



Arkansas Tech University Jones Residence Hall

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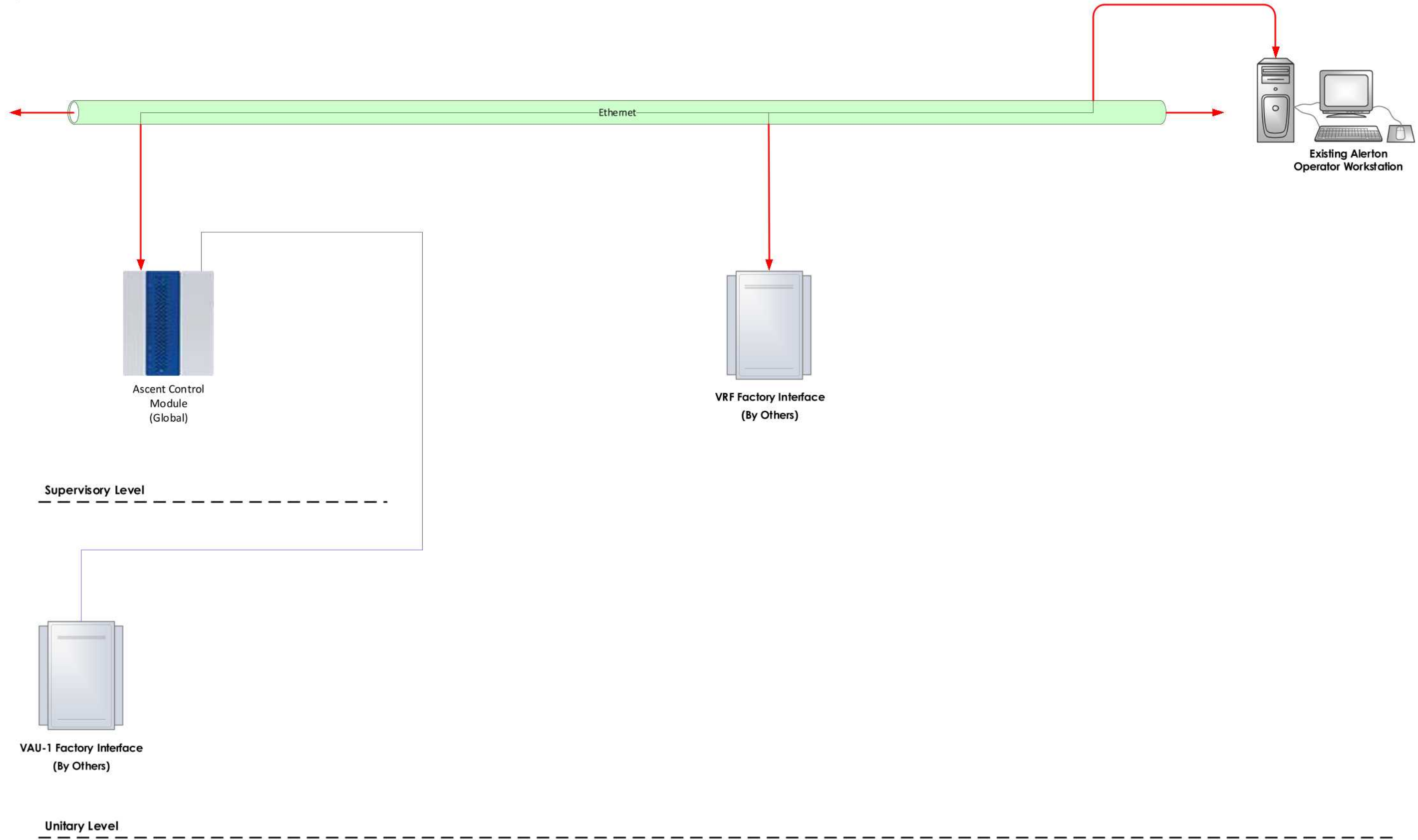
Project number: L22-13284
Application Engineer: VWI
Drawn by: VWI
Checked by: VWI

Project name: Arkansas Tech University Jones Residence Hall
Phase: AsBuljit
Creation Date: 9/26/2022
Revision Date: 12/12/2023
Architect: SCM
Engineers: Pettit & Pettit
Mechanical: CSUSA

