TERRA

Installation Manual

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1.0 GENERAL INFORMATION

This manual includes important instructions for safe connection of the Energy Recovery Ventilator (ERV). Before connecting the unit, please read carefully and follow the instructions.

The manufacturer reserves the right to make changes, including changes in the technical documentation, without previous notification. Please keep this manual for future reference. Consider this manual a permanent part of the product.

This manual will show the manufacturers' recommended installation method. Please note that local codes and regulations may override these recommendations. The installation must follow local codes and standards.

The National Electric Code (NEC), the National Fire Protection Agency (NFPA), and the Canadian Electrical Code (CEC) must be followed. Installation of this product must be performed by a qualified and accredited professional in conformance with local and national codes, standards and licensing requirements.



Caution: This sign indicates apotentially hazardous situation, which may result in minor or moderate injury if not avoided. It may also alert against unsafe practices.



Warning: This sign indicates a situation that may result in equipment or property damage accidents.



Danger: This sign indicates a potentially hazardous situation, which could result in death or serious injury if not avoided.

2.0 INSTALLATION

2.1 Unwrapping the Product

When removing the shrink wrap, be cautious with knives and sharp tools to prevent scratching the paint. The HMI, temperature + humidity sensor, external duct pressure sensor and all other optional field components will be found in the electrical box or fan compartment. They are secured there for transport and to easily find them on the job site. Pallets are two-way entry; therefore, fork extenders or 8-foot forks must be used when moving a palletized unit.

Units are palletized and protected by a skeletal crate of heat-treated wood. These crates are constructed using nails; therefore, to unpack the unit, carefully use a crowbar or reciprocating saw to detach each panel. Additional bracing used to prevent the unit from sliding on the pallet must also be removed.

Once external packaging is removed, carefully remove the stretch wrap and cardboard covering the unit. It is better to use scissors rather than a knife to avoid scratching the unit.

External Pipes are protected by wood boxes that are secured with Poly Strapping and must also be removed. If a unit has a baserail, it will be screwed down directly to the pallet.



Packaged Unit

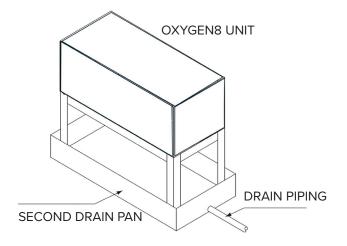


External Pipes Protected by Wood Boxes

2.2 Condensate Protection

When installing in unconditioned spaces, if high humidity levels are anticipated, it is recommended to add a layer of insulation to the exterior of the unit body. Use glass wool or polyethylene foam with a thickness of at least 2 inches, ensuring it fits within the installation space without blocking or inhibiting necessary access to the unit or airflow.

During cooling operation, condensation may form on the outside of the product cabinet. If reinforcing the insulation is not feasible in a humid installation environment, it is recommended to provide and install a second drain pan (supplied by others).



2.3 Split-Unit Assembly

For special requests for split-unit shipments, or if an entire unit length cannot fit on a single pallet, the following steps must be taken to assemble the unit.

Refer to section 2.6.1 Coupled Accessories for bolting instructions on combining the casing modules.

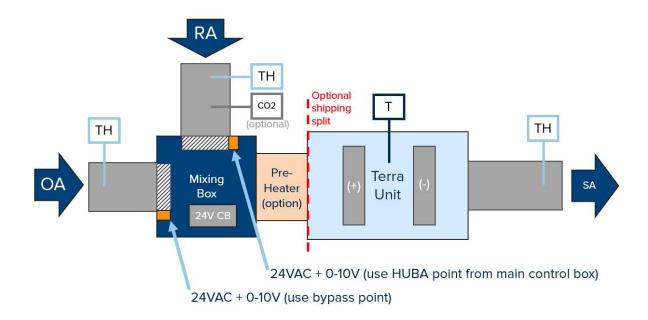
Once combined, there will be a coiled up pressure tubing extending from the filter. Feed the tube through the available grommet at the unit split into the control box. Connect to the pressure port in the right pressure port of the HUBA pressure sensor.

Controls wiring connections must be made by connecting loose quick connector terminals. Please refer to wiring diagrams provided with unit submittal.



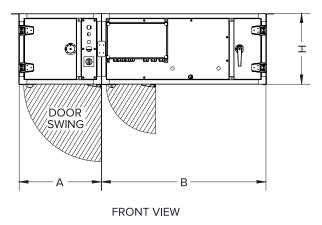
Suggested pressure sensor connection is highlighted in blue above.

Note: On units where the fan and filter modules are separated, a tubing quick connect may be provided.

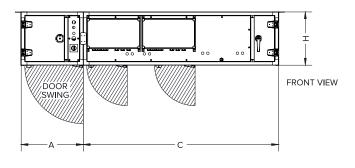


2.4 Dimensions and Clearance

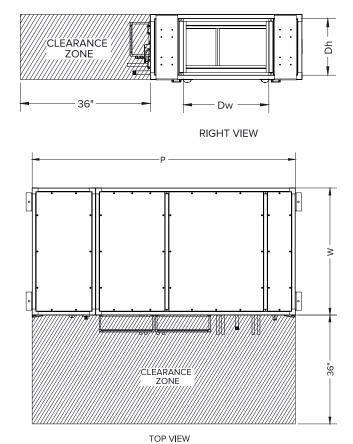
DX Coil



DX Coil with HGRH



General Clearances



	А	В	С	L (DX)	L(DX+HGRH)	н	w	Dh	Dw
т06	21	42	66	63	87	18	30	15 5/8	11 3/8
Т09	21	42	66	63	87	18	36	15 %	17 3⁄8
T12	21	42/48	66	63/69	87	18	42	15 5/8	23 ¾
T15	21	42/28	66	63/69	87	18	48	15 %	29 ¾
T18	24	42/48	66	66/72	90	21	48	18 5/8	29 ¾
T24	24	42/48/66	66	66/72/90	90	21	60	18 5⁄8	41 3/8
T32	30	48	66/84	30	96/114	30	48	27 %	29 3/8
T40	30	48	66/84	30	96/114	30	60	27 %	41 ³ ⁄8
T48	24	48	66/84	24	90/108	30	72	27 %	53 %

Dimensions are in inches. DX and HGRH section lengths depend on number of circuits, driven by coil capacity. Electric heater accessory lengths vary and are not included above.

