Maine Endwell Middle School 2011

Binghamton , New York

Application Engineering by Randy Langille

Engineer/Architect	Bearsch Compeau Knudson
Mechanical Contractor	Evans Mechanical
Job Number	P7619

AUTOMATEDLOGIC CORPORATION

Table of Contents

Symbol Legend

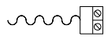
Supply Fan

DX Cooling Coil

Duct Temperature Sensor

Exhaust Fan

Electric Heating Coil



Averaging Duct Temperature Sensor

Return Fan

Gas Heating

Duct Humidity Sensor

Fan w/ Inlet Vane Control

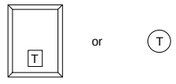
Hot Water Heating Coil

Immersion Temperature Sensor w/ Well

Pump

Chilled Water Cooling Coil

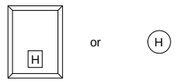
Pressure Sensor



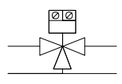
Room Temperature Sensor

Steam Heating Coil

Filter

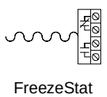


Room Humidity Sensor

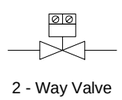


3 - Way Valve

Air Flow Station

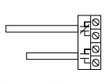


FreezeStat



2 - Way Valve

Damper



Smoke Detector

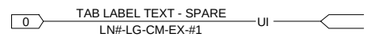
Flow Sensor

Common Abbreviations:

AC	- Air Conditioning	EVAP	- Evaporator	SA	- Supply Air
ACU	- Air Conditioning Unit	F	- Fahrenheit	SF	- Supply Fan
AHU	- Air Handling Unit	FCU	- Fan Coil Unit	SP	- Static Pressure
AI	- Analog Input	HOA	- Hand / Off / Auto	TEMP	- Temperature
AO	- Analog Output	HP	- Heat Pump	UH	- Unit Heater
AUTO	- Automatic	HRU	- Heat Recovery Unit	UV	- Unit Ventilator
AUX	- Auxiliary	HTEX	- Heat Exchanger	VAV	- Variable Air Volume
C	- Common	HW	- Hot Water	VVTU	- Variable Volume Terminal Unit
CHW	- Chilled Water	HWP	- Hot Water Pump	W/	- with
CHWP	- Chilled Water Pump	HWR	- Hot Water Return	W/O	- without
CHWR	- Chilled Water Return	HWS	- Hot Water Supply	WSHP	- Water-Source Heat Pump
CHWS	- Chilled Water Supply	MAX	- Maximum		
COND	- Condenser	MIN	- Minimum		
CW	- Condenser Water	MISC	- Miscellaneous		
CWP	- Condenser Water Pump	NC	- Normally Closed		
CWR	- Condenser Water Return	NO	- Normally Open		
CWS	- Condenser Water Supply	OA	- Outdoor Air		
DA	- Discharge Air	PIU	- Powered Induction Unit		
DI	- Digital Input	RA	- Return Air		
DO	- Digital Output	RF	- Return Fan		
EA	- Exhaust Air	RH	- Relative Humidity		
EF	- Exhaust Fan	RTU	- Roof-top Unit		

General Notes:

1. All control modules are drawn using standard ALC module representations.
2. Electrical points are identified by a tagged method (LN# - LG - CM - EX - Z0):



LN# - The line number (optional).
LG - The gateway number (optional).
CM - The control module address.
EX - The expander module number.
#1 - The channel number.

These tags include wiring for all AI's, DI's, AO's and DO's. Points using pneumatic tubing follow the same convention.

Maine Endwell Middle School 2011

Binghamton , New York

AIR TEMP HEATING & AIR CONDITIONING, INC.
A LINC SERVICE ® *CONTRACTOR*

Symbol Legend

REV: 1	Submittal	9/29/2008	JOB NO: P7619
AUTOMATEDLOGIC® CORPORATION			CHECK BY: RSL
			DSCODE: 07112.00
			3 of 37

Summary Bill of Materials

Summary Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
AAR	ARCNET TO ARCNET ROUTER	AUTOMATED LOGIC	AAR	1 ea
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	128 ea
DA-AB	SR OPEN/CLOSE 133 IN-LB 120V	BELIMO	AF120 ALC	1 ea
DA-AC	NSR PROPORTIONAL 35 IN-LB 24 V	BELIMO	LM24-SR ALC	2 ea
DA-B	SR PROPORTIONAL 133 IN-LB 2-10VDC	BELIMO	AF24-SR ALC	1 ea
DA-CE	SR 0-10VDC 35 IN-LB 24 V	BELIMO	LF24-SR ALC	132 ea
DIAG485	ARC156 DIAGNOSTIC DEVICE	AUTOMATED LOGIC	DIAG485	1 ea
DPT-AD	DIFF PRESSURE TRANSDUCER 0-100 PSI 4-20MA	CONTRACTORS INST	P853D-(0-75#)-R-(0-100#)	1 ea
DTS-A	DUCT 10K THERMISTOR PROBE 12 IN.	BAPI	ALC/10K-2-D-12	27 ea
DTS-B	DUCT 10K THERMISTOR AVERAGING 12 FT.	BAPI	ALC/10K-2-A-12	19 ea
DTS-D	DUCT 10K THERMISTOR PROBE 8 IN.	BAPI	ALC/10K-2-D-8	66 ea
DTS-F	DUCT 10K THERMISTOR AVERAGING 8 FT.	BAPI	ALC/10K-2-A-8	66 ea
E-A	CIRCLE AW NEMA 1 20X20X6	CIRCLE AW	20206-1	1 ea
EQ-PRTL	EQUIPMENT PORTAL	AUTOMATED LOGIC	EQ-PRTL	7 ea
FS-C	FLOW SWITCH (STANDARD FLOW RATE - SPDT)	JOHNSON CONTROLS	F61KB-11	3 ea
FS-D	TEMP LOW LIMIT MAN. RESET DPDT	LANDIS STEAFA	1341504	15 ea
H-A	ALARM HORN 24VAC	FEDERAL/DELTA	350024-30	1 ea
IAQ-AB	CO SPACE SENSOR 0-200 PPM 4-20MA	R.E. TECH	WCO-1B	1 ea
LGR25	LGR25	AUTOMATED LOGIC	LGR25	1 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	59 ea
M0100	M0100	AUTOMATED LOGIC	M0100	1 ea
MX880	MX880	AUTOMATED LOGIC	MX880	1 ea
OAC-A	OA TEMPERATURE/HUMIDITY COMBO SENSOR	BAPI	ALC/10K-2-H220-O	1 ea
PROT485	ARC156 PROTECTION DEVICE	AUTOMATED LOGIC	PROT485	1 ea
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	248 ea
REPT485	ARC156 REPEATER DEVICE	AUTOMATED LOGIC	REPT485	1 ea
RIBXKF	.25 TO 150 CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	66 ea
RS	ROOM STAT	ALC	RS	66 ea
SE6104a	SE6104A	AUTOMATED LOGIC	SE6104A	1 ea
T22AAA	LINE VOLTAGE WALL THERMOSTAT SPST	JOHNSON CONTROLS	T22AAA-1	2 ea
TC-A	HW TEMP CONTROL HIGH LIMIT MAN. RESET	JOHNSON CONTROLS	A19ADB-2	28 ea
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	117 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	46 ea
ZN253	ZN253	AUTOMATED LOGIC	ZN253	101 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	29 ea

Riser

Maine Middle School
Router Panel
Boiler Room

120 VAC — LGR-25 T — 01

Bacnet/IP → SERVER admin Building

MODBUS EIA 232 → AERCO BOILERS

BACnet / ARC 156

N2480

UV 216 ZN253 75 | RTU 217B ZN253 95 | CUH M28A ZN551 96 | UV 214 ZN253 97 | T

N2421

AAR1 | UV M142 ZN253 01 | UV M104 ZN253 02 | CUH 103 ZN551 03 | CUH 101 ZN551 04 | CUH M1-2 ZN220 05 | UV M105B ZN253 06 | UV M105 ZN253 07 | UV M103B ZN253 08 | UV M103 ZN253 09 | CUH M112B ZN551 10 | UV M102 ZN253 11 | UV M144 ZN253 12 | CUH M8 ZN220 13 | EF 13 ZN551 14 | CUH 100 ZN220 15 | CUH M1-12.3 ZN551 16 | CUH M1-12.2 ZN551 17 | CUH M1-12B ZN220 18 | CUH M1-12 ZN551 19 | FCU M140 ZN253 20 | UH 15&16 ZN220 21-22

UV 114 ZN253 54 | FC 18 ZN253 53 | UV 20&21 ZN253 51-52 | EF 17-20 ZN253 50 | EF 21& UV22 ZN253 48-49 | UV 22.1 ZN253 47 | UH 23 ZN220 46 | UV 23 ZN253 45 | FC 17 ZN551 44 | UV 112 ZN253 43 | UV 110 ZN253 42 | CUH M13B ZN551 41 | UV 1&2 ZN253 39-40 | UV 3thru6 ZN253 35-38 | UV 8&9 ZN253 31-32 | CUH 10 ZN220 30 | UV 108B ZN253 29 | UV 108A ZN253 28 | UH 12 ZN220 27 | FCU 11 ZN253 26 | UH 13&14 ZN220 24-25 | CUH M1-3 ZN220 23

UV 116 ZN253 55 | CUH M17B ZN551 56 | UV 106B ZN253 57 | CUH M17A ZN551 58 | UV 106A ZN253 59 | CUH M5.1 ZN220 65 | UV 118 ZN253 66 | UV 122 ZN253 67 | CUH 046 ZN551 68 | CUH 1-9 ZN220 69 | UH Boiler RM ZN551 71 | EF's 31&33 ZN253 72 | EF 39 ZN253 73 | Boiler Pumps ZN253 74 | Phone Dialer ZN220 75 | AHU Office SE6104 76 | EF 35,36 ZN253 77 | EF 31,33 ZN253 89 | T

N2422

AAR2 | RTU Band IOFLX 01 | RTU Chorus IOFLX 02 | CUH ZN551 03 | RTU E. Entry ZN551 04 | CUH ZN220 05 | RTU Auditoriium IOFLX 06 | CUH M211B ZN220 07 | CUH ZN551 08 | CUH's ZN253 10-11 | RTU Practice ZN551 12 | CUH ZN220 13 | RTU E. Cafeteria ZN253 14 | RTU W. Cafeteria ZN253 20 | RTU Orchestra IOFLX 23 | CUH M16 ZN551 28 | CUH M15B ZN551 30 | CUH M15C ZN551 31 | RTU GYM 307A ZN551 32 | RTU GYM 307B ZN551 33 | RTU GYM 305A ZN551 34 | RTU GYM 305B ZN551 35

UV 203 A&B ZN253 63-64 | UV 201 A&B ZN253 61-62 | CUH 201.1 ZN220 60 | EF 7&8 ZN253 59 | CUH 201.2A ZN551 58 | UV 202 ZN253 57 | UV 302 ZN253 56 | CUH M2A ZN551 55 | UV 204 ZN253 54 | UV 304 ZN253 53 | CUH M2B ZN551 52 | CUH M8 Stairs ZN220 51 | CUH 70thru71 ZN551 49-50 | CUH M218B ZN220 48 | EF 1MS ZN253 46 | EF 5MS ZN253 45 | FC 68 ZN253 44 | UV 303 ZN253 43 | UV 301 ZN253 42 | CUH M217B ZN253 41 | CUH M217A ZN551 40 | CUH M218 A ZN551 39

UV 205 ZN253 65 | CUH M2-1A&B ZN551 66-67 | FC 73 ZN253 72 | FC 75 ZN253 73 | EF 9&10 ZN253 71 | EF 11&12 ZN253 74 | UV 207 ZN253 76 | UV 209 ZN253 77 | FC 76 ZN253 80 | FC 74 ZN253 81 | UV 211 ZN253 82 | UV 308 ZN253 83 | UV 208 ZN253 84 | EF 15&14 ZN253 85 | CUH M2-2C ZN551 87 | UV 213A ZN253 88 | UV 215B ZN253 89

N2480

AAR2 | UV219 ZN253 01 | UV221 ZN253 02 | UV223 ZN253 03 | UV225 ZN253 04 | UV227 ZN253 05 | UV229 ZN253 06 | CUH M28B ZN253 07 | UV120 ZN253 08 | CUH M28C ZN551 15 | EF 22&32 ZN253 09

T | Back Lights ZN253 96 | UV 215 ZN253 93 | EF16 ZN551 92 | CUH 2-2A&B ZN551 90-91

← FCU 82 ZN253 74 | RTU 217 Library ZN253 68 | UV 127 ZN253 63 | UV 125 ZN253 62 | UV 123 ZN253 61 | UV 121 ZN253 60 | UV 106A ZN253 59 | UV 106B ZN253 57 | UV 310 ZN253 21 | UV 312 ZN253 27 | EF 26 ZN253 26 | EF 24 ZN220 22 | EF 23&25 ZN253 19

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Binghamton , New York

AIR TEMP HEATING & AIR CONDITIONING, INC.
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Riser

REV: 1	Submittal	9/29/2008	JOB NO: P7619
			CHECK BY: RSL
			DSCODE: 07112.00

AUTOMATEDLOGIC® CORPORATION

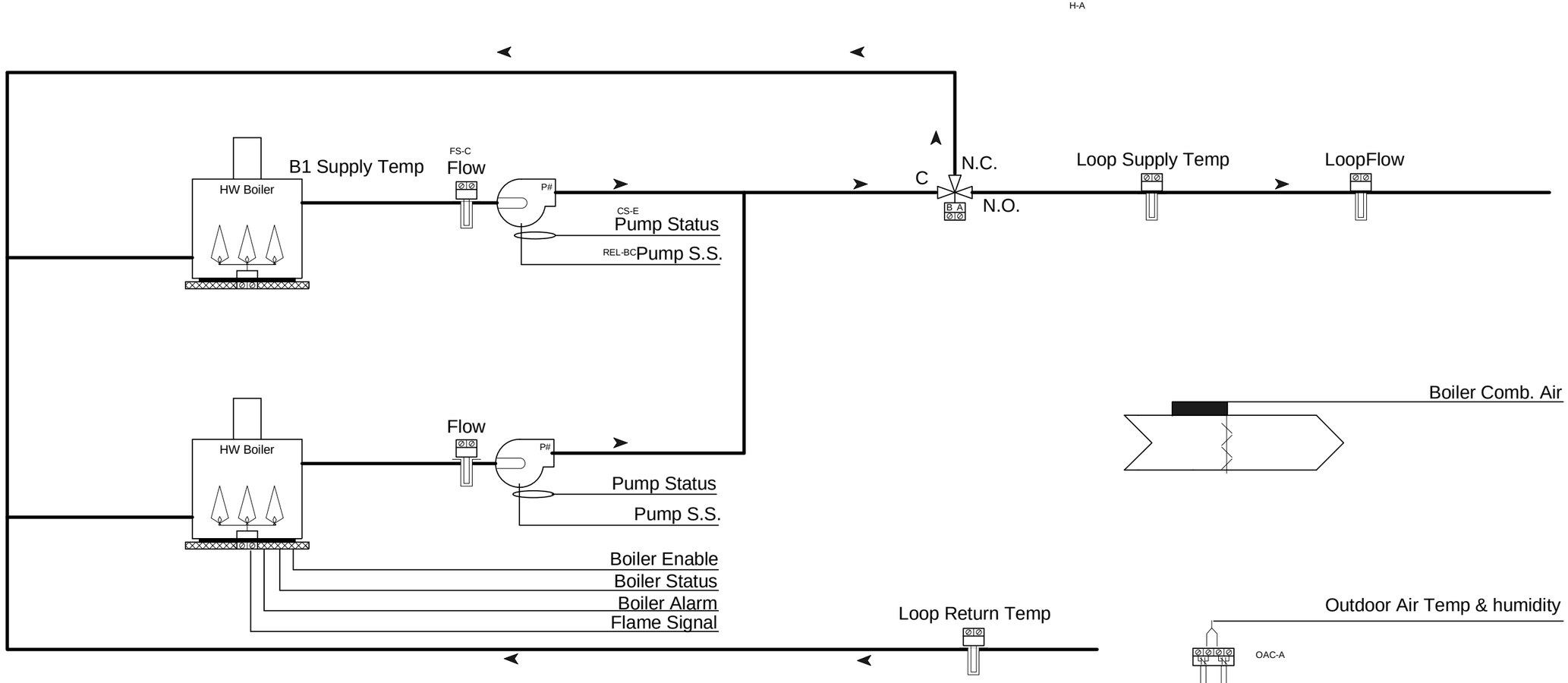
Boilers

Boilers to be controlled by factory Aerco Boiler Panel
C-MORE PANEL-MODBUS

Boiler Controls to be integrated to Automated Logic Via EQPRTL
MODBUS to BACnet

Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	4 ea
FS-C	FLOW SWITCH (STANDARD FLOW RATE - SPDT)	JOHNSON CONTROLS	F61KB-11	3 ea
H-A	ALARM HORN 24VAC	FEDERAL/DELTA	350024-30	1 ea
IAQ-AB	CO SPACE SENSOR 0-200 PPM 4-20MA	R.E. TECH	WCO-1B	1 ea
OAC-A	OA TEMPERATURE/HUMIDITY COMBO SENSOR	BAPI	ALC/10K-2-H220-O	1 ea
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	4 ea