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System Architecture

Typical of 1



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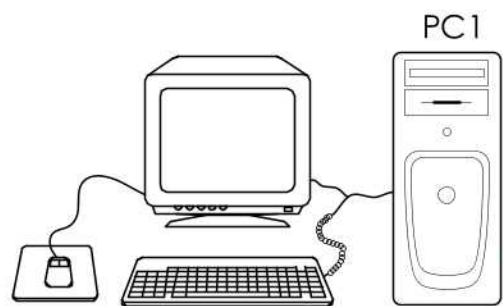
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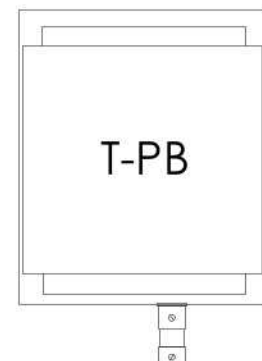
Global Controller

Typical of 1

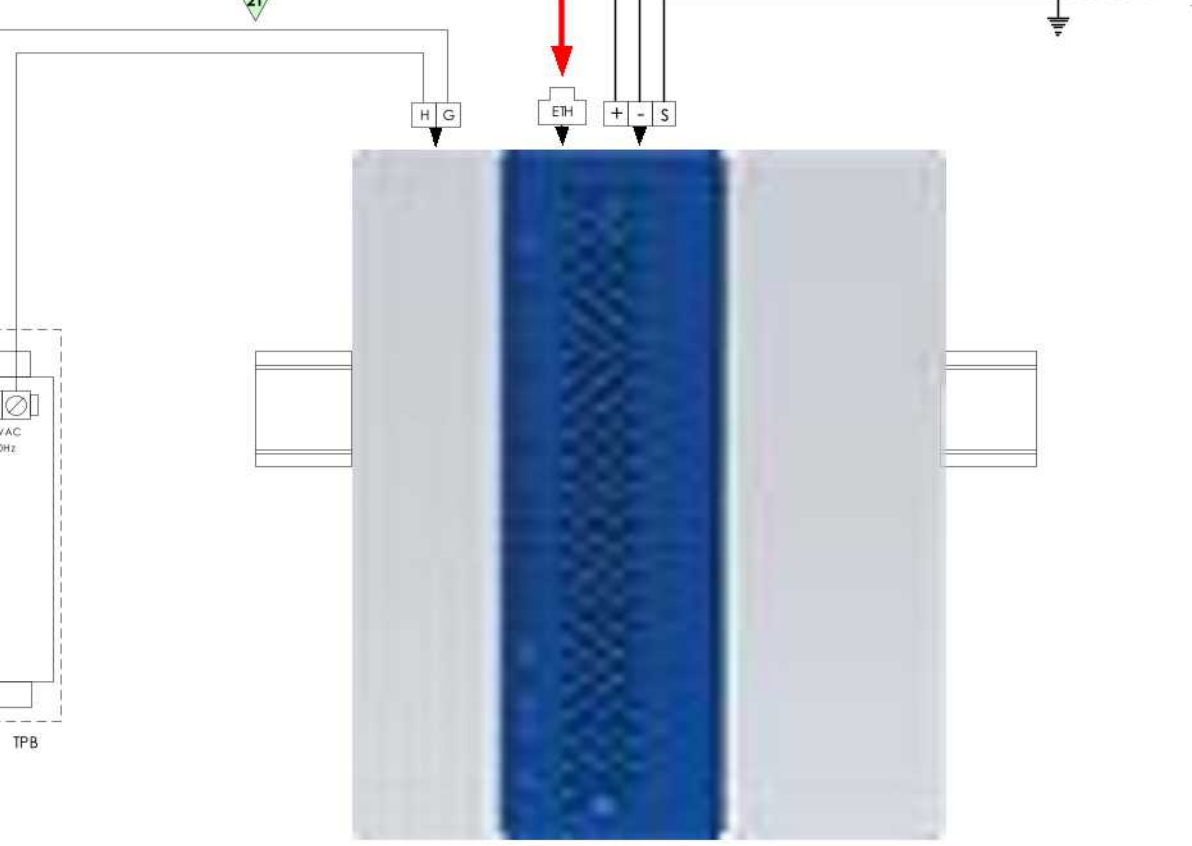
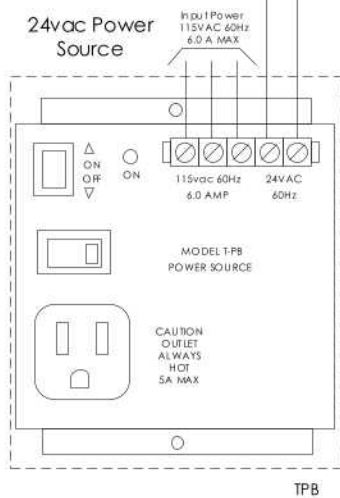
TAG	QTY.	PART NO.	MANUFACTURER	DESCRIPTION
MC1	1	RET2018ULP-DB	Kele	NEMA 1 Enclosure 20"h x 18"w x 7"d Dk Blue
TPB	1	T-PB-202-0	Kele	24VAC power source, 4A (Class 1) panel mount
ACM	1	ACM	Alerton	Ascent control module global controller
	1	ACM256	Alerton	ACM license for up to 256 devices



