The patented UT3000 Zone Control System has been enhanced to provide intelligent zone control of the Daikin FIT™ and ComfortNet™ communicating HVAC systems or 24volt legacy HVAC systems. Create 2 or 3 air zones with a single panel or “twin” two UT3000’s together to create a 4 or 5 zone system. Use EWC® 24volt motorized dampers and any off-the-shelf 24volt thermostat or compatible communicating thermostats. Features like Automatic Equipment Recognition, Modulating and Staged BTU capacity control, Dual Fuel functions, Energy Saving features and Precise Control of Supply Air Target & Limit set-points still come standard. Even the LCD display has been enhanced to include easy to read “System Status” messages. EWC® Controls raises the bar again and sets another new standard for Residential HVAC Air Zoning.

Zone Capacity
Control 2 or 3 air zones with 24vac Power
Open/Close or Spring type dampers. Control
4 - 5 zones by twinning 2 UT3000s together.

Compatible HVAC Systems
Control Communicating HVAC systems
based on the ClimateTalk™ communicating
open protocol. Or any 24volt legacy 2 Heat
/ 1 Cool Gas/Electric system or 2 Heat / 1
Cool conventional or DF Heat Pump.

Compatible Thermostats
The UT3000 is compatible with the Daikin
One+™ smart thermostat and the ComfortNet
CTK04 thermostat. The UT3000 is also
compatible with any typical 24v single stage
Heat/Cool thermostat and typical 2 Heat/
1Cool Heat Pump thermostats.

Automatic Heat / Cool Changeover
The UT3000 is compatible with “automatic
changeover” thermostat settings, which
allows for individual zone comfort from the
HVAC system.

Status LCD
The Liquid Crystal Display scrolls 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
prolonged power failure.

System LED’s
In addition to the LCD, a total of 5 colored
LED’s provide visual indication of the
HVAC system status & 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.

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 successful comm-link and data transmission.
Otherwise, each Tstat Comm LED will remain Off for
non-communicating T-stats.

Fault Free Programming & Intuitive Temperature Control
The UT3000 comes pre-loaded with Default
Operating Parameters (See Page 2, Table 1) for Zoned
HVAC Systems. The Default Programing means less
work for the Installer, but also allows Fine Tuning of
the System to Optimize Performance and Personal
Preference. The UT3000 operates in Staged and
Modulating mode at all times. Multi-Stage and
Modulating Equipment will be operated in a manner
that maximizes efficiency, maximizes temperature control & improves system performance.

Ancillary IAQ Dry Relay Provided
The UT3000 includes a SPDT Indoor Air Quality Dry
Relay (IAQ Relay), with a digital & 24v Input Trigger. It
can be used to interlock and control Ancillary IAQ
functions:
* Fresh Air Damper  * Whole House Humidifier
* Energy Recovery Ventilator

The UT3000 must detect a Fan, Heat or Cool demand
from one or more communicating zone thermostats
or legacy non-communicating zone thermostats, before
the IAQ relay will energize.
MOUNTING: Choose a suitable location to mount the UT3000 housing. Suitable locations are on the Return Duct, a Nearby Wall or Convenient Conduit 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 Cabinet or Evaporator Cabinet to avoid damaging these devices. Unless code permits. Do not mount the UT3000 in the “open” return air stream. Follow all National and/or Local Mechanical & Building Codes.

POWER SUPPLY: The UT3000 requires a dedicated 24vac transformer. 40va minimum - 60va maximum. Follow National Electrical Code and/or Local Electrical Code.

WIRING: Use standard 18awg solid copper multi-conductor cable. Shielded cable is unnecessary. Connect the Power Supply to the UT3000 and wire-up thermostats and dampers. Use the knock-outs provided on the housing as the wire entry-way. Strip the cable jacket back to the point where the cable enters the housing. That reduces bulk and allows easy routing of the individual wires for a professional looking install.