2.5 Weights

MODEL	DX ONLY	HGRH (HG1)	HGRH (HG2)	HGRH (HG3)	HGRH (HG4)	FAN MODULE WEIGHT (LBS)	DX/FAN	HG1/FAN	HG2/FAN	HG3/ FAN	HG4/ FAN
т06	191	237				119	309	355			
Т09	209	264				126	335	390			
T12	227	290	307			134	362	424	441		
T15	246	315	331			162	408	477	493		
T18	258	332	348			182	440	514	530		
T24	345	382	398	422		201	546	583	599	623	
T32	343		393	420	482	260	603		653	680	742
T40	383		446	473	545	303	686		748	776	847
T48	464		501	528	609	297	724		798	825	907

2.6 Installation

2.6.1 Ceiling Mount

Terra is available exclusively for ceiling mount/horizontal applications with inner and outer brackets only. The hanging brackets are factory installed.

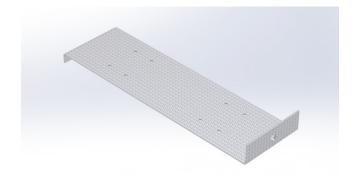
One 5/8" hole on each of the four (4) corner hanging brackets are used for thru-bolting to hang the unit from the 1" flanges.



Caution: The unit must be installed with both the inner and outer bracket. Each unit must also have all four brackets installed to meet these guidelines.



Ceiling Mounted Unit

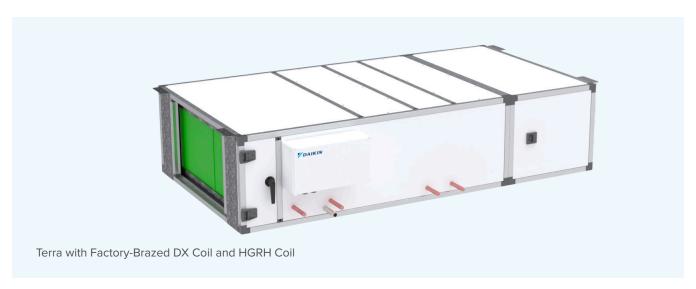


Outer Bracket

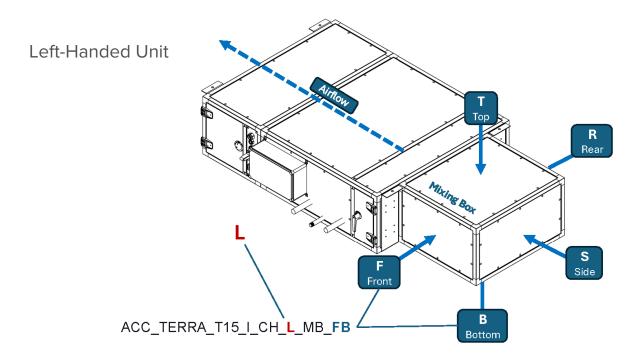
2.7 Installation of Accessories

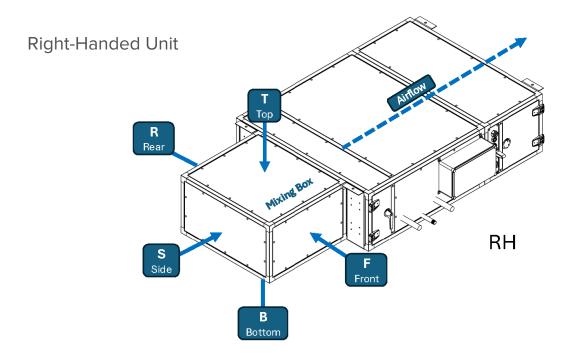






Terra with mixed air ventilation includes a mixing box coupled accessory. Refer to the diagrams below for duct port layouts related to the mechanical drawing nomenclature.





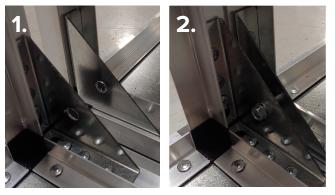
2.7.1 Coupled Modules & Accessories



Terra units come in two or more modules. Refer to the image below for corner bracket details required for coupling.



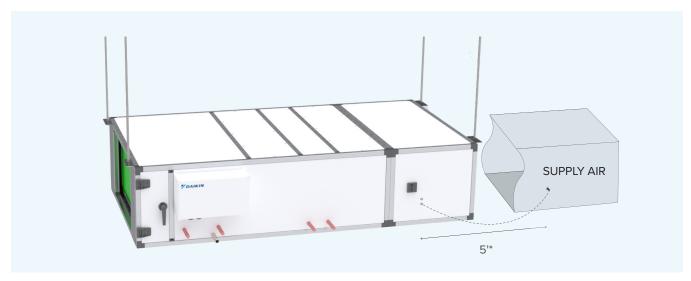
Note: Accessories should be independently supported with Unistrut on the end farthest from the unit.



Corner brackets come installed with each Terra unit.

2.8 External Sensors

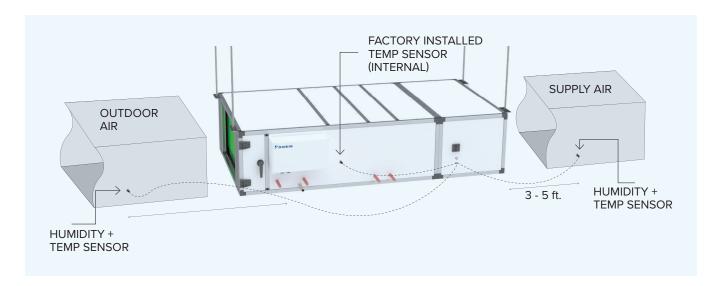
2.8.1 Coupled Accessories



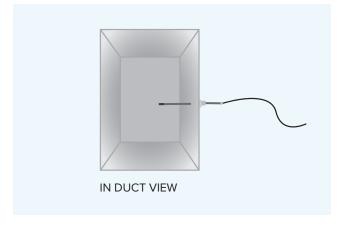
*Sensor must be installed a minimum of 5' from the heating or cooling module.

Temperature + Humidity sensors are also used when only temperature sensing is required. Temperature + Humidity sensors are installed in the ventilation duct using the accompanying bracket, which must be attached to a firm, level surface by means of two screws. The supply voltage is provided via the Modbus connection. The sensor has a pre-fitted cable, which is equipped with a standard RJ12 connector. The cable may be extended up to 50m using a Category 3 extension cable. The sensor is adjustable and must be mounted according to manufacturer instructions and the probe must be aligned parallel to the air flow in the center of the duct.

2.8.2 Hot Gas Reheat Sensors



Humidity + Temperature Modbus RTU (RS-485) sensors are installed in the ventilation duct using the accompanying bracket, which must be attached to a firm, level surface by means of two screws. The cable may be extended to as much as 50 m without any negative effects on measuring accuracy. The surrounding EMC environment must, however, be considered and preferably be low. The sensor should be installed in such a way that the air flow in the duct can pass unhindered through the measuring hole at the end of the sensor, which should be aligned parallel to the air flow. Although the sensor is not affected by the position in which it is installed, it is advisable not to install the sensor in an upright position with the cable downwards as this may cause moisture to accumulate in the sensor. It is important that the sensor is installed in such a way that the measuring hole is positioned at the center of the duct.



2.8.3 Constant Pressure Regulation

For applications including, but not limited to, DOAS integration VRV using constant pressure regulation mode, duct pressure sensing is required. The following is provided loose with the Oxygen8 unit:

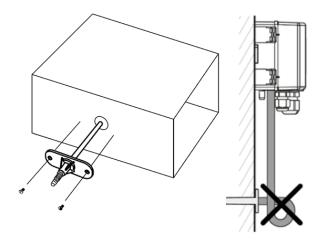
- 1. Huba Differential Pressure Sensor
- 2. Pressure nipple
- 3. 5 ft of tubing
- 4. 30 ft of Modbus cable



2.8.4 Typical Installation

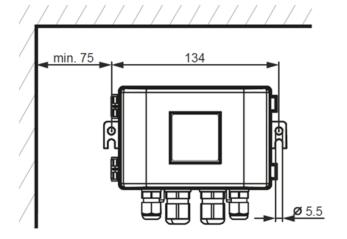
- 1. Select an area for the probe 5 to 8 duct diameters from any elbows, obstructions, or significant changes in the duct area.
- **2.** Drill an 5/16" hole and insert the probe.
- **3.** Determine the duct's flow direction and install based on the unit's flow arrow imprint.
- 4. Install the unit horizontally to assure accurate velocity readings.
- Attach using two self-tapping screws inserted in the 3/16" mounting holes. The FPP/SPP Series have 1/4" OD and a barbed fitting for use with 3/8" OD tubing.

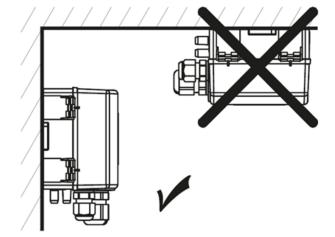






Caution: While installing check that there are no sharp bends in the tubing at any connection. Bends and creases may leak over time as the tubing ages.





Note: Always mount vertically with pressure connections facing downwards, drain of possible condensed water (factory calibration). For the measurement of relative pressure, theindication 'connected to ambient atmosphere' is shown.

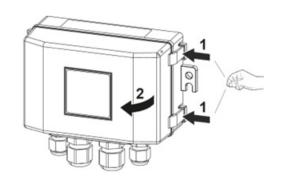
2.8.5 Wiring and Pressure Tubing

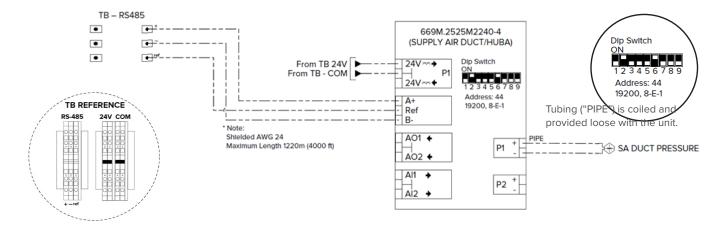
Huba Pressure Sensor features quick release fasteners and a detached cover.

To Open:

- 1. Lift the quick release fasteners
- 2. Swing open the detached cover

Ensure the dip switch configuration from the factory matches what is shown below:

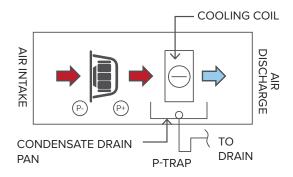




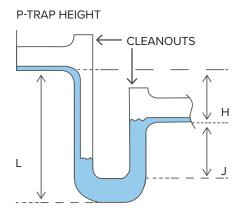
3.0 CONDENSATE DRAIN P-TRAP

3.1 Blow-Through Configuration

Fan located upstream of the cooling coil. Not standard for Ventrum+ units.



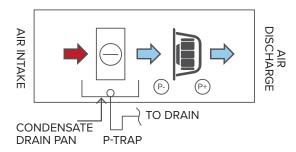
- The water collected in the drain pan below the cooling coil must be removed to prevent overflow, damage, and contamination to the air handler system and building.
- When the fan is ON, it creates positive pressure in the drain pan compartment which aids the drainage of condensate.



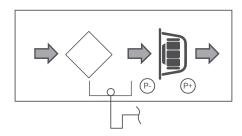
H = 1"w J = 1" for each 1" w.g. maximum static pressure (min 1") L = H + J + Pipe Dia.

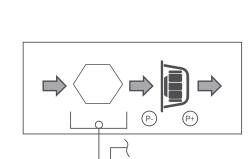
3.2 Draw-Through Configuration

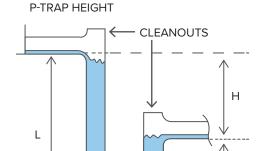
Fan located downstream of the cooling coil. Standard for Ventum+ units.



- The water collected in the drain pan below the cooling coil must be removed to prevent overflow, damage, and contamination to the air handler system and building.
- When the fan is ON, it creates negative pressure in the drain pan compartment which can cause the drain to back up and make it harder to be removed.







H = (1" for each 1" w.g. maximim static pressure) + 1"

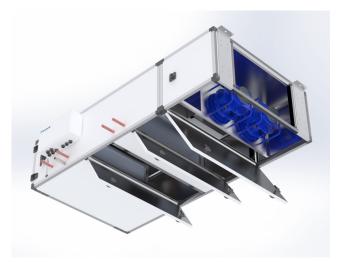
J = H/2; (min 1")

L = H + J + Pipe Dia.

3.3 Condensate Pump

If a condensate pump is required for proper drainage, a P-trap is recommended in all cases; however, a p-trap is not required for blow-through coil applications, depending on the specific conditions and local building codes.

4.0 ACCESS REQUIREMENTS



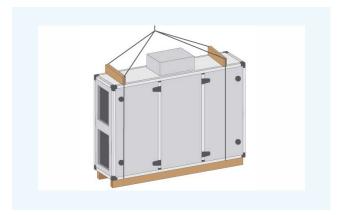
Unit with doors open



Door with removed hinge pin

The National Electrical Code (NEC) stipulates that there must be a minimum of 36 inches of clearance from an electrical connection. The installing contractor must ensure there is at least 36 inches of clearance perpendicular to the top of the electrical box.

5.0 LIFTING REQUIREMENTS



Unit with Spreader Bars

Units can be lifted by mounting angles. Lifting directly from the aluminum frame is not recommended.

Nova model shown as example only.

6.0 ELECTRICAL HOOK UPS



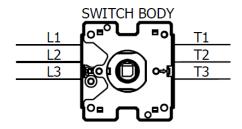
Warning: Hazardous voltage. Disconnect all electrical power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be accidentally re-engaged.

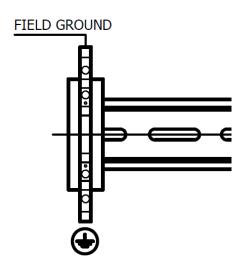
3 phase, 4 wire, 208V, 460V -10% - +15%, 60Hz Recommended fuse diagram

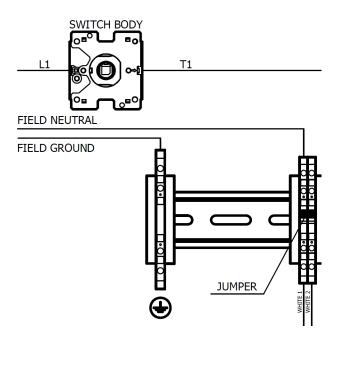
Unit Size	208V	460V
T18	15A	15A
T24	15A	15A
T32	15A	15A
T40	20A	15A
T48	15A	15A

1 phase, 3 wire, 240V -10% - +15%, 60Hz Recommended fuse diagram

Unit Size	208V	240V
Т06	15A	15A
Т09	15A	15A
T12	15A	15A
T15	15A	15A
T18	15A	15A
T24	15A	15A



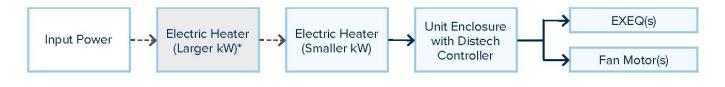


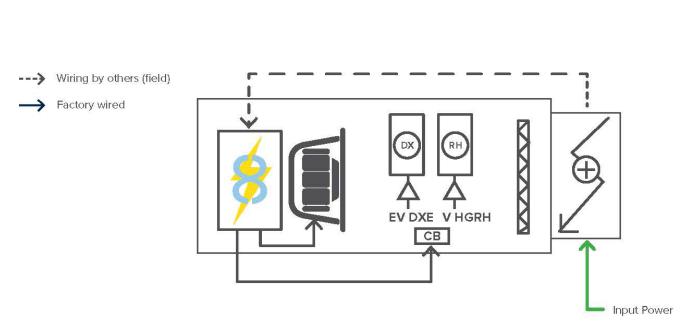


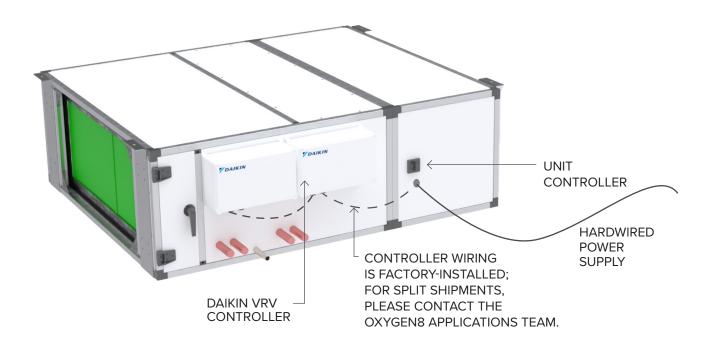
6.1 Electrical Information

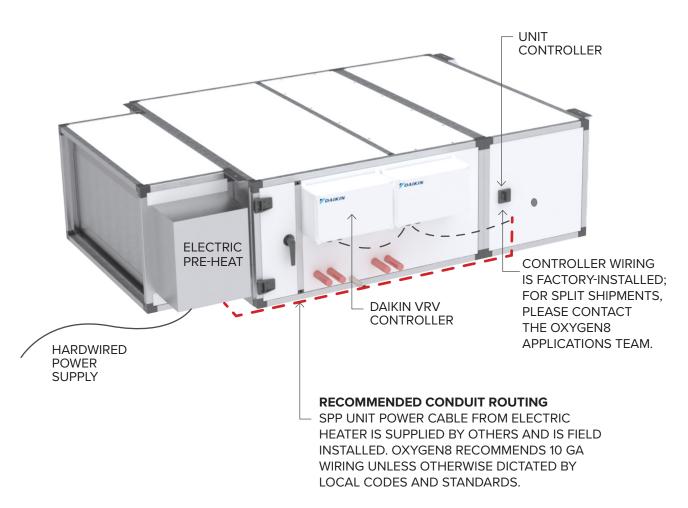
SIZE	NOMINAL VOLTAGE	PHASE	SUPPLY AIR FAN QTY	SUPPLY AIR FAN FLA	MCA	МОР (А)	SCCR (kA)
T06	208 - 240	1	1	2.5	3.1	15	5
Т09	208 - 240	1	1	3.9	4.9	15	5
T12	208 - 240	1	1	3.9	4.9	15	5
T15	208 - 240	1	2	3.9	4.9	15	5
	208 - 240	1	2	3.9	8.8	15	5
T18	208	3	1	6.0	7.5	15	5
	460	3	1	4.0	5.0	15	5
	208 - 240	1	2	3.9	8.8	15	5
T24	208	3	1	6.0	7.5	15	5
	460	3	1	4.0	5.0	15	5
	208	3	1	8.6	10.8	15	5
T32	460	3	1	5.8	7.5	15	5
740	208	3	1	9.0	11.3	20	5
T40	460	3	1	5.4	6.8	15	5
T40	208	3	2	6.0	13.5	15	5
T48	460	3	2	4.0	9.0	15	5

6.2 Single Point Power Wiring

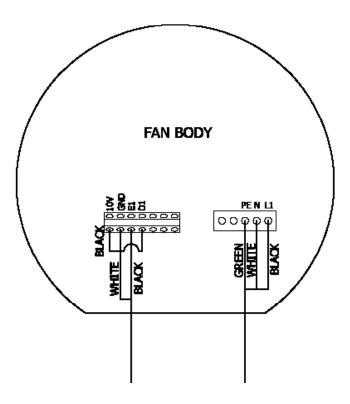




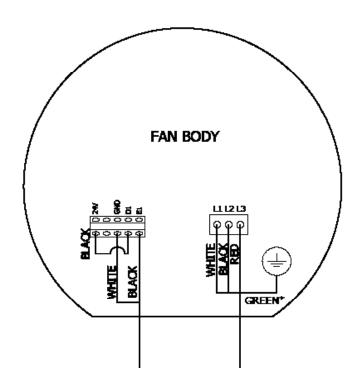




6.3 Fan Connection - Single Phase

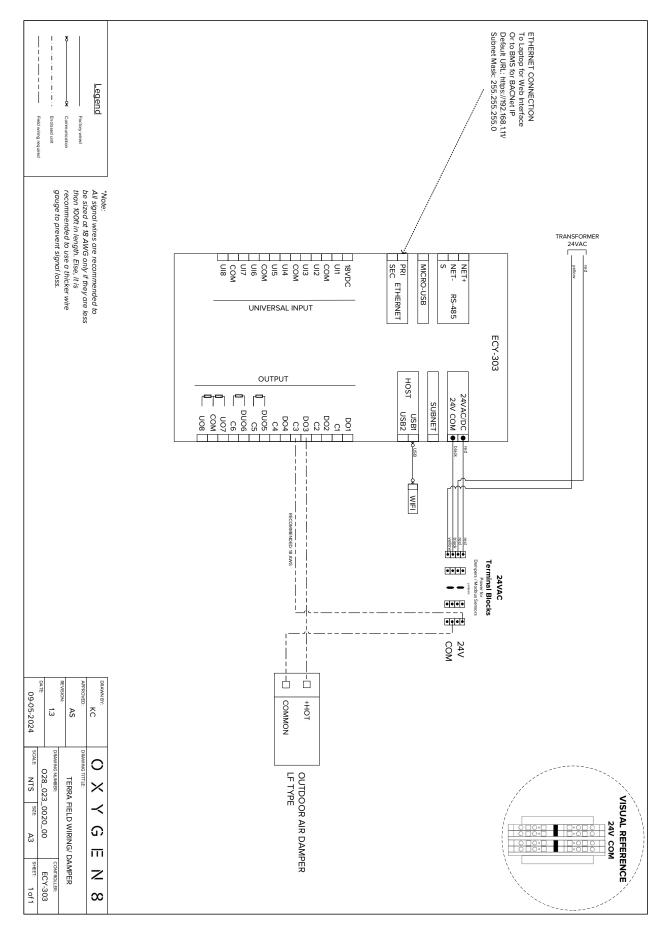


6.4 Fan Connection - Three Phase

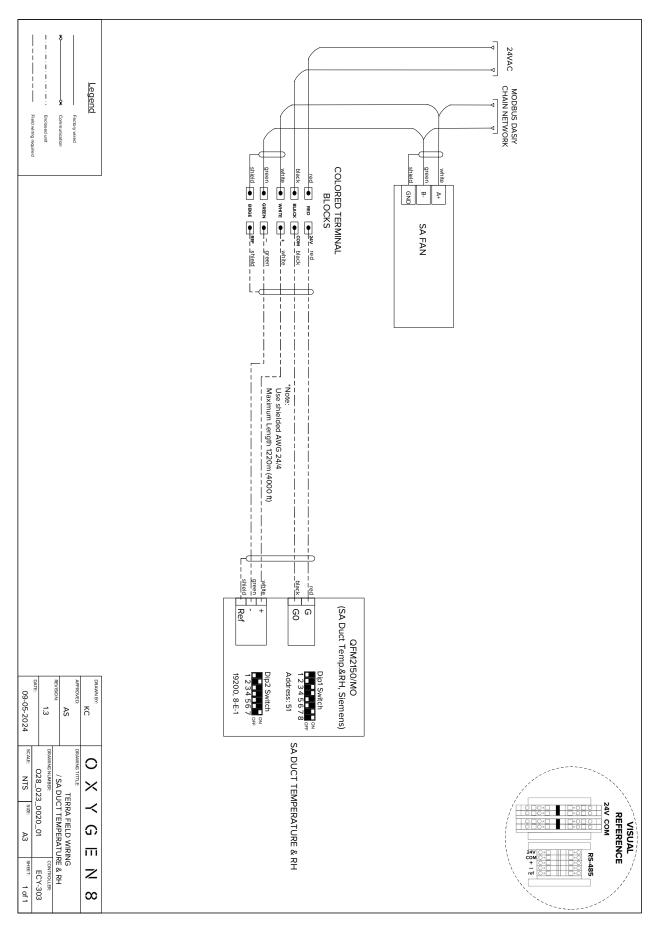


7.0 WIRING DIAGRAMS

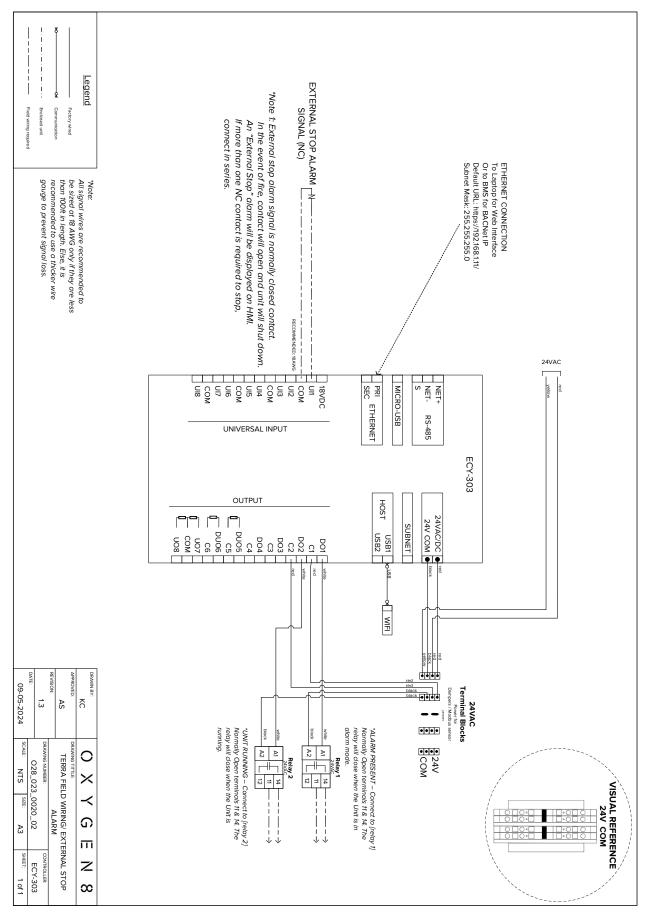
7.1 Dampers



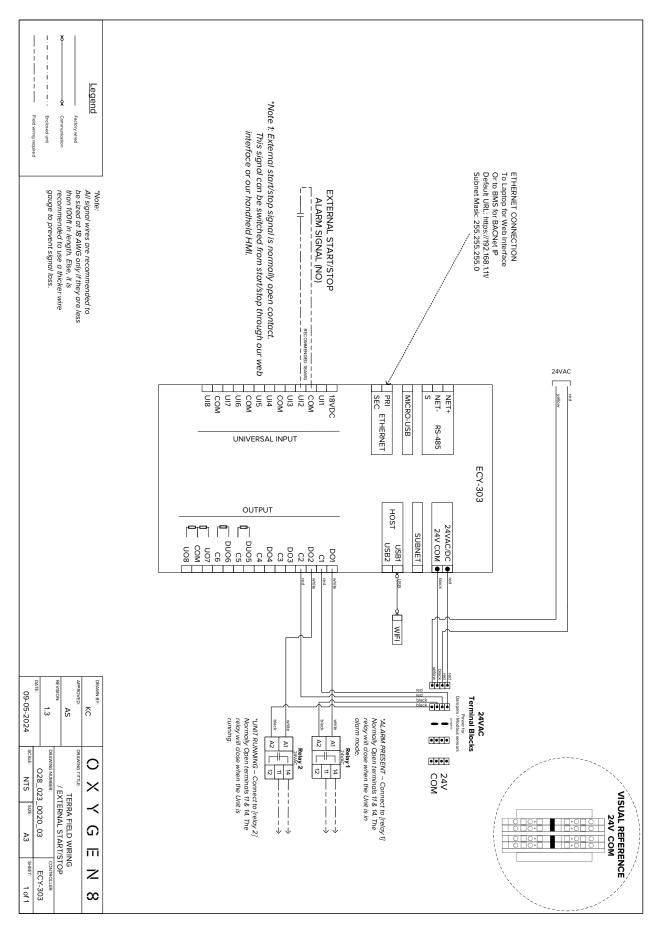
7.2 Supply Air Duct Temperature and HGRH



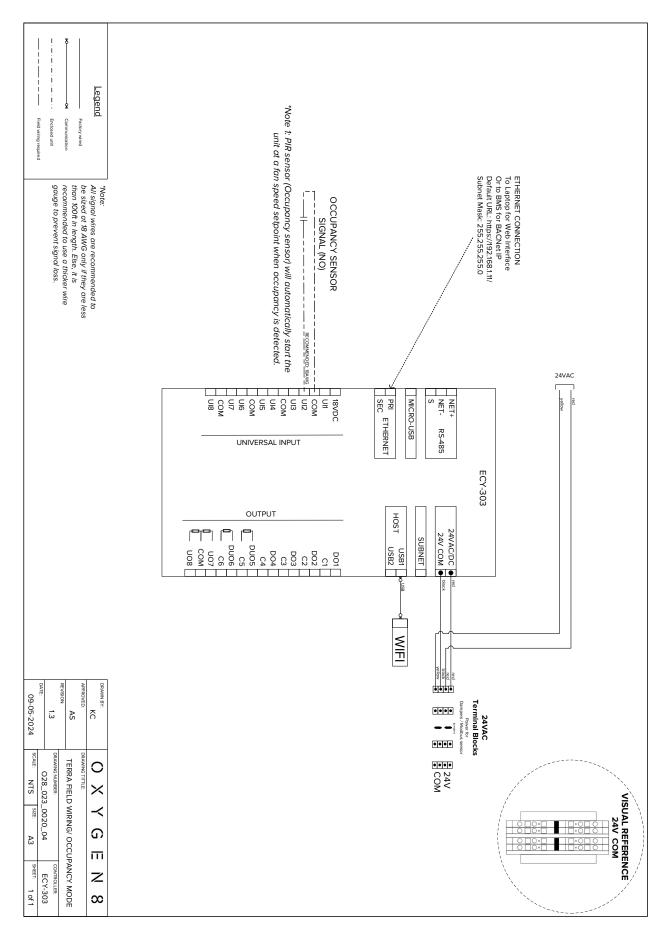
7.3 External Stop Alarm



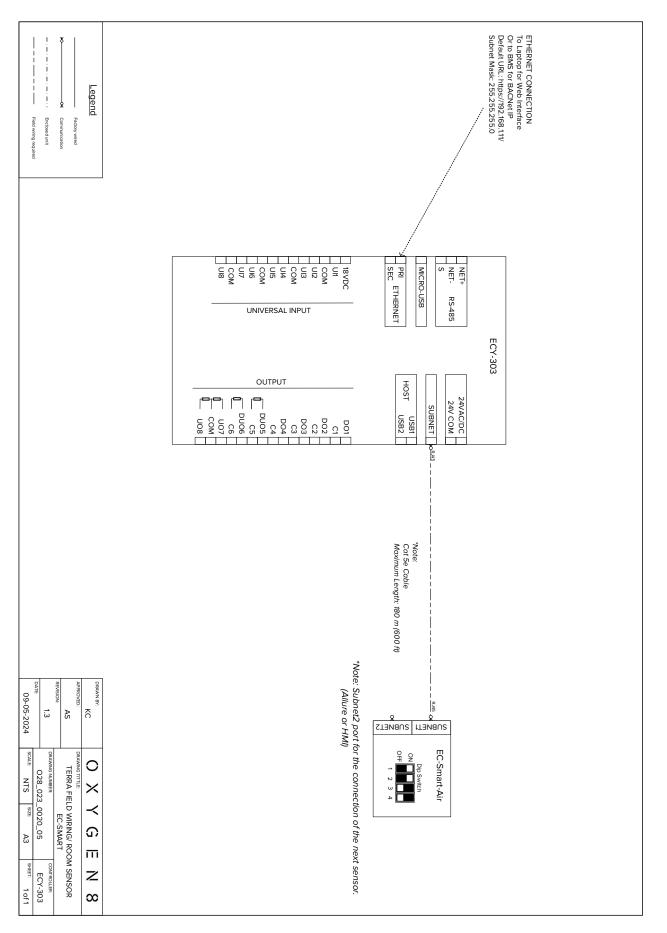
7.4 External Start/Stop



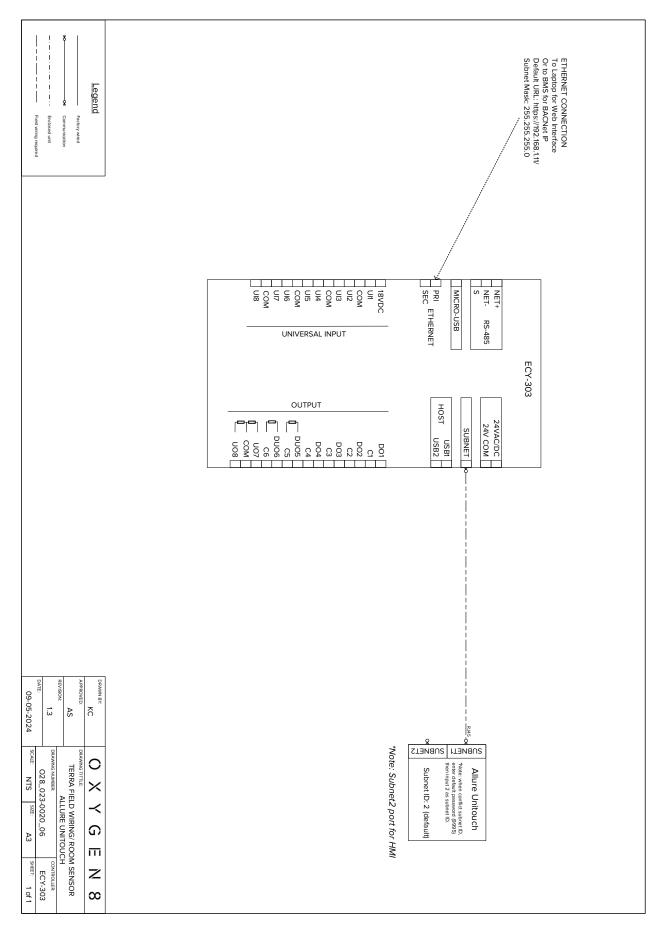
7.5 Occupancy Mode



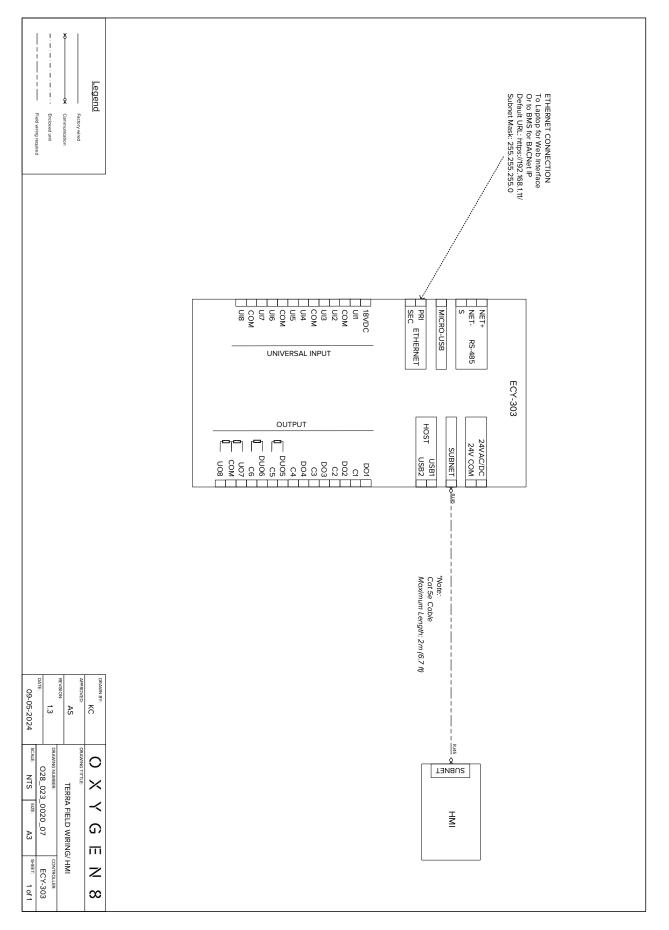
7.6 Room Sensor ECY-303



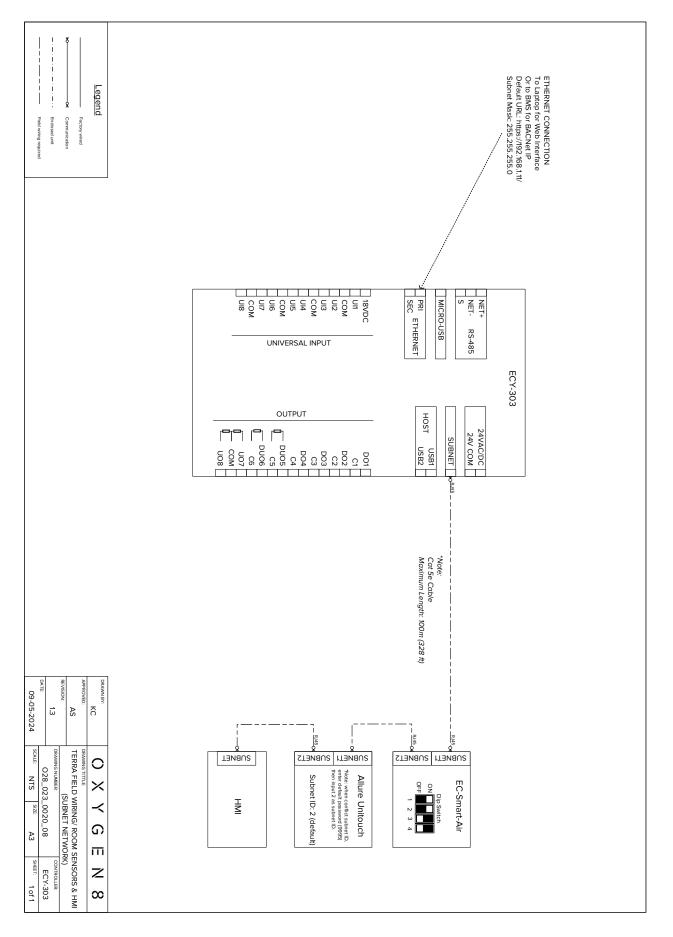
7.7 Room Sensor Allure Unitouch



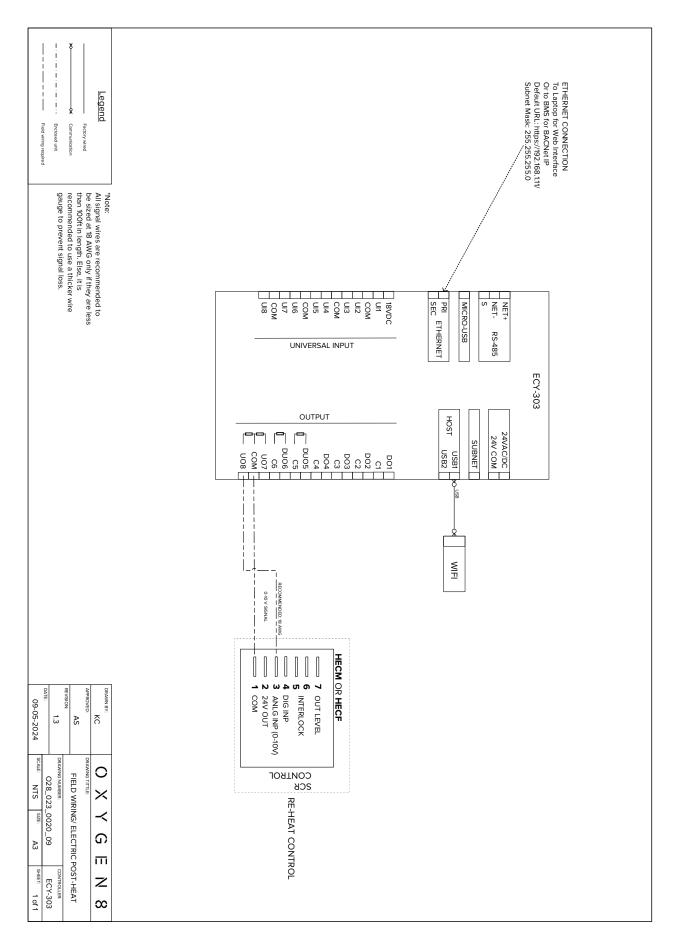
7.8 Distech HMI



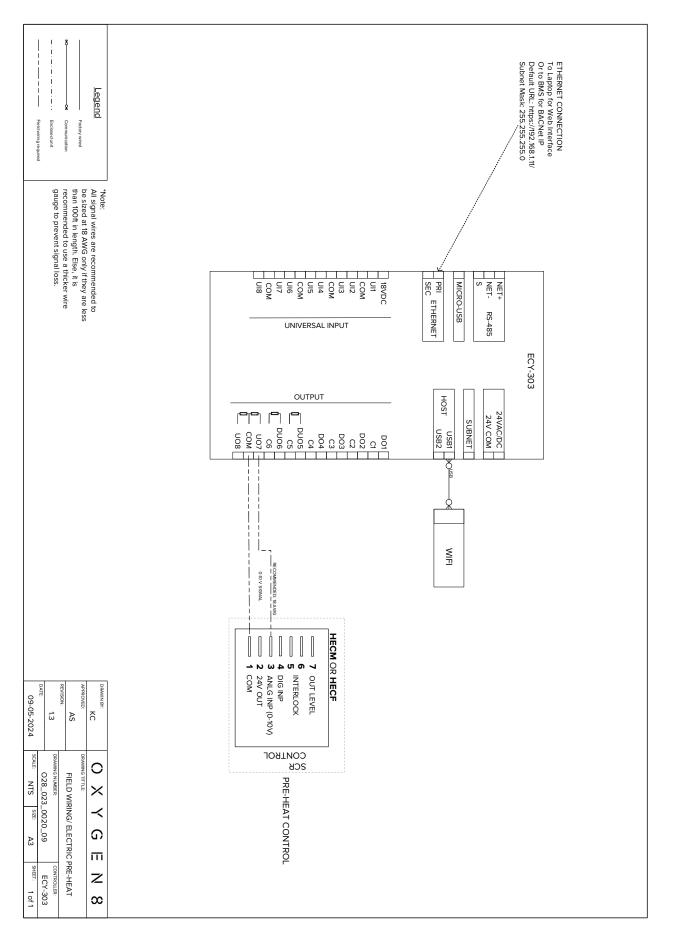
7.9 Room Sensors & HMI (Subnet Network)



