iWorx by Taco Electronic Solutions

Installation Guide

502-010

VPU2 Variable Air Volume Package Unit Controller

Self-Contained Interoperable Controller Model UCP-1

SUPERSEDES: April 17, 2013 EFFECTIVE: April 2, 2015

Plant ID: 001-3958

SPECIFICATIONS

Electrical Inputs

Cabling: twisted shielded pair, 18 AWG recommended—500 feet max. (152 meters), 10 bit resolution

Mixed Low Limit, Filter Status, Smoke Detect, Local IAQ Alarm: Dry Contact, Normally Open, 5 Volts DC Max

Fan Proof: Dry Contact, Normally Closed, 5 Volts DC Max

Return Air Humidity, Static Pressure: 0 - 10 Volts DC

Mixed Air Temperature, Supply Air Temperature, Return Air Temperature: Precon Type III 10K thermistor

Electrical Outputs

Cooling Stages 1, 2, 3, & 4; Heating Stages 1 & 2; Fan Start/Stop; Two-position Economizer: 24 Volts AC, 1A @ 50C, 0.5A @ 60C, limited by the Class 2 supply rating

Modulated Heating, Modulated Cooling, Modulated Economizer, Modulated Static Pressure Fan: 0-10 Volts DC, 2K Ohm minimum load, 8 bit resolution

Recommended Sensor Wire

Cable Type	Pairs	Details	Taco Catalog No.
18AWG	1	Stranded Twisted Shielded Pair, Plenum	WIR-018

Recommended LON Bus FTT-10A Network Wire

Speed: 78KBPS

Max Volts: 42.4 Volts DC

Cabling: Maximum node-to-node distance: 1312 feet (400 meters); Maximum total distance: 1640 feet (500 meters)

Cable Type	Pairs	Details	Taco Catalog No.
Level 4 22AWG (0.65mm)	1	Unshielded, Plenum, U.L. Type CMP	WIR-022

Mechanical

Dimensions: 5.55” (141mm) high, 6.54” (166 mm) wide, 1.75” deep (44 mm), ABS

Controller Weight: 0.70 pounds (0.32 kilograms)

Shipping Weight: 1.0 pounds (0.46 kilograms)

Processor: 3150 Neuron 10 MHz

Flash: 48 Kilobytes

SRAM: 8 Kilobytes

Termination: 0.197” (5.0 mm) Pluggable Terminal Blocks, 14-22 AWG

Temperature: 32 °F to 140 °F (0 °C to 60 °C)

Humidity: 0 to 90%, non-condensing

UL Listed for US and Canada, Energy Management Equipment PAZX and PAZX7

FCC Part 15 Class A compliant

Equipment Location

Abide by all warnings regarding equipment location provided earlier in this document.

Optimally, the equipment should be installed within a secure enclosure.

The equipment must be installed indoors unless contained within a protective enclosure. The enclosure must maintain internal temperature and humidity within the ranges specified for this equipment.

The equipment must be installed within 500 feet of all input peripherals (smoke detectors, sensors, etc.) that will be connected to the equipment. It must be within 200 feet of any connected thermostats.

Selecting a Power Source

This equipment requires a UL recognized external power source (not supplied) to operate. The controller power input requires a voltage of 24 Volts AC.

To calculate power source current requirements, add the power consumption of all peripheral devices to that of the controller.

The controller and triac output loads can use the same power source. If both are using the same power source, the loads must have EMF protection. This protection can be integral to the load, or installed in the 24 VAC wiring across the load’s coil.

To provide necessary RFI and transient protection, the controller’s ground (GND) pin (T40) must be connected to earth ground or the earth ground of the packaged unit’s enclosure ground. Failure to properly ground the controller may cause it to exceed FCC limits. Excessive noise could also produce inaccurate sensor data. The power source must be capable of operating with this connection to ground.

INSTALLATION PRECAUTIONS

General

CAUTION: This symbol is intended to alert the user to the presence of important installation and maintenance (servicing) instructions in the literature accompanying the equipment.

CAUTION: Risk of explosion if battery is replaced by an incorrect type. Contains lithium type battery; dispose of properly.

WARNING: Electrical shock hazard. Disconnect **ALL** power sources when installing or servicing this equipment to prevent electrical shock or equipment damage.

Make all wiring connections in accordance with these instructions and in accordance with pertinent national and local electrical codes. Use only copper conductors that are suitable for 167 °F (75 °C).

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Static Electricity

Static charges produce voltages that can damage this equipment. Follow these static electricity precautions when handling this equipment.

- Work in a static free area.
- Touch a known, securely grounded object to discharge any charge you may have accumulated.
- Use a wrist strap when handling printed circuit boards. The strap must be secured to earth ground.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference. This equipment can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to a power source different from that to which the receiver is connected.
- Consult the equipment supplier or an experienced radio/TV technician for help.

You are cautioned that any changes or modifications to this equipment not expressly approved in these instructions could void your authority to operate this equipment in the United States.

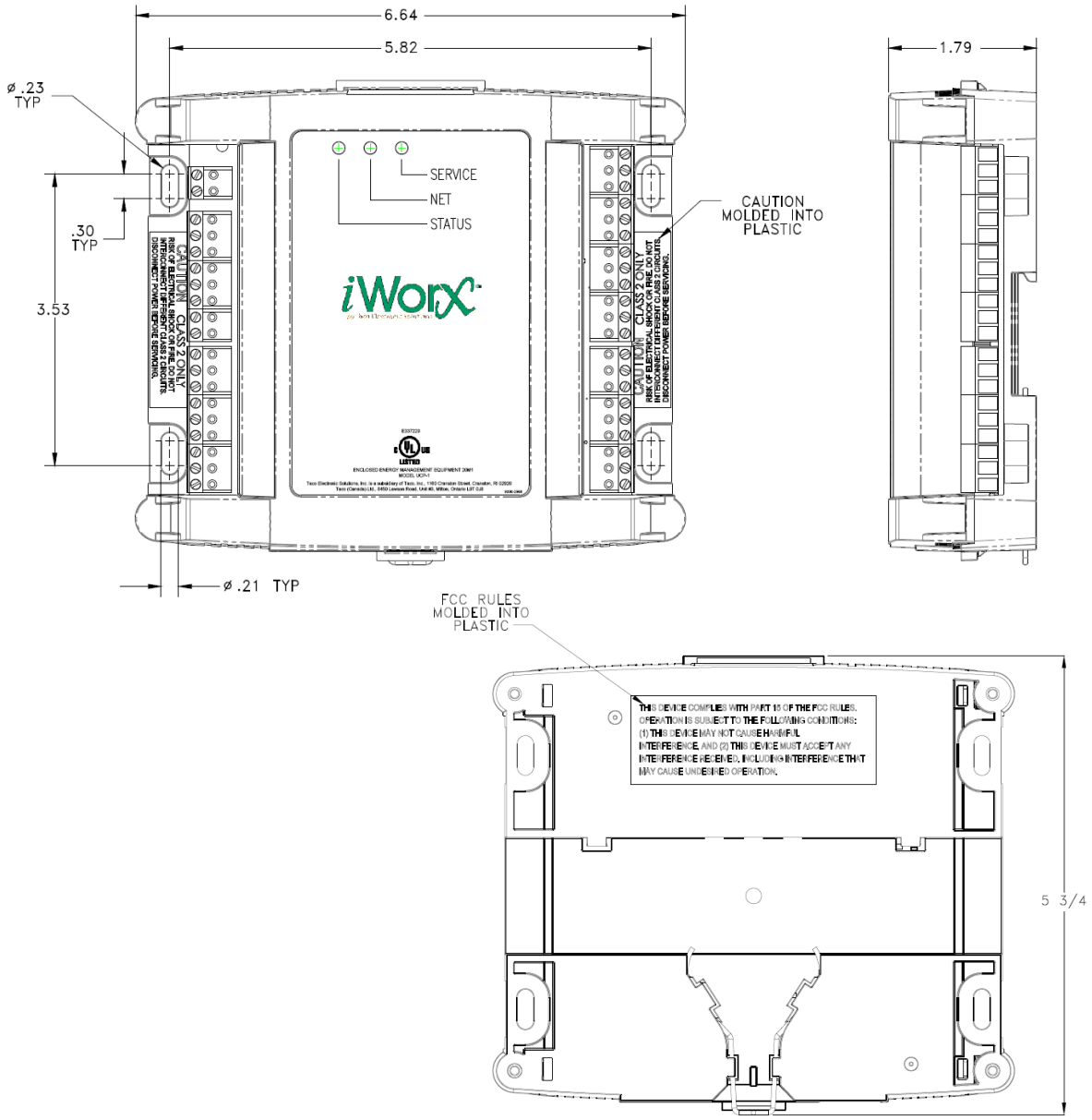
INSTALLATION

Warning: Electrical shock hazard. To prevent electrical shock or equipment damage, disconnect **ALL** power sources to controllers and loads before installing or servicing this equipment or modifying any wiring.

Mounting the Device

1. Select a mounting location. Enclosure mounting is recommended.
2. Hold the controller on the panel you wish to mount it on. With a marker or pencil mark the mounting locations on the panel.
3. Using a small drill bit pre-drill the mounting holes.
4. Using two #6 pan head screws, mount the controller to the panel.
5. Wire the controller.

Figure 1: Mounting Dimensions



Grounding the Device

The ground terminal (T40) must be securely connected to earth ground. Failure to properly ground this equipment will result in improper operation. Improper grounding may also increase the risk of electrical shock and may increase the possibility of interference with radio/TV reception.

For best performance, connect the power supply common terminal (T38) to the same external point as the ground terminal (T40).

Power

Requires: 24VAC (20VAC to 28VAC), requires an external Class 2 supply

Consumes: 7.2W with no external loads, maximum limited by the Class 2 supply rating

