

ULTRA-ZONE[®] Forced Air Zone Controls

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The One of a Kind UT3000 Zone Control System provides intelligent control of a communicating HVAC system or 24volt legacy HVAC system at a maximum of five zones using 24volt motorized dampers and any off-the-shelf 24volt thermostat or compatible communicating thermostat. The UT3000 is 100% plug and play when connected to a communicating HVAC system and network thermostats. The UT3000 includes features such as Proportional Operation, Automatic Equipment Recognition, Dual Fuel Functions and Precise Control of Supply Air Target & Limit set-points. EWC[®] Controls raises the bar again and sets another new standard for Residential and Light Commercial HVAC Air Zoning.

Zone Capacity

Controls 2 or 3 air zones with 24vac Power Open/Close or Spring Assisted motorized dampers. *Can be expanded to 5 zones by twinning 2 UT3000's together.*

Compatible HVAC Systems

Control any Communicating HVAC system based on the ClimateTalk™ Open Protocol. *Or any 24volt 2 Heat / 1 Cool Gas/Electric system or 2 Heat / 1 Cool Conventional or Dual Fuel Heat Pump.*

Compatible Thermostats

The UT3000 is compatible with any Communicating Thermostat that operates on the ClimateTalk™ Open Protocol. Also compatible with any off-the shelf single stage 24volt Heat/Cool Thermostat or 2 Heat/1Cool Heat Pump Thermostat.

Automatic Heat / Cool Changeover

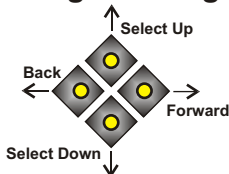
The UT3000 panel features automatic changeover from any thermostat allowing for individual zone comfort from the zoned HVAC system.

Status LCD

OUTSIDE TMP 32

The Liquid Crystal Display rotates to show each zone thermostat demand input and the HVAC system demand output. The outside & supply air temperatures are also displayed. In addition, all UT3000 programming is performed at the LCD.

4 Button LCD Programming



Four buttons are provided just below the LCD screen. The buttons are used to scroll thru the Menu on the LCD and make your selections. Program the UT3000 and select the features you like. Non-volatile memory maintains your settings even after a long power failure.

System LED's

In addition to the LCD, a total of 5 colored LED's provide indication of the HVAC system status and mode of operation.

Damper LED's

A total of 3 green LED's labeled Zone 1 thru Zone 3, are also provided to indicate which dampers are energized to Open.

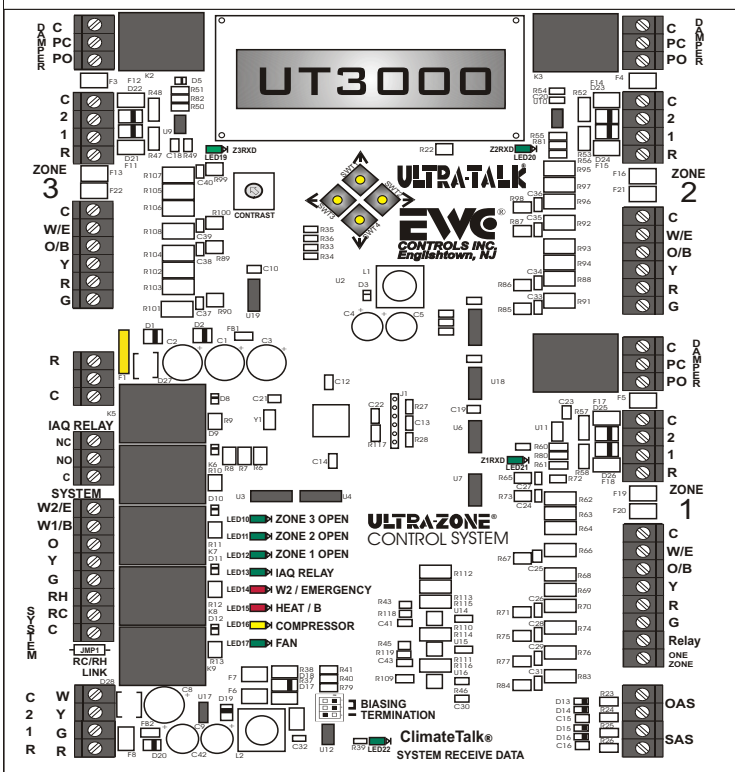


Figure 1. UT3000 panel

Communicating LED's

A total of 4 green Pulsing LED's are provided to indicate a Comm Link has been established with each Communicating T-stat and/or the Communicating HVAC system. A series of Rapid & Random Pulses indicate a successful link and data transmission. Otherwise, the Comm LED's will blink On & Off very slowly for non-communicating devices.

Fault Free Programming & Intuitive Temperature Control

The UT3000 comes pre-loaded with Default Operating Parameters (See Table 1) for Zoned HVAC Systems. The Default Program Settings free the Technician from Programming but also allows Fine Tuning of the System to Optimize Performance and Personal Preference. The UT3000 operates in Proportional Mode at all times. Multi-Stage and Modulating Equipment will be operated in a manner that Minimizes Blower Speed, Maximizes Temperature Control & Improves System Efficiency.

Ancillary IAQ Dry Relay Provided

The UT3000 includes a SPDT Indoor Air Quality Relay with an Input Trigger that can be used to Connect, Interlock and Control Ancillary devices:

- Fresh Air Damper * Whole House Humidifier*
- Heat Recovery Ventilator * Energy Recovery Ventilator*
- Whole House De-humidifier * Combustion Air Damper*

The UT3000 will start the Indoor Fan when the IAQ Relay Input is energized. Connected Zone Dampers operate normally and are not affected by the relay's function.

INSTALLATION INSTRUCTIONS

MOUNT:

Choose a suitable location to mount the UT3000 housing. Likely locations are the Return Duct, a Nearby Wall or Convenient Studs where plywood can be installed to support the housing. Avoid mounting the UT3000 on the Supply duct. Do not mount the UT3000 directly to any Air-Handler, Furnace, Hot Water Coil or Evaporator Cabinet to avoid damage to these devices. Follow National and/or Local Mechanical Code.

POWER:

EWC always recommends to install a separate transformer to power the UT3000. Follow NEC and/or Local Electrical Code.

WIRE:

Connect your thermostats and your dampers. Use the knock-outs provided on the housing as the wire entry-way. Strip the jacket back to where the cable enters the housing. That makes for less bulk and allows easy routing of the wires for a clean install.

4 Wire Communicating Network:

Adhere to the Climate Talk™ Color Code. RED, GREEN, YELLOW, WHITE. Doing so reduces the possibility of mis-wiring between devices on the Network.

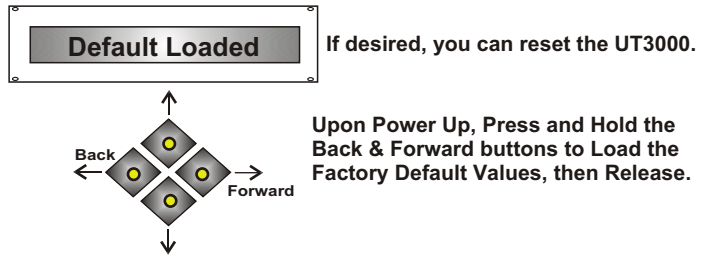
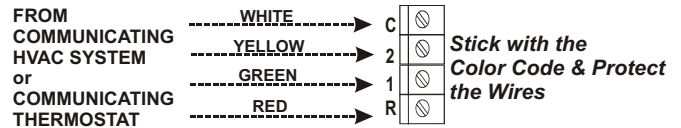
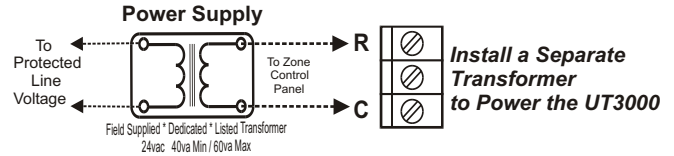
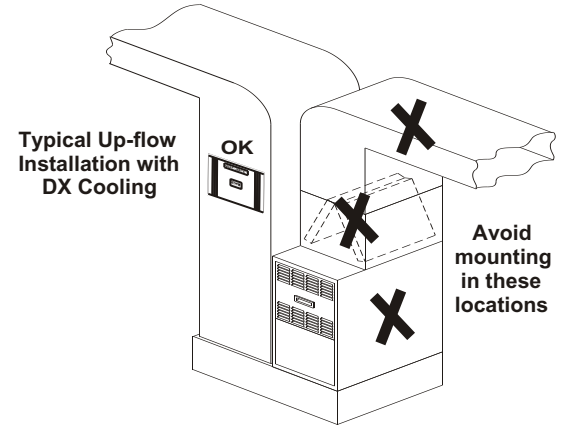
PROGRAM:

When connected to a Fully Communicating HVAC system, programming is not required. The UT3000 will automatically configure the entire system and start running as soon as thermostat demands are detected. Allow at least 1-2 minutes for all Thermostats and the HVAC system to fully configure on the network. The Default Supply air temperature Targets and off-set Limits will be used. Other unique features can be selected and/or you can adjust the default settings to the values you prefer in order to achieve the desired staging and system operation.

When connected to a Conventional 24v HVAC system, you simply scroll thru the LCD menu and select the type of HVAC system you have and the type of thermostats you want to use. The Default Supply air temperature Targets and off-set Limits will be used, or you can adjust your own settings.

FINISH:

When the Installation is complete, run the system thru it's paces and observe the operation of the HVAC system in all possible modes of operation. Check the Zone Dampers and the Bypass Damper for proper operation. Balance the System and Adjust the Feature Range Values as necessary.



UT3000 Version 1.17 SPECIFICATIONS and MENU ITEMS:

NUMBER OF ZONES: 2 or 3 Zones per control panel. Expandable to 5 zones.