4 Wire Communicating Network: Whenever possible, adhere to the Climate Talk® Color code. RED, GREEN, YELLOW, WHITE. Doing so reduces the possibility of mis-wiring components.

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 8 - 10 minutes for all Thermostats and the zoned HVAC system to fully configure, depending on the number of zones. The Default Supply air Sensor temperature Targets and off-set Limits will be used. Other features can be selected and you can adjust the default settings to the values you prefer.

When connected to a Conventional 24v HVAC system, scroll thru the LCD menu and select the type of HVAC system you have and the type of thermostats you want to use. Accept the default settings or adjust them as you prefer.

FINISH: When the Installation is complete, it may be necessary to operate the system in “Test Mode” or “Charging Mode” first! Afterwards, run the system thru it’s paces and observe the HVAC system in all possible modes of operation. Check the Zone Dampers and the Bypass Damper for proper operation. Balance the duct work and adjust the Menu Settings as you prefer.

When connected to a Conventional 24v HVAC system, scroll thru the LCD menu and select the type of HVAC system you have and the type of thermostats you want to use. Accept the default settings or adjust them as you prefer.

If desired, you can reset the UT3000. Upon Power Up, Press and Hold the Back & Forward buttons to Load the Factory Default Values, then Release.

Table 1

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>DEFAULT</th>
<th>RANGE TO SELECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Type</td>
<td>Heat/Cool</td>
<td>Heat Pump or Heat/Cool</td>
</tr>
<tr>
<td>HP Type</td>
<td>NON Dual Fuel</td>
<td>Dual Fuel or Non-Dual Fuel</td>
</tr>
<tr>
<td>T-Stat Type</td>
<td>Heat/Cool</td>
<td>Heat Pump or Heat/Cool</td>
</tr>
<tr>
<td>Rev Valve</td>
<td>RV ‘O’</td>
<td>‘O’ Type RV or ‘B’ Type RV</td>
</tr>
<tr>
<td>Fan Mode</td>
<td>Gas</td>
<td>GAS or HYDRO (Electric)</td>
</tr>
<tr>
<td>OAS SP</td>
<td>OFF</td>
<td>OFF or 7° to 42° F</td>
</tr>
<tr>
<td>O.T. Offset</td>
<td>8° F</td>
<td>5° to 20° F</td>
</tr>
<tr>
<td>U.T. Offset</td>
<td>7° F</td>
<td>5° to 12° F</td>
</tr>
<tr>
<td>SAS HP TGT</td>
<td>112° F</td>
<td>90° to 120° F</td>
</tr>
<tr>
<td>SAS Gas TGT</td>
<td>142° F</td>
<td>120° to 170° F</td>
</tr>
<tr>
<td>SAS Cool TGT</td>
<td>47° F</td>
<td>40° to 60° F</td>
</tr>
<tr>
<td>SAS RSP DLY</td>
<td>22s</td>
<td>10seconds - 180seconds</td>
</tr>
<tr>
<td>W2 Threshold</td>
<td>95%</td>
<td>65% - 99% (Adj. in 5 point increments)</td>
</tr>
<tr>
<td>PURGE FAN</td>
<td>50%</td>
<td>25% - 100% (Adj. in 25 point increments)</td>
</tr>
<tr>
<td>Zone 1 Weight</td>
<td>70%</td>
<td>0% to 100%</td>
</tr>
<tr>
<td>Zone 2 Weight</td>
<td>15%</td>
<td>0% to 100%</td>
</tr>
<tr>
<td>Zone 3 Weight</td>
<td>15%</td>
<td>0% to 100%</td>
</tr>
<tr>
<td>Total Zones</td>
<td>3</td>
<td>2 or 3 zones per panel</td>
</tr>
<tr>
<td>DMP DFLT</td>
<td>Open</td>
<td>Open or Close</td>
</tr>
<tr>
<td>DMP PID</td>
<td>Yes or No</td>
<td></td>
</tr>
<tr>
<td>W2 lockout</td>
<td>99° F</td>
<td>20° to 99° F</td>
</tr>
</tbody>
</table>
LCD Screen Programming

Remember, if you are installing a Communicating HVAC system, this programming is done for you! There is no need to perform the Programming steps below. You can still program certain detail functions ie. (24v T-stat Type). Select only the functions you want or need. Your changes will 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.