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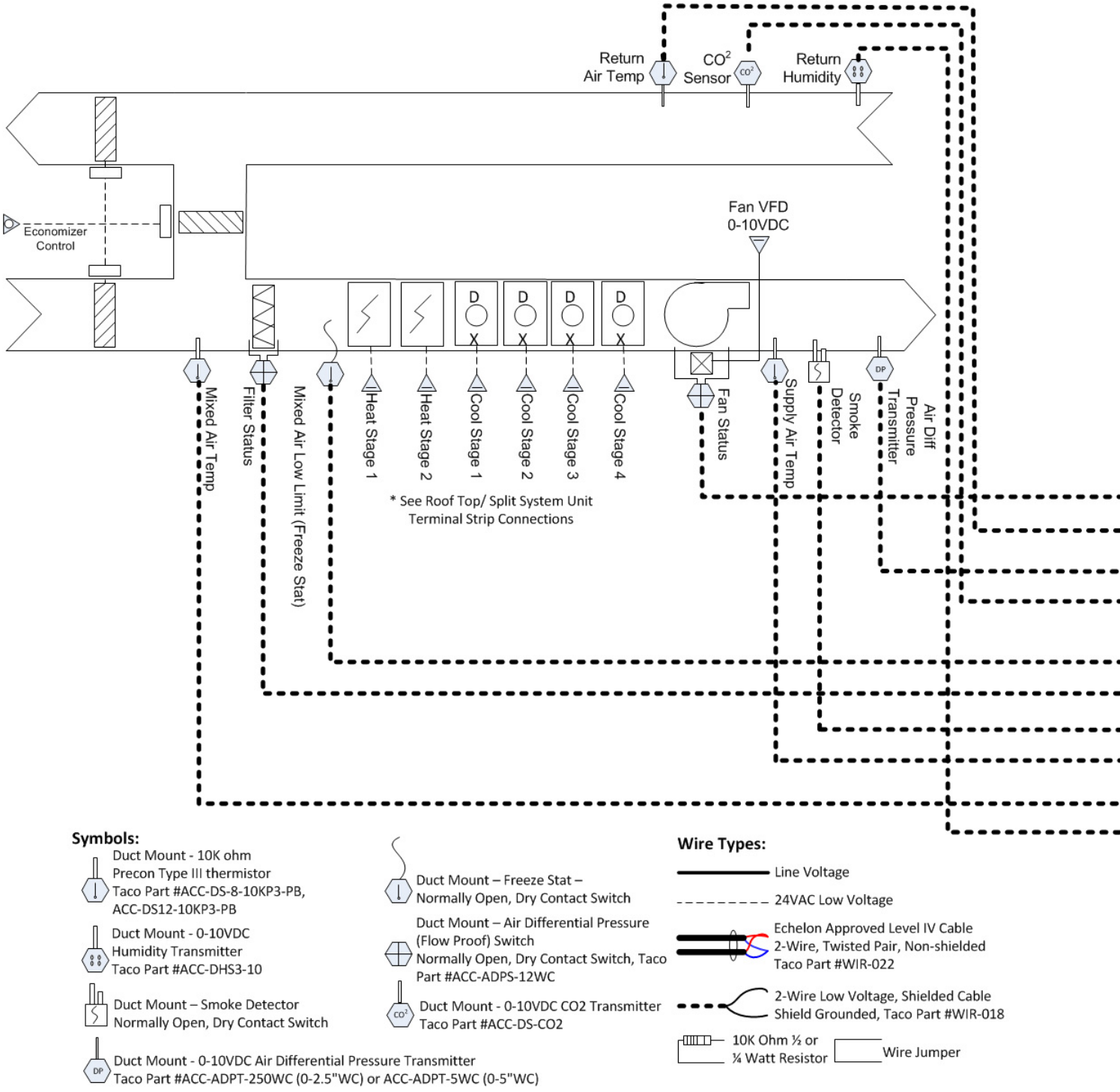

Symbols:

Duct Mount - 10K ohm Precon Type III thermistor
Taco Part #ACC-DS-8-10KP3-PB, ACC-DS12-10KP3-PB

Duct Mount - 0-10VDC Humidity Transmitter
Taco Part #ACC-DHS3-10

Duct Mount – Smoke Detector
Normally Open, Dry Contact Switch

Duct Mount – Freeze Stat –
Normally Open, Dry Contact Switch

Duct Mount – Air Differential Pressure (Flow Proof) Switch
Normally Open, Dry Contact Switch, Taco Part #ACC-ADPS-12WC

Duct Mount - 0-10VDC CO2 Transmitter
Taco Part #ACC-DS-CO2

Duct Mount - 0-10VDC Air Differential Pressure Transmitter
Taco Part #ACC-ADPT-250WC (0-2.5"WC) or ACC-ADPT-5WC (0-5"WC)

Wire Types:

Line Voltage

24VAC Low Voltage

Echelon Approved Level IV Cable
2-Wire, Twisted Pair, Non-shielded
Taco Part #WIR-022

2-Wire Low Voltage, Shielded Cable
Shield Grounded, Taco Part #WIR-018

10K Ohm ½ or ¼ Watt Resistor

Wire Jumper

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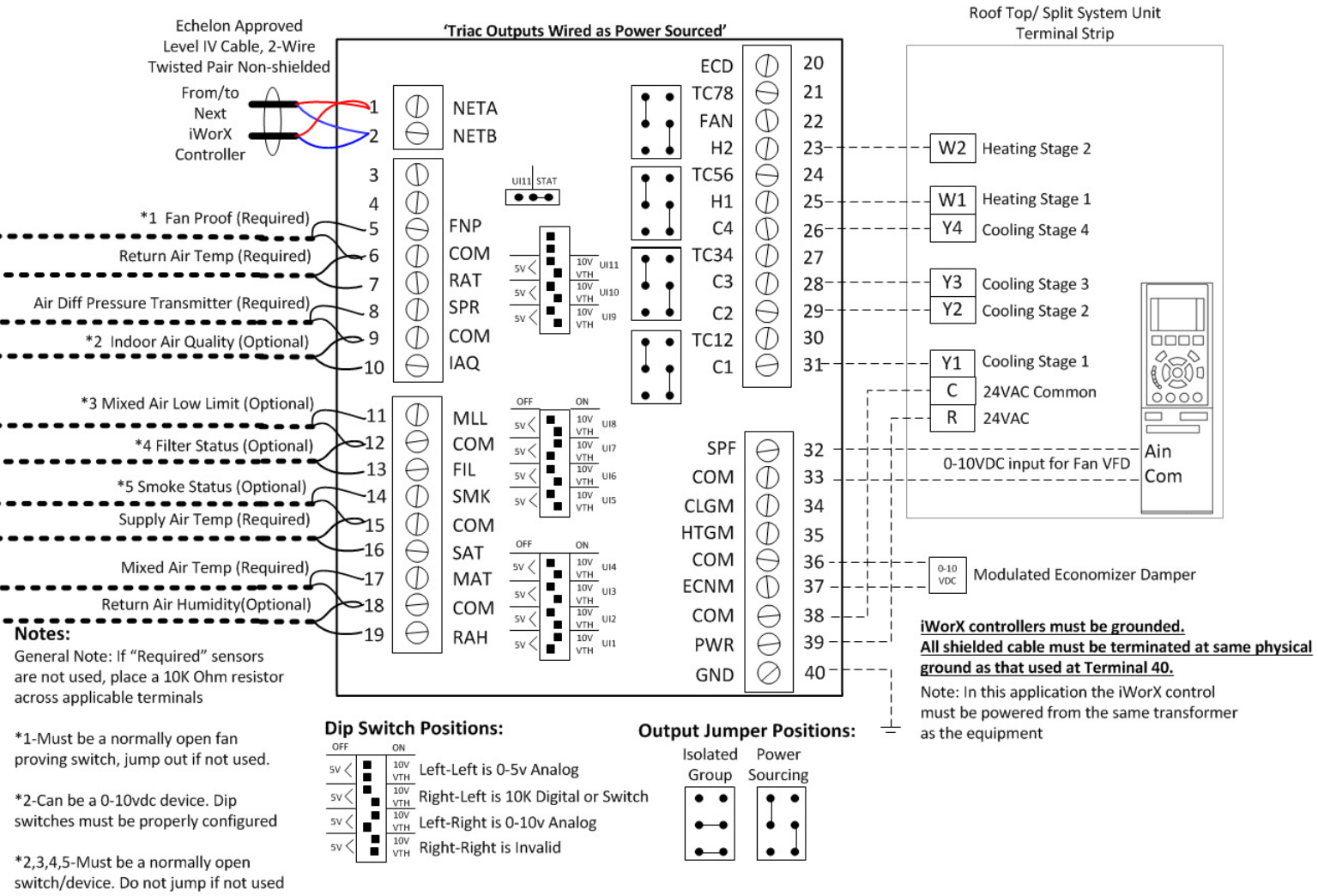
Variable Air Volume (VAV)
Staged Rooftop or Split System
Up to:
- 2 Stage Heating – Electric or Gas
- 4 Stage Cooling – DX
- Fan Variable Frequency Drive
- Modulating or 2-pos. Economizer
- Demand Controlled Ventilation (CO^2)
Can be integrated with up to 56 Taco VAV Controllers on Taco LON Bus



Notes:

General Note: If "Required" sensors are not used, place a 10K Ohm resistor across applicable terminals

*1-Must be a normally open fan proving switch, jump out if not used.

*2-Can be a 0-10vdc device. Dip switches must be properly configured

*2,3,4,5-Must be a normally open switch/device. Do not jump if not used

Dip Switch Positions:

Output Jumper Positions:

iWorX controllers must be grounded.
All shielded cable must be terminated at same physical ground as that used at Terminal 40.

Note: In this application the iWorX control must be powered from the same transformer as the equipment

VPU2 - VARIABLE AIR VOLUME STAGED ROOFTOP OR SPLIT SYSTEM

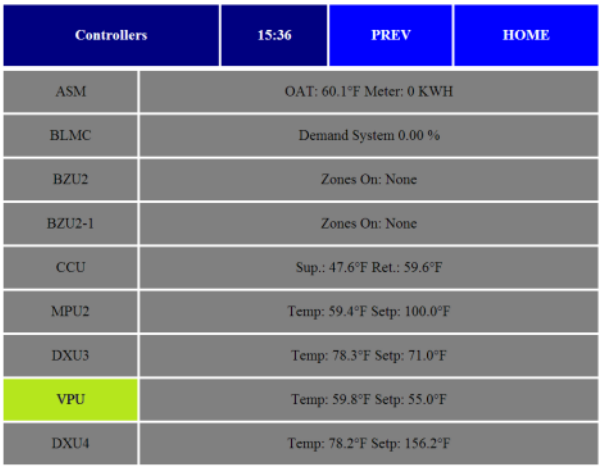
Controlled: 2 stage heating (electric or gas), 4 stage cooling (DX), Fan Variable Frequency Drive

Sensors Required: Supply Air Temp, Fan Proof, Filter Status, Air Differential Pressure Transmitter

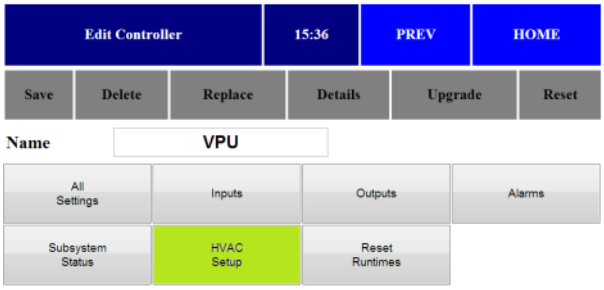
NOTE: Instructions below assume at least 1 VAVD (up to 56) on Taco LON Bus. If none, skip steps 3 through 6.

Setup Instructions

1. Press **Controllers** from main screen.
2. Select required VPU from controller list and press appropriate controller.



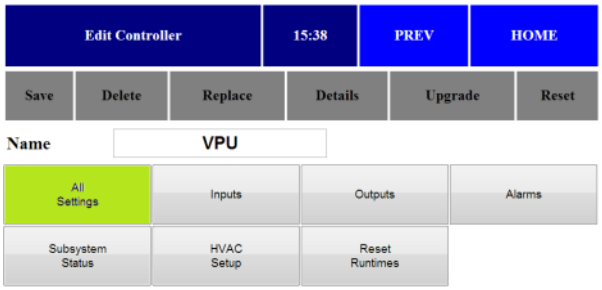
3. Press **HVAC Setup**.



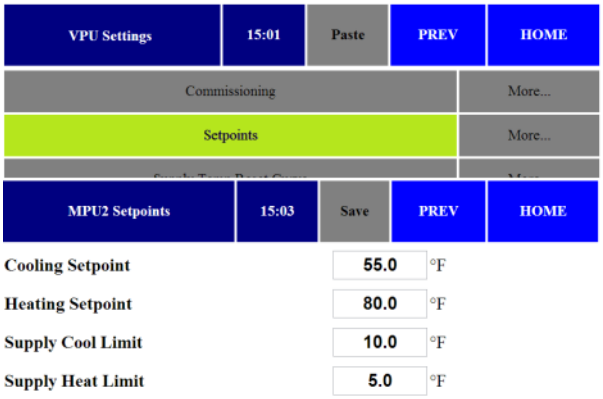
4. The *HVAC Setup* menu opens. Press **Zone Members**.

5. The *Zone Members* menu opens.
6. Press on VAV boxes associated with MPU. Associated controllers show in RED afterward. Press **Save**.

7. Press **Prev**. twice. From the main controller menu, press **All Settings**.



8. Press **Setpoints**.



9. The *Setpoint* menu opens.
   a. Specify **Cooling Setpoint**.
   b. Specify **Heating Setpoint**.
   c. Specify **Supply Cool Limit** (sets deviation from setpoint for alarm).

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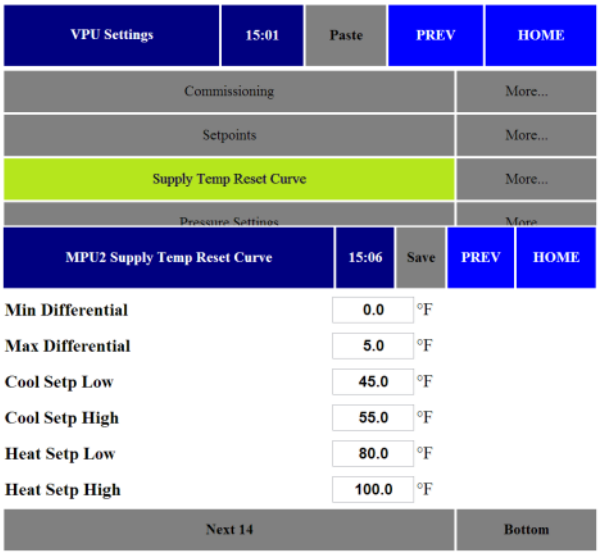
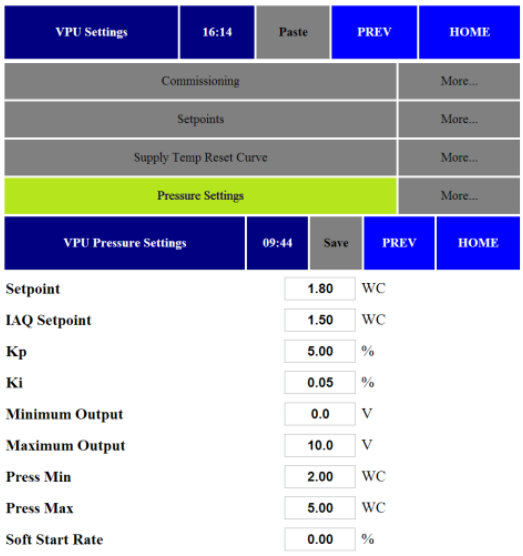
d. Specify **Supply Heat Limit** (sets deviation from setpoint for alarm).
e. Press **Save**.

10. Press **Supply Temp Reset Curve**.



11. The *Supply Temp Reset Curve* menu opens.
a. Specify **Min Differential**.
b. Specify **Max Differential**.
c. Specify **Cool Setp Low**.
d. Specify **Cool Setp High**.
e. Specify **Heat Setp Low**.
f. Specify **Heat Setp High**.
g. Press **Save**.

12. Press **Pressure Settings**.

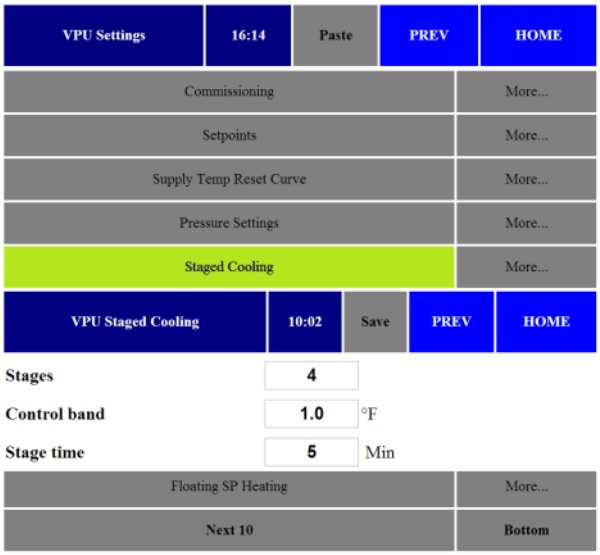


13. The *Pressure Settings* menu opens.
a. Specify **Static Pressure Setpoint** in Inches of WC.
b. Specify the **IAQ Setpoint** (if applicable).

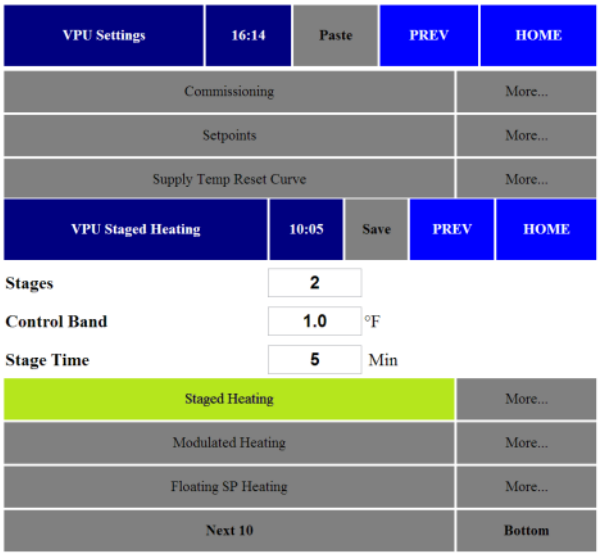
c. Specify **Min Output Voltage** (VDC) for VFD Drive (commonly 0-2VDC).
d. Specify **Max Output Voltage** (VDC) for VFD drive (commonly 10VDC).
e. Specify **Press Min** (Static pressure to report when the Duct SP sensor provides 0 VDC).
f. Specify **Press Max** (Static pressure to report when the Duct SP sensor provides 10 VDC).
g. Specify **Soft Start Rate**. Setting the soft start ramp rate to 0% per second or 100% per second disables soft start ramping. Soft start ramp rate slows initial fan start rate to protect equipment and ductwork.
h. Press **Save**.

NOTE: DO NOT change factory KP/KI settings. Please review Factory KP/KI Setting White Paper # 508-001.

14. Press **Staged Cooling**.

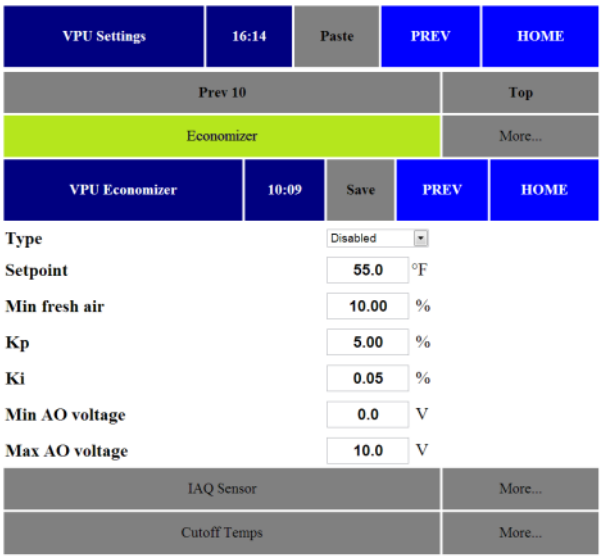


15. The *Staged Cooling* menu opens.
a. Specify number of **Stages** of equipment (0-4).
b. Specify the stage **Control Band** in degrees. Cannot be set to 0.
c. Specify the **Stage Time** in minutes. Cannot be set to 0.
d. Press **Save**.
16. Press **Staged Heating**.

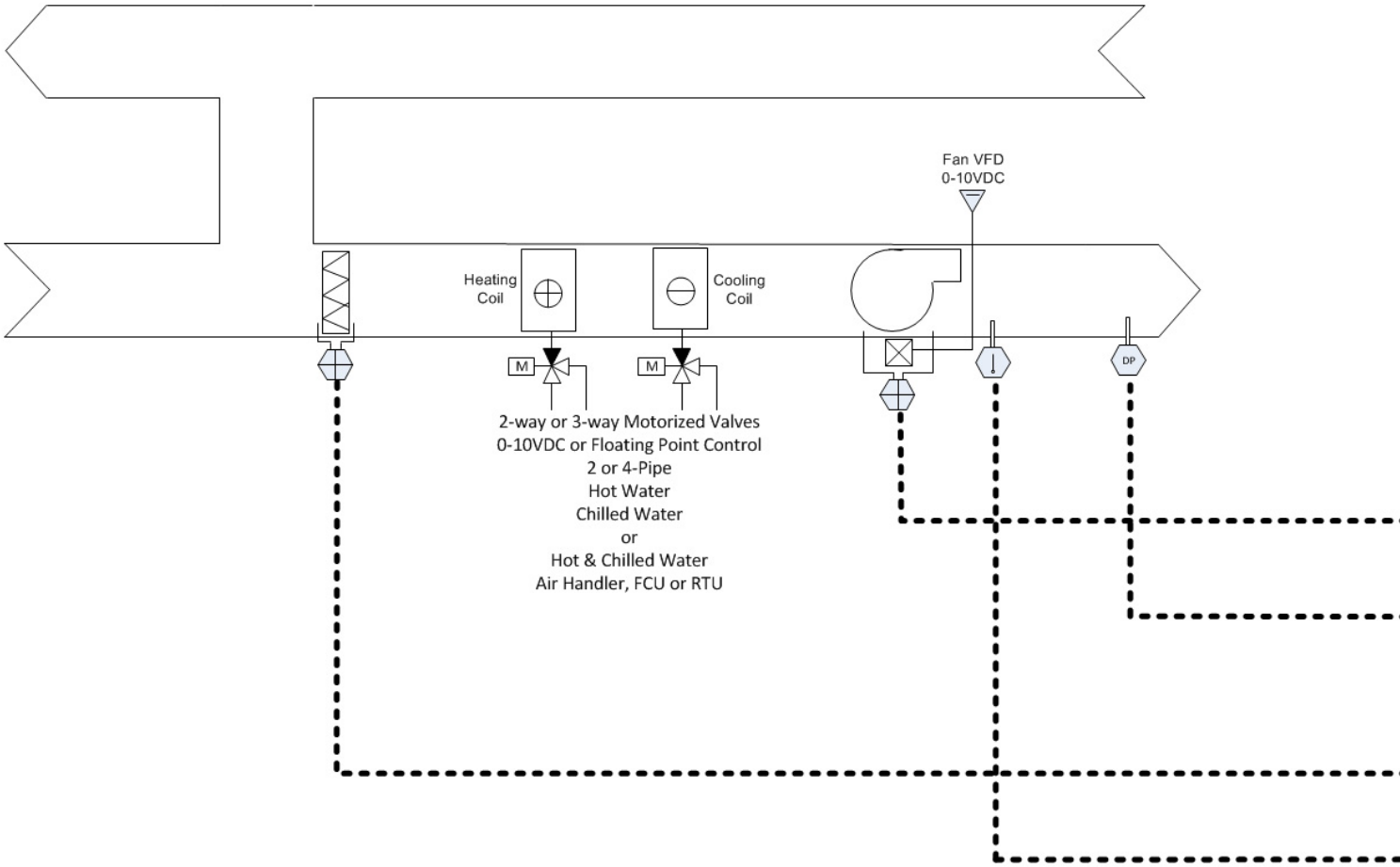


17. The **Staged Heating** menu opens.
    a. Specify number of **Stages** of equipment (0-2).
    b. Specify the stage **Control Band** in degrees. Cannot be set to 0.
    c. Specify the **Stage Time** in minutes. Cannot be set to 0.
    d. Press **Save**.
18. Press **Next 10**.

19. Press **Economizer**.



20. The *Economizer* menu opens.
    a. Select **Disabled**. (if economizer is required, see Economizer programming instructions in this document.)
    b. Press **Save**.



Symbols:

Duct Mount - 10K ohm Precon Type III thermistor
Taco Part #ACC-DS-8-10KP3-PB, ACC-DS12-10KP3-PB

Duct Mount - 0-10VDC Humidity Transmitter
Taco Part #ACC-DHS3-10

Duct Mount – Smoke Detector
Normally Open, Dry Contact Switch

Duct Mount – Freeze Stat –
Normally Open, Dry Contact Switch

Duct Mount – Air Differential Pressure (Flow Proof) Switch
Normally Open, Dry Contact Switch, Taco Part #ACC-ADPS-12WC

Duct Mount - 0-10VDC CO^2 Transmitter
Taco Part #ACC-DS-CO2

Duct Mount - 0-10VDC Air Differential Pressure Transmitter
Taco Part #ACC-ADPT-250WC (0-2.5"WC) or ACC-ADPT-5WC (0-5"WC)

Wire Types:

Line Voltage

24VAC Low Voltage

Echelon Approved Level IV Cable
2-Wire, Twisted Pair, Non-shielded
Taco Part #WIR-022

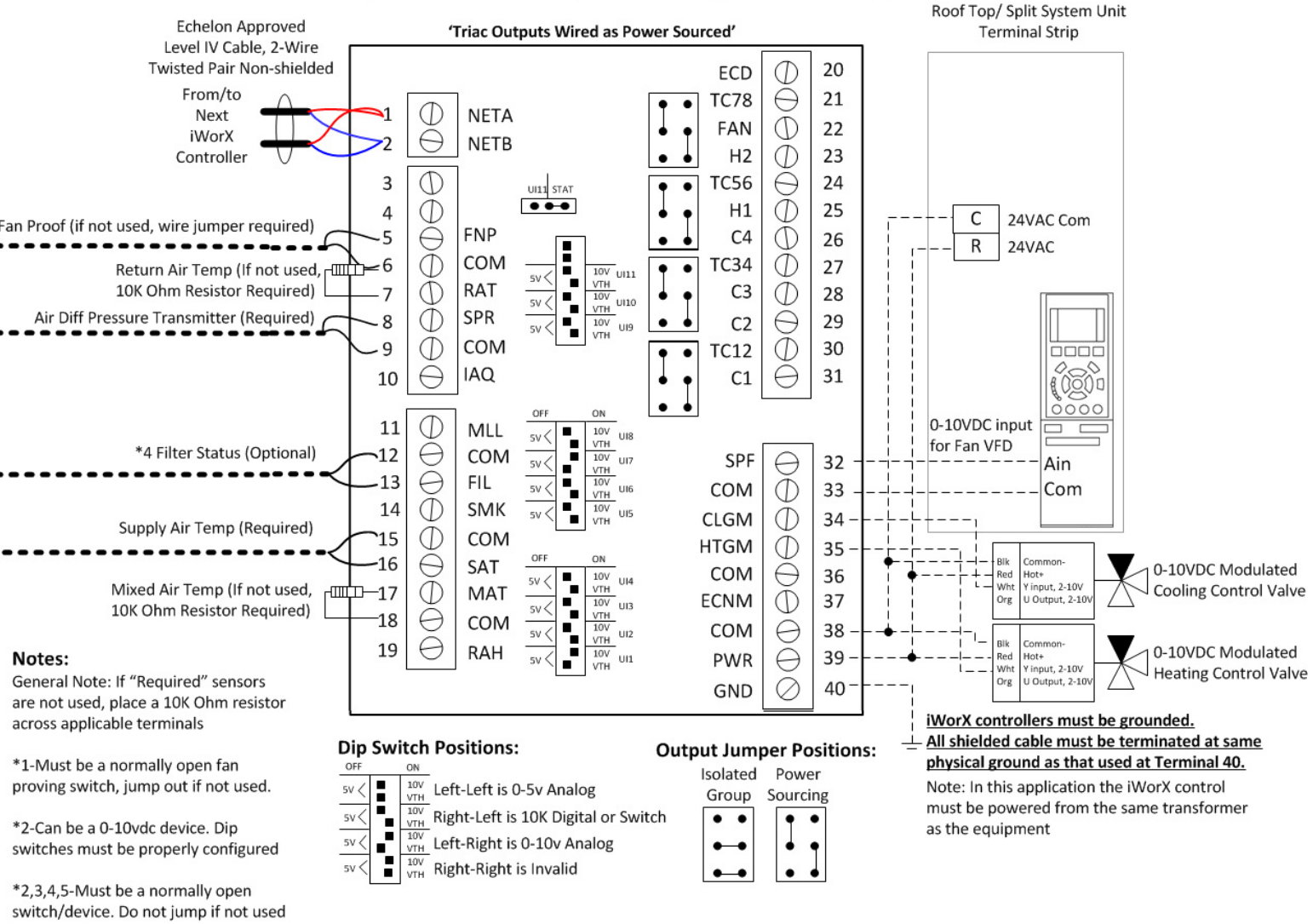
2-Wire Low Voltage, Shielded Cable
Shield Grounded, Taco Part #WIR-018

10K Ohm ½ or ¼ Watt Resistor

Wire Jumper

Variable Air Volume (VAV)
Staged Rooftop or Split System
Up to:
- 0-10VDC Modulating Heating Valve, 0-10VDC Modulated Cooling Valve
- Fan Variable Frequency Drive
Sensors Required – Supply Air Temp, Fan Proof, Filter Status,
Air Differential Pressure Transmitter
Can be integrated with up to 56 Taco VAV Controllers on Taco LON Bus

Note: For Floating Point Valve Setup and Wiring, See VPU2 Application Data Sheet #505-010



VARIABLE AIR VOLUME (VAV) 4-PIPE HOT WATER, CHILLED WATER AHU OR FCU

Controlled: 0-10VDC Modulated Heating Valve, 0-10VDC Modulated Cooling Valve, Fan Variable Frequency Drive

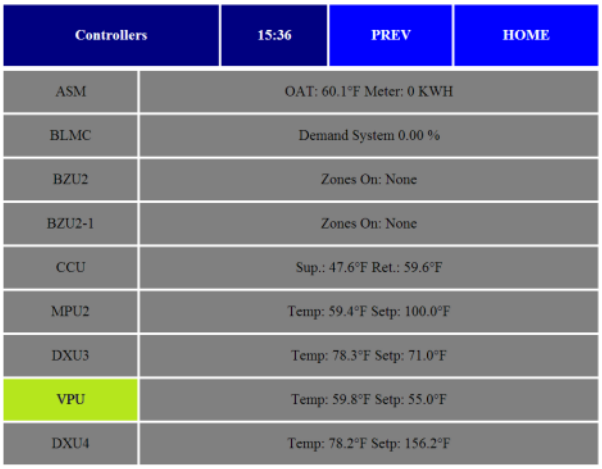
Sensors Required: Supply Air Temp, Fan Proof, Filter Status, Air Differential Pressure Transmitter

NOTE: Instructions below assume at least 1 VAVD (up to 56) on Taco LON Bus. If none, skip steps 3 through 6.

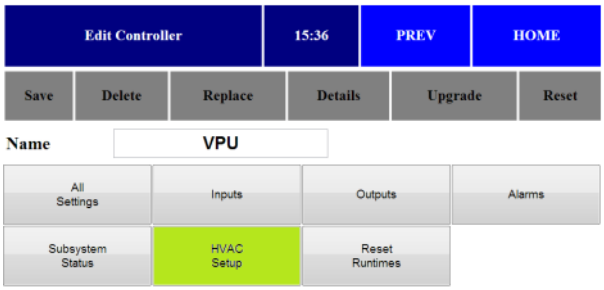
NOTE: For Floating Point Valve Setup and Wiring, See VPU2 Application Data Sheet #505-010.

Setup Instructions

1. Press **Controllers** from main screen.
2. Select required VPU from controller list and press appropriate controller.

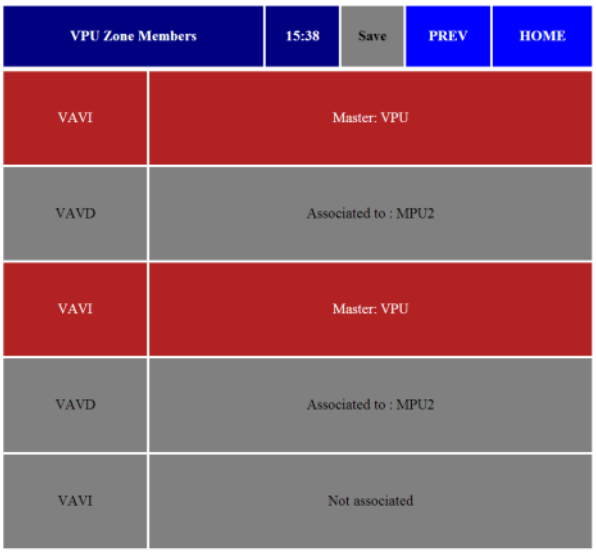


3. Press **HVAC Setup**.

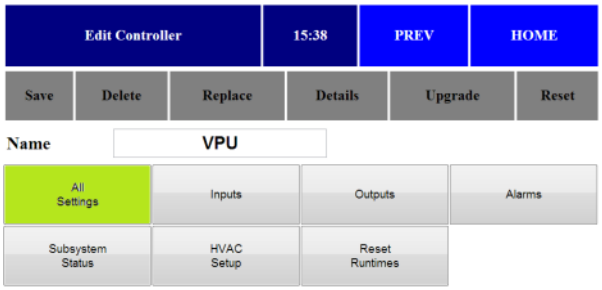


4. The *HVAC Setup* menu opens. Press **Zone Members**.

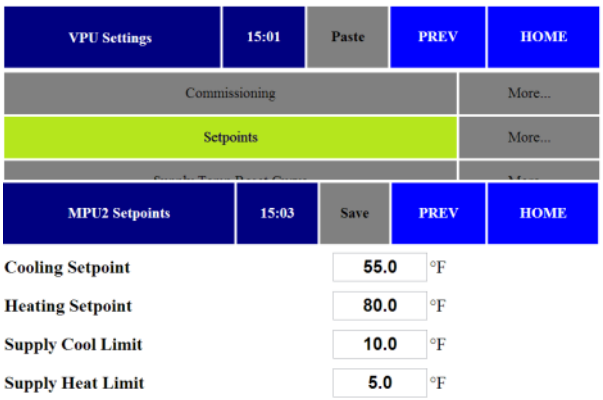
5. The *Zone Members* menu opens.
6. Press on VAV boxes associated with MPU. Associated controllers show in RED afterward. Press **Save**.



7. Press **Prev**. twice. From the main controller menu, press **All Settings**.



8. 8. Press **Setpoints**.



9. The *Setpoint* menu opens.
   a. Specify **Cooling Setpoint**.

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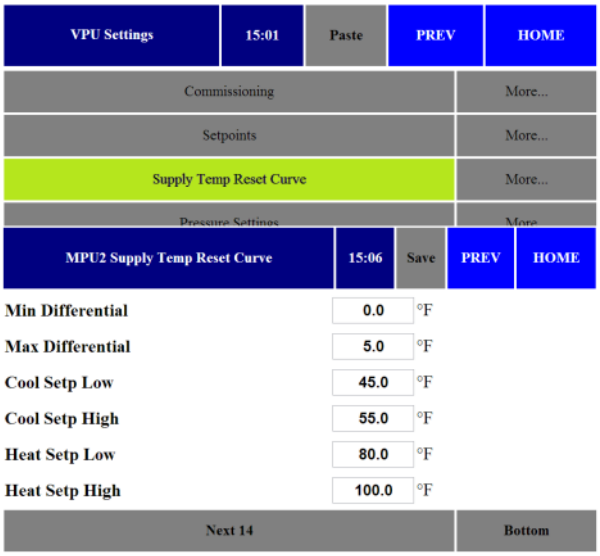
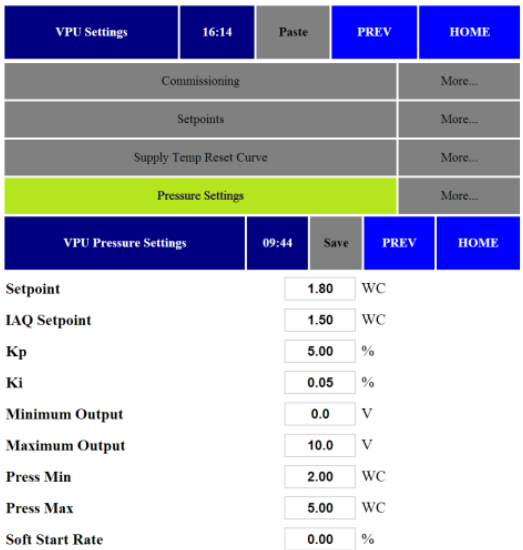
b. Specify **Heating Setpoint**.
c. Specify **Supply Cool Limit** (sets deviation from setpoint for alarm).
d. Specify **Supply Heat Limit** (sets deviation from setpoint for alarm).
e. Press **Save**.

10. Press **Supply Temp Reset Curve**.



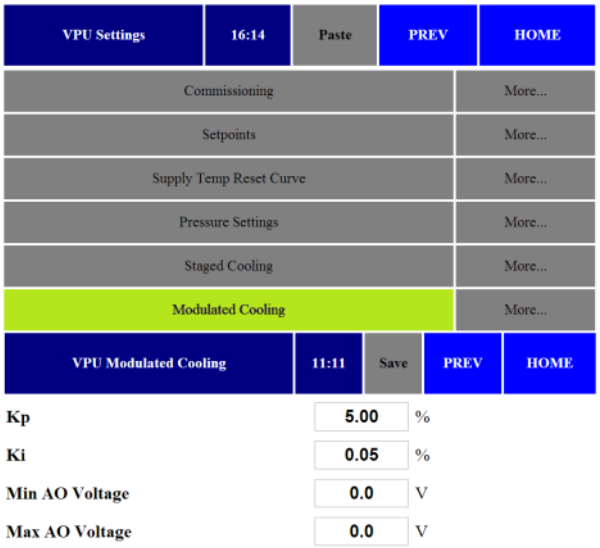
11. The *Supply Temp Reset Curve* menu opens.
a. Specify **Min Differential**.
b. Specify **Max Differential**.
c. Specify **Cool Setp Low**.
d. Specify **Cool Setp High**.
e. Specify **Heat Setp Low**.
f. Specify **Heat Setp High**.
g. Press **Save**.

12. Press **Pressure Settings**.



13. The *Pressure Settings* menu opens.
a. Specify **Static Pressure Setpoint** in Inches of WC.
b. Specify the **IAQ Setpoint** (if applicable).
c. Specify **Min Output Voltage** (VDC) for VFD Drive (commonly 0-2VDC).
d. Specify **Max Output Voltage** (VDC) for VFD drive (commonly 10VDC).
e. Specify **Press Min** (Static pressure to report when the Duct SP sensor provides 0 VDC).
f. Specify **Press Max** (Static pressure to report when the Duct SP sensor provides 10 VDC).
g. Specify **Soft Start Rate**. Setting the soft start ramp rate to 0% per second or 100% per second disables soft start ramping. Soft start ramp rate slows initial fan start rate to protect equipment and ductwork.
h. Press **Save**.

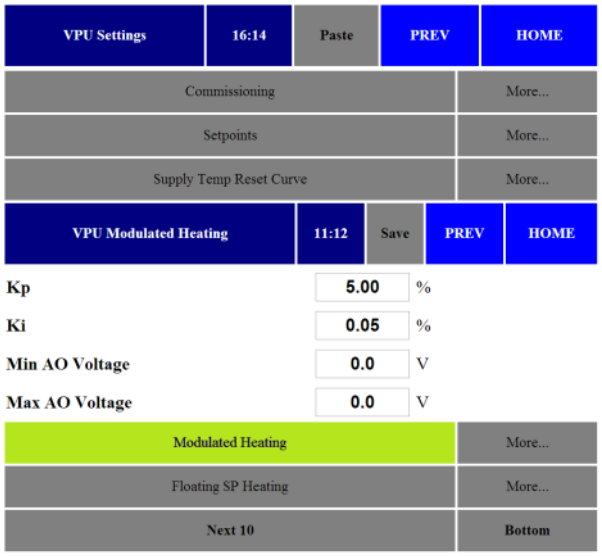
14. Press **Modulated Cooling**.



15. The *Modulated Cooling* menu opens.
a. Specify **Min AO (Output) Voltage** (0-10VDC). 2.0VDC Shown as Example.
b. Specify **Max AO (Output) Voltage** (0-10VDC). 10.0VDC shown as example.
c. Press **Save**.

NOTE: DO NOT change factory KP/KI settings. Please review Factory KP/KI Setting White Paper # 508-001.

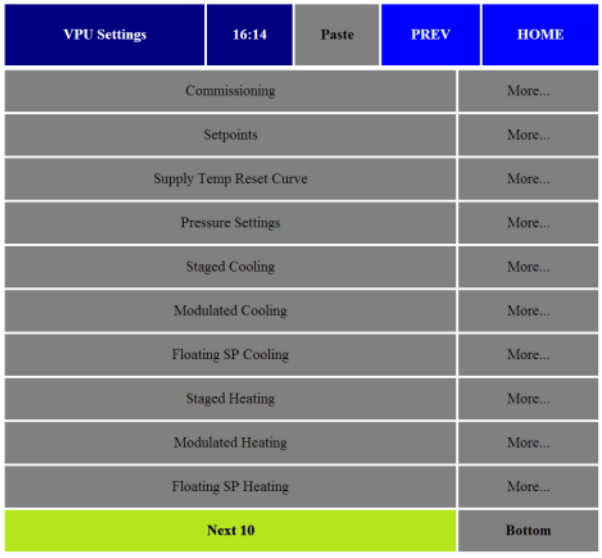
16. Press **Modulated Heating**.



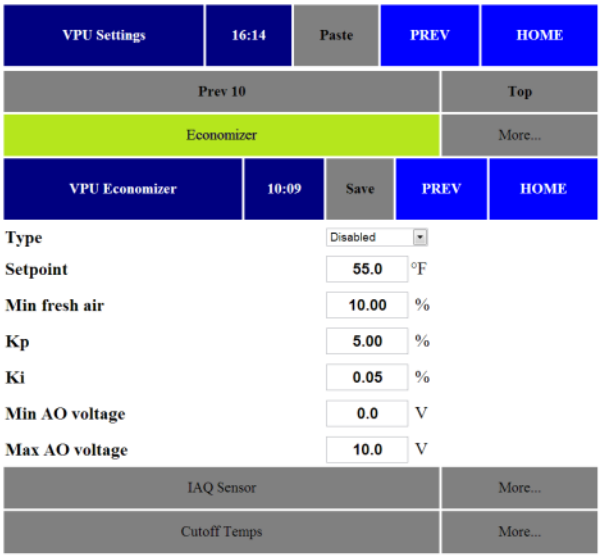
17. The *Modulated Heating* menu opens.
    a. Specify **Min AO (Output) Voltage** (0-10VDC). 2.0VDC Shown as Example.
    b. Specify **Max AO (Output) Voltage** (0-10VDC). 10.0VDC shown as example.
    c. Press **Save**.

    NOTE: DO NOT change factory KP/KI settings. Please review Factory KP/KI Setting White Paper # 508-001.

18. Press **Next 10**.



19. Press **Economizer**.



20. The *Economizer* menu opens.
    a. Select **Disabled**. (if economizer is required, see Economizer programming instructions in this document.)
    b. Press **Save**.

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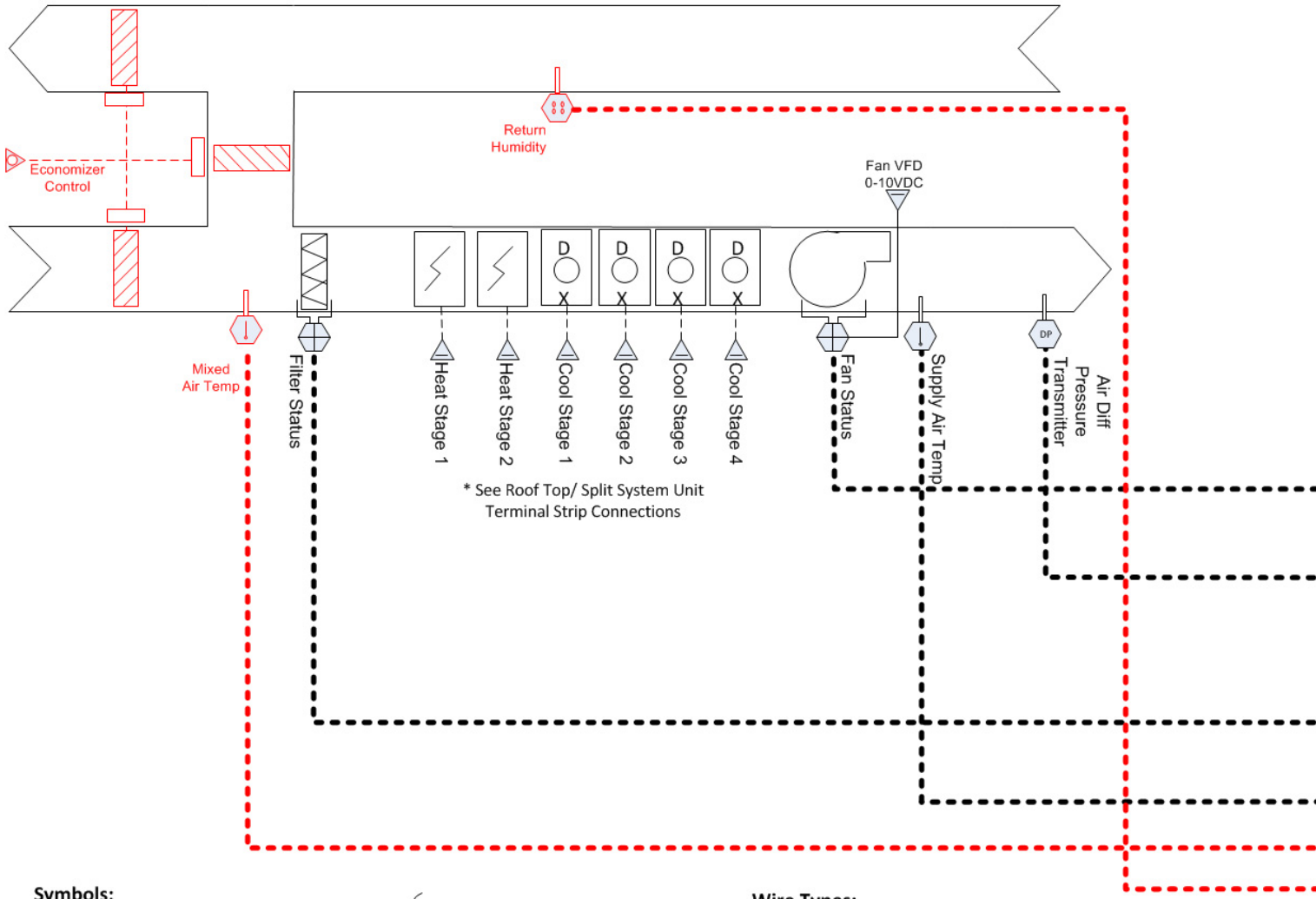