COMPATIBLE EQUIPMENT:

Climate Talk™ based Communicating HVAC systems - Up to 4 Stage Heating (including Modulating Gas Heat) and 2 Stage Cooling
24vac Gas/Electric/Hydro - Up to 2 Stage Heating and 1Stage Cooling
24vac Heat Pump Conventional or Dual Fuel - Up to 2 Stage Heating and 1 Stage Cooling

COMPATIBLE THERMOSTATS:

Any Climate Talk™ based Communicating HVAC Thermostat
 Any 24vac single stage Heat/Cool Thermostat
 Any 24vac 2 Stage Heat, 1 Stage cool Heat Pump Thermostat

COMPATIBLE DAMPERS:

EWC® Ultra-Zone® Models URD, ND, RSD and SID, Or
 Any Competitor's 24vac 3 Wire or 2 Wire damper

MAX. DAMPERS PER ZONE:

Up to 18 ND, URD, or SID Dampers Per Zone @ 26mA per damper. **Total 54**
 Only 1 Spring Type Damper Per Zone @ 400mA per damper. **Total 3**

OVER-CURRENT PROTECTION:

2.5Amp main circuit board protection
 500mA on each Damper Motor Terminal Block
 140mA on each Communicating Thermostat and HVAC System Terminal Block
 140mA on each Regular 24v Thermostat Terminal Block

UT3000 MAXIMUM CURRENT DRAW = .5 Amp

POWER REQUIREMENT = 24vac 40Va 50/60 Hz

AMBIENT OPERATING CONDITIONS:

TEMPERATURE: -4° to 158°F (-20° to 70°C)
 HUMIDITY: 0% - 95% Rh Non-Condensing

ANCILLARY IAQ DRY RELAY FUNCTIONS:

Operate a Humidifier or De-Humidifier
 Control a Fresh Air or Combustion Air Damper
 Operate & Interlock an ERV or HRV

ACCESSORIES:

Model SAS - Supply Air Sensor (Included)
 Model OAS - Outdoor Air Sensor (Optional) Communicating systems provide OAS value
 Model CPLS - Coil Protection Lockout Switch (Optional/Recommended)

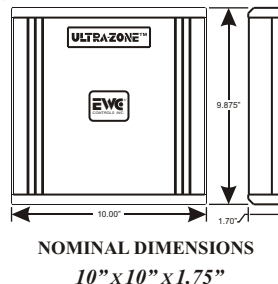
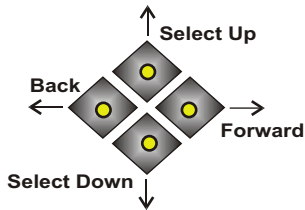


TABLE 1

FEATURE	DEFAULT	RANGE TO SELECT
System Type	Heat/Cool	Heat Pump or Heat/Cool
HP Type	NON Dual Fuel	Dual Fuel or Non-Dual Fuel
T-Stat Type	Heat/Cool	Heat Pump or Heat/Cool
Rev Valve	RV 'O'	'O' Type RV or 'B' Type RV
Fan Mode	Gas	GAS or HYDRO (Electric)
OAS SP	20° F	OFF or 7° to 42° F
O.T. Offset	15° F	5° to 20° F
U.T. Offset	8° F	5° to 10° F
SAS HP TGT	100° F	90° to 120° F
SAS Gas TGT	130° F	120° to 170° F
SAS Cool TGT	50° F	42° to 60° F
SAS RSP DLY	30s	10seconds - 180seconds
W2 Threshold	80%	65% - 100% (Adj. in 5 point increments)
PURGE FAN	25%	25% - 100% (Adj. in 25 point increments)
Legacy DMD	50%	25%, 50%, 75% or 100%
Total Zones	3	2 or 3 zones per panel
Limit SAS PID	N	Yes or No
DMP DFLT	Open	Open or Close

LCD Screen Programming



4 Button LCD Programming

Use the *Forward* & *Back* buttons to navigate thru the Menu Features. Use the *Up* & *Down* buttons to change or adjust the options available in that feature. **Place a check mark next to each selection or write the value in the box for future reference!**

Remember if you are installing a Communicating HVAC system, the programming is done for you. **There is no need to perform these Programming steps.** You can still program certain detail functions ie. (24v T-stat Type). Select only the functions you want or need. Your program changes take effect in real time and the UT3000 will remember your settings even after a power failure. When the power is restored, the UT3000 will re-configure the network automatically.

Step 1

Heat Pump System

OR

Heat Cool System

Select either **Heat Pump** or regular **Heat/Cool** system. If you have a Heat Pump and a Gas/Oil Furnace, you should still select Heat Pump.

Step 2

Dual Fuel System

OR

Non- Dual Fuel

If you selected a Heat Pump system in Step 1, select whether your Heat Pump has a **Furnace** back-up system **or Electric Heat** back-up. You can still operate most any Heat Pump in a restricted mode by using an Outdoor Sensor.

Step 3

Heat Pump 'Stats

OR

Heat / Cool 'Stats

Select the type of 24v (Non-Communicating) Thermostat you want to use. You may have a Communicating thermostat in Zone 1 and Regular 24v thermostats in the other zones. **So you must select which type are in the other zones. You cannot mix 24v HP and HC type T-stats. All 24v T-stats must be Wired and/or Programmed for HC or HP Mode of Operation and the correct Reversing Valve Operation. Conflicting Zone Demands due to mis-wiring or incorrect programming will not be honored!**

Step 4

HP Stat Type 'B'

OR

HP Stat Type 'O'

IMPORTANT
This selection is important when using HP T-stats. You must Wire and/or Program your HP T-stats to match this selection!

If you selected a Heat Pump system in Step 1 and Heat Pump Thermostats in Step 3, then select the type of Reversing Valve Operation.

Step 5

Fan Mode Hydro

OR

Fan Mode Gas

Select how you want the Indoor Fan to operate during Heating Operations. Select HYDRO if you have an Air-Handler with Hot Water Coil or an Electric Furnace. Select GAS if your system is a Gas/Oil Furnace with A/C. If you selected a Heat Pump system in Step 1, the Fan Mode is set for you, in which case you'll see the screen Fan Mode N/A.

Fan Mode N/A

Step 6

OAS SP 20°

If you are using the Outside Air Sensor to Lock-Out the Heat Pump, select that **Set-Point** Temperature right here. If you do not want to use an OAS Sensor to lock-out the heat Pump, adjust the OAS SP (Set-Point) value down to the OFF position and the UT3000 will display the screens to the right.

OAS SP OFF

OAS Sensor N/A

Step 7

O.T. Offset: 15°

AND

U.T. Offset: 8°

Examples:
SAS HP Target = 100°F
O.T. Offset + 15°F
HP Heat Limit = 115°F

SAS Cool Target = 50°F
U.T. Offset - 8°F
Cooling Limit = 42°F

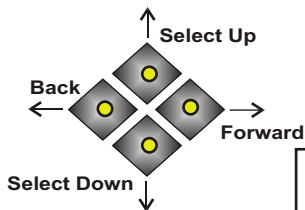
SAS Gas Target = 125°F
O.T. Offset + 15°F
Gas Heat Limit = 140°F

If the Supply Air Temperature exceeds any Target Set-Point, (Plus or Minus the Off-Set), the resulting value becomes the **Over Temperature Condition**. Choose an **Off-Set** value that will provide a safe operating limit for your HVAC equipment. The UT3000 will cycle the system off-line for 3 minutes, allowing the discharge air temperature to moderate while displaying the Over or Under Temp Condition (OTC or UTC) screen, depending on the mode of operation.

Supply OTC* 141

Supply UTC* 41

LCD Screen Programming



4 Button LCD Programming

Use the *Forward & Back* buttons to navigate thru the Menu Features. Use the *Up & Down* buttons to change or adjust the options available in that feature. **Place a check mark next to each selection or write the value in the box for future reference!**

The UT3000 staging process is very unique. The difference between the Target Set-point and the Actual Supply Air temperature along with the SAS Response Delay determines how fast or slow the UT3000 will stage the HVAC system. Via the System (**SYS**) Output screen, (see the next page) the UT3000 will increase or decrease the System Output value so it can match the Target set-point. When the target is matched, the UT3000 will stop staging.

Step 8

SAS HP TGT 100°

Select the **HP** Heating Supply Air Temperature Target that the UT3000 will demand from the HVAC system. The UT3000 will automatically stage the HVAC system Up or Down to maintain this value.

Step 9

SAS GAS TGT 130°

Select the **GAS** Heating Supply Air Temperature Target that the UT3000 will demand from the HVAC system. The UT3000 will automatically stage the HVAC system Up or Down to maintain this value.

Step 10

SAS COOL TGT 50°

Select the **COOLING** Supply Air Temperature Target that the UT3000 will demand from the HVAC system. The UT3000 will automatically stage the HVAC system Up or Down to maintain this value.

Step 11

SAS RSP DLY 30s

Select how often the UT3000 will force an increase or decrease to (Ramp up or Ramp Down) the SYSTEM (**SYS**) Heat or Cool Demand Output. **The UT3000's PI Control constantly monitors and wants to match the supply air temperature in the duct, to the active operational target set-point. The UT3000 achieves this by increasing or decreasing the SYSTEM (SYS) demand output, trying to match the Supply Air Temperature delivered from the HVAC system, to the active Cool Target, Gas Target or HP Target Set-Point. The SAS Response Delay allows the user to control how fast this function is allowed to occur.** The Default value to Ramp Up or Down is once every 30 seconds. **HEAT MODE:** If the Heating Supply Air is below the Heat Target, the UT3000 will increase the **SYS** Heat Output by 1% every 30 seconds. If the Heating Supply Air is above the Heat Target, it will decrease the **SYS** Heat Output by 3% every 30 seconds. **Continued on the next column**

COOL MODE: If the Cooling Supply Air Temperature is above the Cooling Target, the UT3000 will increase the **SYS** Cool Output by 1% every 30 seconds. If the Cooling Supply Air Temperature is below the Cooling Target, the UT3000 will decrease the **SYS** Cool Output by 3% every 30 seconds.

