		UI10	FFLT-ST	DPS	COS		0=Clean 1=Dirty						
		UI11	LLT	CC	COS		0=Normal 1=Alarm						
		UI12	SAF-ST Hi	CC	COS		0=Off 1=On						
IOX-1	167772389	UI13	SAF-ST Lo										
IOX-1	167772389	UI14	RAF-ST Hi							RTU2			
IOX-1	167772389	UI15	RAF-ST Lo							RTU2			RTU-2
IOX-1	167772389	UI16	FRZ PUMP-ST							RTU2			RTU-2
IOX-2	167772414	UI17	KMUAE2-ST							RTU2			RTU-2
IOX-2	167772414	UI18	KMUA EF2-ST							RTU2			RTU-2
IOX-2	167772414	UI19	KMUAF1-ST							RTU2		(From kitchen GPC DO3)	RTU-2
IOX-2	167772414	UI20	KMUA EF1-ST							RTU2		(From kitchen GPC DO4)	RTU-2
IOX-3	167772409	UI21	RH10-SPT							RTU2		(From kitchen GPC DO5)	RTU-2
IOX-3	167772409	UI22	RH11-SPT							RTU2		(From kitchen GPC DO6)	RTU-2
IOX-3	167772409	UI23	RH8-SPT							Quad-A			Quad-A
IOX-3	167772409	UI24	RH9-SPT							Quad-A			Quad-A
GPC		DI1	Enth/Econ Flag	BI49	OI A/B		0=Normal 1=Econ			Quad-A			Quad-A
IOX-1	167772389	DI2	Econ ST Flag	BI50	OI A/B					Quad-A			Quad-A
IOX-2	167772414	DI3	Reheat Override Status	BI51	OI A/B								
IOX-2	167772414	DI4	Reheat Override Status	BI52	OI A/B					RTU2			RTU-2
		DI5								RTU2			RTU-2
		DI6								RTU2			RTU-2
		DI7											
		DI8											
		DO1	SAF/RAF-SS LO-SPD										
		DO2	SAF HI-SPD				0=Stop 1=Start						
		DO3	RAF HI-SPD				0=Stop 1=Start						
		DO4	Freeze Pump-EN				0=Stop 1=Start						
		DO5	Kitchen Auto-Damper				0=Disable 1=Enable						
		DO6	RH-8,9,10,11 SB Status				0=Disable 1=Enable						
IOX-1	167772389	DO7	Enth/Econ										
IOX-1	167772389	DO8	Econ Status							RTU2			
IOX-2	167772414	DO9	RH-8,9,10,11 SU Status							RTU2			RTU-2
IOX-2	167772414	DO10	CWV Reset Lockout (on OAH)							RTU2			RTU-2
IOX-3	167772409	DO11	Econ C/O (pseudo) CWV Lockout							RTU2			RTU-2
IOX-3	167772409	DO12	Enth C/O (pseudo)							Quad-A			RTU-2
										Quad-A			Quad-A

Job Name:
Equipment: RTU-3
Equip Location: QUAD ??
Date:

Controller Type: GPC1
Controller Serial: 1000652(79)
CTLR ID/SAGE#/SAGE Port: ID 79 / Sage-1 / Port-3
Technician:

CTLR PRG: (1)RVFD_SIG, (2)DPRCTL, (3)RTU_DPR

Stat Bus	Device	Serial Number	IO Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #	Notes:
			AO1	SVFD	4-20	Ma		0-100	PCT				ABB VFD		
			AO2	RVFD	4-20	Ma		0-100	PCT				ABB VFD		
			AO3	SPARE											
			AO4	OAD	2-10	VDC		0-100	PCT				Belimo		
			AO5	RAD/EAD	2-10	VDC		0-100	PCT				Belimo		
			AO6	HWV	2-10	VDC		0-100	PCT				Belimo		
1	IOX-1	167772400	AO7	CWV	2-10	VDC		0-100	PCT						
	IOX-1	167772400	AO8												
	IOX-2	167772397	AO9												
	IOX-2	167772397	AO10												
			AO11												
			AO12												
			UI01	OAT	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-0	
			UI02	OAH	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-1	
			UI03	RAT	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-2	
			UI04	RAH	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-3	
			UI05	MAT	Th	Res		-30-230	DEGF				ACI	10K-AN-A-1'	
			UI06	PH-SAT	4-20	Ma		-40-240	DEGF				ACI	TTK1K-A-12'	
			UI07	SAT	4-20	Ma		40-240	DEGF				ACI	TT1K-D-18"	
			UI08	RA-CFM	4-20	Ma		0-27600	CFM				Ebtron	GTA-116F/D	
			UI09	OA-CFM	4-20	Ma		0-189600	CFM				Ebtron	GTA-116-P	
			UI10	SA-CFM	4-20	Ma		0-27600	CFM				Ebtron	GTA-116F/D	
			UI11	SASP	4-20	Ma		0-5	INWC				SETRA	264	
			UI12	SAF-ST	CC	COS		0=Off 1=On					Hawkeye	708	
1	IOX1-1	167772400	UI13	RAF-ST	CC	COS		0=Off 1=On					Hawkeye	708	
1	IOX1-1	167772400	UI14	SVFD-FBK	4-20	Ma		0-100	PCT				ABB		
1	IOX1-1	167772400	UI15	RVFD-FBK	4-20	Ma		0-100	PCT				ABB		
1	IOX1-1	167772400	UI16	FRZ PUMP-ST	CS	COS		0=Off 1=On					Hawkeye	800	
2	IOX1-2	167772397	UI17	EF9-ST	CS	COS		0=Off 1=On					Hawkeye	800	
2	IOX1-2	167772397	UI18	PFLT-ST	DPS	COS		0=Clean 1=Dirty					Dwyer	1910-1	
2	IOX1-2	167772397	UI19	FFLT-ST	DPS	COS		0=Clean 1=Dirty					Dwyer	1910-1	
2	IOX1-2	167772397	UI20	LLT	CC	COS		0=Normal 1=Alarm					Johnson	A70HA-1(2)	
3	FI1-1	671110457	UI21	ECON-ST	FI1	COS		0=Disable 1=Auto							
3	FI1-2	671110499	UI22	CWV-LOCKOUT	FI1	COS		0=Disable 1=Auto							
			UI23												
			UI24												
	GPC		DI1			OI/AB									
	IOX-1		DI2			OI/AB									
	IOX-2		DI3			OI/AB									
			DI4												
			DI5												
			DI6												
			DI7												
			DI8												
			DO1	SVFD/RVFD-SS											
			DO2	EF9-SS				0=Stop 1=Start							
			DO3	FREEZE PUMP-SS				0=Stop 1=Start							
			DO4	ENTHALPY/ECON ENABLE-ST				0=Stop 1=Start							
			DO5	ECON-ST (CWV LOCKOUT)				0=Disable 1=Enable					RIB Relay	RIBU1C	
			DO6					0=Disable 1=Enable							
			DO7												
			DO8												
			DO9												
			DO10	CLG STPT RESET LOCKOUT (ON OAH)											
			DO11	ECON FLAG				(PSEUDO)							
			DO12	ENTH FLAG				(PSEUDO)							
								(PSEUDO)							

Notes:

Job Name:
Equipment: RTU-4
Equip Location: Quad C&D (VAV's) & Canteen
Date:

Controller Type: GPC1
Controller Serial: 1000709(80)
CTLR ID/SAGE#/SAGE Port: ID 80 / Sage-1 / Port-3
Technician:

CTLR PRG: (1)RVFD_SIG, (2)DPRCTL, (3)RTU_DPR

Stat Bus	Device	Serial Number	IO Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #	Notes:
			AO1	SVFD	4-20	Ma		0-100	PCT				ABB VFD		
			AO2	RVFD	4-20	Ma		0-100	PCT				ABB VFD		
			AO3	SPARE											
			AO4	OAD	2-10	VDC		0-100	PCT				Belimo		
			AO5	RAD/EAD	2-10	VDC		0-100	PCT				Belimo		
			AO6	HWV	2-10	VDC		0-100	PCT				Belimo		
1	IOX-1	167772396	AO7	CWV	2-10	VDC		0-100	PCT						
	IOX-1		AO8												
	IOX-2		AO9												
	IOX-2		AO10												
			AO11												
			AO12												
			UI01	OAT	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-0	
			UI02	OAH	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-1	
			UI03	RAT	Th	Res		-30-230	DEGF				ACI	RH3-10K-AN-2	
			UI04	RAH	4-20	Ma		0-100	%RH				ACI	RH3-10K-AN-3	
			UI05	MAT	Th	Res		-30-230	DEGF				ACI	10K-AN-A-1'	
			UI06	PH-SAT	4-20	Ma		-40-240	DEGF				ACI	TT21K-A-12'	
			UI07	SAT	4-20	Ma		40-240	DEGF				ACI	TT21K-D-18"	
			UI08	RA-CFM	4-20	Ma		0-27600	CFM				Ebtron	GTA-116F/D	
			UI09	OA-CFM	4-20	Ma		0-189600	CFM				Ebtron	GTA-116-7	
			UI10	SA-CFM	4-20	Ma		0-27600	CFM				Ebtron	GTA-116F/D	
			UI11	SASP	4-20	Ma		0-5	INWC				SETRA	264	
			UI12	SAF-ST	CC	COS		0=Off 1=On					Hawkeye	708	
1	IOX-1	167772396	UI13	RAF-ST	CC	COS		0=Off 1=On					Hawkeye	708	
1	IOX-1	167772396	UI14	SVFD-FBK	4-20	Ma		0-100	PCT				ABB		
1	IOX-1	167772396	UI15	RVFD-FBK	4-20	Ma		0-100	PCT				ABB		
1	IOX-2	167772396	UI16	FRZ PUMP-ST	CS	COS		0=Off 1=On					Hawkeye	800	
1	IOX-2	167772395	UI17	EF10b-ST	CS	COS		0=Off 1=On					Hawkeye	800	
1	IOX-2	167772395	UI18	PFLT-ST	DPS	COS		0=Clean 1=Dirty					Dwyer	1910-1	
1	IOX-2	167772395	UI19	FFLT-ST	DPS	COS		0=Clean 1=Dirty					Dwyer	1910-1	
1	IOX-2	167772395	UI20	LLT	CC	COS		0=Normal 1=Alarm					Johnson	A70HA-1(2)	
2	FI1-1	67110500	UI21	ECON-ST	FI1	COS		0=Disable 1=Auto							
3	FI1-2	67110510	UI22	CWV-LOCKOUT	FI1	COS		0=Disable 1=Auto							
			UI23												
			UI24												
	GPC		DI1	Spare											
	IOX-1		DI2	Spare	OI A/B										
	IOX-2		DI3	Spare	OI A/B										
			DI4	Spare	OI A/B										
			DI5	Spare											
			DI6	Spare											
			DI7	Spare											
			DI8	Spare											
			DO1	SVFD/RVFD-SS				0=Stop 1=Start							
			DO2	EF10b-SS				0=Stop 1=Start							
			DO3	FREEZE PUMP-SS				0=Stop 1=Start							
			DO4	ENTHALPY/ECON ENABLE-ST				0=Disable 1=Enable					RIB Relay	RIBU1C	
			DO5	ECON-ST (CWV LOCKOUT)				0=Disable 1=Enable							
	IOX-1		DO6	Spare											
	IOX-1		DO7	Spare											
	IOX-2		DO8	Spare											
	IOX-2		DO9	Spare											
	Psuedo		DO10	CLG STPT RESET LOCKOUT (ON OAH)				(PSEUDO)							
	Psuedo		DO11	ECON FLAG				(PSEUDO)							
			DO12	ENTH FLAG				(PSEUDO)							

Notes:

Job Name:
Equipment: Canteen Ventilation
Equip Location Canteen
Date:

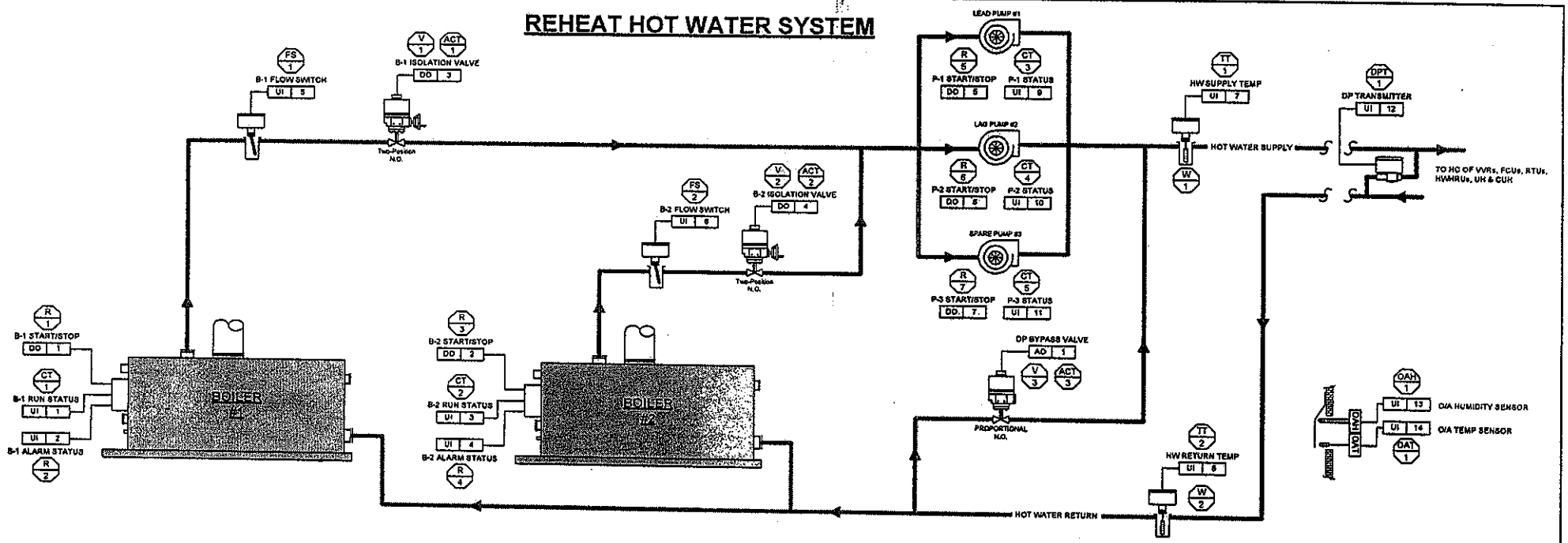
Controller Type: GPC1
Controller Serial: XXXXXX(XX)
CTLR ID/SAGE#/SAGE Port: ID XX / Sage-X / Port-X
Technician:

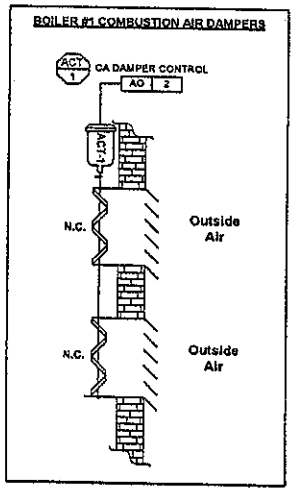
CTLR PRG: (1) -

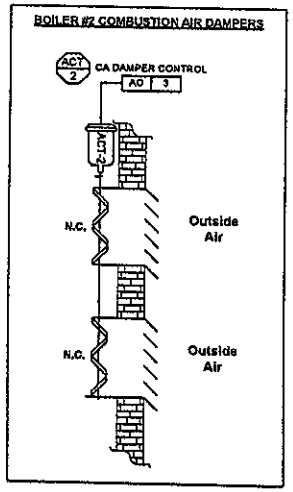
t	Device	Serial Number	IO Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #	Notes:
	GPC		AO1												
	GPC		AO2												
	GPC		AO3												
	GPC		AO4												
	GPC		AO5												
	GPC		AO6												
	GPC		UI01	Exhaust Fan-Status				0=Off 1=On							
	GPC		UI02	Damper-A Supply Temp											
	GPC		UI03	Damper-A Status				0=Closed 1=Open							
	GPC		UI04	Damper-B Status				0=Closed 1=Open							
	GPC		UI05	Exhaust Fan-Enable									Hood Switch (Relay)		
	GPC		UI06												
	GPC		UI07												
	GPC		UI08												
	GPC		UI09					0=Off 1=On							
	GPC		UI10					0=Off 1=On							
	GPC		UI11					0=Off 1=On							
	GPC		UI12					0=Off 1=On							
	GPC		DI1		OI A/B										
			DI2												
			DI3												
			DI4												
			DI5												
			DI6												
			DI7												
			DI8												
	GPC		DO1	Exhaust Fan-SS				0=Stop 1=Start							
	GPC		DO2	Damper-A Enable				0=Disable 1=Enable					Pseudo		
	GPC		DO3	Damper-B Enable				0=Disable 1=Enable							
	GPC		DO4	VAV Occupancy Status				0=Unocc 1=Occupied							
	GPC		DO5										Relay		
	GPC		DO6												

Notes:

REHEAT HOT WATER SYSTEM

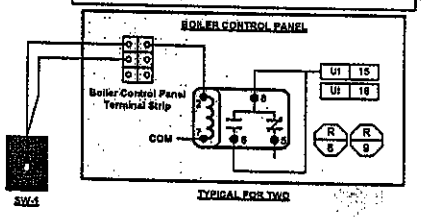






BOILER EMERGENCY SHUTDOWN SWITCH TO BE LOCATED BY THE MECHANICAL ROOM ENTRY DOOR AND INSTALLED BY THE BOILER MANUFACTURER.