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 in the box for future reference!

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.

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 any Heat Pump in a restricted mode by using the OAS-SP feature.

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 non-communicating HP and HC type thermostats. All 24v T-stats must be Wired and/or Programmed for HC or HP Operation. Conflicting Zone Demands due to mis-wiring or incorrect programming will not be recognized!

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

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 the screen will display “Fan Mode N/A”.

OAS SP       OFF

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

O.T. Offset: 8°

AND

U.T. Offset: 7°

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.
The UT3000 staging/ramping process is 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 UT3000’s advanced staging logic, (see the next page) the UT3000 will stage or modulate (increase/decrease) the System’s BTU capacity to match the discharge air set-point target, for each mode of operation.

**Cooling Mode**: If the Cooling Supply Air Temperature is above the Cooling Target, the UT3000 will increase the SYS Cool Output by 1 point every 22 seconds. If the Cooling Supply Air Temperature is below the Cooling Target, the UT3000 will decrease the SYS Cool Output by 2 points every 22 seconds.

**Heat Output**

- **W2 Threshold**
  - Typically the W2 threshold is set to 95%. This means the Auxiliary system operates more often. Setting a high value means the Auxiliary system will operate less often. There is a 5% differential added to the value selected which prevents short cycling. **Setting the W2 threshold to 99% effectively turns it OFF**. The reason for this is the differential. So, a value of 94% actually trips at 99%. Thus, a value of 99% would require the System Output to reach 104% which is impossible. **Set the W2 Threshold to 99%**, if you want the Auxiliary system to energize on the Outside Air set-point (OAS SP) only! If desired, you can use the Outside Air Set-point and set the W2 Threshold to maximum 95%. That would require the System (SYS) Output Percentage to reach 100% demand or the Outside Air temperature drop low enough, to energize Auxiliary heat.

**Heat Output**

- **Purge - Fan**
  - 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 50%.

**Heat Output**

- **SYS Heat Target set-point**, Thermostat type and the Thermostat demand value.

**Important Note**: Review all Programming Features carefully and call EWC Controls if you have questions. With years of experience Zoning HVAC systems, we have plugged in default values that should work fine for the majority of the jobs you will encounter. If desired, you can 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 depending on factors such as the Internal & External Load, SAS Response Delay Setting, Supply Air Target set-point, Thermostat type and the Thermostat demand value.
**LCD Screen Programming**

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, unless the x3 staging range stops it first.

**4 Button LCD Programming**

The UT3000 utilizes a zone weighting feature. You can select the weight for each zone independently. For example, if zone 1 has more heat loss/gain than zone 2 or zone 3, you can now assign it more weight. 3 zone default weight values are 70/15/15. 2 zone default weight value is 60/40.

**Step 14**

Select the Weight value that will be applied to Zone 1 Thermostat. You may select from a range of 0% to 100%. The factory default value is 70%. The sum of all the zones weights can add up to 100% or less.

**Z1 WEIGHT 70%**

**Step 15**

Select the Weight value that will be applied to Zone 2 Thermostat. You may select from a range of 0% to 100%. The factory default value is 15%. The sum of all the zones weights can add up to 100% or less.

**Z2 WEIGHT 15%**

**Step 16**

Select the Weight value that will be applied to Zone 3 Thermostat. You may select from a range of 0% to 100%. The factory default value is 15%. The sum of all the zones weights can add up to 100% or less.

**Z3 WEIGHT 15%**

**Step 17**

Select the total number of zones (thermostats) you have connected to each UT3000. You may select 2 zones or 3 zones. The factory default value is 3 zones. It may be necessary to assign very low weight values to some or all zones zones, in order to avoid air noise issues. The total assigned weight values do not have to equal 100%, but going above 100% is not permitted.

**Total ZONES = 3**

**Step 18**

Select “N” for NO, if you want the UT3000 to Stage the HVAC system Up & Down, in an effort to match the programmed Supply Air Temperature Targets for HP heat, Gas heat or Cool operations. The PID Loop is allowed triple the sum of the Zone T-stat demand multiplied by the weight assignment. This is the Default mode of system operation. The System (SYS) demand value is based upon the sum of the demand(s) times the weight of each active calling zone. See page 16 for more details.

**LIMIT SAS PID N**

**Step 19**

Select “Y” for YES, if you want the UT3000 to ignore the Supply Air Temperature Targets. Simply stated, the UT3000 will not increase or decrease the System (SYS) demand values in an effort to match the programmed Supply Air Targets! This will limit the HVAC system demand based purely on the number of zones calling and the sum of the demand weight from each calling zone. See page 17 for more details.

**LIMIT SAS PID Y**

**Step 20**

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 but first make sure the HVAC system’s purge cycle is set for no longer than 90 seconds. You can individually select OPEN or CLOSED on all Slave Panels when twinning.

**DMP DFLT OPEN**

**Step 21**

W2 Lockout feature allows the installer to prevent Auxiliary Heat from energizing above a selected outside temperature. An energy savings code requirement in some states.

**W2 LOCKOUT 99°**

**Finish**

The final program screen displays the code version of your UT3000. It may be different than shown above. No further action is required. Leave the buttons alone for 10 seconds and the LCD screen will resume scrolling. The programming is complete and the UT3000 will store all settings into permanent memory.
Once the programming is complete and the System is running, 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, Auxillary and Emergency mode including IAQ 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 one time.

Below are typical LCD data screen examples:

This screen is displayed when there are no demands from any zones.

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 15% fan capacity. That means 1st stage heat (Y1) is active. If the HP Target set-point 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 or W2Gas
W2 Threshold 65% - 95% = W2HP

Note: The UT3000 may interpret a Zone Thermostat input as 100% demand but it may 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 or, it stops staging due to the zone weighting system.

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/IAQ demands may come from a Communicating thermostat or a 24v device like a conventional Humidistat. The UT3000 honors De-Humidify demands from Communicating thermostats only. The Dehumidify function is the AC system (cool mode) with low speed fan.

This screen is displayed at the end of a heating or cooling call. The damper(s) in the last zone to satisfy are held open while others remain closed, allowing the purge function. The purge cycle is fixed at 210 seconds.
This screen shows the outside air temperature in real time, at the location of the outside air sensor. This OA value could be from the Communicating outdoor unit or from a sensor (#OAS) 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 or high heat for all heating demands.

NOTE: During Cooling & Heating operations, delivered CFM is controlled by the HVAC system! The only time the indoor fan operates at the UT3000’s demand is during Fan Only.

This screen shows the duct temperature at the location of the supply air sensor in real time. The UT3000 monitors and compares the Actual Supply Air Temperature to the selected HP Target, Cooling Target or Gas Target Set-points.

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 value, the UT3000 will display the screens shown below.

This screen shows the outside air temperature in real time, at the location of the outside air sensor. This OA value could be from the Communicating outdoor unit or from a sensor (#OAS) 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 or high heat for all heating demands.

NOTE: The OAS Sensor Bad! screen is also a reliable indication that the UT3000 is not communicating with the outdoor HP or AC unit! Review the troubleshooting chart for corrective action.

The Zone 1 & Zone 2 screens above (left) each show heating demands of 50% and 100% respectively.

The Zone 3 screen above (right) shows a cooling demand of 30%. All calls are active at the same time but the Zone 1 & Zone 2 heating calls were detected first, so the UT3000 honored Zone 1 & Zone 2 by running the heating system and closing the Zone 3 damper.

The UT3000 will delay (postpone) the Zone 3 cooling demand until Zone 1 & 2 satisfy OR the 20 minute “Opposite Mode” clock expires.

The 20 minute “Opposite Mode” clock has now expired because both heating demands did not satisfy during the allotted 20 minutes. Zone 1 and/or Zone 2 heating demands may still be present, but the UT3000 will now service the cool demand in Zone 3, and restart the 20 minute “Opposite Mode” clock again.

The UT3000 will display one of the screens above, depending on whether the change-over is from Heat to Cool (HC) or from Cool to Heat (CH). The display is your indication that “Opposing Demands” from the zone thermostats are occurring.
The UT3000 has built-in Delay Timers that insure safe HVAC system operation.

*Purge Delay Timer  210 seconds, 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**

**Purge Delay Timer**
At the end of any cooling or heating operation, the UT3000 will hold the last calling zone open for 210 seconds.

**Short Cycle Timer**
When all Zones are satisfied, the UT3000 will not restart 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 dry relay with a digital or 24v input Trigger. The IAQ relay can be used to Interlock and Control various IAQ devices. The Indoor Fan will operate automatically, whenever the Relay is Triggered.

**NOTE:** The UT3000 must observe a Heating, Cooling or Fan demand from any one of the zone thermostats, in addition to the IAQ relay input, before the IAQ relay will trigger!
The "R" wire and "Common" wire are not required at the communicating outdoor unit.

See the Addendum sheet #090376A0180 rev R, for wiring and guidance on "twinning" (4 and 5 zone) systems.
**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.

EWC highly recommends using communicating thermostats in all zones! Communication LEDs (LED19, 20, 21 & 22) are provided at each “communicating terminal block” to indicate that a “link” has been established with each communicating network. (Z1, Z2, Z3 & SYSTEM). Each Comm LED will pulse (at random intervals) to indicate the “link” is active. Otherwise, the Comm LED will remain OFF (by zone) when non-communicating thermostats have been detected. Be patient and allow sufficient time (10 - 15 minutes) for the UT3000 to discover the HVAC network, and for all communicating thermostats to finish their configuration process, which includes equipment identification, menus and outside temperature conditions. Ideally, all zone thermostats should be set to OFF during this process.

**NOTE:** The UT3000 allows the user to install Communicating Thermostats in all zones! System commissioning and maintenance functions are accessed via the zone 1 communicating thermostat only! The Daikin One+ must be connected to Zone 1 for “Daikin Cloud Inverter Menu” access. Communicating thermostats can also be used in combination with 24v non-communicating thermostats if desired.

**NOTE:** Regardless of the type of thermostats used, the W2 Threshold feature, W2 Lockout feature and/or the OAS Set-Point feature, will control the Auxiliary/Backup heat in non-emergency mode. Once the W2 Threshold is crossed, the W2 Lockout set-point is reached or the Outdoor Air Set-Point is reached, Auxiliary Heat will energize. Auxiliary demands from each thermostat simply increase the observed (input) demand from that zone, which may or may not activate Auxiliary heat operations, based on the use and settings of the above mentioned features.

**NOTE:** High fire (W2) on a 2 stage communicating furnace occurs at 51% system demand, similar to Y2 HP Heating or Cooling. The W2 Threshold setting has no affect on a 2 stage or modulating furnace. The W2 Threshold setting only affects Auxiliary/Backup on heat pump systems.

For a detailed commissioning and installation video, including further instructions on the Daikin One+ smart thermostat, please visit the thermostat website at [https://daikinone/smart_thermostats/oneplus/pros/](https://daikinone/smart_thermostats/oneplus/pros/)

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**WIRING INSTRUCTIONS**

*ClimateTalk™ Daikin One+ smart thermostat or CTK04ae communicating thermostat*

*Figure 2a*

For a detailed commissioning and installation video, including further instructions on the Daikin One+ smart thermostat, please visit the thermostat website at [https://daikinone/smart_thermostats/oneplus/pros/](https://daikinone/smart_thermostats/oneplus/pros/)

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*Daikin One+ smart thermostat or CTK04ae communicating thermostat*

*Figure 2a*

For a detailed commissioning and installation video, including further instructions on the Daikin One+ smart thermostat, please visit the thermostat website at [https://daikinone/smart_thermostats/oneplus/pros/](https://daikinone/smart_thermostats/oneplus/pros/)

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**Typical “non-communicating” Thermostat**

*Figure 2c*

Typical thermostat wired and programmed for 1 heat & 1 cool. Refer to Mfr’s instructions.

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**Typical Heat Pump Thermostat**

*Figure 2b*

Typical Heat Pump Thermostat configured for 2 heat & 1 cool. Refer to Mfr’s instructions.

---

**Typical “non-communicating” HP Thermostat**

*Figure 2b*

Typical Heat Pump Thermostat configured for 2 heat & 1 cool. Refer to Mfr’s instructions.

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**WiFi Thermostat # EWT-855i**

*Figure 2d*

WiFi thermostat configured for 1 heat & 1 cool. Refer to Mfr’s instructions. Nest or Ecobee brand Thermostats are also compatible.
Daikin Communicating Inverter System “FIT”

“FIT” INVERTER OUTDOOR UNIT

Communicating CAPE/CAPEA or CHPE EEV DX Coil

Communicating AIR HANDLER or FURNACE

EWC highly recommends wiring all components as shown above in a daisy chain (series) configuration. Avoid making all wire connections at the furnace or air handler. Note that by doing so, there are never more than two wires connected to each screw terminal.

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

The UT3000 panel was designed to be Plug and Play! We have provided several typical field wiring diagrams for your reference. Your actual field wiring may vary but in most cases will match these diagrams. 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. Your new communicating heat pump may have a non-communicating backup/auxiliary system, or your new communicating furnace still uses the non-communicating condensing unit outside. In all of these cases, the UT3000 is compatible. Other non-communicating application wiring diagrams and solutions are available. Contact EWC Controls Technical Support for.

**“Daikin or ComfortNet” communicating 2 Stage Heat Pump or A/C System**

Four wires are required to each component. **Plug & Play**

**“Daikin or ComfortNet” communicating INVERTER Heat Pump or A/C system**

Two or four wires are required to each component. **Plug & Play**
Existing Boiler with New HP System

You may have a new Communicating Heat Pump but want to use your Old Boiler as the Auxiliary backup rather than electric resistance heat. Connect the T&T circuit from your boiler control panel to the Rh and W2/E terminals on the UT3000.

Note: You must specify the equivalent KW electric strip heat rating in the Air Handler ClimateTalk User Menu (or dip switch settings) to achieve the correct/desired airflow!

Communicating Furnace with 24v Legacy Air Conditioner

Four wires are required from the UT3000 to the Communicating furnace. Two wires are required to the 24v air conditioner.

Note: You must specify the tonnage of the non-communicating outdoor unit, inside the Furnace equipment User Menu, in order to achieve the correct airflow!
Note: The 500mA Damper Auto-Reset Circuit Breaker may trip, if too many Spring Type dampers are connected to a single zone!...You can connect only one (1) Model RSD or any other competitor's Spring type damper to a single terminal block (depending on current draw) without tripping the breaker. You can connect up to eighteen (18) Model ND, URD, or SID type dampers to a single terminal block without tripping the breaker.

Note: You can select all zone dampers to default “OPEN” or “CLOSE” after all zone demands are satisfied, and no HVAC demands are detected, from any zone thermostats.

ZONE DAMPER MOTOR TERMINAL BLOCK DESIGNATION & FUNCTION

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Designation &amp; Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>24vac Power to Close a Damper</td>
</tr>
<tr>
<td>PO</td>
<td>24vac Power to Open a Damper</td>
</tr>
<tr>
<td>C</td>
<td>24vac Common (Neutral)</td>
</tr>
</tbody>
</table>

Figure 4

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

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

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. (C to Com)(PO to PO)(PC to PC) (1-1) (4-4) (6-6)

EWC Controls Typical Spring Return Motor Wiring

Figure 5b

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

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.

Figure 5d

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

Isolation Relay Wiring

SPST action with 24vac coil Relay is shown de-energized. All dampers are OPEN

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

The UT3000 utilizes a zone weighting feature. You can select the weight for each zone independently. For example, if zone 1 has more heat loss/gain than zone 2 or zone 3, you can now assign it more weight, which is a big advantage over the old “Legacy DMD” demand feature. Here are some examples on how this new feature works.

### LIMIT SAS PID “N” = PID LOOP ACTIVE

The equation for calculating the “SYSTEM Initial and Maximum demand when active zones are calling is the following:

\[
\text{Zone WEIGHT} \times \text{Tstat DEMAND} = \left(\frac{\text{Initial System Demand}}{100}\right)
\]

\[
\text{Initial System Demand (x3)} = \left(\frac{\text{Maximum System Demand}}{100}\right)
\]

#### EXAMPLE 1:

<table>
<thead>
<tr>
<th>Assigned Weight</th>
<th>Thermostat Demand</th>
<th>System Demand</th>
<th>Calculated Initial Demand</th>
<th>Max System Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1 = 70%</td>
<td>30% (.30)*</td>
<td>21%</td>
<td>36%</td>
<td>100%*</td>
</tr>
<tr>
<td>Zone 2 = 15%</td>
<td>100% (1.0)*</td>
<td>15%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 3 = 15%</td>
<td></td>
<td>36%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Unless Thermostat(s) Demand Changes

#### EXAMPLE 2:

<table>
<thead>
<tr>
<th>Assigned Weight</th>
<th>Thermostat Demand</th>
<th>System Demand</th>
<th>Calculated Initial Demand</th>
<th>Final System Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1 = 65%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 2 = 35%</td>
<td>30% (.30)*</td>
<td>11%</td>
<td>11%</td>
<td>33%*</td>
</tr>
</tbody>
</table>

* Unless Thermostat(s) Demand Changes

### UT 3000 SYSTEM HEAT/COOL STAGING SCALE

<table>
<thead>
<tr>
<th>OFF 0%</th>
<th>HP: Y1 (Heat or Cool)</th>
<th>HP: Y2 (Cool)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>HP: Y2 (Heat)</td>
<td>HP: W2 (Aux)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HP= HEAT PUMP SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC= HEAT/COOL SYSTEM</td>
</tr>
</tbody>
</table>

Threshold  
(\(65\% - 99\%\))
ZONE WEIGHTING FEATURE

The UT3000 utilizes a zone weighting feature. You can select the weight for each zone independently. For example, if zone 1 has more heat loss/gain than zone 2 or zone 3, you can now assign it more weight, which is a big advantage over the old “Legacy DMD” demand feature. Here are some examples on how this new feature works.

LIMIT SAS PID “Y” = PID LOOP INACTIVE

The equation for calculating the “SYSTEM” starting and final demand when active zones are calling is the following:

\[ \text{Zone WEIGHT} \times \text{Tstat DEMAND} = (\text{Initial System Demand}) \times \frac{1}{100} \]

**EXAMPLE 1 :**

<table>
<thead>
<tr>
<th>Assigned Weight</th>
<th>Thermostat Demand</th>
<th>System Demand</th>
<th>Calculated Initial Demand</th>
<th>Max System Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1 = 70%</td>
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</tr>
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<td>100% (1.0)*</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Zone 3 = 15%</td>
<td></td>
<td>36%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Unless Thermostat(s) Demand Changes

**EXAMPLE 2 :**

<table>
<thead>
<tr>
<th>Assigned Weight</th>
<th>Thermostat Demand</th>
<th>System Demand</th>
<th>Calculated Starting Demand</th>
<th>Final System Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1 = 65%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>11%</td>
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*Unless Thermostat(s) Demand Changes

**UT 3000 SYSTEM HEAT/COOL STAGING SCALE**

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<tr>
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<th>HP: Y2 (Heat)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**HP=** HEAT PUMP SYSTEM  
**HC=** HEAT/COOL SYSTEM

**Threshold**

- **(Fixed)**
- **(Adjustable 65% - 99%)**
**SYMPTOM**
Cooling thermostat displays E11 fault code. LCD & LED’s are responding properly.

**SOLUTIONS**
Some HVAC systems require a “System Test” prior to normal operation. Access the Zone 1 thermostat and perform the System Startup Test. Clear all fault codes in the Outdoor and Indoor unit diagnostic menu folders. Access the Zone 1 thermostat and initiate System Charge mode.

HVAC system does not always respond properly. Periodic faults are displayed on thermostats. Cannot achieve 0.6vdc BIAS on the system data wires.

**SOLUTIONS**
Check BIAS DC voltages: Data 1 to C = 2.8 & Data 2 to C = 2.2 or Data 1 to C = 1.9 & Data 2 to C = 1.3. Combination of CAPE coil and 2 stage furnace will read Data 1 to C = 2.3 & Data 2 to C = 1.7. TERM / DS1 switches on the communicating outdoor unit should be set to OFF. Clear all fault codes in the Outdoor and Indoor unit diagnostic menu folders.

LCD & LED’s function and HVAC system functions normally but dampers do not respond.

**SOLUTIONS**

LCD & LED’s do not function and HVAC system does not respond.

**SOLUTIONS**
Check HVAC & UT3000 system transformer supply voltage. Check HVAC & UT3000 system 24vac transformer voltage/fuse/breakers. Test all wires for Continuity, shorts to 24v Common or shorts to earth ground. Check HVAC & UT3000 system wiring for shorts and miswiring.

Time Delay is Active and won’t allow Heat or Cool to Function.

**SOLUTIONS**
When Troubleshooting, Simultaneously Press the Back & Forward buttons for 1 second to Bypass any Active Time Delay.

---

**CHECK YOUR WIRING**

**DETECTING 24vac SHORTS**
HVAC system not responding and UT3000 LED’s are off.

**SYMPTOM:** Entire Panel or a Single Zone appears to be dead!

If 24vac short has occurred, 24vac will be present at the UT3000 24v Input terminals R & C, but 24vac will not be present at any thermostat R&C terminals.

One or more thermostats will not power up and/or show a display.

**SOLUTIONS:** Remove wires from thermostat terminal blocks and allow 140 or 350mA circuit breaker to cool! Find and repair short(s) in thermostat field wiring. Restore 24 vac power.

**ISOLATING 24vac SHORTS**
140mA, 350mA & 500mA circuit breakers protect the UT3000 and react to a short in the Thermostat or Damper Motor field wiring.

**SYMPTOM:** Detecting 24v shorts to common or shorts to earth ground

**SOLUTIONS:** 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.

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**TECHNICAL SUPPORT**

**Detected 2.5A (F1) breaker is tripped it will get hot to the touch! The LCD and the LED’s will not illuminate!**

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, 350mA 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 shorted wires or device 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 a non-communicating thermostat is connected and a short occurs on the 24v wires, the thermostat will not power up and that zone will not function. Find and repair the short using the methods described above.

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**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.ewccontrols.com**

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

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JOB NOTES:

This Technical Bulletin and Addendum sheet are available for download at www.ewccontrols.com.

For installation guidance and wiring diagrams on “twinning” (4 and 5 zone) applications, see the included Addendum sheet #090376A0180 rev R.
If you have questions pertaining to this product, contact EWC Technical Support at 800-446-3110. You can also Email us at tech@ewccontrols.com.