Symbols:

Duct Mount - 10K ohm Precon Type III thermistor
Taco Part #ACC-DS-8-10KP3-PB, ACC-DS12-10KP3-PB

Duct Mount - 0-10VDC Humidity Transmitter
Taco Part #ACC-DHS3-10

Duct Mount – Smoke Detector
Normally Open, Dry Contact Switch

Duct Mount – Freeze Stat –
Normally Open, Dry Contact Switch

Duct Mount – Air Differential Pressure (Flow Proof) Switch
Normally Open, Dry Contact Switch, Taco Part #ACC-ADPS-12WC

Duct Mount - 0-10VDC CO_2 Transmitter
Taco Part #ACC-DS-CO2

Duct Mount - 0-10VDC Air Differential Pressure Transmitter
Taco Part #ACC-ADPT-250WC (0-2.5"WC) or ACC-ADPT-5WC (0-5"WC)

Wire Types:

Line Voltage

24VAC Low Voltage

Echelon Approved Level IV Cable
2-Wire, Twisted Pair, Non-shielded
Taco Part #WIR-022

2-Wire Low Voltage, Shielded Cable
Shield Grounded, Taco Part #WIR-018

10K Ohm ½ or ¼ Watt Resistor

Wire Jumper

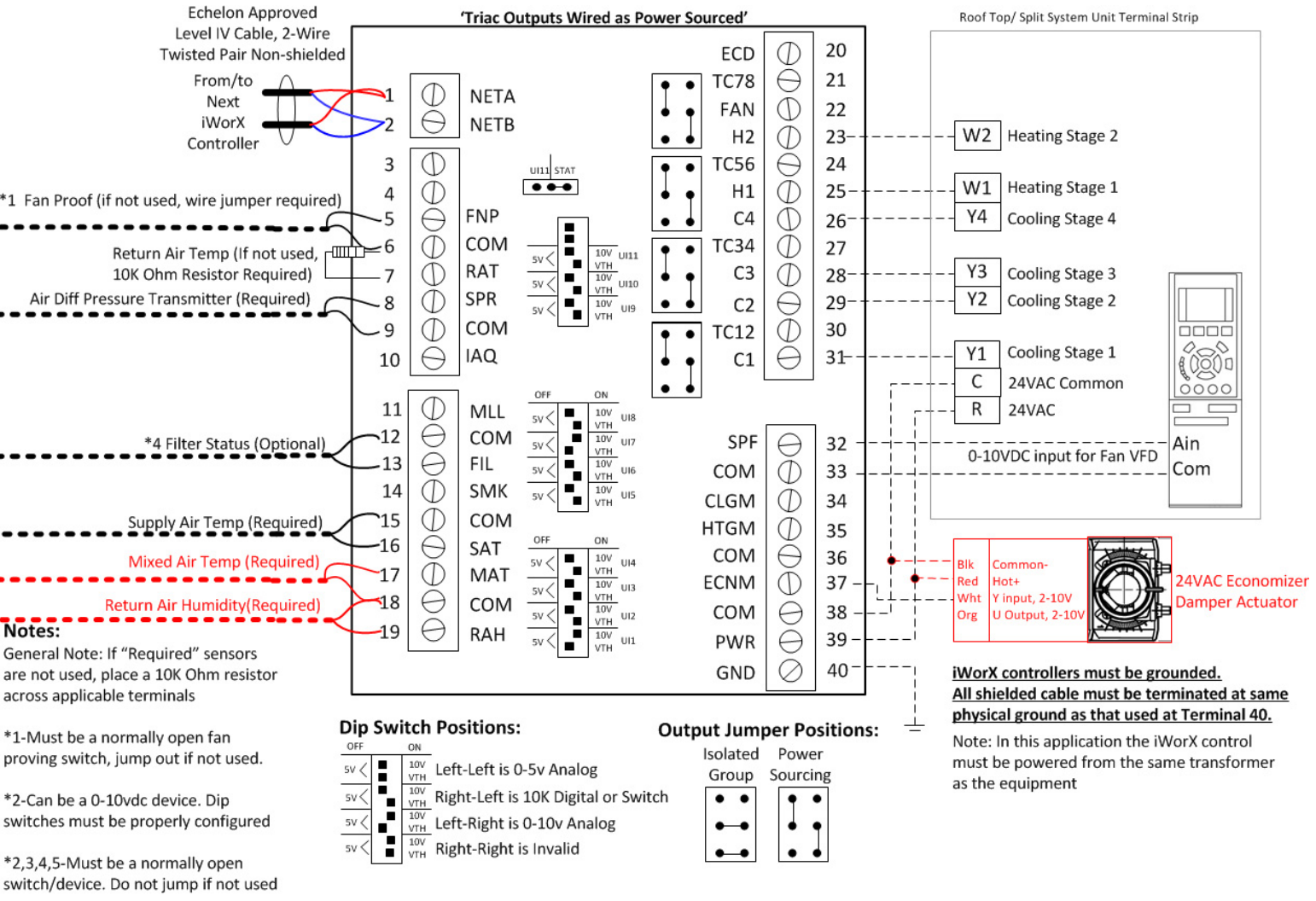
Adding Enthalpy Economizer

Added Module Required – Add ASM Module to network with OA Temp and Humidity Sensors

Added Sensors Required – Mixed Air Temp, Return Air Humidity

Existing Sensors Required – Supply Air Temp, Fan Proof, Filter Status, Air Differential Pressure Transmitter

Can be integrated with up to 56 Taco VAV Controllers on Taco LON Bus



Notes:

General Note: If "Required" sensors are not used, place a 10K Ohm resistor across applicable terminals

*1-Must be a normally open fan proving switch, jump out if not used.

*2-Can be a 0-10vdc device. Dip switches must be properly configured

*2,3,4,5-Must be a normally open switch/device. Do not jump if not used

Dip Switch Positions:

Left-Left is 0-5v Analog
Right-Left is 10K Digital or Switch
Left-Right is 0-10v Analog
Right-Right is Invalid

Output Jumper Positions:

iWorX controllers must be grounded. All shielded cable must be terminated at same physical ground as that used at Terminal 40.

Note: In this application the iWorX control must be powered from the same transformer as the equipment

ADDING ENTHALPY ECONOMIZER

Controlled: 0-10VDC Modulated or 2-pos Economizer Damper Actuator

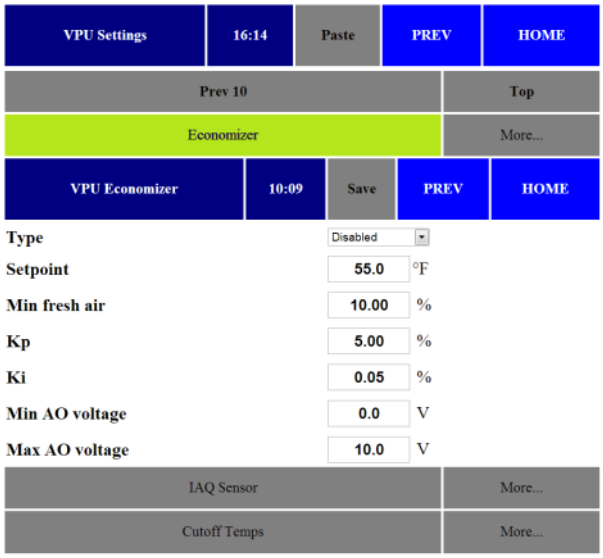
Added Module Required: Add ASM Module to network with OA Temp and Humidity Sensors

Added Sensors Required: Mixed Air Temp, Return Air Humidity

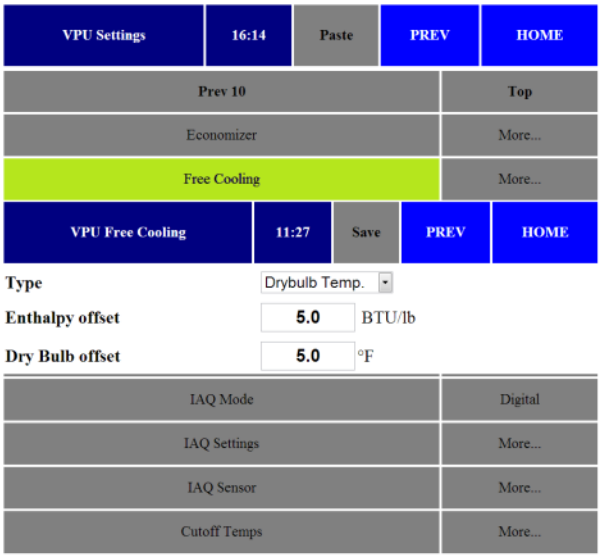
Existing Sensors Required: Return Air Temp, Supply Air Temp, Fan Proof, Filter Status

Setup Instructions

1. Press **Controllers** from main screen.
2. Select required VPU from controller list and press appropriate controller.
3. Press **All Settings**.
4. Press **Next 14**.
5. Press **Economizer**.



6. The *Economizer* menu opens.
   a. Select **Type** of economizer control:
      -2 st (2 position), Unocc ON
      -2 st (2 position), Unocc OFF
      -Mod (modulating), Unocc ON
      -Mod (modulating), Unocc OFF
      NOTE: Unocc ON/OFF specifies whether you want the economizer enabled (ON) or disabled(OFF) during the unoccupied time periods.
   b. Select economizer **setpoint**, which specifies the outside air temperature at which the economizer is enabled.
   c. Select **Min Fresh Air %**. The minimum required damper position for ventilation specified.
   d. Select **Min AO** (Output) Voltage (0-10VDC) for damper actuator. 0.0VDC Shown as Example.
   e. Select **Max AO** (Output) Voltage (0-10VDC) for damper actuator. 10.0VDC shown as example. If a reverse action damper is used then reverse the min and max voltages.
   f. Press **Save**.
   g. Note: DO NOT change factory KP/KI settings. Please review Factory KP/KI Setting White Paper # 508-001.
7. Press **Free Cooling**.



8. 8. The *Free Cooling* menu opens.
   a. Select **Type** of economizer control:
      -Return Air Humidity (Enthalpy)
      -Global Humidity (not used)
      -Dry Bulb
   b. Select **Enthalpy Offset** (Humidity Ratio) in BTU/lb
   c. Select **Dry Bulb Offset** in degrees.
   d. Press **Save**.
   e. Note: Setting as per engineered documents. If specific settings are not known, leave at factory defaults shown above.
9. Press **Next 4**.