Maine Endwell Middle School 2011
Binghamton , New York

AIR TEMP HEATING & AIR CONDITIONING, INC.
A LINC SERVICE ® *CONTRACTOR*

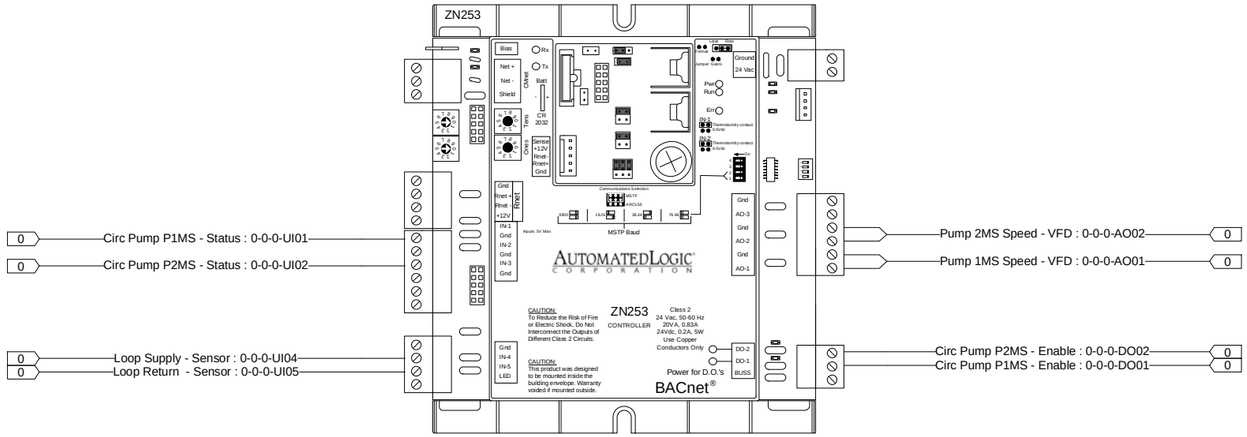
Boilers

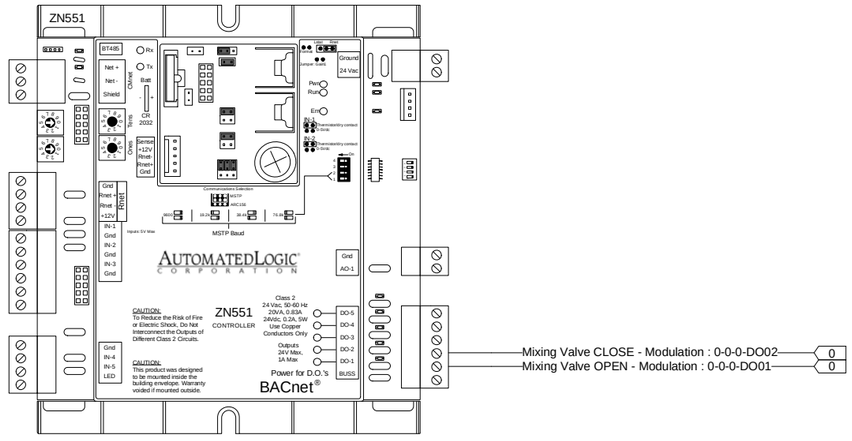
REV: 1	Submittal	9/29/2008	JOB NO: P7619
			CHECK BY: RSL
			DSCODE: 07112.00

AUTOMATEDLOGIC® CORPORATION

Boilers2

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
ZN253	ZN253	AUTOMATED LOGIC	ZN253	1 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	1 ea





SEQUENCE

Boilers to be controlled by factory Aerco Boiler Panel C-MORE PANEL-MODBUS

Boiler Controls to be integrated to Automated Logic Via EQPRTL MODBUS to BACnet

Maine Endwell Middle School 2011

Binghamton , New York

AIR TEMP HEATING & AIR CONDITIONING, INC.
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Boilers2

REV: 1	Submittal	9/29/2008	JOB NO: P7619
			CHECK BY: RSL
AUTOMATED LOGIC CORPORATION			DSCODE: 07112.00
			7 of 37

Boilers3

Boiler Plant SEQUENCE

A. General

1. All controls shall be field mounted

B. Boiler Control

1. The Boilers shall be controlled by the boiler panel to maintain supply header temperature as reset by outdoor air temperature.
2. System shall be enabled when outdoor air temp is below 60 deg. F
3. Provide enable disable and status interface with B.A.S.

C. Boiler reset controls

1. The boilers shall operate on a reset hot water schedule with the temperature of the hot water supply being reset inversely with outdoor air temperature.

Outdoor Air	Hot Water
60 Deg. F.	140 Deg. F.
0 Deg. F.	190 Deg. F.

D. Boiler Emergency Shutdown.

1. When emergency shutdown switches are broken boiler shall be de energized.

E. Boiler Room pumps

1. Boiler pump P1MS and P2MS shall be controlled by boiler control panel. Boiler pumps shall operate on Lead/lag operation. Lead pump operation shall switch weekly or as determined by owner. Pumps shall operate in a fail safe back up mode. Pump shut down shall run on outdoor air temperature, set 5 deg. F. above boiler enable S.P.

F. Combustion Air Dampers

1. When any boiler or hot water heater is energized, the associated outdoor air damper shall open.

G. Alarms

1. Should any pump fail, or standby pump be energized, due to failure of the lead pump, an alarm shall sound at the boiler panel.
2. Should any alarm condition occur at the boiler panel, an alarm shall be sent to the B.A.S. System.
3. Should any pump fail to run, or flow not be sensed when any terminal heating unit is an alarm shall sound an all terminal heating equipment shall be disabled.
4. Should carbon monoxide concentrations exceed 100PPM the CO monitor shall sound an alarm and alarm shall be sent to B.A.S.

Boilers to be controlled by factory Aerco Boiler Panel C-MORE PANEL-MODBUS

Boiler Controls to be integrated to Automated Logic Via EQPRTL MODBUS to BACnet

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Boilers3

REV: 1	Submittal	9/29/2008	JOB NO: P7619
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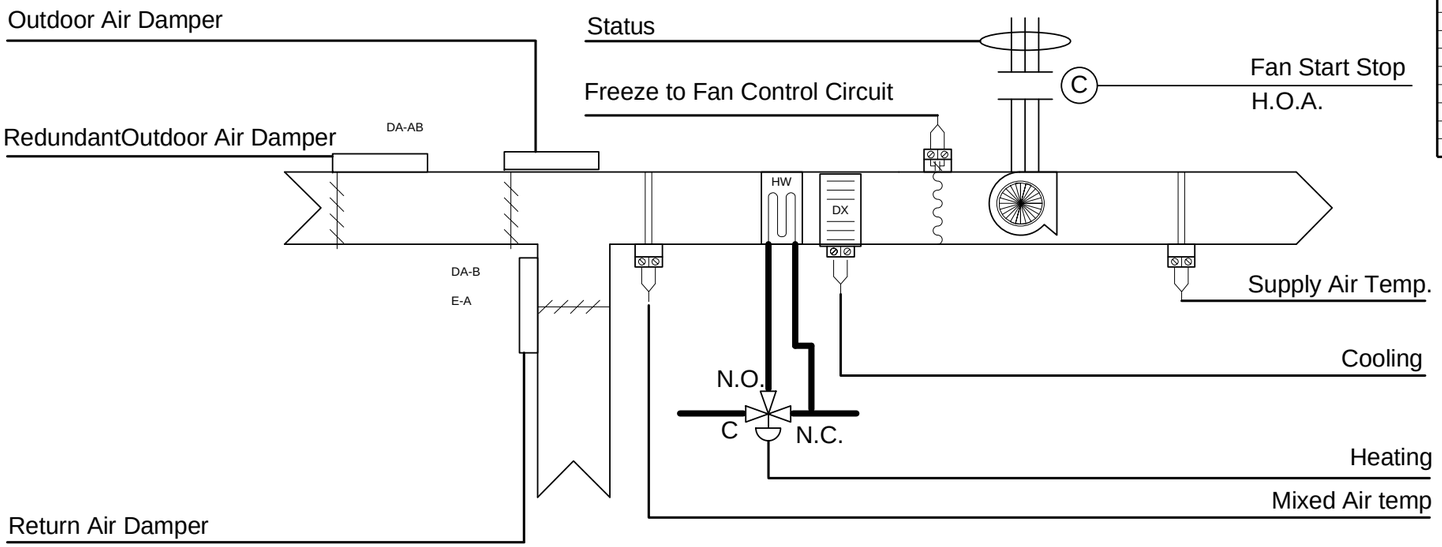
			DSCODE: 07112.00

AUTOMATED LOGIC CORPORATION

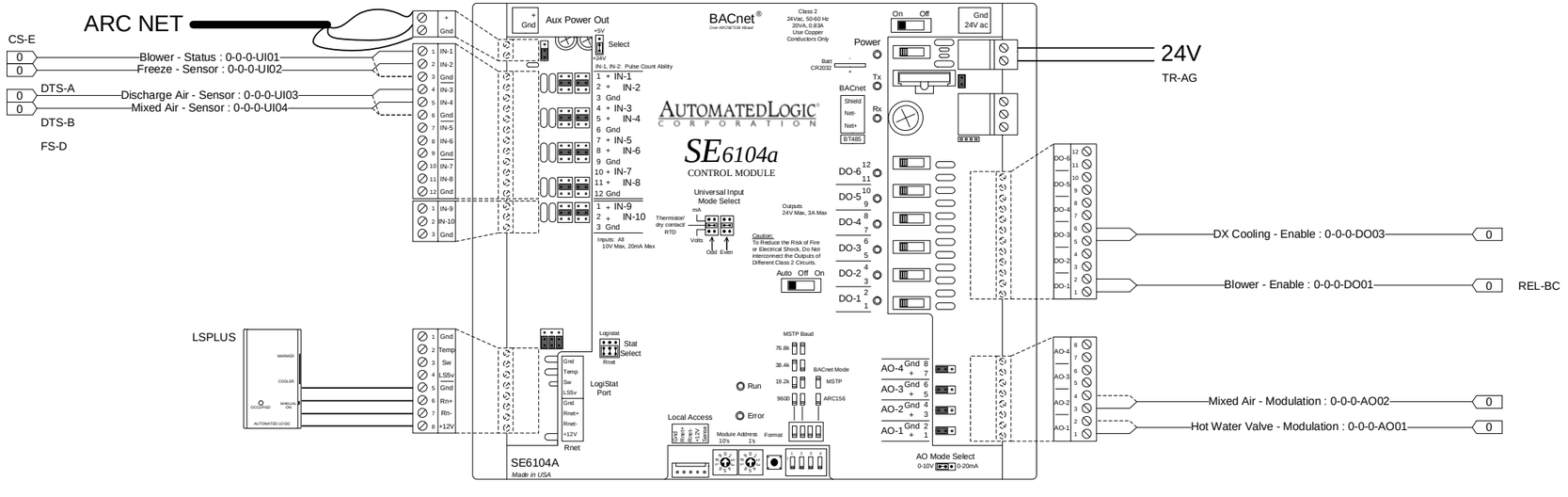
AHU 1MS

Serves Main Offices
Located in Mechanical Room



Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	1 ea
DA-AB	SR OPEN/CLOSE 133 IN-LB 120V	BELIMO	AF120 ALC	1 ea
DA-B	SR PROPORTIONAL 133 IN-LB 2-10VDC	BELIMO	AF24-SR ALC	1 ea
DTS-A	DUCT 10K THERMISTOR PROBE 12 IN.	BAPI	ALC/10K-2-D-12	1 ea
DTS-B	DUCT 10K THERMISTOR AVERAGING 12 FT.	BAPI	ALC/10K-2-A-12	1 ea
E-A	CIRCLE AW NEMA 1 20X20X6	CIRCLE AW	20206-1	1 ea
FS-D	TEMP LOW LIMIT MAN. RESET DPDT	LANDIS STEAFA	1341504	1 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	1 ea
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	3 ea
SE6104a	SE6104A	AUTOMATED LOGIC	SE6104A	1 ea
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	1 ea



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AIR TEMP HEATING & AIR CONDITIONING, INC. A LINC SERVICE ® *CONTRACTOR*	
AHU 1MS	
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AUTOMATEDLOGIC CORPORATION	CHECK BY: RSL
	DSCODE: 07112.00
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AHU 1MS Sequence

AHU 1MS Sequence

A. General

1. Unit shall be indexed to occupied and unoccupied by B.A.S.

2. A 5 degrees dead band shall be maintained between heating and mechanical cooling space temperature set points.

3. Redundant outdoor air damper.

.

B. Occupied Heating Cycle:

1. Supply fan shall run continuously and redundant outdoor air damper opens 100%

2.Outdoor air damper shall position to its scheduled minimum position with return air damper positioning correspondingly. Outdoor air is never positioned below its minimum scheduled outdoor air position.

3. Space sensor shall modulate hot water valve to maintain occupied cycle set point. Outdoor and return air dampers shall modulate to reduce overheating.

C. Unoccupied heating Cycle:

1. The outdoor air damper shall remain fully closed, return air damper fully open with control valve modulating in sequence with supply fan to maintain unoccupied set point.

2. redundant outdoor air damper shall be closed.

D. Warm Up Cycle:

1. The unit shall perform an optimized warm up prior to the start of the occupied mode.

2. During the warm up cycle the outdoor air damper shall remain closed., the H.W. valve shall be 100% open with 100% return air until occupied S.P. is obtained.