RELAY COIL VOLTAGE AND EXACT TIE-IN POINT OF MANUFACTURER'S CONTROL PANEL TO BE DETERMINED IN FIELD



NOTE: SW-1 NOT BY I.D. GRIFFITH, INC.

BILL OF MATERIALS

Design.	Qty	Part #	Description
Field Devices:			
ACT-1,2,3	3	SEE VALVE SCHEDULE	
CT-1 thru 5	3	H708	HAWKEYE, 1-135A, N.O., STATUS LED, TRIP POINT ADJUSTABLE
DPT-1	1	2301-100PD2F-11-B	SETRA PRESSURE TRANSMITTER, 0-100 PSID, 4-20mA OUTPUT
FS-1,2	2	F61KB-11	SPDT FLOW SWITCH, NEMA 1 ENCLOSURE, STAINLESS STEEL PADDLE
OAH-1	1	A/RH1-O	OUTSIDE AIR HUMIDITY SENSOR
OAT-1	1	A/AN-O	OUTSIDE AIR TEMPERATURE SENSOR
R-1 thru 4	4	RIBU1C	MULTI-VOLT, SPDT RELAY
R-5 thru 7	3	RIBU1S	MULTI-VOLT, SPST, RELAY WITH HOA SWITCH
R-8,9	2	(TBD)	GENERAL PURPOSE MIDGET RELAY WITH INDICATOR LIGHT
	2	(TBD)	STANDARD RAIL MOUNT SOCKET FOR RH1B-UL
TT-1,2	2	ACI/TT1K	4", 4-20mA, IMMERSION TEMPERATURE TRANSMITTER
V-x	3	SEE VALVE SCHEDULE	
W-1,2	2	ACI/TT1K	4" STAINLESS STEEL THERMOWELL

REVISION:	BY:	DATE:

NOTES:

I. D. GRIFFITH INC.
MECHANICAL CONTRACTORS
735 South Market Street
Wilmington, Delaware 19801
PH: 302-656-8253 FAX: 302-656-8268
"Quality, Integrity, Pride"

PROJECT: State of Delaware, Delaware Veterans Home, Milford, Delaware	Date: 1-5-05	Programmer: Pending	
	Drawn By: MWG	Installer: Pending	
	Scale: N/A	Installer: Pending	
Sales Engineer: Jim Yasik	Job No: Y-222	Drawing No: ATC-17	
Project Manager: Jim Yasik			

0.0 °F

0.0 %rH

Boiler Control Panel Alarm Status

NORMAL

Pump Lead/Standby Settings

	Runhours	Current Status
Pump #1	0 Hrs.	Boiler#1 Lead
Pump #2	0 Hrs.	Boiler#2 Lead
Pump #3	0 Hrs.	Standby

0

0= Blr1-P1Lead / Blr2-P2Lead / P3-Standby
1= Blr1-P2Lead / Blr2-P3Lead / P1-Standby
2= Blr1-P3Lead / Blr2-P1Lead / P2-Standby

Boiler Control Panel Status

Boiler#1 in Standby | Boiler#2 in Standby

Boiler#1 Pump Lead/Standby Settings

	Boiler#1	Status
Lead	Pump#1	Normal
Standby	Pump#3	Normal
Pump Alarm Reset	0	Normal

Change Value from zero "0" to One "1" to reset

Boiler#2 Pump Lead/Standby Settings

	Boiler#2	Status
Lead	Pump#2	Normal
Standby	Pump#3	Normal
Pump Alarm Reset	0	Normal

Change Value from zero "0" to One "1" to reset

Pump #1 Off

Pump #2 Off

Pump #3 Off

HW Supply 0.0 °F

Differential 0 Psi

Located in QUAD D

No Flow

Flow switches have been removed from the control of the boiler.

No Flow

Closed

Closed

HW Bypass Valve

0.0 °F

HW Return

Differential PSI Bypass

0 Psi Setpt.

0 Psi Loop

0 % Valve

Boiler#1

Boiler#2

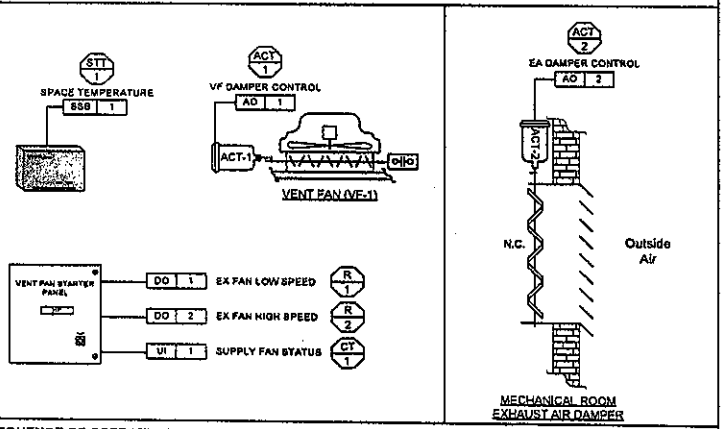
Main | ERU #1 | RTU #1 | RTU #3 | Previous

Kitchen | ERU #2 | RTU #2 | RTU #4 | Cooling System

MAIN MECHANICAL ROOM AND MAIN ELECTRICAL ROOM & EMERGENCY ELECTRICAL ROOM SPACE VENTILATION

MAIN MECHANICAL ROOM SPACE VENTILATION

TYPICAL FOR VENT FAN (VF-1) AND ASSOCIATED EXHAUST DAMPER LOCATED IN MAIN MECHANICAL ROOM

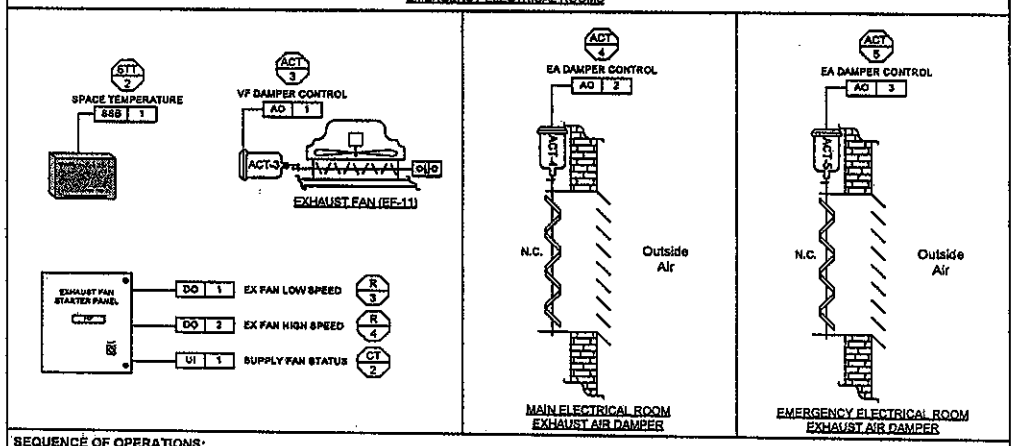


SEQUENCE OF OPERATIONS:

With a rise in main mechanical room space temperature above set point _____°F (adjustable), as measured by the space temperature sensor, the vent fan intake damper and associated exhaust damper shall be commanded to open. Once the intake damper position is verified by the attached end switch, the vent fan shall be commanded to run at low speed. As space temperature increases 2°F (adjustable) above set point the vent fan shall be commanded to run at high speed. On a drop in space temperature the reverse shall occur. When space temperature falls to the set point the vent fan shall cycle from high to low speed. On a further drop in space temperature to 2°F (adjustable) below set point the vent fan shall cycle off and the intake and exhaust dampers shall close.

MAIN ELECTRICAL ROOM & EMERGENCY ELECTRICAL ROOM SPACE VENTILATION

TYPICAL FOR VENT FAN (EF-11) AND ASSOCIATED EXHAUST DAMPERS LOCATED IN MAIN ELECTRICAL & EMERGENCY ELECTRICAL ROOMS



SEQUENCE OF OPERATIONS:

With a rise in the main electrical room space temperature above set point _____°F (adjustable), as measured by the space temperature sensor, the vent fan intake damper and associated exhaust dampers shall be commanded to open. Once the intake damper position is verified by the attached end switch, the vent fan shall be commanded to run at low speed. As space temperature increases 2°F (adjustable) above set point the vent fan shall be commanded to run at high speed. On a drop in space temperature the reverse shall occur. When space temperature falls to the set point the vent fan shall cycle from high to low speed. On a further drop in space temperature to 2°F (adjustable) below set point the vent fan shall cycle off and the intake and two exhaust dampers shall close.

NOTE(S):
VF-1, EF-11 AND ASSOCIATED EQUIPMENT WILL BE WIRED/CONTROLLED BY LOCALLY MOUNTED ASCe CONTROLLERS. REFERENCE DRAWING ATC-77 FOR CONTROL DETAIL.
EXHAUST FAN DAMPERS ORDERED WITH END SWITCHES INSTALLED.