The PI Control functions in response to the Supply Air Sensor actual temperature value, as compared to the Target Set-point including a 1°F differential. Select a lower value (10 - 20 seconds) to Stage Faster. Select a higher value (60 - 90 seconds) to Stage Slower.

Step 12

W2 Threshold 80%

Select the value at which the Auxiliary (W2) or Back-up system energizes. The Range is 65% - 100% and the default value is 85% of System (**SYS**) Output. Setting the value low means the Auxiliary system will operate more often. Setting a high value means the Auxiliary system operates less often. There is a 5% differential added to the value selected which prevents short cycling. **Setting the W2 threshold to 100% effectively turns it OFF.** The reason for this is the differential. So, a value of 90% actually trips at 95%. **Thus a value of 100% would require the System Output to reach 105% which is impossible. Use the 100% value if you want the Auxiliary system to Energize on the Outside Air Set-point only.** If desired, you can use the Outside Air Set-point **and** set the W2 Threshold to 95%. That would require the System (**SYS**) Output Percentage to reach 100% demand **or** the Outside Air temperature has to drop low enough, to warrant energizing the Auxiliary system.

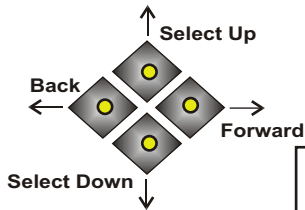
Step 13

Purge - Fan 25%

Select how fast you want the Indoor Fan to run at the end of a cycle to Purge the last of the hot or cool air into the last zone calling. You may select 25%, 50%, 75% or 100%. The default value is 25%. **Note 1:** Fan Only operations using 24v T-stats on all zones will operate at the Fan Purge Setting. **Note 2:** Fan Only operations using 24v T-stats on zone 2&3 with a Communicating T-stat in zone 1 will operate at whatever speed is selected on the Zone 1 T-stat. Simply operate the communicating Zone 1 T-stat in Fan Only mode for a minimum of 20 minutes.

Important Note: Review all of these Programming Features carefully and call EWC Controls if you have any questions. With years of experience Zoning HVAC systems, we have plugged in the default values that should work fine for the majority of the jobs you will encounter. If desired, you can still adjust the settings to your own preference. When doing so, wait patiently and observe the effect of those changes before changing them again. The UT3000's SYS output (PI Control) to the HVAC equipment will vary and change depending on numerous factors such as: Internal Load, Outdoor/External Load, SAS Response Delay Setting, Supply Air Target set-points, Thermostat Type and Thermostat Set-points.

LCD Screen Programming



4 Button LCD Programming

Use the *Forward & Back* buttons to navigate thru the Menu Features. Use the *Up & Down* buttons to change or adjust the options available in that feature. **Place a check mark next to each selection or write the value in the box for future reference!**

The UT3000 staging process is very unique. The difference between the Target Set-point and the Actual Supply Air temperature along with the SAS Response Delay determines how fast or slow the UT3000 will stage the HVAC system. Via the System (**SYS**) Output screen, (see the next page) the UT3000 will increase or decrease the System Output value so it can match the Target set-point. When the target is matched, the UT3000 will stop staging.

Step 14

LEGACY DMD 50%

Select the Weight value that will be applied to all 24v Non-Communicating Zone Thermostats. You may select 100%, 75%, 50% or 25%. The factory default value is 50%.

Step 15

Total ZONES = 3

Select the total number of zones you have connected to each UT3000. You may select two zones or three zones. The factory default value is 3 zones. Changing this value changes the quotient divider (2 or 3) which is used to determine the System Demand Starting Value, for all Heating, Cooling, Fan Operations. (**SYS h000, c000, f000**) Set this value to match the total number of zones you have connected to the UT3000. Depending on the type of thermostats you have connected to each zone and the number of zones created, it can be advantageous to set this value to 3 zones when you actually have 2 zones.

Step 16

LIMIT SAS PID N

Select N for NO if you want the UT3000 to Stage the HVAC system Up & Down, in an effort to achieve the programmed Supply Air Temperature Targets for HP heat, Gas heat or Cool operations. *This is the Default/Normal mode of system operation.* Select Y for YES if you want the UT3000 to ignore the Supply Air Temperature Targets and the SAS Response Delay. **Simply stated, the UT3000 will not increase or decrease the System (SYS) demand values in an effort to match the programmed Supply Air Targets!** The System (SYS) demand value will be based purely on the sum of the Demand Weight of each calling zone.

In addition, the Legacy (DMD) Demand setting (25%, 50%, 75%, 100%) and the Total Number of Zones setting of (2 or 3), will obviously affect the System (SYS) values.

Continued on next column

LIMIT SAS PID Y

DO NOT ENABLE this feature when using CTK03 Communicating Thermostats!

This feature may benefit those who want to save energy and limit HVAC system capacity based purely on the number of zones calling and the sum of the demand weight from each calling zone. There is also an advantage for those who want to improve de-humidification when a single zone calls or limit the HVAC system to 1st stage operation, when a single zone calls.

EXAMPLE 1:

LEGACY DMD 100%

Total ZONES = 3

Zone 1 - Calling for cool @ 100%
 Zone 2 - Idle @ 000%
 Zone 3 - Idle @ 000% = 100% Total Zone Demand
 100% divided by 3 zones = 33% Total System Demand

The UT3000 will start the HVAC system @ 33% (Y1 Cool) and will not increase

SYS h000c033f033

from that value unless another zone calls along with Zone 1. 2 zones calling would then calculate @ 200% / 3 = 67% (Y2 Cool).

EXAMPLE 2:

LEGACY DMD 75%

Total ZONES = 2

Zone 1 - Calling for heat @ 075%
 Zone 2 - Calling for heat @ 075% = 150% Total Zone Demand
 150% divided by 2 zones = 75% Total System Demand

The UT3000 will start the HVAC system @ 75% (Hi Heat) and will not increase

SYS h075c000f000

from that value. The System Demand would not decrease either unless Zone 1 or Zone 2 satisfies. A single zone calling would then calculate @ 75% / 2 = 38% (Lo Heat).

DMP DFLT OPEN

Step 17

Change the default position of the zone dampers when the HVAC system is idle. The factory default is to OPEN all dampers when idle. Select CLOSE if desired. Just make sure the HVAC system's purge cycle is set no longer than 90 seconds. Use this feature on Panel "B" when twinning.

Ultra Talk V 1.17

Finish

The final program screen displays the code version of the UT3000. No further action is required. Leave the buttons alone for 10 seconds and the UT3000 will resume scrolling the LCD screen. The programming is now complete. The UT3000 will store all settings into permanent memory.

LCD Screen Scrolling Displays

Once the programming is complete and the System is functioning, the LCD screen will scroll and display the following data screens continuously. The HVAC system mode of operation is displayed including Supply Air and Outdoor Air temperature, Auxiliary/Emergency mode and Ancillary Functions. The UT3000 LCD will continuously Scroll data as to which Zones are actively calling for a Heating, Cooling or Fan Operation. By watching the LCD display you can observe all system functions as they occur. If desired, you can lock the LCD on a single screen by pushing the Program Up button one time. Then select the screen you want to watch using the Up or Down button. The LCD will stay locked on that screen for 10 minutes then resume scrolling, or you can unlock the screen by pushing the Forward button once. Below are LCD data screen examples:



Communicating Thermostats are capable of providing a proportional heat or cool demand signal.

Zone 1 is calling for Heat @30%. This indicates the presence of a Communicating Thermostat in Zone 1 whose demands are given a weighted value due to it's proportional capability. (0% - 30% - 60% - 85% - 100% - etc.)



24v HP Thermostats cannot provide a proportional heat or cool demand signal. ie: Heat demand = 50% - 100% (Y with Aux) Cool demand = 100% (Y alone)

Zone 2 is calling for Heat @50% including Fan. The Fan Only demand is pro-rated. This indicates the presence of a Regular 24v HP T-stat in Zone 2 whose demands are given menu selectable values only. (0% - 12% - 25%) or (0% - 25% - 50%) or (0% - 37% - 75%) or (0% - 50% - 100%)



24v HC Thermostats cannot provide a proportional heat or cool demand signal. Heat demand = 100% (W) Cool demand = 100% (Y)

Zone 3 is calling for Cooling @100%. This indicates the presence of a Regular 24v H/C Thermostat in Zone 3, whose demands are given menu selectable values only. (0%, 25%, 50%, 75% or 100%)

IMPORTANT NOTE: You cannot mix 24V HP Thermostats with 24V Heat/Cool Thermostats. The LCD screens shown above are examples only. A Typical installation may have a Communicating T-stat in Zone 1 and the rest may be 24v Heat Pump type.

Acceptable UT3000 Thermostat Combinations:

Zone 1 = Communicating
Zone 2 = Communicating
Zone 3 = Communicating

Zone 1 = Communicating **NOTE: The Comm T-stat could be in any Zone!**
Zone 2 = 24v H/C But to make 24v fan operations behave like the Communicating T-stat, keep the Comm T-stat in Zone 1.
Zone 3 = 24v H/C

Zone 1 = Communicating **NOTE: The Comm T-stat could be in any Zone!**
Zone 2 = 24v HP But to make 24v fan operations behave like the Communicating T-stat, keep the Comm T-stat in Zone 1.
Zone 3 = 24v HP

Zone 1 = 24v H/C
Zone 2 = 24v H/C
Zone 3 = 24v H/C

Zone 1 = 24v HP
Zone 2 = 24v HP
Zone 3 = 24v HP

Refer to Page 9 for Sample Thermostat Diagrams

SYS h035c000f035

This screen displays the SYSTEM (SYS) Output percentage to the HVAC Equipment. In this Heat Pump Example, the UT3000 is demanding 35% heating capacity and 35% fan capacity. That means 1st stage heat (Y1) is active. If the HP Target set-point (100F) is not satisfied before reaching 51% SYS Output, Y2 will energize. If the HP target set-point is still not satisfied before reaching the W2 threshold value, W2 will energize.