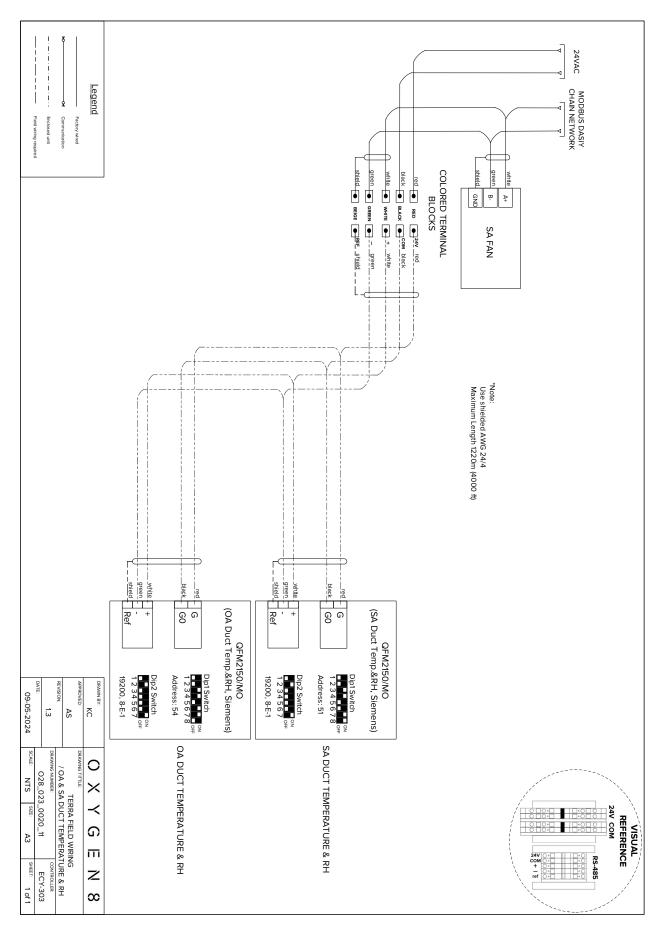
7.10 Electric Post-Heat



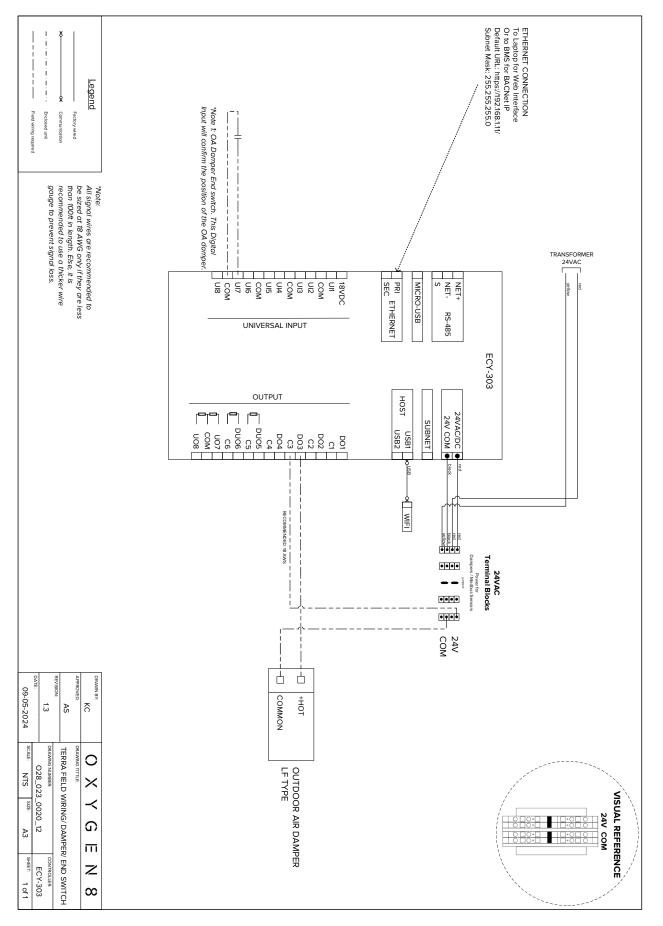
7.11 Electric Pre-Heat



7.12 OA & SA Duct Temperature & RH



7.13 Damper & End Switch



7.14 SA Duct Pressure Sensor