BILL OF MATERIALS

Design.	Qty	Part #	Description
Field Devices:			
ACT-x	5	AF24-SR US	BELIMO PROPORTIONAL DAMPER ACTUATOR, SPRING RETURN
CT-1,2	2	H800	HAWKEYE, 0.25-200A, N.O.
R-1 thru 4	4	RIBU1C	MULTI-VOLT, SPDT RELAY
STT-1,2	2	SBC-STAT2	DIGITAL SENSOR WITH SET POINT ADJ, LED STATUS INDICATOR

REVISION:	BY:	DATE:

NOTES:

I. D. GRIFFITH INC.
MECHANICAL CONTRACTORS
735 South Market Street
Wilmington, Delaware 19801
PH: 302-656-8253 FAX: 302-656-8268
"Quality, Integrity, Pride"

PROJECT: State of Delaware, Delaware Veterans Home, Milford, Delaware	Date: 1-5-06	Programmer: Pending	
	Drawn By: MWG	Installer: Pending	
	Scale: N/A	Installer: Pending	
Sales Engineer: Jim Yasik	Job No: Y-222	Drawing No: ATC-12	
Project Manager: Jim Yasik			

Job Name:
Equipment: HW&CW SYSTEM
Equip Location MER
Date:

Controller Type: GPC1
Controller Serial: 1000710(84)
CTLR ID/SAGE#/SAGE Port: ID 84 / Sage-1 / Port-3
Technician:

CTLR PRG: (1)CWP LEAD, (2)HWP LLSEL, (3)HWP SEL1, (4) HWP SEL2, (5)HWP SEL3

Device	Serial Number	IO Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #	Notes:
GPC		AO1	HW BYP-VLV	2-10	VDC		0-100	PCTOPN						
GPC		AO2	CW BYP-VLV	2-10	VDC		0-100	PCT						
GPC		AO3	BLR RM UH-1 HWV	2-10	VDC		0-100	PCT						
GPC		AO4	BLR RM UH-2 HWV	2-10	VDC		0-100	PCT						
GPC		AO5	SPARE											
GPC		AO6	SPARE											
		AO7												
		AO8												
		AO9												
		AO10												
		AO11												
		AO12												
GPC		UI01	OAT	Th										
GPC		UI02	OAH	4-20										
GPC		UI03	HWST	4-20										
GPC		UI04	HWRT	4-20										
GPC		UI05	HW-DPT (0-100PSI)											
GPC		UI06	CW-DPT (0-100PSI)	4-20										
GPC		UI07	CWST	4-20										
GPC		UI08	CWRT	4-20										
GPC		UI09	HW P1-ST				0=Off 1=On							
GPC		UI10	HW P2-ST				0=Off 1=On							
GPC		UI11	HW P3-ST				0=Off 1=On							
GPC		UI12	CW P4-ST				0=Off 1=On							
IOX-1	167772402	UI13	CW P5-ST				0=Off 1=On							
IOX-1	167772402	UI14	BLR E-STOP SW				0=Disable 1=Enable							
IOX-1	167772402	UI15	BLR1-SS (Blr CTL Panel)				0=Off 1=On							
IOX-1	167772402	UI16	BLR1 DPR-ST				0=Closed 1=Open							
IOX-2	167772401	UI17	BLR1 FLOW SW-ST				0=No Flow 1=Flow							
IOX-2	167772401	UI18	BLR1 BYPVLV-ST				0=Closed 1=Open							
IOX-2	167772401	UI19	BLR2-SS (Blr CTL Panel)				0=Off 1=On							
IOX-2	167772401	UI20	BLR2 DPR-ST				0=Closed 1=Open							
IOX-3	167772410	UI21	BLR2 FLOW SW-ST				0=Off 1=On							
IOX-3	167772410	UI22	BLR1 BYPVLV-ST				0=Closed 1=Open							
IOX-3	167772410	UI23	BLR1&2 ALARM				0=Normal 1=Alarm							
IOX-3	167772410	UI24	MECH RM-SPT											
GPC		DI1	BLR1-LEAD SELECT	OIA/B			0=Disable 1=Enable							
IOX-1	167772402	DI2	BLR2-LEAD SELECT	OIA/B			0=Disable 1=Enable							
IOX-2	167772401	DI3	Elec/ATS EF-ST	OIA/B			0=Disable 1=Enable							
IOX-3	167772410	DI4	Elec/ATS EF-EN	OIA/B			0=Disable 1=Enable							
		DI5	Spare									From ASCe's		
		DI6	Spare											
		DI7	Spare											
		DI8	Spare											
GPC		DO1	HEATING ENABLE				0=Disable 1=Enable							
GPC		DO2	COOLING ENABLE				0=Disable 1=Enable							
GPC		DO3	HW P1-SS				0=Stop 1=Start							
GPC		DO4	HW P2-SS				0=Stop 1=Start							
GPC		DO5	HW P3-SS				0=Stop 1=Start							
GPC		DO6	CW P4-SS				0=Stop 1=Start							
IOX-1	167772402	DO7	CW P5-SS				0=Stop 1=Start							
IOX-1	167772402	DO8	MER VENTFAN (LS) &DPR				0=Off 1=Start							
IOX-2	167772401	DO9	Elec/ATS EF-SS				0=Off 1=Start							
IOX-2	167772401	DO10	SPARE											
IOX-3	NO DEVICE	DO11	SPARE											
IOX-3	NO DEVICE	DO12	CW SYS ENABLE											

Notes:

Equipment: Electrical Room Ventilation

Equip Location MER

Date:

CHECKOUT INFORMATION:

Controller Type NB-ASCe

Controller Serial: 204349A (86)

Controller ID/SAGE#/SAGE Port: ID 86 / Sage-1 / Port-3

Technician:

t	Device	Serial Number	Hardware Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #
			AO1											
			AO2											
			AO3											
			AO4											
			SSB	Elec Room Space Temp										
			UI01	Elec Room Damper Status										
			UI02	Jumper (Simulate Fan-ST)										
			UI03	10K Ohm Resister (Simulate OAT)										
			UI04	RED & White Wire ????										
			UI05	White & Black Wire ????										
			OIA/B DI1											
			DO1	Psuedo (EF-SS)										
			DO2	Elec Rm EF & Damper Enable										
			DO3		Output to Damper & Relay (relay contacts are parallelled and connect to GPC DI4 (IOX-3) For EF-EN)									
			DO4											
			DO5											

Job Name:

Equipment: ATS Room Ventilation

Equip Location MER

Date:

CHECKOUT INFORMATION:

Controller Type NB-ASCe

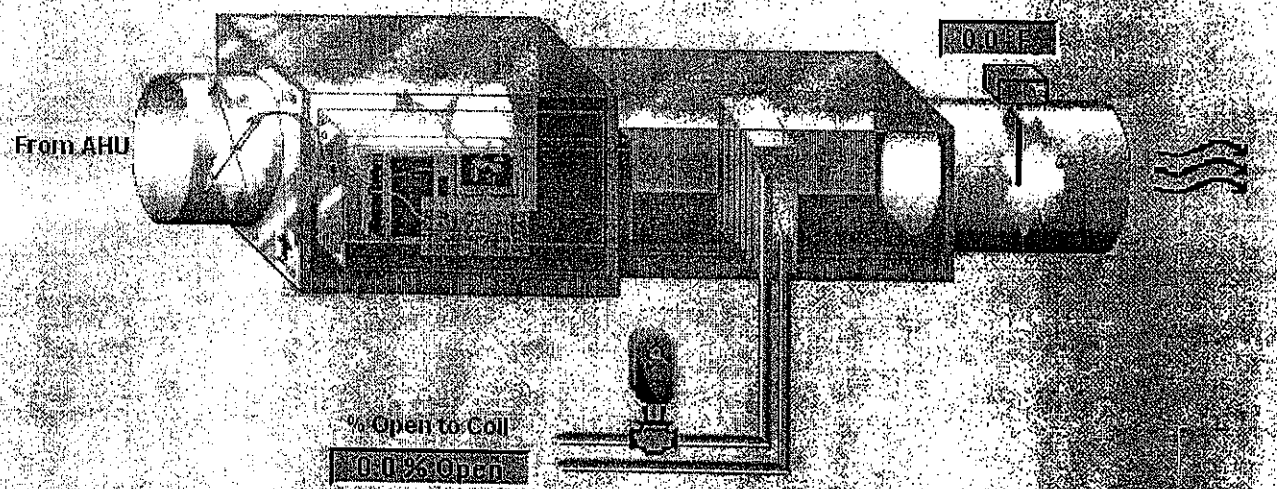
Controller Serial: 205771 (85)

Controller ID/SAGE#/SAGE Port: ID 85 / Sage-1 / Port-3

Technician:

Device	Serial Number	Hardware Point	System Name	Input Range	EU	CHK	Output Range	EU	CHK	Analog Reading	Analog Offset	Manufacture	Part #
		AO1											
		AO2											
		AO3											
		AO4											
		SSB	ATS Space Temp										
		UI01	ATS Damper Status										
		UI02	Jumper (Simulate Fan-ST)										
		UI03	10K Ohm Resister (Simulate OAT)										
		UI04											
		UI05	MER Vent Fan Status										
		OIA/B DI1											
		DO1	Psuedo (EF-SS)										
		DO2	ATS Rm EF & Damper Enable										
		DO3		Output to Damper & Relay (relay contacts are parallelled and connect to GPC DI4 (IOX-3) For EF-EN)									
		DO4											
		DO5											

ELECTRIC ROOM RM#1053



0.0 °F

Previous
Main
A Wing
B Wing
C Wing
D Wing
ERU #1
ERU #2
RTU #1
RTU #2
RTU #3
RTU #4

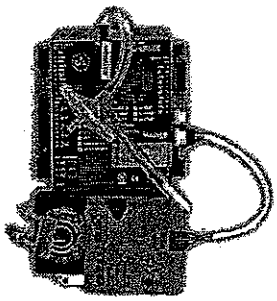
Airflow Setpoints

	Minimum	Maximum
Cooling Air Flow	0 CFM	0 CFM
Heating Air Flow	0 CFM	0 CFM
Desired Air Flow	0 CFM	
Measured Air Flow	0 CFM	

		Calc Setpoint
Stat Multiplier	0.0 °F	
Cooling Setpoint	0.0 °F	0.0 °F
Heating Setpoint	0.0 °F	0.0 °F

AMERICAN AUTO-MATRIX
SMART BUILDING SOLUTIONS®

NB-VAV



AAM has over 30 BTL listed controls.

Details

The NB-VAV family of terminal box digital controllers is designed to function in numerous scenarios that require variable air volume (VAV), constant air volume (CAV), and CO2 measurement, while providing flexible mounting solutions to increase ease of installation. Each controller complies with ANSI/ASHRAE Standard 135-2004, BACnet®, and communicates on MS/TP. Using STATbus™ technology, SBC-STAT room sensors can be connected to the NB-VAV without consuming onboard I/O. This product is BTL listed as a B-ASC (BACnet - Application Specific Controller).

Features

- BACnet MS/TP network protocol over EIA-485
- 5 Digital Outputs (Relay or Triac)
- Real-time clock module (optional)
- Integrated high-resolution airflow sensor
- Easy duct scaling K-Factor balance calibration
- VAV can be balanced by using menu driven capabilities of the SBC-STAT3
- IAQ variants offer an additional Universal Input that is to be used for a CO2 sensor for Indoor Air Quality control
- On-board Belimo Actuator (can be either standard actuator or feedback actuator)
- Flash memory for easy updates
- Time-of-day and holiday scheduling

Additional Information

NB-VAV Data Sheet (Low Res) (High Res)

NB-VAV Protocol Implementation Conformance Statement (PICS)

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SAGE 2

VVR (VAV Terminal Units) & CVR (Constant Volume Terminal Units)

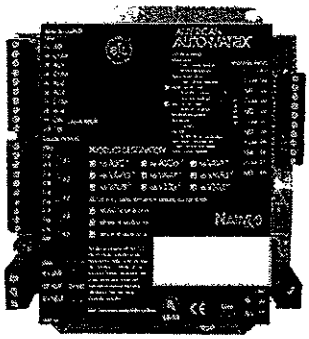
Unit ID #	Serial Number	New	Sage Port	Bldg. QUAD	Room #	Fed From	Unit Description	MIN	MAX	Box Size	K Factor	Notes	Comm.
1	804410		1	A	1186	RTU-3	VVR	102	205	5"	381		
2	804394		1	A	1185	RTU-3	VVR	180	360	6"	421		
3	804424		1	A	1184	RTU-3	VVR	58	115	4"	526		
4	804671		1	A	1177	RTU-3	VVR	248	495	8"	826		
5	804425		1	A	1191	RTU-3	VVR	185	185	5"	484		
6	804578		1	A	1182	RTU-3	VVR	238	475	8"	798		
7	804538		1	A	1180	RTU-3	VVR	248	595	8"	828		
8	804414		1	A	1179	RTU-3	VVR	80	160	5"		Laundry	
9	804549		1	A	1175	RTU-3	VVR	163	325	6"	430		
10	~~804395~~	805495	1	A	1168	RTU-3	VVR	85	170	5"	468	Replaced 12/05/06	
11	804427		1	A	1153	RTU-3	VVR	950	1900	14"	2851		
12	804540		1	A	1198	RTU-3	VVR	373	745	10"	1251		
13	804393		1	A	1195	RTU-3	VVR	145	290	6"	437		
14	804572		1	A	1197	RTU-3	VVR	345	690	8"	869		
15	804400		1	A	1218	HWHRU-2	CVR	430	430	10"	1078	Isolation Room	
16	804575		1	A	1219	HWHRU-2	CVR	430	430	10"	1233	Isolation Room	
17	804382		1	A	1203	RTU-3	VVR	440	880	10"	1405		
18	804569		1	A	1205	RTU-3	VVR	275	550	8"	800		
19	1000719		1	A	1151/1152 / 1172/1223	RTU2/HWHRU-2	RH 8,9,10,11 / 6	n/a	n/a	n/a			
20	804554		1	A	1164	RTU-3	VVR	150	300	6"	406		
21	804423		1	A	1200	RTU-3	VVR	97	195	5"	392		
22	804546		1	A	1163	RTU-3	VVR	170	340	6"	461		
23	804564		1	A	1162	RTU-3	VVR	440	875	10"	313		
24	804421		1	A	1161	RTU-4	VVR	103	205	5"	352		
25	~~804556~~	805497	1	A	1156	RTU-4	VVR	222	445	8"	846	Replaced 12/05/06	
26	804389		1	A	1155	RTU-4	VVR	Unocc=800	Occ=1450	12"	No Cal. 1993	Canteen VAV Box	
27	805498		1	A	1155	RTU-4	VVR- EOL	Unocc=0	Occ=390	8"		Canteen MUA-Dpr (Flow & SAT only)	
86	1000653		1	A	1155	RTU-4	GPC					Canteen Damper Control	
28	804539		2	B	1166	RTU-4	VVR	323	645	8"	817		
29	804416		2	B	1018	RTU-4	VVR	115	230	5"	363		
30	804550		2	B	1020	RTU-4	VVR	195	390	6"	398		
31	804412		2	B	1021	RTU-4	VVR	83	165	4"	255		
32	804570		2	B	1015	RTU-4	VVR	58	115	4"	236		
33	804420		2	B	1002	RTU-4	VVR	175	350	6"	438		
34	804542		2	B	1003	RTU-4	VVR	188	375	6"	447		
35	804407		2	B	1004	RTU-4	VVR	555	1110	12"	2163		
36	804383		2	B	1005	RTU-4	VVR	440	880	10"	1309		
37	804388		2	B	1006	RTU-4	VVR	198	395	8"	870		
38	804555		2	B	1010	RTU-4	VVR	220	440	8"	835		
39	804579		2	B	1009	RTU-4	VVR	165	330	8"	834		
40	804384		2	B	1269	RTU-4	VVR	98	195	5"	411		
41	804533		2	B	1238	RTU-4	VVR	835	1675	14"	2782	Old 1271	
42	804429		2	B	1240	RTU-4	VVR	123	245	5"	395		
43	804387		2	B	1244	RTU-4	VVR	143	285	5"	248		
44	804413		2	B	1246	RTU-4	VVR	128	255	5"	383		
45	804552		2	B	1248	RTU-4	VVR	273	545	8"	853		
46	205597		2	B	corridor1267/1284	HWHRU-2	RH 4 & 5	n/a	n/a	n/a			
47	1406		2	B	1264	HWHRU-2	CVR	430	430	10"	1107	Isolation Room	

VVR (VAV Terminal Units) & CVR (Constant Volume Terminal Units)