01% - 50% Output = Y1HP or Y1A/C or W1Gas

51% - 65% Output = Y2HP or Y2A/C

W2 Threshold 65% - 99% = W2HP or W2Gas

Note: The UT3000 may interpret a Zone Thermostat input as 100% demand but it will not Output a 100% System Demand. The UT3000 will demand only as much System Capacity as is necessary, to satisfy the Active Supply Air Target Set-Point. Upon the start of any heat or cool operation, any single calling zone is considered to be a maximum 33% demand out of a possible 99% demand, if all zones were calling.

SYS Aux100 Em100

SYS Hum000 Dh015

This screen displays the System Percentage demand from the Auxiliary and/or the Emergency system. The **Aux** will display a value during Auxiliary mode. Both screens will display values during Emergency mode. The next screen displays the System Percentage demand to Humidify or De-humidify. Humidify or IAQ demands may come from a Communicating thermostat or 24v Control. The UT3000 honors De-Humidify demands from Communicating thermostats with Communicating HVAC systems only.

Supply TMP 127

! SAS Sensor Bad !

This screen shows the supply air temperature at the location of the supply air sensor in real time. The UT3000 monitors and compares the Actual Supply Air Temperature to the HP Target, Cooling Target or Gas Target Set-points. The UT3000 will increase (by 1% increments) or decrease (by 3% increments) the SYS Demand Output in order to increase or decrease HVAC system capacity. If the Supply Air Sensor is disconnected or fails, the UT3000 will display the "Bad Sensor" screen and will default to "Timed Mode" staging until the Zone T-stat demands are satisfied. If the UT3000 observes the supply air temperature exceed any Target set-point plus or minus the OT or UT off-set, the UT3000 will

display one of these screens.

Supply OTC* 147

Supply UTC* 38

Outside TMP 32

! OAS Sensor Bad !

This screen shows the real time outside air temperature at the location of the outside air sensor. This OA value could be from the Communicating HVAC system or from a Sensor connected to the UT3000. If the OAS sensor fails or is disconnected, the UT3000 will display the "Bad Sensor" screen and will default to emergency mode. If you do not want to use an OAS Sensor to stage the system, adjust the OAS SP (Set-Point) value down to the OFF position and the UT3000 will display the screen to the right.

OAS Sensor N/A

Built-In Delay Timer Settings

EWC recommends turning off all of the Thermostat Time Delays and let the UT3000 Timers protect the HVAC system. Doing so avoids stacking or doubling the wait time.

The UT3000 has built-in Delay Timers that insure safe HVAC system operation.

- *Start-up Delay Timer 1 minute, fixed.
- *Short Cycle Timer 2 minutes, fixed.
- *Supply Air Limit Delay 3 minutes, fixed.
- *Changeover Timer 4 minutes, fixed.
- *Opposing System Service Timer 20 minutes, fixed.

TIMER DEFINITIONS

Start-Up Delay Timer

Upon initial power up or after a power failure, the UT3000 will not start the equipment for at least 1 minute.

Short Cycle Timer

When all Zones are satisfied, the UT3000 will not resume the same call for a minimum of 2 minutes.

Supply Air Limit Timer

If a Heating or Cooling operation cycles down due to excessive Supply Air temperature, the UT3000 will not restart the HVAC system for 3 minutes.

Changeover Timer

At the end of a call, a 4 minute timer is started and the UT3000 will not switch to the opposite mode of system operation until the timer has expired.

Opposing System Service Timer

A 20 minute delay must expire, or the active zone(s) must satisfy, before the UT3000 will honor a thermostat demand to changeover to the opposite mode of system operation.

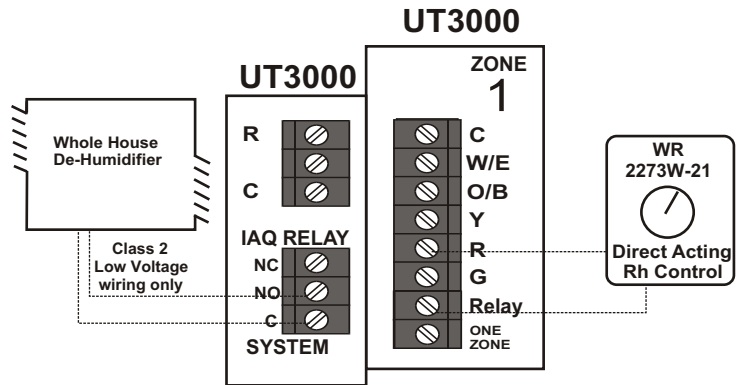
One Zone Mode Feature

The UT3000 includes the ONE ZONE feature that allows a Commercial Grade Thermostat or Time Clock to Force the UT3000 into the ONE ZONE MODE during Setback Periods. In compliance with California Title 24, when the One Zone Terminal is energized, the UT3000 ignores all Zone T-stat demands except for Zone 1. All Zone Dampers are Forced Open. When the One Zone terminal is de-energized, the UT3000 will resume Zoning Operations.

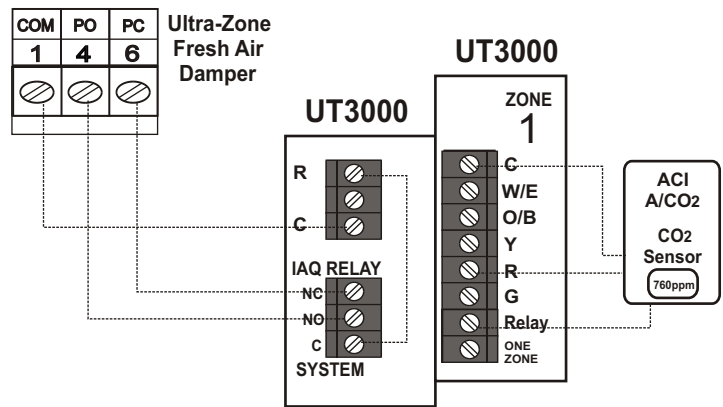
Ancillary IAQ Dry Relay Functions

The UT3000 includes a SPDT Indoor Air Quality Relay with an Input Trigger that can be used to Connect, Interlock and Control various IAQ devices. The Indoor Fan will operate automatically, when the Dry Relay Input is Triggered. All Connected Zone Dampers still operate normally and are not affected by the relay's function, unless a fan call is detected from a particular zone along with the IAQ relay input.

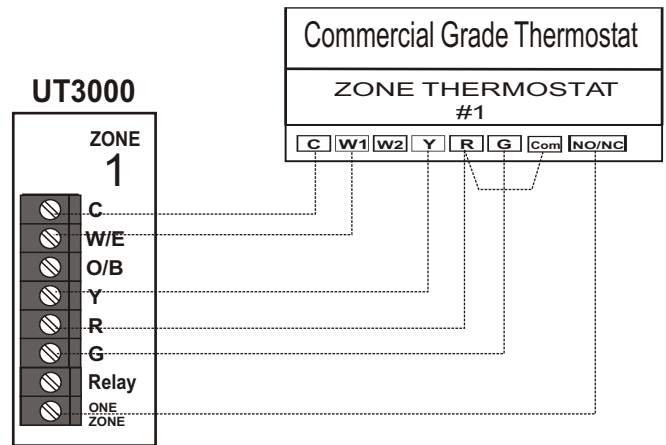
The Following Diagrams reflect ways to Utilize the IAQ Dry Relay and ONE ZONE Mode to your Advantage. These and Other Customized Wiring Diagrams are Available by contacting EWC® Controls. For Clarity, other wire connections are not shown.



Interlock and Operate a De-humidifier. The UT3000 will energize the Indoor Blower to increase air movement thru the home