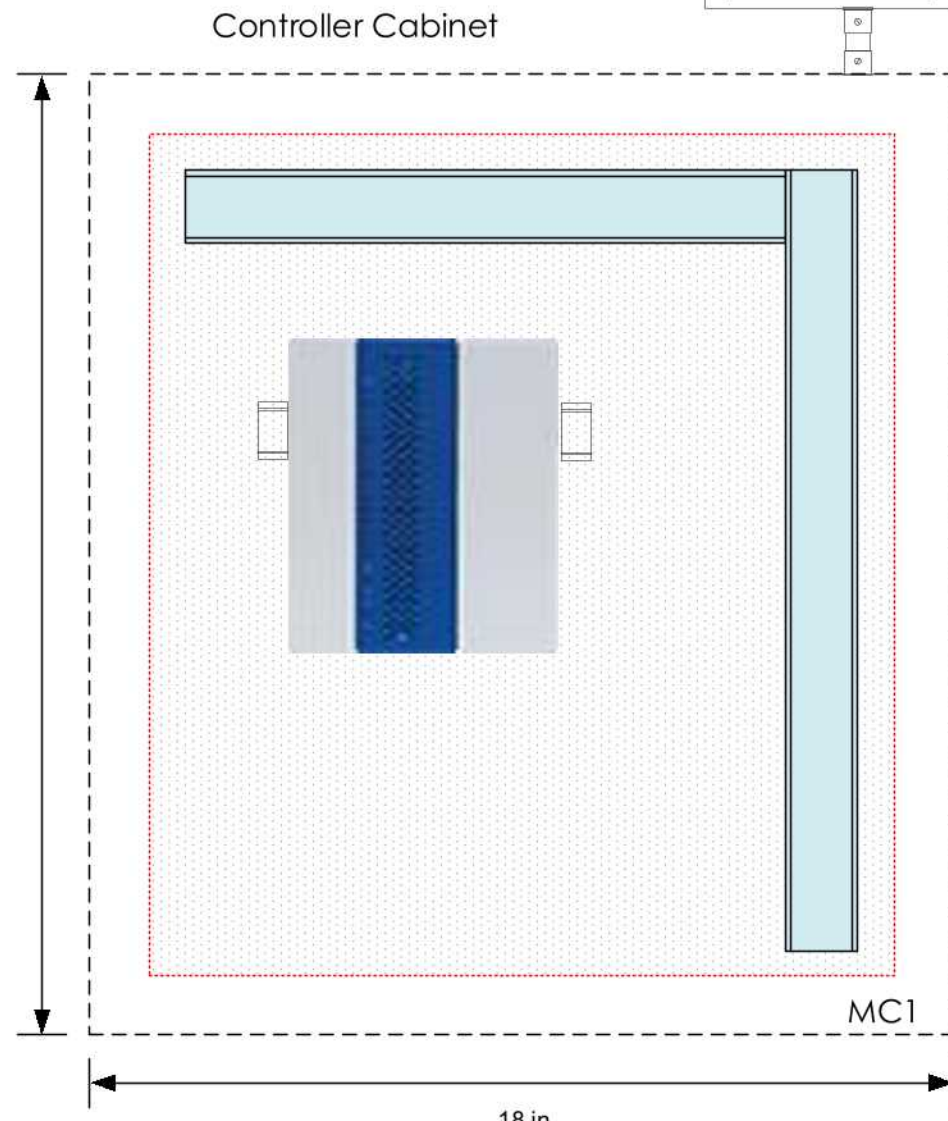
Existing Alerton
Operator Workstation



T-PB



To Building Unitary
Controllers



Controller Cabinet

20 in

18 in

MC1

UNIT TYPE	DEVICE INST	MAC ADDR	REP-JOB-APP
ACM	110	0	rep\job\app

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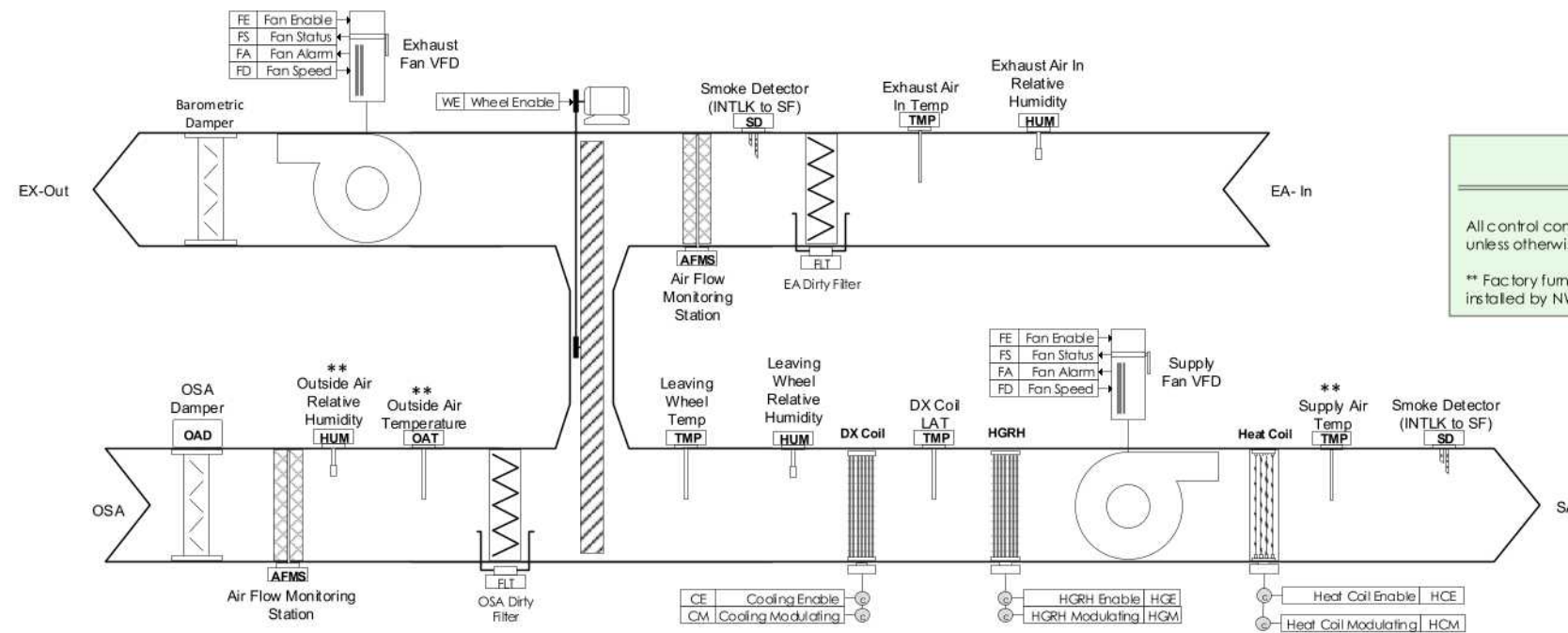
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VAU-1 Control Diagram

Typical of 1



Sequence of Operation

OCCUPIED/UNOCCUPIED MODE:

THE MAKEUP AIR UNIT SHALL BE INDEXED FROM UNOCCUPIED TO OCCUPIED MODE BY A PRESET SCHEDULE OR MANUAL OVERRIDE.

FAN CONTROL:

SUPPLY AND EXHAUST FAN WILL BE ENABLED BY THE BAS AND SHALL RUN CONTINUOUSLY. THE VFDS SHALL CONTROL THE FANS TO RAMP UP SLOWLY TO THEIR ASSOCIATED DUCT STATIC PRESSURE SETPOINTS. THE SUPPLY FAN WILL BE SHUT DOWN IN THE EVENT OF A SMOKE/FIRE ALARM (HARDWIRE INTERLOCK), BUT THE EXHAUST FAN SHALL REMAIN IN OPERATION. THE OSA DAMPER SHALL BE OPENED FOR FAN OPERATION AND SPRING RETURN CLOSED WHEN THE FAN IS SHUTDOWN.

ALARM:

ANY ALARMS SHALL BE VIEWABLE ON THE UNIT MOUNTED TOUCHSCREEN DISPLAY.

COOLING:

WHEN THE RTU IS IN THE COOLING MODE, THE ENERGY RECOVERY WHEEL AND THE COMPRESSORS WILL STAGE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT THE DISCHARGE COOLING SET POINT OF 55° F. (ADJ.) THE HOT GAS RE-HEAT COIL SHALL MODULATE AS REQUIRED TO RE-HEAT THE AIR LEAVING THE COOLING COIL TO THE SUPPLY AIR DISCHARGE SETPOINT OF 72° F. (ADJ.)

HEATING:

SUPPLY TEMPERATURE CONTROL DURING WHEN HEATING IS REQUIRED IS ACCOMPLISHED BY ENABLING THE ENERGY WHEEL AND THE GAS HEAT AS NEEDED TO MAINTAIN DISCHARGE AIR SETPOINT OF 72° F. (ADJ.)

MAKEUP AIR AND OUTSIDE AIR TEMPERATURE AND RH:

RELIEF AIR AND OUTSIDE AIR TEMPERATURE AND RELATIVE HUMIDITY READINGS MAY BE ACQUIRED FROM THE UNIT DISPLAY.

ENERGY RECOVERY WHEEL:

THE ENERGY RECOVERY WHEEL SHALL BE ENABLED ANY TIME THE SUPPLY AND EXHAUST FANS ARE ENABLED AND ENERGY TRANSFER BETWEEN THE EXHAUST AIR AND THE OUTSIDE AIR IS A BENEFIT TO SUPPLY AIR TEMPERATURE CONTROL. THE WHEEL SHOULD BE DISABLED WHEN THE OUTSIDE AIR TEMPERATURE IS EQUAL TO OR HIGHER THAN THE DESIRED SUPPLY TEMPERATURE AS WELL AS LOWER THAN THE EXHAUST TEMPERATURE.

General Notes

All control components including VFD's, are factory furnished / installed unless otherwise noted.

** Factory furnished components shipped loose with unit to be field installed by NWC.

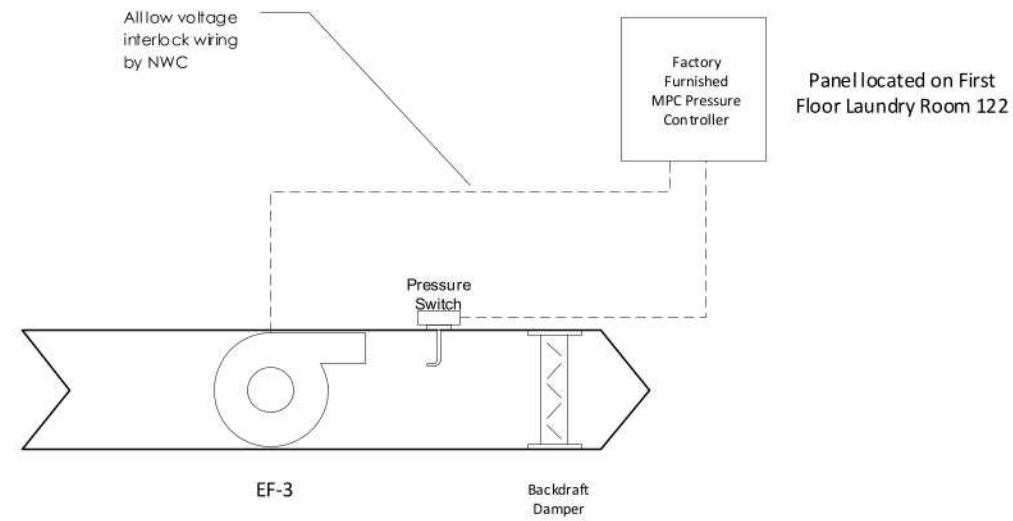
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Dryer Exhaust System and Exhaust Fan Control Diagram

Typical of 1



All control components are factory furnished / installed. Any loose shipped 24v control components provided with equipment to be installed by NWC.

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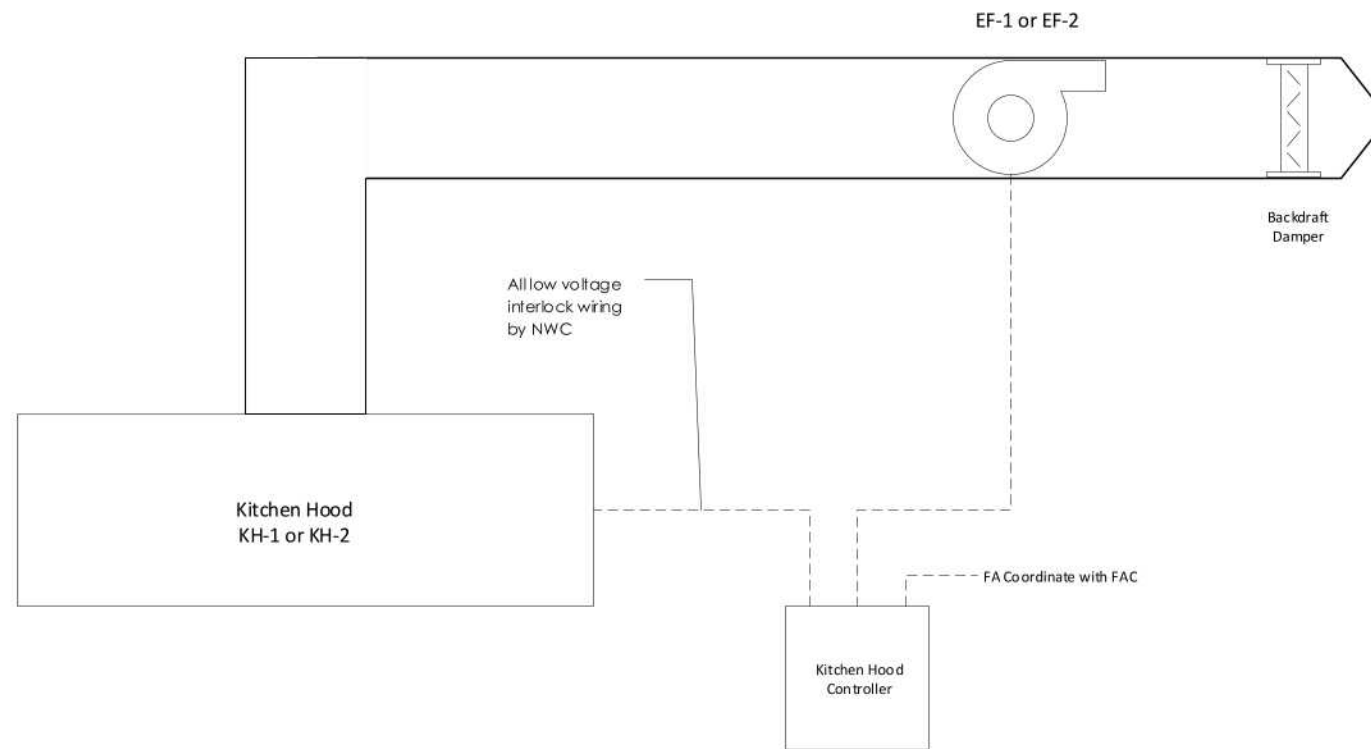
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Kitchen Hood and EF Control Diagram

Typical of 2

All control components are factory furnished / installed. Any loose shipped 24v control components provided with equipment to be installed by NWC.



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VRF Control Diagram

Typical of 13

Sequence of Operation

UNIT CONTROLS:
VRF SYSTEM SHALL BE PROVIDED WITH EQUIPMENT MANUFACTURER'S UNIT-MOUNTED CONTROLS SYSTEM. CONTROLS INTERFACE SHALL BE TOUCH SCREEN.

SPACE TEMPERATURE CONTROL:
THE SUPPLY FAN SHALL RUN CONTINUOUS. THE UNIT SHALL UTILIZE HEAT RECOVERY SEQUENCES THAT ALLOW EACH INDIVIDUAL ZONE TO BE IN EITHER HEATING OR COOLING INDEPENDENT OF ALL OTHER ZONES IN THE SYSTEM. COOLING/HEATING SHALL MODULATE TO MAINTAIN THE ACTIVE SPACE TEMPERATURE SETPOINT. THE SPACE TEMPERATURE SHALL BE MAINTAINED BETWEEN THE OCCUPIED COOLING SETPOINT (75°F ADJ) AND THE OCCUPIED HEATING SETPOINT (70°F ADJ).

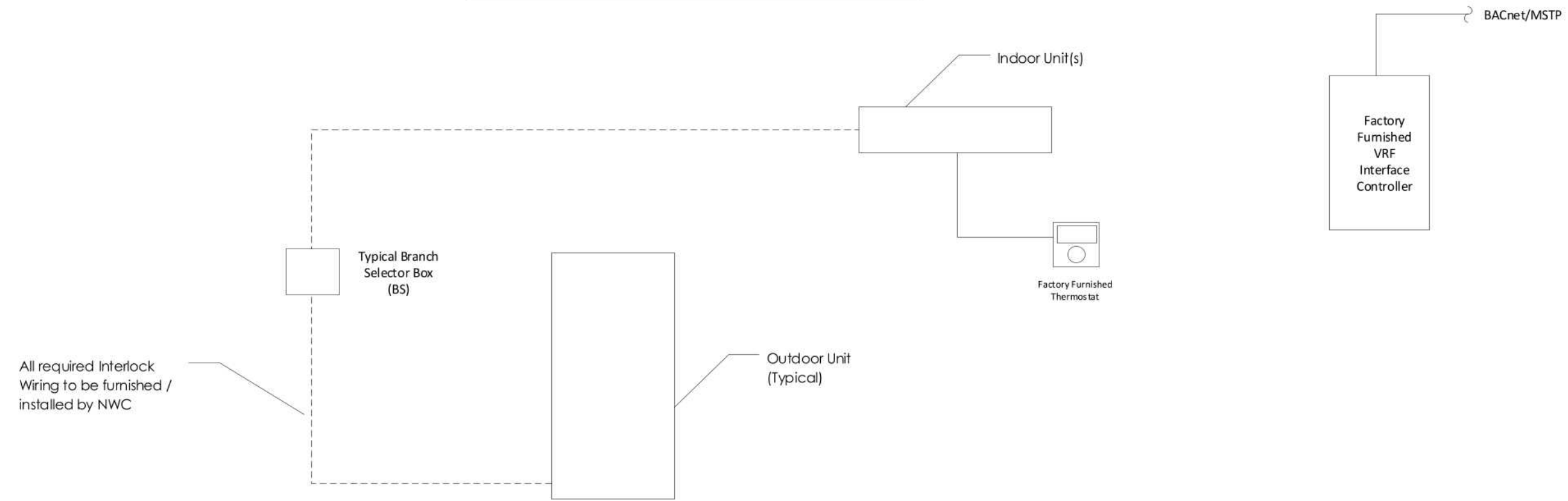
NWC Scope of Work

There are (13) individual systems. (Submittal Comment)

All interlock wiring for Mini-Split System equipment to be furnished and installed by NWC.

All control components for Mini-Split Systems to be furnished and factory installed by equipment manufacturer.

Factory furnished space thermostats to be installed by NWC.



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GENERAL WIRING NOTES

All controller inputs, outputs and communications trunks must be run separate from any circuits containing voltages greater than 30vac. Do not run signal or communication wires near high voltage sources such as ballasts, transformers or transmitters. Wires in conduit must not be nicked, stretched or compromised in any way. Use pulling force of less than 50 lbs. Wires attached to building structures must be suspended in a way that does cause undue stress on the wire. Do not use any securing method that compresses the wire beyond the outside jacket.

All inputs and analog outputs require shielded wire. Use single-point grounding point in each cabinet or controller location. Do not ground any shield to the GRN or COM terminals of modules.

Additional general installation information can be found in the following Alerton manuals:

LTBT-TM-SYSDSGN	System design Manual	LTBT-TM-VLX	VLX Installation Manual
LTBT-TM-GEN4VLC	VLC installation manual	LTBT-TM-NETWRK	Network Design and Installation Manual

CONTROLS WIRING SCHEDULE

SYMBOL	DESCRIPTION	PART NUMBER	INSTALLATION NOTES
1	BACtalk thermostats	Connect Air P/N W233C-2560 White jacket, 3 #18 conductor w/shield, plenum rated	Max distance for a BACtalk Microset or Microtouch is 250 feet. Maximum distance for Microset II is 1000ft.
2	Thermistor/resistor inputs	Connect Air P/N W181P-2540 Mint green jacket, 2 #18 conductors w/shield, plenum rated.	Maximum distance is 1000 feet.
3	2 wire inputs 4-20ma, 0-5volts, 0-10volts	Connect Air P/N W181P-2540 Mint green jacket, 2 #18 conductors w/shield, plenum rated.	Most 4-20ma inputs require input resistors. Consult module page for verification. Do not power controller or attach sensor until verified! Input 0 of the VLC series of controllers require a 470 ohm resistor in series with any dry contact.
4	3 or 4 wire inputs 4-20ma, 0-5 volts or 0-10 volts	3-wire use Connect Air P/N W233C-2560 White jacket, 3 #18 conductor w/shield, plenum rated 4-wire use Connect Air P/N W181P-2540 Mint green jacket, 2 #18 conductors w/shield, plenum rated. Run 2 cables, one for signal and 1 for power.	Most 4-20ma inputs require input resistors. Consult module page for verification. Do not power controller or attach sensor until verified.
5	Binary outputs	Use #18 conductors within the mounting cabinet or when the distance to the output load is less than 50 feet (W181P-2540 wire is acceptable). For longer distances consult engineering department.	Return BO loads to transformer ground - not to the controller terminal. Exception are when switching ground based outputs or when the controller load is a pilot relay within 50 feet. Shielded wire can be substituted (of appropriate rating) when in an extremely noisy environment. Connect shield to panel/earth ground at controller end only.
6 7	Analog outputs	Connect Air P/N W181P-2540 Mint green jacket, 2 #18 conductors w/shield, plenum rated.	Maximum distance is 1000 feet.
21 22	Unitary controller power	Match power source conductor size to controller or distribution terminals. Always use #18 conductor or larger to controller terminals.	None
31	MS/TP Communications	Connect Air P/N W221P-2544 Raspberry jacket, 2 #22 conductors w/shield, low capacitance, plenum rated.	Maximum segment length (end-to-end) 4000 ft. All devices must be wired in a BUS or daisy-chained wiring arrangement (including global controllers) with termination resistors at each end of the bus. Ground shield drain wire at single point earth (panel) ground --not VLC ground. Tape off shield drain wire at other end. Tie shield drain wire through at each VLC. DO NOT GROUND SHIELD AT MULTIPLE LOCATIONS! The preferred location for grounding is in the physical center of the bus. MS/TP repeaters may be required to extend distance. Consult engineering department before using.
41	Ethernet (IEEE 8802.3) Cat 5 Wiring preferred	Connect Air P/N W244P-2030 or W244P-1026 or equivalent.	Maximum segment length is 328 ft. Multiple units require Ethernet hub or switch. See system architecture page for details. End terminations must follow the TIA/EIA-568-A pinout using color code option #1.

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