

# Holt Las Colinas

1000 Rochelle Blvd.  
Irving, Texas 75062



## Building Automation

Plans Revision: 10/17/2022



**Job#: AU230034C**

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Yates Company LLC

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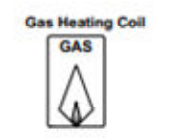
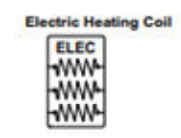
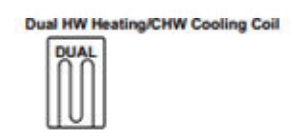
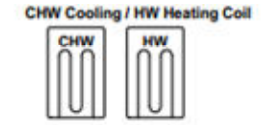
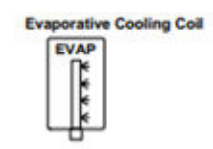
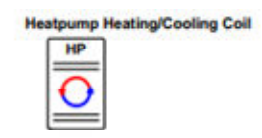
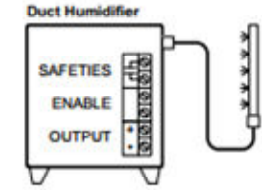
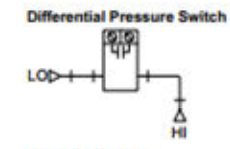
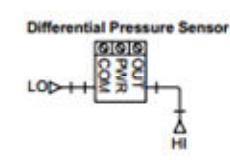
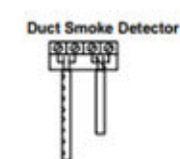
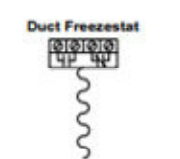
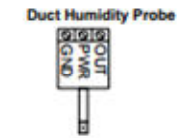
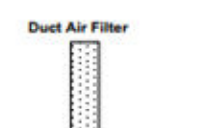
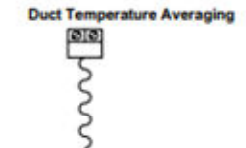
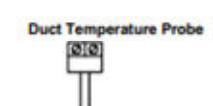
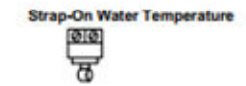
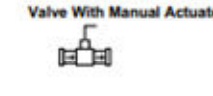
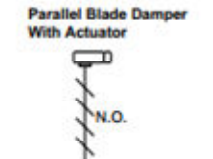
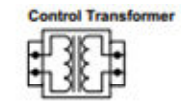
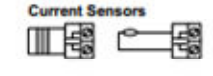
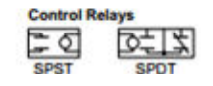
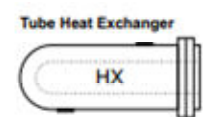
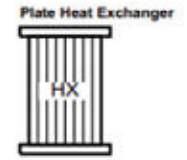
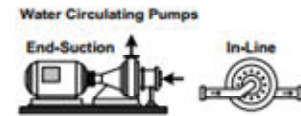
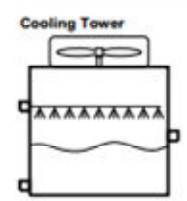
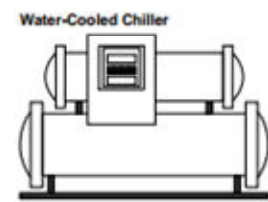
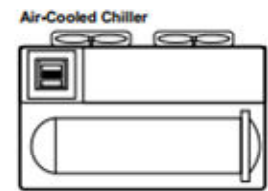
Architect: acufarm  
Engineer: Infinity MEP+S



REV #	DESCRIPTION	DATE
0	SUBMITTED	9/8/2023
AB	As-built	

Abbreviations/Symbols

ACU - Air Conditioning Unit	GEN - Generator
AFF - Above Finished Floor	GPM - Gallons Per Minute
AHU - Air Handling Unit	H2 - Hydrogen
AI - Analog Input	HD - Heating Deck
ALM - Alarm	HGR - Hot Gas Reheat
AMP - Ampere	HOA - Hand/Off/Auto
AO - Analog Output	HP - Heat Pump
AUTO - Automatic	HRU - Heat Recovery Unit
AUX - Auxiliary	HX - Heat Exchanger
AWG - American Wire Gauge	HU - Humidifier
BAI - BACnet Analog Input	HW - Hot Water
BAO - BACnet Analog Output	HWP - Hot Water Pump
BAS - Building Automation System	HWR - Hot Water Return
BBI - BACnet Binary Input	HWS - Hot Water Supply
BBO - BACnet Binary Output	IO - Input/Output
BH - Basin Heater	IAQ - Indoor Air Quality
BI - Binary Input	IP - Internet Protocol
BLR - Boiler	mA - Milliamp
BO - Binary Output	MAT - Mixed Air Temperature
BOM - Bill Of Materials	MAU - Makeup Air Unit
BTU - British Thermal Units	MAX - Maximum
C - Celsius	MGR - Manager
CAV - Constant Air Volume	MIN - Minimum
CCW - Counter Clockwise	MISC - Miscellaneous
CD - Cooling Deck	NC - Normally Closed
CFM - Cubic Feet Per Minute	NO - Normally Open
CHLR - Chiller	OA - Outdoor Air
CHW - Chilled Water	OAD - Outdoor Air Damper
CHP - Chilled Water Pump	OAH - Outdoor Air Humidity
CHWR - Chilled Water Return	OAT - Outdoor Air Temperature
CHWS - Chilled Water Supply	OAT/H - Outdoor Air Temperature / Humidity
CHWW - Chilled Water Valve	OPS - Oil Pressure Switch
CM - Control Module	PCHP - Primary Chilled Water Pump
CRAC - Computer Room Air Conditioner	PCHWR - Primary Chilled Water Return
CRAH - Computer Room Air Handler	PCHWS - Primary Chilled Water Supply
CRU - Computer Room Unit	PDU - Power Distribution Unit
CT - Cooling Tower	PPM - Parts Per Million
CTRL - Control	PSI - Pounds Per Square Inch
CU - Condensing Unit	PWR - Power
CUH - Cabinet Unit Heater	R - Relay
CW - Clockwise	RA - Return Air
CWP - Condenser Water Pump	RAD - Return Air Damper
CWR - Condenser Water Return	RF - Return Fan
CWS - Condenser Water Supply	RH - Relative Humidity
DA - Discharge Air	RTU - Rooftop Unit
DAT - Discharge Air Temperature	S/S - Start / Stop
DD - Double Duct	SA - Supply Air
DDC - Direct Digital Controls	SAT - Supply Air Temperature
DEV - Device	SCHP - Secondary Chilled Water Pump
DH - Duct Heater	SCHWR - Secondary Chilled Water Return
DI - Digital Input	SCHWS - Secondary Chilled Water Supply
DMPR - Damper	SD - Smoke Detector
DO - Digital Output	SF - Supply Fan
DP - Differential Pressure	SPDT - Single Pole Double Throw
DPDT - Double Pole Double Throw	SPST - Single Pole Single Throw
DPS - Differential Pressure Switch	STS - Static Transfer Switch
DPST - Double Pole Single Throw	TB - Terminal Block
DPT - Differential Pressure Transducer	TCP - Temperature Control Panel
DWG - Drawing	TEMP - Temperature
DX - Direct Expansion	TX - Transformer
(E) - Existing	UH - Unit Heater
EA - Exhaust Air	UPS - Uninterrupted Power Supply
EAD - Exhaust Air Damper	UV - Unit Ventilator
ECON - Economizer	VA - Apparent Power (Voltage * Amperage)
EDH - Electric Duct Heater	VAC - AC Voltage
EF - Exhaust Fan	VAV - Variable Air Volume
EPO - Emergency Power Off	VDC - DC Voltage
EVAP - Evaporator	VFD - Variable Frequency Drive
F - Fahrenheit	VP - Velocity Pressure
FCU - Fan Coil Unit	VSD - Variable Speed Drive
FO - Fuel Oil	VVT - Variable Volume Terminal Unit
FOP - Fuel Oil Pump	*WC - Inches of Water Column
FS - Flow Switch	WSHP - Water Source Heat Pump
GND - Ground	ZD - Zone Damper



General 1  
Abbreviations, Symbols  
JOB # AU230034C  
DWG # 0.1

Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

Drawn: 9/8/2023  
ENG: Jordan Felts

REV #	DATE	DESCRIPTION
0		SUBMITTED

Yates Company LLC  
4738 Whirlwind Dr.  
San Antonio, TX 78217  
Phone: 210-702-3820

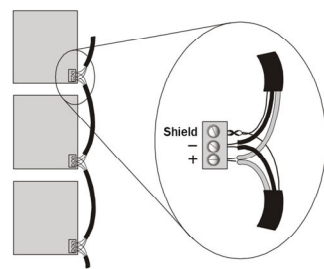
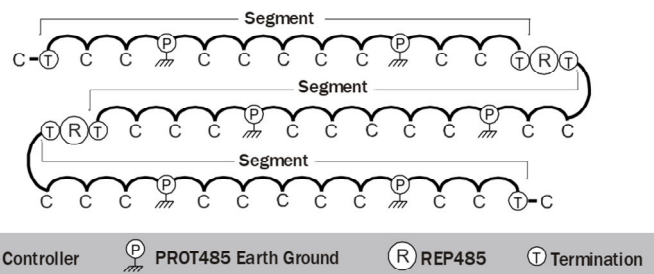


# Holt Las Colinas GEN

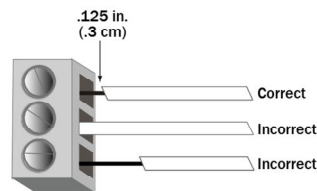
## Network Configurations

A network can be configured as either a daisy-chain or hybrid configuration (w/ repeaters). Each network segment must be in a daisy-chain configuration.

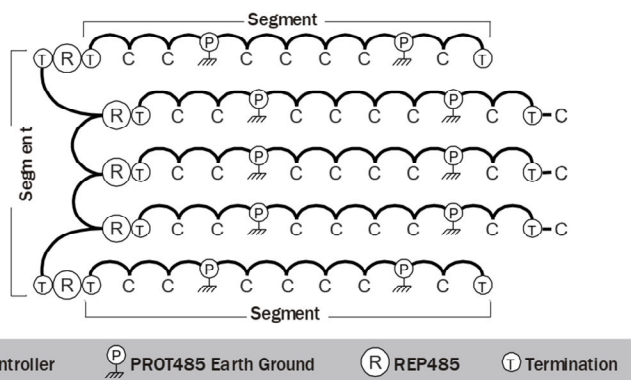
### Sample daisy-chain configuration:



Do not allow more than .125 inch (.3 cm) bare communication wire to protrude.



### Sample hybrid configurations:



## Network Protection

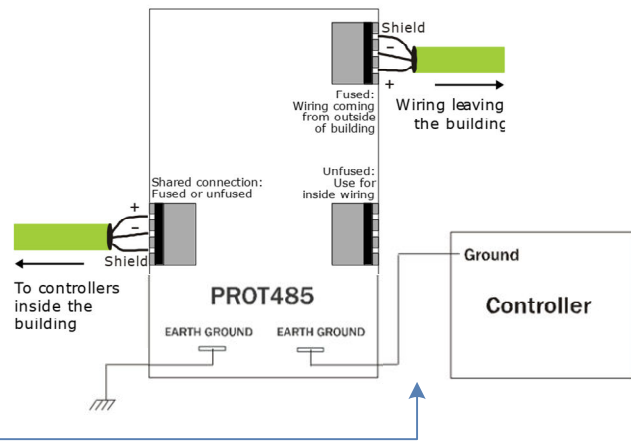
A PROT485 for surge protection shall be installed wherever:

- RS485 wiring enters or exits the building envelope
- Within 250 feet of every controller

Do NOT ground the shield to earth ground or the controller's power ground. The PROT485 and the individual controllers allow the shield to float a limited amount so that there are no ground loops. If the voltage on the shield becomes too great, relative to earth ground, then the excess voltage is bled off with the protective devices on the PROT485 or on the controllers.

Use 12 AWG ground wire, no more than 6 feet long.

If the controller is within 6 feet of the PROT485, connect one ground wire to the controller and another ground wire to the earth ground.