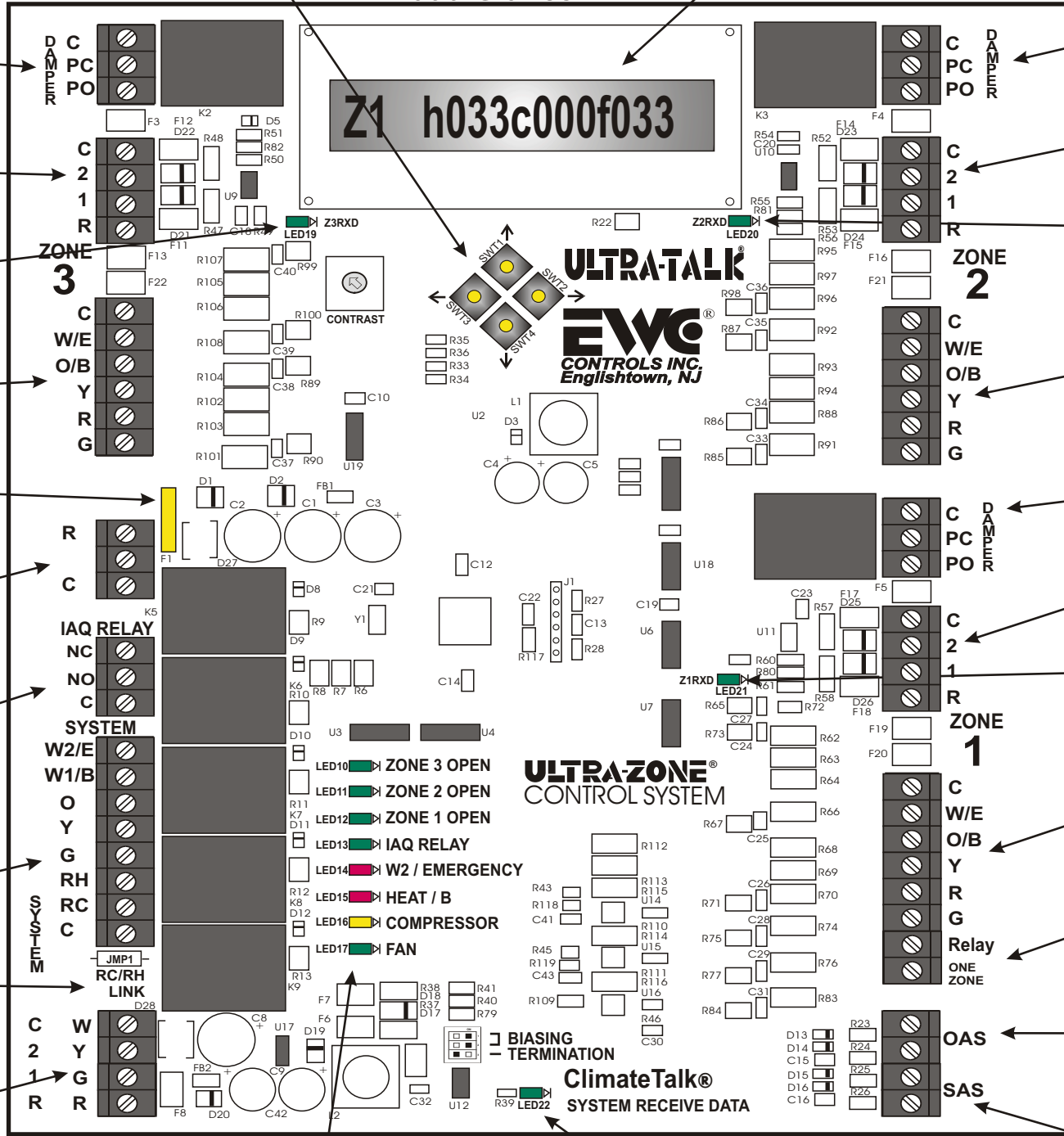


Fresh Air IAQ Solution using a Field Supplied Co2 Monitor



Setback "One Zone" Solution using a Commercial Grade Thermostat. If you prefer, you can use a Part # VAC Manual Vacation Switch. Call EWC Controls for assistance with your Setback solution.

UT3000 Features at a Glance



Zone Damper #3

Communicating T-stat #3

Commincating LED Indicator Zone #3

Regular T-stat #3

Over-Current Breaker 2.5 amp

24vac Power Input

Ancillary Dry Relay Output

Regular Dry Relay System Output

Rc/Rh Jumper

Communicating System Output

Color Coded LED's

Communicating SYSTEM LED Indicator

Zone Damper #2

Communicating T-stat #2

Communicating LED Indicator Zone #2

Regular T-stat #2

Zone Damper #1

Communicating T-stat #1

Communicating LED Indicator Zone #1

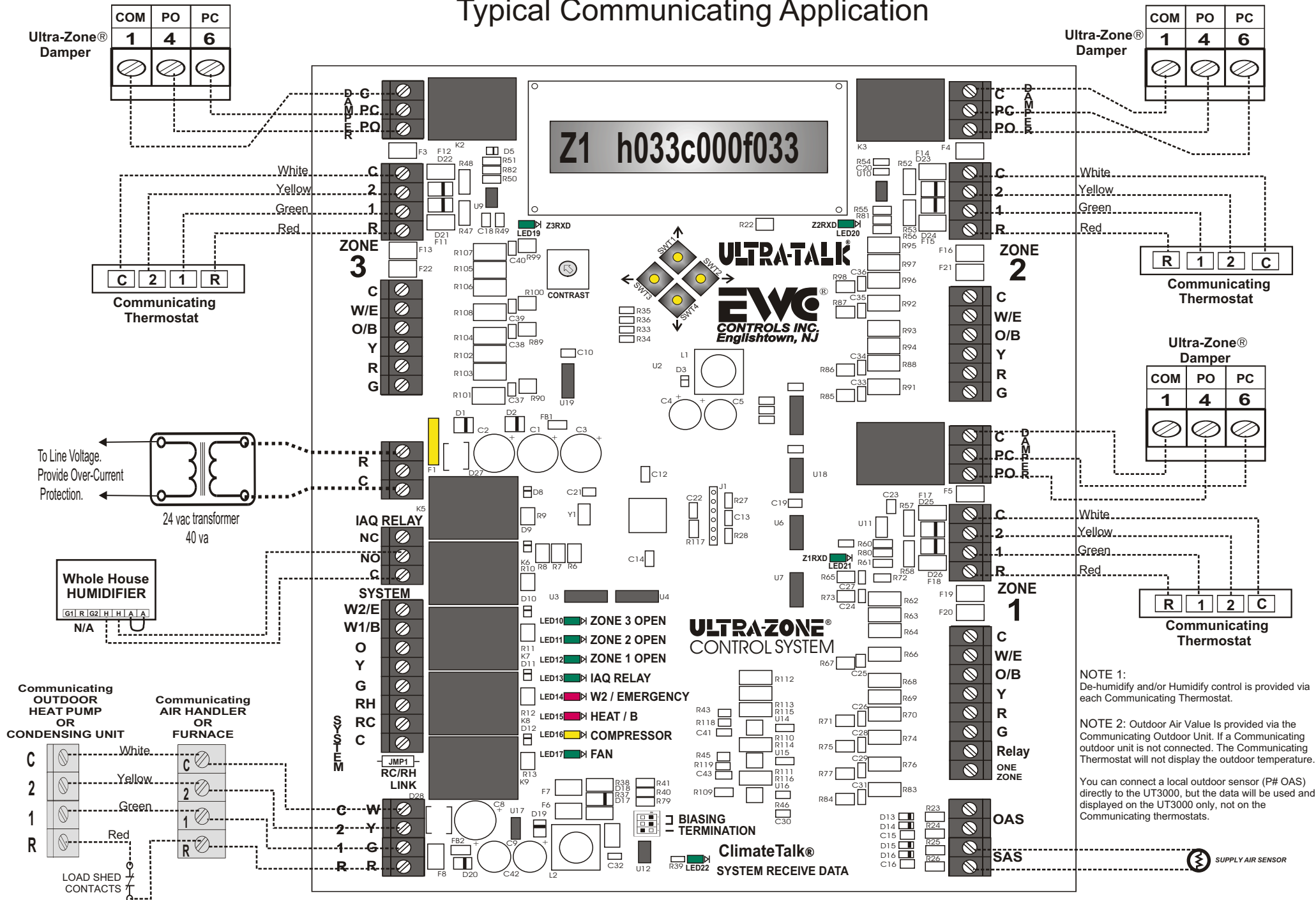
Regular T-stat #1

Ancillary IAQ Function Inputs

Outdoor Air Sensor Terminals

Supply Air Sensor Terminals

Typical Communicating Application



NOTE 1:
De-humidify and/or Humidify control is provided via each Communicating Thermostat.

NOTE 2: Outdoor Air Value Is provided via the Communicating Outdoor Unit. If a Communicating outdoor unit is not connected. The Communicating Thermostat will not display the outdoor temperature.

You can connect a local outdoor sensor (P# OAS) directly to the UT3000, but the data will be used and displayed on the UT3000 only, not on the Communicating thermostats.



WIRING INSTRUCTIONS

WARNING: THESE PANELS ARE DESIGNED FOR USE WITH 24VAC. DO NOT USE OTHER VOLTAGES! USE CAUTION TO AVOID ELECTRIC SHOCK OR EQUIPMENT DAMAGE. ALL WORK SHOULD BE PERFORMED TO LOCAL AND NATIONAL CODES AND ORDINANCES. USE 18 AWG SOLID COPPER, COLOR-CODED, MULTI-CONDUCTOR THERMOSTAT CABLE.

Thermostat Wiring

Communicating thermostats can be used on all zones for all applications. You can also mix Communicating thermostats with 24v thermostats. Just make sure you select the correct type of 24v thermostat in the program menu. You cannot mix 24v Single stage heat/cool thermostats with 24v Heat Pump thermostats. A Comm LED is provided at each Comm Terminal Block to indicate a Link has been established with each communicating device. The Comm LED will pulse rapidly & randomly to indicate the Link is active. Otherwise it will blink very slow. Be patient and allow sufficient time for all Communicating T-stats to finish the configuration process. Usually 60 seconds or less. Make sure to allow enough time for the entire HVAC system to access the network. Usually no more than 3 minutes.

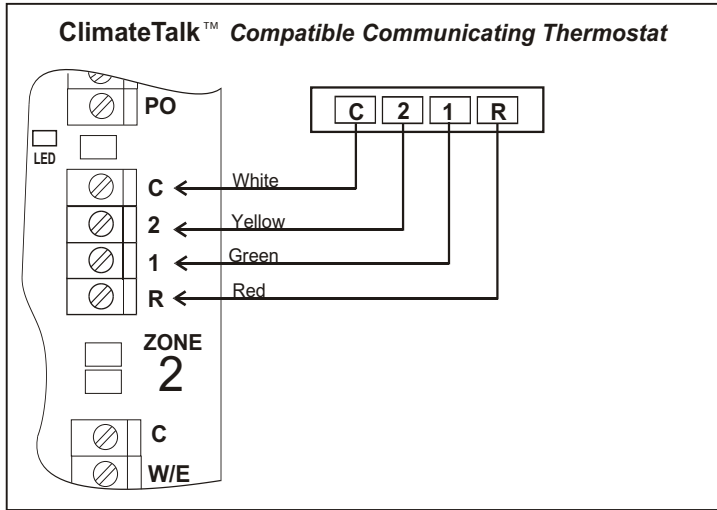


Figure 2a

OEM Mfr's Communicating Thermostat. See thermostat instructions for further details. You can use communicating thermostats on every zone. Or use a communicating thermostat in Zone 1 and less expensive 24v thermostats in Zone 2 and Zone 3.