3. Redundant outdoor air damper shall remain closed.

C. Occupied Cycle Cooling:

1. Supply fan shall run continuously. Redundant outdoor air damper shall be open.

2. Outdoor air damper shall position to its minimum with return air damper positioning correspondingly. Outdoor air damper is never positioned below minimum position.

3. Space sensor shall cycle condensing unit to maintain occupied cycle set point.

4. Discharge air Low limit shall be disabled.

D. Unoccupied Cycle Cooling:

1. The outdoor air damper shall remain fully closed, return air damper fully opened with condensing unit and supply fan cycling to maintain unoccupied S.P.

2. Redundant outdoor air damper shall remain closed..

AHU 1MS Sequence2

E. Cool Down Cycle:

1. The unit shall perform an optimized cool down prior to the start of the occupied mode.

2. During the cool down cycle the outdoor air damper shall remain closed. The unit shall recirculate 100% return air in sequence with the condensing unit to obtain occupied S.P.

3. Redundant outdoor air damper shall remain closed.

F. Exhaust Fan Interlock:

1. Where called for, whenever the interlocked exhaust fan is energized, the air handling unit shall be returned to occupied cycle, with outdoor air damper 100% open and return air damper closed.

G. Economizer:

1. Unit shall utilize 100% outdoor air based on single building enthalpy sensor whenever possible, for free cooling.

H. Safeties:

1. Discharge air sensor shall indicate an alarm when high temperature discharge air is sensed through the coil (130 Deg. F.)

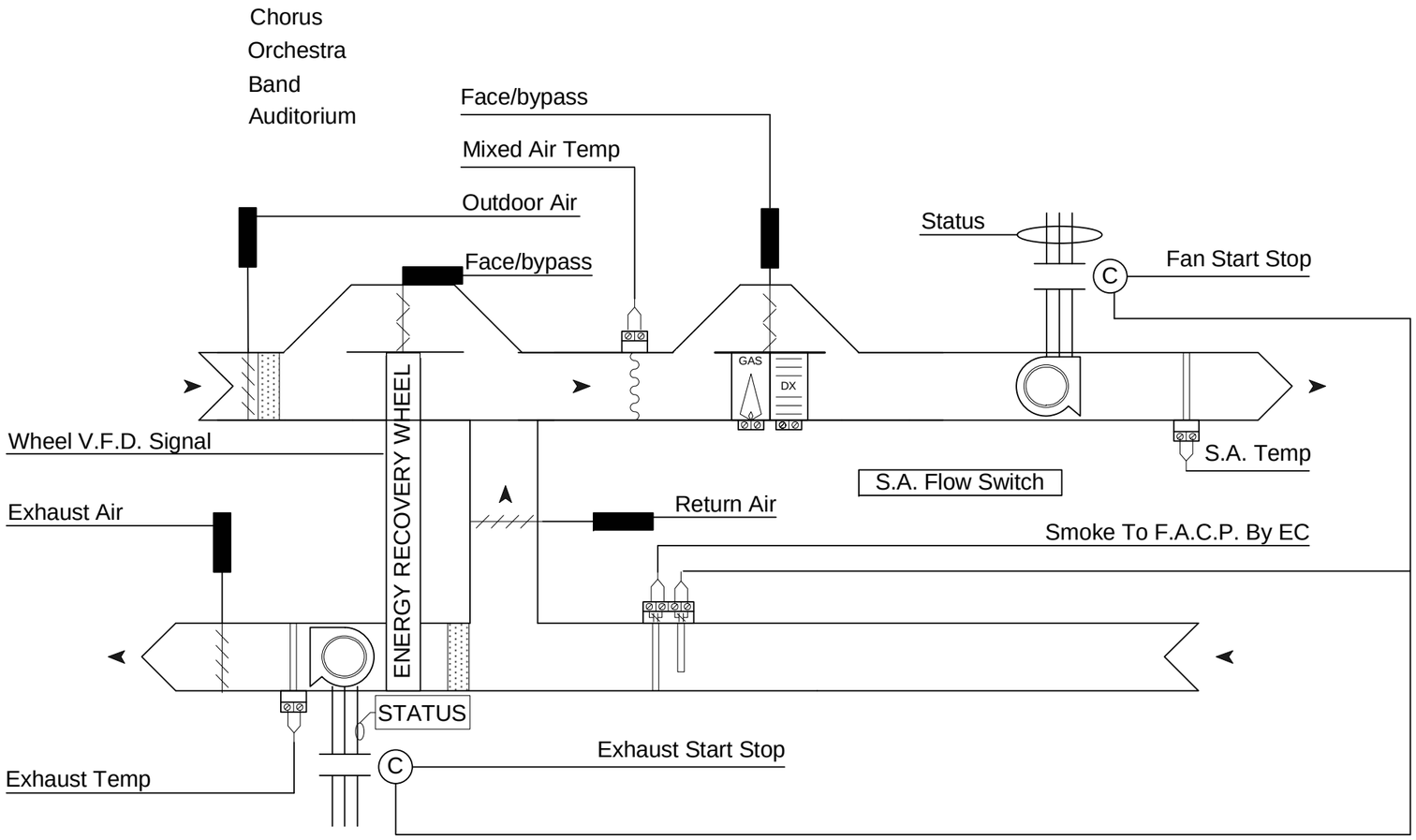
2. Low temperature limit shall de energize unit when low coil temperature is sensed (37 Deg. F.)

3. Fan shutdown shall be provided by the electrical contractor through the B.A.S.

4. Discharge air sensor shall assume control of dampers as required (outdoor air damper closed return air damper open control valve to 100%) to maintain minimum discharge air temperature of 55 Deg. F.

HRU

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
EQ-PRTL	EQUIPMENT PORTAL	AUTOMATED LOGIC	EQ-PRTL	1 ea



SUPPLY FAN
RETURN FAN
HEAT 1
HEAT 2
HEAT MOD
COOL 1
COOL 2
ECON

AHU Control

A. ***General:***

1. Provided field mounted controls.
2. Index unit to occupied and unoccupied cycles from BMS.

B. ***Safeties:***

1. Stop fans, shut hot water valve for high temperature, shut OA damper, open RA damper, and generate alarm at BMS when any of the following occurs:
   a. Discharge air temperature is above 130°F.
   b. Discharge air temperature is below 40°F.
   c. Freezestat is less than 36°F.
   d. Smoke detector senses smoke.
   e. Fire alarm from F.A.C.P. by EC
2. Smoke detectors are furnished by EC, mounted and wired to alarm panel and starter by EC.

C. ***Occupied Cycle:***

1. Run supply and exhaust fan continuously.
2. Open unit E.A.100 Percent, and modulate O.A. to Minimum position
3. Modulate face/bypass damper at gas furnace to maintain 90 deg. Supply air in heat mode.
5. Cycle DX cooling to maintain 55 deg. Supply air during cooling mode
6. heat recovery face/bypass damper shall modulate to maintain a minimum of 35 deg. Leaving the heat exchanger to prevent frost

D. ***Economizer Position:***

1. Unit shall utilize 100% outside air for cooling.
2. Economizer shall initiate from the units enthalpy sensor.
3. O.A. damper shall open to 100%
4. Heat wheel face/bypass damper shall open to full bypass.
5. Gas burner/DX face/bypass damper shall go to full bypass.
6. Return air damper shall modulate closed.

E. ***Un-Occupied Cycle:***

1. Stop supply fan
2. Shut outside air and open exhaust air dampers.
3. Open return air damper to 100%
4. Supply fan and gas furnace shall maintain space set point.

F. ***Warm-Up Cycle:***

1. Supply fan shall energize
2. Gas furnace shall energize.
3. HRU shall recirculate 100% return air until space reaches set point.

Maine Endwell Middle School 2011
Binghamton , New York

AIR TEMP HEATING & AIR CONDITIONING, INC.
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HRU

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AUTOMATEDLOGIC® CORPORATION			DSCODE: 07112.00
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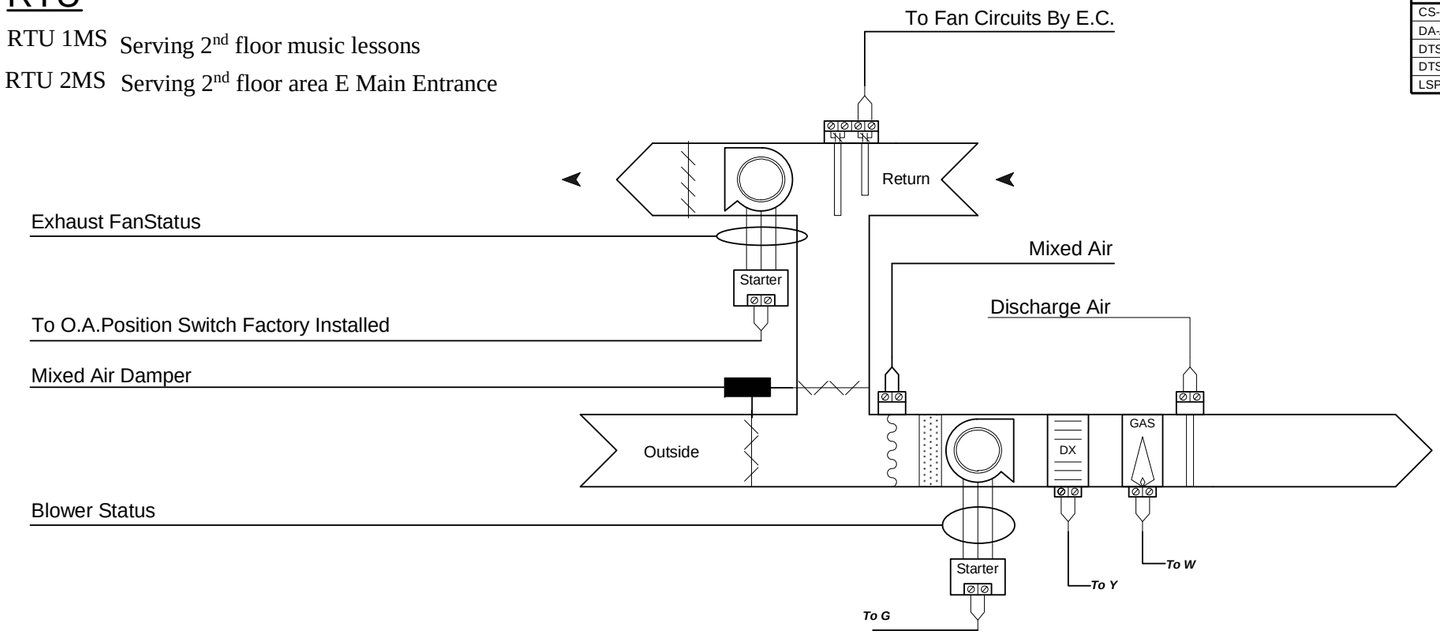
RTU

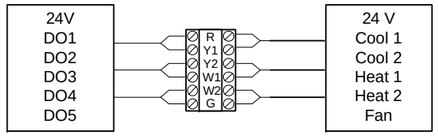
RTU 1MS Serving 2nd floor music lessons

RTU 2MS Serving 2nd floor area E Main Entrance

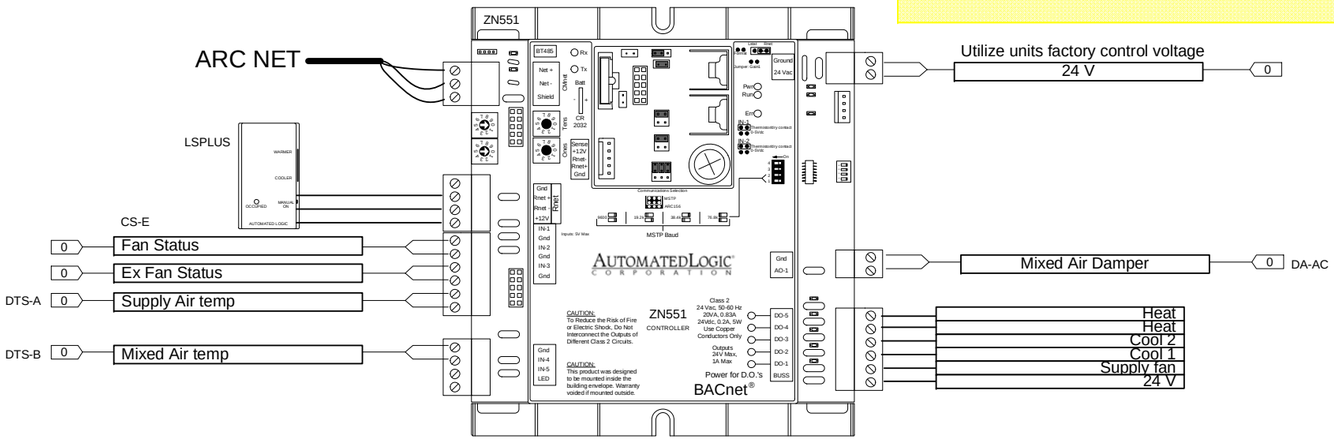
Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	4 ea
DA-AC	NSR PROPORTIONAL 35 IN-LB 24 V	BELIMO	LM24-SR ALC	2 ea
DTS-A	DUCT 10K THERMISTOR PROBE 12 IN.	BAPI	ALC/10K-2-D-12	2 ea
DTS-B	DUCT 10K THERMISTOR AVERAGING 12 FT.	BAPI	ALC/10K-2-A-12	2 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	2 ea





All Field mounted Automated Logic Controllers will be mounted indoors



Maine Endwell Middle School 2011

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AIR TEMP HEATING & AIR CONDITIONING, INC.
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RTU

REV: 1	Submittal	9/29/2008	JOB NO: P7619
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RTU Sequence

A. General

1. Unit shall be indexed to occupied and unoccupied by B.A.S.

2. A 5 degrees dead band shall be maintained between heating and mechanical cooling space temperature set points.

.

B. Occupied Heating Cycle:

1. Supply fan shall run continuously and redundant outdoor air damper opens 100%

2.Outdoor air damper shall position to its scheduled minimum position with return air damper positioning correspondingly. Outdoor air is never positioned below its minimum scheduled outdoor air position.

3. Space sensor cycle gas burners to maintain occupied cycle set point. Outdoor and return air dampers shall modulate to reduce overheating.

C. Unoccupied heating Cycle:

1. The outdoor air damper shall remain fully closed, return air damper fully open with burners modulating in sequence with supply fan to maintain unoccupied set point.

D. Warm Up Cycle:

1. The unit shall perform an optimized warm up prior to the start of the occupied mode.

2. During the warm up cycle the outdoor air damper shall remain closed., the burners shall run with 100% return air until occupied S.P. is obtained.

C. Occupied Cycle Cooling:

1. Supply fan shall run continuously.

2. Outdoor air damper shall position to its minimum with return air damper positioning correspondingly. Outdoor air damper is never positioned below minimum position.

3. Space sensor shall cycle condensing unit to maintain occupied cycle set point.

4. Discharge air Low limit shall be disabled.

D. Unoccupied Cycle Cooling:

1. The outdoor air damper shall remain fully closed, return air damper fully opened with condensing unit and supply fan cycling to maintain unoccupied S.P.

RTU Sequence 2

E. Cool Down Cycle:

1. The unit shall perform an optimized cool down prior to the start of the occupied mode.

2. During the cool down cycle the outdoor air damper shall remain closed. The unit shall recirculate 100% return air in sequence with the condensing unit to obtain occupied S.P.

F. Exhaust Fan Interlock:

1. Where called for, whenever the interlocked exhaust fan is energized, the air handling unit shall be returned to occupied cycle, with outdoor air damper 100% open and return air damper closed.

G. Economizer:

1. Unit shall utilize 100% outdoor air based on single building enthalpy sensor whenever possible, for free cooling.

H. Safeties:

1. Discharge air sensor shall indicate an alarm when high temperature discharge air is sensed through the coil (130 Deg. F.)

2. Low temperature limit shall de energize unit when low coil temperature is sensed (37 Deg. F.)

3. Fan shutdown shall be provided by the electrical contractor through the B.A.S.

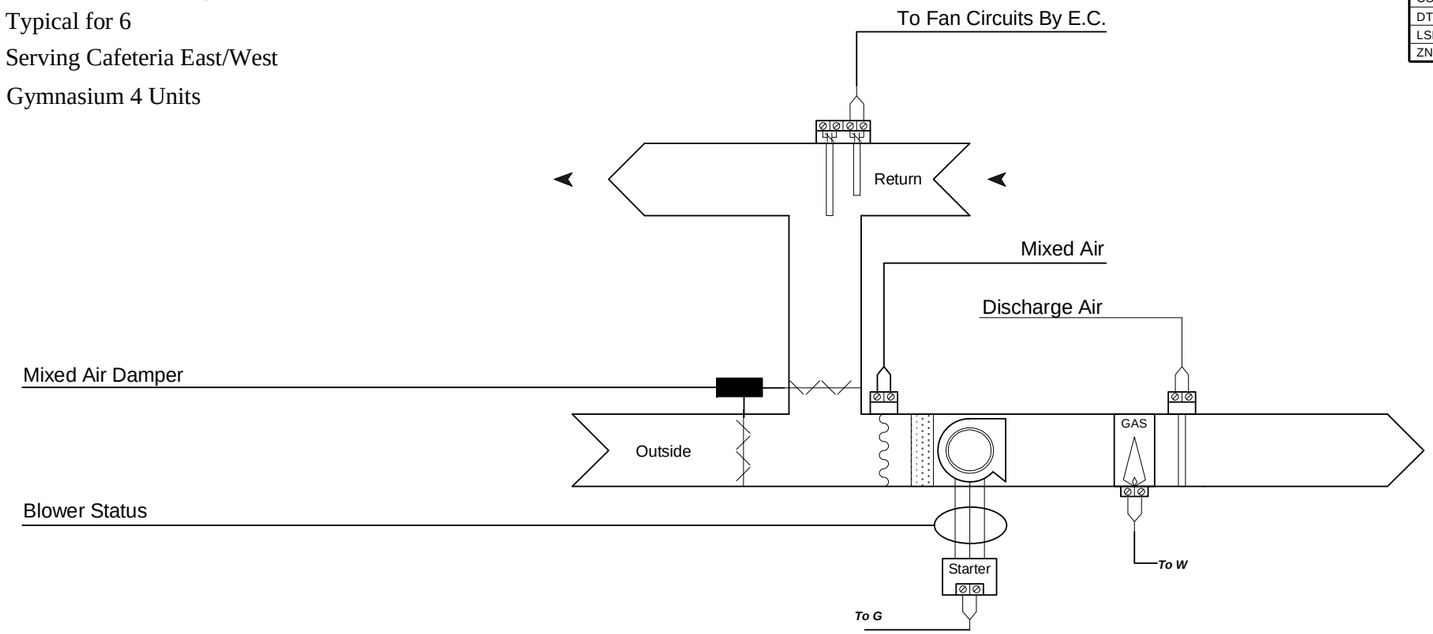
4. Discharge air sensor shall assume control of dampers as required (outdoor air damper closed return air damper open control valve to 100%) to maintain minimum discharge air temperature of 55 Deg. F.

RTU Existing

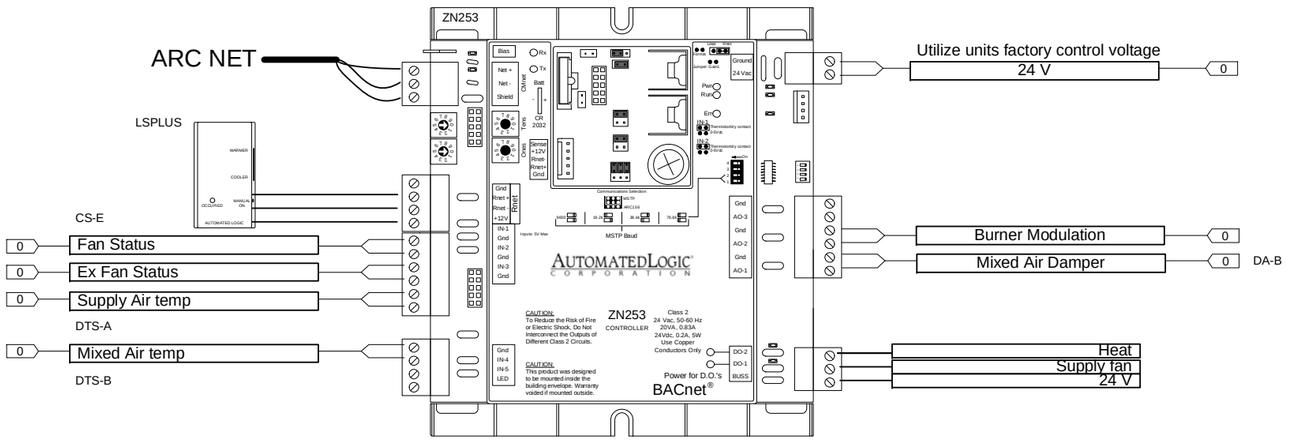
Typical for 6

Serving Cafeteria East/West

Gymnasium 4 Units



All Field mounted Automated Logic Controllers will be mounted indoors



Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	16 ea
DTS-A	DUCT 10K THERMISTOR PROBE 12 IN.	BAPI	ALC/10K-2-D-12	8 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	8 ea
ZN253	ZN253	AUTOMATED LOGIC	ZN253	8 ea

A. General

1. Unit shall be indexed to occupied and unoccupied by B.A.S.

2. A 5 degrees dead band shall be maintained between heating and mechanical cooling space temperature set points.

B. Occupied Heating Cycle:

1. Supply fan shall run continuously and redundant outdoor air damper opens 100%

2.Outdoor air damper shall position to its scheduled minimum position with return air damper positioning correspondingly. Outdoor air is never positioned below its minimum scheduled outdoor air position.

3. Space sensor cycle gas burners to maintain occupied cycle set point. Outdoor and return air dampers shall modulate to reduce overheating.

C. Unoccupied heating Cycle:

1. The outdoor air damper shall remain fully closed, return air damper fully open with burners modulating in sequence with supply fan to maintain unoccupied set point.

D. Warm Up Cycle:

1. The unit shall perform an optimized warm up prior to the start of the occupied mode.

2. During the warm up cycle the outdoor air damper shall remain closed., the burners shall run with 100% return air until occupied S.P. is obtained.

E. Safeties:

1. Stop fans, shut hot water valve for high temperature, shut OA damper, open RA damper, and generate alarm at BMS when any of the following occurs:
   a. Discharge air temperature is above 130°F.
   b. Discharge air temperature is below 40°F.
   c. Freezestat is less than 36°F.
   d. Smoke detector senses smoke.
   e. Fire alarm from F.A.C.P. by EC
2. Smoke detectors are furnished by EC, and wired to alarm panel and starter by EC.

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Binghamton , New York

AIR TEMP HEATING & AIR CONDITIONING, INC.
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RTU Existing

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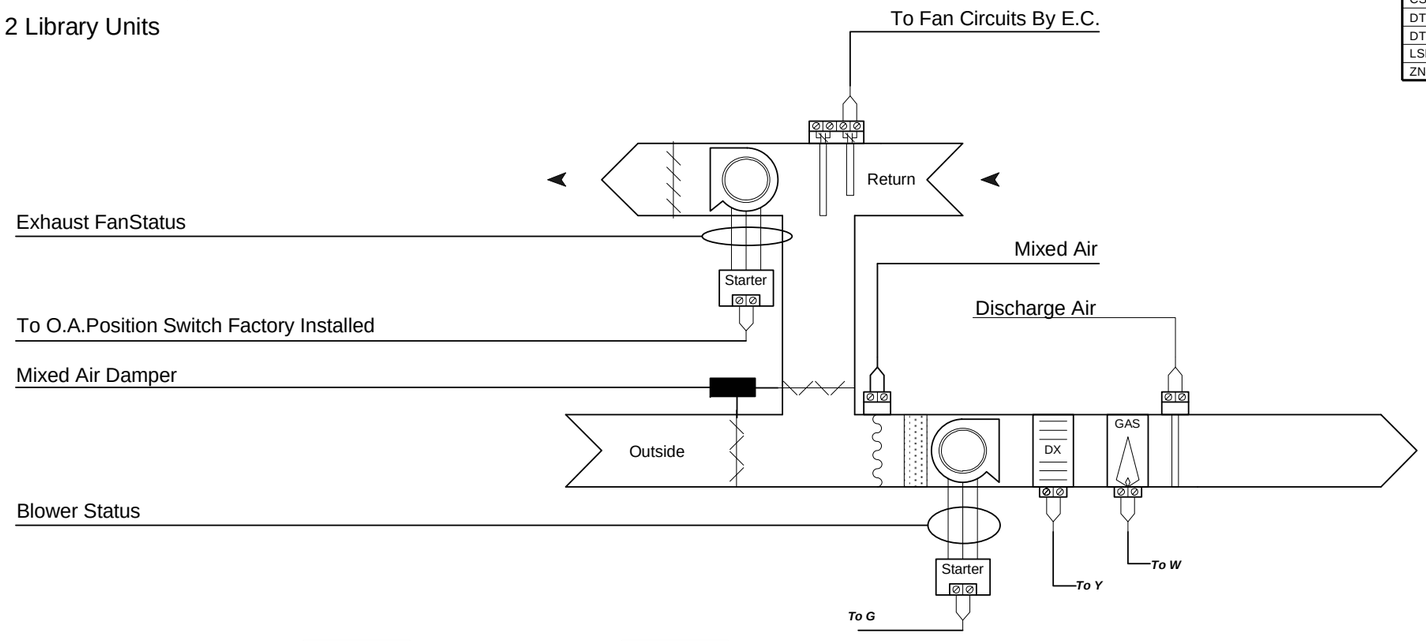
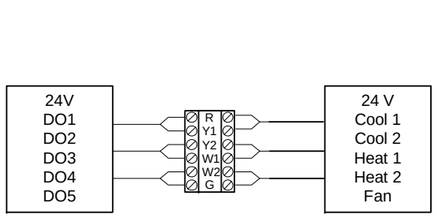
RTU. E. DX

2 Library Units

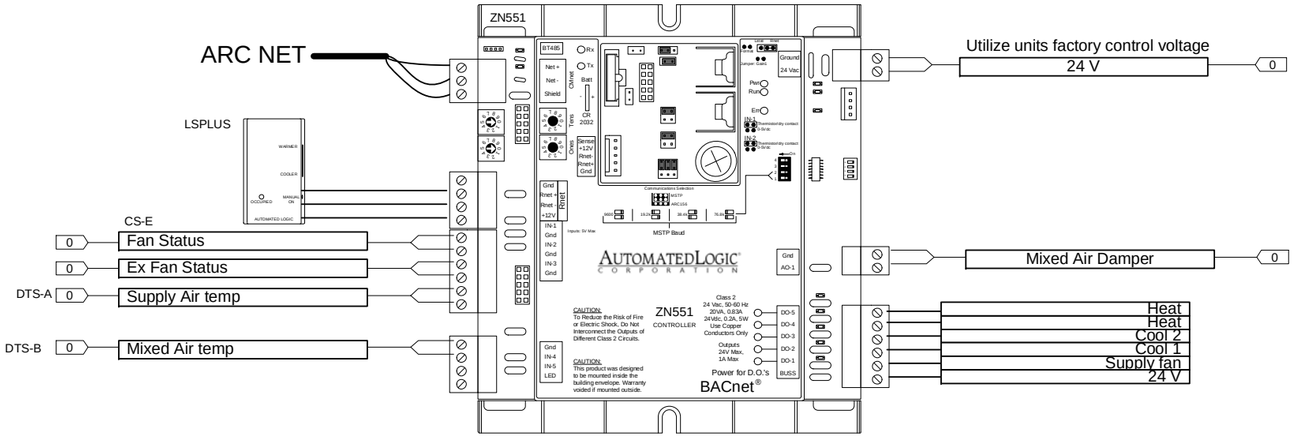
Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	4 ea
DTS-A	DUCT 10K THERMISTOR PROBE 12 IN.	BAPI	ALC/10K-2-D-12	2 ea
DTS-B	DUCT 10K THERMISTOR AVERAGING 12 FT.	BAPI	ALC/10K-2-A-12	2 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	2 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	2 ea





All Field mounted Automated Logic Controllers will be mounted indoors



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RTU. E. DX

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RTU Existing Sequence 1

A. General

1. Unit shall be indexed to occupied and unoccupied by B.A.S.

2. A 5 degrees dead band shall be maintained between heating and mechanical cooling space temperature set points.

.

B. Occupied Heating Cycle:

1. Supply fan shall run continuously and redundant outdoor air damper opens 100%

2.Outdoor air damper shall position to its scheduled minimum position with return air damper positioning correspondingly. Outdoor air is never positioned below its minimum scheduled outdoor air position.

3. Space sensor cycle gas burners to maintain occupied cycle set point. Outdoor and return air dampers shall modulate to reduce overheating.

C. Unoccupied heating Cycle:

1. The outdoor air damper shall remain fully closed, return air damper fully open with burners modulating in sequence with supply fan to maintain unoccupied set point.

D. Warm Up Cycle:

1. The unit shall perform an optimized warm up prior to the start of the occupied mode.

2. During the warm up cycle the outdoor air damper shall remain closed., the burners shall run with 100% return air until occupied S.P. is obtained.

C. Occupied Cycle Cooling:

1. Supply fan shall run continuously.

2. Outdoor air damper shall position to its minimum with return air damper positioning correspondingly. Outdoor air damper is never positioned below minimum position.

3. Space sensor shall cycle condensing unit to maintain occupied cycle set point.

4. Discharge air Low limit shall be disabled.

D. Unoccupied Cycle Cooling:

1. The outdoor air damper shall remain fully closed, return air damper fully opened with condensing unit and supply fan cycling to maintain unoccupied S.P.

RTU Existing Sequence 2

E. Cool Down Cycle:

1. The unit shall perform an optimized cool down prior to the start of the occupied mode.

2. During the cool down cycle the outdoor air damper shall remain closed. The unit shall recirculate 100% return air in sequence with the condensing unit to obtain occupied S.P.

F. Exhaust Fan Interlock:

1. Where called for, whenever the interlocked exhaust fan is energized, the air handling unit shall be returned to occupied cycle, with outdoor air damper 100% open and return air damper closed.

G. Economizer:

1. Unit shall utilize 100% outdoor air based on single building enthalpy sensor whenever possible, for free cooling.

H. Safeties:

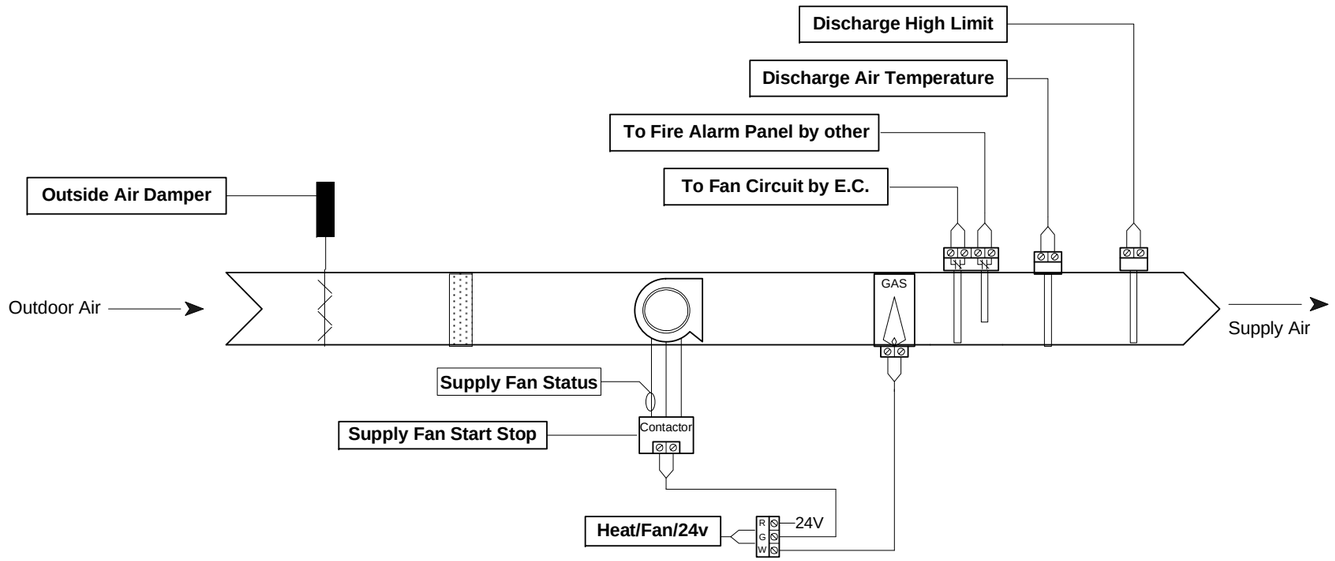
1. Discharge air sensor shall indicate an alarm when high temperature discharge air is sensed through the coil (130 Deg. F.)

2. Low temperature limit shall de energize unit when low coil temperature is sensed (37 Deg. F.)

3. Fan shutdown shall be provided by the electrical contractor through the B.A.S.

4. Discharge air sensor shall assume control of dampers as required (outdoor air damper closed return air damper open control valve to 100%) to maintain minimum discharge air temperature of 55 Deg. F.

Make Up Air



MAU CONTROL

Packaged Roof top MAU's to be provided with factory Installed controls

FACTORY CONTROLLED BY MELINK

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Make Up Air

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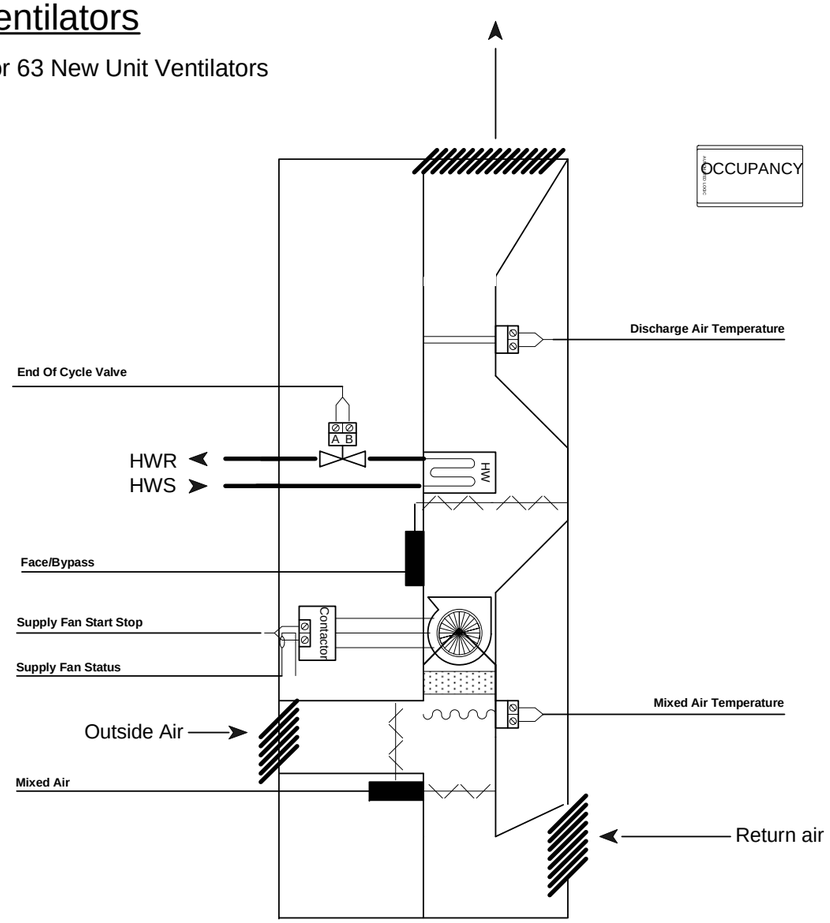
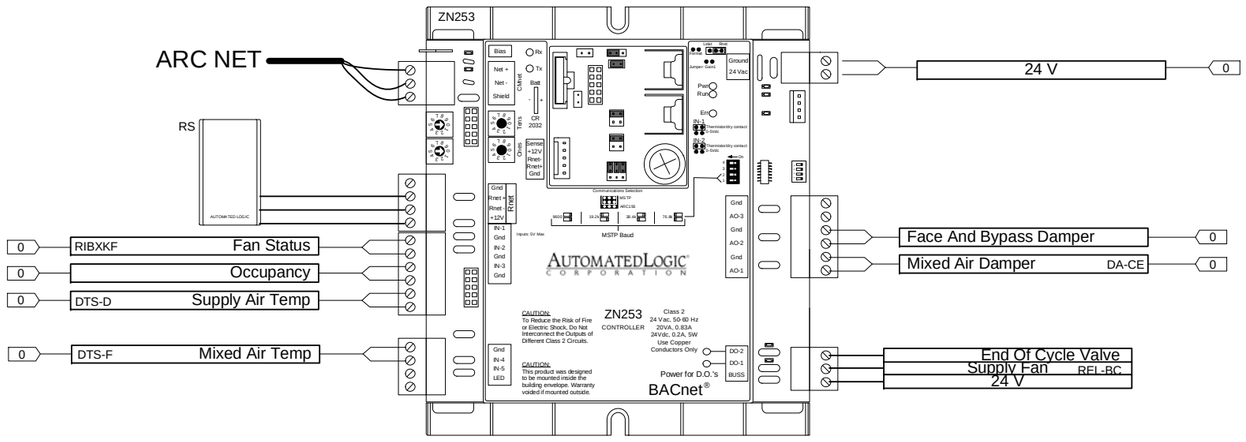
Unit Ventilators

Typical For 63 New Unit Ventilators





Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
DA-CE	SR 0-10VDC 35 IN-LB 24 V	BELIMO	LF24-SR ALC	126 ea
DTS-D	DUCT 10K THERMISTOR PROBE 8 IN.	BAPI	ALC/10K-2-D-8	63 ea
DTS-F	DUCT 10K THERMISTOR AVERAGING 8 FT.	BAPI	ALC/10K-2-A-8	63 ea
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	63 ea
RIBXKF	.25 TO 150 CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	63 ea
RS	ROOM STAT	ALC	RS	63 ea
ZN253	ZN253	AUTOMATED LOGIC	ZN253	63 ea

UV CONTROL

A. GENERAL:

1. Provide field mounted controls.
2. Index unit to occupied and unoccupied cycles from BMS.
3. End of cycle valve is normally open and shall close when unit begins economizer mode.

B. SAFETIES:

1.Stop fan shut outside air damper open return air damper, open face damper, and generate and alarm at BMS when any of the following occur.

A. Discharge air temp is above 130 degrees F.
b. Discharge air temp is below 40 degrees F.

C. OCCUPIED CYCLE:

1. Run fan continuously with end of cycle valve full open.
2. Open unit outside air damper to scheduled minimum position.
3. Modulate face and bypass damper to maintain 72 degrees F in space.
4. As space temperature rises above 72 degrees F. shut face damper, and end of cycle valve and modulate unit O.A. damper and R.A. damper to maintain 74 degrees F. in space.

D. UN-OCCUPIED CYCLE:

1. Run fan only on call for heat to maintain 62 degrees F. in space.
2. Shut outside air dampers and return air dampers.
3. Open face and bypass dampers to full face when outside air is below 60 degrees F.

E. WARM UP CYCLE:

1. Run fan only on call for heat to maintain 72 degrees F. in space.
2. Shut O.A. damper, and open R.A. damper.
3. Open face and bypass dampers to full face when outside air is below 60 degrees F.

F. OCCUPANCY SENSORS :

1. Where indicated on electrical drawings, sensor shall close O.A. and open R.A. damper when room is unoccupied. Fan shall remain energized to maintain room temperature set point.

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AIR TEMP HEATING & AIR CONDITIONING, INC.
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Unit Ventilators

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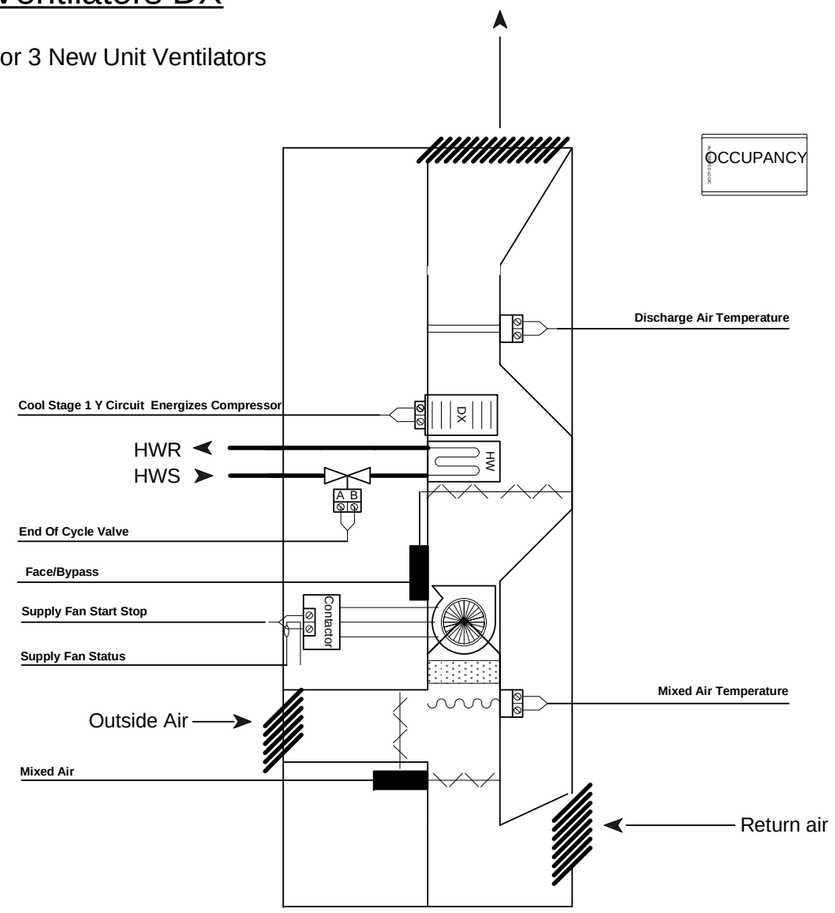
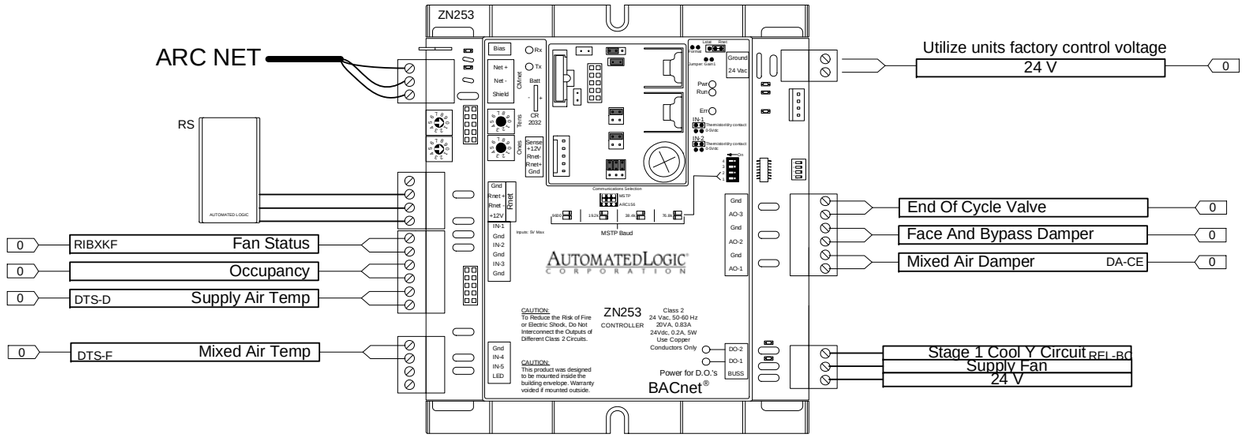
Unit Ventilators DX

Typical For 3 New Unit Ventilators





Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
DA-CE	SR 0-10VDC 35 IN-LB 24 V	BELIMO	LF24-SR ALC	6 ea
DTS-D	DUCT 10K THERMISTOR PROBE 8 IN.	BAPI	ALC/10K-2-D-8	3 ea
DTS-F	DUCT 10K THERMISTOR AVERAGING 8 FT.	BAPI	ALC/10K-2-A-8	3 ea
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	6 ea
RIBXKF	.25 TO 150 CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	3 ea
RS	ROOM STAT	ALC	RS	3 ea
ZN253	ZN253	AUTOMATED LOGIC	ZN253	3 ea

SEE FOLLOWING PAGE FOR SEQUENCES

Maine Endwell Middle School 2011

Binghamton , New York

AIR TEMP HEATING & AIR CONDITIONING, INC.
A LINC SERVICE ® *CONTRACTOR*

Unit Ventilators DX

REV: 1	Submittal	9/29/2008	JOB NO: P7619
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AUTOMATED LOGIC CORPORATION			DSCODE: 07112.00
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UV DX Sequence

A. GENERAL:

1. Provide field mounted controls.
2. Index unit to occupied and unoccupied cycles from BMS.
3. End of cycle valve is normally open and shall close when unit begins economizer mode.
4. Unit shall be automatically indexed to heating or cooling by BAS.
5. redundant OA damper applicable on ceiling hung units above 2000 cfm.
6. Control interlock shall prevent compressor from running when fan is off
7. A 5 deg. Dead-band shall be maintained between mechanical cooling and heating S.P.
8. E.O.C. valve shall close when outdoor air is above 40 deg and economizer is operating.

B. SAFETIES:

1.Stop fan shut outside air damper open return air damper, open face damper, and generate and alarm at BMS when any of the following occur.

A. Discharge air temp is above 130 degrees F.
b. Discharge air temp is below 40 degrees F.
C. .

C. OCCUPIED CYCLE:

1. Run fan continuously with end of cycle valve full open. Redundant OA damper opens
2. Open unit outside air damper to scheduled minimum position.
3. Modulate face and bypass damper to maintain 72 degrees F in space.
4. As space temperature rises above 72 degrees F. shut face damper, and end of cycle valve and modulate unit O.A. damper and R.A. damper to maintain 74 degrees F. in space.

D. UN-OCCUPIED CYCLE:

1. Run fan only on call for heat to maintain 55 degrees F. in space.
2. Shut outside air dampers and return air dampers.
3. Open face and bypass dampers to full face when outside air is below 60 degrees F.

E. WARM UP CYCLE:

1. Run fan only on call for heat to maintain 72 degrees F. in space.
2. Shut O.A. damper, and open R.A. damper.
3. Open face and bypass dampers to full face when outside air is below 60 degrees F.

F. OCCUPANCY SENSORS :

1. Where indicated on electrical drawings, sensor shall close O.A. and open R.A. damper when room is unoccupied. Fan shall remain energized to maintain room temperature set point.

G. Occupied Cooling:
1. Supply fan shall run continuously, and redundant outside air damper shall open.
2. Outdoor air damper goes to minimum position.
3. Space sensor shall cycle condensing unit to maintain space temp. when outdoor air enthalpy permits free cooling outdoor air damper will open 100% and E.O.C. valve shall close.

H. Unoccupied Cooling:

1. The outdoor air damper shall remain fully closed. Condensing unit shall be cycled to maintain 85 Deg. F.

I. Cool Down:

1. The unit shall perform an optimized cool down prior to the occupied cooling mode.
2. During the cool down, the outside air dampers shall remain closed until the condensing unit obtains occupied S.P.

J. Exhaust Fan Interlock:

1.When ever the exhaust serving the space is energized, the air handler shall be returned to occupied with outdoor air damper at 100% open.

Fan Coils A

Total of 4

Area A 1st Floor Team Room
Area A 2nd Floor Team Room
Area C 1st Floor offices
Area B 1st Floor Food Service office

Fan Coils B

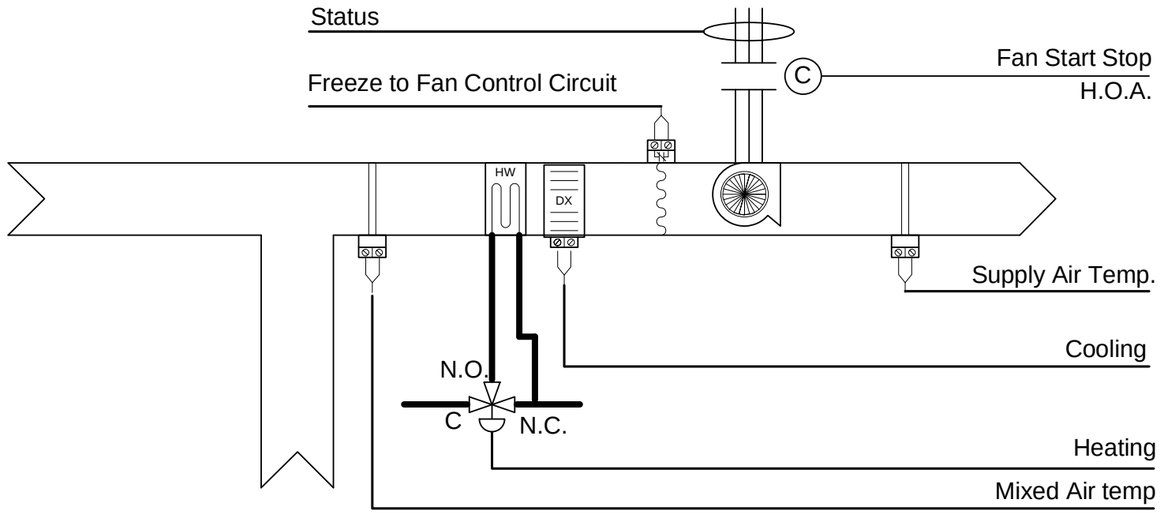
Total of 10

Area C 1st Floor Psych
Area B 2nd Floor Team Room
Area C 2nd Floor Team Room
Area C 2nd Floor Team Room
Area C 2nd Floor Conference

Area C 1st Floor ALS
Area B 2nd Floor Team Room
Area B 2nd Floor Conference
Area B 2nd Floor Conference
Area C 2nd Floor Conference

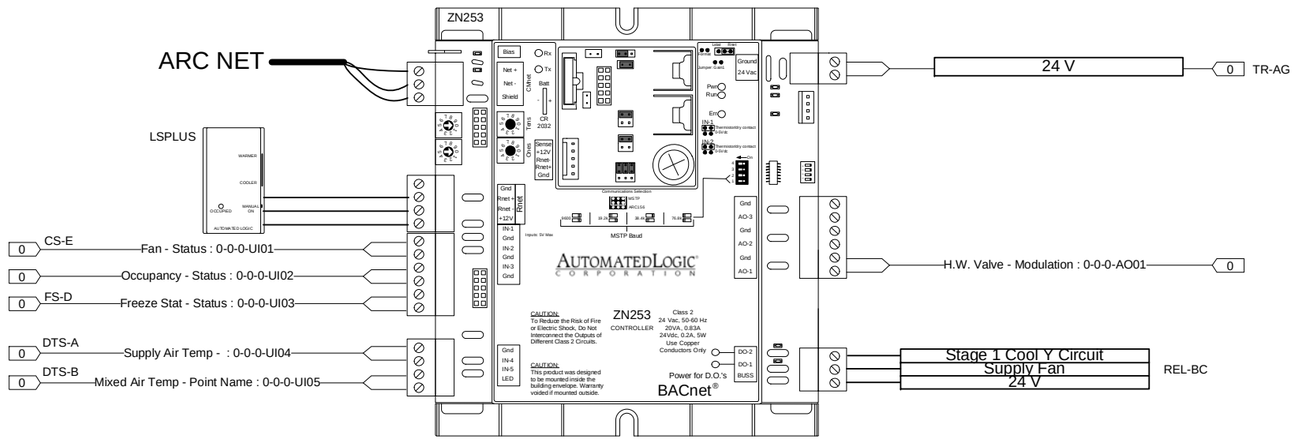
Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	14 ea
DTS-A	DUCT 10K THERMISTOR PROBE 12 IN.	BAPI	ALC/10K-2-D-12	14 ea
DTS-B	DUCT 10K THERMISTOR AVERAGING 12 FT.	BAPI	ALC/10K-2-A-12	14 ea
FS-D	TEMP LOW LIMIT MAN. RESET DPDT	LANDIS STEAFA	1341504	14 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	14 ea
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	28 ea
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	14 ea
ZN253	ZN253	AUTOMATED LOGIC	ZN253	14 ea



NOTE : Fan Coils will Be interlocked Via BACNET NETWORK TO CORRESPONDING EXHAUST

NOTE : Fan Coils B will Be interlocked Via BACNET NETWORK TO CORRESPONDING NON POWERED RV FOR OUTDOOR AIR DAMPER



Maine Endwell Middle School 2011

Binghamton , New York

AIR TEMP HEATING & AIR CONDITIONING, INC.
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Fan Coils A

REV: 1	Submittal	9/29/2008	JOB NO: P7619
			CHECK BY: RSL
			DSCODE: 07112.00

AUTOMATED LOGIC CORPORATION

Fan Coil A Sequence

A. General

1. Unit shall be indexed to occupied and unoccupied by B.A.S.

2. A 5 degrees dead band shall be maintained between heating and mechanical cooling space temperature set points.

.

B. Occupied Heating Cycle:

1. Supply fan shall run continuously

2. Space sensor shall modulate hot water valve to maintain occupied cycle set point.

C. Unoccupied heating Cycle:

1. control valve will modulate in sequence with supply fan to maintain unoccupied set point.

D. Warm Up Cycle:

1. The unit shall perform an optimized warm up prior to the start of the occupied mode.

2. During the warm up cycle the H.W. valve shall be 100% until occupied S.P. is obtained.

C. Occupied Cycle Cooling:

1. Supply fan shall run continuously.

2. Space sensor shall cycle condensing unit to maintain occupied cycle set point.

4. Discharge air Low limit shall be disabled.

D. Unoccupied Cycle Cooling:

1. The condensing unit and supply fan cycling to maintain unoccupied S.P.

Maine Endwell Middle School 2011

Binghamton , New York

AIR TEMP HEATING & AIR CONDITIONING, INC.
A LINC SERVICE ® *CONTRACTOR*

Fan Coil A Sequence

REV: 1	Submittal	9/29/2008	JOB NO: P7619
AUTOMATEDLOGIC CORPORATION			CHECK BY: RSL
			DSCODE: 07112.00

Fan Coil A Sequence 2

E. Cool Down Cycle:

1. The unit shall perform an optimized cool down prior to the start of the occupied mode.

2. During the cool down cycle the condensing unit will obtain occupied S.P.

F. Exhaust Fan Interlock:

1. Where called for, whenever the interlocked exhaust fan is energized, the air handling unit shall be returned to occupied cycle

G. Safeties:

1. Discharge air sensor shall indicate an alarm when high temperature discharge air is sensed through the coil (130 Deg. F.)

2. Low temperature limit shall de energize unit when low coil temperature is sensed (37 Deg. F.)

3. Fan shutdown shall be provided by the electrical contractor through the B.A.S.

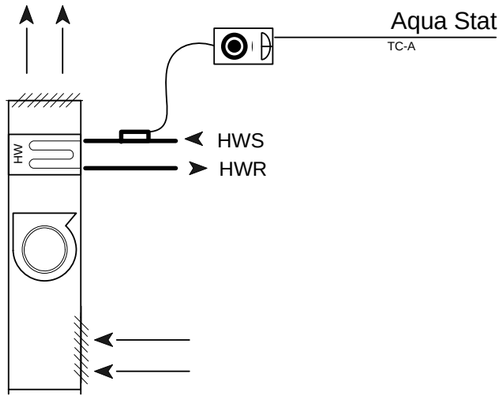
4. Discharge air sensor shall assume control of valve to maintain minimum discharge air temperature of 55 Deg. F.

CUH/UH

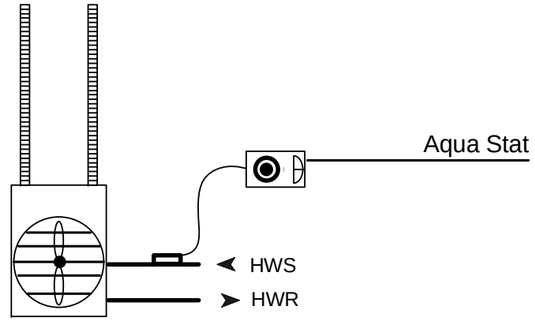
Typical For 28 CUH's

Typical For 9 UH's

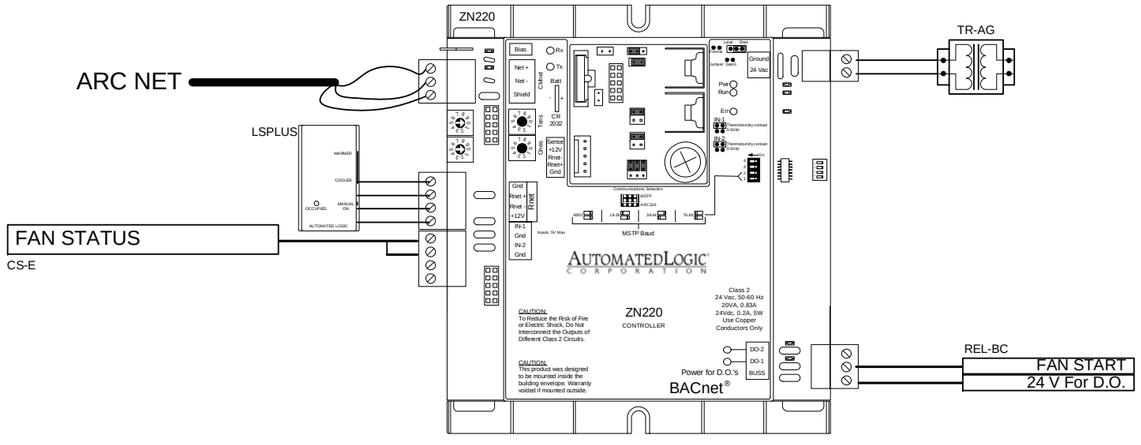
Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	28 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	14 ea
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	28 ea
TC-A	HW TEMP CONTROL HIGH LIMIT MAN. RESET	JOHNSON CONTROLS	A19ADB-2	28 ea
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	28 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	14 ea



CABINET HEATER



UNIT HEATER



UH & CUH SEQUENCE

A. General

1. Unit shall be provided with field mounted controls.
2. Aquastat shall de-energize unit when water temperature is less than 110 degrees F
3. The supply fan shall cycle to maintain space temperature.

B. Occupied

1. When the B.A.S. system places the system in the occupied mode, the supply fan shall cycle to maintain occupied temperature requirement of 68 degrees.

C. Unoccupied

1. When the B.A.S. system places the system in unoccupied mode, the supply fan shall cycle to maintain unoccupied temperature requirement of 55 degrees

2. System shall have the capability of overriding the unoccupied mode and returning to occupied for a period of 1 HR.

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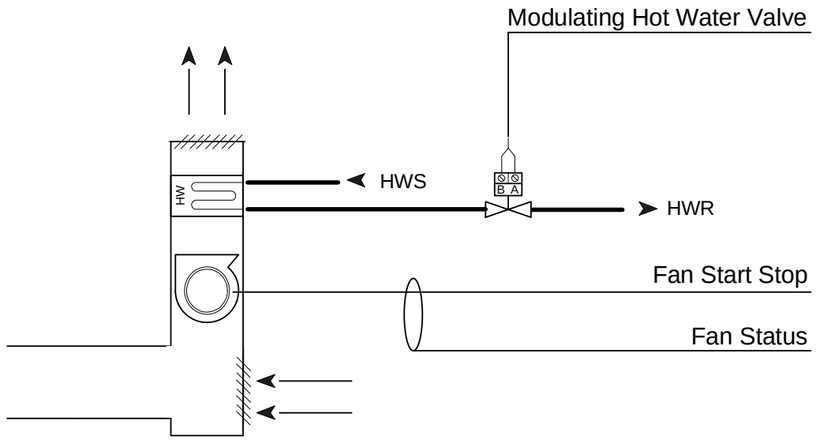
CUH/UH

REV: 1	Submittal	9/29/2008	JOB NO: P7619
AUTOMATEDLOGIC CORPORATION			CHECK BY: RSL
			DSCODE: 07112.00

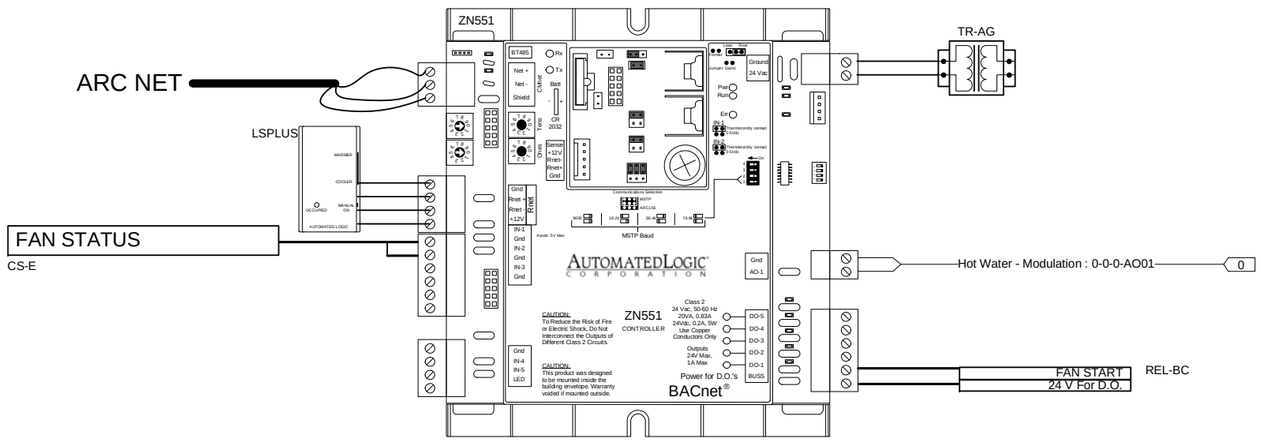
CUH OUTDOOR AIR

Typical For 27 CUH's

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	27 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	13 ea
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	54 ea
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	27 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	27 ea



CABINET HEATER



UH & CUH SEQUENCE

A. General

1. Unit shall be provided with field mounted controls.
2. Aquastat shall de-energize unit when water temperature is less than 110 degrees F
3. The supply fan shall cycle to maintain space temperature.

