

Windsor School District Palmer Middle School

Windsor, New York

Application Engineering by Randy Langille

Engineer/Architect M/E Engineering

Mechanical Contractor J.L. Lewis

Job Number P7776

AUTOMATEDLOGIC[®]
CORPORATION

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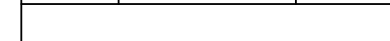
Windsor School District Palmer Middle School

Windsor, New York

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

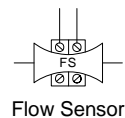
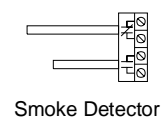
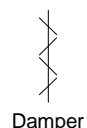
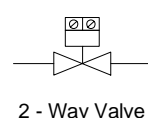
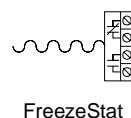
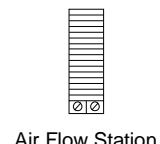
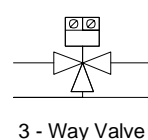
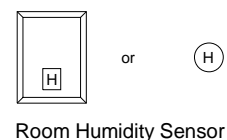
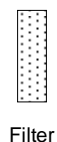
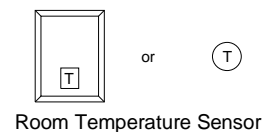
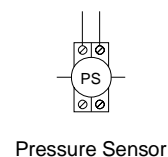
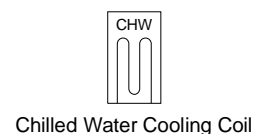
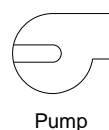
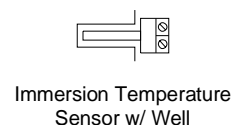
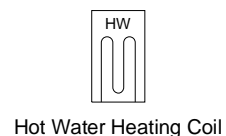
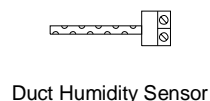
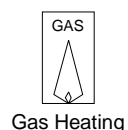
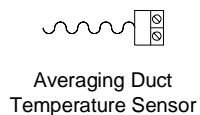
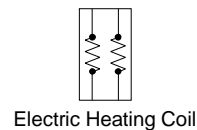
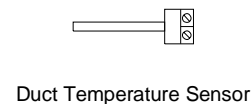
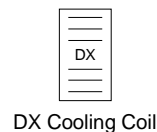
Table of Contents

REV: 1	As-Built	12/4/2009	JOB NO: P7776
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			CHECK BY: RSL
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			DSCODE: 07112.00
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Symbol Legend



Common Abbreviations:

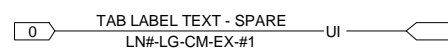
AC - Air Conditioning
 ACU - Air Conditioning Unit
 AHU - Air Handling Unit
 AI - Analog Input
 AO - Analog Output
 AUTO - Automatic
 AUX - Auxiliary
 C - Common
 CHW - Chilled Water
 CHWP - Chilled Water Pump
 CHWR - Chilled Water Return
 CHWS - Chilled Water Supply
 COND - Condenser
 CW - Condenser Water
 CWP - Condenser Water Pump
 CWR - Condenser Water Return
 CWS - Condenser Water Supply
 DA - Discharge Air
 DI - Digital Input
 DO - Digital Output
 EA - Exhaust Air
 EF - Exhaust Fan

EVAP - Evaporator
 F - Fahrenheit
 FCU - Fan Coil Unit
 HOA - Hand / Off / Auto
 HP - Heat Pump
 HRU - Heat Recovery Unit
 HTEX - Heat Exchanger
 HW - Hot Water
 HWP - Hot Water Pump
 HWR - Hot Water Return
 HWS - Hot Water Supply
 MAX - Maximum
 MIN - Minimum
 MISC - Miscellaneous
 NC - Normally Closed
 NO - Normally Open
 OA - Outdoor Air
 PIU - Powered Induction Unit
 RA - Return Air
 RF - Return Fan
 RH - Relative Humidity
 RTU - Roof-top Unit

SA - Supply Air
 SF - Supply Fan
 SP - Static Pressure
 TEMP - Temperature
 UH - Unit Heater
 UV - Unit Ventilator
 VAV - Variable Air Volume
 VVTU - Variable Volume Terminal Unit
 W/ - with
 W/O - without
 WSHP - Water-Source Heat Pump

General Notes:

- All control modules are drawn using standard ALC module representations.
- 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.

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Symbol Legend

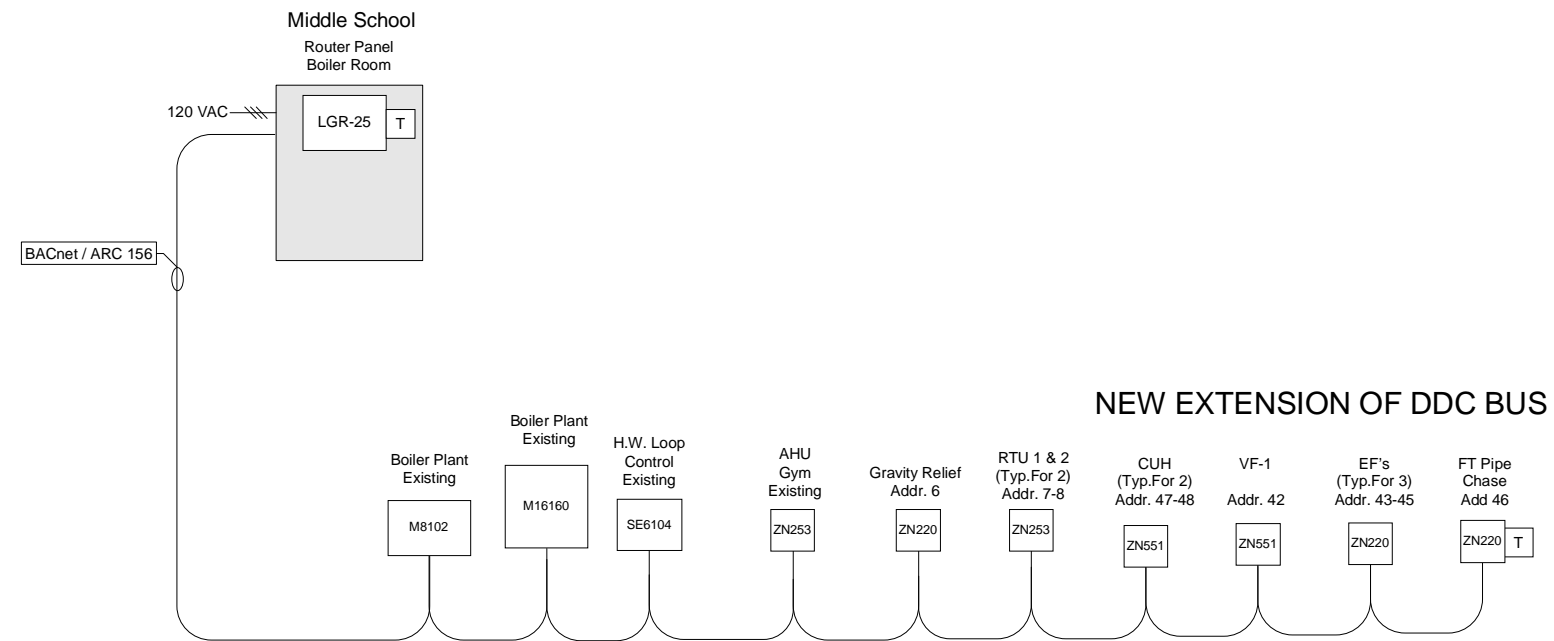
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Riser



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.

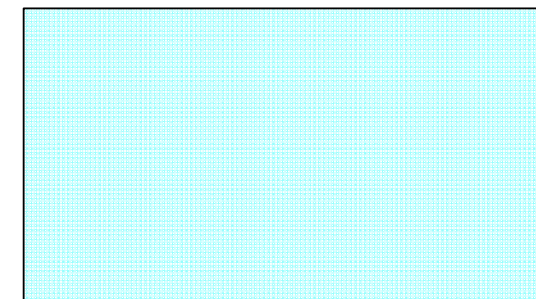
Each ARC156 segment should have one (1) PROT485 installed to provide protection from electrical surges.



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.





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Riser			
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Summary Bill of Materials

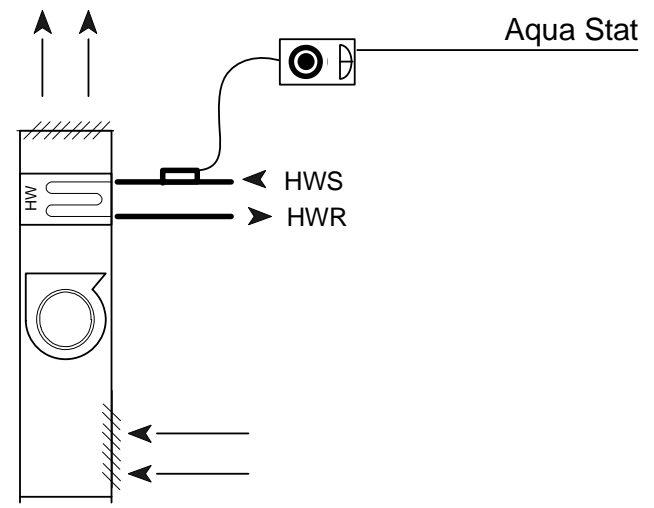
Summary Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
DA-AA	SR OPEN/CLOSE 60 IN-LB 24V AUX SWITCH	BELIMO	NF24-S ALC	1 ea
DA-BB	SR OPEN/CLOSE 35 IN-LB 24 V	BELIMO	LF24 ALC	4 ea
DTS-D	DUCT 10K THERMISTOR PROBE 8 IN.	BAPI	ALC/10K-2-D-8	1 ea
E-AB	HOFFMAN NEMA 3 12X12X4	HOFFMAN	A12R124	6 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-F	RIB PILOT RELAY SPDT 10AMP	KELE & ASSOC.	RIBU1C	4 ea
RIBU1C	RELAY	FUNCTIONAL DEVICES	RIBU1C	3 ea
RIBXKF	.25 TO 150 CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	6 ea
RSPLUS	ROOM SENSOR WITH PB AND SA	ALC	RSPLUS	8 ea
TR-A	TRANSFORMER, 120/24VAC, 50VA	CORE COMPONENTS	LE-117	8 ea
TR-D	TRANSFORMER, MULTITAP 24VAC, 100VA	CORE COMPONENTS	LE170	1 ea
TR50VA	MULTI TAP PRIMARY 24V	FUNCTIONAL DEVCICES	TR50VA	3 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	12 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	4 ea

Dampers and Valves are on schedules

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Summary Bill of Materials			
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Cabinet Unit Heaters

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
E-AB	HOFFMAN NEMA 3 12X12X4	HOFFMAN	A12R124	2 ea
REL-F	RIB PILOT RELAY SPDT 10AMP	KELE & ASSOC.	RIBU1C	2 ea
RIBXKF	CURRENT SENSOR	RIB	RIBXKF	2 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	2 ea



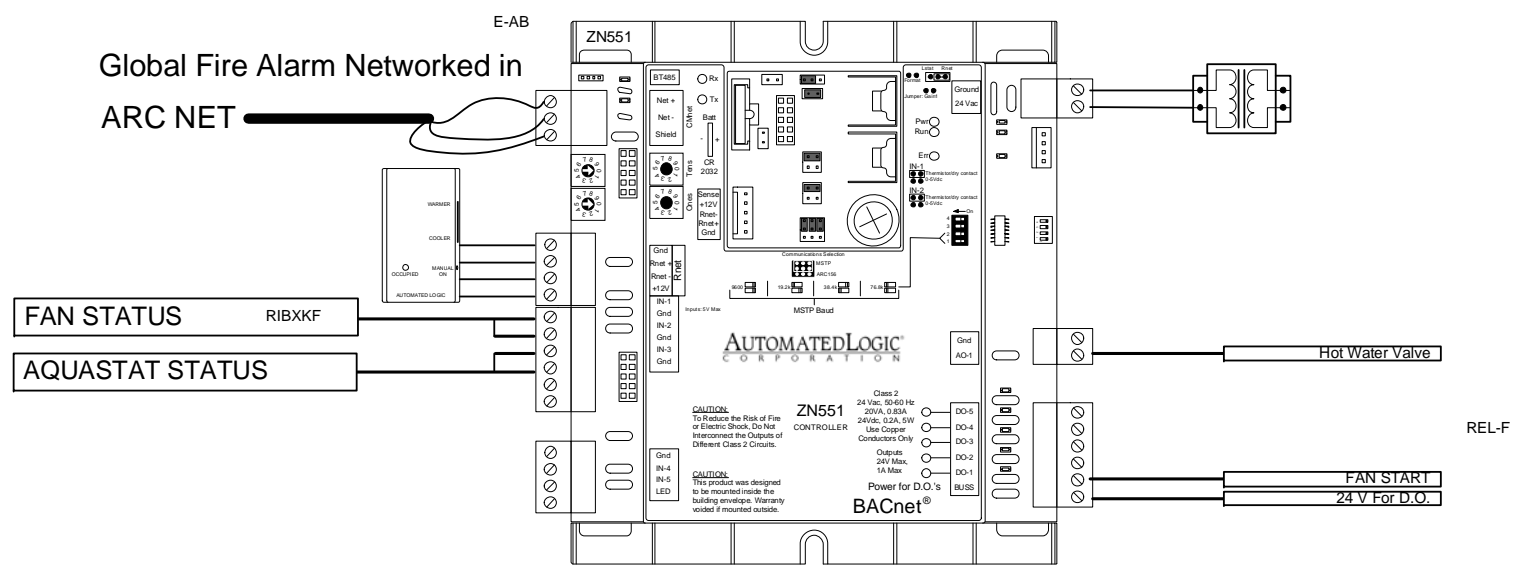
CABINET HEATER

CUH CONTROL

1. fan shall be energized by BAS during a heat call, and off when space temperature is satisfied.
2. Valve will open during occupied mode, and hot water will continuously circulate. During unoccupied mode, valve will remain closed until a heat call is generated based on unoccupied set point.
3. Aqua stat will hold fan off if water temperature is under 100 deg. F.

CUH ALARMS

1. CUH will generate an alarm if status is not proved when fan is enabled.
2. CUH will be shut down, and damper closed during a global fire alarm .



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Cabinet Unit Heaters

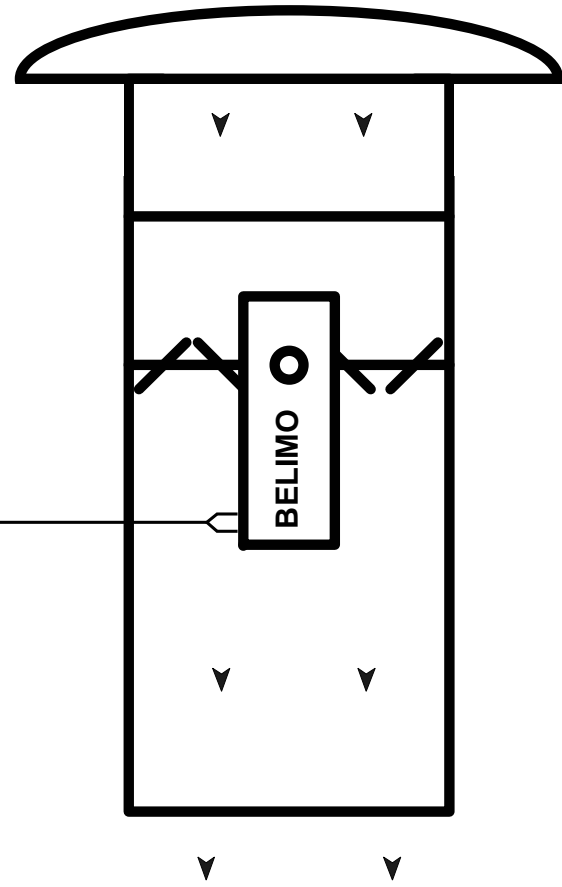
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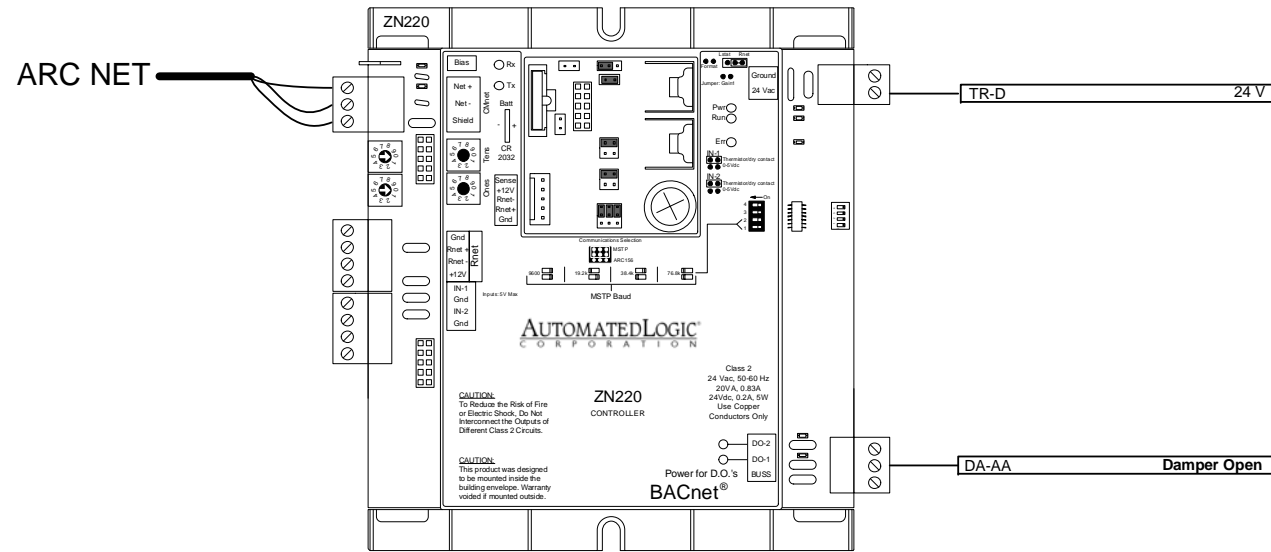
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IV 1



2 Position Spring Return Actuator



Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
DA-AA	SR OPEN/CLOSE 60 IN-LB 24V AUX SWITCH	BELIMO	NF24-S ALC	1 ea
TR-D	TRANSFORMER, MULTITAP 24VAC, 100VA	CORE COMPONENTS	LE170	1 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	1 ea

GRAVITY RELIEF CONTROL

SAFETIES:



1. Shut damper, and generate an alarm at BMS panel when any of the following occur
 - a. Fire alarm from fire alarm control panel by EC

OCCUPIED CYCLE:

1. Open damper when exhaust fans are in occupied cycle and remain open when units are in occupied cycle operation.

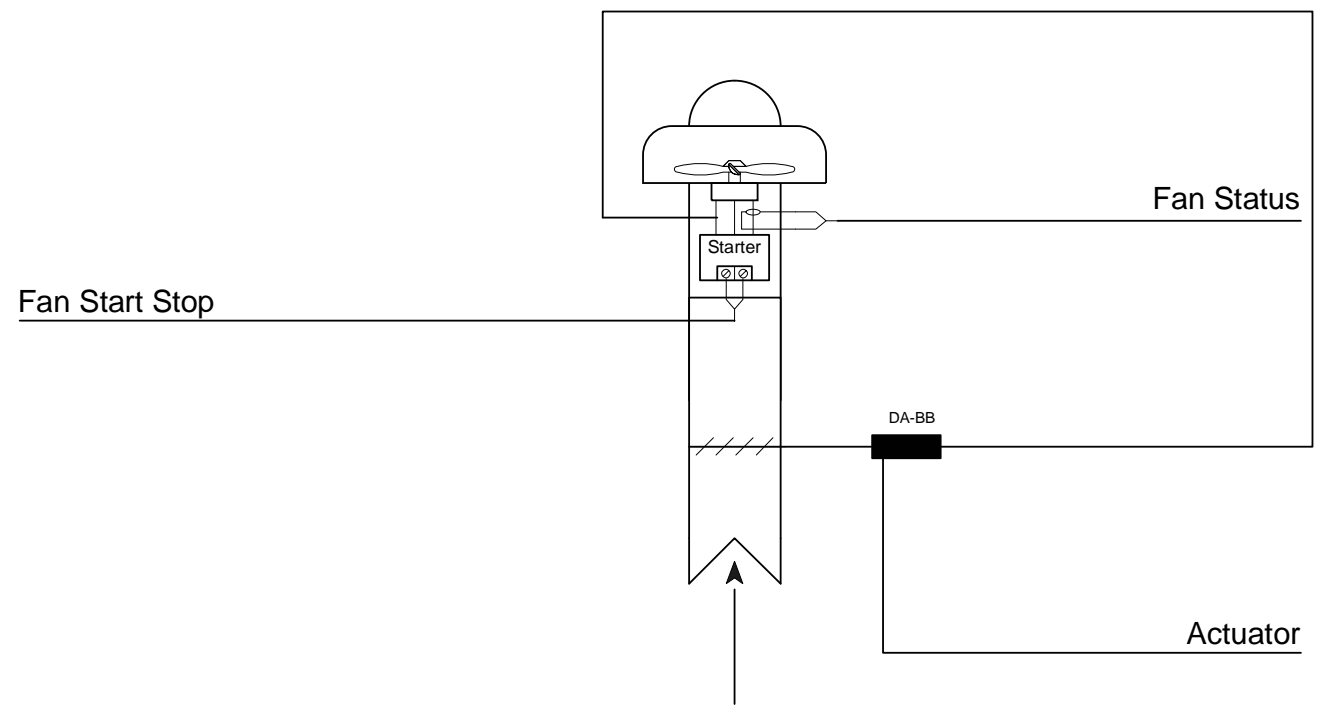
UN-OCCUPIED CYCLE:

2. Close intake damper

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IV 1			
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Exhaust Fans

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
DA-BB	SR OPEN/CLOSE 35 IN-LB 24 V	BELIMO	LF24 ALC	3 ea
E-AB	HOFFMAN NEMA 3 12X12X4	HOFFMAN	A12R124	3 ea
RIBU1C	RELAY	FUNCTIONAL DEVICES	RIBU1C	3 ea
RIBXKF	.25 TO 150 CURRENT SENSOR	FUNCTIONAL DEVICES	RIBXKF	3 ea
TR50VA	MULTI TAP PRIMARY 24V	FUNCTIONAL DEVICES	TR50VA	3 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	3 ea

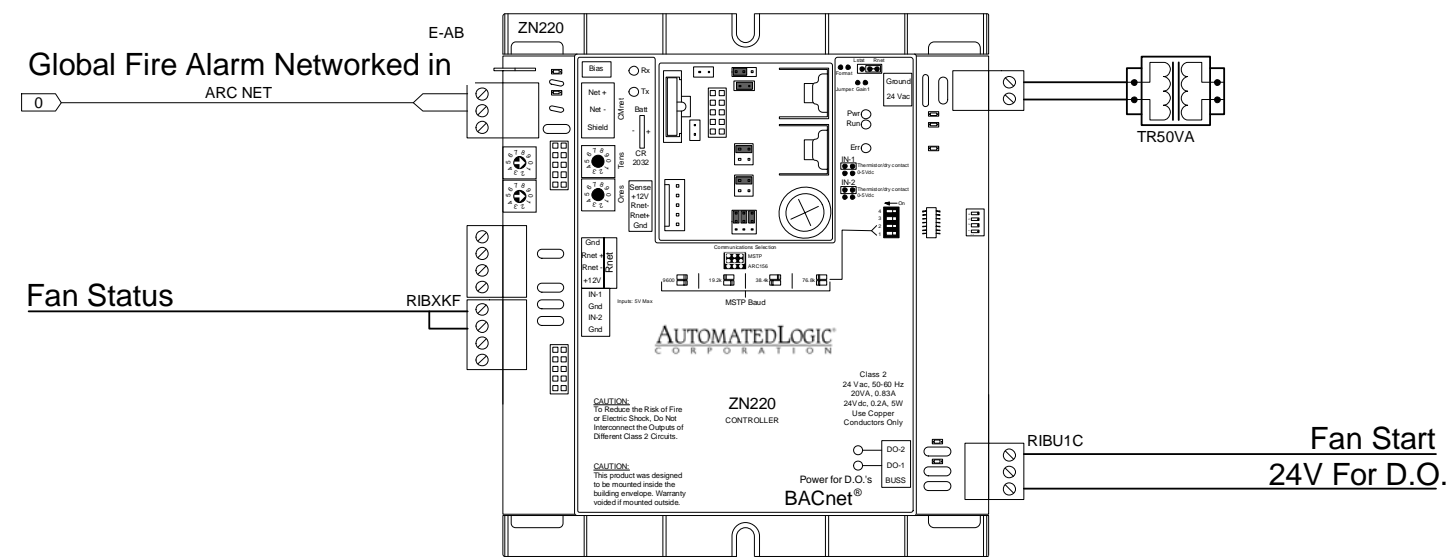


EXHAUST FAN CONTROL

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.

EXHAUST FAN ALARMS

1. Fan will generate an alarm if status is not proved when fan is enabled.
2. Fan will be shut down, and damper closed during a global fire alarm .



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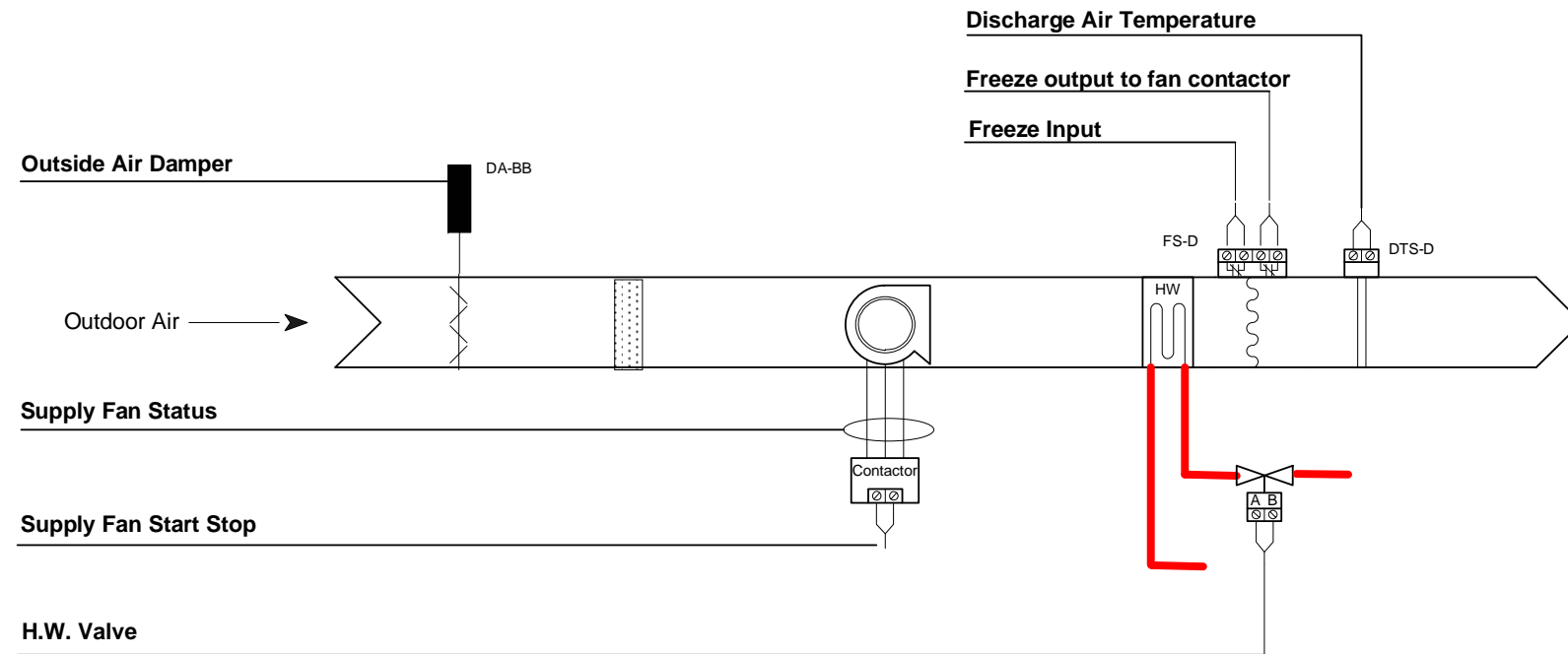
Exhaust Fans

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VF-1

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
DA-BB	SR OPEN/CLOSE 35 IN-LB 24 V	BELIMO	LF24 ALC	1 ea
DTS-D	DUCT 10K THERMISTOR PROBE 8 IN.	BAPI	ALC/10K-2-D-8	1 ea
E-AB	HOFFMAN NEMA 3 12X12X4	HOFFMAN	A12R124	1 ea
FS-D	TEMP LOW LIMIT MAN. RESET DPTD	LANDIS STEAFA	1341504	1 ea
LSPLUS	LOGISTAT 10K ROOM SENSOR W/ SETP ADJ, TLO, COMM	BAPI	LSPLUS	1 ea
REL-F	RIB PILOT RELAY SPDT 10AMP	KELE & ASSOC.	RIBU1C	2 ea
RIBXKF	CURRENT SENSOR	RIB	RIBXKF	1 ea
ZN551	ZN551	AUTOMATED LOGIC	ZN551	2 ea

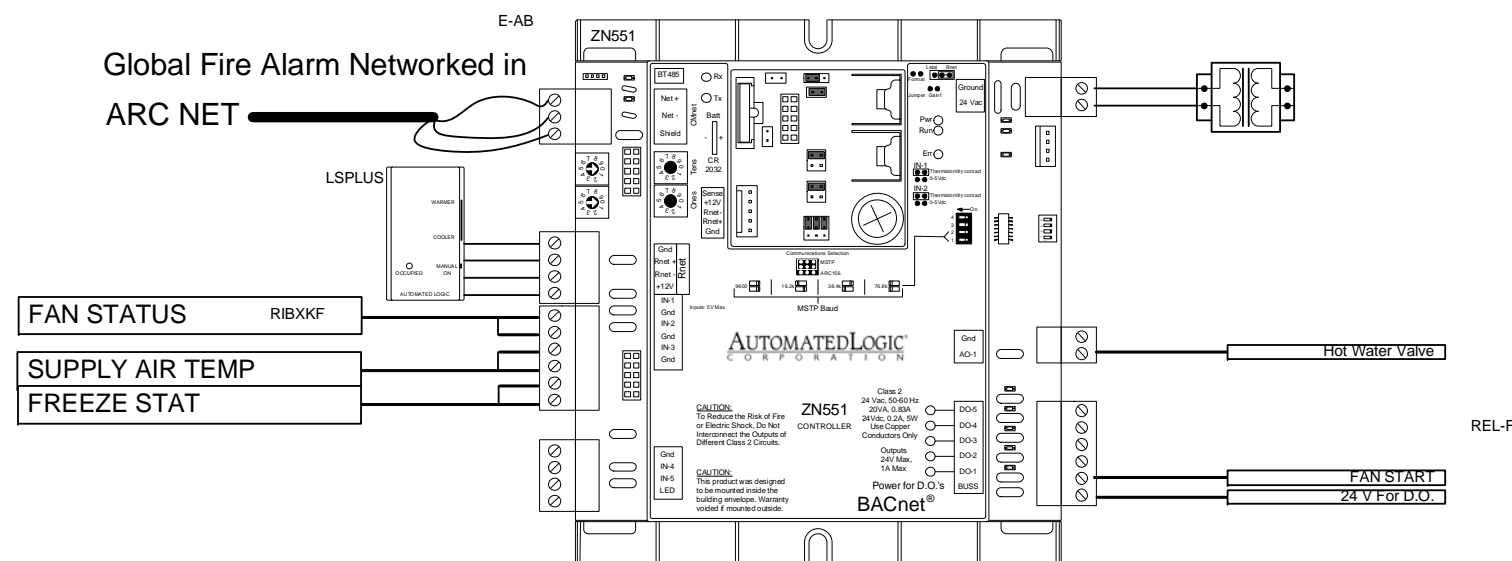


CUH CONTROL

1. fan shall be energized by BAS during occupied mode
2. Valve will open to maintain occupied set point
3. During unoccupied, fan shall remain off until an unoccupied heating call. Valve will remain open

CUH ALARMS

1. VF will generate an alarm if status is not proved when fan is enabled
2. VF will be shut down, and damper closed during a global fire alarm .
3. VF fan will be de energized if freeze stat trips and heat valve will go to full open, outdoor damper will close



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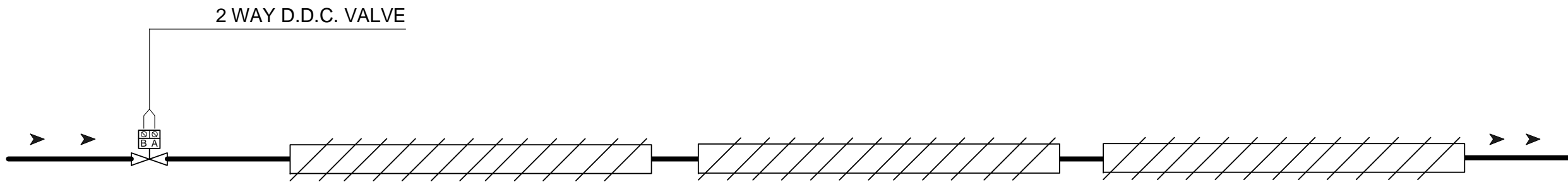
VF-1

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FINTUBE A

Bill of Materials				
DID	DESCRIPTION	MANUFACTURER	PART NUMBER	QTY
RSPLUS	ROOM SENSOR WITH PB AND SA	ALC	RSPLUS	8 ea
TR-A	TRANSFORMER, 120/24VAC, 50VA	CORE COMPONENTS	LE-117	8 ea
ZN220	ZN220	AUTOMATED LOGIC	ZN220	8 ea



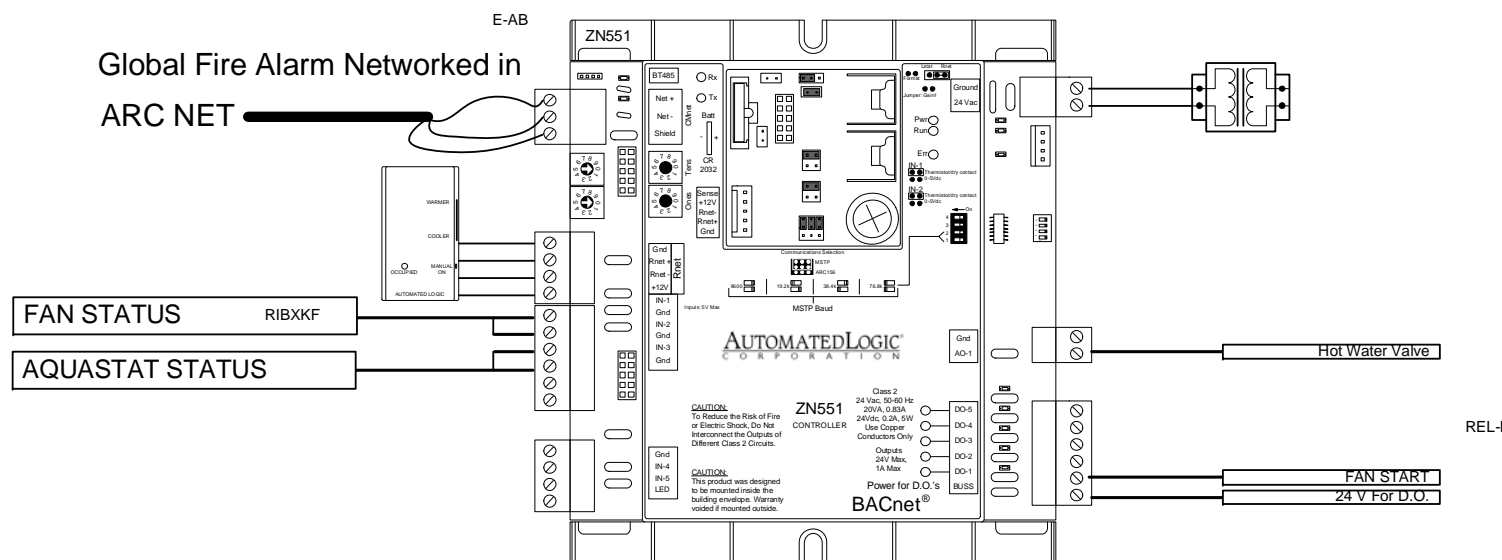
FTR CONTROL

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.



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Valve Schedule





Pos	Re-Order #	Qty	Tag	Datasheet	Valve Pattern	Pipe Size	Flow	DP	Req. Cv	Body Size	Valve Cv	Actual DP	Close Off Pressure	Valve Part Nr.	Actuator Part Nr.	Set Up
1	B218S3+LF24-SR-S US	1	VF1	B2_LF24_SR_S.pdf	2W		2.5	0.07	9.45	3/4"	7.4	0.1	200	B218	LF24-SR-S US	NO/FO
2	B210B3+LF24-SR-S US	1	CU1	B2B_LF24_SR_S.pdf	2W		2	2.4	1.29	1/2"	1.2	2.8	200	B210B	LF24-SR-S US	NO/FO
3	B210B3+LF24-SR-S US	1	CU2	B2B_LF24_SR_S.pdf	2W		2	2.4	1.29	1/2"	1.2	2.8	200	B210B	LF24-SR-S US	NO/FO
4	Z2ZN0094	1		ZoneValves.pdf	2W		1	1	NA	3/4"	3.5	0.1	30	ZONE220N-35	ZONE24NO-S	NO/FO

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Damper Schedule

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 C O R P O R A T I O N
DAMPERS HAVE BEEN PROVIDED BY M.C.

Identifier	QTY.	Damper mfg	Model	Size (W")	X Size (H")	Sq. Ft.	Opp or Par Blade	Qty Actuators	Actuator Type	Actuator mfg model
VF 1	1	BELIMO	BY M.C.	BY M.C.	BY M.C.	BY M.C.	BY M.C.	1	2POS	NF24SALC
IV1	1	BELIMO	BY M.C.	BY M.C.	BY M.C.	BY M.C.	BY M.C.	1	2POS	NF24SALC

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