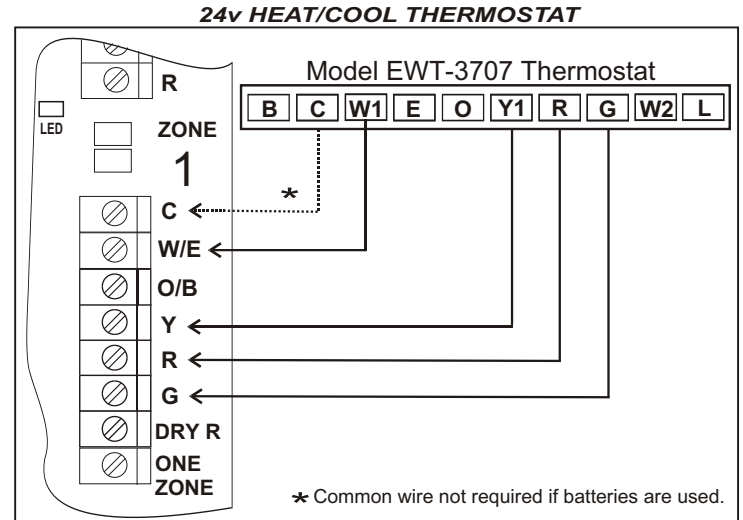


Figure 2c

Model EWT-3707 Thermostat Configured for 1 heat & 1 cool (SS1 mode). See thermostat instructions for details. The HVAC system equipment may be 24v Legacy or Communicating type.

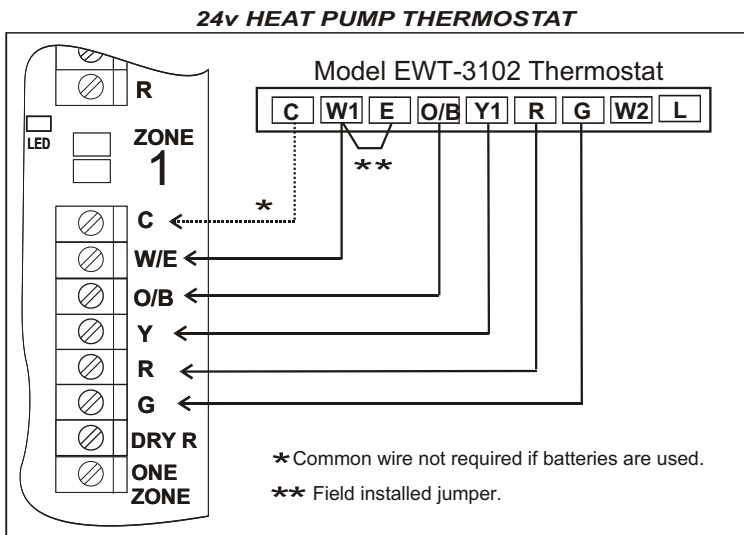


Figure 2b

Model EWT-3102 Thermostat Configured for 2 heat & 1 cool (HP1 mode). See thermostat instructions for details. The HVAC system equipment may be 24v Legacy or Communicating. You can also mix 24v type thermostats and communicating thermostats.

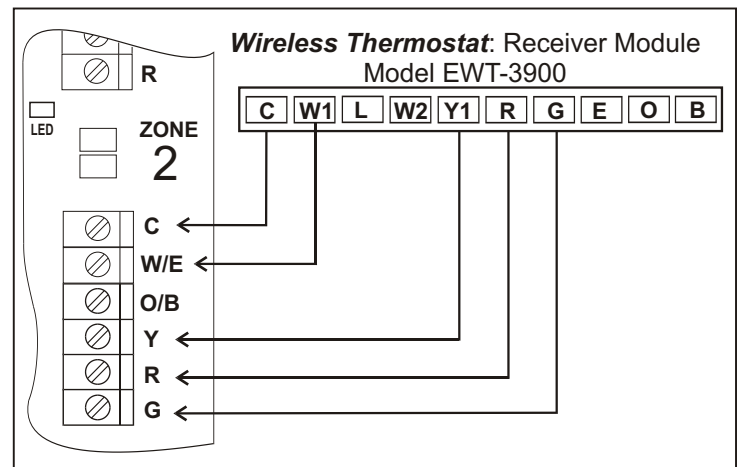


Figure 2d

Model EWT-3900 Wireless Thermostat. Configured for 1 heat 1 cool (SS1 mode). Can be configured for heat pump also. See thermostat instructions for details. Use Wireless thermostats in Zone 2 and/or Zone 3. Always use a hard wired type thermostat for Zone 1.

NOTE: The UT3000 allows the user to install Communicating Thermostats on all zones. Communicating thermostats can also be used in combination with 24v thermostats. You may also use regular Heat/Cool type thermostats or Heat Pump thermostats on all zones. This design simplifies the thermostat selection process and allows the installer to easily adapt the UT3000 to most any residential application.

NOTE: Regardless of the type of 24v thermostats used, the W2 Threshold feature or the OAS Set-Point will control the auxiliary system. Once the W2 Threshold is crossed or the Outdoor Air Set-Point is reached, Auxiliary Heat will energize. Auxiliary demands from each thermostat are only used to determine the weight or percentage of demand from that zone, rather than immediately activating Auxiliary operations.

Note: Hi fire on a two stage furnace is controlled by the W2 Threshold. Modulating furnaces are not affected by the W2 threshold setting.

System Wiring

The UT3000 panel was designed to be easy to wire up and operate. We have provided several typical field wiring diagrams to review. Your actual field wiring may vary. In full communicating mode, four wires are all that is required from each thermostat and to the HVAC system. The UT3000 will "Talk" to the HVAC system and "Talk" to the thermostats in order to automatically setup and start operating the HVAC system. In 24volt mode, you can program the UT3000 to operate the type of HVAC system you are installing. Either way, the UT3000 allows you to Plug & Play or Program & Play!

Communicating Fuel/Electric System

Four wires are all that is required to each component. Plug & Play

Communicating Dual Fuel or Standard Heat Pump System

Four wires are all that is required to each component. Plug & Play

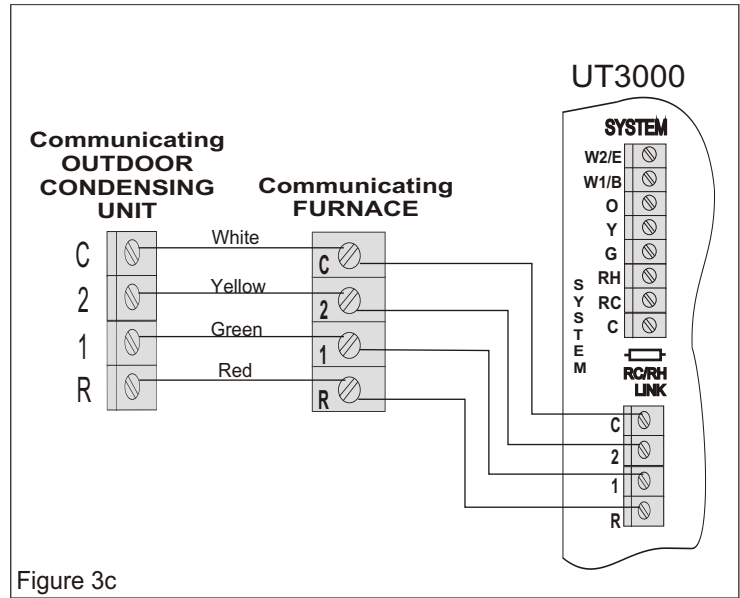
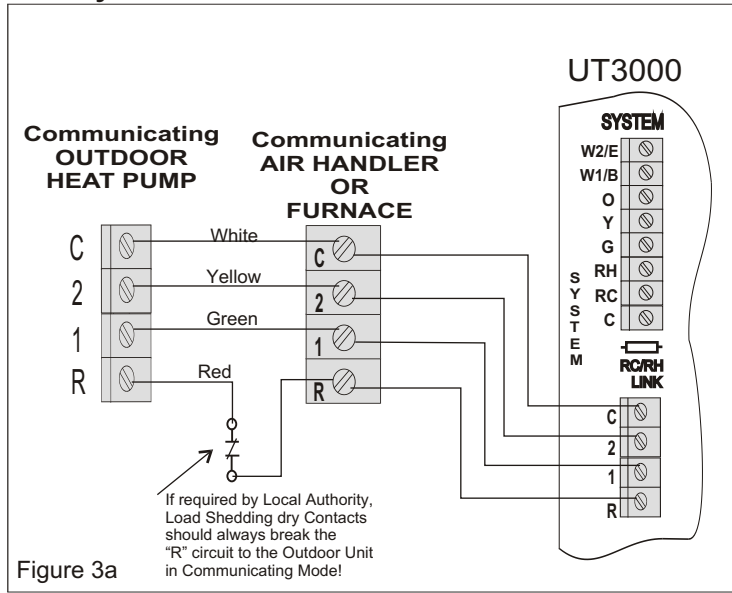


Figure 3c

Existing Boiler with New A/C System

You may have a new Communicating A/C unit but still want to use your Old Boiler as the Heating system. Connect the T&T circuit from your boiler control panel to the Rh and W1/B terminals on the UT3000. Program the UT3000 for Hydronic Fan mode. Program & Play

Communicating Furnace with 24v Air Conditioner

Four wires are required from the UT3000 to the Communicating furnace. Two or three wires are required to the 24v air conditioner. The 2 or 3 wires can come from the UT3000 or the Furnace. This diagram shows the wires coming from the furnace. Call EWC for other 24v wiring solutions.