## MS/TP Network Segment Requirements

Each network segment MUST:

- Be wired in a daisy-chain configuration
- Be no longer than 2000 feet
- Have fewer than 32 devices
- Have network terminations (BT485, TERM485 or on-board dip switch activated)

## MS/TP Network Termination

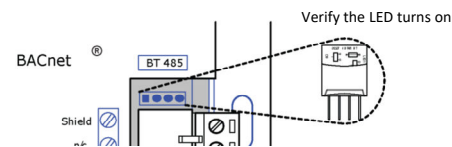
Network termination prevents end-of-line (EOL) reflections, noise, and signal distortion by effectively terminating each network segment. BT485 as well as on-board termination dip switches also apply bias to the network. Bias allows the

## Repeaters (REP485)

The REP485 is a repeater that boosts communication signals over lengthy runs of wire. A repeater must be installed

- After every 30 controllers
- After 2000 feet of network
- At each branch of a hybrid network

Each repeater begins a new network segment. Network termination (TERM485 or BT485) is required on both sides of the repeater in a daisy-chain configuration or the secondary side in the hybrid configuration.

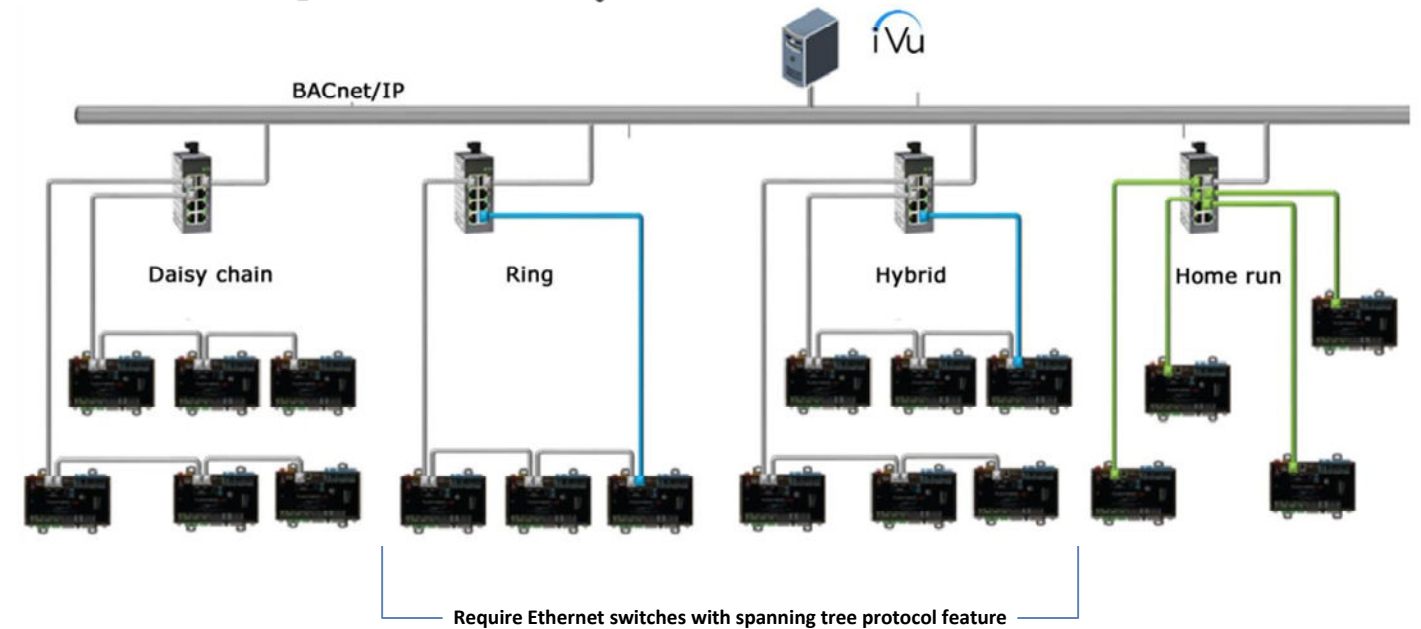
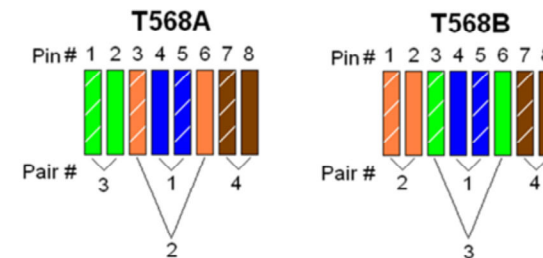


## Ethernet cable wiring

The Eth0/Eth1 ports communicate at 10/100 megabits per second, requiring Cat5e or greater cabling for connections. Between controllers, the total cable distance should not exceed 164 ft (50 m.). This ensures that if a single controller is powered off for any reason, the failover switch on the controller connects the two ports and allows the network to continue without exceeding the Ethernet limit of 328 ft (100 m.). If controllers are installed in a home run configuration, with each controller directly connected to a switch, the distance between each controller and the switch should not exceed 328 ft (100 m.).

Notes:

- Custom-made patch cables must either use the T568A or T568B wiring standard and you MUST use the same standard on both ends of the cable.
- Crossover cables (a cable using both standards, one at either end) can be used, but are not required.



General 2  
Installation Guidelines  
JOB # AU230034C  
DWG # 0.2

Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

Drawn:	ENG: Jordan Felts
DATE	9/6/2023
DESCRIPTION	SUBMITTED
REV #	0

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Holt Las Colinas  
GEN

Standard Cable Specification & Abbreviations

	Cable Line Types	Typical Application	Wire Type	Manufacturer	Part #	Color	Circuit Type
Communications	Ethernet/Cat5e	Network Wire BACnet/IP BACnet/Ethernet	24 AWG / 4 Conductors Stranded, shielded, plenum rated	Best Wire 972-231-5600	8130PL-6-(Color)	Blue jacket (BLU) - Standard Violet jacket (PRP) - Option Orange jacket (ORG) - Option	Network communications
	BACnet MS/TP	Network Wire RS485	22 AWG / 2 Conductors (Twisted pair) Stranded, shielded, plenum rated, low capacitance	Best Wire 972-231-5600	4340PL-LC-(Color)	Violet jacket (PRP) - Standard Blue jacket (BLU) - Option Orange jacket (ORG) - Option	Net + Net -
	Modbus	Network Wire RS485	22 AWG / 2 Conductors (Twisted pair) Stranded, shielded, plenum rated, low capacitance	Best Wire 972-231-5600	4340PL-LC-(Color)	Violet jacket (PRP) - Standard Blue jacket (BLU) - Option Orange jacket (ORG) - Option	Net + Net -
Inputs / Outputs	18/2	I/O Wiring	18 AWG / 2 Conductors Stranded, plenum rated	Best Wire 972-231-5600	4040PL-(Color)	White jacket - Standard Grey jacket (GRY) – Option White & black conductors	Class 2 wiring ONLY
	18/4	I/O Wiring	18 AWG / 4 Conductors Stranded, plenum rated	Best Wire 972-231-5600	4240PL-(Color)	White jacket - Standard Grey jacket (GRY) – Option White & black conductors	Class 2 wiring ONLY
	18/8	I/O Wiring Thermostat	18 AWG / 8 Conductors Stranded, plenum rated	Best Wire 972-231-5600	4248PL	White jacket	Class 2 wiring ONLY
Power	24 VAC	Power Wiring	See I/O - 18/2	Best Wire 972-231-5600	See I/O - 18/2	See I/O - 18/2	24 VAC Hot (white) 24 VAC Neutral (black)
	24 VAC	Power Wiring Long runs (>100 ft) OR > 6 controllers	16 AWG / 2 Conductors Stranded, plenum rated	Best Wire 972-231-5600	4050PL	White jacket Red & black conductors	24 VAC Hot (white) 24 VAC Neutral (black)
	24 VAC	Power Wiring (inside panels)	18 AWG TFFN, Stranded	Best Wire 972-231-5600	9010-(Color)	Green (GRN) Black (BLK) White (WHT) Red (RED)	24 VAC Hot (Red) 24 VAC Neutral (Black) 24 VAC Ground (Green)
	120 VAC	Power Wiring	14 AWG THHN, Stranded	Best Wire 972-231-5600	9030-(Color)	Green (GRN) Black (BLK) White (WHT) Red (RED)	120 VAC Hot (black) 120 VAC Neutral (white) 120 VAC Ground (Green)

Abbreviations

AWG	American Wire Gauge
CAT-5, 5e, 6	Ethernet cable
Class 2	NEC Classification. For indoor use. Protection against falling dirt and dripping, or light splashing
TFFN	Thermoplastic-Insulated, Nylon-jacketed conductor for use in dry locations & operating temperature < 90°C
EIA-485	Communication protocol
Gnd or G	Ground
I/O	Input/Output
MS/TP	Master-Slave/Token=Passing protocol
NEC	National Electric Code
Net +/-	Positive/negative polarity designation for communications
ST/SC/ST	Fiber Optic connector type

General 3		Cable Specifications		JOB # AU230034C		DWG # 0.3	
Holt Las Colinas				1000 Rochelle Blvd.			
Irving, Texas							
DATE		9/8/2023		Drawn:		ENG: Jordan Felts	
DESCRIPTION		SUBMITTED		REV #		0	
Yates Company LLC 4738 Whirlwind Dr. San Antonio, TX 78217 Phone: 210-702-3820							
							

Holt Las Colinas  
GEN

**Panel and Field Device Notes (typical of all pages)**

**1 ELECTRICAL POWER POVISIONS:**

A. Primary power will be provided under Division 26 by the electrical contractor to the panel locations indicated on the mechanical & electrical drawings. Provide step down transformers at panel enclosure locations. Provide all necessary fuses and circuit protection devices.

B. Power will be provided to the controllers serving fan powered terminal units with electric heat via the control transformer provided with the unit.

C. All components of the EMCS shall be powered from the sources above. Provide final terminations from the locations indicated on the Division 23 Drawings

**2 PANELS AND ENCLOSURES:**

A. Provide panels and enclosures for all components of the EMCS, which are susceptible to physical or environmental damage.

B. Interior panels and enclosures shall be NEMA 1 rated painted steel panels with locking door.

C. Exterior mounted panels and enclosures shall be NEMA 4 painted steel panels with locking door.

D. Panels for USCs shall be mounted on the outside of all unit ventilators and fan coil units with three feet of wall clearance in front of them and no higher than 7 feet to the bottom of the panel.

**3 LABELING and WARNING NOTICES:**

A. Provide labeling for all control panels and enclosures.

B. Provide labeling of all control wires and input/output points at the controller and at the control device; the label at each end of the wire shall be the same. Labels shall be machine generated, typed and clearly legible with a maximum of 17 characters. Hand written labels or labels written on the control wire jacket will not be acceptable. Each label shall be unique to its function and shall reference the applicable system. For example "AHU-1 SAT" will indicate the supply air temperature sensor for AHU-1. Improper labeling shall be removed and shall require re-commissioning of the control device and controller to document correct functionality.

C. Provide high voltage warning notices at all equipment controlled by the EMCS and at all associated motor starters when used by equipment controller.

**4 TUBING AND PIPING:**

A. Provide tubing and piping as required for the field instrumentation.

B. Tubing within equipment rooms, vertical risers, and penetrations to ductwork shall be either copper pipe or shall be plastic tubing within conduit. Tubing for all water-based instrumentation shall be copper pipe. Identify the type of tubing proposed in the shop drawing submittal.

C. Provide suitable bulk head fittings for duct and panel penetrations.

D. Tubing in plenum rated areas may be plastic tubing. Polyethylene tubing shall meet, at minimum, the following requirements: flame retardant; crack resistant; 300 psi burst pressure.

**5 CONDUIT AND FITTINGS:**

A. Provide all conduits, raceways and fittings for the EMCS monitoring, communication and control cabling. All work shall meet all applicable codes.

B. Conduit, where required, shall meet, the requirements specified within Division 26.

C. EMCS monitoring and control cable shall not share conduit with cable carrying voltages in excess of 90 VAC.

**6 CABLING:**

A. Provide all cables for the EMCS. Cable shall meet, at minimum, the following requirements:

1. Minimum 98% conductivity stranded copper.
  2. Proper impedance for the application as recommended by the EMCS component manufacturer.
  3. Monitoring and control cable shall be #18 AWG or larger, dependent on the application.
  4. Management Level Network cable shall be CAT 6, 24 gauge unshielded.
  5. Automation Level Network cable shall be #22 AWG shielded.
  6. Shield shall be grounded at the CCP, UC, or control panel. Ground at one end only to avoid ground loops. Tie all sensor drain wires from shields and terminate to earth ground. Tape back shield at sensor end.
  7. Identification of each end at the termination point. Identification should be indicated on and correspond to the record drawings.
- B. 120 VAC power wiring shall be of #12 AWG solid conductor or larger as required

**7 INSTALLATION OF COMPONENTS:**

A. Provide all interlock and control wiring. All wiring shall be installed in a neat and professional manner in accordance with specification Division 26 and all national, state and local electrical codes.

B. Provide wire and wiring techniques recommended by equipment manufacturers. Control wiring shall not be installed in power circuit raceways. Magnetic starters and disconnect switches shall not be used as junction boxes. Provide auxiliary junction boxes as required. Coordinate location and arrangement of all control equipment with the Owner's Representative prior to rough-in. Provide auxiliary pilot duty relays on motor starters as required for control function.

C. Electrical Contractor shall provide 120 or 277 volt power at a junction box within 48" of the controller. The BAS Contractor shall coordinate with the Electrical Contractor to identify locations of power requirements prior to the installation of the controls.

- D. Conduit for control wiring shall be provided whenever one of the following:
1. Conduit is indicated on the drawings or specifically required by the specifications.
  2. Cabling runs through inaccessible areas such as within partitions/walls, above closed in ceilings, under floor; within trenches and underground; on the exterior of the building; exposed on the surface of the building; when encased in concrete or other material that makes the cable inaccessible or when located such that access to the cable is not readily obtained.
  3. Cable within mechanical, telecommunications and electrical equipment rooms and control rooms.
  4. Conduit shall be installed, inside wall from sensor box to above the wall, for all wall mounted temperature, humidity and CO2 sensors conditions exists.


E. Control wiring located above an accessible ceiling space may be plenum rated cable. Plenum rated wire shall be bundled and routed at right angles to the building lines and secured to the building structure every 15 feet.

F. When communication bus enters or exits a building, a surge suppressor shall be installed. The surge suppressor shall be installed according to the controls manufacturer's instructions.

G. Provide sleeves for all cable and conduit passing through walls, partitions, structural components, floors and roof.

H. All sensor wiring shall be labeled to indicate the origination (at the device) and destination of data (at the control panel). The description shall indicate the type and location of the control device such as "AHU-1 SA temp" or "VAV 1-1 space temp".

I. Wall temp sensors at 48" above the finished floor to comply with ADA requirements and to match the height of the light switches. Mount humidity sensor at equal height to wall temperature sensor

General 4 Installation Notes JOB # AU230034C DWG # 0.4	Holt Las Colinas 1000 Rochelle Blvd. Irving, Texas
Drawn: ENG: Jordan Felts	
9/6/2023 DATE	SUBMITTED DESCRIPTION
0 REV #	
Yates Company LLC 4738 Whirlwind Dr. San Antonio, TX 78217 Phone: 210-702-3820	
	

Holt Las Colinas  
BOM

Bill of Materials				
DID	Quantity	Part #	Manufacturer	Description
CT	33	A/MSCS	ACI	Fixed Current Switch, Split Core, NO, 0 to 150A Range, <0.55A Trip Point
T-D-4	48	BA/10K-2-D-4"-BBX	BAPI	Duct, 10K-2 Thermistor, Probe, 4"
TH-OA	1	BA/10K-2-H200-O-BB2	BAPI	Outside Air Temp/Humidity Combo, 0-5 VDC/4-20 mA, 2%
WD-1.5	1	WD-B40X80N	c3controls	1 1/2"W X 3"H Narrow Slot, Wiring Duct & Cover, 1pc, 6ft
WD-3	2	WD-B80X80N	c3controls	3"W X 3"H Narrow Slot, Wiring Duct & Cover, 1pc, 6ft
OPN-B3-P-02	48	OPN-B3-P-02	Carrier	Programmable Zone II controller with Air Flow, Actuator, AO and 3 BO (45 in-lb)
OPN-UC	2	OPN-UC	Carrier	Prog. Controller (5 BO, 6 UI), 5 Equipment
PROT485	5	PROT485	Carrier	Network Protection Board
XT-LB	1	XT-LB	Carrier	i-Vu XT Router; up to 60 controllers on BACnet MS/TP
ZS2-H-CAR	2	ZS2-H-CAR	Carrier	ZS Standard; Carrier brand space temp sensor w/ humidity
ZS2PL-CAR	48	ZS2PL-CAR	Carrier	ZS Plus; Carrier brand space temp sensor, Setpt Adj, TLO
XF100	1	TR100VA001	Functional Devices	Control Transformer (120 VAC Input - 24 VAC Output)
XF50	2	TR50VA015	Functional Devices	Control Transformer (120/208/240/277/480 VAC Input - 24 VAC Output)
PANEL-20x20	1	A20N20ALP+GRAY	Hoffman	Enclosure, Wall-mount, Hinged, Steel, NEMA1, 20"x20"x6"
PERF-20x20	1	A20N20MPP	Hoffman	Enclosure, Perforated Back Plate, 20"x20"
PANEL-12x12	2	AHE12X12X4	Hoffman	Enclosure, Wall-mount, Hinged, Steel, NEMA1, 12"x12"x4"
PANEL-LOCK	1	AL12AR	Hoffman	Enclosure Key Lock Kit
SWITCH	1	T5225-W	Leviton	Single Pole Switch, Standard Receptacle; Self-grounding

Yates Company LLC  
4738 Whirlwind Dr.  
San Antonio, TX 78217  
Phone: 210-702-3820



REV #	DESCRIPTION	DATE	Drawn:	ENG:
0	SUBMITTED	9/8/2023	Jordan Felts	Jordan Felts

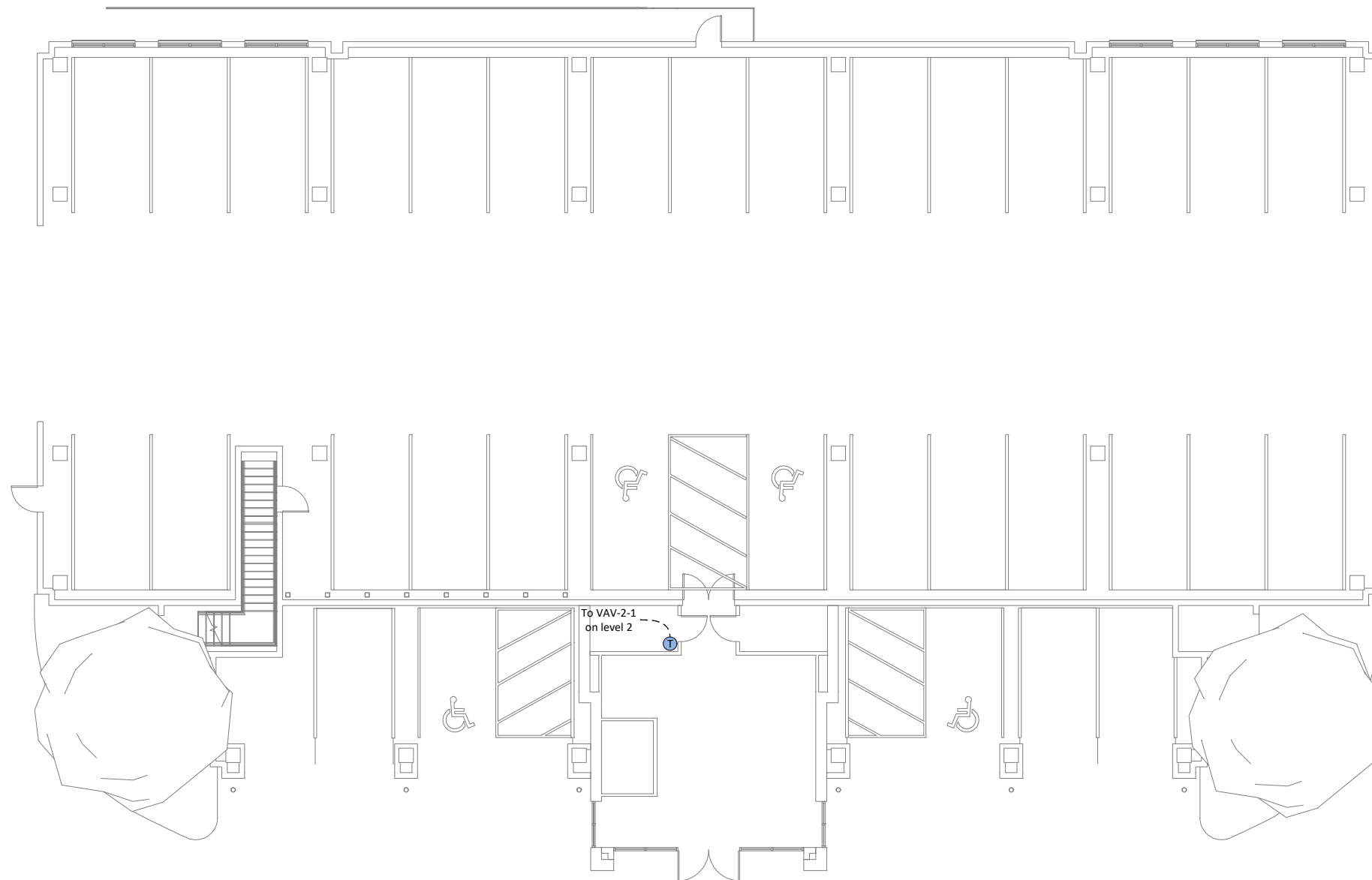
Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

Summary Bill of Material  
JOB # AU230034C  
DWG # 1.0





# Holt Las Colinas NET



## Network Riser Legend

- B BT485 Network Termination + Bias
- T TERM485 Network Termination
- E End-of-line Network Termination (onboard dip switch)
- R REP485 Network Repeater
- P PROT485 Network Protection Board
- D DIAG485 Network Diagnostic Board

- BACnet MS/TP Wiring
- I/O Expander Wiring
- - - Ethernet Wiring
- · - · - Thermostat Wiring
- - - - - Zone Sensor Wiring

I Controller

Sensor Type

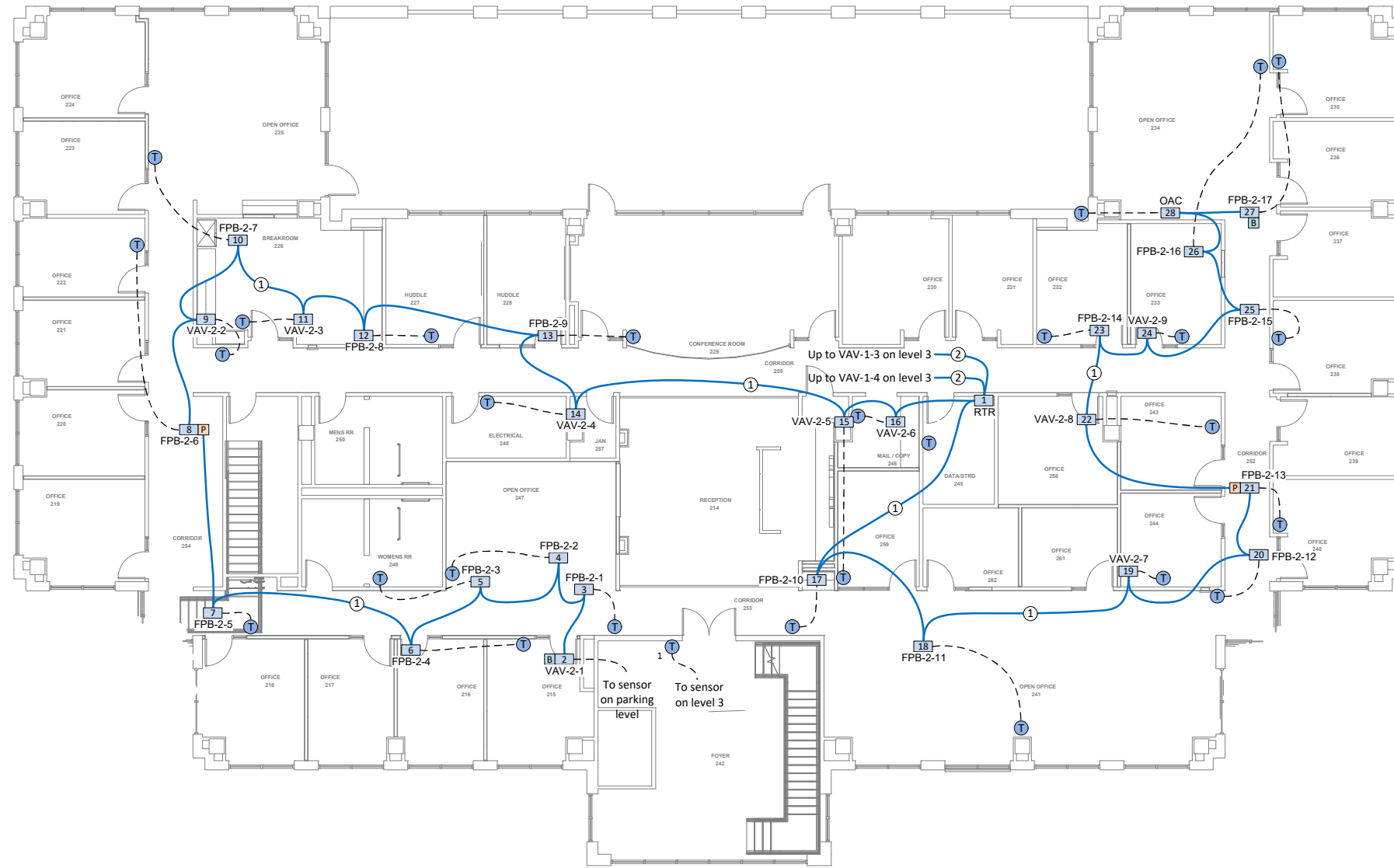
- B=Base
- PL=Plus
- P=Pro
- M=Motion
- PL 1
- 2 HC
- CO2 Included
- Humidity Included
- Address (if multiple)

P Pressure Sensor

	Network Parking Level		JOB # AU230034C	DWG # 1.2.1
Holt Las Colinas 1000 Rochelle Blvd. Irving, Texas				
			Drawn:	ENG. Jordan Felps
		9/8/2023	DATE	
0	SUBMITTED	DESCRIPTION		
REV #				
Yates Company LLC 4738 Whirlwind Dr. San Antonio, TX 78217 Phone: 210-702-3820				



# Holt Las Colinas NET



### Network Riser Legend

- B BT485 Network Termination + Bias
- T TERM485 Network Termination
- E End-of-line Network Termination (onboard dip switch)
- R REP485 Network Repeater
- P PROT485 Network Protection Board
- D DIAG485 Network Diagnostic Board

- BACnet MS/TP Wiring
- I/O Expander Wiring
- Ethernet Wiring
- Thermostat Wiring
- Zone Sensor Wiring

#### Controller

- Sensor Type**
- B=Base
  - PL=Plus
  - P=Pro
  - M=Motion
  - HC
  - CO2 Included
  - Humidity Included
  - Address (if multiple)

P Pressure Sensor

NETWORK LEGEND	
①	Network 16004
②	Network 16005

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Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

Network Level 2  
JOB # AU230034C  
DWG # 1.2.2

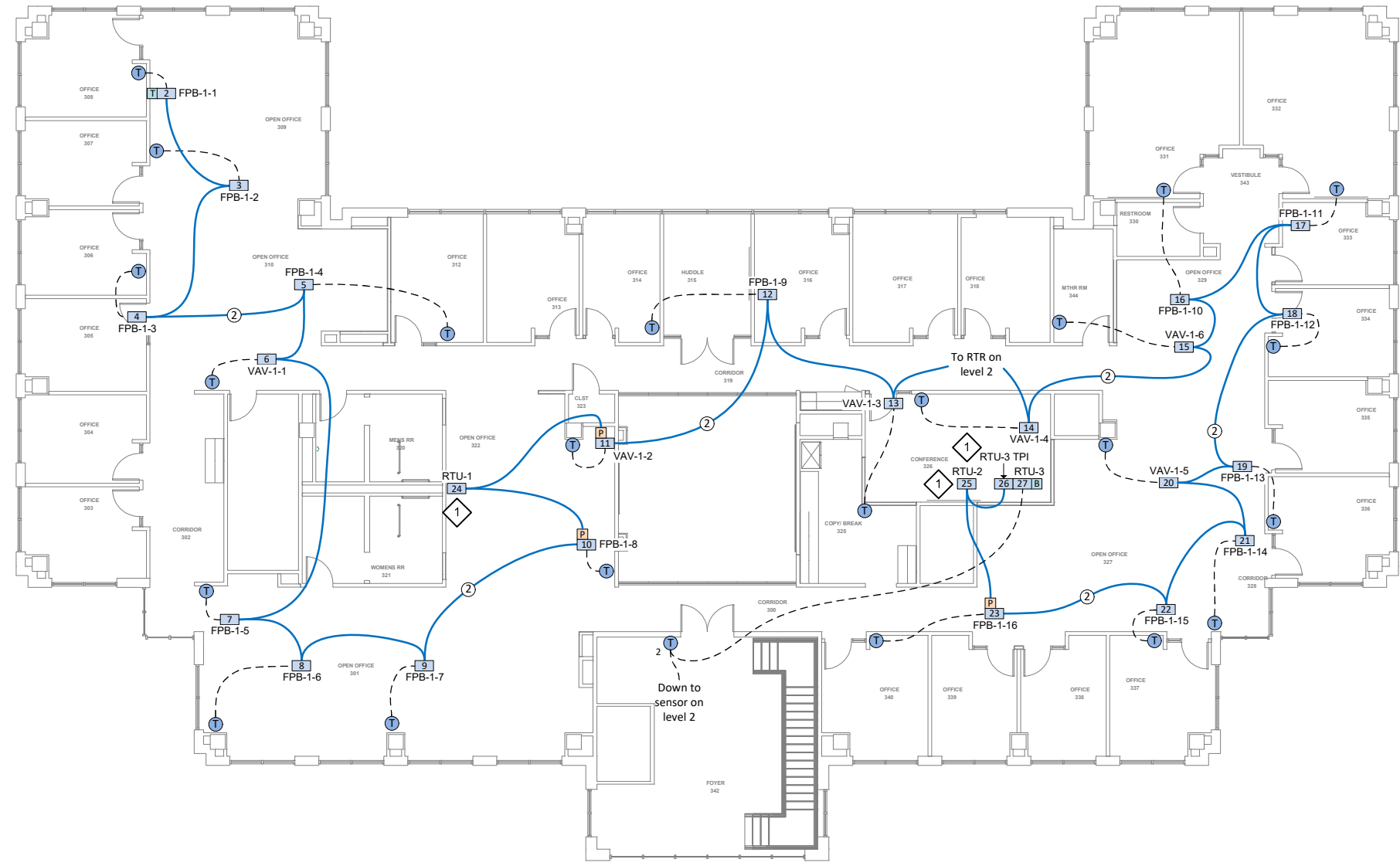
REV #	DATE	DESCRIPTION	Drawn:	ENG:
0	9/6/2023	SUBMITTED	JORDAN FELPS	JORDAN FELPS

# Holt Las Colinas NET

**Key Drawing Notes:**

1	Controller inside RTU
---	-----------------------

- General Notes:**
1. Refer to Network Diagram and Cable Specification Chart for wiring details and control module address.
  2. Coordinate with Electrical Contractor (Div. 26) to provide 120 VAC circuit power to control panels.
  3. Refer to Carrier Technical Documentation for specifications on control module setup, wiring, and driver configuration



### Network Riser Legend

- B BT485 Network Termination + Bias
- T TERM485 Network Termination
- E End-of-line Network Termination (onboard dip switch)
- R REP485 Network Repeater
- P PROT485 Network Protection Board
- D DIAG485 Network Diagnostic Board

- BACnet MS/TP Wiring
  - I/O Expander Wiring
  - Ethernet Wiring
  - - - Thermostat Wiring
  - - - Zone Sensor Wiring
- Controller**
- Sensor Type**
- B=Base
  - PL=Plus
  - P=Pro
  - M=Motion
  - PL 1
  - 2 HC
  - CO2 Included
  - Humidity Included
  - Address (if multiple)
- P Pressure Sensor

NETWORK LEGEND	
1	Network 16004
2	Network 16005

Holt Las Colinas 1000 Rochelle Blvd. Irving, Texas	Network Level 3 JOB # AU230034C DWG # 1.2.3	
Drawn: 9/8/2023 DATE	ENG: Jordan Felts DATE	SUBMITTED DESCRIPTION
REV # 0		
Yates Company LLC 4738 Whirlwind Dr. San Antonio, TX 78217 Phone: 210-702-3820		

Holt Las Colinas  
NET

**Network Schedule 1003 - IP**

Network Number	IP Number	MAC Address	Controller	Network Tag	Equipment Tag/Name	Equipment Location	Floor Location	Area Served	Controller Location	S1 Network	S2 Network	Device Instance
1003	001	1	XT-LB	RTR	RTR	Data/Storage 245	2	Building Network	Data/Storage 245	16004	16005	1003001

**Network Schedule 16004 - Level 2**

Network Number	MAC Address	Controller	Network Tag	Equipment Tag/Name	Equipment Location	Floor Location	Area Served	Controller Location	Device Instance
16004	2	OPN-B3-P-02	VAV-2-1	VAV-2-1	Office 215	2	Parking Storage	Office 215	1600402
16004	3	OPN-B3-P-02	FPB-2-1	FPB-2-1	Open Office 247	2	Reception 214	Open Office 247	1600403
16004	4	OPN-B3-P-02	FPB-2-2	FPB-2-2	Open Office 247	2	Open Office 247	Open Office 247	1600404
16004	5	OPN-B3-P-02	FPB-2-3	FPB-2-3	Open Office 247	2	Restrooms 249/250	Open Office 247	1600405
16004	6	OPN-B3-P-02	FPB-2-4	FPB-2-4	Office 216	2	Offices 215-218	Office 216	1600406
16004	7	OPN-B3-P-02	FPB-2-5	FPB-2-5	Corr. 254 Southeast	2	Corr. 254 Southeast	Corr. 254 Southeast	1600407
16004	8	OPN-B3-P-02	FPB-2-6	FPB-2-6	Corr. 254	2	Offices 219-222	Corr. 254	1600408
16004	9	OPN-B3-P-02	VAV-2-2	VAV-2-2	Breakroom 226	2	Corr. 254 Southwest	Breakroom 226	1600409
16004	10	OPN-B3-P-02	FPB-2-7	FPB-2-7	Breakroom 226	2	Offices 223-225	Breakroom 226	1600410
16004	11	OPN-B3-P-02	VAV-2-3	VAV-2-3	Breakroom 226	2	Breakroom 226	Breakroom 226	1600411
16004	12	OPN-B3-P-02	FPB-2-8	FPB-2-8	Breakroom 226	2	Huddle 227/228	Breakroom 226	1600412
16004	13	OPN-B3-P-02	FPB-2-9	FPB-2-9	Huddle 228	2	Conference 229	Huddle 228	1600413
16004	14	OPN-B3-P-02	VAV-2-4	VAV-2-4	Janitor 257	2	Electrical 248	Janitor 257	1600414
16004	15	OPN-B3-P-02	VAV-2-5	VAV-2-5	Mail/Copy 246	2	Office 259	Mail/Copy 246	1600415
16004	16	OPN-B3-P-02	VAV-2-6	VAV-2-6	Mail/Copy 246	2	Mail/Copy 246	Mail/Copy 246	1600416
16004	17	OPN-B3-P-02	FPB-2-10	FPB-2-10	Reception 214 Northeast	2	Reception 214	Reception 214 Northeast	1600417
16004	18	OPN-B3-P-02	FPB-2-11	FPB-2-11	Open Office 241 Southwest	2	Open Office 241	Open Office 241 Southwest	1600418
16004	19	OPN-B3-P-02	VAV-2-7	VAV-2-7	Office 244	2	Office 244 & Corr. 252	Office 244	1600419
16004	20	OPN-B3-P-02	FPB-2-12	FPB-2-12	Corr. 252	2	Corr. 252 Northeast	Corr. 252	1600420
16004	21	OPN-B3-P-02	FPB-2-13	FPB-2-13	Corr. 252	2	Office 240	Corr. 252	1600421
16004	22	OPN-B3-P-02	VAV-2-8	VAV-2-8	Office 244	2	Office 244 & Corr. 252 East	Office 244	1600422
16004	23	OPN-B3-P-02	FPB-2-14	FPB-2-14	Office 232	2	Offices 230-232	Office 232	1600423
16004	24	OPN-B3-P-02	VAV-2-9	VAV-2-9	Office 233	2	Office 233	Office 233	1600424
16004	25	OPN-B3-P-02	FPB-2-15	FPB-2-15	Corr. 252	2	Offices 236-239	Corr. 252	1600425
16004	26	OPN-B3-P-02	FPB-2-16	FPB-2-16	Office 233	2	Open Office 234	Office 233	1600426
16004	27	OPN-B3-P-02	FPB-2-17	FPB-2-17	Corr. 252 Northwest	2	Office 235	Corr. 252 Northwest	1600427
16004	28	OPN-UC	OAC	OAC	Corr. 252 Northwest	2	OA Conditions	Corr. 252 Northwest	1600428