Unit ID #	Serial Number	New	Sage Port	Bldg. QUAD	Room #	Fed From	Unit Description	MIN	MAX	Box Size	K Factor	Notes	Comm.
48	804557		2	B	1250	RTU-4	VVR	190	380	6"	402		
49	804541		2	B	1249	RTU-4	VVR	188	375	6"	452		
50	804402		3	C	1088	RTU-1	VVR	180	360	6"	438		
51	804409		3	C	1087	RTU-1	VVR	198	395	8"	847		
52	804408		3	C	1086	RTU-1	VVR	190	380	8"	749		
53	804547		3	C	1054	RTU-1	VVR	248	495	8"	504		
54	804391		3	C	1085	RTU-1	VVR	195	390	6"	454		
55	804386		3	A	1154	RTU-1	VVR- EOL	580	1160	12"	2154		
56	804417		3	C	1082	RTU-1	VVR	108	215	5"	372		
57	804419		3	C	1051	RTU-1	VVR	130	260	5"	399		
58	805499		3	C	1057	RTU-1	VVR	409	815	10"	1366		
59	804585		3	C	1055	RTU-1	VVR	380	760	10"	1315		
60	804577		3	C	1053	RTU-1	VVR	150	300	6"	394		
61	804548		3	C	1049	RTU-1	VVR	363	725	10"	1271		
62	~~204744~~	204741	3	C	1075	HWHRU-1	RH 3	n/a	n/a	n/a			
63	804576		3	C	1070	HWHRU-1	CVR	430	430	10"	1295	Isolation Room	
64	804580		3	C	1071	HWHRU-1	CVR	430	430	10"	1309	Isolation Room	
65	804558		3	C	1048	RTU-1	VVR	203	405	8"	792		
66	804428		3	C	1045	RTU-1	VVR	95	190	5"	364		
67	804385		3	C	1044	RTU-1	VVR	123	245	5"	350		
68	804534		3	C	1043	RTU-1	VVR	60	120	4"	237		
69	804563		3	C	1040	RTU-4	VVR	73	145	4"	215		
70	804553		3	C	1039	RTU-4	VVR	68	135	4"	227		
71	804535		3	C	1036	RTU-4	VVR	238	565	8"	846		
72	804561		3	C	1024	RTU-4	VVR	460	920	10"	1246		
73	804568		3	C	1027	RTU-4	VVR	458	915	10"	1339		
74	804543		3	C	1030	RTU-4	VVR- EOL	568	1135	12"	1971		
75	804544		4	D	1127	RTU-1	VVR	625	1250	12"	2256		
76	804551		4	D	1097	RTU-1	VVR	285	570	8"	604		
77	804536		4	D	1098	RTU-1	VVR	83	165	4"	243		
78	804398		4	D	1101	RTU-1	VVR	140	280	6"	439		
79	804574		4	D	1105	RTU-1	VVR	313	625	8"	1013		
80	804415		4	D	1103	RTU-1	VVR	180	360	6"	438		
81	804405		4	D	1106	RTU-1	VVR	188	375	6"	397		
82	804418		4	D	1107	RTU-1	VVR	195	390	6"	395		
83	804560		4	D	1120	RTU-1	CVR	430	430	10"	1281	Isolation Room	
84	205596		4	D	corridor1147/1123	RTU-1	RH 1 & 2	n/a	n/a	n/a			
85	804537		4	D	1125	RTU-1	VVR	85	170	4"	246		

AMERICAN AUTO-MATRIX
SMART BUILDING SOLUTIONS®

NB-ASC(e)



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AAM has over 30 BTL listed controls.

Details

The SBC-ASC® and SBC-ASCe® are application selectable controllers. These controllers can be programmed from a list of pre-configured applications. The current applications are Heat Pump, Rooftop, and Fan Coil.

The SBC-ASC/ASCe works on existing Public Unitary Protocol (PUP) networks and has an integrated SBC-STAT® Sensor Bus for sensor communications.

Features

- Backward compatible with the American Auto-Matrix family of products
- Flash memory for easy updates and pre-configured applications
- Zone temperature input with 15-bit resolution
- State-of-the-art Surface Mount Technology
- Real-time Clock module (standard in the SBC-ASC(e) and optional in the SBC-ASC)
- Easy duct scaling K-Factor balance calibration
- Time-of-day and holiday scheduling
- State-of-the-art Motorola Digital DNA Technology

Additional Information

NB-ASC(e) Data Sheet (Low Res) (High Res)

NB-ASC(e) Protocol Implementation Conformance Statement (PICS)

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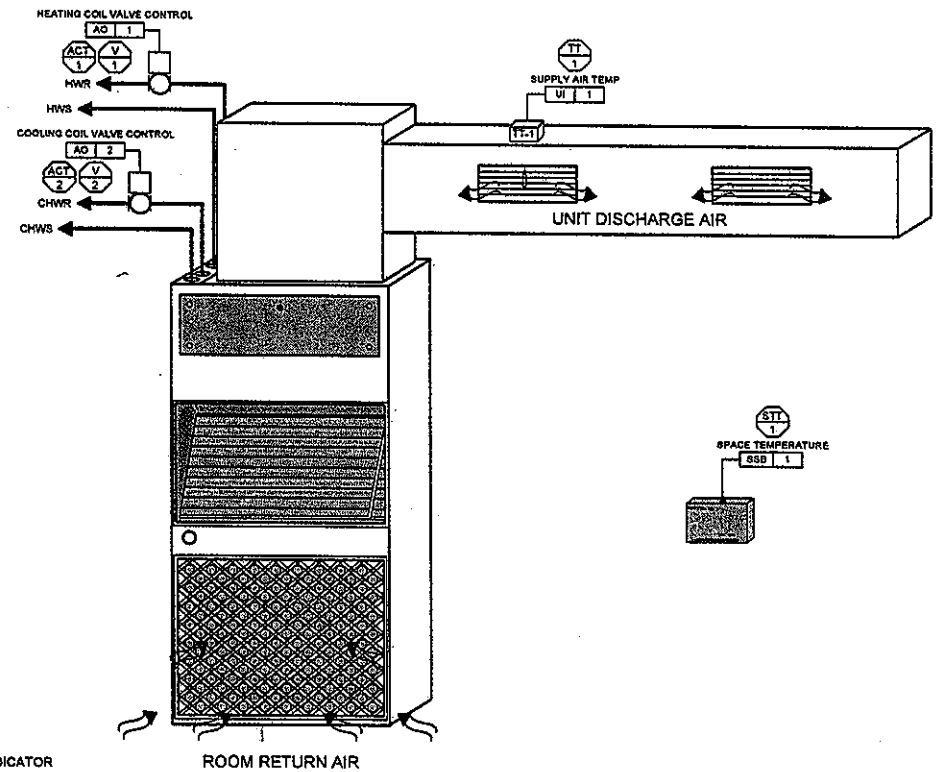
FAN COIL CONTROL DIAGRAM

(TYPICAL FOR 76 UNITS)



BILL OF MATERIALS

Design.	Qty	Part #	Description
Field Devices:			
ACT-1,2	2	SEE VALVE SCHEDULE	
STT-1	1	SBC-STAT2	DIGITAL SENSOR, SET POINT ADJ, LED STATUS INDICATOR
TT-1	1	ACI/10K-AN	18" THERMISTOR TYPE DUCT SENSOR
V-1,2	2	SEE VALVE SCHEDULE	

NOTE: THE ROOM THERMOSTAT SHALL BE WALL MOUNTED AT A HEIGHT OF _____ FEET.

SEQUENCE OF OPERATION:

The BAS shall monitor the temperature of each room and generate an alarm if the space temperature deviates more than 4°F (adjustable) from set point.

OCCUPIED MODE:
The wall mounted thermostat shall cycle the chilled and hot water valves to maintain the room occupied heating and cooling set points of _____/_____°F (adjustable). The unit's fan shall operate continuously.

UNOCCUPIED MODE:
The wall mounted thermostat shall cycle the chilled and hot water valves to maintain the room unoccupied heating and cooling set points of _____/_____°F (adjustable). The unit's fan shall operate in the AUTO mode.

REVISION:	BY:	DATE:

NOTES:

I. D. GRIFFITH INC.
MECHANICAL CONTRACTORS
735 South Market Street
Wilmington, Delaware 19801
PH: 302-656-8253 FAX: 302-656-8268
"Quality, Integrity, Pride"

PROJECT: State of Delaware, Delaware Veterans Home, Milford, Delaware	Date: 1-6-06	Programmer: Pending	
	Drawn By: MWG	Installer: Pending	
	Scale: N/A	Installer: Pending	
Sales Engineer: Jim Yasik	Job No: Y-222	Drawing No: ATC-13	
Project Manager: Jim Yasik			

SAG31

Fan Coil Units, Cabinet Unit Heaters and Reheat Coils

Port	Quad	Serial Number	Unit ID #	Room #	Area Serving/Notes	Unit Description	CWV	HWV	CUH_HWV RHT_HWV
1	A	204760	1	1217	A	Fan Coil Unit	2W	2W	n/a
1	A	205598	2	1216	A	Fan Coil Unit	2W	2W	n/a
1	A	204731	3	1215	A	Fan Coil Unit	2W	2W	n/a
1	A	204758	4	1214	A	Fan Coil Unit	2W	2W	n/a
1	A	204772	5	1213	A	Fan Coil Unit	2W	2W	n/a
1	A	204744	6	1212	A+ CUH Corridor 1223	Fan Coil Unit	2W	2W	n/a
1	A	204790	7	1211	A	Fan Coil Unit	2W	2W	n/a
1	A	204763	8	1210	A	Fan Coil Unit	2W	2W	n/a
1	A	204743	9	1209	A	Fan Coil Unit	2W	2W	n/a
1	A	204728	10	1208	A	Fan Coil Unit	2W	2W	n/a
1	A	204756	11	1207	A	Fan Coil Unit	2W	2W	n/a
1	A	204733	12	1206	A	Fan Coil Unit	2W	2W	n/a
1	A	204727	13	1227	A	Fan Coil Unit	2W	2W	n/a
1	A	204765	14	1228	A	Fan Coil Unit	2W	2W	n/a
1	B	204716	15	1229	B	Fan Coil Unit	2W	2W	n/a
1	B	204788	16	1230	B	Fan Coil Unit	2W	2W	n/a
1	B	204776	17	1263	B	Fan Coil Unit	2W	2W	n/a
1	B	204793	18	1262	B	Fan Coil Unit	2W	2W	n/a
1	B	204718	19	1261	B	Fan Coil Unit	2W	2W	n/a
1	B	204769	20	1260	B	Fan Coil Unit	2W	2W	n/a
1	B	204722	21	1258	B	Fan Coil Unit	2W	2W	n/a
1	B	204764	22	1257	B+ CUH Corridor 1267	Fan Coil Unit	2W	2W	n/a
1	B	204725	23	1256	B	Fan Coil Unit	2W	2W	n/a
1	B	204777	24	1255	B	Fan Coil Unit	2W	2W	n/a
1	B	204754	25	1254	B	Fan Coil Unit	2W	2W	n/a
1	B	204795	26	1253	B	Fan Coil Unit	2W	2W	n/a
1	B	204773	27	1252	B	Fan Coil Unit	2W	2W	n/a
1	B	204787	28	1251	B	Fan Coil Unit	2W	2W	n/a
1	B	204746	29	1281	B	Fan Coil Unit	2W	2W	n/a
1	B	204801	30	1280	B	Fan Coil Unit	2W	2W	n/a
1	B	204729	31	1279	B	Fan Coil Unit	2W	2W	n/a
1	B	204774	32	1278	B	Fan Coil Unit	2W	2W	n/a
1	B	204749	33	1277	B+ CUH Corridor 1284	Fan Coil Unit	2W	2W	n/a
1	B	204781	34	1276	B	Fan Coil Unit	2W	2W	n/a
1	B	204739	35	1275	B	Fan Coil Unit	2W	2W	n/a
1	B	204778	36	1274	B	Fan Coil Unit	2W	2W	n/a
1	B	204791	37	1273	B	Fan Coil Unit	2W	2W	n/a
1	B	204761	38	1272	B - End Of Line	Fan Coil Unit	2W	2W	n/a
2	C	204782	39	1069	C - EOL Sprinkler Pump Rm CUH Rm 1031	Fan Coil Unit	2W	2W	2W
2	C	204785	40	1068	C + Employee entrance CUH Rm 1041	Fan Coil Unit	2W	2W	2W
2	C	204737	41	1067	C	Fan Coil Unit	2W	2W	n/a
2	C	204784	42	1066	C	Fan Coil Unit	2W	2W	n/a
2	C	204724	43	1065	C	Fan Coil Unit	2W	2W	n/a
2	C	204780	44	1064	C+ CUH Corridor 1075	Fan Coil Unit	3W	3W	2W
2	C	204751	45	1063	C	Fan Coil Unit	3W	3W	n/a
2	C	204767	46	1062	C	Fan Coil Unit	2W	2W	n/a
2	C	204745	47	1061	C	Fan Coil Unit	2W	2W	n/a
2	C	204742	48	1060 ?	C	Fan Coil Unit	2W	2W	n/a
2	C	204714	49	1059	C	Fan Coil Unit	2W	2W	n/a
2	C	204770	50	1058	C + Main Entrance CUH Rm 1000	Fan Coil Unit	2W	2W	2W
2	C	204771	51	1080	C	Fan Coil Unit	2W	2W	n/a
2	C	204719	52	1081	C	Fan Coil Unit	2W	2W	n/a
2	D	204726	53	1132	D	Fan Coil Unit	2W	2W	n/a
2	D	204721	54	1131	D Was disconnected Plugged back in	Fan Coil Unit	2W	2W	n/a
2	D	204734	55	1119	D	Fan Coil Unit	2W	2W	n/a
2	D	204768	56	1118	D	Fan Coil Unit	2W	2W	n/a
2	D	204723	57	1117	D- Drain Wire was not connected	Fan Coil Unit	2W	2W	n/a
2	D	204715	58	1116	D	Fan Coil Unit	2W	2W	n/a
2	D	204762	59	1115	D	Fan Coil Unit	2W	2W	n/a
2	D	204755	60	1114	D + CUH Corridor 1123	Fan Coil Unit	3W	3W	2W

		Number	ID #	#		Description			RHT_HWV
2	D	204766	61	1113	D	Fan Coil Unit	3W	3W	n/a
2	D	204748	62	1112	D	Fan Coil Unit	2W	2W	n/a
2	D	204736	63	1111	D	Fan Coil Unit	2W	2W	n/a
2	D	204732	64	1110	D	Fan Coil Unit	2W	2W	n/a
2	D	204794	65	1109	D	Fan Coil Unit	2W	2W	n/a
2	D	205599	66	1108	D	Fan Coil Unit	2W	2W	n/a
2	D	204738	67	1144	D	Fan Coil Unit	2W	2W	n/a
2	D	204759	68	1143	D	Fan Coil Unit	2W	2W	n/a
2	D	204720	69	1142	D	Fan Coil Unit	2W	2W	n/a
2	D	204757	70	1141	D	Fan Coil Unit	2W	2W	n/a
2	D	204740	71	1140	D+ CUH Corridor 1147	Fan Coil Unit	3W	3W	2W
2	D	204735	72	1139	D	Fan Coil Unit	3W	3W	n/a
2	D	204752	73	1138	D	Fan Coil Unit	2W	2W	n/a
2	D	204786	74	1137	D	Fan Coil Unit	2W	2W	n/a
2	D	204779	75	1136	D	Fan Coil Unit	2W	2W	n/a
2	D	204717	76	1135	D	Fan Coil Unit	2W	2W	n/a
3	D	1000269	77		C&D VAV'S	RTU 1			
3	D	1000657	78		DINING AREAS	RTU 2			
3	D	1000652	79		QUAD C VAV'S	RTU 3			
3	D	1000709	80		QUAD B VAV'S	RTU 4			
3	D	1000654	81		QUAD C&D FCU'S	ERU1			
3	D	1000655	82		QUAD A&B FCU'S	ERU2			
3	D	1000704	83		KITCHEN	Makeup Air Unit			
3	D	1000710	84		BOILERS/PUMPS/MECH RM UNIT HEATERS	Mech. Rm			

Fan Coil Unit Valve Configuration and setup

Typical FCU with two way hot & chilled water control valves (2W,2W)
HWV LS=100
HWV HS=0.0

CWV LS=100
CWV HS=0.0

FCU-39 (Typical for FCU-40&50) two way hot and chilled water control valves plus two way CUH or RHT control valve (2W,2W,2W)
HWV LS=100
HWV HS=0.0

CWV LS=100
CWV HS=0.0

CUH HWV LS=100
CUH HWV HS=0.0

FCU-45 (Typical for FCU-61) with three way hot and chilled water control valves (3W,3W)
HWV LS=0.0
HWV HS=100

CWV LS=0.0
CWV HS=100

FCU-44 (Typical for FCU-60&71) with three way hot and chilled water control valves plus two way CUH or RHT control valve (3W,3W,2W)
HWV LS=0.0
HWV HS=100

CWV LS=0.0
CWV HS=100

CUH HWV LS=100
CUH HWV HS=0.0

BACnet Communications Module

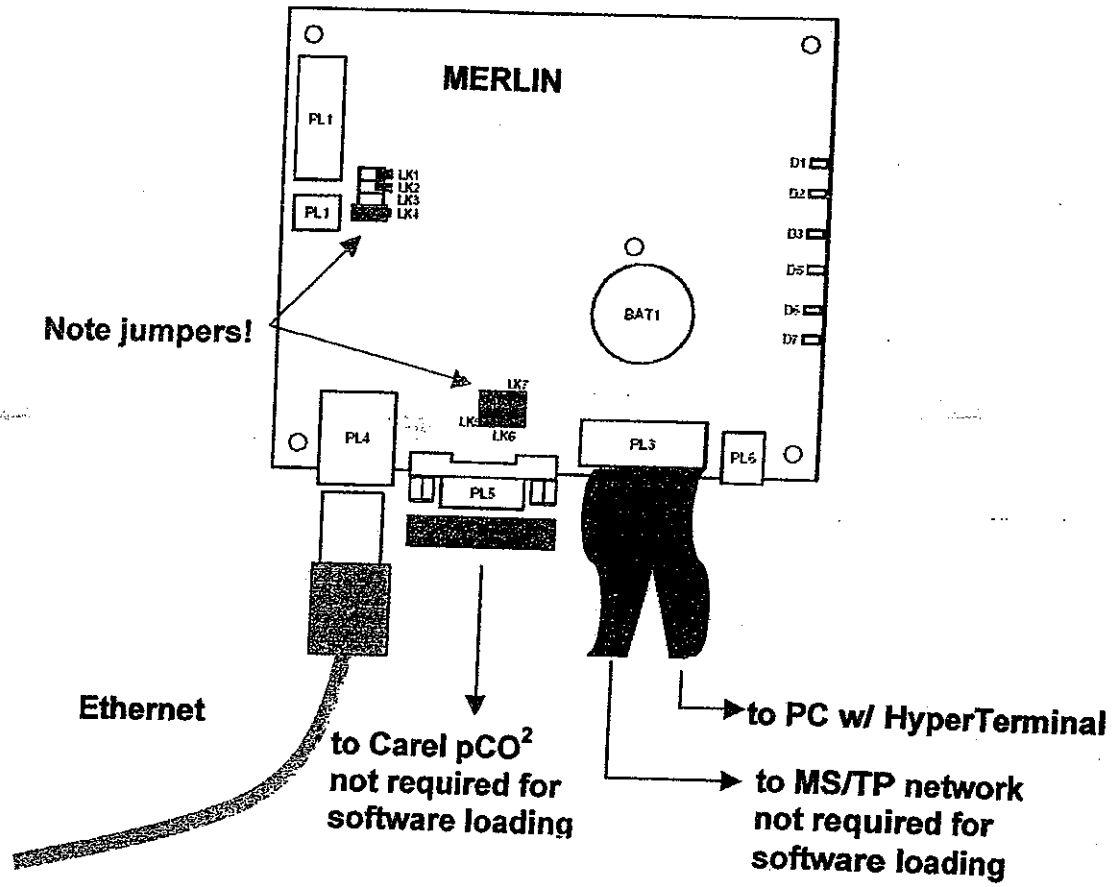
Software Loading Instructions

McQuay International

14-Jan-2003

Introduction

This document describes the procedure for loading software to the BACnet Communications Module (BCM). Unzip the "Files Transferred to BCM rel x.zip" file accompanying this document to the hard drive of your computer. The "transfer.bat" batch file will be used to load the enclosed software files to the BCM. Before loading software to a virgin BCM, the MERLIN must be configured and wired as shown in the diagram:



The MERLIN hardware must have jumpers fitted as shown. This enables the battery backup for the static RAM drive D:, and configures the COM2 port for MS/TP 2 wire EIA-485 operation. The Ethernet port should connect to a hub/switch that is also connected to the Windows PC to be used for software loading. PL3 must have the development kit cable (or equivalent) as shown, com1 must be connected to a PC with HyperTerminal.

DOCUMENT FOR INTERNAL USE ONLY

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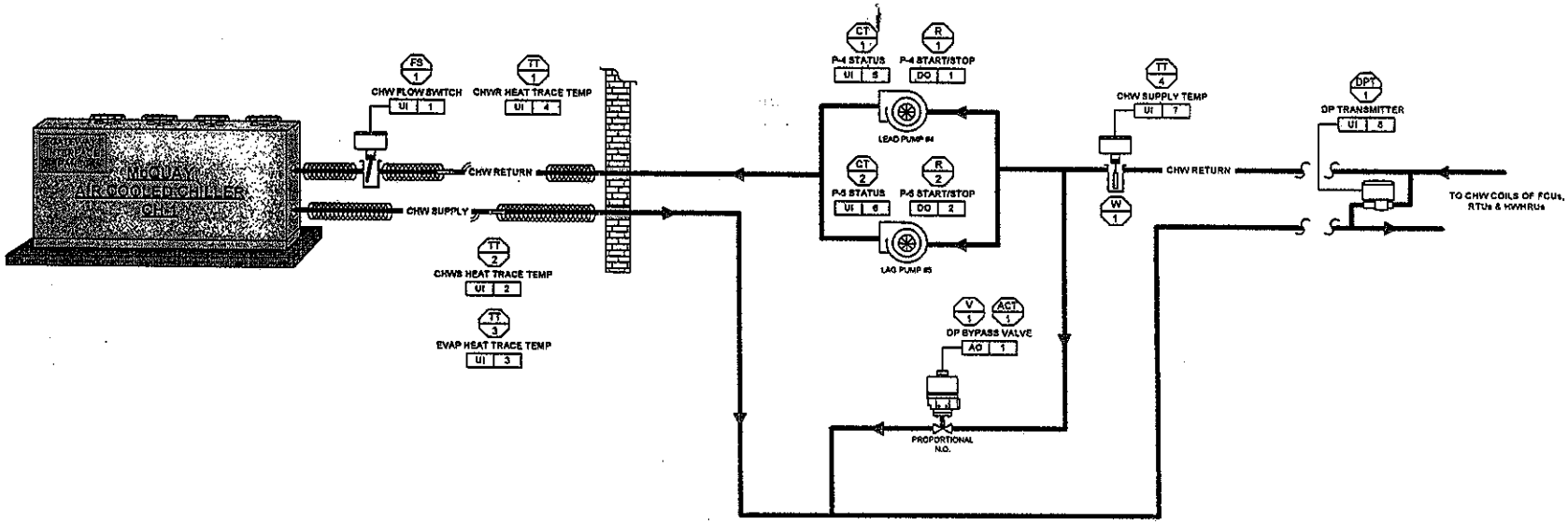
CHILLED WATER SYSTEM



SEQUENCE OF OPERATION:

INITIAL START-UP SEQUENCE:
The chiller shall be enabled to operate whenever outside air temperature is above 55°F (adjustable) and disabled whenever the outside air temperature is below 48°F (adjustable). On initial startup of the chiller the active chilled water pump (P-4) shall be started and once water flow is proven by the return mounted flow switch, the chiller shall be enabled to operate under its own self-contained packaged controls.

PUMPS (P-4 & P-5) ACTIVE/SPARE SEQUENCE:
Initially the chilled water pumps shall have the following designations: P-4 (Active) and P-5 (Spare). The pumps will be on a lead/lag schedule with selection of lead and lag pumps based upon adjustable runtime, initially set at 168 hours. The run status of each pump shall be monitored via a current transducer. If failure of the active pump is indicated, the spare pump will assume the failed pump's assignment and automatically be started. An alarm for the failed pump shall be generated at the OWS. The alternation of pumps via runtime schedule shall be suspended until the failed pump is repaired and the system is reset.

CHILLED WATER RESET SEQUENCE:
The BAS shall reset the chilled water supply temperature up from 45°F (adjustable) to maintain the chilled water control valve output with the most load for RTUs-1,3,4 at 100% open. The chilled water supply temperature sensor (TT-1) shall be monitored through the DDC system.

DP BYPASS CONTROL VALVE SEQUENCE:
A remote differential pressure transmitter shall monitor loop pressure and modulate the chilled water bypass control valve to maintain loop pressure set point of 20 psi (adjustable) .

HEAT TRACE SEQUENCE:
The chilled water supply and return piping and unit evaporator temperature shall be monitored by the BAS system. An alarm shall be generated at the OWS when piping or evaporator temperatures fall below set point of 38°F (adjustable).

BACNet GATEWAY INTERFACE:
If available, the following points shall be monitored by the BAS system via the BACNet Gateway Interface: all chiller alarms, chilled water supply and return temperatures, compressor amp draw, chilled water flow status, evaporator refrigerant pressure, evaporator refrigerant temperature, condenser refrigerant pressure, condenser refrigerant temperature, compressor discharge refrigerant temperature, oil pressure and temperature, chiller status, chilled water temperature set point, chiller maximum kw demand set point.

BILL OF MATERIALS

Design.	Qty	Part #	Description
Field Devices:			
ACT-1	1	SEE VALVE SCHEDULE	
CT-1,2	2	H708	HAWKEYE, 1-135A, N.O., STATUS LED, TRIP POINT ADJUSTABLE
DPT-1	1	2301-100PD2F-11-B	SETRA PRESSURE TRANSMITTER, 0-100 PSID, 4-20mA OUTPUT
FS-1	1	F61KB-11	SPDT FLOW SWITCH, NEMA 1 ENCLOSURE, STAINLESS STEEL PADDLE
R-1,2	2	RIBU1S	MULTI-VOLT, SPST, RELAY WITH HOA SWITCH
TT-1,2,3	3	ACI/10K-AN-BP	1" THERMISTOR BULLET PROBE SENSOR
TT-4	1	ACI/10K-AN	18" THERMISTOR TYPE IMMERSION SENSOR
V-1	1	SEE VALVE SCHEDULE	
W-1	1	ACI/TT1K	4" STAINLESS STEEL THERMOWELL

REVISION:	BY:	DATE:

NOTES:

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"Quality, Integrity, Pride"

PROJECT: State of Delaware, Delaware Veterans Home, Milford, Delaware	Date: 1-6-06	Programmer: Pending	
	Drawn By: MWG	Installer: Pending	
	Scale: N/A	Installer: Pending	
Sales Engineer: Jim Yasik	Job No: Y-222	Drawing No: ATC-19	
Project Manager: Jim Yasik			