B. Occupied

1. When the B.A.S. system places the system in the occupied mode, the supply fan shall cycle to maintain occupied temperature requirement of 68 degrees.

C. Unoccupied

1. When the B.A.S. system places the system in unoccupied mode, the supply fan shall cycle to maintain unoccupied temperature requirement of 55 degrees

2. System shall have the capability of overriding the unoccupied mode and returning to occupied for a period of 1 HR.

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AIR TEMP HEATING & AIR CONDITIONING, INC.
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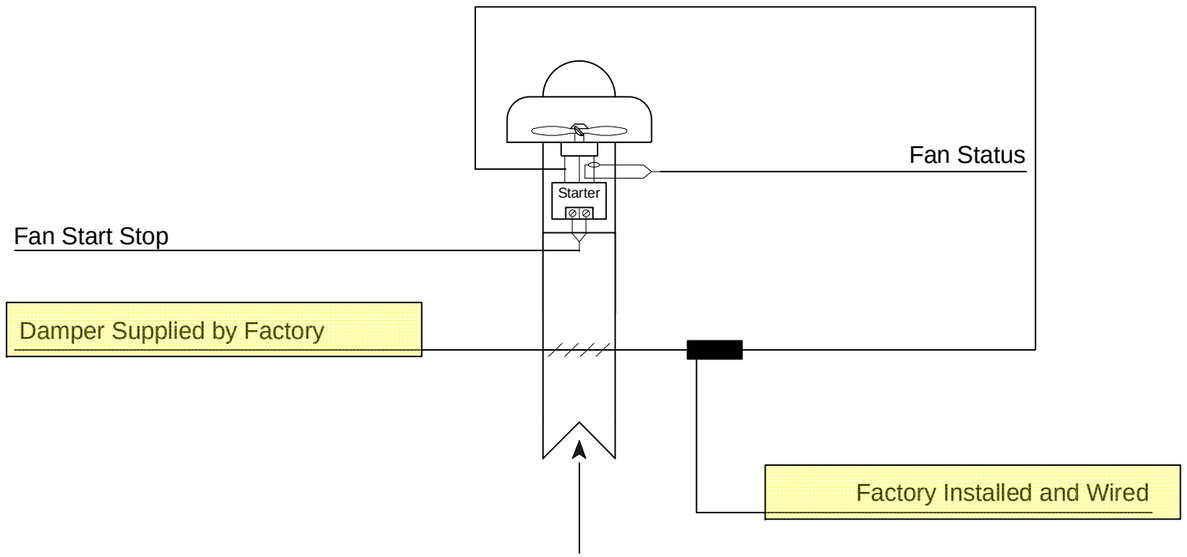
CUH OUTDOOR AIR

REV: 1	Submittal	9/29/2008	JOB NO: P7619
			CHECK BY: RSL
AUTOMATED LOGIC CORPORATION			DSCODE: 07112.00

Exhaust Fans

Typical for 32

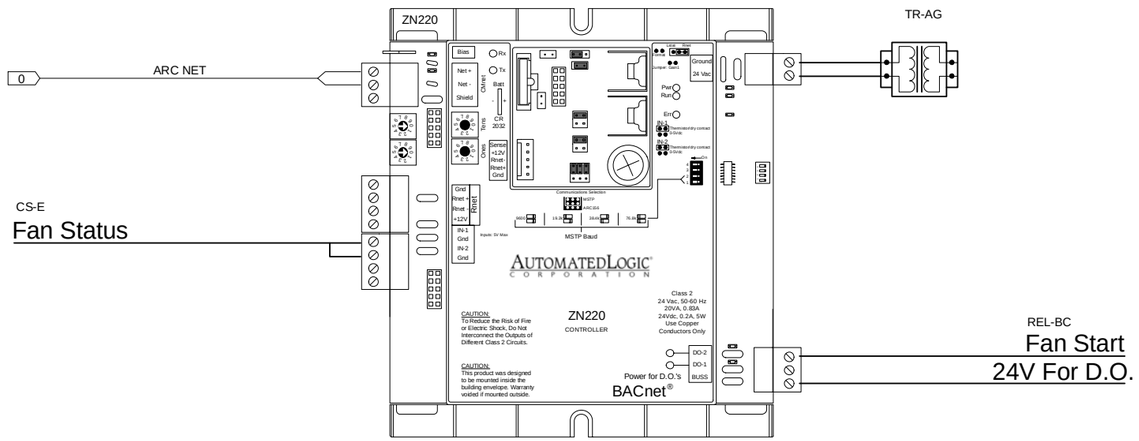
Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
CS-E	CURRENT SWITCH .5-200 AMP SOLID CORE GO/NO GO	VERUS IND.	H-800	30 ea
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	30 ea
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	15 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	15 ea



Coordinate with EC and MC for automatic dampers & actuators and associated wiring. Reference specification section 15910, 3.01 and the fan schedule for requirements and responsibilities

EXHAUST FAN CONTROL

1. fan shall be energized by BAS during occupied mode, and off during unoccupied mode.
2. Automatic damper shall open when fan is energized and close when fan is off.
3. Damper actuator to be electric.



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AIR TEMP HEATING & AIR CONDITIONING, INC.
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Exhaust Fans

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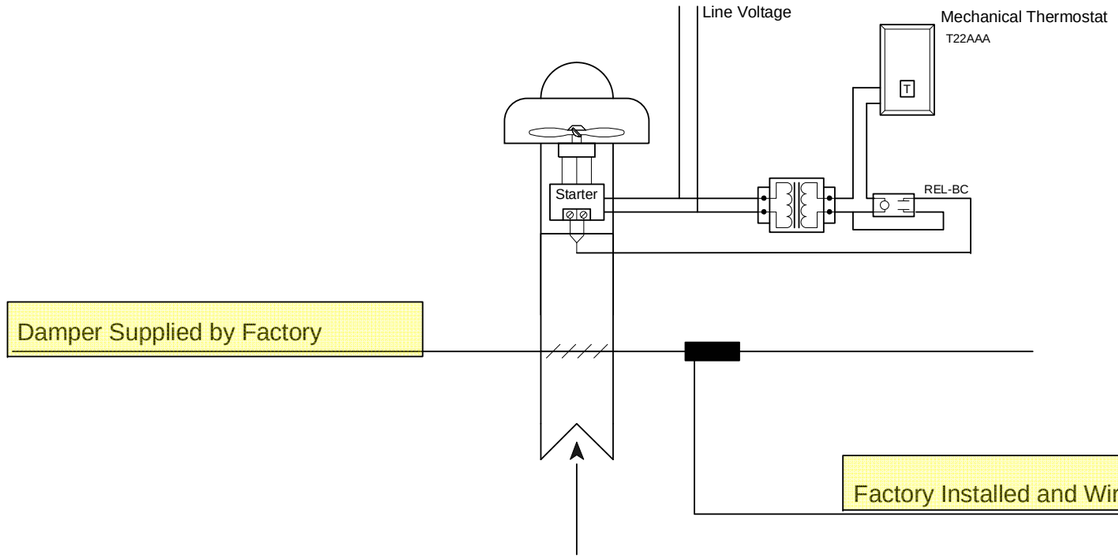
Exhaust Fans 2

F-37 Serves M1-12.4 Electrical Room
F-38 M1-2.1 MACH Room



Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	2 ea
T22AAA	LINE VOLTAGE WALL THERMOSTAT SPST	JOHNSON CONTROLS	T22AAA-1	2 ea

Coordinate with EC and MC for automatic dampers & actuators and associated wiring. Reference specification section 15910, 3.01 and the fan schedule for requirements and responsibilities

EXHAUST FAN CONTROL

1. fan shall be energized by a reverse acting mechanical thermostat.
2. Automatic damper shall open when fan is energized and close when fan is off.
3. Damper actuator to be electric.

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AIR TEMP HEATING & AIR CONDITIONING, INC.
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Exhaust Fans 2

REV: 1	Submittal	9/29/2008	JOB NO: P7619
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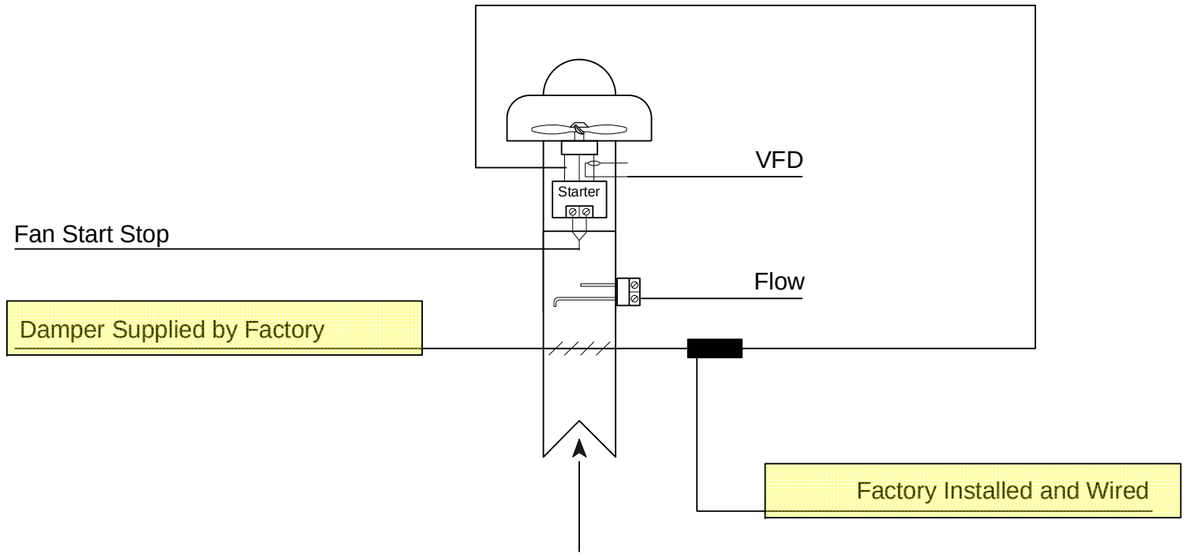
			DSCODE: 07112.00

Power Relief

Typical for 32

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
REL-BC	PILOT RELAY 24 VAC DPDT W/ LED	OMRON	LY2N-24V	30 ea
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	15 ea
ZN253	ZN253	AUTOMATED LOGIC	ZN253	12 ea

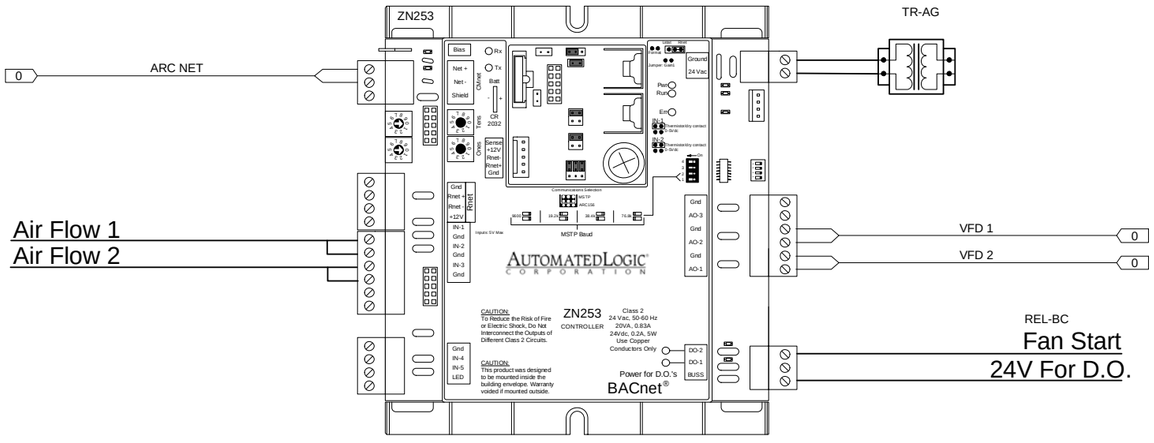


1MS
4MS
5MS
7MS
8MS
9MS
10MS
11MS
12MS
13MS
15MS
16MS
17MS
20MS
21MS
22MS
23MS
25MS
26MS
31MS
32MS
33MS
35MS
36MS

Coordinate with EC and MC for automatic dampers & actuators and associated wiring. Reference specification section 15910, 3.01 and the fan schedule for requirements and responsibilities

Power Relief Sequence

1. Automatic damper goes to 100% open when any associated U.V. runs during the occupied cycle.
2. The exhaust fan shall be controlled by the variable speed drive to maintain speed proportional to the outside air damper %
3. For control of single room eliminate variable speed drive and provide fan with 2 speed motor. Damper fully opens when U.V. runs in occupied cycle. Fan runs at low speed when U.V. O.A. damper is at minimum position. Fan runs at high speed when U.V. goes into economizer operation.



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Power Relief			
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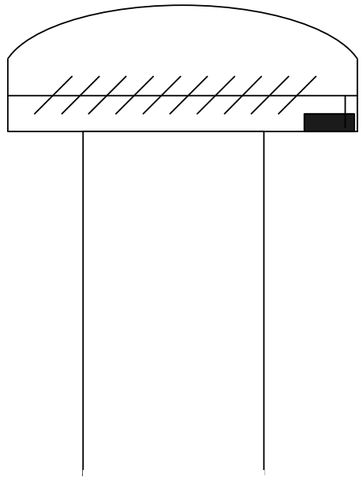
Roof Vents

DAMPER IS FACTORY SUPPLIED
24 VOLT ACTUATORS ARE FACTORY SUPPLIED



Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	12 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	12 ea

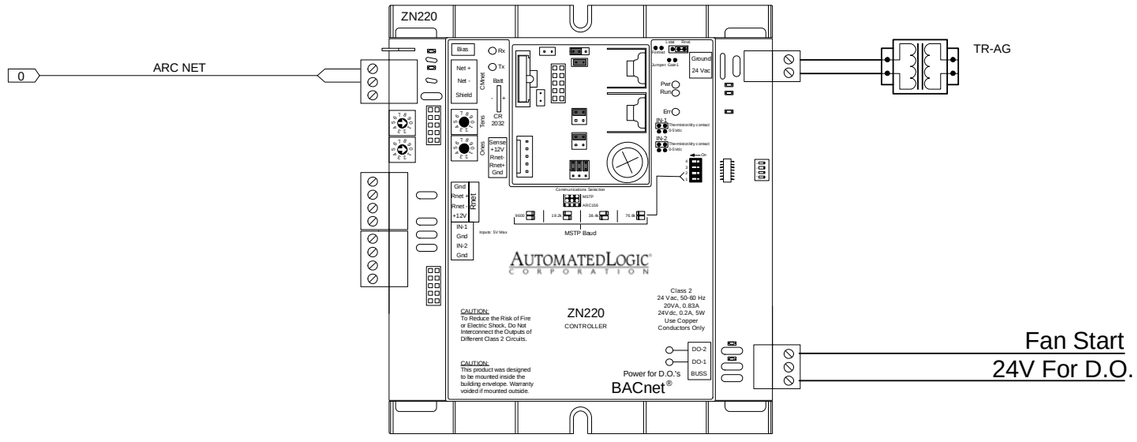
Coordinate with EC and MC for automatic dampers & actuators and associated wiring. Reference specification section 15910, 3.01 and the fan schedule for requirements and responsibilities

NOTE. NON POWERED RV'S THAT ARE DUCTED TO FAN COILS WILL FOLLOW FAN COIL SEQUENCE

ROOF VENT CONTROL

1. Damper shall be energized by BAS during occupied mode, and off during unoccupied mode.

2. Damper actuator to be electric.



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Roof Vents			
REV: 1	Submittal	9/29/2008	JOB NO: P7619
AUTOMATED LOGIC CORPORATION			CHECK BY: RSL
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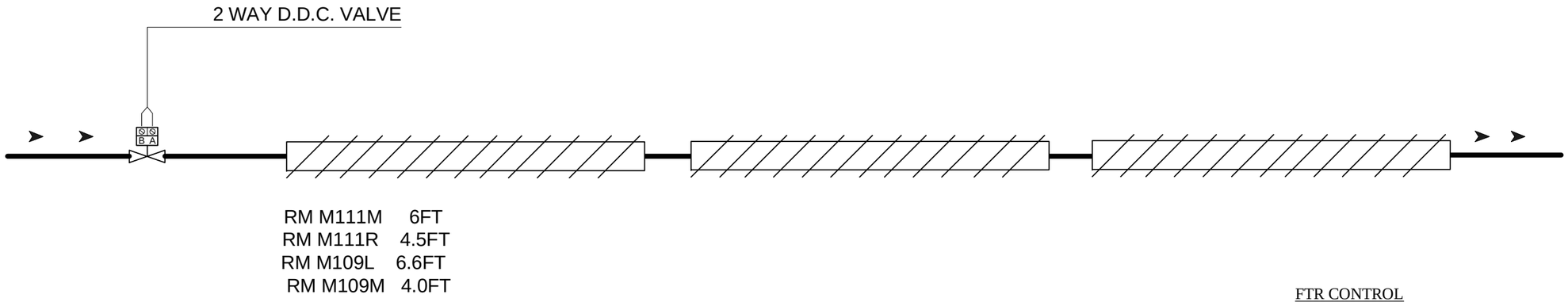
Fin Tube

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	4 ea
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	4 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	4 ea

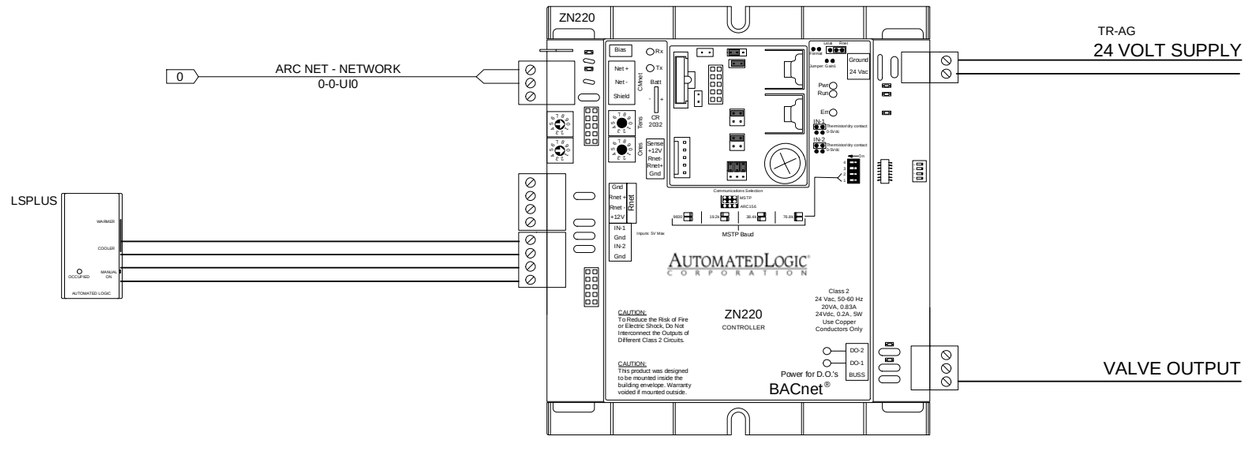


FTR CONTROL

A. Sequence Occupied
1. D.D.C. Valve shall open to maintain occupied set point.
2. Set point is adjustable at room sensor. Set point adjust can be limited, or disabled by operator.

B. Sequence Unoccupied
1. D.D.C. Valve shall remain closed. If room space temp drops below the unoccupied set point, valve shall open to maintain unoccupied set point.

2. When override button is pushed on the wall mounted space temp sensor, the room shall operate as occupied until the override timer has expired. Override time is adjustable by operator



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AIR TEMP HEATING & AIR CONDITIONING, INC.
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Fin Tube

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AUTOMATED LOGIC CORPORATION			DSCODE: 07112.00
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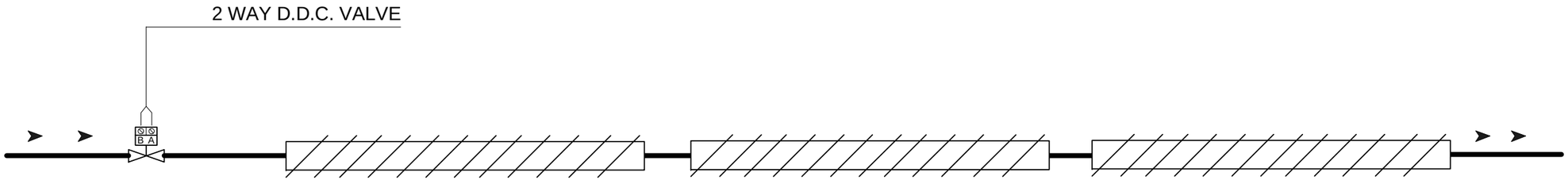
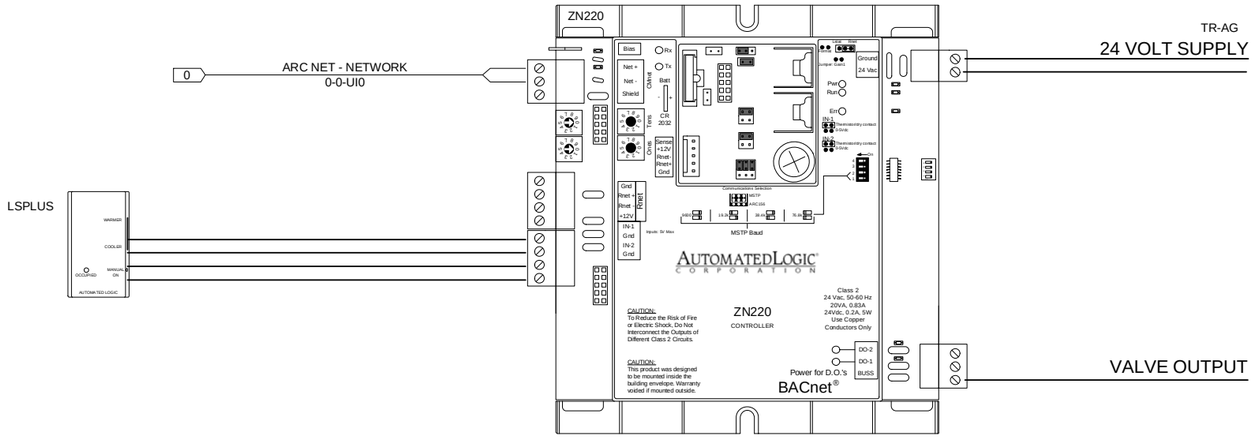
Fin Tube Existing

C Wing Stairwell

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	1 ea
TR-AG	TRANSFORMER, 120/24VAC 150VA W/CCT BREAKER	CORE COMPONENTS	LE-124	1 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	1 ea





FTR CONTROL

A. Sequence Occupied
1. D.D.C. Valve shall open to maintain occupied set point.
2. Set point is adjustable at room sensor. Set point adjust can be limited, or disabled by operator.

B. Sequence Unoccupied
1. D.D.C. Valve shall remain closed. If room space temp drops below the unoccupied set point, valve shall open to maintain unoccupied set point.

2. When override button is pushed on the wall mounted space temp sensor, the room shall operate as occupied until the override timer has expired. Override time is adjustable by operator

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Fin Tube Existing

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AUTOMATED LOGIC CORPORATION

Valve Schedule

AUTOMATEDLOGIC CORPORATION

TAG	Service Hot/Chilled Water or Steam	Valve Type 2 Way NO or NC	GPM/PPH	Design PD (psi)	Calculated CV	Actual CV	Actual PD (psi)	Manufacturer	Model No.	Valve Size (in.)	Line Size (in.)	Closeoff (psi)*	Actuator Signal	Fail Position
RM M111M-FT	HW	2	1.5	NA	NA	3.5	2.300	Belemo	zone220n-3524n0	0.75	0.75	75	24 v	open
RM M111R-FT	HW	2	1.5	NA	NA	3.5	2.300	Belemo	zone220n-3524n0	0.75	0.75	75	24 v	open
RM M109L-FT	HW	2	1.5	NA	NA	3.5	2.300	Belemo	zone220n-3524n0	0.75	0.75	75	24 v	open
RM M109M-FT	HW	2	1.5	NA	NA	3.5	2.300	Belemo	zone220n-3524n0	0.75	0.75	75	24 v	open
AHU 1MS	HW	3	12	2.3	8.0	14	0.850	Belemo	G325nvf24mftus	1.00	1.25	130	0-10VDC	open
Unit Vent C/30	HW	2	3	0.6	3.8	4.7	0.41	Belemo	B213BTX24US	0.50	0.5	200	24v	open
Unit Vent B/19	HW	2	4	0.88	4.2	4.7	0.72	Belemo	B213BTX24US	0.50	0.5	200	24v	open
Unit Vent A/3	HW	2	4	0.79	4.5	4.7	0.85	Belemo	B213BTX24US	0.50	0.5	200	24v	open
Unit Vent H/3	HW	2	4	0.94	4.1	4.7	0.72	Belemo	B213BTX24US	0.50	0.5	200	24v	open
Unit Vent 1/3	HW	2	3	0.24	6.1	7.4	0.16	Belemo	B214BTX24srUS	0.50	0.5	200	0-10VDC	open
Unit Vent F/2	HW	2	4	0.6	5.7	7.4	0.3	Belemo	B214BTX24US	0.50	0.5	200	24v	open
Unit Vent G/2	HW	2	3.5	0.38	5.8	7.4	0.22	Belemo	B214BTX24US	0.50	0.5	200	24v	open
UV Existing/3	HW	2	4	0.79	4.5	4.7	0.85	Belemo	B213BTX24US	0.50	0.5	200	24v	open
Fan Coil A/4	HW	3	0.97	0.46	1.4	2.2	0.19	Belemo	G314NVFD24MFTEUS	0.50	0.5	250	0-10VDC	open
Fan Coil B/9	HW	3	2	2.2	3.4	4.4	0.2	Belemo	G315NVFD24MFTEUS	0.50	0.5	250	0-10VDC	open
Cabinet UH A-D/53	HW	2	3	0.4	4.7	4.7	0.4	Belemo	B213BTF24SRUS	0.50	0.5	200	0-10VDC	open
Cabinet UH E/2	HW	2	4	0.7	4.8	4.7	0.7	Belemo	B213BTF24SRUS	0.50	0.5	200	0-10VDC	open
Loop HW Mix	HW	3	455	34.8	77	3136	34.8	Belemo	F7200HSUSY324	8.00	8	50	0-10	open
Loop HW Mix		Butterfly					System PD	Belemo						

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AIR TEMP HEATING & AIR CONDITIONING, INC.
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Valve Schedule

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			CHECK BY: RSL
AUTOMATEDLOGIC CORPORATION			DSCODE: 07112.00

Damper Schedule

Exhaust Fans, HRU's And RV's are shipping with factory dampers

AUTOMATEDLOGIC® CORPORATION

Identifier	QTY.	Damper mfg	Model	Size (W")	X Size (H")	Sq. Ft.	Opp or Par Blade	Qty Actuators	Actuator Type	Actuator mfg model
AHU1MS Redundant	1	RUSKIN	CD50	40	6	240.00	OPP	1	2 POS	BELEMO LF24US
Boiler Combustion	1	RUSKIN	CD50	15	30	900.00	OPP	1	2 POS	BELEMO LF24US
Boiler Combustion	1	RUSKIN	CD50	15	30	900.00	OPP	1	2 POS	BELEMO LF24US

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AIR TEMP HEATING & AIR CONDITIONING, INC.
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Damper Schedule

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AUTOMATEDLOGIC® CORPORATION			CHECK BY: RSL
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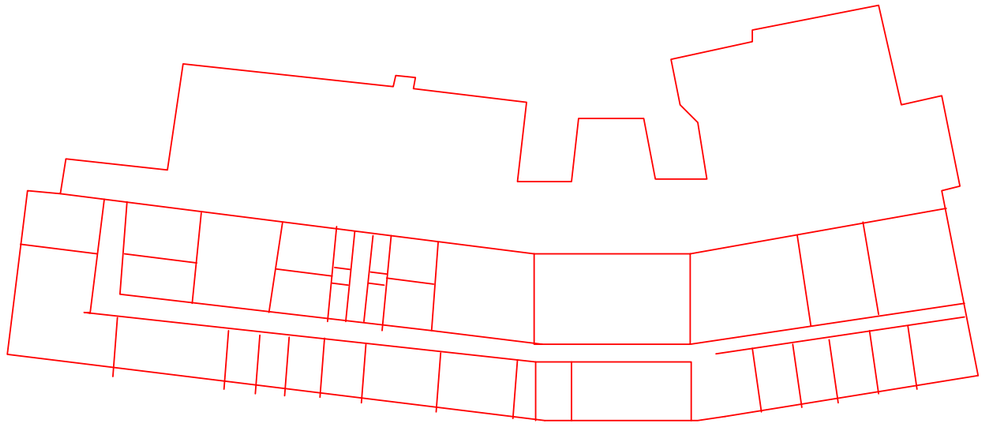

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