**Network Schedule 16005 - Level 3**

Network Number	MAC Address	Controller	Network Tag	Equipment Tag/Name	Equipment Location	Floor Location	Area Served	Controller Location	Device Instance
16005	2	OPN-B3-P-02	FPB-1-1	FPB-1-1	Open Office 309	3	Office 308	Open Office 309	1600502
16005	3	OPN-B3-P-02	FPB-1-2	FPB-1-2	Open Office 309	3	Open Office 309	Open Office 309	1600503
16005	4	OPN-B3-P-02	FPB-1-3	FPB-1-3	Office 305	3	Offices 303-307	Office 305	1600504
16005	5	OPN-B3-P-02	FPB-1-4	FPB-1-4	Open Office 310	3	Offices 310-312	Open Office 310	1600505
16005	6	OPN-B3-P-02	VAV-1-1	VAV-1-1	Open Office 310 Corr.	3	Corr. 302 West, Corr. 319 South	Open Office 310 Corr.	1600506
16005	7	OPN-B3-P-02	FPB-1-5	FPB-1-5	Corr. 302 Southeast	3	Corr. 302 Southeast	Corr. 302 Southeast	1600507
16005	8	OPN-B3-P-02	FPB-1-6	FPB-1-6	Open Office 301 South	3	Open Office 301 South	Open Office 301 South	1600508
16005	9	OPN-B3-P-02	FPB-1-7	FPB-1-7	Open Office 301	3	Open Office 301	Open Office 301	1600509
16005	10	OPN-B3-P-02	FPB-1-8	FPB-1-8	Open Office 322	3	Corr. 300, Atrium	Open Office 322	1600510
16005	11	OPN-B3-P-02	VAV-1-2	VAV-1-2	Open Office 322	3	Open Office 322	Open Office 322	1600511
16005	12	OPN-B3-P-02	FPB-1-9	FPB-1-9	Office 316	3	Offices 313-318	Office 316	1600512
16005	13	OPN-B3-P-02	VAV-1-3	VAV-1-3	Conf. 326	3	Copy/Break 325	Conf. 326	1600513
16005	14	OPN-B3-P-02	VAV-1-4	VAV-1-4	Conf. 326	3	Conf. 326	Conf. 326	1600514
16005	15	OPN-B3-P-02	VAV-1-6	VAV-1-6	Open Office 329	3	MTHR 344, Corr. 319 North, RR 330	Open Office 329	1600515
16005	17	OPN-B3-P-02	FPB-1-11	FPB-1-11	Office 333	3	Office 332	Office 333	1600517
16005	18	OPN-B3-P-02	FPB-1-10	FPB-1-10	Open Office 329	3	Office 331	Open Office 329	1600518
16005	18	OPN-B3-P-02	FPB-1-12	FPB-1-12	Office 334	3	333-335	Office 334	1600518
16005	19	OPN-B3-P-02	FPB-1-13	FPB-1-13	Open Office 327	3	Office 336	Open Office 327	1600519
16005	20	OPN-B3-P-02	VAV-1-5	VAV-1-5	Open Office 327	3	Open Office 327	Open Office 327	1600520
16005	21	OPN-B3-P-02	FPB-1-14	FPB-1-14	Corr. 328 Northeast	3	Corr. 328 Northeast	Corr. 328 Northeast	1600521
16005	22	OPN-B3-P-02	FPB-1-15	FPB-1-15	Corr. 300 North	3	Office 337	Corr. 300 North	1600522
16005	23	OPN-B3-P-02	FPB-1-16	FPB-1-16	Corr. 300	3	Offices 338-340	Corr. 300	1600523
16005	24	TPI	RTU-1	RTU-1	Roof	Roof	Level 3	Roof	1600524
16005	25	TPI	RTU-2	RTU-2	Roof	Roof	Level 2	Roof	1600525
16005	26	TPI	RTU-3 TPI	RTU-3	Roof	Roof	Foyer All Levels	Roof	1600526
16005	27	OPN-UC	RTU-3	RTU-3	Level 3	Roof	Foyer All Levels	Level 3	1600527

Network Schedules

Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

JOB # AU230034C DWG # 1.2.4

Drawn: ENG: Jordan Felts


DATE 9/8/2023

SUBMITTED

DESCRIPTION

REV # 0

Yates Company LLC  
4738 Whirlwind Dr.  
San Antonio, TX 78217  
Phone: 210-702-3820



# Holt Las Colinas BOM

## VAV AHU with Packaged Controls

### Run Conditions - Requested:

The unit will run whenever:

- Any zone is occupied.
- OR a definable number of unoccupied zones need heating or cooling.

### Run Conditions:

Operation Modes:

- Automatic: Based on zone occupancy.
- Manual: On/Off as selected by the operator

The unit will run in automatic mode whenever:

- Any zone is occupied.
- OR a definable number of unoccupied zones need heating or cooling.

### Unoccupied Mode:

The unit will have a user definable (adj.) minimum runtime of 15 min. (adj.).

### AHU Interface Control and Monitoring:

The controller will control and/or monitor the following points via BACnet interface as provided by unit manufacturer:

#### Control Outputs

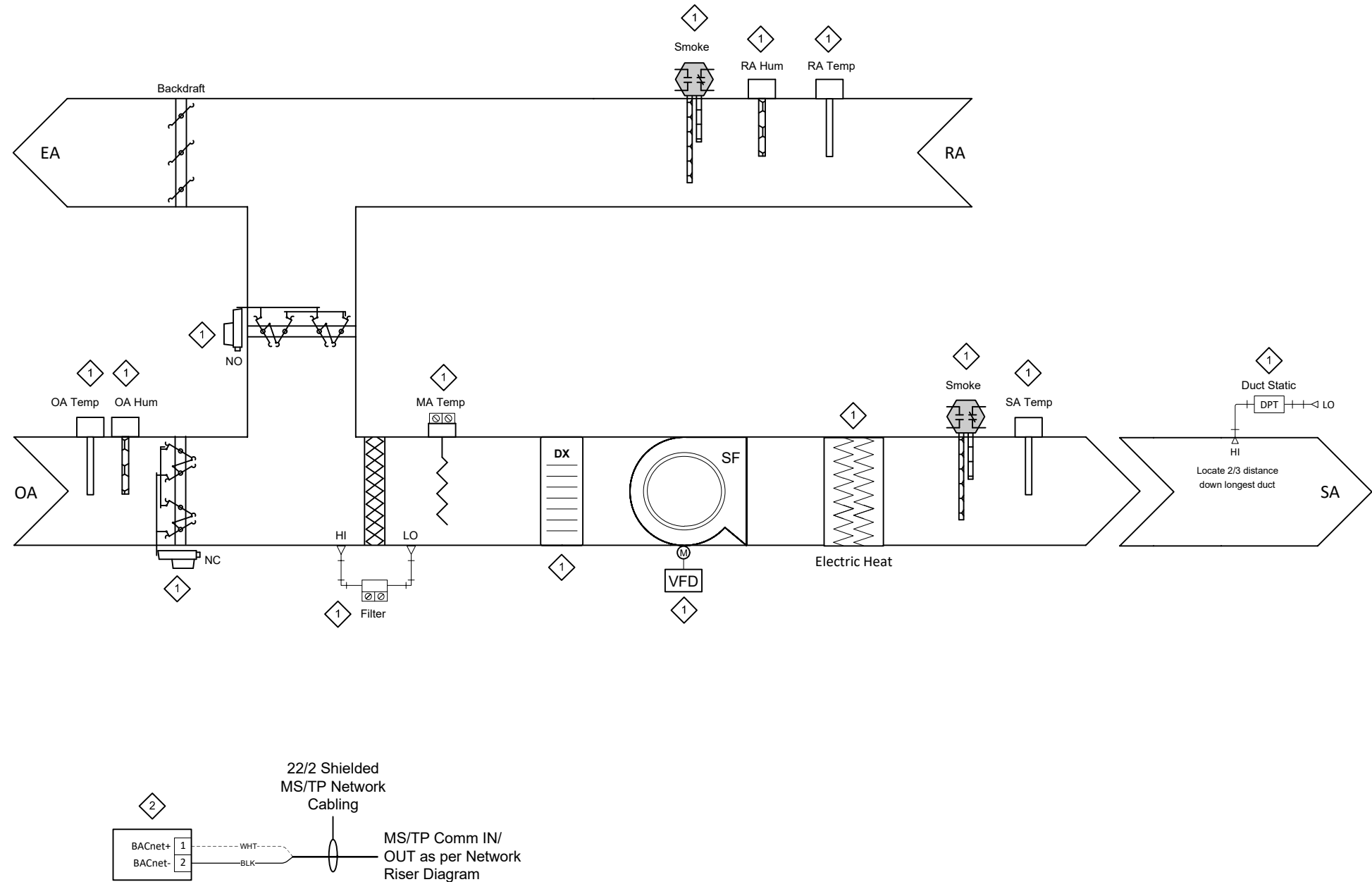
- Occupancy
- Supply air temperature setpoint
- Duct static pressure setpoint
- Building static pressure setpoint (if applicable)

#### Monitoring points

- Supply air temperature
- Duct static pressure
- Supply fan command
- Supply fan speed
- Supply fan status
- Supply fan fault
- DX cooling command (per compressor)
- DX cooling status (per compressor)
- Heat command
- Return air temperature
- Return air humidity (if available)
- Return air CO2 (if available)
- Return air static pressure
- Filter status
- OA damper position
- OA temp
- OA humidity
- Mixed air temperature (if available)
- Return smoke detector (if available)
- Supply smoke detector (if available)

Alarms will be provided as follows (if possible):

- Compressor Fail
- Compressor Hand
- Supply Fan Fail
- Supply Fan Hand
- Duct Static Pressure Low
- Duct Static Pressure High
- High Static Alarm
- Supply Smoke Detector
- Return Smoke Detector
- Return Air Temperature Low
- Return Air Temperature High
- Supply Air Temperature Low
- Supply Air Temperature High
- Filter Change Required



Key Drawing Notes:	
1	Provided by unit manufacturer – Integrated through BACnet connection
2	RTU package controls include factory installed control module.

### General Notes:

1. Refer to Network Diagram and Cable Specification Chart for wiring details and control module address.
2. Coordinate with Electrical Contractor (Div. 26) to provide 120 VAC circuit power to control panels.
3. Refer to Carrier Technical Documentation for specifications on control module setup, wiring, and driver configuration

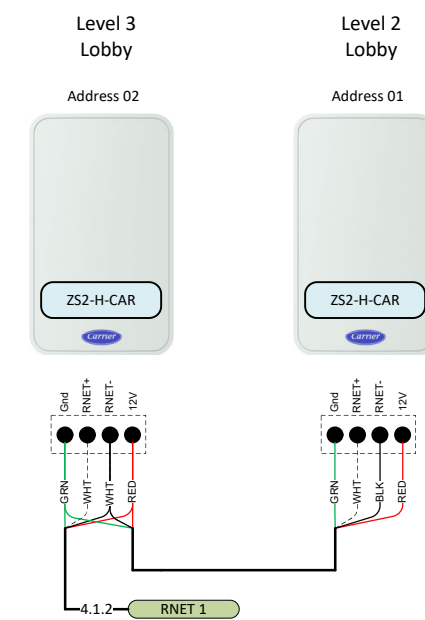
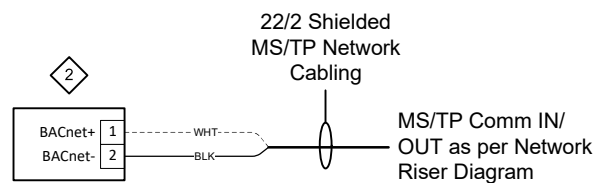
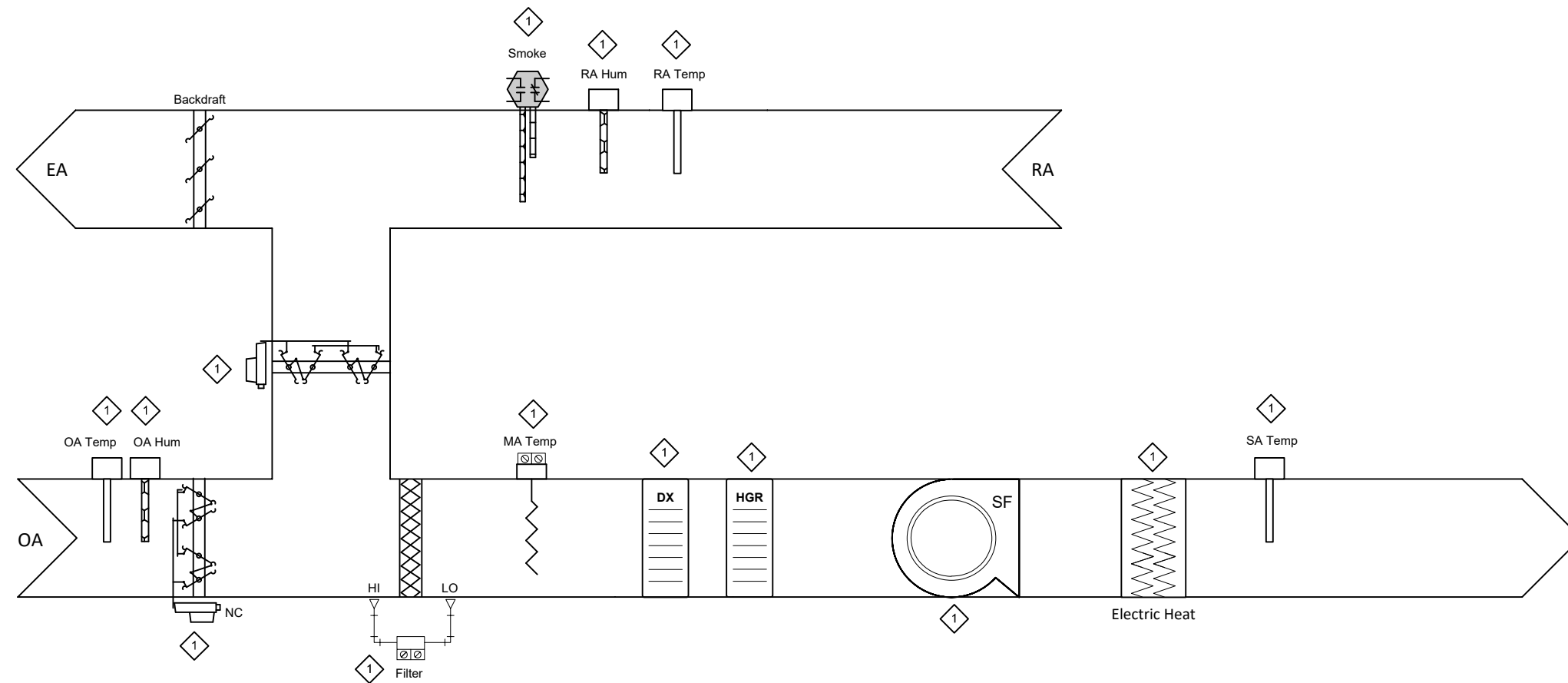
RTU-1 & 2 Schematic JCI PV40 JOB # AU230034C	Holt Las Colinas 1000 Rochelle Blvd. Irving, Texas	DWG # 4.0.1 ENG: Jordan Felps DATE: 9/8/2023 SUBMITTED: 0 DESCRIPTION:
Yates Company LLC 4738 Whirlwind Dr. San Antonio, TX 78217 Phone: 210-702-3820		





# Holt Las Colinas RTU

Bill of Materials				
DID	Quantity	Part #	Manufacturer	Description
ZS2-H-CAR	2	ZS2-H-CAR	Carrier	ZS Standard; Carrier brand space temp sensor w/ humidity



Key Drawing Notes:	
1	Provided by unit manufacturer – Integrated through BACnet connection
2	RTU package controls include factory installed control module. See next page for supplemental controls provided by Y8S.

### General Notes:

1. Refer to Network Diagram and Cable Specification Chart for wiring details and control module address.
2. Coordinate with Electrical Contractor (Div. 26) to provide 120 VAC circuit power to control panels.
3. Refer to Carrier Technical Documentation for specifications on control module setup, wiring, and driver configuration

RTU-3 Schematic

JCI ZYE

JOB # AU230034C  
DWG # 4.1.1

Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

Drawn: ENG. Jordan Felps

DATE 9/8/2023

DESCRIPTION SUBMITTED

REV # 0

Yates Company LLC  
4738 Whirlwind Dr.  
San Antonio, TX 78217  
Phone: 210-702-3820



# Holt Las Colinas RTU

Bill of Materials				
DID	Quantity	Part #	Manufacturer	Description
OPN-UC	1	OPN-UC	Carrier	Prog. Controller (5 BO, 6 UI), 5 Equipment
XF50	1	TR50VA015	Functional Devices	Control Transformer (120/208/240/277/480 VAC Input - 24 VAC Output)
PANEL-12x12	1	AHE12X12X4	Hoffman	Enclosure, Wall-mount, Hinged, Steel, NEMA1, 12"x12"x4"

## SZ AHU with Packaged Controls

### Run Conditions - Scheduled:

The unit will run according to a user definable time schedule in the following modes:

- Occupied Mode: The unit will maintain
  - A 74°F (adj.) cooling setpoint
  - A 70°F (adj.) heating setpoint.

- Unoccupied Mode (night setback): The unit will maintain
  - A 85°F (adj.) cooling setpoint.
  - A 60°F (adj.) heating setpoint.

Alarms will be provided as follows:

- High Zone Temp: If the zone temperature is greater than the cooling setpoint by a user definable amount (adj.).
- Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).

### Run Conditions:

#### Operation Modes:

- Automatic: Based on zone occupancy.
- Manual: On/Off as selected by the operator

The unit will run in automatic mode whenever:

- Any zone is occupied.
- OR a definable number of unoccupied zones need heating or cooling.

### Unoccupied Mode:

The unit will have a user definable (adj.) minimum runtime of 15 min. (adj.).

### Smoke Detection:

The unit will shut down based on unit provided device and generate an alarm upon receiving a supply or return air smoke detector status.

### Supply Fan:

The supply fan will run according to unit package controls anytime the unit is commanded to run, unless shutdown on safeties.

Alarms will be provided as follows:

- Supply Fan Failure: Commanded on, but the status is off.
- Supply Fan in Hand: Commanded off, but the status is on.
- Supply Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).

### Cooling Stages:

The unit provided controller will measure the space temperature and stage/modulate the cooling to maintain its cooling setpoint.

### Economizer:

The unit provided controller will measure the outside/return air enthalpy and modulate the economizer dampers in sequence to maintain a space cooling setpoint.

### Return Air Humidity:

The unit provided controller will monitor the return air humidity and use as required for economizer control or humidity control.

Alarms will be provided as follows:

- High Return Air Humidity: If the return air humidity is greater than 70% (adj.).

### Return Air Temperature:

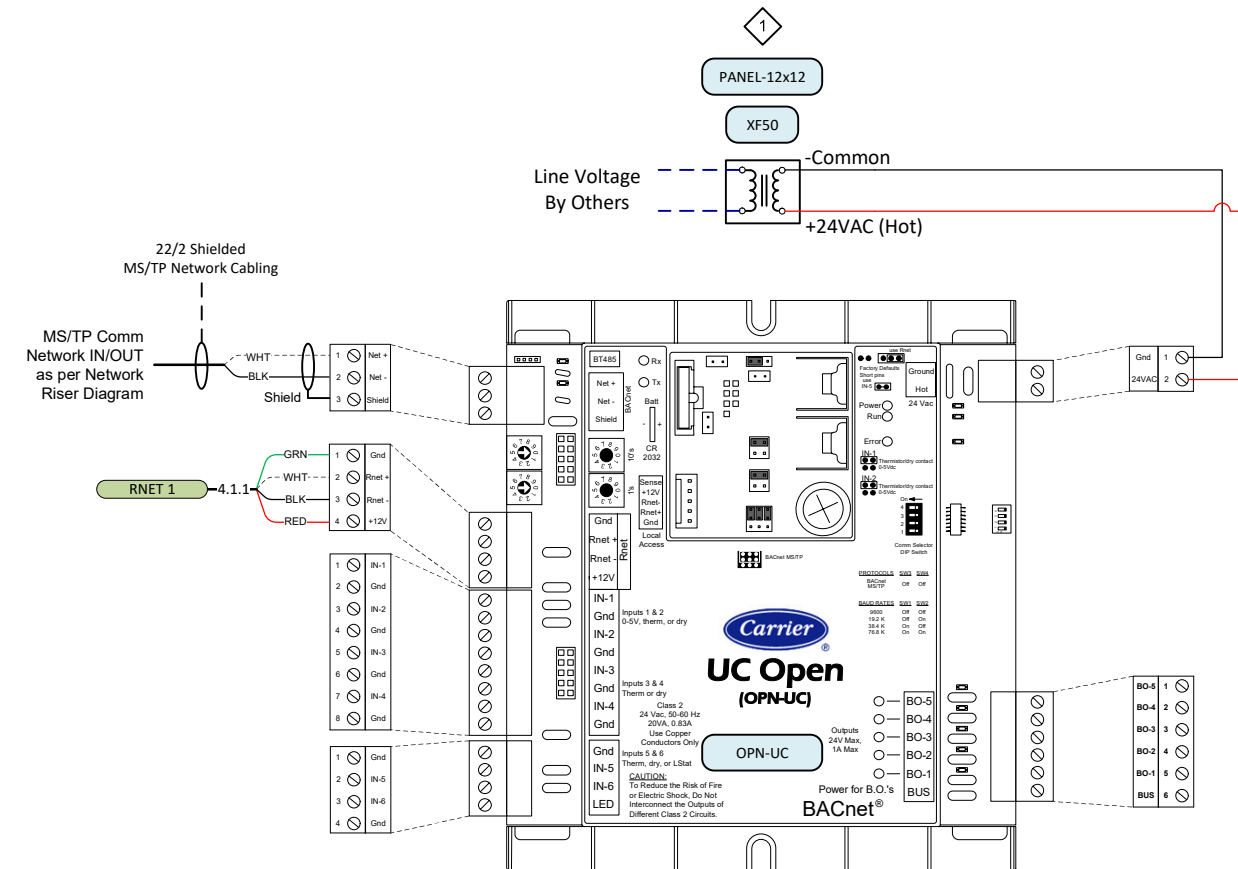
The unit provided controller will monitor the return air temperature and use as required for setpoint control or economizer control.

### Dehumidification:

The unit provided controller will measure the return air humidity and override the cooling sequence to maintain return air humidity at or below 60 %rh (adj.). Dehumidification will be enabled whenever the supply fan status is on.

Additional necessary points may be monitored or controlled via BACnet interface. These points will be determined during startup. Below is a list of expected points based on RTU equipment submittals and plans.

- Outside air temperature
- Outside air humidity
- Space temperature
- Return air temperature
- Return air humidity
- Supply fan speed (if available)
- Supply fan status
- Economizer signal
- Heating stage status
- Compressor enable
- Compressor status
- Cooling signal
- Hot gas reheat status/signal
- Refrigerant circuit suction pressure (if available)
- Refrigerant circuit discharge pressure (if available)
- Filter Status
- Safety shutdown



#### Key Drawing Notes:

- Install enclosure and transformer inside building envelope if no available space inside unit enclosure on roof.

#### General Notes:

- Refer to Network Diagram and Cable Specification Chart for wiring details and control module address.
- Coordinate with Electrical Contractor (Div. 26) to provide 120 VAC circuit power to control panels.
- Refer to Carrier Technical Documentation for specifications on control module setup, wiring, and driver configuration

Yates Company LLC

4738 Whirlwind Dr.  
San Antonio, TX 78217  
Phone: 210-702-3820

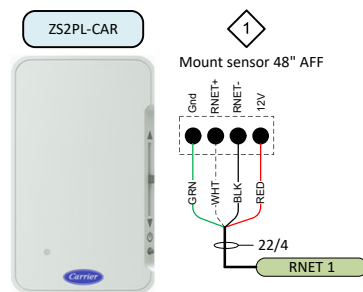
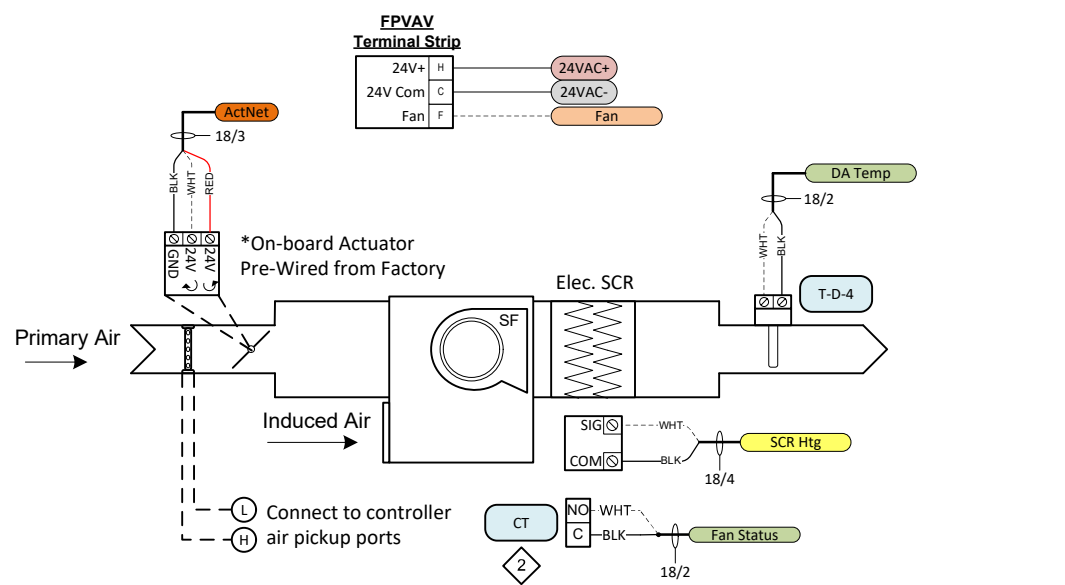


Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

RTU-3 Panel  
Supplemental  
JOB # AU230034C  
DWG # 4.1.2

REV #	DATE	DESCRIPTION	ENG.	Drawn:
0	9/8/2023	SUBMITTED	Jordan Felps	

# Holt Las Colinas VAV



Bill of Materials				
DID	Quantity	Part #	Manufacturer	Description
CT	33	A/MSCS	ACI	Fixed Current Switch, Split Core, NO, 0 to 150A Range, <0.55A Trip Point
T-D-4	33	BA/10K-2-D-4"-BBX	BAPI	Duct, 10K-2 Thermistor, Probe, 4"
OPN-B3-P-02	33	OPN-B3-P-02	Carrier	Programmable Zone II controller with Air Flow, Actuator, AO and 3 BO (45 in-lb)
ZS2PL-CAR	33	ZS2PL-CAR	Carrier	ZS Plus; Carrier brand space temp sensor, Setpt Adj, TLO

## Sequence of Operations

Run Conditions - Scheduled:

The unit will run according to a user definable time schedule in the following modes:

Occupied Mode: The unit will maintain

A 74°F (adj.) cooling setpoint

A 70°F (adj.) heating setpoint

Unoccupied Mode (night setback): The unit will maintain

A 85°F (adj.) cooling setpoint

A 60°F (adj.) heating setpoint

Alarms will be provided as follows:

High Zone Temp: If the zone temperature is greater than the cooling setpoint by a user definable amount (adj.).

Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).

Zone Setpoint Adjust:

The occupant will be able to adjust the zone temperature heating and cooling setpoints at the zone sensor (+/-2°F limit).

Zone Optimal Start:

The unit will use an optimal start algorithm for morning start-up. This algorithm will minimize the unoccupied warm-up or cool-down period while still achieving comfort conditions by the start of scheduled occupied period.

Zone Unoccupied Override:

A timed local override control will allow an occupant to override the schedule and place the unit into an occupied mode for an adjustable period of time. At the expiration of this time, control of the unit will automatically return to the schedule.

Variable Volume Terminal Unit - Flow Control:

The unit will maintain zone setpoints by controlling the airflow through one of the following:

Occupied:

When zone temperature is greater than its cooling setpoint, the zone damper will modulate between the minimum occupied airflow (adj.) and the maximum cooling airflow (adj.) until the zone is satisfied.

When the zone temperature is less than the cooling setpoint, the zone damper will maintain the minimum required zone ventilation (adj.).

Unoccupied:

When the zone is unoccupied the zone damper will control to its minimum unoccupied airflow (adj.).

When the zone temperature is greater than its cooling setpoint, the zone damper will modulate between the minimum unoccupied airflow (adj.) and the maximum cooling airflow (adj.) until the zone is satisfied.

Fan Control - Series:

The fan will run anytime the unit is commanded to run. The fan will run for a minimum user definable time (adj.). The zone damper will close completely before the fan starts to prevent air from the AHU from causing the fan to spin backward. The zone damper will return to automatic control after the fan starts.

Fan Status:

The controller will monitor the fan status.

Alarms will be provided as follows:

Fan Failure: Commanded on, but the status is off.

Fan in Hand: Commanded off, but the status is on.

Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

Reheating - SCR:

The controller will measure the zone temperature and modulate the electric reheat SCR signal on dropping temperature to maintain its heating setpoint.

The reheating will be enabled whenever:

Outside air temperature is less than 65°F (adj.).

AND the zone temperature is below setpoint.

AND sufficient airflow is provided.

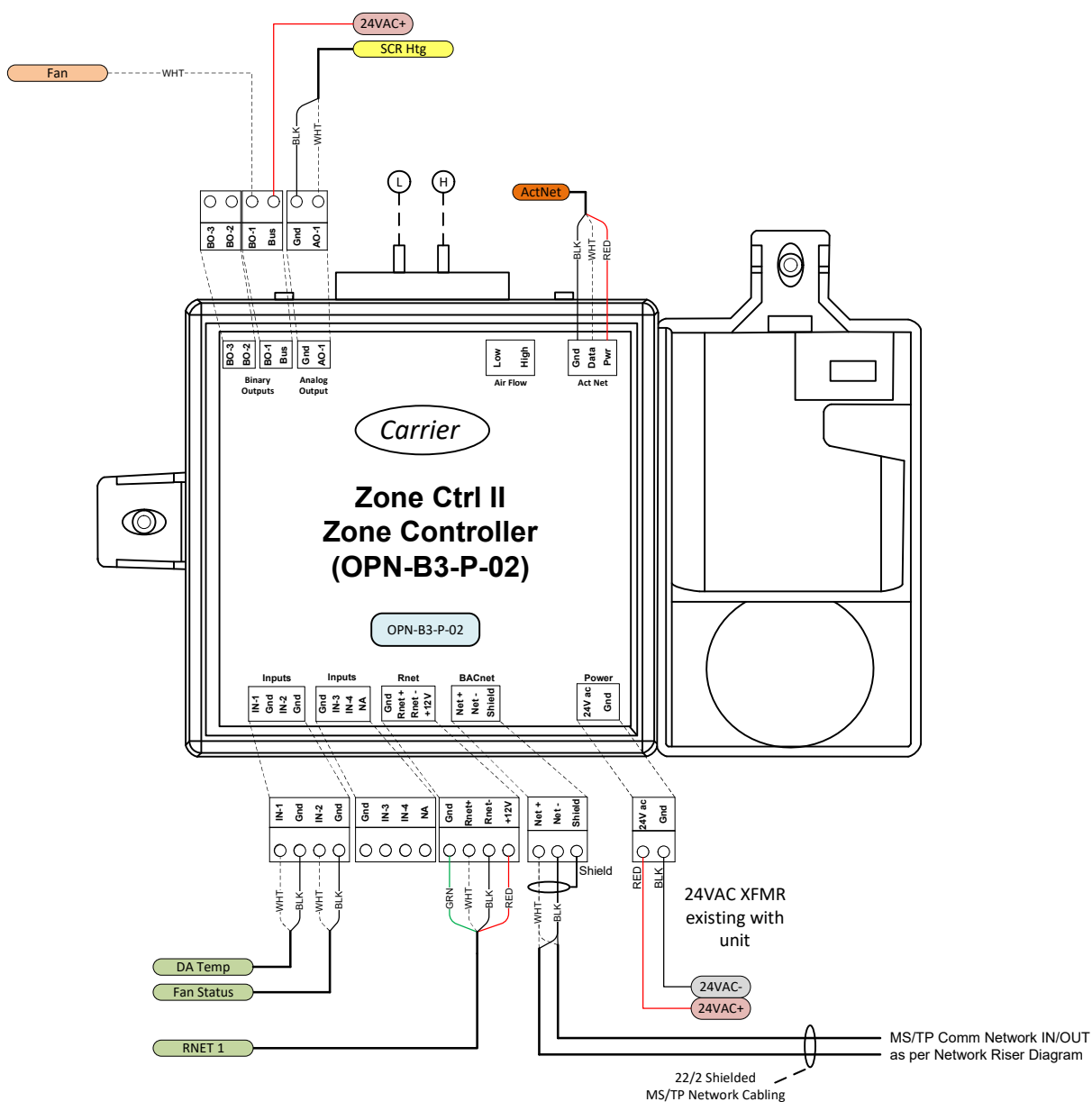
Discharge Air Temperature:

The controller will monitor the discharge air temperature.

Alarms will be provided as follows:

High Discharge Air Temp: If the discharge air temperature is greater than 120°F (adj.).

Low Discharge Air Temp: If the discharge air temperature is less than 40°F (adj.).



Typical of 33  
(See terminal unit schedule for specific units)

Key Drawing Notes:	
1	RFI-002 pending response for space sensor height. Confirm prior to installation
2	Install current switch around incoming power leg of fan

FPVAV  
Air Terminal Units

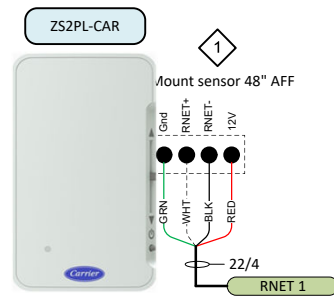
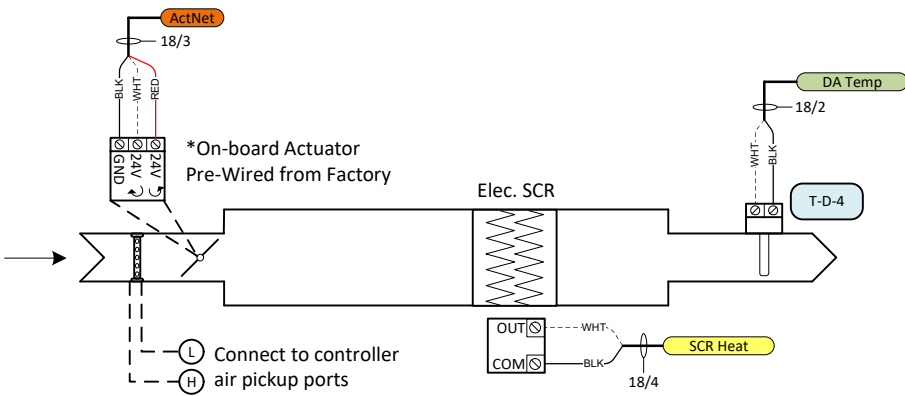
Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

JOB # AU230034C  
DWG # 5.0.1

Drawn:	9/8/2023	DATE
ENG: Jordan Felps		
0		REV #
SUBMITTED		DESCRIPTION

Yates Company LLC  
4738 Whirlwind Dr.  
San Antonio, TX 78217  
Phone: 210-702-3820

# Holt Las Colinas VAV



Bill of Materials				
DID	Quantity	Part #	Manufacturer	Description
T-D-4	15	BA/10K-2-D-4-BBX	BAPI	Duct, 10K-2 Thermistor, Probe, 4"
OPN-B3-P-02	15	OPN-B3-P-02	Carrier	Programmable Zone II controller with Air Flow, Actuator, AO and 3 BO (45 in-lb)
ZS2PL-CAR	15	ZS2PL-CAR	Carrier	ZS Plus; Carrier brand space temp sensor, Setpt Adj, TLO

### Sequence of Operations

Run Conditions - Scheduled:

The unit will run according to a user definable time schedule in the following modes:

Occupied Mode: The unit will maintain

A 74°F (adj.) cooling setpoint

A 70°F (adj.) heating setpoint

Unoccupied Mode (night setback): The unit will maintain

A 85°F (adj.) cooling setpoint

A 60°F (adj.) heating setpoint

Alarms will be provided as follows:

High Zone Temp: If the zone temperature is greater than the cooling setpoint by a user definable amount (adj.).

Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).

Zone Setpoint Adjust:

The occupant will be able to adjust the zone temperature heating and cooling setpoints at the zone sensor (+/-2°F limit).

Zone Optimal Start:

The unit will use an optimal start algorithm for morning start-up. This algorithm will minimize the unoccupied warm-up or cool-down period while still achieving comfort conditions by the start of scheduled occupied period.

Zone Unoccupied Override:

A timed local override control will allow an occupant to override the schedule and place the unit into an occupied mode for an adjustable period of time. At the expiration of this time, control of the unit will automatically return to the schedule.

Variable Volume Terminal Unit - Flow Control:

The unit will maintain zone setpoints by controlling the airflow through one of the following:

Occupied:

When zone temperature is greater than its cooling setpoint, the zone damper will modulate between the minimum occupied airflow (adj.) and the maximum cooling airflow (adj.) until the zone is satisfied.

When the zone temperature is less than the cooling setpoint, the zone damper will maintain the minimum required zone ventilation (adj.).

Unoccupied:

When the zone is unoccupied the zone damper will control to its minimum unoccupied airflow (adj.).

When the zone temperature is greater than its cooling setpoint, the zone damper will modulate between the minimum unoccupied airflow (adj.) and the maximum cooling airflow (adj.) until the zone is satisfied.

Reheating - SCR:

The controller will measure the zone temperature and modulate the SCR heating on dropping temperature to maintain its heating setpoint. Flow control will continue to maintain minimum required zone ventilation.

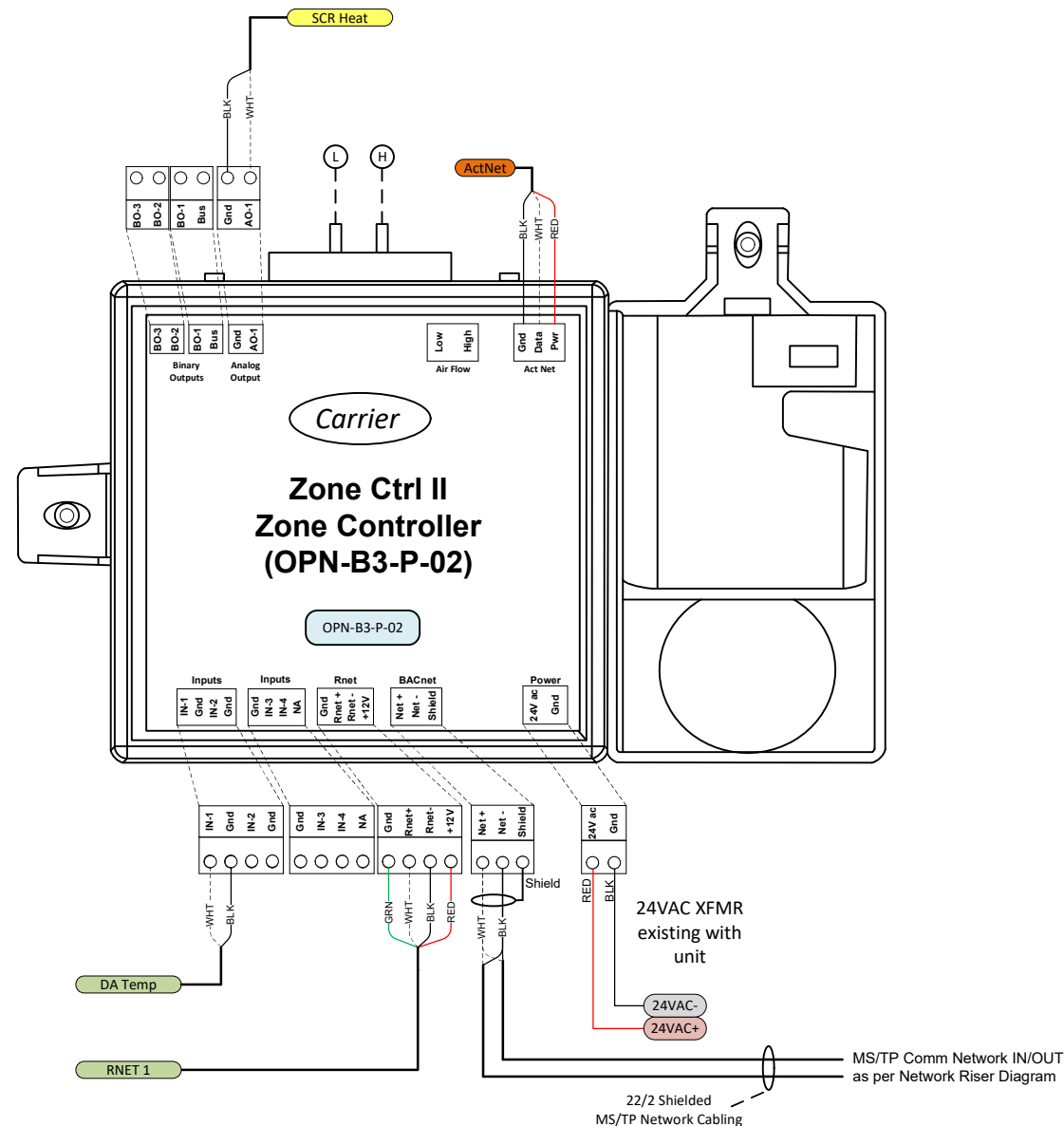
Discharge Air Temperature:

The controller will monitor the discharge air temperature.

Alarms will be provided as follows:

High Discharge Air Temp: If the discharge air temperature is greater than 120°F (adj.).

Low Discharge Air Temp: If the discharge air temperature is less than 40°F (adj.).



Typical of 15  
(See terminal unit schedule for specific units)

Key Drawing Notes:	
1	RFI-002 pending response for space sensor height. Confirm prior to installation

VAV

Air Terminal Units

Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

JOB # AU230034C      DWG # 5.1.1

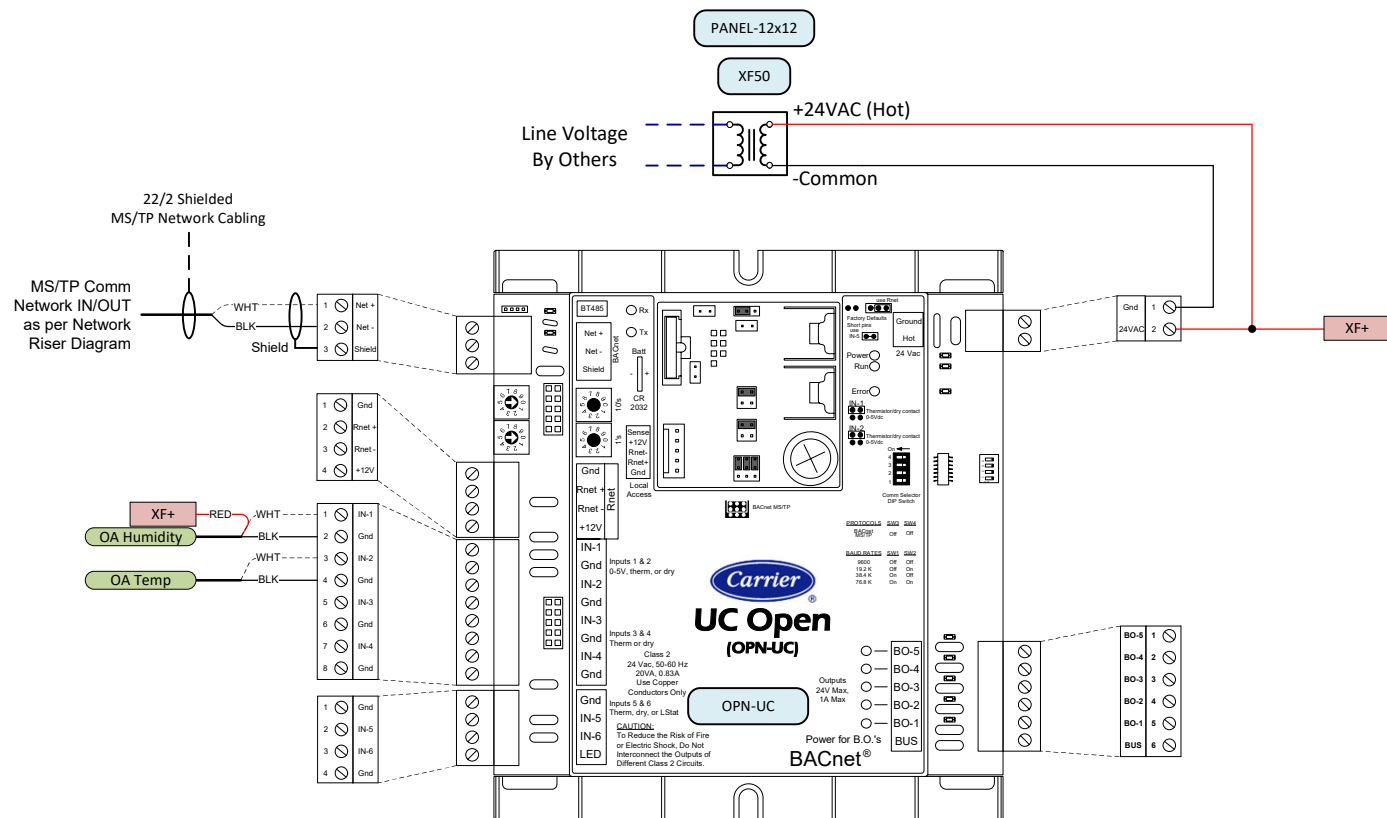
	Drawn: JORDAN FELPS
	DATE: 9/8/2023
	REVISION: 0
	DESCRIPTION: SUBMITTED

Yates Company LLC  
4738 Whirlwind Dr.  
San Antonio, TX 78217  
Phone: 210-702-3820

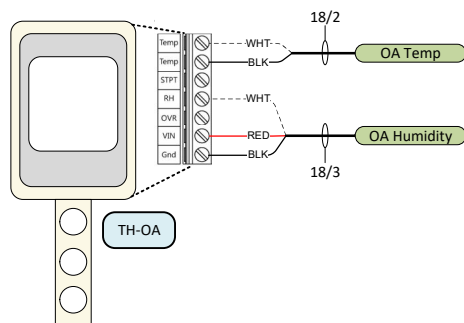


Holt Las Colinas  
MISC

Bill of Materials				
DID	Quantity	Part #	Manufacturer	Description
TH-OA	1	BA/10K-2-H200-O-BB2	BAPI	Outside Air Temp/Humidity Combo, 0-5 VDC/4-20 mA, 2%
OPN-UC	1	OPN-UC	Carrier	Prog. Controller (5 BO, 6 UI), 5 Equipment
XF50	1	TR50VA015	Functional Devices	Control Transformer (120/208/240/277/480 VAC Input - 24 VAC Output
PANEL-12x12	1	AHE12X12X4	Hoffman	Enclosure, Wall-mount, Hinged, Steel, NEMA1, 12"x12"x4"



**Outside Air Conditions**



**Sequence of Operations**

**Outside Air Conditions**

The controller will monitor the outside air temperature and humidity and calculate the outside air enthalpy on a continual basis. These values will be made available to the system at all times.

**Alarm will be generated as follows:**

Sensor Failure: Sensor reading indicates shorted or disconnected sensor.

If an OA Temp Sensor cannot be read, a default value of 65°F will be used.

If an OA Humidity Sensor cannot be read, a default value of 50% will be used.

**Outside Air Temperature History:**

The controller will monitor and record the high and low temperature readings for the outside air. These readings will be recorded on a daily, month-to-date, and year-to-date basis.

**Cooling Degree Day:**

The controller will provide a Degree Day history index that reflects the energy consumption for the facilities cooling demand. Computations will use a mean daily temperature of 65°F (adj.). The Degree Day peak value readings will be recorded on a daily, month-to-date, and year-to-date basis.

**Heating Degree Day:**

The controller will provide a Degree Day history index that reflects the energy consumption for the facilities heating demand. Computations will use a mean daily temperature of 65°F (adj.). The Degree Day peak value readings will be recorded on a daily, month-to-date, and year-to-date basis.

**General Notes:**

1. Refer to Network Diagram and Cable Specification Chart for wiring details and control module address.
2. Coordinate with Electrical Contractor (Div. 26) to provide 120 VAC circuit power to control panels.
3. Refer to Carrier Technical Documentation for specifications on control module setup, wiring, and driver configuration

Yates Company LLC  
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San Antonio, TX 78217  
Phone: 210-702-3820



Holt Las Colinas  
1000 Rochelle Blvd.  
Irving, Texas

Drawn: [Blank]  
ENG: Jordan Felps

9/8/2023  
DATE

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SUBMITTED  
DESCRIPTION

REV #

OA Conditions  
JOB # AU230034C

DWG # 9.0.1