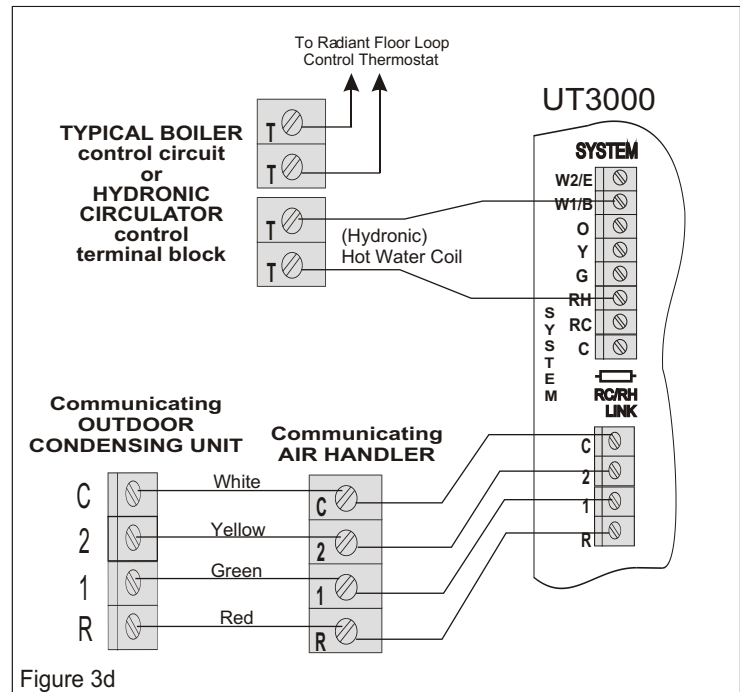
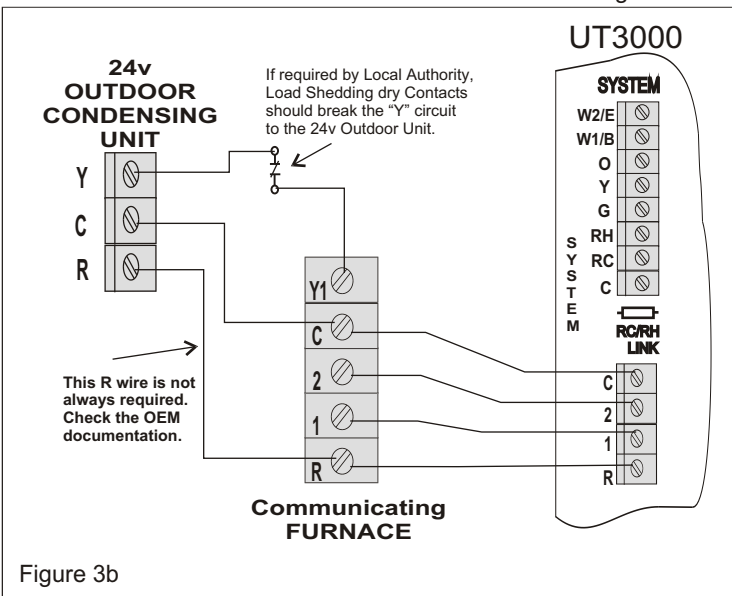


Figure 3d

Contact EWC Controls Technical Support for assistance on these and other Equipment Wiring Solutions.

DAMPER WIRING

Note: The 500mA Damper Circuit Breaker limits how many dampers can be directly connected to a single terminal block. You can connect up to eighteen (18) genuine ND, URD, or SID dampers to a single terminal block before relay isolation is required. You can connect only one (1) RSD or Competitor's Spring type damper to a single terminal block before relay isolation is required.

Note: All zone dampers default to the "OPEN" position after a purge delay and when all zone demands are satisfied, and no signals are detected from any zone thermostats.

ZONE DAMPER MOTOR TERMINAL BLOCK DESIGNATION & FUNCTION

- Terminal PC 24vac Power to Close a Damper
- Terminal PO 24vac Power to Open a Damper
- Terminal C 24vac Common (Neutral)

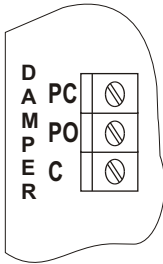


Figure 4

Genuine ND, URD & SID Damper Wiring

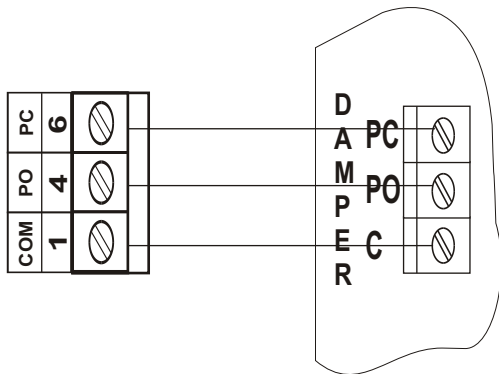
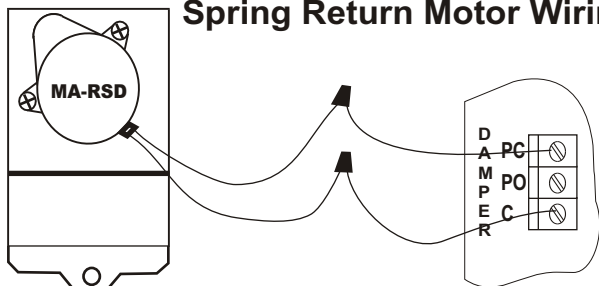


Figure 5a

On all these dampers and most older style dampers, including competitor's dampers, always wire up number to number or by terminal designations. (Com to Com)(PO to PO)(PC to PC) (1-1)(4-4)(6-6)

EWC Controls Typical Spring Return Motor Wiring



Any Spring Open Damper is wired to C & PC
Any Spring Close Damper is wired to C & PO

Figure 5b

Current Draw for a ND, URD, or SID Damper = **26mA**
Current Draw for a Spring Type Damper = **400mA**

Three or More ND, URD, SID Dampers on a Single Zone Terminal Block No Isolation is Required

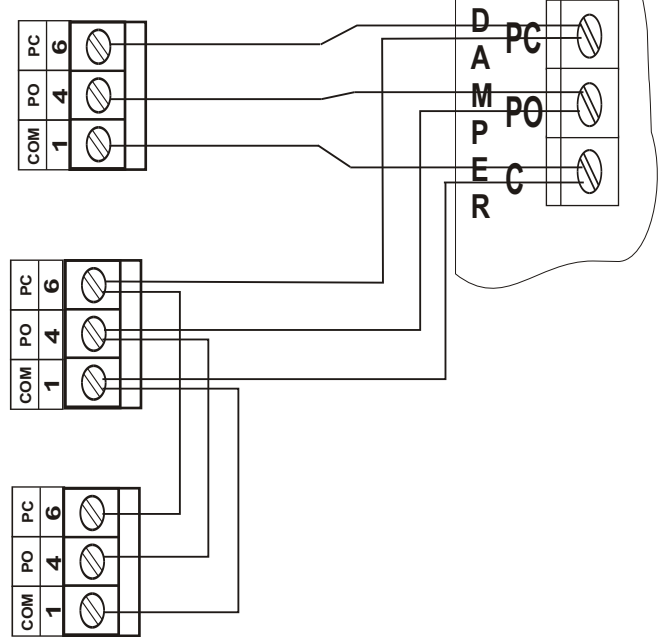


Figure 5c

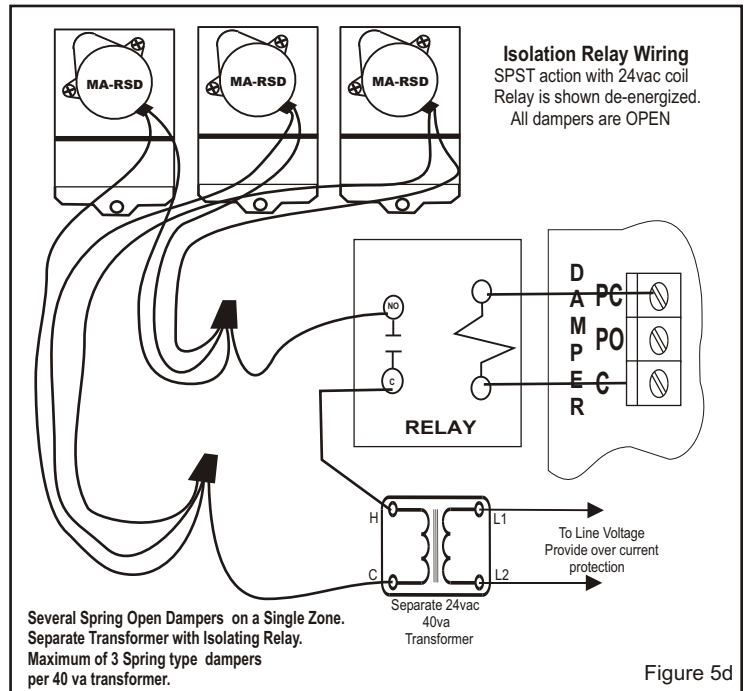
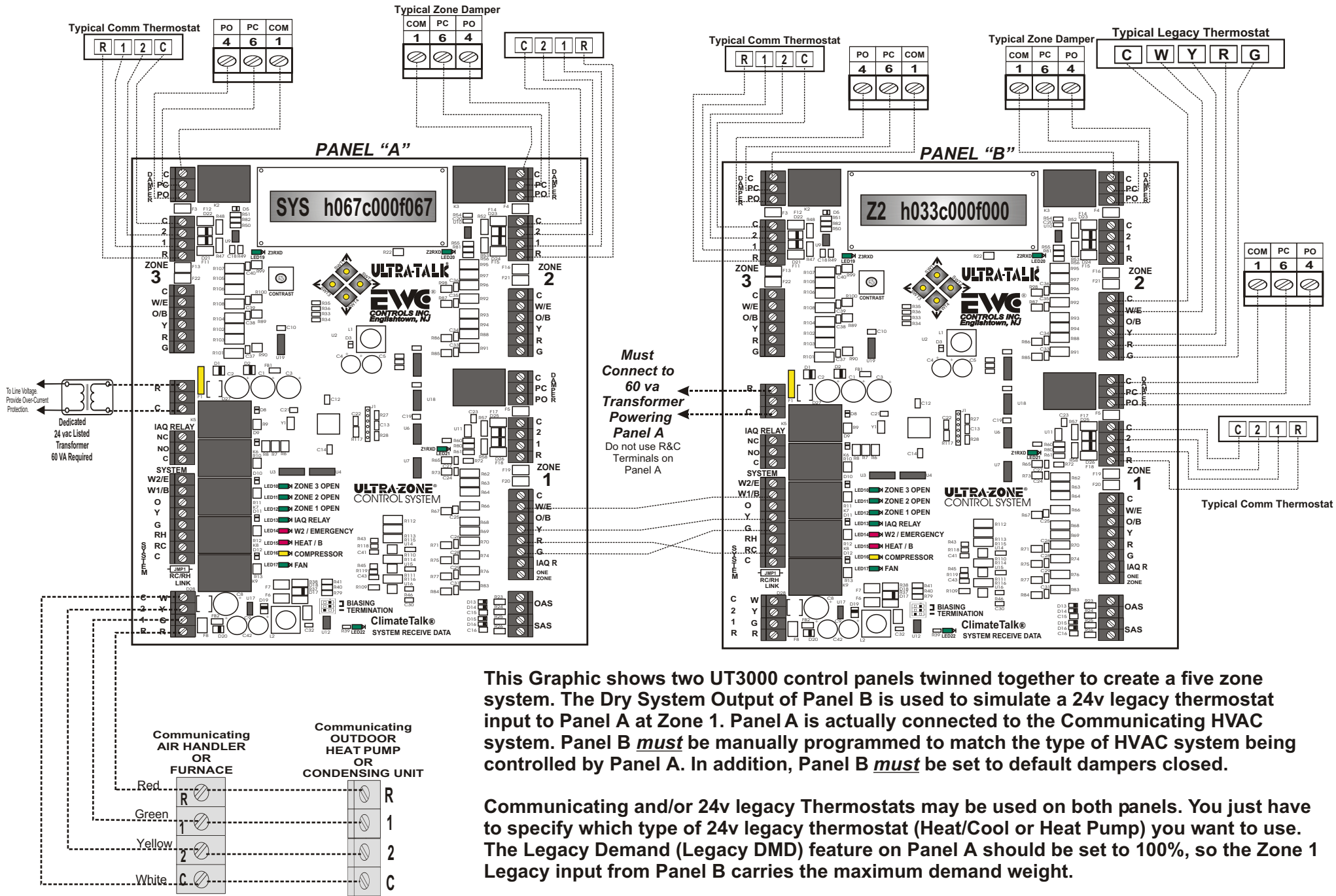


