

# Candor Schools

Candor, New York

Application Engineering by Randy Langille

Engineer/Architect

Highland Associates

Mechanical Contractor


J&K Plumbing and Heating

Job Number

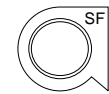
P7793

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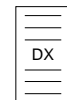
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# Symbol Legend



Supply Fan



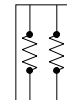
DX Cooling Coil



Duct Temperature Sensor



Exhaust Fan



Electric Heating Coil



Averaging Duct Temperature Sensor



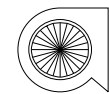
Return Fan



Gas Heating



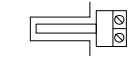
Duct Humidity Sensor



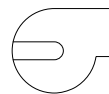
Fan w/ Inlet Vane Control



Hot Water Heating Coil



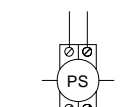
Immersion Temperature Sensor w/ Well



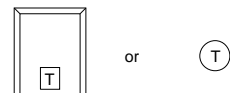
Pump



Chilled Water Cooling Coil



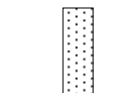
Pressure Sensor



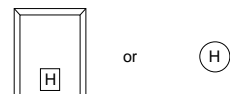
Room Temperature Sensor



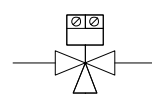
Steam Heating Coil



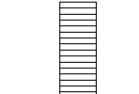
Filter



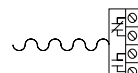
Room Humidity Sensor



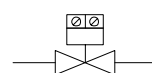
3 - Way Valve



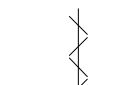
Air Flow Station



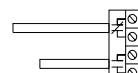
FreezeStat



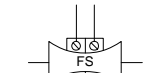
2 - Way Valve



Damper



Smoke Detector



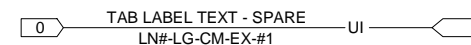
Flow Sensor

## 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.

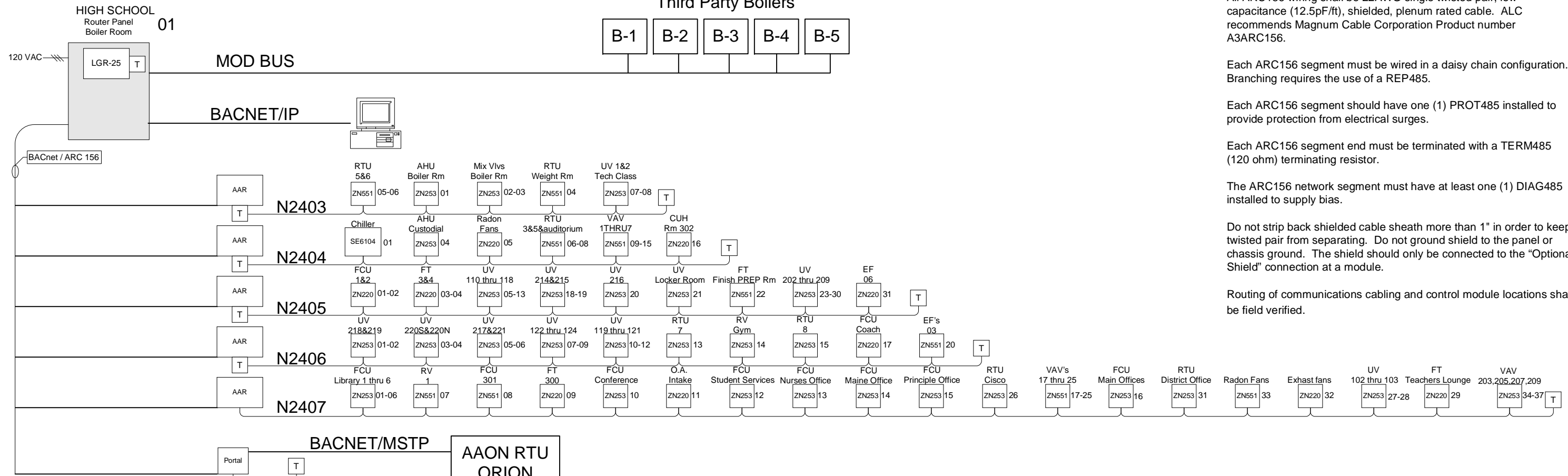
Candor Schools Candor, New York			
Symbol Legend			
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# Summary Bill of Materials

Summary Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
A10k-d	DUCT TEMP SENSOR 10K-2	ALPS	A10K-2-D-8	4 ea
AAR	ARCNET TO ARCNET ROUTER	AUTOMATED LOGIC	AAR	2 ea
BAQ	CO2 SENSOR DUCT MOUNT	BAPI	BA/AQS-D8	6 ea
DA-CE	SR 0-10VDC 35 IN-LB 24 V	BELIMO	LF24-SR ALC	5 ea
DTS-D	DUCT 10K THERMISTOR PROBE 8 IN.	BAPI	ALC/10K-2-D-8	5 ea
FS-D	TEMP LOW LIMIT MAN. RESET DPDT	LANDIS STEAFA	1341504	87 ea
LGR25	LGR25	AUTOMATED LOGIC	LGR25	2 ea
Portal	PORTAL	AUTOMATED LOGIC	PORTAL	2 ea
REL-F	RIB PILOT RELAY SPDT 10AMP	KELE & ASSOC.	RIBU1C	1 ea
TR50	50 VA TRANSFORMER	FUNCTIONAL DEVICES	TR50VA	1 ea
U551	U551	AUTOMATED LOGIC	U551	5 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	2 ea
ZN253	ZN253	AUTOMATED LOGIC	ZN253	0 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	9 ea
rib	CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	6 ea
rsp	RSPL	ALC	RSPL	2 ea

Candor Schools Candor, New York			
Summary Bill of Materials			
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# Riser



### General Notes:

All ARC156 wiring shall be 22AWG single twisted pair, low capacitance (12.5pF/ft), shielded, plenum rated cable. ALC recommends Magnum Cable Corporation Product number A3ARC156.

Each ARC156 segment must be wired in a daisy chain configuration. Branching requires the use of a REP485.

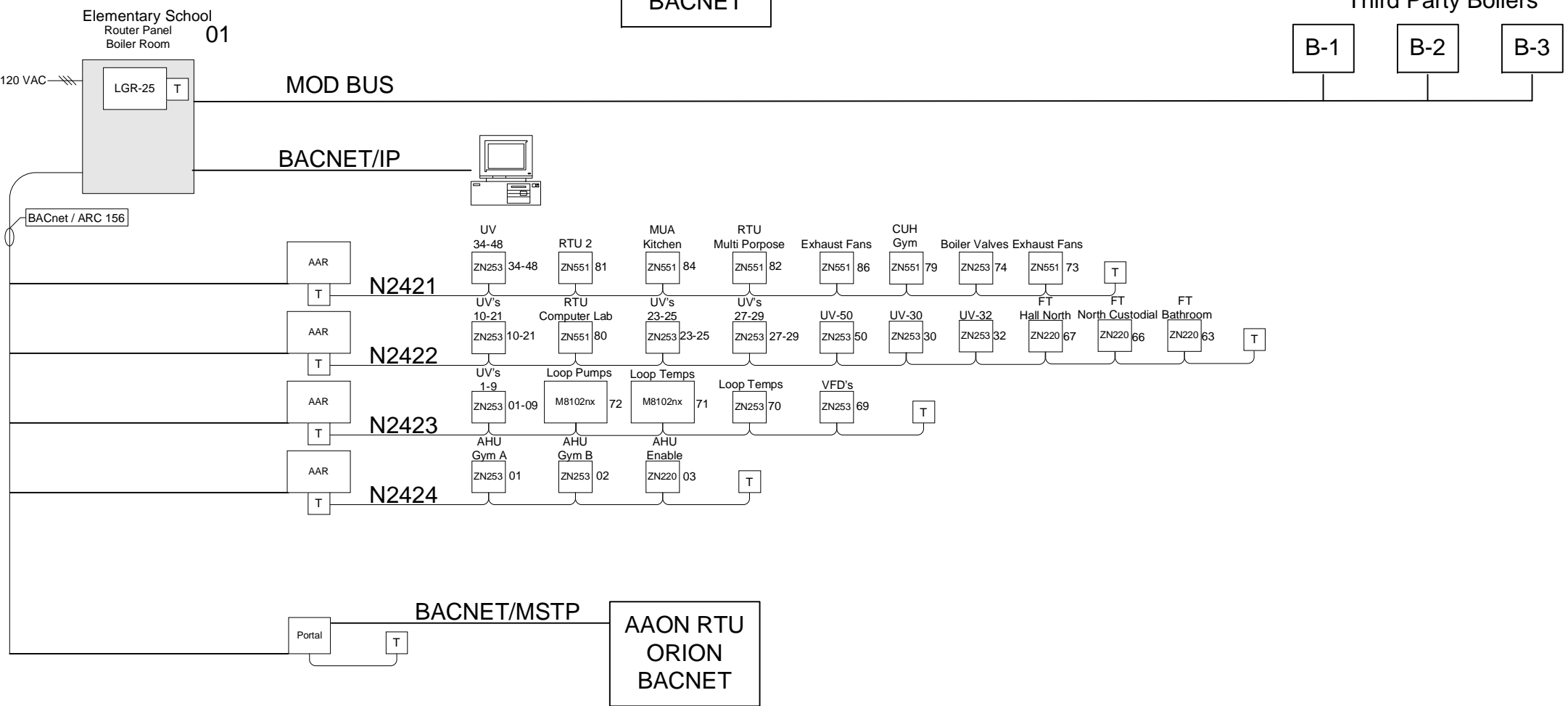
Each ARC156 segment should have one (1) PROT485 installed to provide protection from electrical surges.

Each ARC156 segment end must be terminated with a TERM485 (120 ohm) terminating resistor.

The ARC156 network segment must have at least one (1) DIAG485 installed to supply bias.

Do not strip back shielded cable sheath more than 1" in order to keep twisted pair from separating. Do not ground shield to the panel or chassis ground. The shield should only be connected to the "Optional Shield" connection at a module.

Routing of communications cabling and control module locations shall be field verified.



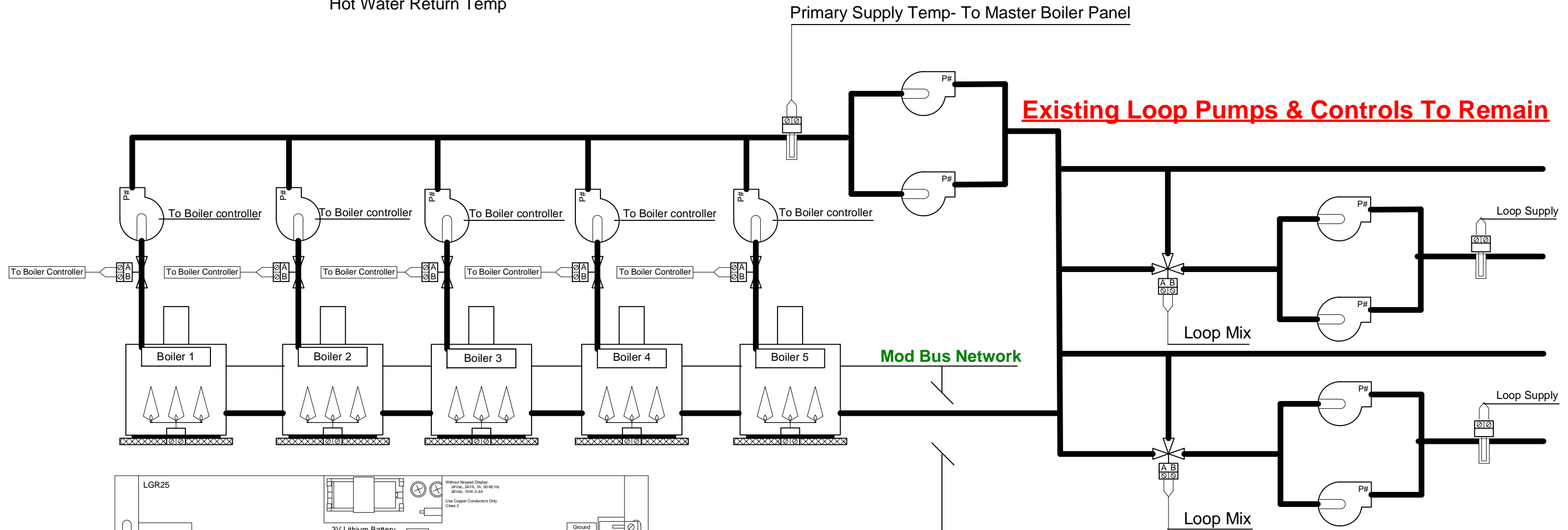
Candor Schools Candor, New York			
Riser			
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**Intigration Heat Net to Existing Automated Logic**

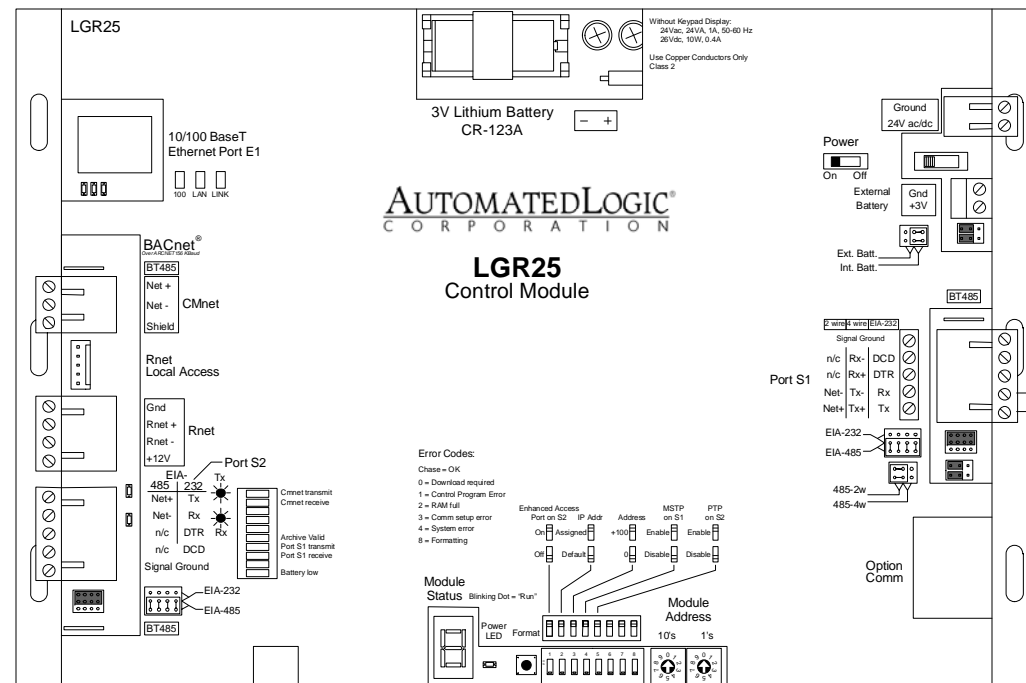
Boiler 1 thru 5 Start/Stop  
 Boiler 1 thru 5 Status  
 Boiler 1 thru 5 Feed Pump  
 Boiler 1 thru 5 Alarm  
 Hot Water Supply Temp  
 Hot Water Return Temp

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
LGR25	LGR25	AUTOMATED LOGIC	LGR25	1 ea



**Existing Loop Pumps & Controls To Remain**

**Existing Loop Pumps & Controls To Remain**



Mod Bus Network

**Existing Programed Controls & Logic Include**

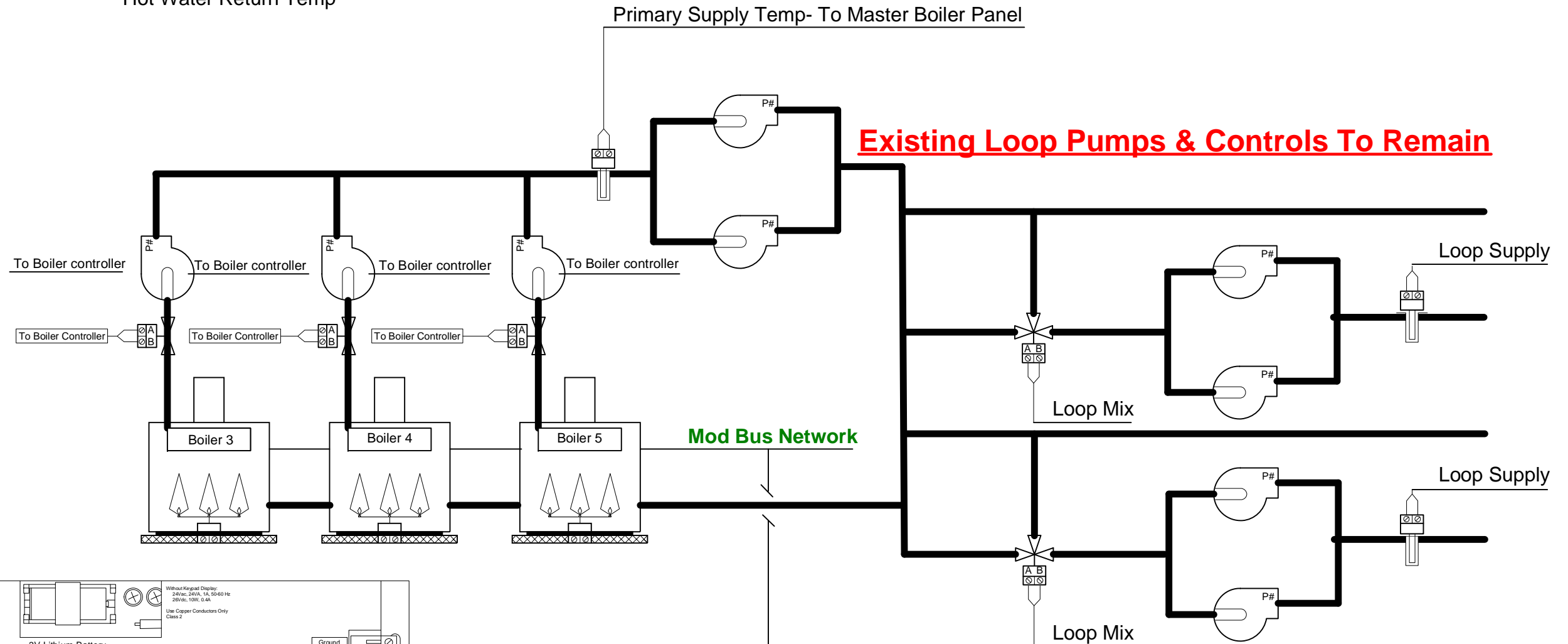
Heat loop Zone Pumps 6 thru 14  
 Associated Mixing Valves  
 Zone loop Supply Water Temperatures  
 Zone loop Return Water Temperatures  
 Outdoor Air Temperature

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Boiler Plant High School			
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**Intigration Heat Net to Existing Automated Logic**

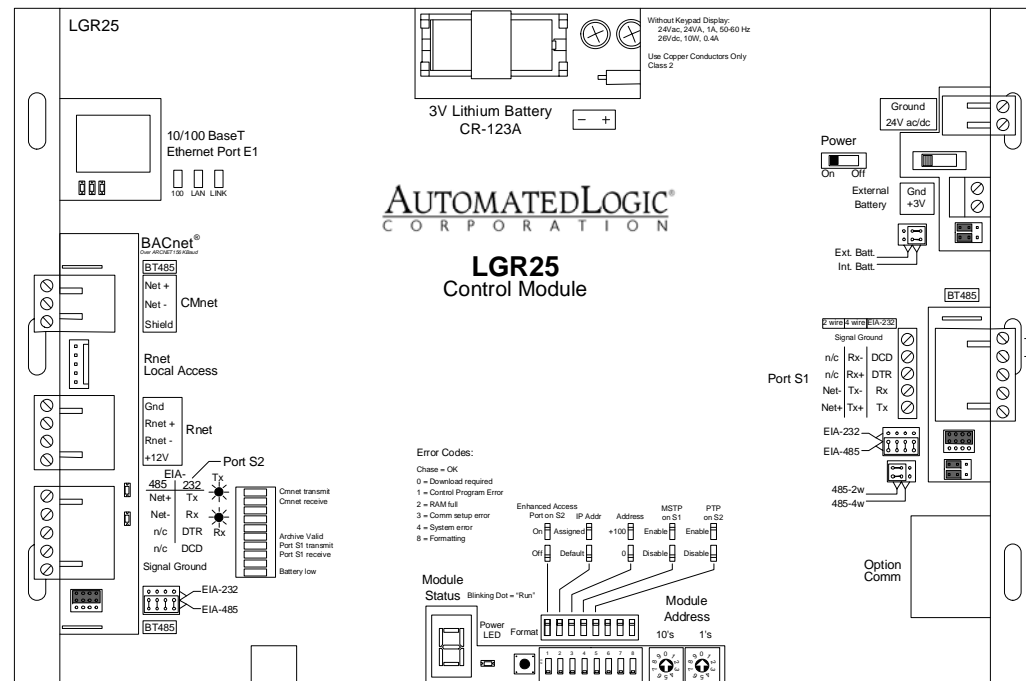
Boiler 1 thru 3 Start/Stop  
 Boiler 1 thru 3 Status  
 Boiler 1 thru 3 Feed Pump  
 Boiler 1 thru 3 Alarm  
 Hot Water Supply Temp  
 Hot Water Return Temp

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
LGR25	LGR25	AUTOMATED LOGIC	LGR25	1 ea



**Existing Loop Pumps & Controls To Remain**

**Existing Loop Pumps & Controls To Remain**



Mod Bus Network

**Existing Programed Controls & Logic Include**

Heat loop Zone Pumps  
 Associated Mixing Valves  
 Zone loop Supply Water Temperatures  
 Zone loop Return Water Temperatures  
 Outdoor Air Temperature

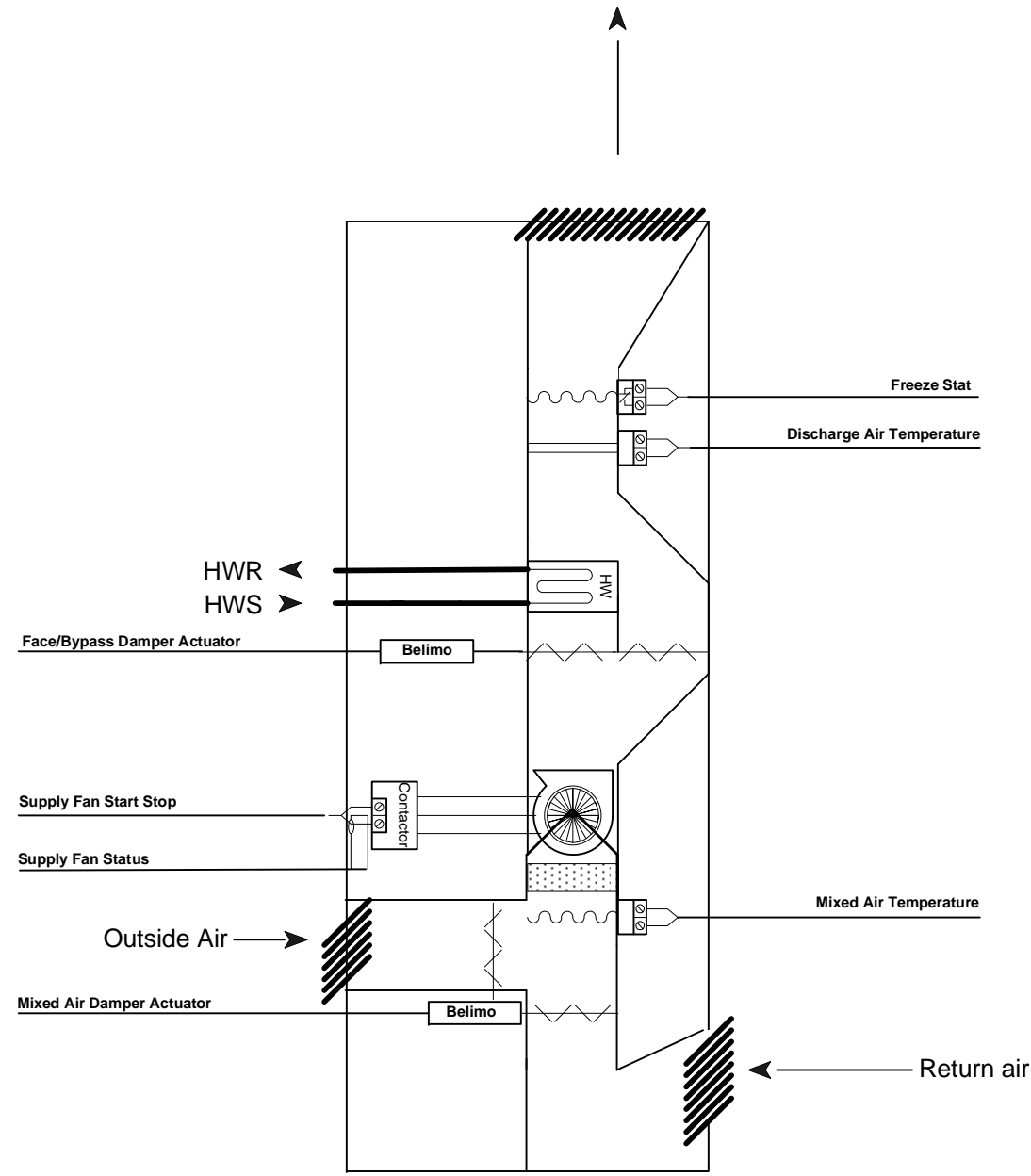
Candor Schools Candor, New York			
Boiler Plant Elementary School			
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AUTOMATEDLOGIC CORPORATION			CHECK BY: RSL DSCODE: 07112.00
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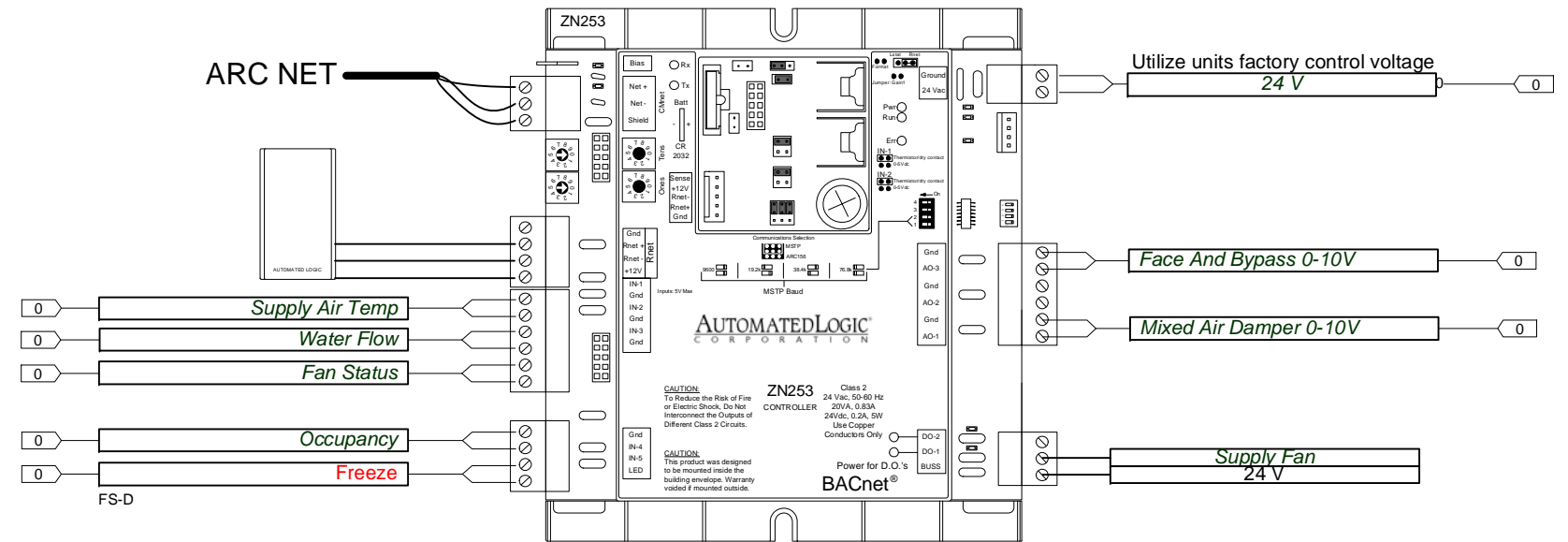
# Unit Ventilators H.S.

Typical For 42 Existing Unit Ventilators

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
FS-D	TEMP LOW LIMIT MAN. RESET DPDT	LANDIS STEAFA	1341504	42 ea
ZN253	ZN253	AUTOMATED LOGIC	ZN253	0 ea



## Added Control Upgrades Existing Controls

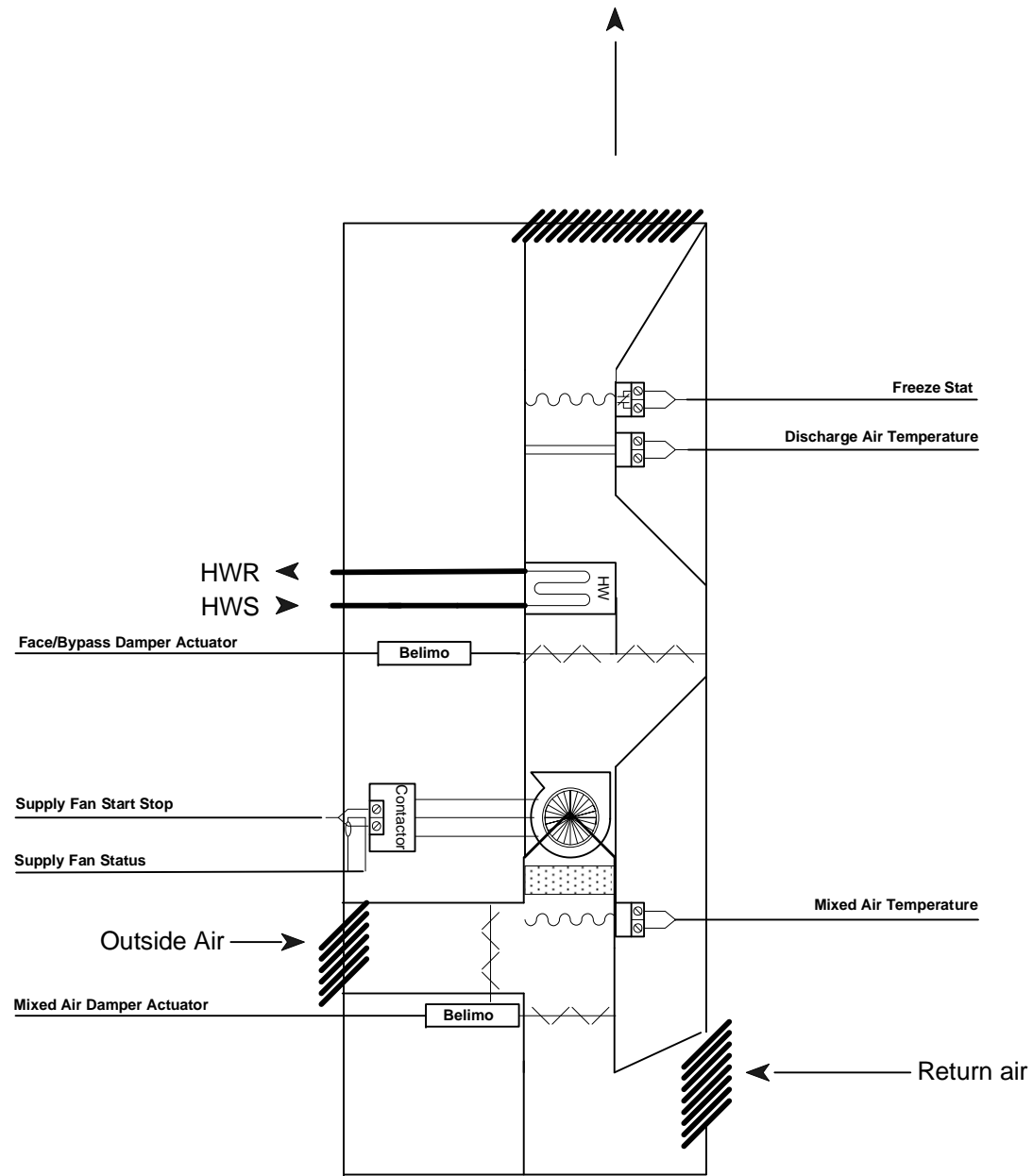


Candor Schools Candor, New York			
Unit Ventilators H.S.			
REV: 1	Submittal	9/29/2008	JOB NO: P7793
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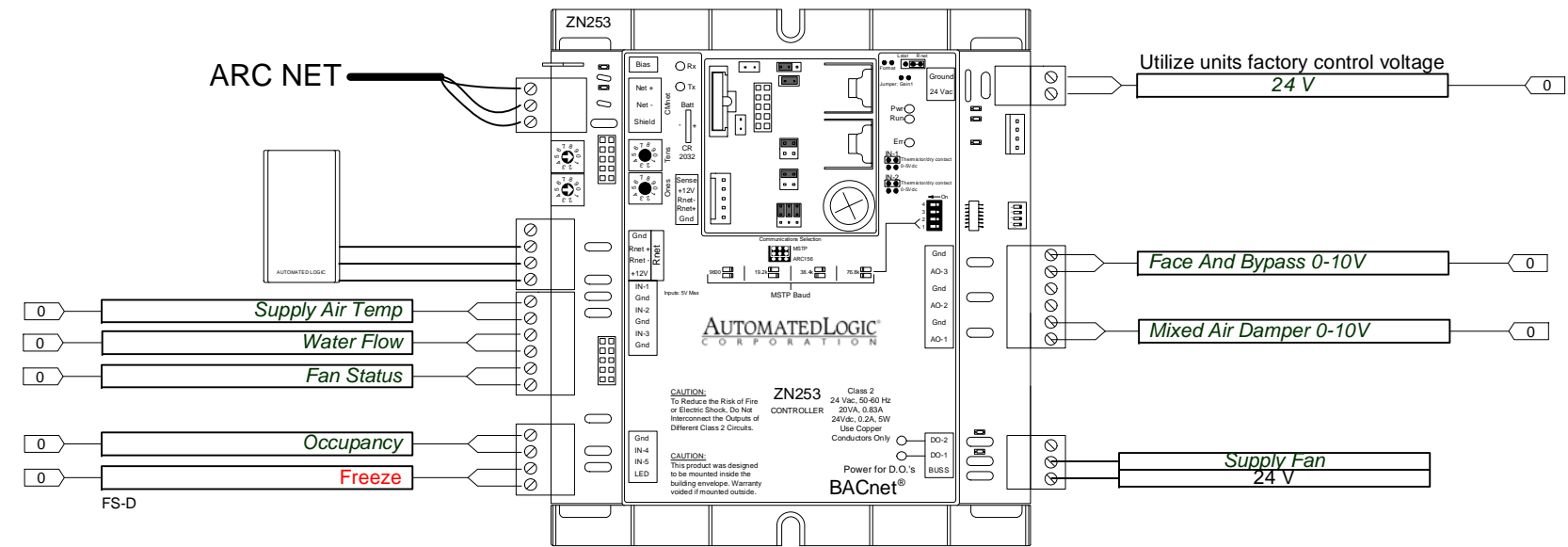
# Unit Ventilators E.S.

Typical For 45 Existing Unit Ventilators

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
FS-D	TEMP LOW LIMIT MAN. RESET DPDT	LANDIS STEAFA	1341504	45 ea
ZN253	ZN253	AUTOMATED LOGIC	ZN253	0 ea



## Added Control Upgrades Existing Controls



Candor Schools  
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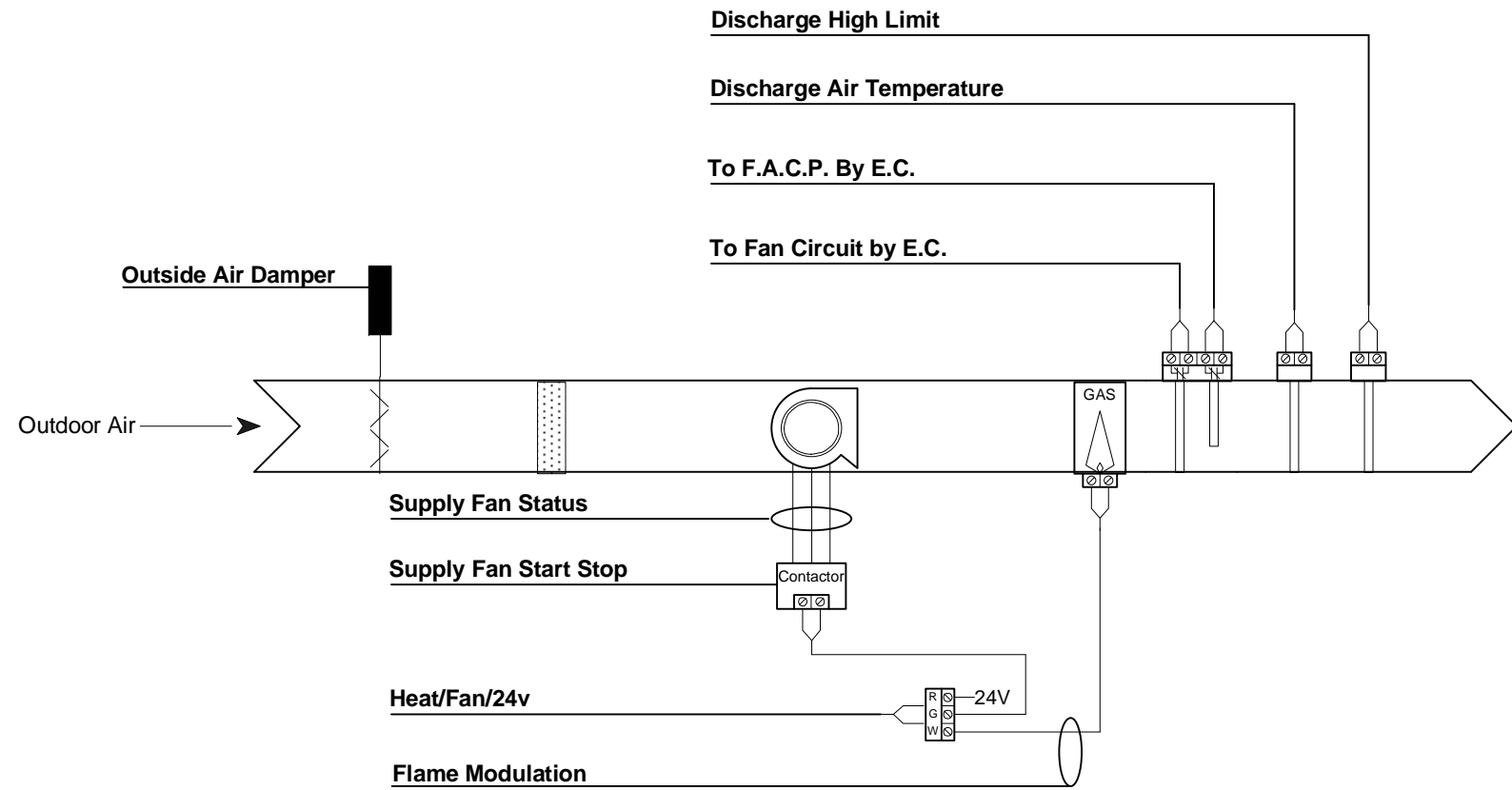
Unit Ventilators E.S.

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**AUTOMATED LOGIC**  
CORPORATION

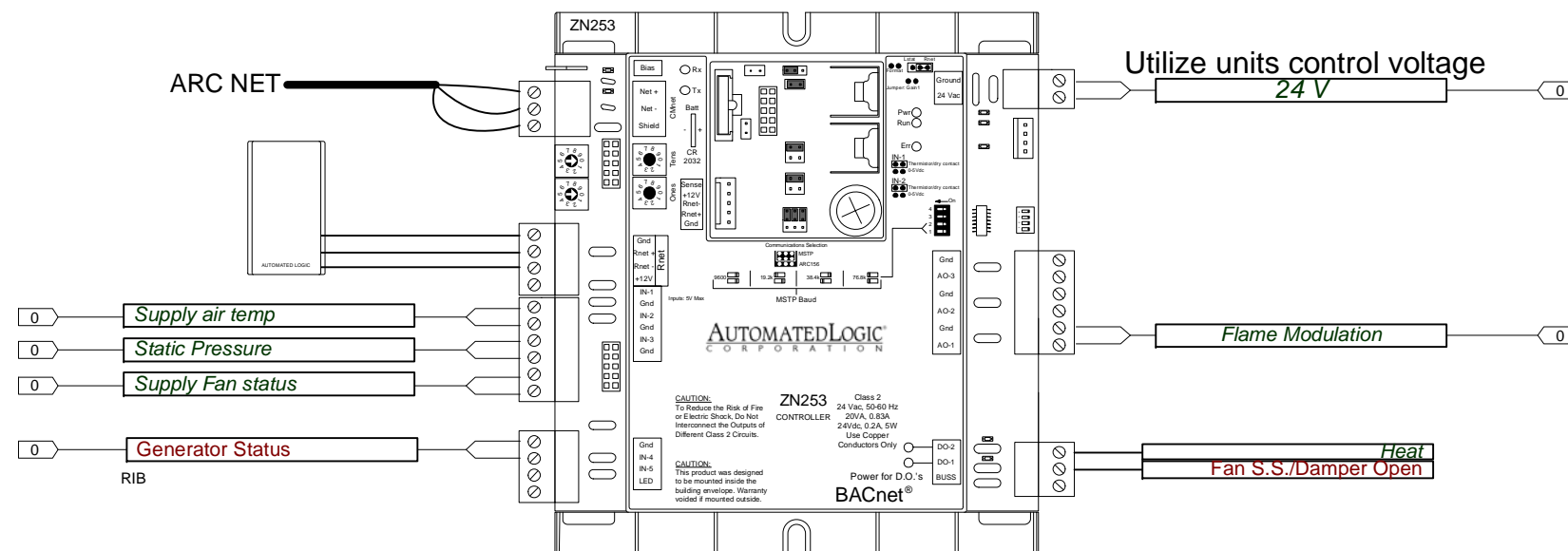
CHECK BY: RSL  
DSCODE: 07112.00

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
rib	CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	1 ea



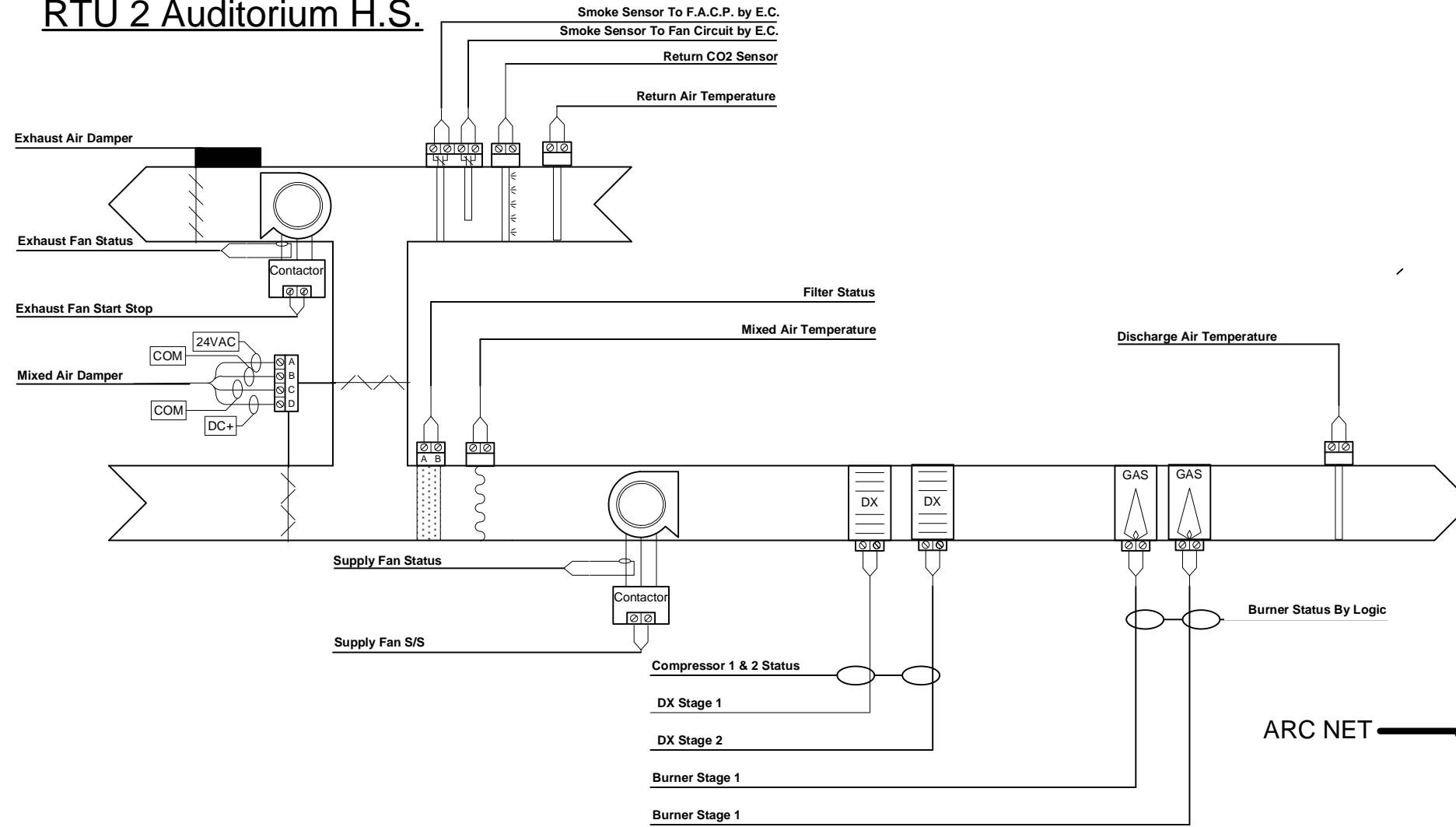
**LOGIC UPDATE**

System shutdown when generator starts



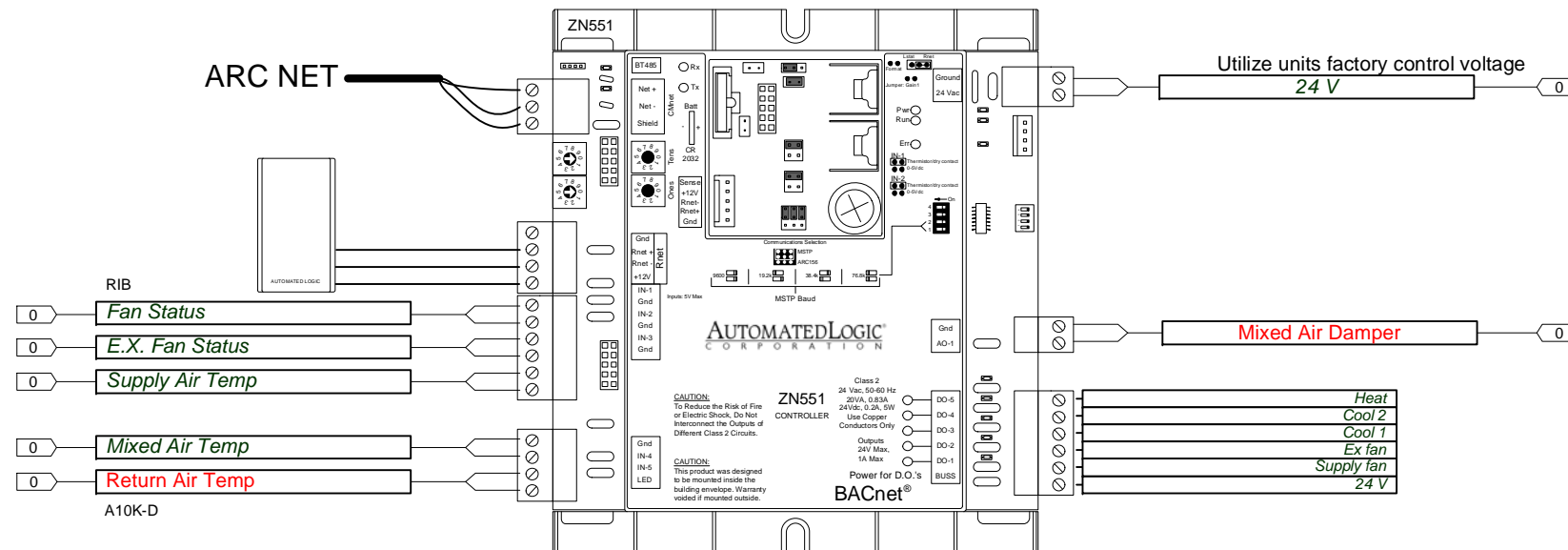
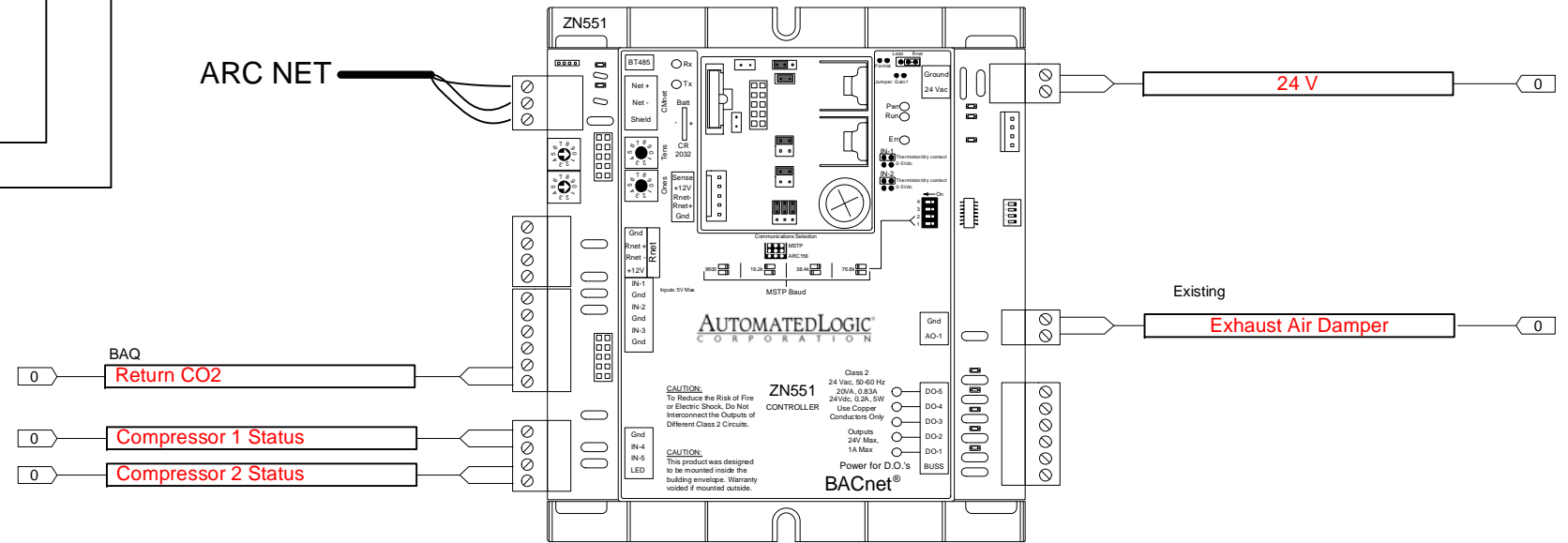
Candor Schools Candor, New York			
RTU 1S Shop H.S.			
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AUTOMATEDLOGIC CORPORATION			CHECK BY: RSL DSCODE: 07112.00
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# RTU 2 Auditorium H.S.



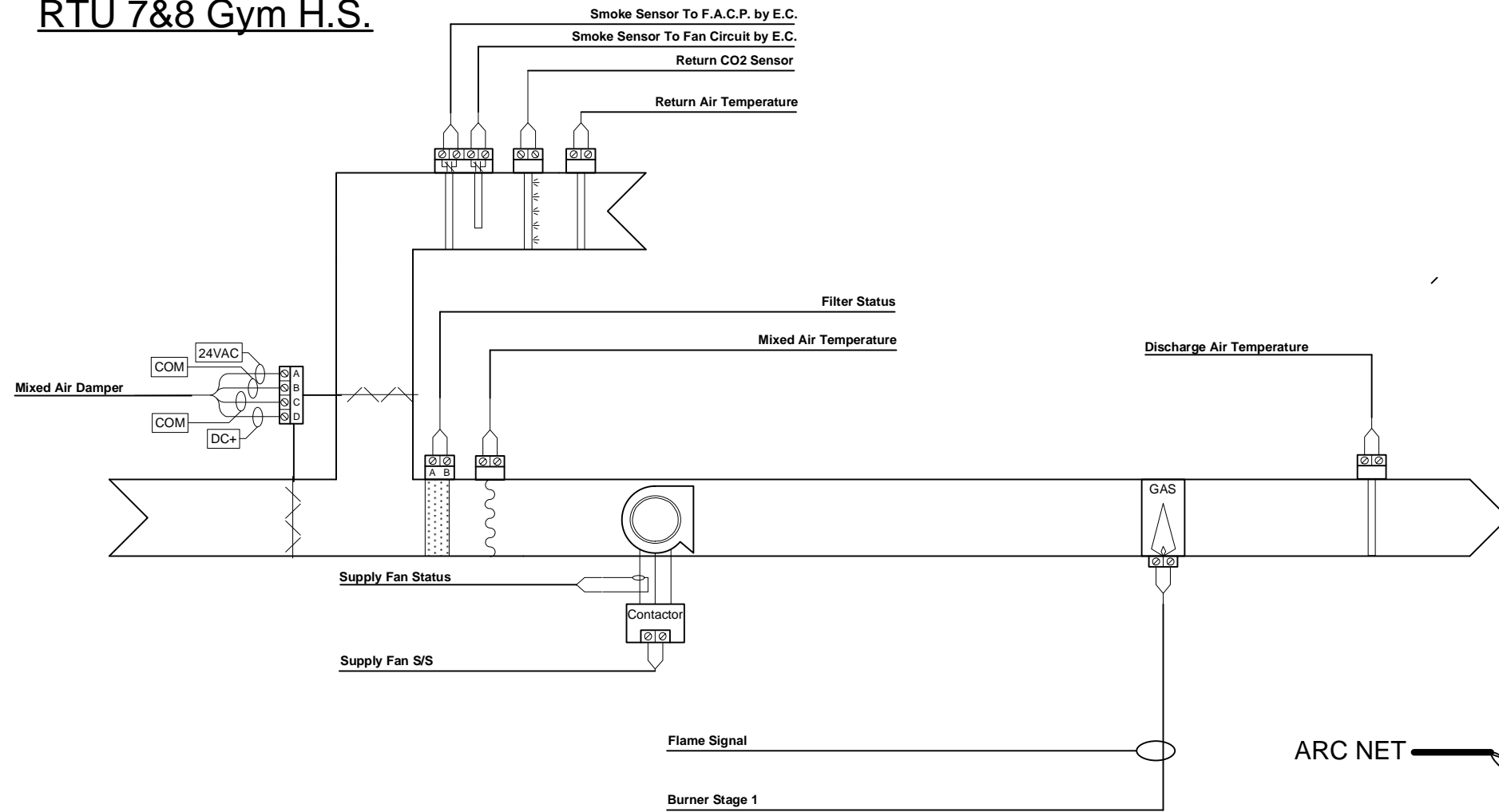
Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
A10k-d	DUCT TEMP SENSOR 10K-2	ALPS	A10K-2-D-8	1 ea
BAQ	CO2 SENSOR DUCT MOUNT	BAPI	BA/AQS-D8	2 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	1 ea
rib	CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	2 ea

**EXISTING CONTROLS**  
**ADDED CONTROLS**



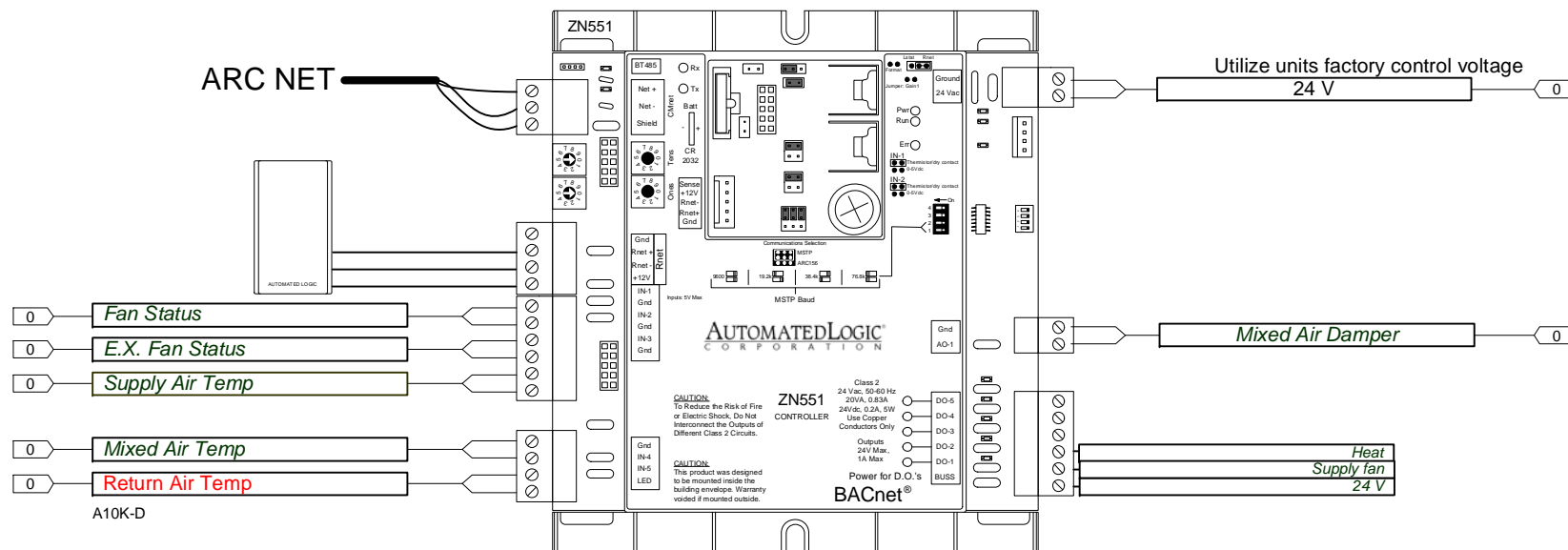
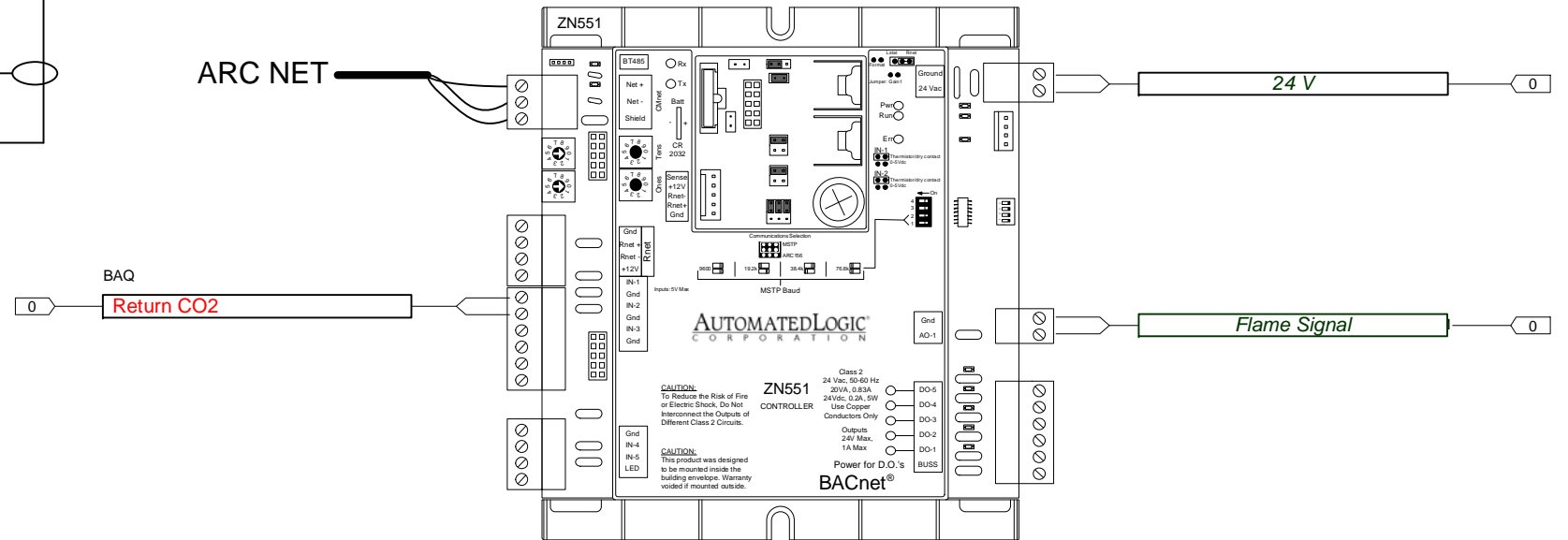
Candor Schools Candor, New York			
RTU 2 Auditorium H.S.			
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# RTU 7&8 Gym H.S.



Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
A10k-d	DUCT TEMP SENSOR 10K-2	ALPS	A10K-2-D-8	1 ea
BAQ	CO2 SENSOR DUCT MOUNT	BAPI	BA/AQS-D8	2 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	2 ea

## EXISTING CONTROLS ADDED CONTROLS

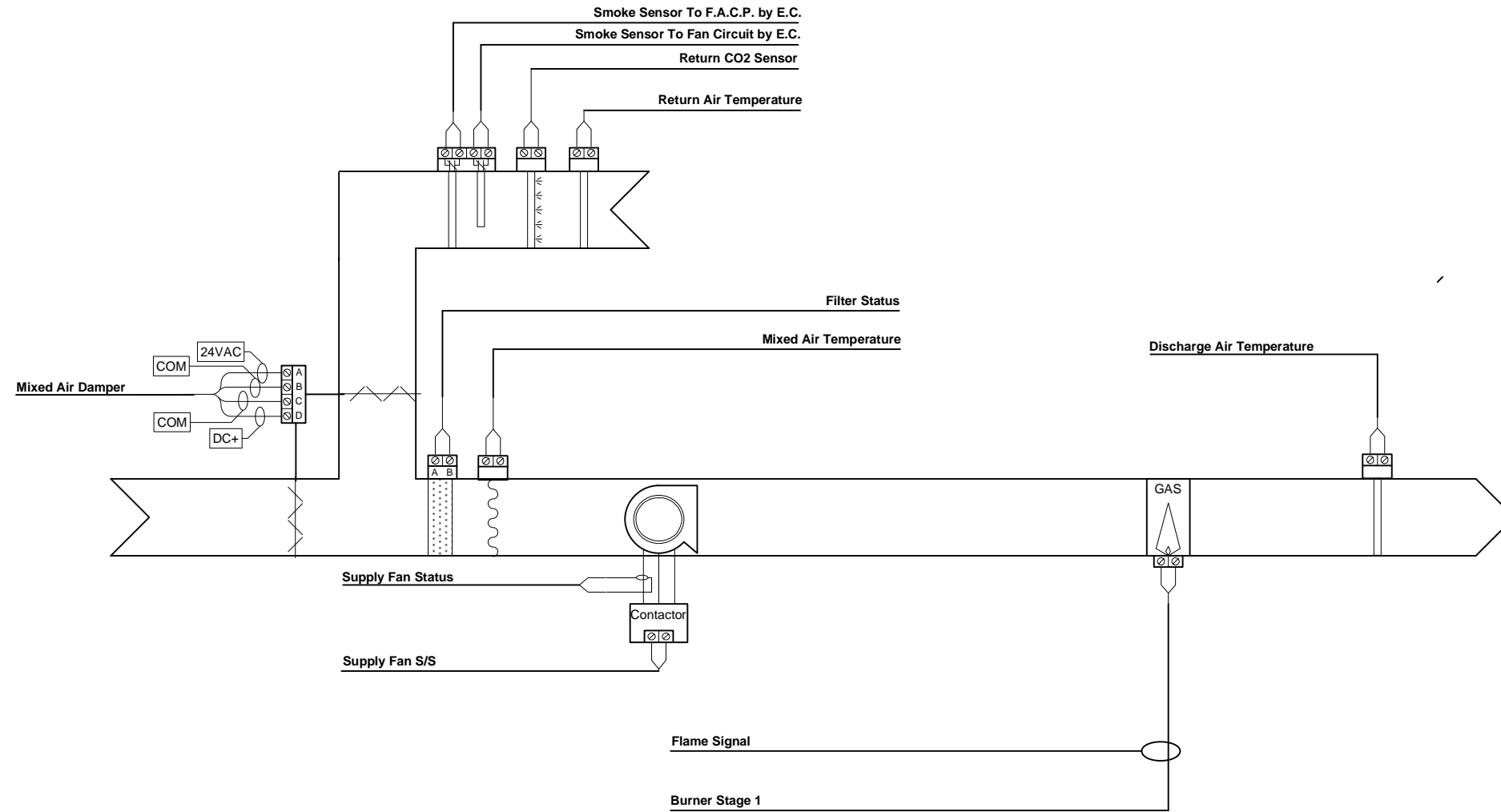


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RTU 7&8 Gym H.S.			
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AUTOMATEDLOGIC CORPORATION			CHECK BY: RSL DSCODE: 07112.00
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# RTU 8S Weight Room H.S.

## Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
ZN551	ZN551	AUTOMATED LOGIC	ZN551	0 ea

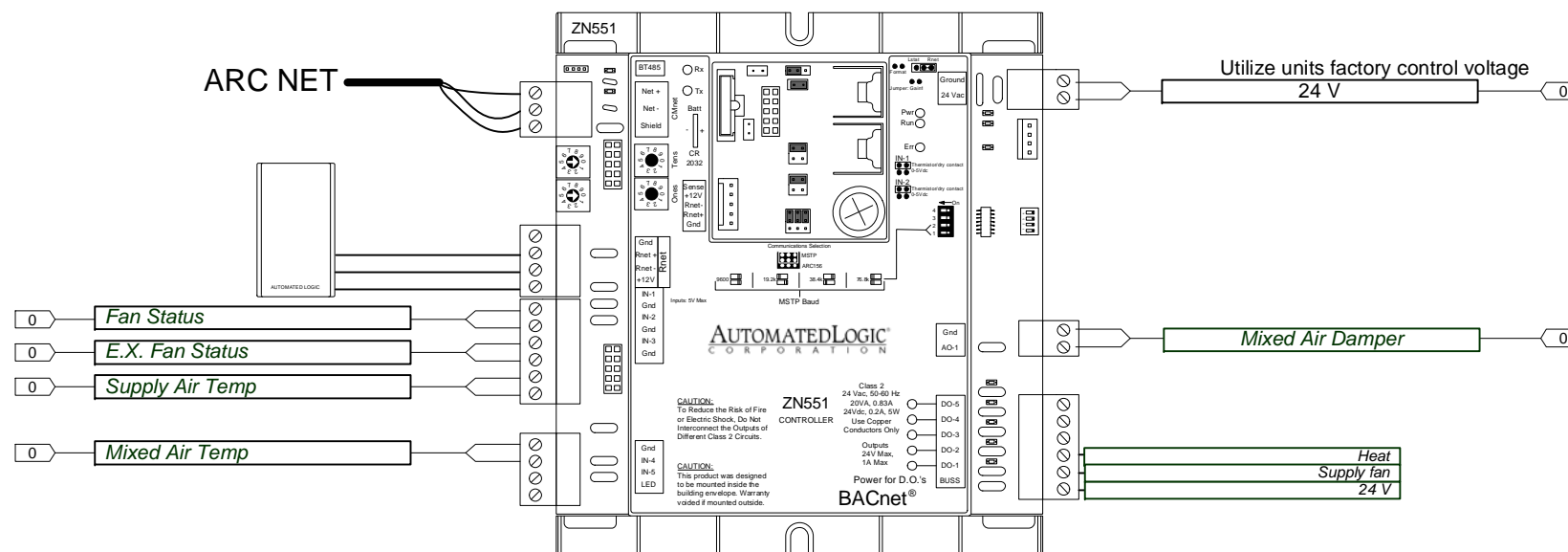


### LOGIC UPDATE

Outdoor Air to close on generator start up  
 Generator Status will be networked in from RTU 1S controller

### EXISTING CONTROLS

### ADDED CONTROLS



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RTU 8S Weight Room H.S.

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**AUTOMATED LOGIC**  
 CORPORATION

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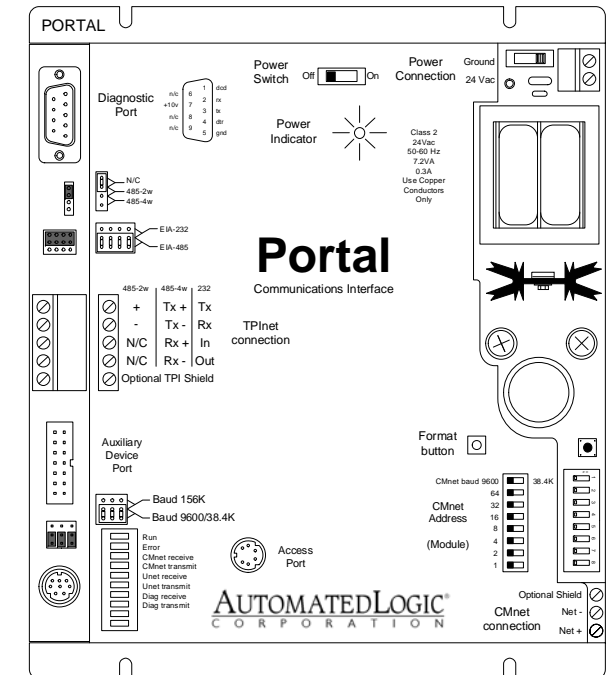
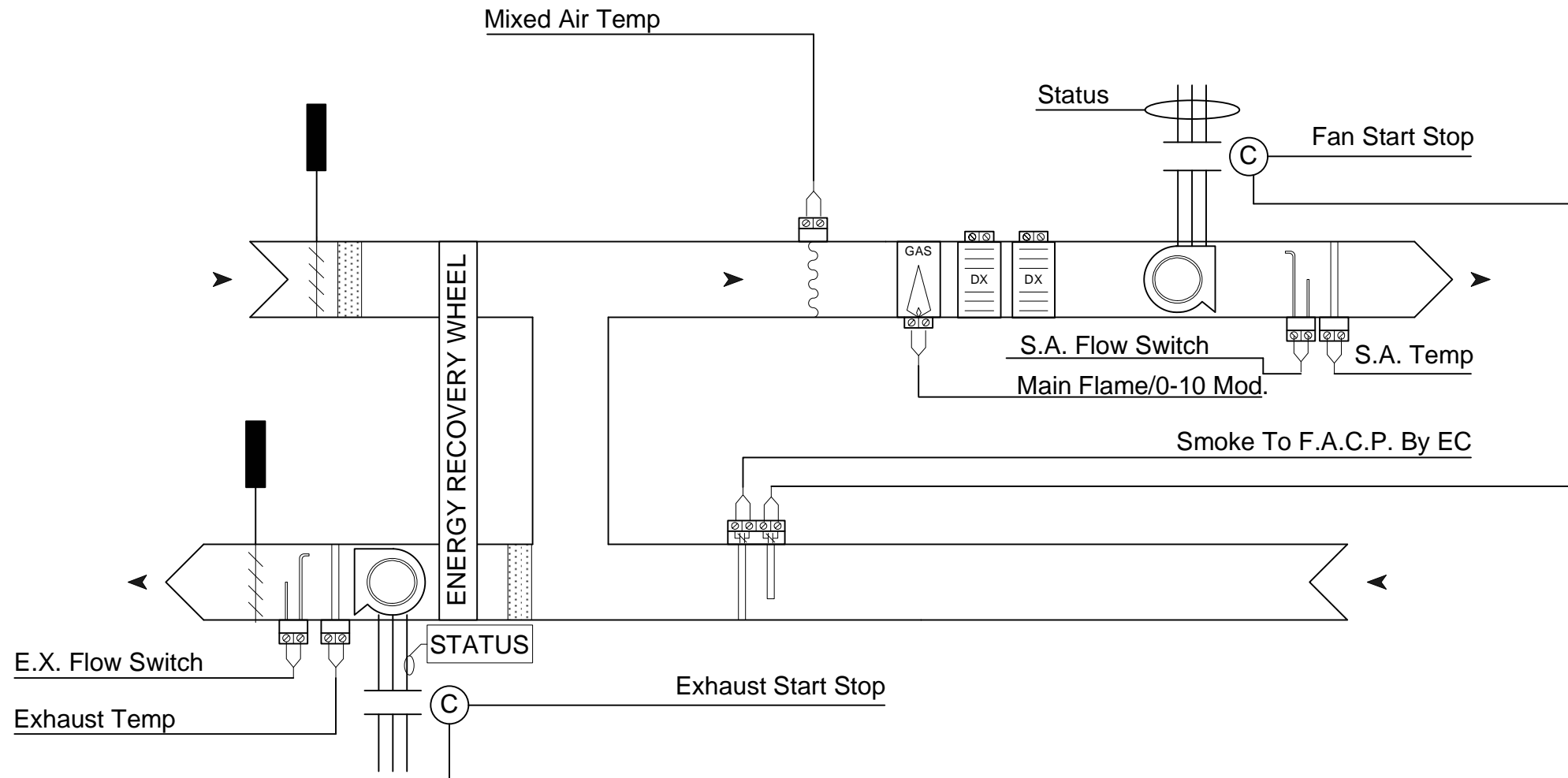
# RTU Cafeteria H.S.

## NOTE

This unit is shipped with AAON proprietary factory control, onboard CPU

This on board control processor is BACNET open protocol as specified for the facilities BAS

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
Portal	PORTAL	AUTOMATED LOGIC	PORTAL	1 ea



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RTU Cafeteria H.S.			
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# RTU 1S Cafe E.S.

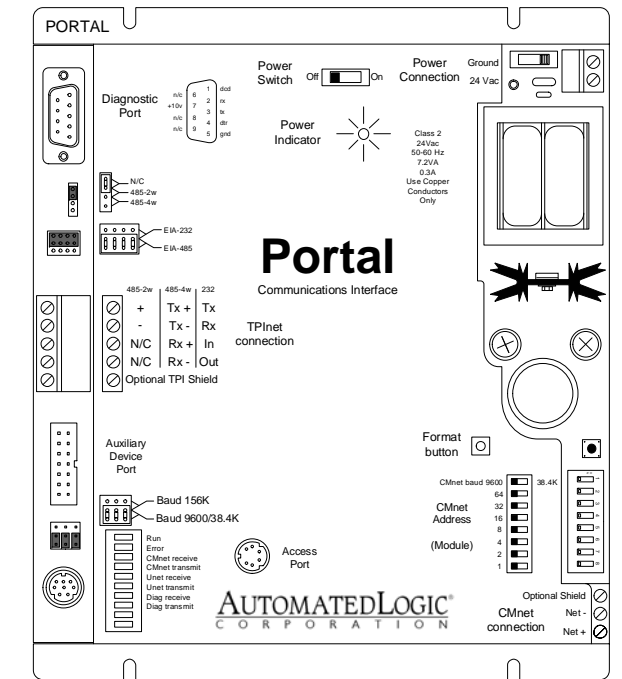
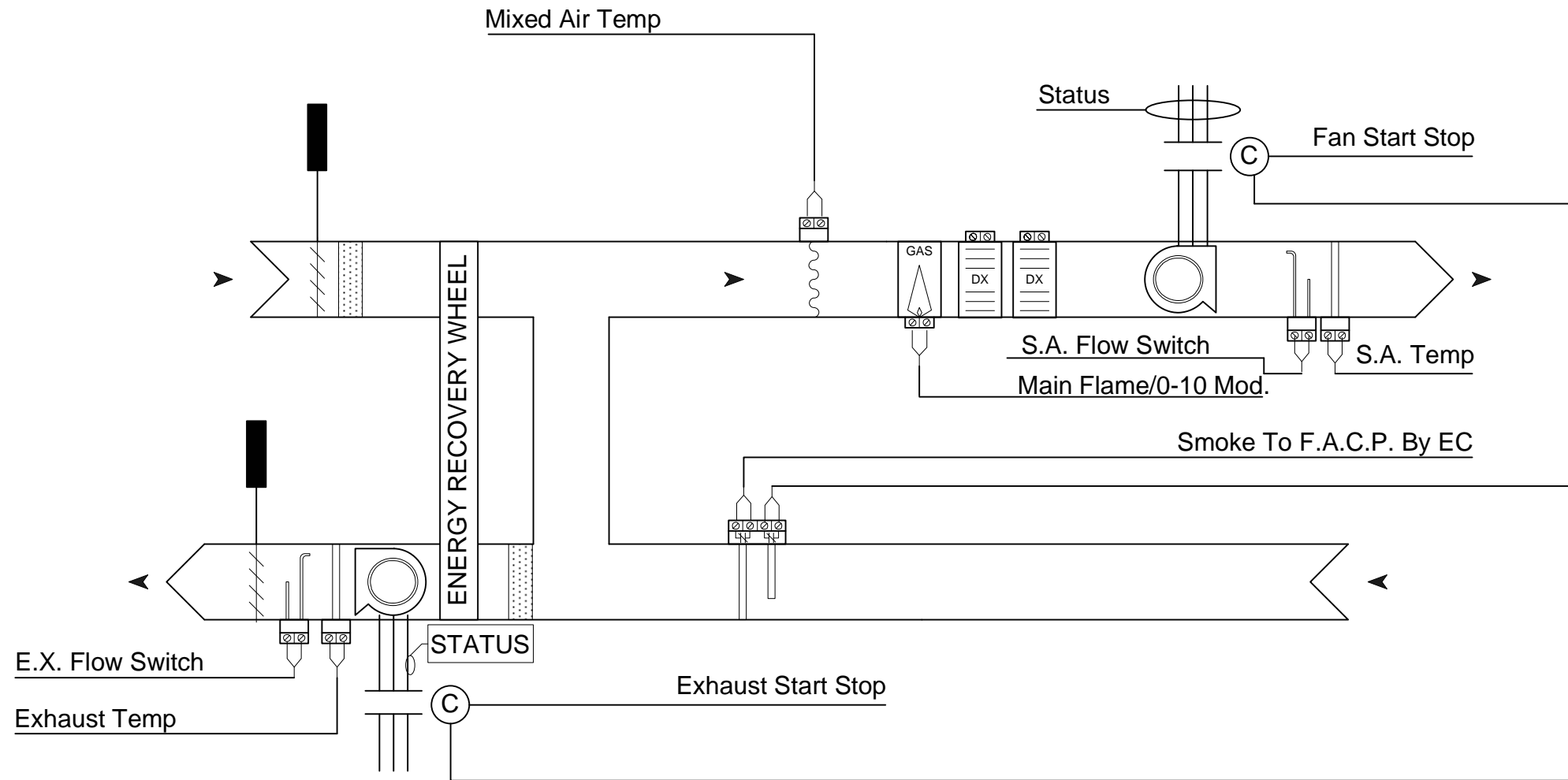
## Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
Portal	PORTAL	AUTOMATED LOGIC	PORTAL	1 ea

### NOTE

This unit is shipped with AAON proprietary factory control, onboard CPU

This on board control processor is BACNET open protocol as specified for the facilities BAS



Candor Schools  
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RTU 1S Cafe E.S.

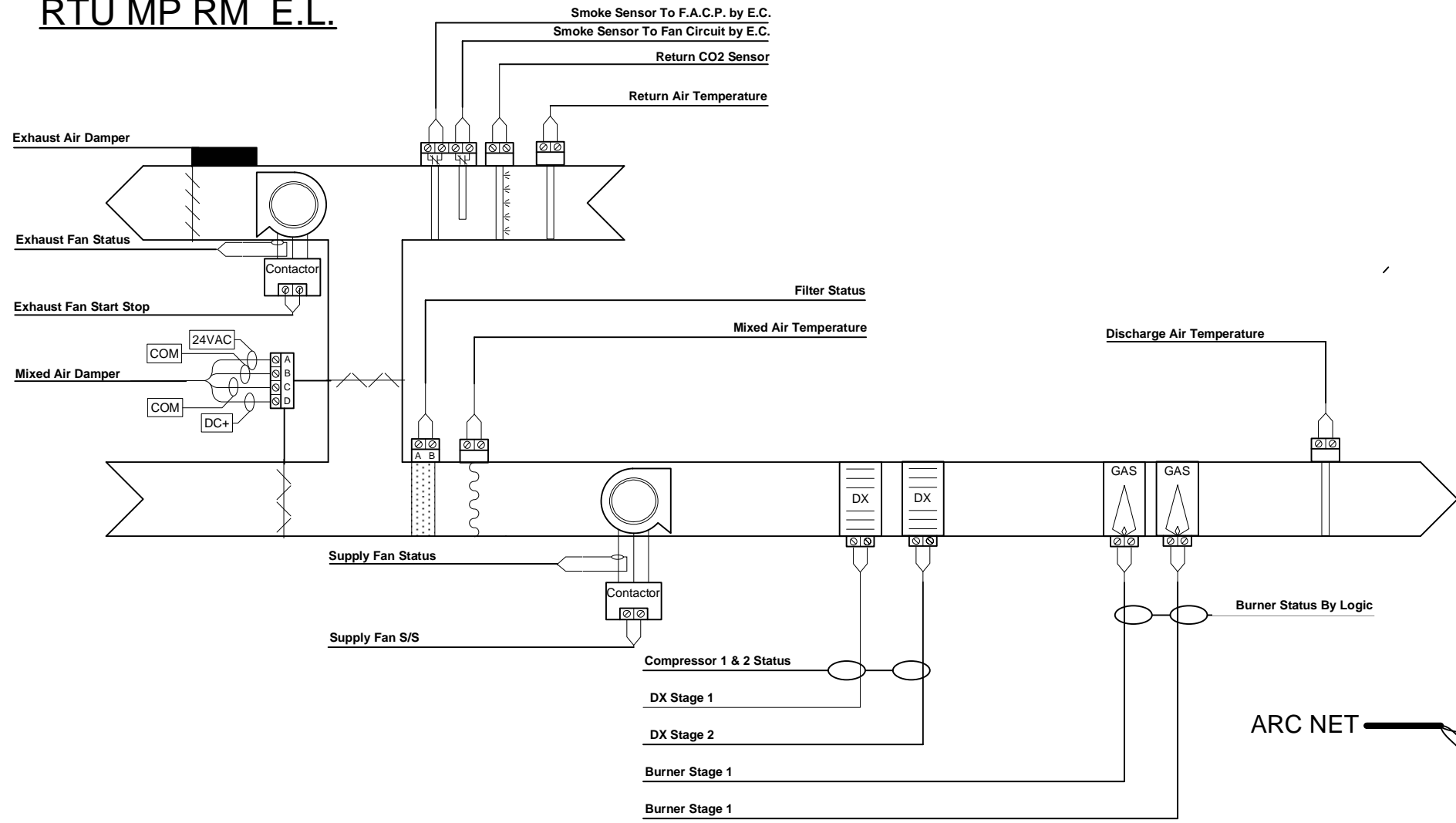
REV: 1	Submittal	9/29/2008	JOB NO: P7793
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**AUTOMATED LOGIC**  
CORPORATION

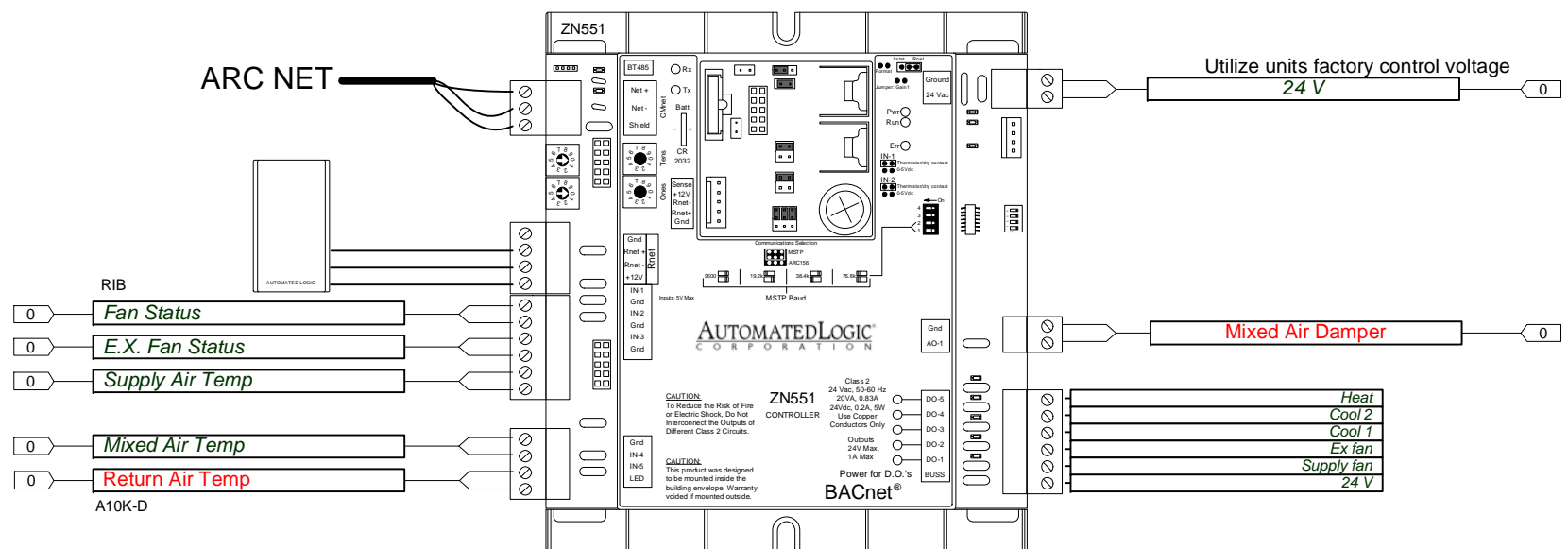
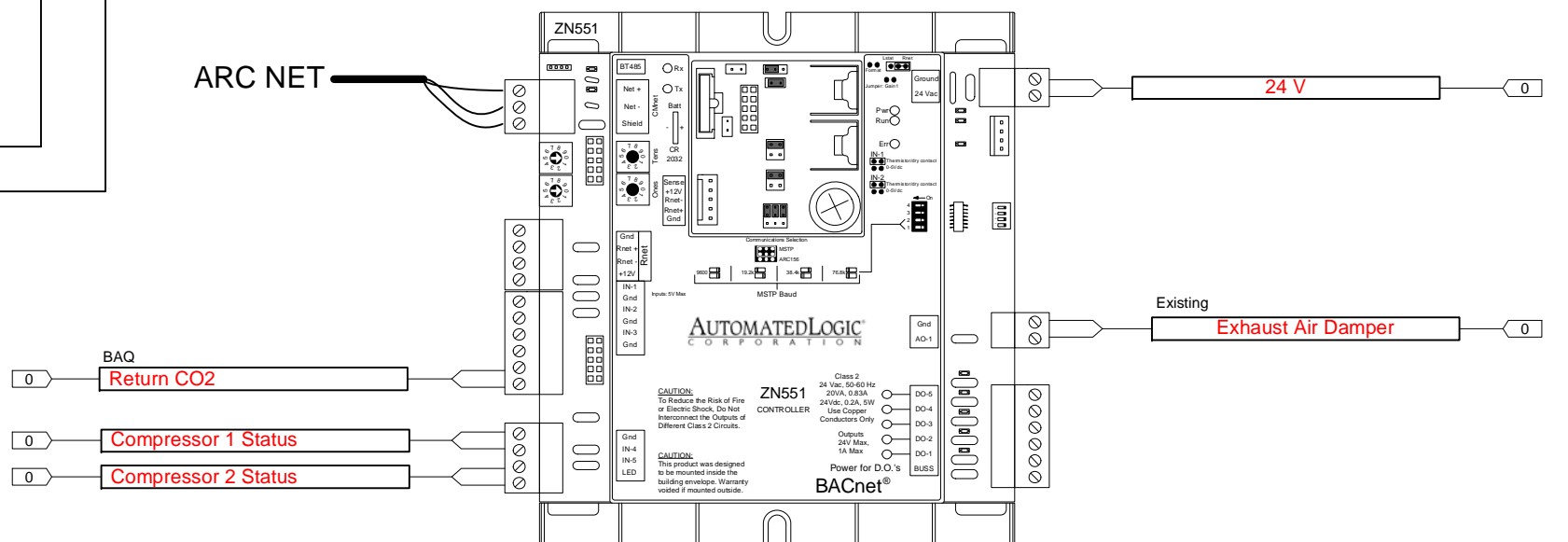


# RTU MP RM E.L.



Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
A10k-d	DUCT TEMP SENSOR 10K-2	ALPS	A10K-2-D-8	1 ea
BAQ	CO2 SENSOR DUCT MOUNT	BAPI	BA/AQS-D8	2 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	1 ea
rib	CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	2 ea

**EXISTING CONTROLS**  
**ADDED CONTROLS**



Candor Schools  
Candor, New York

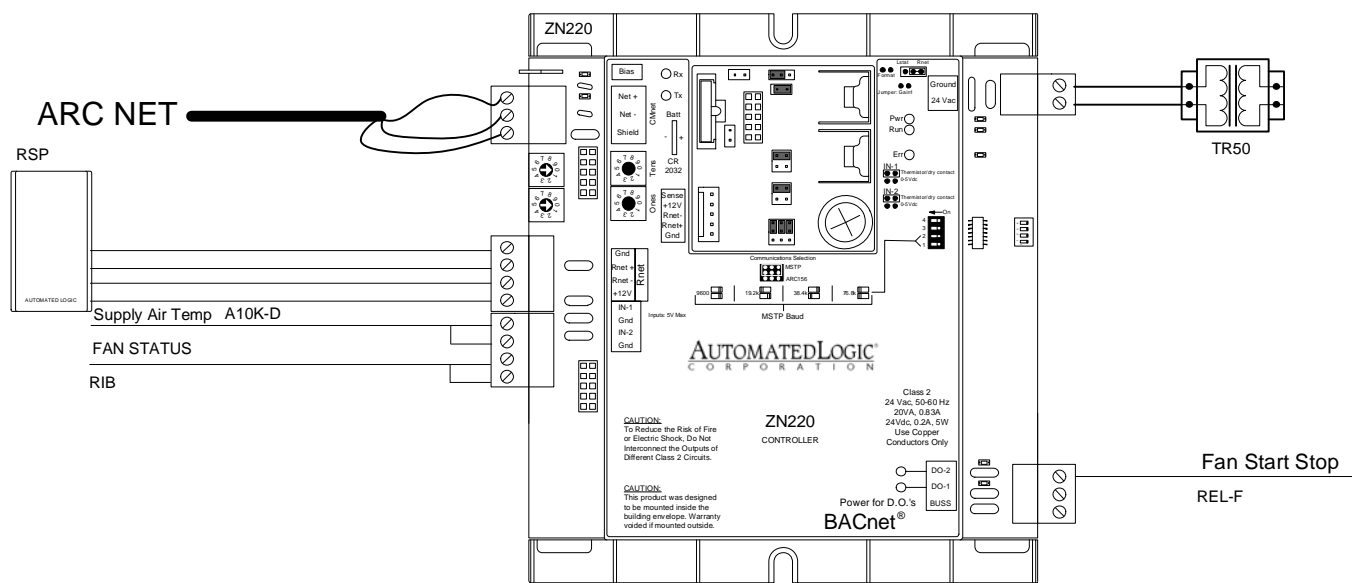
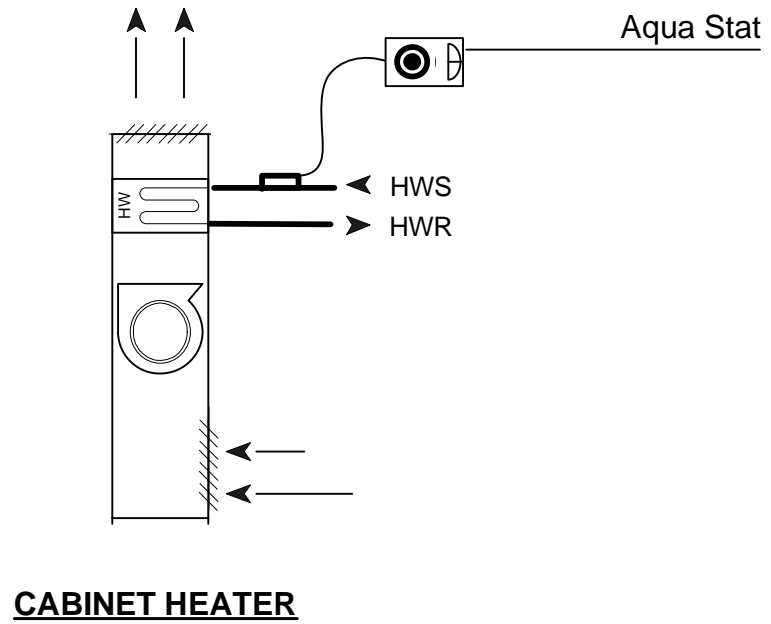
RTU MP RM E.L.

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AUTOMATED LOGIC CORPORATION			CHECK BY: RSL DSCODE: 07112.00
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# FC-1 H.S.

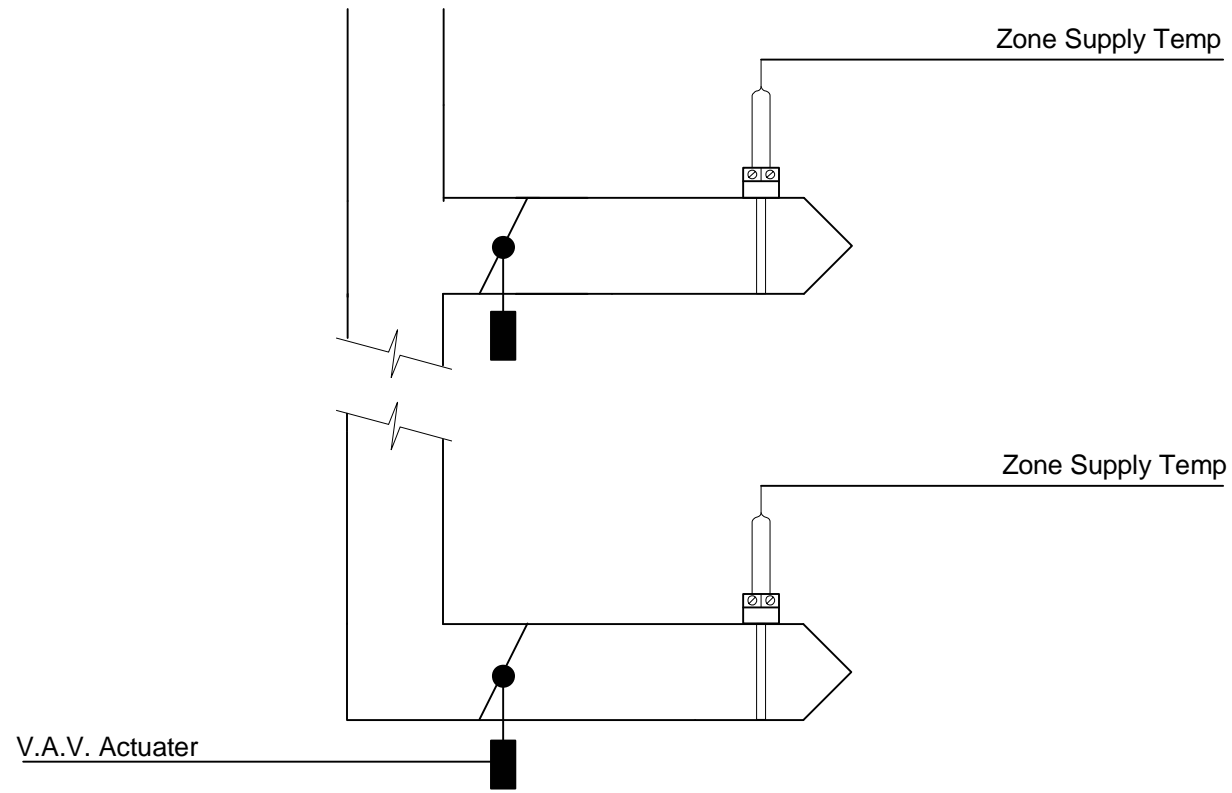
Front Entry

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
A10k-d	DUCT TEMP SENSOR 10K-2	ALPS	A10K-2-D-8	1 ea
REL-F	RIB PILOT RELAY SPDT 10AMP	KELE & ASSOC.	RIBU1C	1 ea
TR50	50 VA TRANSFORMER	FUNCTIONAL DEVICES	TR50VA	1 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	1 ea
rib	CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	1 ea
rsp	RSPL	ALC	RSPL	1 ea



Candor Schools Candor, New York			
FC-1 H.S.			
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# VAV H.S.



## Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
DA-CE	SR 0-10VDC 35 IN-LB 24 V	BELIMO	LF24-SR ALC	5 ea
DTS-D	DUCT 10K THERMISTOR PROBE 8 IN.	BAPI	ALC/10K-2-D-8	5 ea
U551	U551	AUTOMATED LOGIC	U551	5 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	5 ea

## NOTES

1. Space Sensor is shared with U.V. Sensor

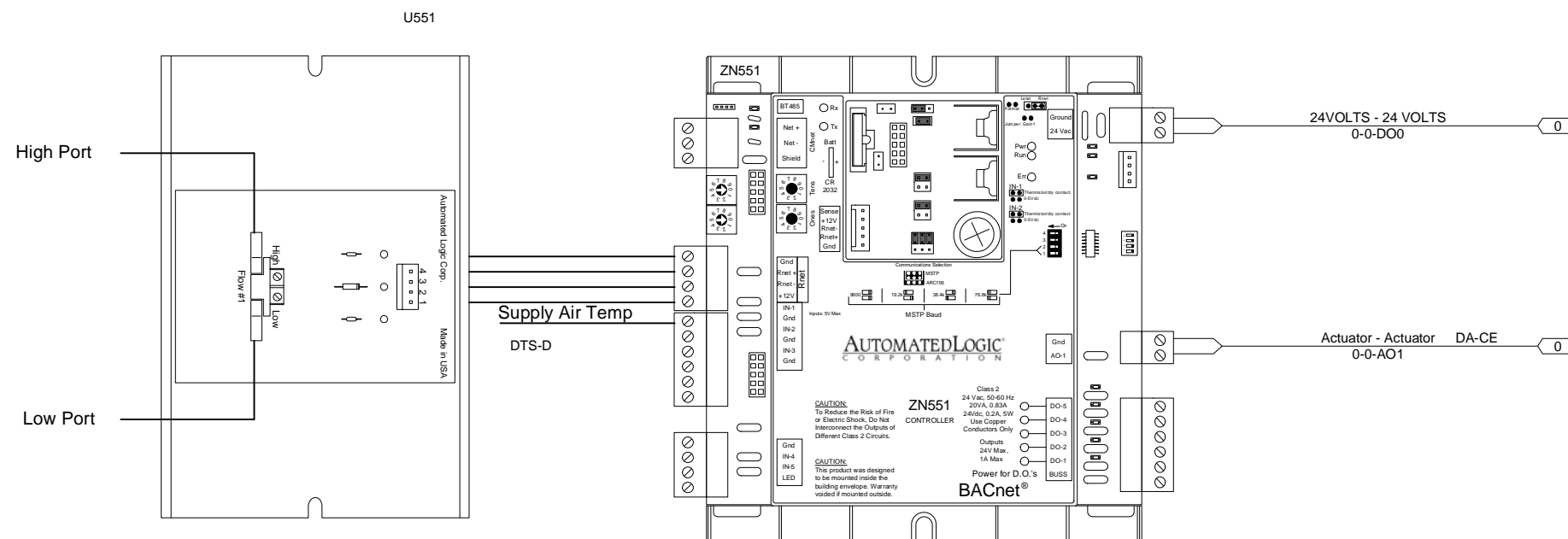
## SERVING

English S 209

English S 207

Teachers Work Room S 205

Faculty S 204



Candor Schools  
Candor, New York

VAV H.S.

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**AUTOMATEDLOGIC**  
CORPORATION

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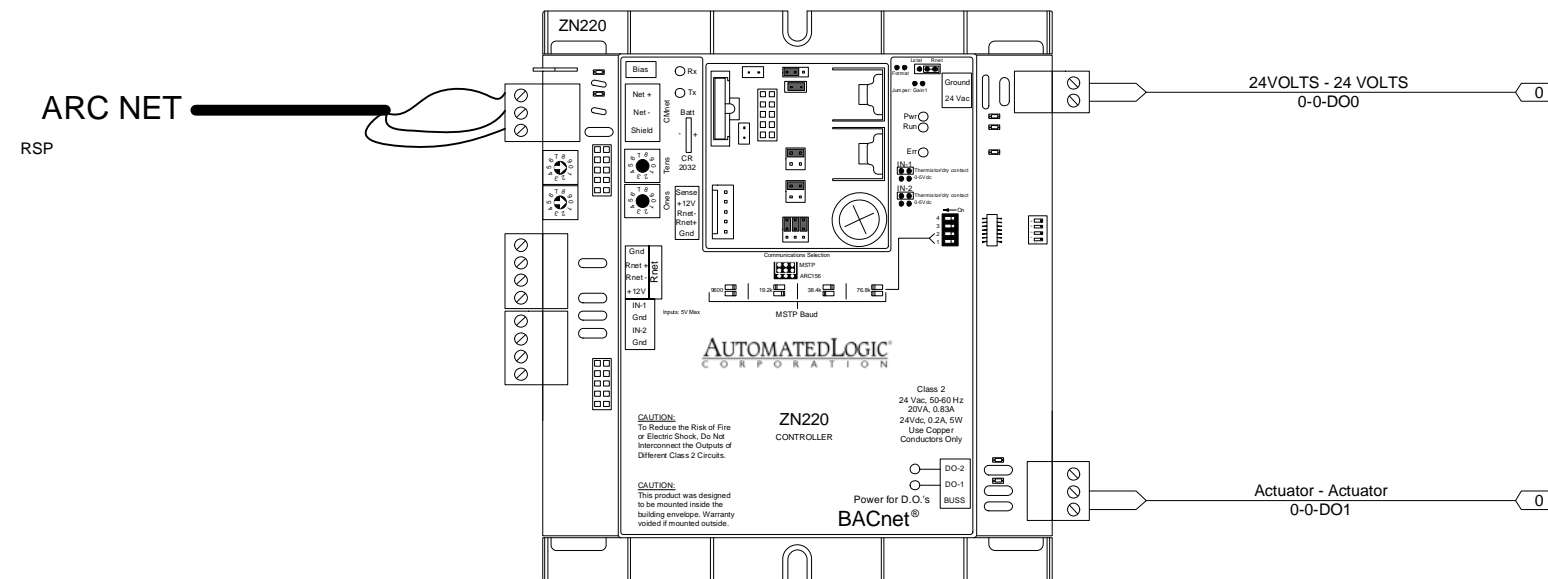
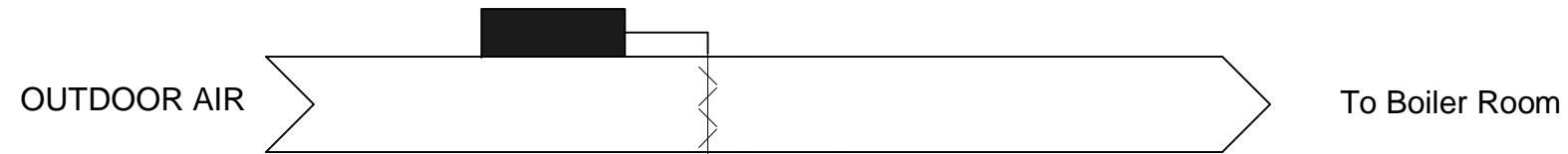
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# Domestic Boiler Fresh Air

## Bill of Materials

DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
ZN220	ZN220	AUTOMATED LOGIC	ZN220	1 ea
rsp	RSPL	ALC	RSPL	1 ea



Candor Schools  
Candor, New York

Domestic Boiler Fresh Air

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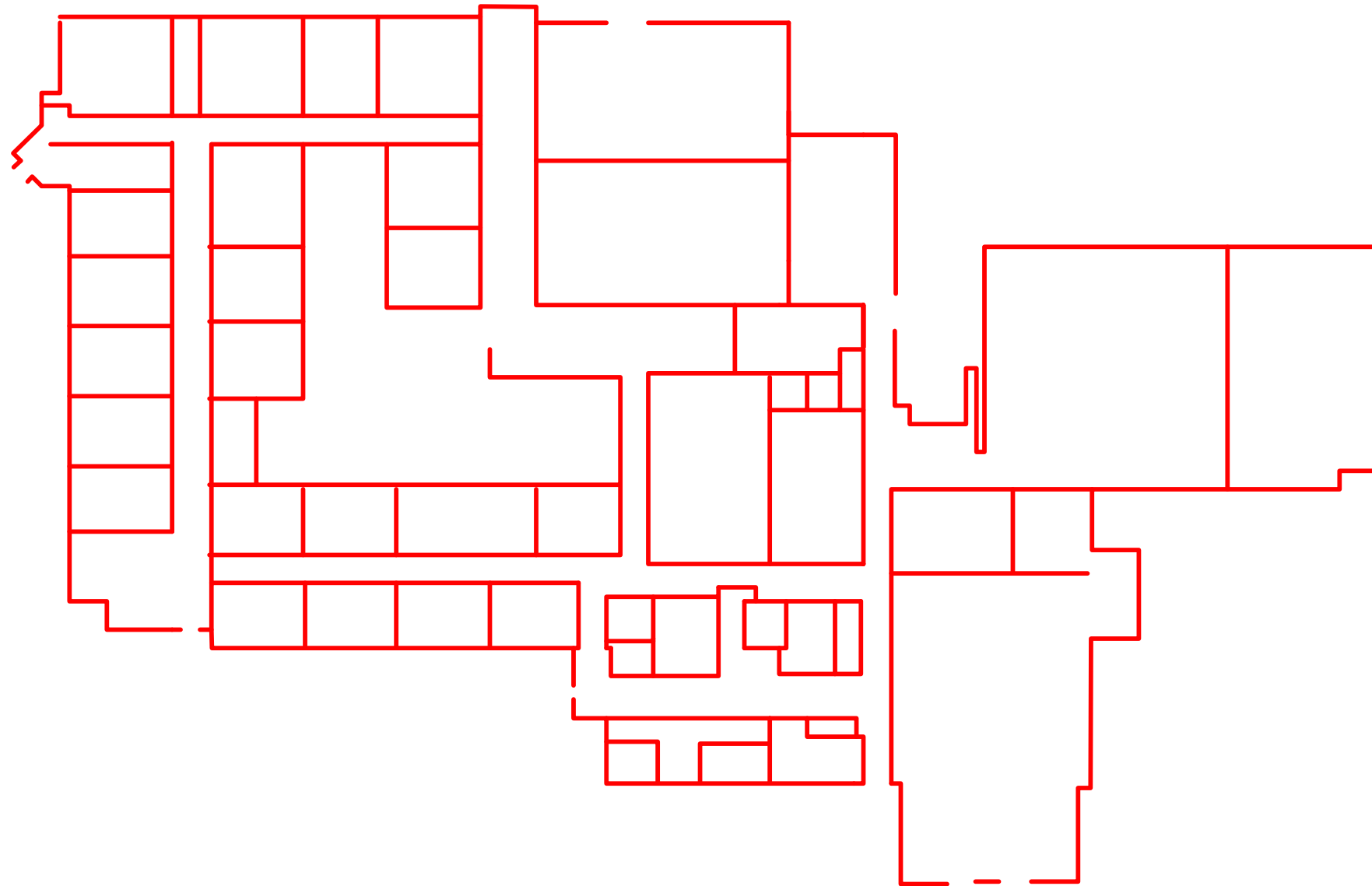
**AUTOMATED LOGIC**  
CORPORATION

CHECK BY: RSL  
DSCODE: 07112.00



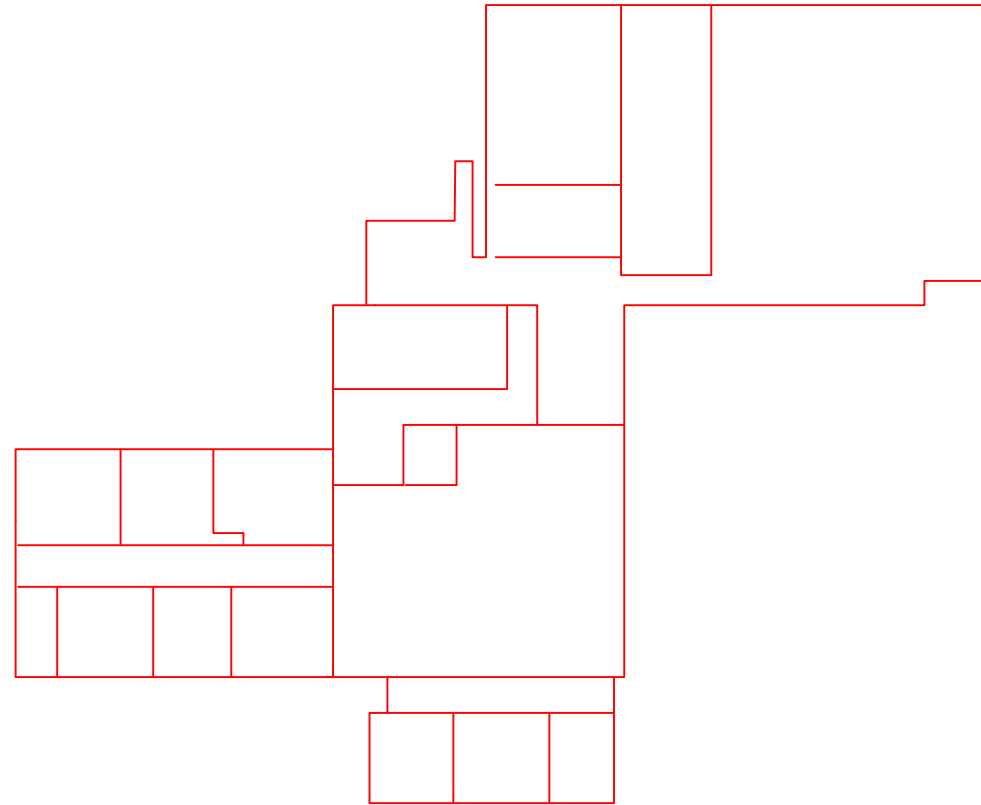


FIRST FLOOR



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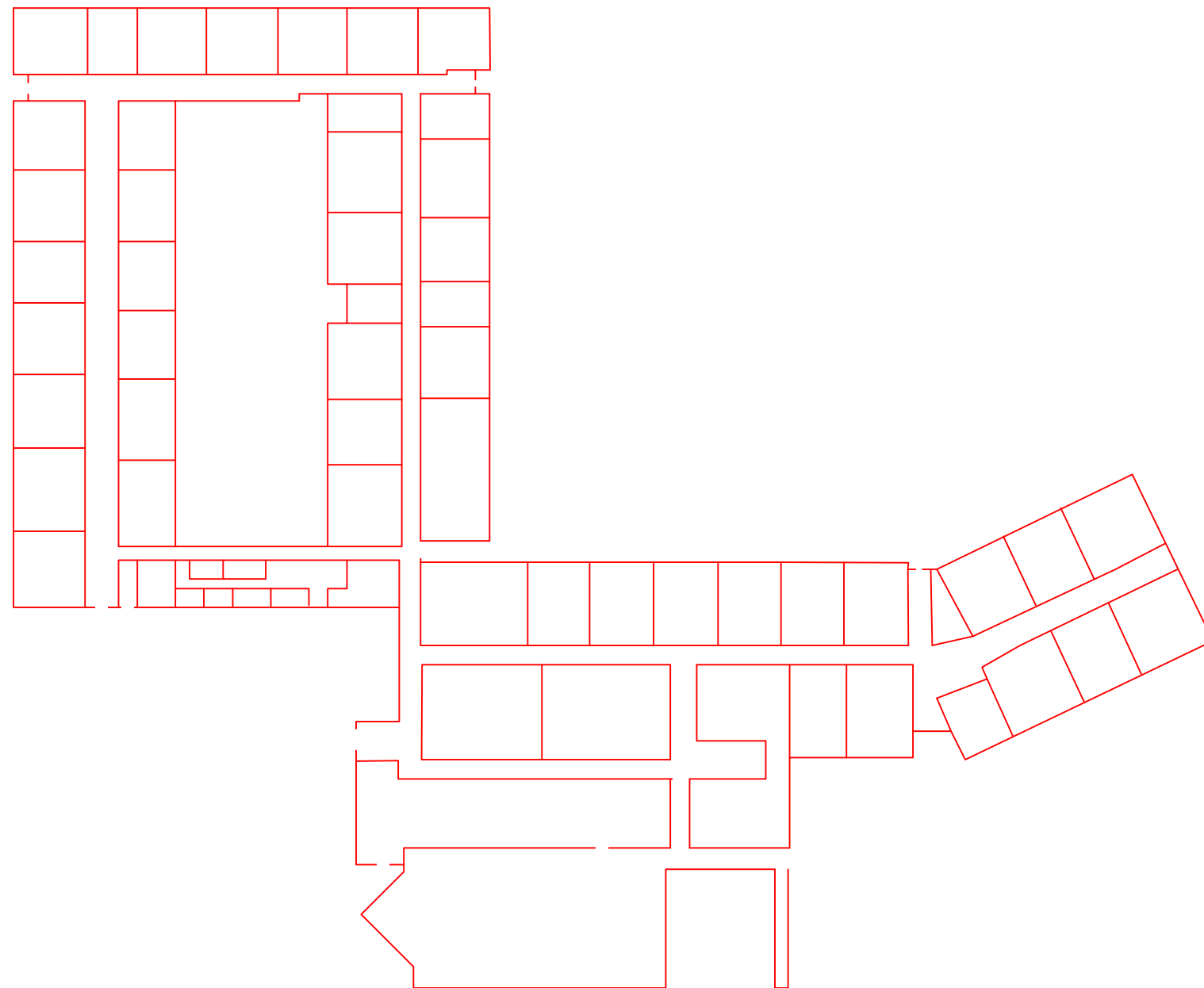
BASEMENT



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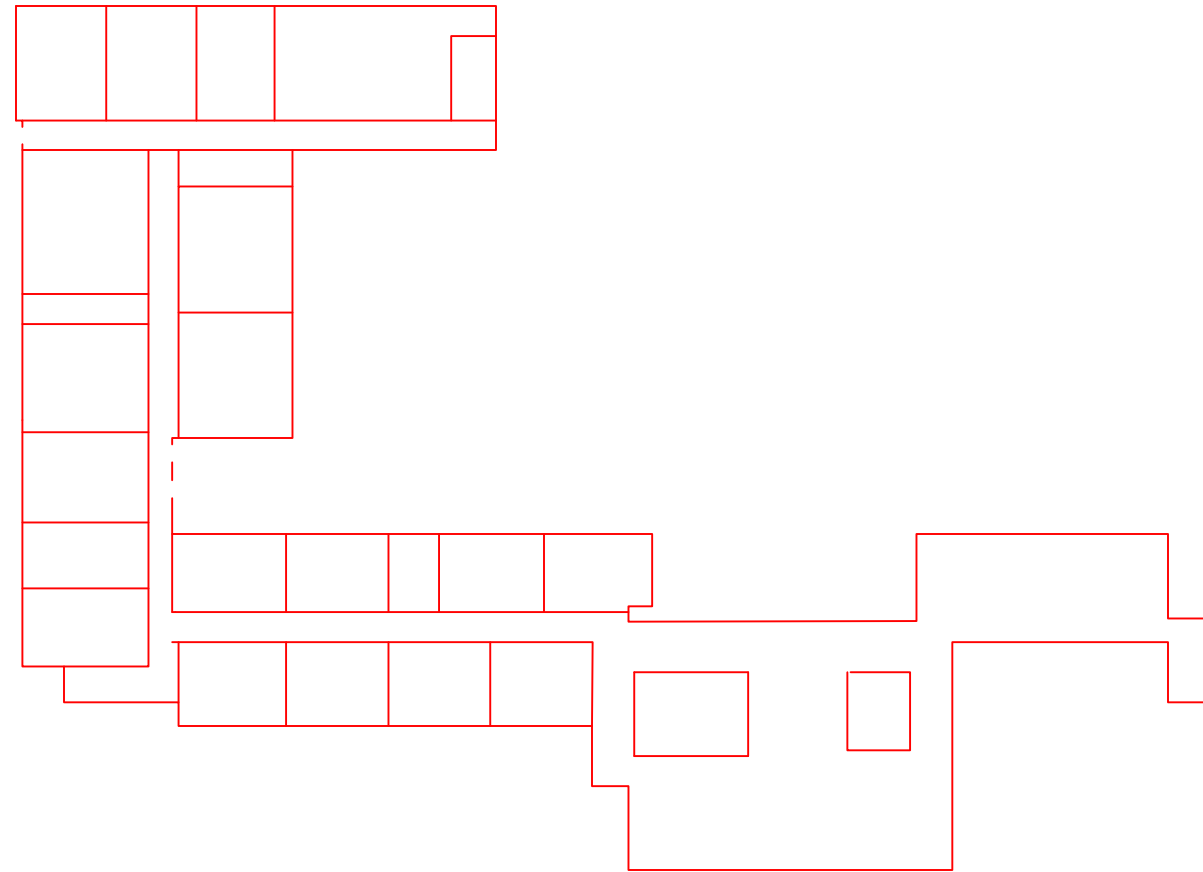


Elementary School



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High School Second Floor



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