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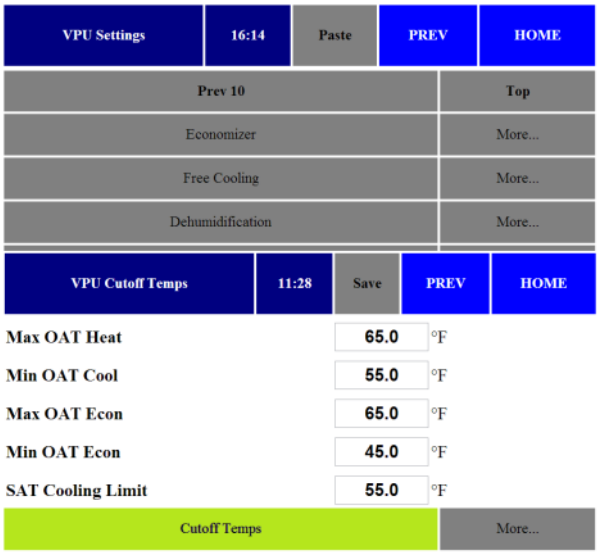
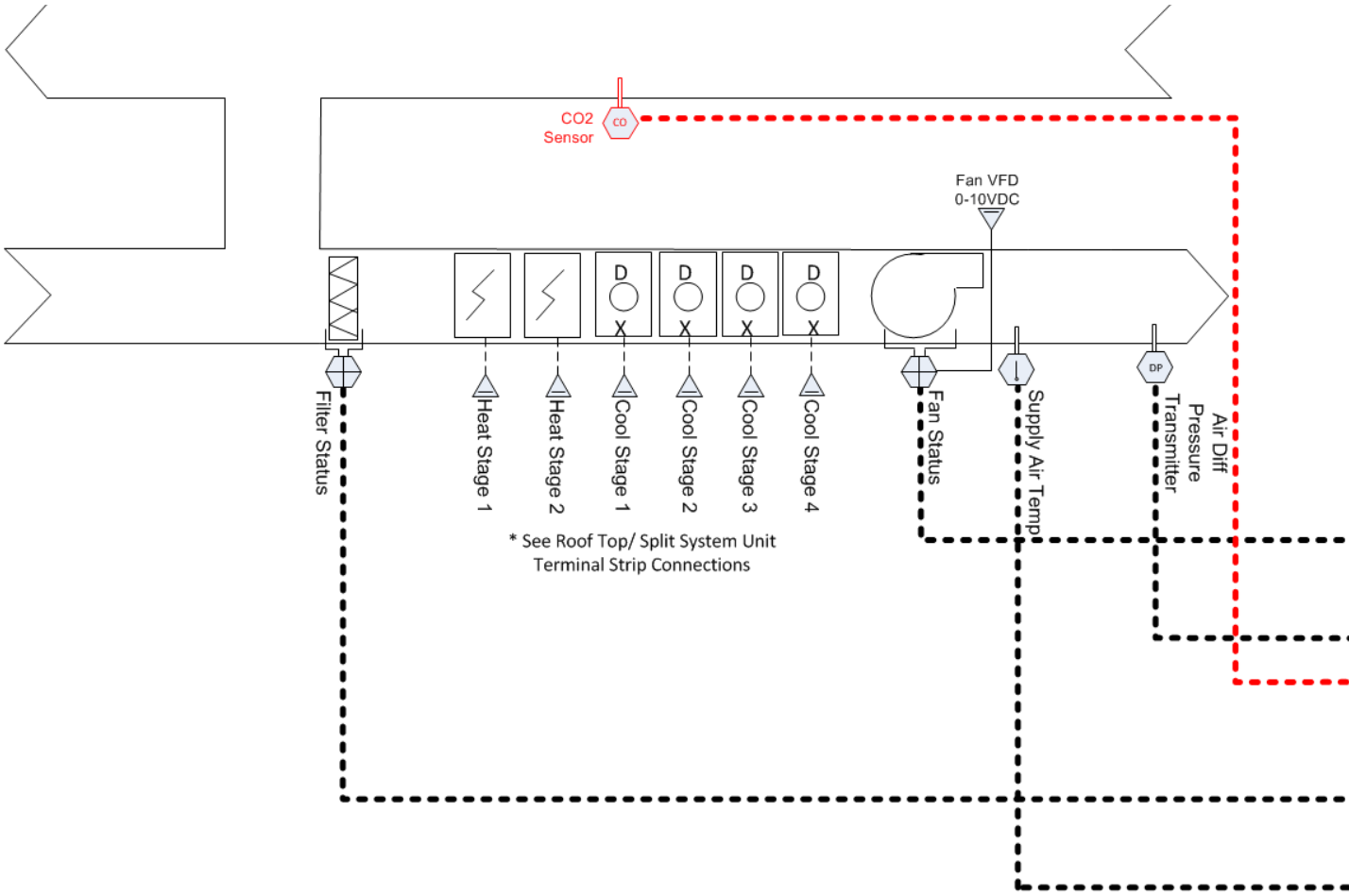
10. Press **Cutoff Temps**.



11. The *Cutoff Temps* menu opens.
    a. Specify **Max OAT Heating**.
    b. Specify **Min OAT Cooling**.
    c. Specify **Max OAT Economizer**.
    d. Specify **SAT Cooling Limit**.
    e. Press **Save**.



Symbols:

Duct Mount - 10K ohm
Precon Type III thermistor
Taco Part #ACC-DS-8-10KP3-PB,
ACC-DS12-10KP3-PB

Duct Mount - 0-10VDC
Humidity Transmitter
Taco Part #ACC-DHS3-10

Duct Mount – Smoke Detector
Normally Open, Dry Contact Switch

Duct Mount – Freeze Stat –
Normally Open, Dry Contact Switch

Duct Mount – Air Differential Pressure
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Normally Open, Dry Contact Switch, Taco
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Duct Mount - 0-10VDC CO2 Transmitter
Taco Part #ACC-DS-CO2

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Taco Part #ACC-ADPT-250WC (0-2.5"WC) or ACC-ADPT-5WC (0-5"WC)

Wire Types:

Line Voltage

24VAC Low Voltage

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Taco Part #WIR-022

2-Wire Low Voltage, Shielded Cable
Shield Grounded, Taco Part #WIR-018

10K Ohm ½ or
¼ Watt Resistor

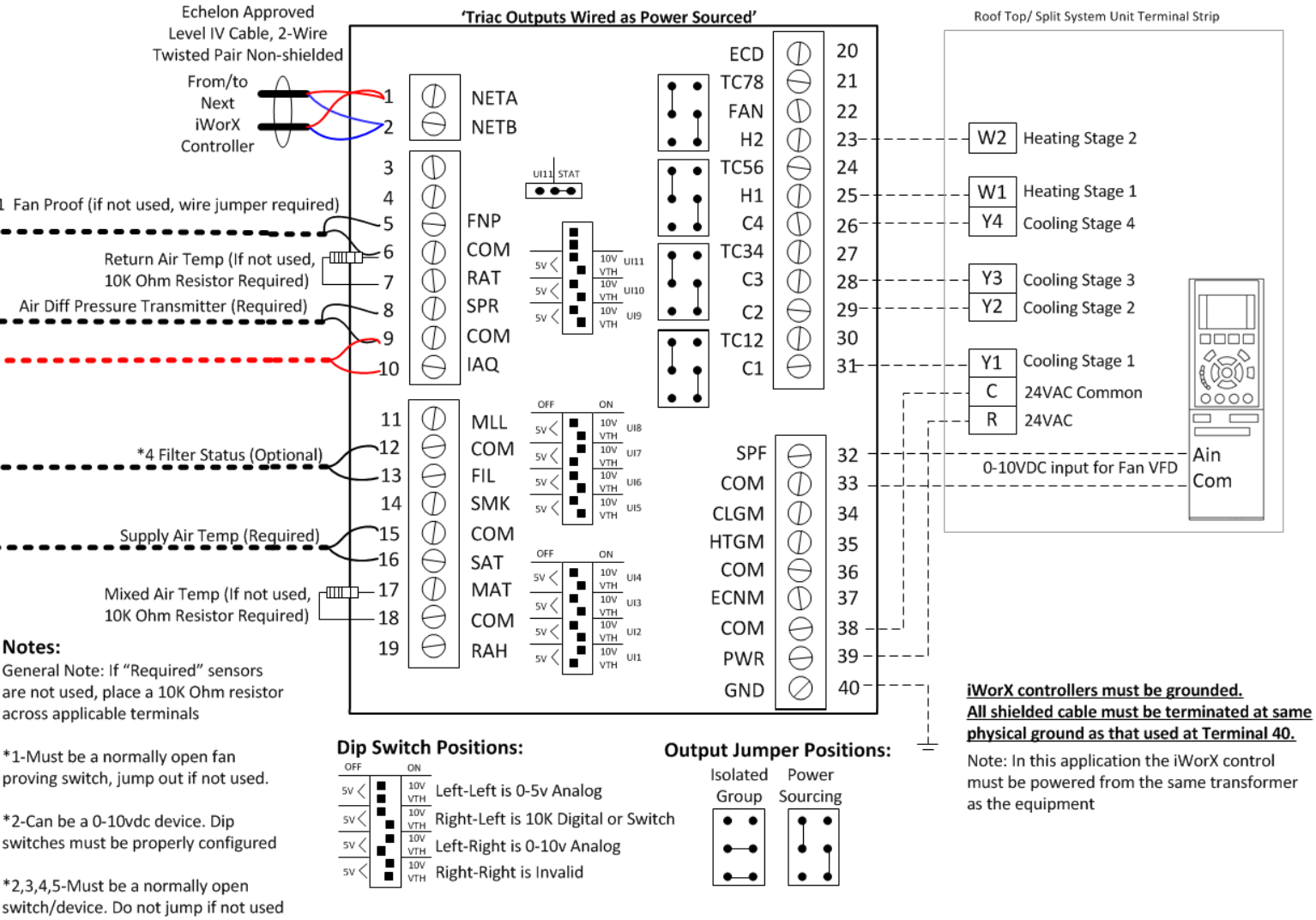
Wire Jumper

Adding Demand Controlled Ventilation (CO2)

Added Sensors Required – Duct Mount (Taco Part #ACC-DS-CO2)

Existing Sensors Required – Supply Air Temp, Fan Proof, Filter Status, Air Differential Pressure Transmitter

Can be integrated with up to 56 Taco VAV Controllers on Taco LON Bus



Notes:

General Note: If "Required" sensors are not used, place a 10K Ohm resistor across applicable terminals

*1-Must be a normally open fan proving switch, jump out if not used.

*2-Can be a 0-10vdc device. Dip switches must be properly configured

*2,3,4,5-Must be a normally open switch/device. Do not jump if not used

Dip Switch Positions:

Left-Left is 0-5v Analog
Right-Left is 10K Digital or Switch
Left-Right is 0-10v Analog
Right-Right is Invalid

Output Jumper Positions:

iWorX controllers must be grounded.
All shielded cable must be terminated at same physical ground as that used at Terminal 40.

Note: In this application the iWorX control must be powered from the same transformer as the equipment

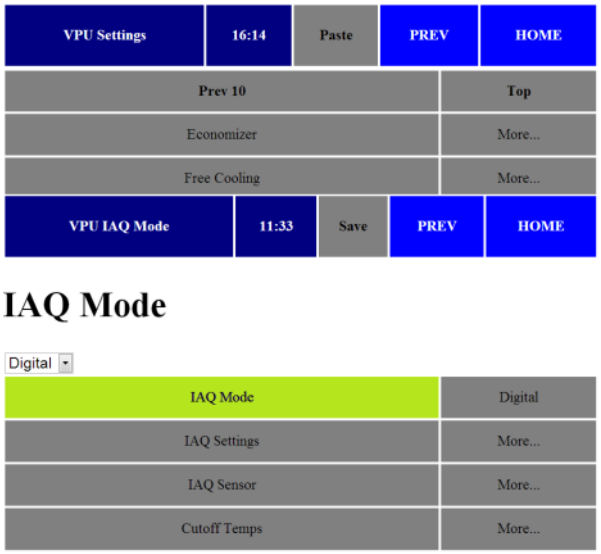
ADDING DEMAND CONTROLLED VENTILATION (CO2)

Controlled: 0-10VDC Modulated or 2-pos Economizer Damper Actuator based on space or return duct CO2

Added Sensors Required: Duct Mount (Taco Part #ACC-DS-CO2) or Wall Mount (Taco Part #ACC-RS-CO2) CO2 Sensor

Existing Sensors Required: Return Air Temp, Supply Air Temp, Fan Proof, Filter Status

1. Press **Controllers** from main screen.
2. Select required VPU from controller list and press appropriate controller.
3. Press **All Settings**.
4. Press **Next 10**.
5. Press **IAQ Mode**.



6. The *IAQ Mode* menu opens.
7. Select IAQ sensor input mode:
   - Digital = Open/close switch sensor
   - Analog = 0-10VDC Sensor (shown)
8. Press **Save**.

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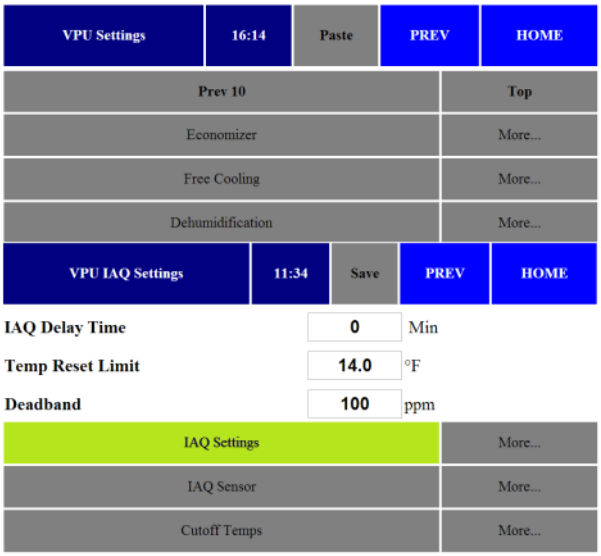
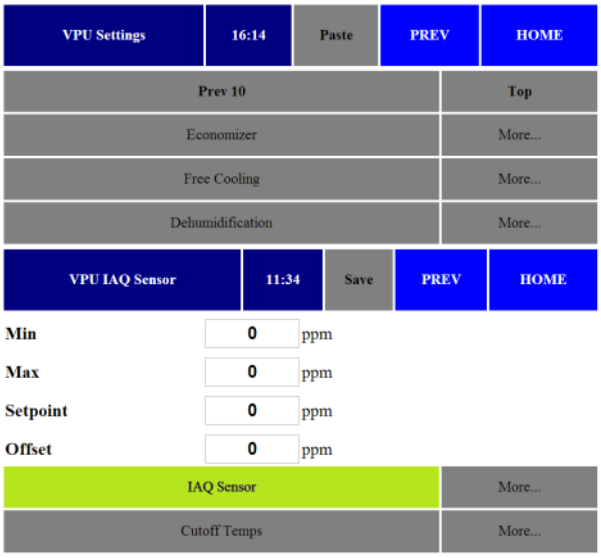
9. Press **IAQ Settings**.



10. The *IAQ Settings* menu opens.
    a. Select **IAQ Delay Time** before response to IAQ demand.
    b. Select **Temp Reset Limit** to allow +- deviation from space temperature setpoint in order to satisfy IAQ demand.
    c. Set Deadband in PPM.
    d. Press **Save**.
11. Press **IAQ Sensor**.



12. The *IAQ Sensor* menu opens.
    a. Select **Min** PPM.
    b. Select **Max** PPM.
    c. Select **Setpoint** PPM.
    d. Select **Offset** (calibration) PPM.
    e. Press **Save**.

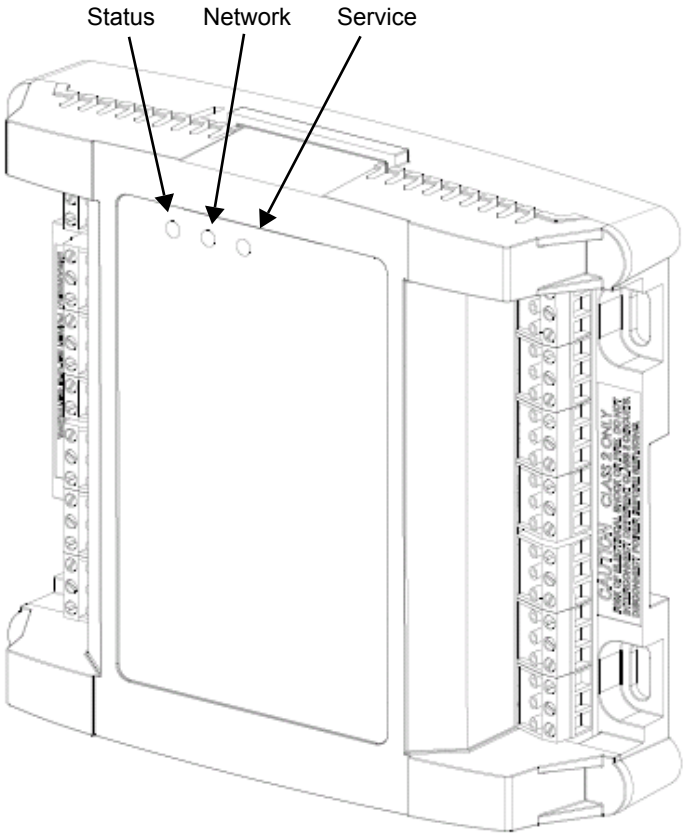
TROUBLESHOOTING

Diagnostic LEDs

The controller has 3 LED indicators. These indicators can aid in troubleshooting equipment operation problems. The following table lists the functions of the controller's LEDs in the order they appear from left to right on the unit.

LED	Indication
Status	– Solid green when running and configured by an LCI (networking) – Flashing green when running and NOT configured by an LCI (stand-alone) – Solid red when a fault condition exists (control shut down) – Blinking Red - the controller has a device failure – Solid Amber - The controller has not received a LCI ping message in over 10 minutes and is part of a network.
Network	– Yellow while the controller is transmitting data onto the FTT-10A network – Green when there is network activity – Off when there is no network activity
Service	– Illuminated when the service pin is depressed or when a controller gets configured by the LCI.

Figure 2: VPU2 Controller LEDs



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Troubleshooting Tips

The table below provides solution to some common problems you may encounter.

Problem	Solution
Controller is not running and Status LED is not illuminated.	No power to controller. Verify the voltage on the controller's power connector (24 VAC).
How do I reset the controller?	The controller can be reset by the LCI, or you can cycle power to the controller. Refer to the LCI documentation for more information on resetting the controller using the LCI.
Can my iWorx® system contain multiple VPU2 controllers?	Yes, provided that you do not exceed the maximum number of controllers that can be handled by the Local Control Interface (LCI).
Thermistor readings fluctuate rapidly, sometimes by several degrees.	The controller is not properly grounded. The controller's ground (GND) pin (T40) must be connected to earth ground. Also ensure that the controller's digital inputs are dry contacts and that no voltage is being applied or switched to the inputs.
How do I associate my VAVI controllers with the VPU2?	Use the VPU2's grouping mechanism, specifically **`Zone Members`** on the *HVAC Setup* screen of the LCI.

Getting Help

Components within an iWorx® VPU2 controller cannot be field repaired. If there is a problem with a controller, follow the steps below before contacting your local TES representative or TES technical service.

1. Make sure controllers are connected and communicating to desired devices.
2. Record precise hardware setup indicating the following:

   Version numbers of applications software.

   Controller firmware version number.

   A complete description of difficulties encountered.

REPRESENTATIONS AND WARRANTIES

This Document is subject to change from time to time at the sole discretion of Taco Electronic Solutions, Inc. All updates to the Document are available at www.taco-hvac.com. When installing this product, it is the reader's responsibility to ensure that the latest version of the Document is being used.

iWorx® products shall only be used for the applications identified in the product specifications and for no other purposes. For example, iWorx® products are not intended for use to support fire suppression systems, life support systems, critical care applications, commercial aviation, nuclear facilities or any other applications where product failure could lead to injury to person, loss of life, or catastrophic property damage and should not be used for such purposes.

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APPLICABLE DOCUMENTATION

See the table below for additional documentation that may be applicable to this controller.

Description	Audience	Purpose
iWorx® VPU2 Application Guide, Document No. 505-010	– Application Engineers – Installers – Service Personnel – Start-up Technicians – End user	Provides instructions for setting up and using the iWorx® VPU2 controller.
iWorx® LCI Application Guide, Document No. 505-002 *iWorx® LCI3 Application Guide*, Document No. 505-050	– Application Engineers – Installers – Service Personnel – Start-up Technicians – End user	Provides instructions for setting up and using the iWorx® Local Control Interface.
iWorx® VAV Series Application Guide, Document No. 505-011	– Application Engineers – Installers – Service Personnel – Start-up Technicians – End user	Provides instructions for setting up and using the iWorx® VAV Series controller.
http://www.iWorxWizard.com	– Application Engineers – Wholesalers – Contractors	An on-line configuration and submittal package generator based on user input. Automatically generates bill of materials, sequence of operations, flow diagrams, wiring diagrams, points and specifications.
Additional Documentation	*LonWorks FTT-10A Free Topology Transceiver User's Guide,* published by Echelon Corporation. It provides specifications and user instructions for the FTT-10A Free Topology Transceiver. See also: www.echelon.com/support/documentation/manuals/transceivers.	

Notes:

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LIMITED WARRANTY STATEMENT

Taco Electronic Solutions, Inc. (TES) will repair or replace without charge (at the company's option) any product or part which is proven defective under normal use within one (1) year from the date of start-up or one (1) year and six (6) months from date of shipment (whichever occurs first).

In order to obtain service under this warranty, it is the responsibility of the purchaser to promptly notify the local TES stocking distributor or TES in writing and promptly deliver the subject product or part, delivery prepaid, to the stocking distributor. For assistance on warranty returns, the purchaser may either contact the local TES stocking distributor or TES. If the subject product or part contains no defect as covered in this warranty, the purchaser will be billed for parts and labor charges in effect at time of factory examination and repair.

Any TES product or part not installed or operated in conformity with TES instructions or which has been subject to accident, disaster, neglect, misuse, misapplication, inadequate operating environment, repair, attempted repair, modification or alteration, or other abuse, will not be covered by this warranty.

TES products are not intended for use to support fire suppression systems, life support systems, critical care applications, commercial aviation, nuclear facilities or any other applications where product failure could lead to injury to person, loss of life, or catastrophic property damage and should not be sold for such purposes.

If in doubt as to whether a particular product is suitable for use with a TES product or part, or for any application restrictions, consult the applicable TES instruction sheets or in the U.S. contact TES at 401-942-8000 and in Canada contact Taco (Canada) Limited at 905-564-9422.

TES reserves the right to provide replacement products and parts which are substantially similar in design and functionally equivalent to the defective product or part. TES reserves the right to make changes in details of design, construction, or arrangement of materials of its products without notification.

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Taco Electronic Solutions, Inc., 1160 Cranston Street, Cranston, RI 02920
Telephone: (401) 942-8000 FAX: (401) 942-2360.

Taco (Canada), Ltd., 8450 Lawson Road, Unit #3, Milton, Ontario L9T 0J8.
Telephone: 905/564-9422. FAX: 905/564-9436.

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