Figure 5d

DO NOT overload the UT3000's Damper Motor Circuit Breakers. If you need to connect more than one (1) Spring Type Damper to a single terminal block, use figure 5d to separate and isolate those dampers.



This Graphic shows two UT3000 control panels / twinned together to create a five zone system. The Dry System Output of Panel B is used to simulate a 24v legacy thermostat input to Panel A at Zone 1. Panel A is actually connected to the Communicating HVAC system. Panel B **must** be manually programmed to match the type of HVAC system being controlled by Panel A. In addition, Panel B **must** be set to default dampers closed.

Communicating and/or 24v legacy Thermostats may be used on both panels. You just have to specify which type of 24v legacy thermostat (Heat/Cool or Heat Pump) you want to use. The Legacy Demand (Legacy DMD) feature on Panel A should be set to 100%, so the Zone 1 Legacy input from Panel B carries the maximum demand weight.

Legacy 24v equipment can be controlled by this 5 zone system as well and still make use of communicating thermostats. Contact EWC Controls for information.

UT3000 PANEL TWINNING PROCEDURES



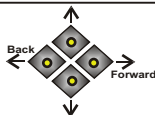
TECHNICAL BULLETIN ULTRA-TALK[®] 3000 PATENT PENDING

Refer to the Graphic on Page 13

1. Mount Panel "A" and Panel "B" in close proximity to the HVAC system and each other.
2. Install a dedicated 24v 60va listed transformer and run 24v power to both UT3000's.
* Do not power up yet.
3. Connect the Communicating HVAC system to the Panel "A" Communicating SYSTEM block.
4. Connect Communicating and/or Legacy 24v thermostats to Panel "A" as desired.
5. Connect Communicating and/or Legacy 24v thermostats to Panel "B" the same as Panel "A".
6. Connect the twinning wire connections between the Dry SYSTEM output block of Panel "B" to the Legacy 24v Zone 1, Zone 2 or Zone 3 T-stat input of Panel "A".
7. Power up the Communicating HVAC system first and then power up the UT3000's.
8. Panel "A" will automatically configure and talk to the Communicating HVAC system.
9. Communicating Thermostats that are connected to Panel "A" will also configure automatically.
10. If using 24v legacy T-stats, program Panel "A" for the type of 24v thermostats being used.
* The UT3000 defaults to Heat/Cool type 24v T-stats. Change to Heat Pump type if necessary.
11. Program Panel "B" to match the HVAC system type shown in the LCD screen on Panel "A".
12. Program Panel "B" to default dampers to the closed position when idle.
13. Communicating Thermostats that are connected to Panel "B" will configure automatically
14. Program Panel "B" to match the 24v Legacy T-stat type programmed into Panel "A".
15. Program the Panel "A" feature "Legacy DMD" to 100% to ensure Panel "B" demands carry the maximum demand weight.
16. Program Panel "B" communicating thermostat Fan Only speeds to Medium Speed only.
17. Set all thermostats to operational mode and operate the HVAC system in both Heating and Cooling modes, to confirm proper operation.
18. Call EWC Controls Engineering Dept. If you have questions.

TROUBLESHOOTING

SYMPTOM	SOLUTIONS
LCD & LED's are responding properly but HVAC system is malfunctioning. Communicating T-stat displays fault messages.	Check HVAC system wiring for proper connections. Check HVAC system wiring for shorts/miswiring. Test wires for Continuity/Shorts. Check HVAC equipment for faults via a Communicating T-stat & clear all faults. Check for proper voltage: Data1 to C @ 2.8 or 1.8vdc. Check Data 2 to C @ 2.2 or 1.2vdc.
LCD & LED's are not responding properly and HVAC system is malfunctioning. Data voltages are incorrect.	Check Zone system wiring for shorts/miswiring. Test wires for Continuity/Shorts. Check HVAC system wiring for proper wiring. Check HVAC system for faults. Check Zone thermostats for proper connections. Test wires for Continuity/Shorts. Check BIAS switch settings on the HVAC system. Make sure they are ON.
LCD & LED's function and HVAC system functions normally but dampers do not respond.	Check damper motor wiring for proper connections. Check damper motor 24volt & 500mA Breaker. Test wires for Continuity/Shorts. Check damper motor wiring for shorts/miswiring. Test wires for Continuity/Shorts. Refer to Page 12 for Damper Wiring.
LCD & LED's do not function and HVAC system does not respond.	Check HVAC/UT3000 system transformer supply voltage. Check HVAC/UT3000 system 24vac transformer voltage/Breaker. Test all wires for Continuity, shorts to Common or shorts to earth ground. Check HVAC/UT3000 system wiring for shorts/miswiring.
Time Delay is Active and won't allow Heat or Cool to Function.	When Troubleshooting, Simultaneously Press the Back & Forward buttons for 1 second to Bypass any Active Time Delay.



CHECK YOUR WIRING

DETECTING 24vac SHORTS	SYMPTOM: Entire Panel or a Single Zone appears to be dead!
HVAC system not responding and UT3000 LED's are off.	If 24vac short has occurred, 24vac will be present at the UT3000 24v <i>Input terminals R & C</i> ; but 24vac will not be present at any <i>Thermostat R&C</i> .
Dampers not responding and The UT3000 LED's are off.	SOLUTIONS: Remove 24vac power from UT3000 and allow F1 circuit breaker to cool! Find and repair short(s) in damper and/or thermostat field wiring. Restore 24 vac power.
ISOLATING 24vac SHORTS	Disconnect the wire(s) from the 'R' terminals on the UT3000 thermostat terminal blocks, and the "C/PO/PC" terminals on the UT3000 damper motor terminal blocks. Restore power. If the short is no longer present, Ohm out the thermostat and damper field wiring for continuity, shorts to common and/or shorts to earth ground. Replace or repair wires as necessary. Restore power.
<i>140mA & 500mA circuit breakers protect the UT3000 and react to a short in the Thermostat/Damper component field wiring.</i>	

Detecting 24v shorts to common or shorts to earth ground

When the 2.5A breaker is tripped it will get hot to the touch and none of the panel LED's will illuminate. The LCD will also cease to function. To reset the breaker, locate the short by removing each hot wire connected to the panel, one at a time. When the shorted wire is removed, the panel will resume normal functions. Now you must repair or replace the shorted wire. If one or more 140mA or 500mA breakers trip, only the device(s) connected to that block will be affected. Remove each hot wire connected to that block until the voltage is restored. Find and repair the short before re-connecting the wires. If there is a short between the Data 1 & 2 wires or if the Data wires are shorted to 24v or earth ground, the Communicating thermostat on that zone will alert you by displaying "Call for Service". If no communicating thermostat is connected and a short occurs on the 24v wires, that zone will not function. Find and repair the short using the methods described above.

TECHNICAL SUPPORT

EWC® Controls provides superior toll free Troubleshooting Support for the UT3000 when you are on the job site!

Call 1-800-446-3110 Monday - Friday 8am to 5pm EST. Otherwise call 1-732-446-3110 for information on the UT3000 and other ULTRA-ZONE® products. Visit our web site to download this Technical Bulletin and other related information at www.ewcccontrols.com

When calling for Technical Support from the job-site, please have a multi-meter, pocket screwdriver, and wire cutters/strippers on hand.

JOB NOTES: