

DEDICATED OUTDOOR AIR SYSTEM INSTALLATION GUIDE (PRODIGY M2 ONLY)

General

This installation guide should be used only as a supplement to component installation instructions.

Check all components for shipping damage. Receiving party should contact last carrier immediately if shipping damage is found.

These instructions are intended as a general guide and do not supersede local codes in any way. Authorities having jurisdiction should be consulted before installation.

Applications

This guide is used with Lennox Emergence® rooftop units equipped with the Humiditrol® dehumidification system option. The rooftop unit M2 Unit Controller must be version 7.00 or higher. This application uses a dedicated unit to provide 100% of the system outdoor air requirements. The unit delivers tempered outdoor air without contributing to the building HVAC load. Return and exhaust air are accomplished using additional equipment.

Components

Curb (welded in one piece; supports both the unit and mixing box).

Rooftop unit (equipped with an M2 Unit Controller).

Bypass mixing box, bypass air damper, fresh air damper and outdoor air hood.

NOTE - Components may arrive separately. Make sure all applicable components are on site. Lift components on the same day to reduce cost.

⚠ CAUTION

Danger of sharp metallic edges. Can cause injury. Take care when servicing unit to avoid accidental contact with sharp edges.

Order of Installation

1. Curb
2. Rooftop unit
3. Bypass air damper
4. Bypass mixing box
5. Fresh air damper
6. Outdoor air hood
7. Relocate discharge air sensor.
8. Unit start-up.
9. Test and balance.

10. Setpoint and ECTO settings.

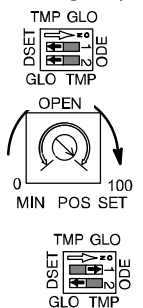
Installation

1. Set the unit / bypass curb. Make sure the mixing box support is present and oriented in the correct position. See figure 1. These illustrations should only be used as supplements to the installation instructions provided with the curb and the unit.
2. Set the unit on the curb. Verify the curb is the right size and the unit is set correctly on the curb.
3. The Remote Sensor Kit is available as a field kit or provided with the unit. When provided with the unit, the wire connections are factory-installed. The kit is located in the bottom of the compressor section on 090-300S (7-1/2 to 25 ton) units and the bottom of the blower section on 036-072 (3 to 6 ton) units. Install according to instructions provided with kit.
4. Install the bypass air damper as shown in figures 2, 3, and 4.
5. Install the bypass mixing box as shown in figures 2, 3 and 4.
6. Install the fresh air damper and hood as shown in figure 2.

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer or service agency.

7. M2 Unit Controller must be configured for economizer. Reference the M2 User Guide.
8. Verify voltage and phasing and apply power to unit.
9. For outside air damper control (see figure 5, Page 5):
 - Set economizer DIP switch to "DSET" and rotate MIN POS SET potentiometer to 100%. (DO NOT use ECTO 5.24 to set the min damper; use potentiometer only).
 - Set economizer DIP switch to GLO.
 - **For 3-5 ton direct drive units,** set ECTO 0.09 to 100.



NOTE - The outdoor damper motor harness must be wired from the damper motor to the P262 connection on the M2 Unit Controller. Refer to the Prodigy M2 Unit Controller Setup and Installation guide for a description of P262.

cause of the ventilation requirements on most applications. Set the bypass damper to the appropriate bypass %. Keep in mind that a damper that is open 25% is not bypassing 25% of the air. There could be as much as 50% of the airflow bypassing through the damper because one side of the damper has a positive pressure from the blower and the other side of the damper has a negative pressure from the blower. Refer to the project submittal for bypass percentage and CFM.

- 10. Start unit according to instructions provided with unit.
- 11. **IMPORTANT:** Verify airflow. Run a test and balance to assure correct damper settings and airflow. This is extremely important in dedicated outside air systems be-

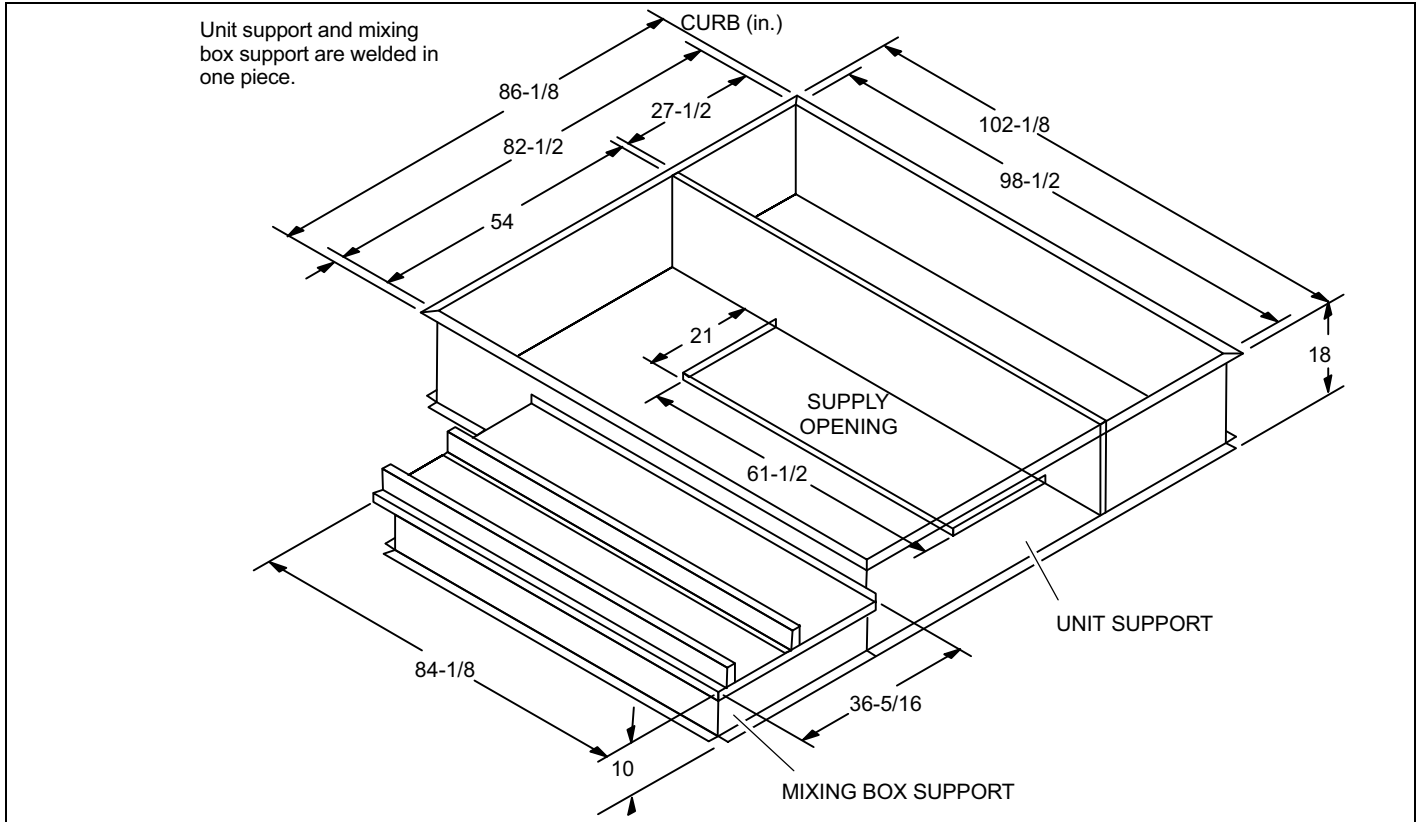


Figure 1. Set the Unit / Bypass Curb

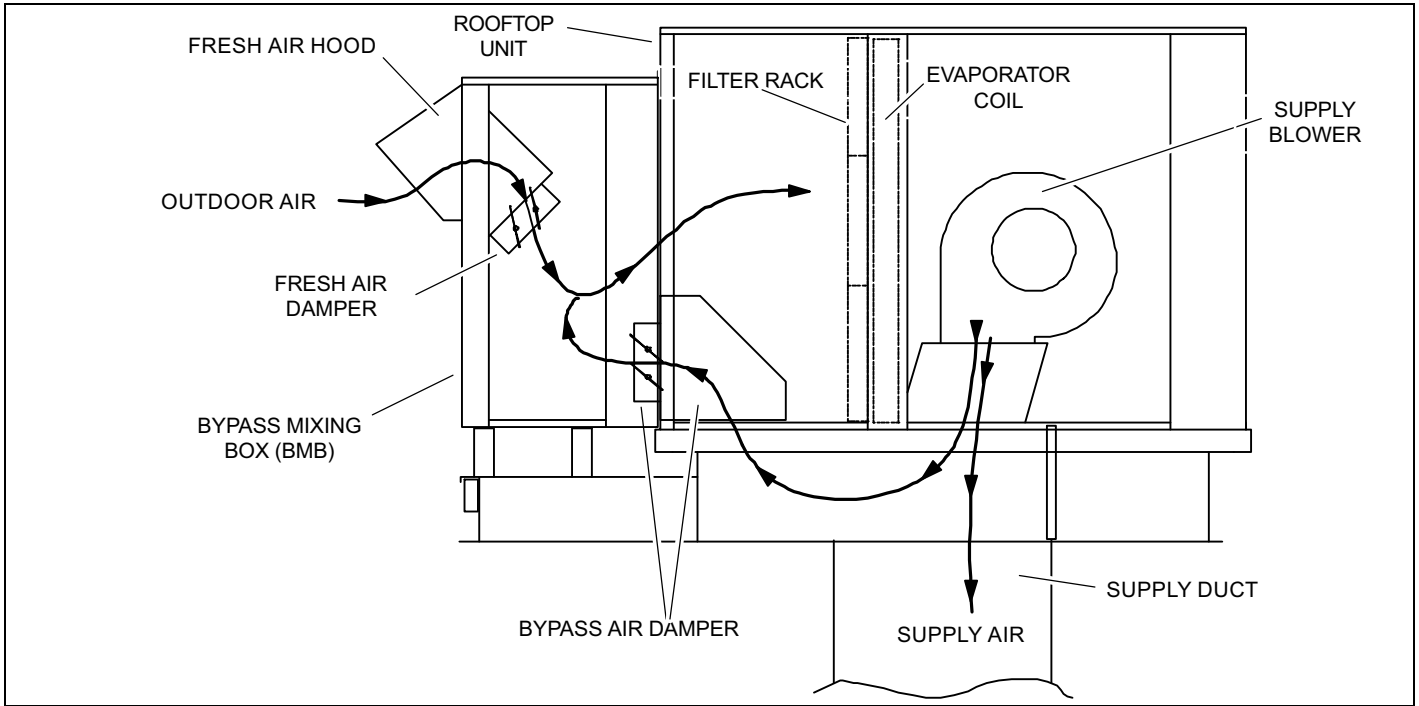


Figure 2. Bypass Air Damper (036-300s; 3 to 25 Ton Units)

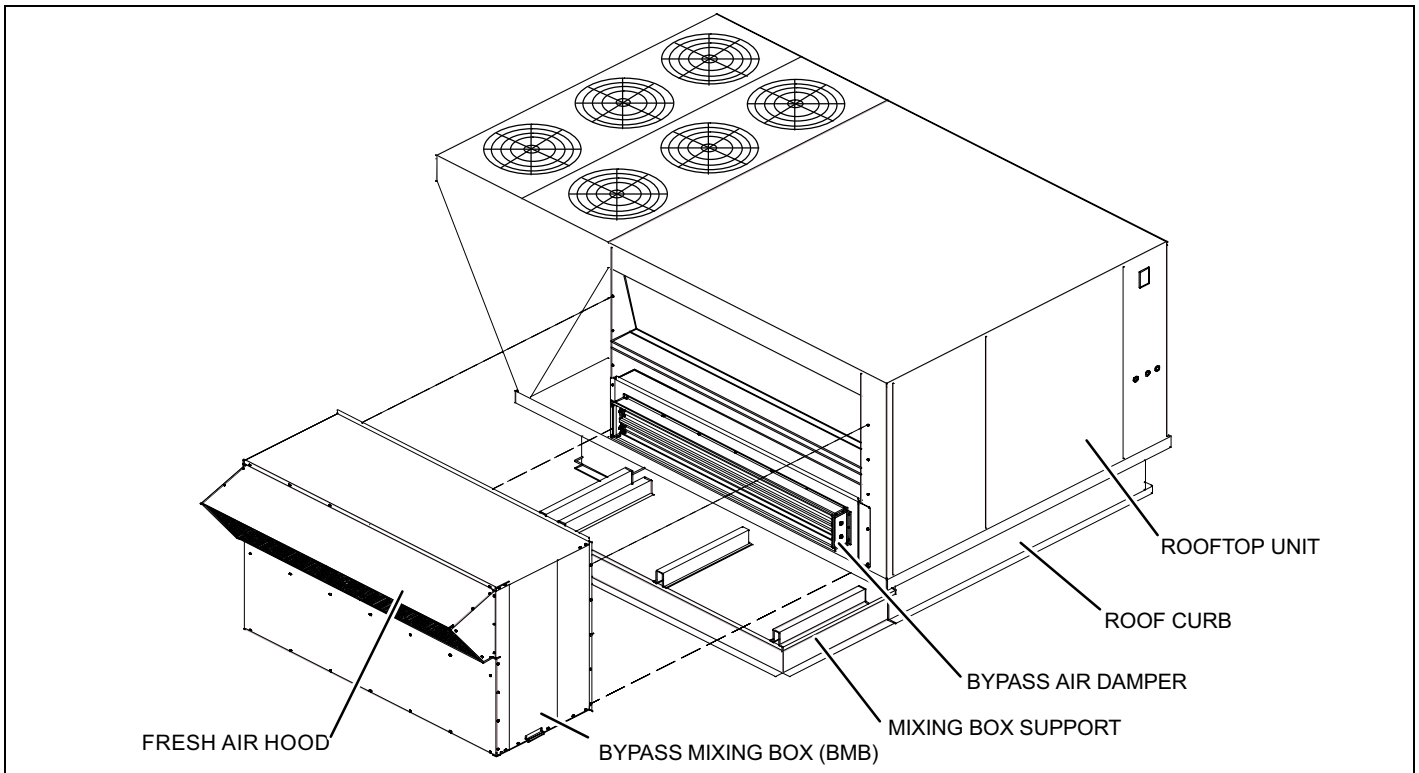


Figure 3. Bypass Air Damper (156-300s; 13 to 25 Ton Unit Shown)

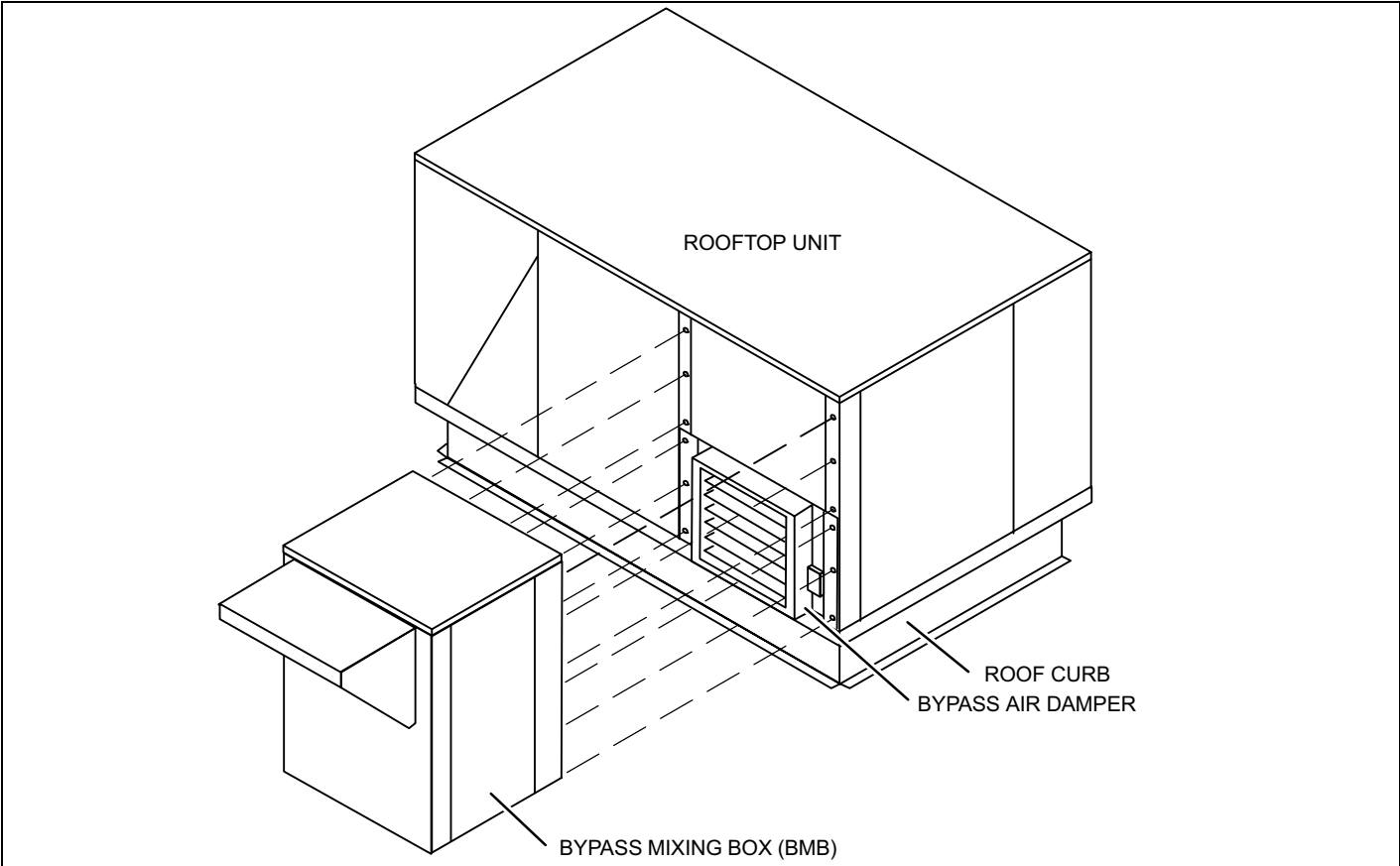


Figure 4. Bypass Mixing Box (090-150 shown)

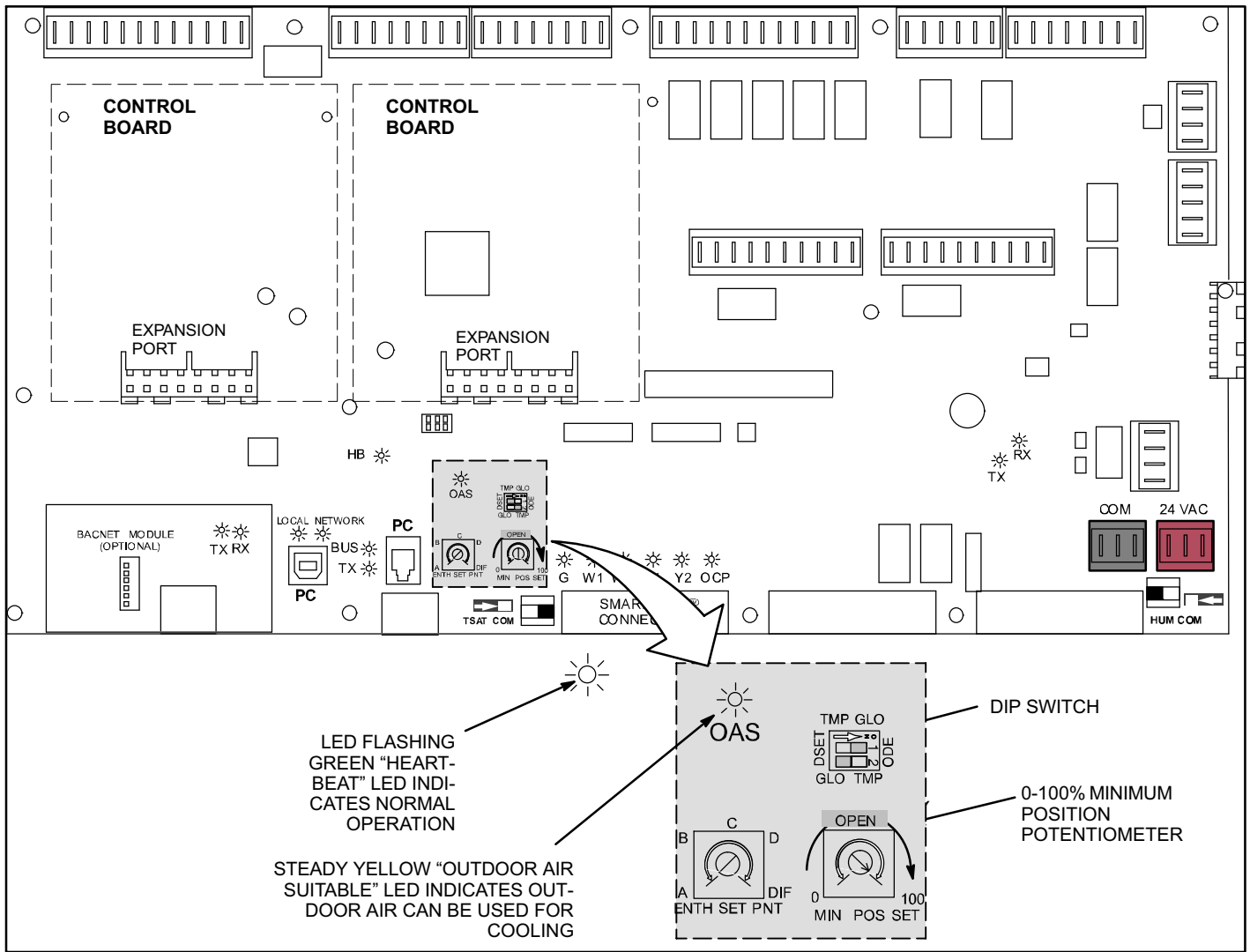


Figure 5. Economizer

System Settings

Wire thermostat or zone sensor and make setpoint and ECTO settings according to type of system:

- Direct to Space - Thermostat
- Direct to Space - Zone Sensors
- Direct to Unit - Zone Sensors

Direct to Space - Thermostat

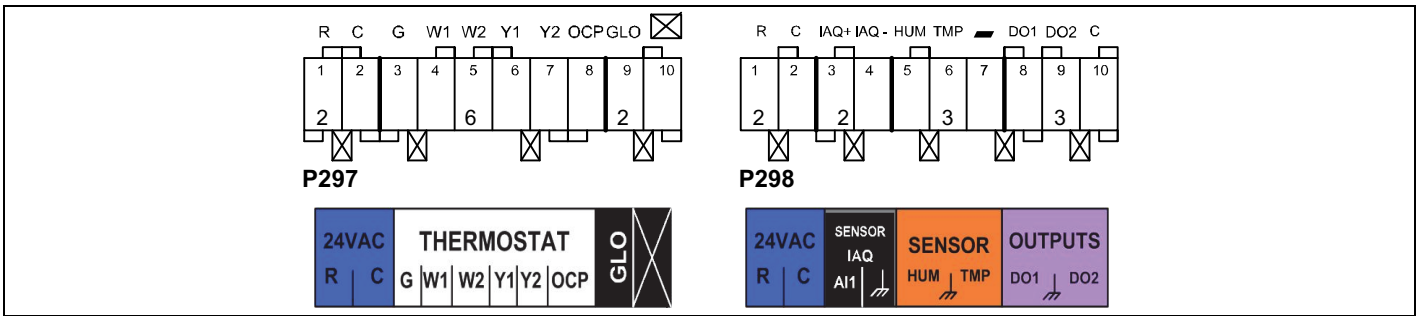


Figure 6. Reheat and Thermostat Connections

Wall mount thermostat in the space utilized by the dedicated outside air unit. Wall mount the remote humidity sensor in the same space.

Wire thermostat and humidity sensor to plug terminals P297 and P298 on the M2 Unit Controller. Make wire connections as shown in figures 6 and 7 and tables 1 and 2.

Set UC ECTO settings as shown in table 3. Refer to M2 Unit Controller User Guide located in the unit pocket for more detailed description and instructions.

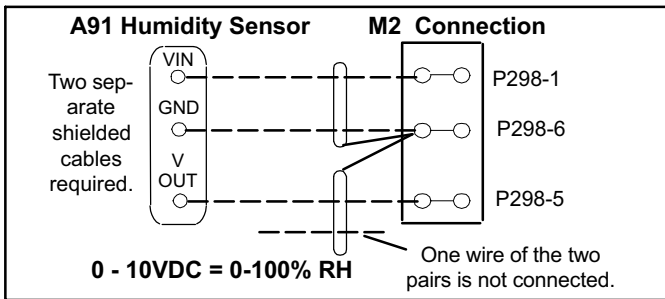


Figure 7. Reheat Sensor Diagram

Table 1. Thermostat Connections

M2 Connection	Thermostat
P297-1	24VAC
P297-1	Occupied Signal (24VAC)
P297-2	24VAC Common
P297-3	G
P297-4	W1
P297-5	W2
P297-6	Y1
P297-7	Y2
P297-8	Occupied Signal (Signal)

Table 2. RH Sensor Connections

M2 Connection	RH Sensor
P298-1	24VAC
P298-5	0-10V
P298-6	GND

Table 3. UC ECTO Settings

Parameter	Description	Counts
4.04	Freeze stats will record (no lock out)	4
4.13	Compressor minimum run time 120 seconds	60
4.24	Humiditrol reheat control	6
4.26	Humiditrol reheat dead band	5
5.05	Return air limit (sensor moved to space)	1
5.06	Return air limit – heat setpoint 100°	95
5.07	Return air limit - cool setpoint 60°	154
6.20	(FAH) fresh air heating setpoint 67°	143
6.21	Fresh air heat stage dead band 5°	7
6.22	Fresh air heat minimum cycle time	15
7.05	(FAT) fresh air tempering change over delay 15 minutes	28
7.06	(FAC) fresh air cooling setpoint 73°	135
7.07	Fresh air cool stage dead band 5°	7
7.08	Fresh air cool minimum cycle time	15

Occupied setpoints—The wall mounted thermostat will serve as a secondary high and low temperature control. To achieve this, set the heating and cooling setpoints outside the fresh air tempering setpoints. For example:

Thermostat cooling setpoint	77
Fresh air cooling setpoint (7.06)	73
Fresh air heating setpoint (6.20)	67
Thermostat heating setpoint	63

Unoccupied setpoints—During unoccupied mode, the damper for the dedicated outside air unit is driven closed. If the space were to meet the unoccupied setpoint, the unit would attempt to run with no provisions for airflow. All local units and/or exhaust fans must have the same occupied and unoccupied schedule as the dedicated outside air unit. Set local unit unoccupied heating setpoint higher and cooling setpoint lower than dedicated outside air unit. For example, if the dedicated outside air unit unoccupied setpoints are 84°F cooling and 56°F heating, set the local unit unoccupied setpoints to 80°F cooling and 60°F heating.

DOAS thermostat cooling setpoint	84
Local unit thermostat cooling setpoint	80
Local unit thermostat heating setpoint	60
DOAS thermostat heating setpoint	56

For continuous operation, make a jumper between pins P297-1 & P297-8 on the M2. For intermittent operation, use an external device to provide an occupied signal between pins P297-1 & P297-8 on the M2. The input to P297-8 turns the unit on/off.

Direct to Space - Zone Sensors

Wall mount non-adjustable zone sensor in the space utilized by the dedicated outside air unit. Wall mount the remote humidity sensor in the same space.

Wire zone and humidity sensor to plug terminals P298 on the M2 Unit Controller. Make wire connections as shown in figures 6 and 7 (see Page 6) and tables 4 and 5.

Set UC ECTO settings as shown in table 6. Refer to M2 Unit Controller User Guide located in the unit pocket for more detailed description and instructions.

The wall mounted zone sensor will serve as a secondary high and low temperature control. To achieve this, set the heating and cooling setpoints outside the fresh air tempering setpoints. For example:

Zone sensor cooling setpoint (6.04)	77
Fresh air cooling setpoint (7.06)	73
Fresh air heating setpoint (6.20)	67
Zone sensor heating setpoint (6.02)	63

For Continuous Operation—The occupied input turns the unit on/off. Setup for continuous operation in one of two ways, with or without jumper:

- **Without jumper** - Set ECTO 8.26 for occupied following reset. (ECTO 8.26 = 1 [see Note*]) The ECTO provides the occupied input that turns the unit on. This is the factory default.
- **With jumper** - Set ECTO 8.26 for unoccupied following reset. (ECTO 8.26 = 0 [see Note*]) Add jumper on P297-1 to P297-8. The jumper provides the occupied input that turns the unit on.

For Intermittent Operation—Set ECTO 8.26 for unoccupied following reset. (ECTO 8.26 = 0 [see Note*]) Use an external device to provide an occupied signal at P297-8 that turns the unit on.

**NOTE - ECTO 8.26 is used for multiple options. See the Prodigy Application Guide (Advanced Features) for more information on what these features are, and how to enable/disable individual options in a weighted-option ECTO parameter. In the case where no other ECTO 8.26 options are being used, then setting ECTO 8.26 to 0 or 1 as described above is acceptable. If the current value of ECTO 8.26 is not 0 or 1, then other options are being used, and the Advanced Features Guide should be consulted when changing ECTO 8.26 in order to keep these features enabled.*

Table 4. Zone Sensor Connections

M2 Connection	Zone Sensor*
P298-6	A2
P298-7	A2
*Zone sensor is not polarity sensitive	

Table 5. RH Sensor Connections

M2 Connection	RH Sensor
P298-1	24VAC
P298-5	0-10V
P298-6	GND

Table 6. UC ECTO Settings

Parameter	Description	Counts
4.04	Freeze stats will record (no lock out)	4
4.13	Compressor minimum run time 120 seconds	60
4.22	0 Stage 4 cooling stage up timer	0
4.21	0 Stage 3 cooling stage up timer	0
4.20	0 Stage 2 cooling stage up timer	0
4.23	Cooling stage down timer 0 minutes	0
4.24	Humiditrol reheat control	6
4.26	Humiditrol reheat deadband	5
5.05	Return air limit (sensor moved to space)	1
5.06	Return air limit – heat setpoint 100°	95
5.07	Return air limit - cool setpoint 60°	154
6.01	System control mode	1
6.02	Back-up setpoint for heating 63°	148
6.03	Unoccupied setpoint for heating 40°	240
6.04	Back-up setpoint for cooling 77°	92
6.05	Unoccupied - setpoint for Cooling 95°	20
6.17	Continuous blower operation during on (occupied)	1
6.20	(FAH) fresh air heating setpoint 67°	143
6.21	Fresh air heat stage dead band 5°	7
6.22	Fresh air heat minimum cycle time	15
7.05	(FAT) fresh air tempering change over delay 15 minutes	28
7.06	(FAC) fresh air cooling setpoint 73°	135
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Direct to Unit - Zone Sensors

The A2 56L81 duct sensor should be placed as far down the dedicated outside air unit supply ductwork as possible, next to the fresh air tempering sensor, before the ductwork branches to the local units.

Replace RT16 return air sensor with a 59M04 miniature wall sensor in the conditioned space.

Install the humidity sensor next to the miniature wall sensor.

Wire zone and humidity sensor to plug terminal P298 on the M2 Unit Controller. Make wire connections as shown in figures 6 and 7 (see Page 6) and tables 7 and 8.

Set UC ECTO settings as shown in table 6. Refer to M2 Unit Controller User Guide located in the unit pocket for more detailed description and instructions.

The duct mounted zone sensor will serve as a secondary high and low temperature control. To achieve this set the heating and cooling setpoints outside the fresh air tempering setpoints. For example:

Zone sensor cooling setpoint (6.04)	77
Fresh air cooling setpoint (7.06)	73
Fresh air heating setpoint (6.20)	67
Zone sensor heating setpoint (6.02)	63

For Continuous Operation—The occupied input turns the unit on/off. Setup for continuous operation in one of two ways, with or without jumper:

- **Without jumper** - Set ECTO 8.26 for occupied following reset. (ECTO 8.26 = 1 [see Note*]) The ECTO provides the occupied input that turns the unit on. This is the factory default.

- **With jumper** - Set ECTO 8.26 for unoccupied following reset. (ECTO 8.26 = 0 [see Note*]) Add jumper on P297-1 to P297-8. The jumper provides the occupied input that turns the unit on.

For Intermittent Operation—Set ECTO 8.26 for unoccupied following reset. (ECTO 8.26 = 0 [see Note*]) Use an external device to provide an occupied signal at P297-8 that turns the unit on.

**NOTE - ECTO 8.26 is used for multiple options. See the Prodigy Application Guide (Advanced Features) for more information on what these features are, and how to enable/disable individual options in a weighted-option ECTO parameter. In the case where no other ECTO 8.26 options are being used, then setting ECTO 8.26 to 0 or 1 as described above is acceptable. If the current value of ECTO 8.26 is not 0 or 1, then other options are being used, and the Advanced Features Guide should be consulted when changing ECTO 8.26 in order to keep these features enabled.*

Table 7. Zone Sensor Connections

M2 Connection	Zone Sensor*
P298-6	A2
P298-7	A2
	*Zone sensor is not polarity sensitive

Table 8. RH Sensor Connections

M2 Connection	RH Sensor
P298-1	24VAC
P298-5	0-10V