

Leave this bulletin on the job site for future reference!

The **BMPlus Zone Control System** allows you to easily upgrade an inefficient single zone HVAC system, into a Multi-zone, Energy savings, Comfort producing, HVAC system. The Superior Design, Intuitive Firmware, Simple Setup Options, Easy to Understand wiring and Backwards Compatibility, makes the BMPlus Zoning system the Contractors dream. Combined with EWC Motorized Dampers and any off-the-shelf Thermostats, EWC Controls sets another high standard in the residential & light commercial Forced Air Zoning Industry.

Zone Capacity

The main module controls three zones using motorized dampers and may be expanded to 5 or 7 zones, using 1 or 2 Model **XM2 Expansion Modules**.

Compatible HVAC Systems

Controls 2 & 3 stage conventional or dual fuel heat pumps, without the need for dual fuel kits. Also single or two-stage gas, oil, & hydronic heating systems, with single or two stage air conditioning. Constant or variable speed fan systems.

Compatible Thermostats

Compatible with any off the shelf Heat Pump Thermostat (2heat/1cool). You may also use any regular Heat/Cool thermostat (1heat/1cool). You may still use regular Heat/Cool thermostats to control a Heat Pump system.

Automatic Heat/Cool Changeover

The BMPlus Zone system features automatic changeover from any thermostat allowing for individual zone comfort from the HVAC system.

Status LED

The STATUS LED pulses as a steady heart beat to indicate active Micro-processor status.

System LEDs

On board LED's illuminate to indicate HVAC system mode, system status, active and inactive zone identification. See page 10 for details.

Damper LEDs

LEDs labeled Zone 1 thru Zone 7 indicate which dampers are energized open.

Operating Power

INPUT VOLTAGE: 19-30VAC 60 Hz
 Transformer 40-100VA MAX. NEC Class 2.
CURRENT DRAW: Max 15VA @ 24VAC.
OVER-CURRENT PROTECTION: 4.0 amp

Operating Conditions

TEMPERATURE: -20° to 160°F (-29° to 71°C)
HUMIDITY: 0% - 95% RH Non-Condensing.

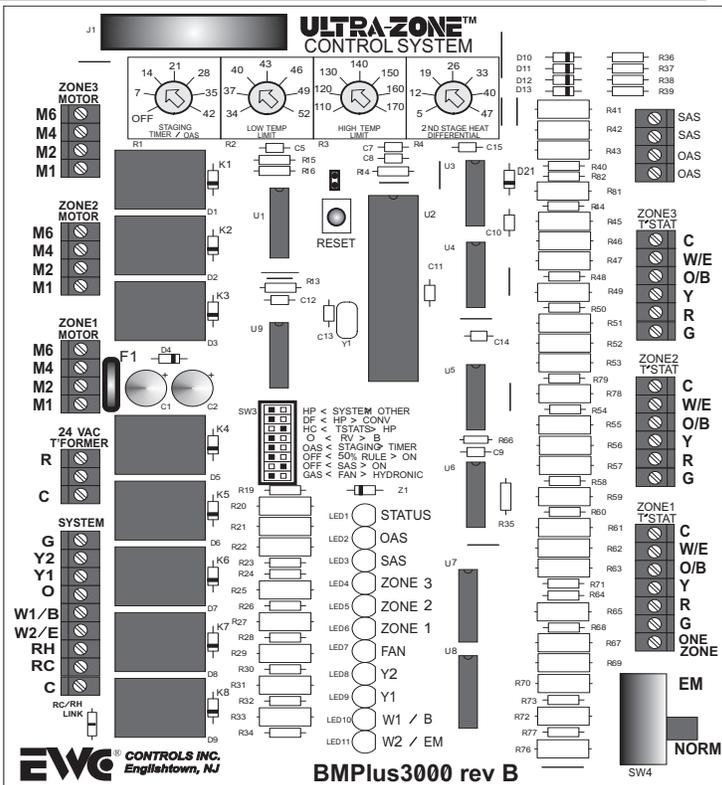


Figure 1

Box Contents

- * BMPlus 3000 Control Panel
- * Supply Air Sensor
- * Technical Bulletin TB228
- * Mounting Hardware

Thermal Circuit Breaker

The BMPlus module has a Thermal circuit breaker that protects the module(s) from shorts in the damper and thermostat field wiring. **It will not protect against shorts in the HVAC system wiring.**

CAUTION: When the circuit breaker is tripped it will get quite hot. To reset the breaker: **Shut off power to the panel. Find and repair the short. Restore the 24VAC power.**

Indoor Fan Control

Any zone can activate the indoor fan and only the dampers in zones calling for continuous fan operation will open. Continuous fan operation will only occur when there are no active or pending, heat or cool demands. A dip switch is provided to enable automatic fan operation in heat mode. Useful for straight **electric heat** or **hydronic** heat applications.

BMPPlus 3000 FIRMWARE/HARDWARE FEATURES

*Built-In Timer Settings

The panel has seven built-in Delay Timers that insure safe & reliable operation.

- * Start-up Delay Timer = 3 minutes-fixed
- * Short Cycle Timer = 3 minutes-fixed
- * Change Over Timer = 4 minutes-fixed
- * Opposing Call Timer = 20minutes-fixed
- * Staging Timer = OFF or 7-42 min. -Adj.
- * Supply Air Limit Timer = 3minutes-fixed
- * Purge Delay Timer = 90 seconds-fixed

*Startup Delay Timer

The panel will not activate any cooling or heating operations until the startup delay has expired. This occurs after any initial power up, after any power failure or after pressing the **Reset** button for 7

*Short Cycle Timer

When all zone demands are satisfied, the panel will not resume the same mode of operation for a minimum of 3 minutes.

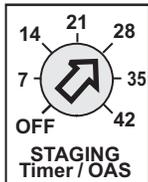
*Changeover Timer

A built-in timer prevents the system from rapidly switching between heating and cooling modes. At the end of a call, a 4 minute timer is started and the panel will not switch to the opposing mode until the timer has expired.

*Opposing Call Delay Timer

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

Staging Timer / OAS



OFF, 7 to 42 minutes or 7 to 42 degrees F.

Any setting below 7 is off!
DO NOT set to off if using OAS

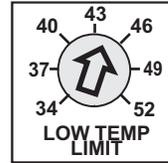
*Supply Air Limit Delay Timer

The time delay of 3 minutes must expire before the BMPPlus 3000 will re-energize heat or cool mode. This delay occurs when the processor detects the supply air temperature is higher or lower than the High or Low temperature limit settings.

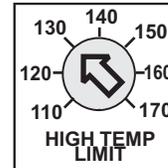
*Purge Delay Timer

The last Damper(s) will be held Open for 90 seconds at the end of every call allowing a system purge into the last zone that was calling.

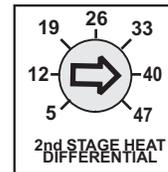
Cooling and Heating Limit Controls



The Adjustable Cooling Limit potentiometer sets the supply air temperature at which the cooling is cycled off and the fan continues to run, allowing the coil to warm up.



The Adjustable Heating Limit potentiometer sets the 1st stage heat supply air temperature, at which the heating is cycled off and the fan continues to run, allowing the heat exchanger or coil to cool down.



The Adjustable 2nd stage heat differential potentiometer sets the 2nd stage heat supply air temperature, at which the heating is cycled off and the fan continues to run, allowing the heat exchanger or coil to cool down.

Example:
Hi Temp. Limit = 130°F
plus 2nd stg. ΔT = 40°F
New Limit = 170°F.

NOTE: Allows the supply air sensor to be installed in the supply air plenum, regardless of the coil/heat exchanger configuration. Allows the installer to fine tune virtually any multi stage heating system!

Reset BUTTON



RESET

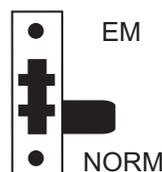
Always reset the CPU anytime you make dip-switch changes to the BMP3000 panel!

DO NOT use a sharp object to press the button! Your finger tip will work fine.

The separate reset buttons on the old BMP3000 have been replaced by a single button with dual functions. Momentarily pressing the RESET button clears the built-in timers controlling the Startup delay timer, Short cycle timer, W2 timer, Supply air sensor timer and the Changeover timer. This enables you to test the installation faster. Caution should be observed when using this button.

Pressing the RESET button for 7 seconds will reset the CPU for the entire zone system.

Emergency Heat Switch



An On-Board Switch is provided that allows the Customer to set the system to the Emergency heat mode.

This switch is shown in the NORMAL position.

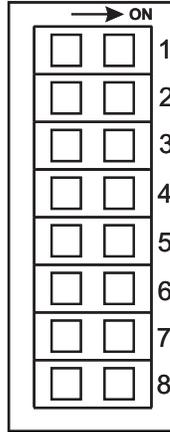
This switch would be used for Heat Pump applications where the Customer chooses to use Regular Heat/Cool thermostats instead of Heat Pump thermostats.

Selecting the Options Using the DIP Switches

***FS = Factory Settings

RECORD YOUR OWN DIP SWITCH SETTINGS HERE

Programming and setting up the BMPlus 3000 to control your HVAC system is very easy! Look below for an explanation of each dip switch function and choose your settings. Some functions may not apply to your application. Then use a pencil to mark/record your settings. If the settings get changed later on, you will have a record of the original settings.



HP < SYSTEM > OTHER FS
DF < HP > CONV FS
FS **HC < TSTATS > HP**
FS **O < RV > B**
OAS < STAGING > TIMER FS
FS **OFF < 50%RULE > ON**
FS **OFF < SAS > ON**
FS **GAS < FAN > HYDRONIC**

HP < SYSTEM > OTHER

Choose the type of **HVAC system** you want to control. Select **HP**, if your system is any type of Heat Pump. Select **OTHER**, if your system is a standard Gas or Oil furnace. Other setting also applies to straight electric furnaces or hydronic (hot water coil) heating systems.

DF < HP > CONV

Choose the **type of Heat Pump** you want to control. Select **DF** (*Restricted Mode*) if you wish to lock out the compressor during auxiliary heat operation, typically set for Dual Fuel operation. Select **CONV** (*Unrestricted Mode*) if you wish to have the compressor run during auxiliary heat operations, typically set for Electric Back-up.

HC < TSTATS > HP

Select **HC**, if you want to use regular **Heat/Cool** thermostats on your job. Select **HP**, if you want to use **Heat Pump** thermostats on your job. Remember that you can use standard Heat/Cool Thermostats on a Heat Pump application. **IMPORTANT NOTE:** The BMPlus 3000 Zone Control System allows Heat Pump thermostats to be connected to all zones. Using heat pump thermostats means that the zone panel will obey thermostatic demands. This comfort over-ride feature provides a level of versatility to your zoning system and gives the homeowner comfort control over the system, instead of waiting for the adjustable timer to energize 2nd stage heat. *True thermostatic staging is not available when using 2 Stage compressor heatpumps, it is advisable to use Heat/Cool thermostats and allow the BMPlus to stage via the on-board timer. If true thermostatic staging is required, then it is recommended to upgrade to the Model UZC series of Control Panels.*

O < RV > B

Select the correct **Reversing Valve** signal for your particular Heat Pump. Choose "O" for any Heat Pump that energizes the RV in the cooling mode. Choose "B" for any Heat Pump that energizes the RV in heating mode.

OAS < STAGING > TIMER

Select **OAS**, if you want to delay auxiliary heat based on the outside air temperature sensor. Select **TIMER**, if you want to delay staging heat & cool based on the adjustable on-board timer. **NOTE:** 'Y2' defaults to a 30 minute delay, when OAS is chosen. **NOTE:** An optional Outside Air Sensor (OAS) is required to use the OAS feature.

OFF < 50%RULE > ON

Select **OFF**, if you do not want to inhibit auxiliary heat/cool based on the total number of zones calling. Select **ON**, if you want to inhibit auxiliary heat/cool based on the total number of zones calling. More than half the total zones must be calling for the same mode, or auxiliary will not activate. If **DF** or **OAS** has been selected, the 50% rule will apply to cooling operations only, auxiliary heat will not be affected. The 50% rule will always dominate the staging timer or thermostat demands unless Emergency mode is active.

OFF < SAS > ON

Select **OFF**, if you do not want to use the supply air sensor included with the BMPlus Zone Control system. Select **ON**, if you intend to use the included supply air sensor. *Refer to the data sheet included with the supply air sensor for details.*

GAS < FAN > HYDRONIC

Select **GAS**, if your HVAC system is a gas or oil forced air furnace. Select **HYDRONIC**, if your HVAC system has a hot water coil, or straight electric heat with no indoor blower support. Useful when you need the indoor blower to run automatically in heat mode, just like it does in cool mode. **NOTE:** When you select HP on dip switch #1, the indoor fan mode is automatically set for you. There is no need to move this switch when setting up for Heat Pump operations.

INSTALLATION & 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.

Mount the panel housing in a suitable/convenient location. Mounting hardware is provided. Avoid locations that may become wet or produce condensation. Hot attics are OK. Use the knockouts on the panel housing as wire entryways. Strain relief fittings can be used if desired. Use care and do not damage the circuit board when removing the knockouts and making wire connections. NOTE: The 24vac power supply should be supplied by a separate transformer. DO NOT use the 24vac power supply from the HVAC system unless there is no other alternative. 2 zones and 2 dampers is the limit when stealing voltage from the HVAC system.

POWER WIRING

A single 24vac, 40va UL Listed transformer can power the BMPlus3000 Main module with up to 12 genuine ND or URD dampers. See page 9 for more load and transformer data.

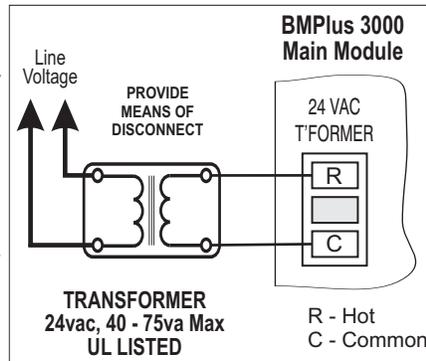


Figure 2 BMPlus 3000 Power wiring

HEAT PUMP THERMOSTATS

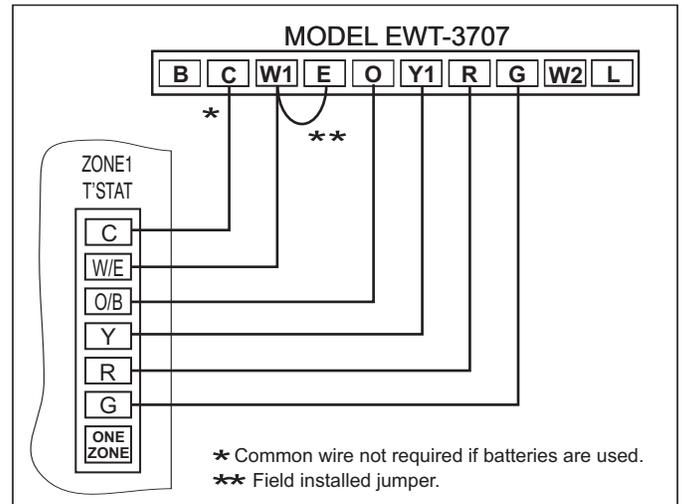


Figure 2c. Model EWT-3707: Configured for 2 heat 1 cool heat pump (HP1 mode). See thermostat for further details.

NOTE: The BMPlus 3000 allows the user to install Heat Pump thermostats on all zones. You may still use regular Heat/Cool type thermostats with a Heat Pump system and use the Staging Timer to energize the auxiliary heat. Doing so may save more energy. It is advisable to use Heat/Cool thermostats with 2 stage compressor Heat Pumps.

Thermostat Wiring

HEAT/COOL THERMOSTATS

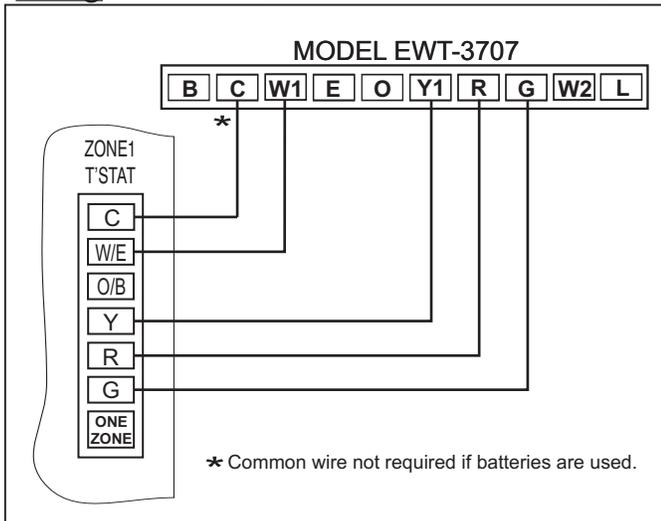


Figure 2a. Model EWT-3707: Configured for 1 heat 1 cool (SS1 mode). See thermostat instructions for Further details.

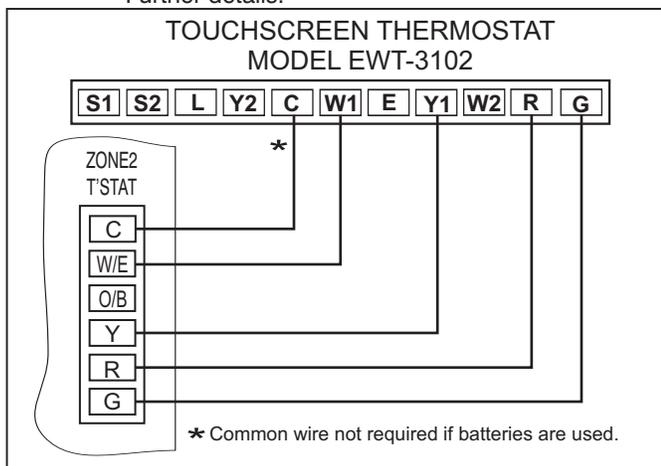


Figure 2b. Model EWC-3102: Configured for 1 heat 1 cool (SS1 mode). Can be configured for heat pump. See thermostat instructions for further details.

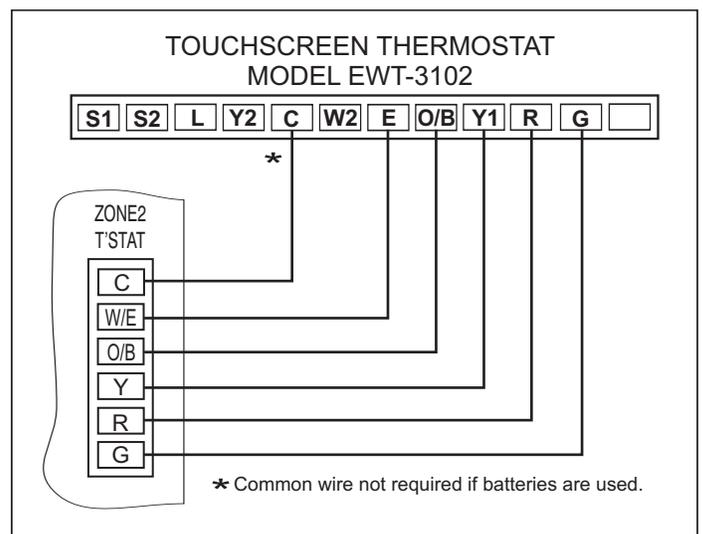


Figure 2d. Model EWC-3102: configured for 2 heat 1 cool heat pump (HP1 mode). See thermostat instructions for further details.

THERMOSTAT WIRING CONTINUED

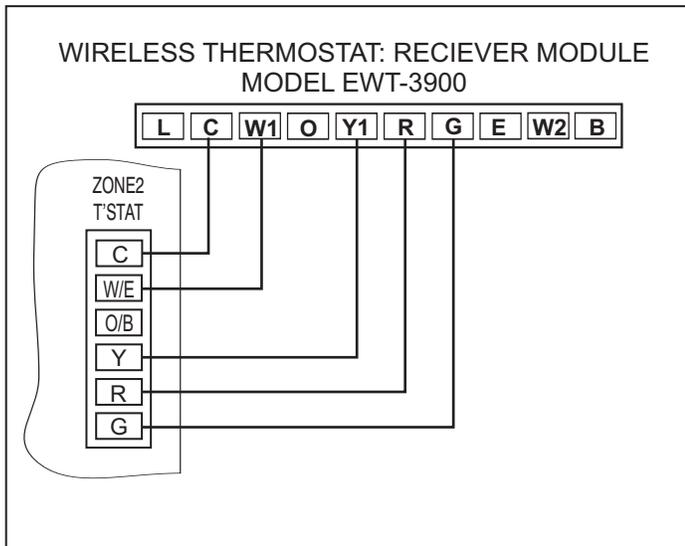


Figure 3 Model EWT-3900: Wireless Thermostat. Configured for 1 heat 1 cool (SS1 mode). Can be configured for heat pump. See thermostat instructions for further details.

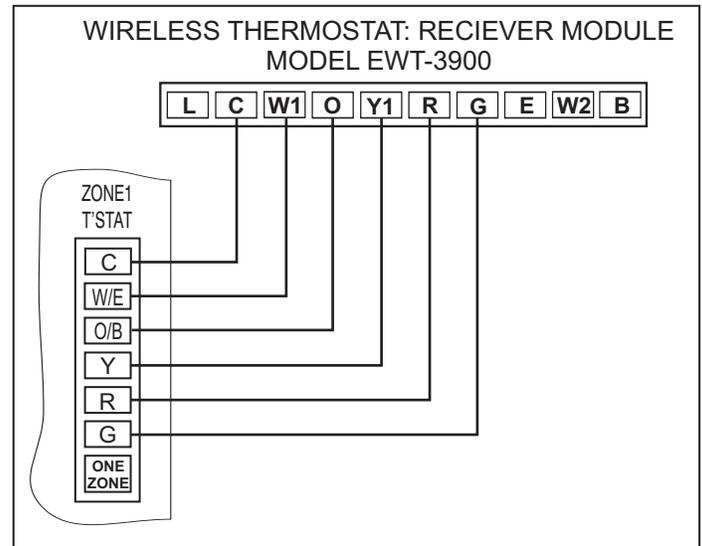


Figure 4 Model EWT-3900: Wireless Thermostat. Configured for 2 heat 1 cool heat pump (HP1 mode.) See thermostat instructions for further details.

WIRING FOR RADIANT FLOOR HEAT

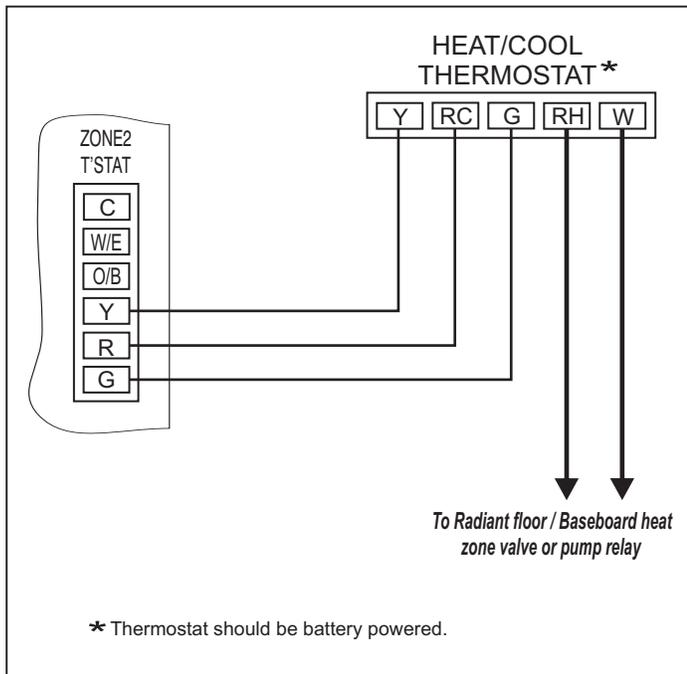


Figure 5 Wiring a split circuit thermostat to operate a Radiant floor heating or Baseboard heating Hydronic system. The BMPlus 3000 controls the cooling only in this type of configuration.

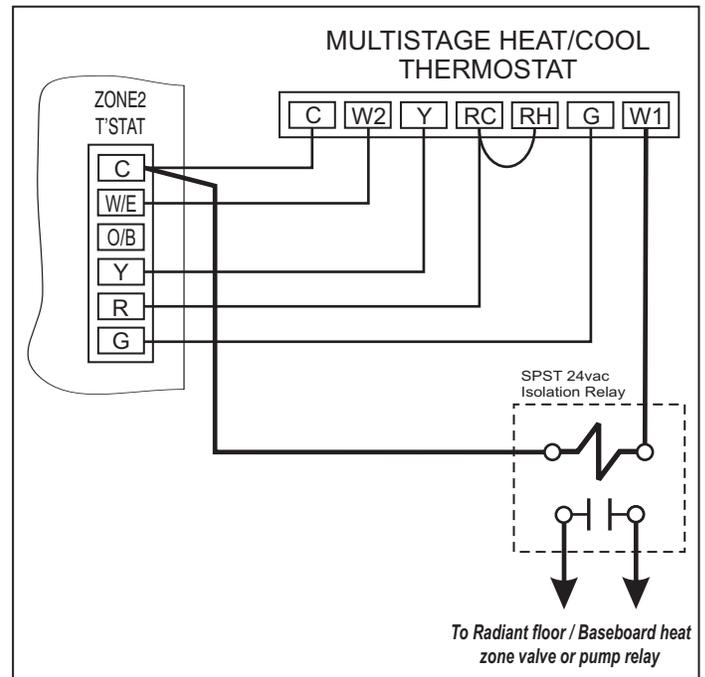


Figure 6 Wiring for a Radiant floor loop as the first stage of heat via the isolation relay and 2nd stage Forced Air heat is controlled through the zone panel.

SYSTEM WIRING

Single Transformer Gas or Electric Furnace & A/C 1 or 2 Stage Heat

Typical gas or Electric Furnace with A/C. Note the common "C" wire is connected to the SYSTEM terminal block of the BMPlus 3000.

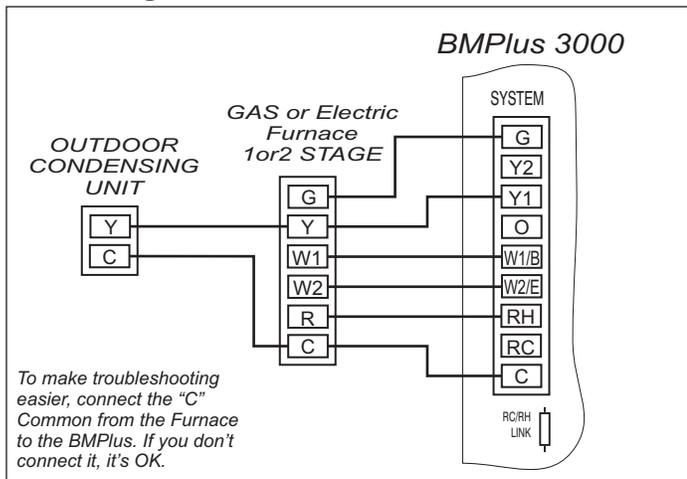


Figure 7 Single transformer Conventional system.

Conventional or Dual Fuel 2 Heat / 1 Cool Heatpump with O (Cool) Type Reversing Valve

Typical heat pump system wiring with electric resistance or Gas backup heat (No Dual Fuel kit required). This diagram applies to air cooled or geothermal / ground source systems.

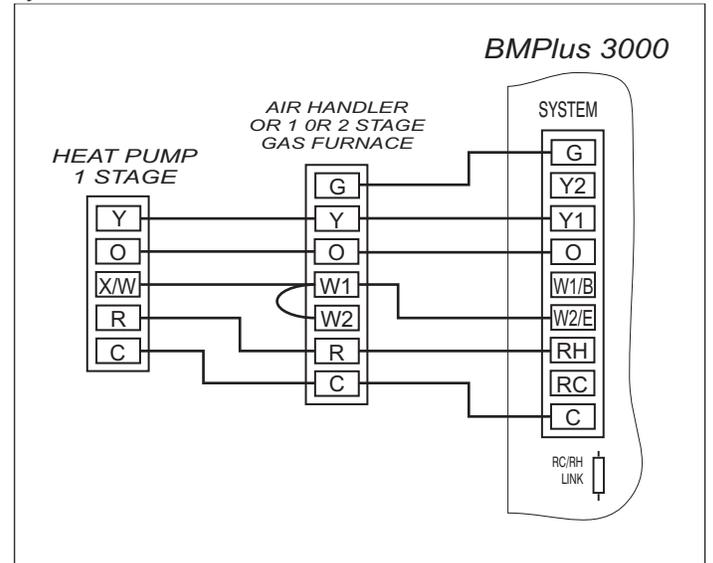


Figure 9 -- 2 Heat / 1 Cool Heat Pump System

Two Transformer Systems

Wiring diagram for a typical oil burner, hydronic zone / Air handler with A/C. Cut the Rc / Rh link on the BMPlus Panel for systems requiring isolation.

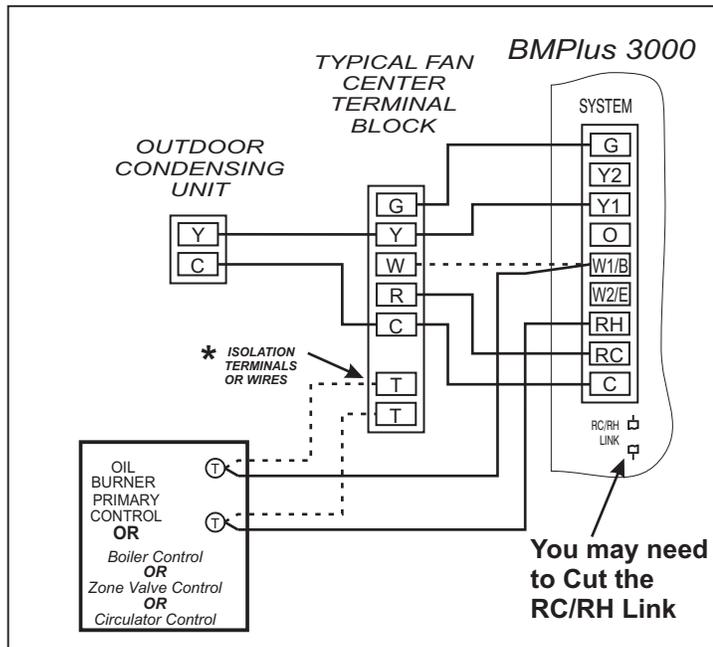


Figure 8 Two transformer Oil or Hydronic / A/C system.

*** Note: Your Air Handler may include a W terminal. That means it may have it's own isolation circuit. If you can confirm this, simply connect the W1/B terminal to the W terminal on the air handler. Do not cut the Rc/ Rh jumper. Wire up your Oil Burner, Circulator relay, or Hydronic Zone valve to the isolation contacts or wires provided in the air handler. The fan is controlled via the time delay relay inside the air handler.**

Don't worry if you accidentally cut the Rc/Rh link. Just install your own jumper across the Rc/Rh terminals!

Conventional or Dual Fuel 3 Heat / 2 Cool Heat Pump with O (Cool) Type Reversing Valve

Conventional or Dual Fuel Heat Pump wiring with 3 Heat / 2 Cool. With electric or Gas Furnace Backup (No dual fuel kit is required). This diagram applies to air cooled or geothermal / ground source systems.

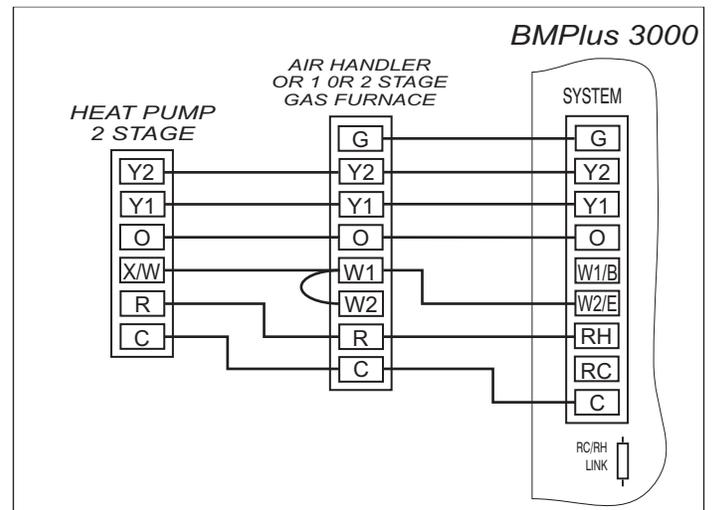


Figure 10 - 3 Heat / 2 Cool Heatpump System

****Note that a Conventional & Dual fuel heat pump wire up more or less the same. The difference is how auxiliary heat operates. In a Conventional system, the indoor fan & the compressor continues to run when auxiliary energizes. In a Dual Fuel system, the indoor fan & the compressor shuts down when auxiliary energizes. The BMPlus 3000 will perform these functions automatically. All you have to do is set the dip switches to the correct settings. Select CONV or DF at dip switch #2. Install regular Heat/Cool thermostats and choose to activate auxiliary heat by TIMER or by OUTSIDE AIR TEMPERATURE. (Optional Sensor required). Or you may choose to install Heat Pump Thermostats on all zones. When the thermostat auxiliary heat demand is satisfied, the BMPlus 3000 will stage down, unless DF or OAS has been selected and the outdoor temperature is lower than the OAS changeover setting. In that case the system will continue in FUEL mode, until all current heating demands are satisfied.**

SYSTEM WIRING CONTINUED

Single Transformer Gas & A/C 2 stage heat 2 stage cool

Typical 2 stage gas furnace with 2 stage A/C. Constant or variable speed systems can be connected and controlled. Choose Timer or Outside air to delay 2nd stage.

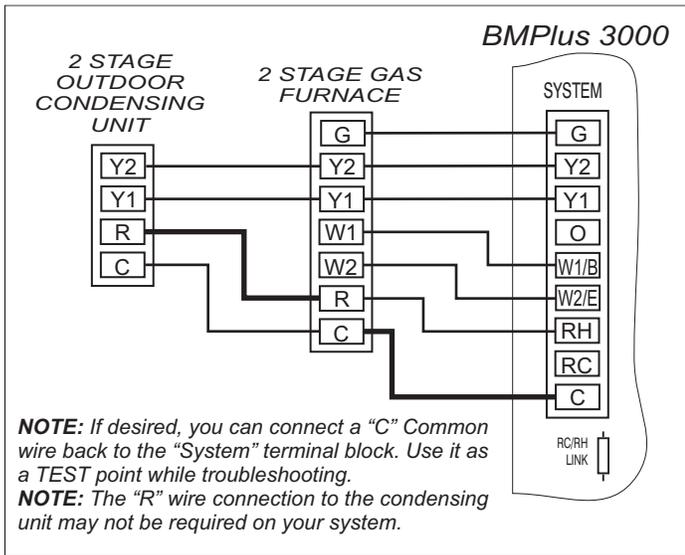


Figure 11 Single transformer 2 Stage Heat & Cool system

Warning: All of the wiring diagrams provided are general in nature and may not perfectly match your particular application, due to differences in HVAC Mfr's design and terminal designations and functions! Variations on these diagrams and other System or Thermostat applications are available by contacting the EWC Technical Support Hotline.

Conventional or Dual Fuel 3 Heat / 2 Cool Heat Pump with B (Heat) Type Reversing Valve

Conventional or Dual Fuel Heat Pump wiring with 3 Heat / 2 Cool with B (Heat) Type Reversing Valve. Electric or Gas Furnace Backup (No dual fuel kit is required). This diagram applies to air cooled or geothermal / ground source systems.

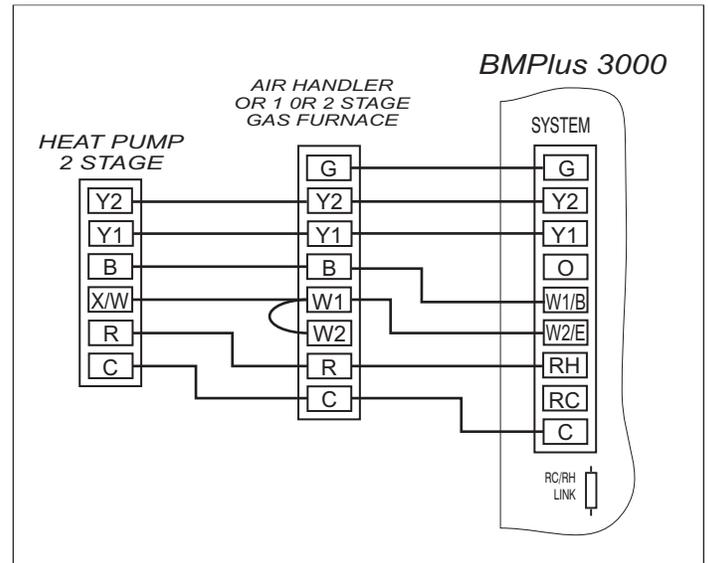


Figure 12 -- 3 Heat / 2 Cool Heat Pump with B (Heat) Type Reversing Valve

ENHANCED FEATURES AND FUNCTIONS

MODULE TO MODULE FACTORY POWER WIRING

The BMPlus 3000 includes Factory Power Wiring on all expanded systems. The 24 vac power to the expansion modules is fed through the bus cable. This simplifies your wiring and minimizes the chances of reversing polarity.

DUAL FUEL COMPATIBLE

The BMPlus 3000 is compatible with Dual Fuel Heat Pumps. Dual Fuel kits are not required. Select staging based on Adjustable Time Delay or an Optional Outside Air temperature Sensor. The intelligent firmware does the rest.

SHORTED ZONE FEATURE FIRMWARE

The BMPlus 3000 Zone Control System includes the Shorted Zone Feature. This feature allows the BMPlus to ignore demands from a zone thermostat that is putting out simultaneous demands for heat & cool. A condition most likely due to a short in the field wiring, incorrect wiring, or a defective thermostat. The BMPlus will honor any legitimate demands from any other zone(s), except the shorted zone. When the problem is identified and repaired, the BMPlus 3000 will automatically recognize that zone.

- * OFF, 7 TO 42 MINUTE STAGING TIME DELAY SETTINGS
- * 7 TO 42°F. OUTSIDE AIR CHANGEVER
- * OPERATES WITH MULTI STAGE HEATPUMPS
- * ADJUSTABLE DIFFERENTIAL LIMIT CONTROL

- *SECOND STAGE 50% ZONE RULE SAVES ENERGY
- * STATUS LED's ARE INCLUDED ON ALL MODULES
- *1 ZONE MODE COMPLIES WITH CALIFORNIA TITLE 24
- * SIMPLIFIED WIRING AND EASY SYSTEM SETUP

DAMPER WIRING AND CONFIGURATION

Note: All zone dampers default to the "OPEN" position after a purge delay has occurred. Dampers also default "OPEN" during changeover & short cycle delays, and when all zone demands are satisfied, and no signals are detected from the thermostats.

REFERENCE THESE DIAGRAMS PRIOR TO INSTALLATION AND POWER WIRING. DOING SO WILL SAVE TIME AND LABOR LATER ON.

ZONE MODULE DAMPER MOTOR TERMINAL BLOCK DESIGNATION & FUNCTION

- Terminal M6 24vac to Close a damper(s)
- Terminal M4 24vac to Open a damper(s)
- Terminal M2 Constant 24vac HOT
- Terminal M1 Common 24vac

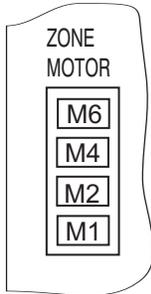


Figure 13

All Models ND, URD and SID Damper Wiring

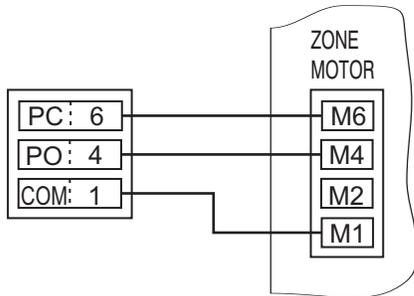
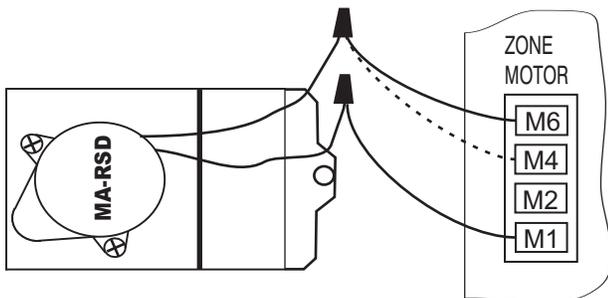


Figure 14

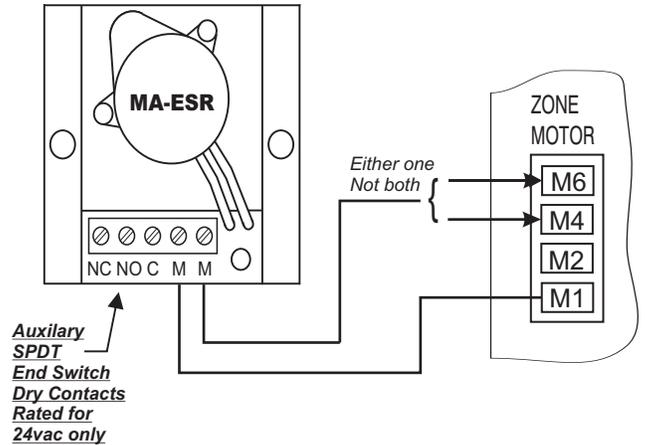
All Models RSD Damper Wiring



A Spring Open Damper is wired to M1 & M6
A Spring Close Damper is wired to M1 & M4

Figure 15

All Models ESR Damper Wiring



A Spring Open Damper is wired to M1 & M6
A Spring Close Damper is wired to M1 & M4

Figure 16

Multiple ND and/or URD Damper Wiring on a Single Zone (2-4 Dampers)

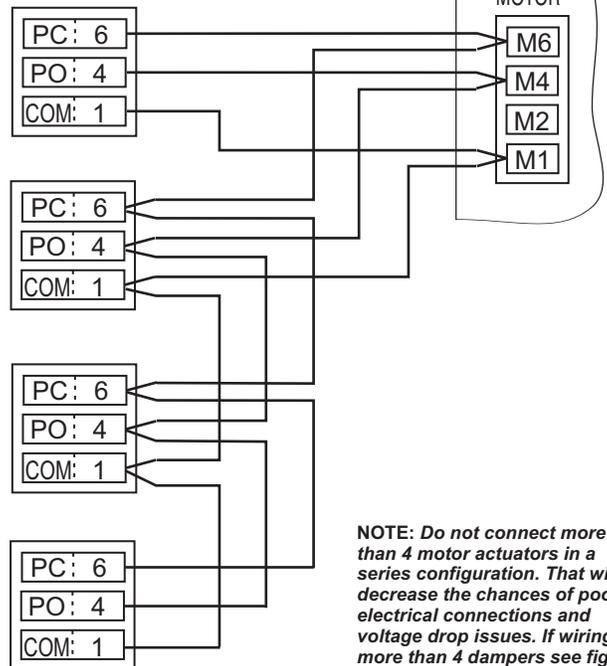


Figure 17

On all these dampers and most older style dampers, including competitor's dampers, always wire up number to number or designation to designation.

Do not overload your transformer!

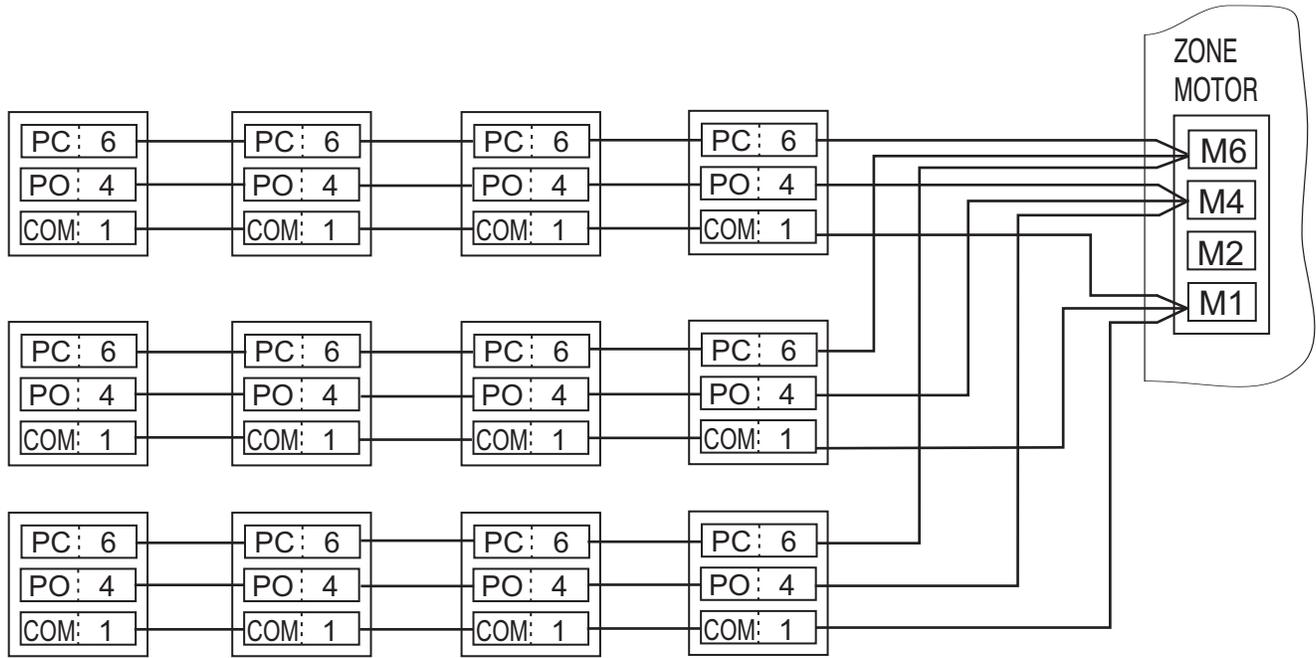
Contact EWC Controls Technical Support when you are on the job site for assistance with damper wiring. Have a Multi-Meter, pocket screw driver and wire snips on hand.

DAMPER WIRING CONTINUED

If you need to connect numerous dampers to a single zone, or you are using dampers of unknown current draw such as Spring Types, Isolation relays and separate power supplies may be required. Parallel as many dampers as you want as long the total current load of the motor actuators does not exceed the VA rating of the transformer. Other factors should also be considered, such as the full load amp rating of the isolating relay contacts, voltage drops from long wire runs and feeder conductor sizing to junction points.

NOTE: Some older style dampers and competitor's dampers cannot be paralleled and must be isolated or wired in tandem. Contact EWC Controls Technical Support for assistance.

Variations on this diagram and other damper solutions are available.



12 Dampers wired to a single zone.

Figure 18

BMPlus 3000, 5000, 7000, Revision "B" Recommended Power Solutions

Zone Panel	Transformer Size			<p>These charts show the maximum number of dampers that can be connected to the entire BMPlus3000/5000/7000 based on the transformer being used.</p> <p>Maximum number of dampers per ZONE is 12.</p> <p>Use Class 2 UL Listed 1585 Inherently current limiting transformers only!</p>	Zone Panel	Transformer Size		
	40VA	60VA	75VA			40VA	60VA	75VA
BMPlus 3000	12	22	30	<p>Spring Types @ 8 VA per damper</p>	BMPlus 3000	3	5	7
BMPlus 5000	9	19	26		BMPlus 5000	2	4	6
BMPlus 7000	5	15	23		BMPlus 7000	1	3	5

ND / URD's @ 2 VA per damper

Spring Types @ 8 VA per damper

Non-inherently current limiting transformers must have field provided over-current protection on the secondary 24 vac output. The table values provided pertain to genuine ULTRAZONE Dampers and Competitors typical 24vac Spring loaded dampers. Included in these VA load ratings are the correct number of thermostats, the BMPlus Zone System, and a 5% field factor. Spring loaded dampers draw higher currents & require more power.

TESTING DAMPER MOTORS

- ND / URD / SMD / BMD Dampers** - Connect 24vac common to terminal 1 and 24vac hot to terminal 4. Damper should Open. Remove 24vac hot from terminal 4 and apply to terminal 6. Damper should Close.
- RDN / SMDL / BMDL Dampers** - Connect 24vac common to terminal 1 and 24vac hot to terminals 2 and 4. Damper should Open. Remove 24vac hot from terminal 4. Damper should Close.
- SR / ESR / RSD Power Close / Spring Open Dampers** - Connect 24vac common & hot to the two motor (M) terminals. Damper should Close. Remove 24 vac hot. Damper should Open.
- SR / ESR / RSD Power Open / Spring Close Dampers** - Connect 24vac common & hot to the two motor (M) terminals. Damper should Open. Remove 24vac hot. Damper should Close.

LED'S

BMPlus 3000 LED's

The BMPlus is equipped with 11 LED's which indicate system operation and status. Familiarize yourself with the LED's definitions, in order to quickly & accurately determine the current system status and mode of operation.

- RED STATUS** The STATUS LED pulses as a steady heart beat to indicate proper Microprocessor system status.
- RED OAS** The OAS LED illuminates solid to indicate that the Outdoor Temperature has fallen below the chosen set point. LED will blink rapidly to indicate a malfunctioning Outdoor Air Sensor.
- RED SAS** The SAS LED illuminates solid to indicate that the Supply Temperature has exceeded the chosen set point on either the HIGH TEMP LIMIT or the LOW TEMP LIMIT. LED will blink rapidly to indicate a malfunctioning Supply Air Sensor.
- RED ZONE 3** The ZONE 3 LED will illuminate solid to indicate that damper(s) is energized open, and the Zone is active.
- RED ZONE 2** The ZONE 2 LED will illuminate solid to indicate that damper(s) is energized open, and the Zone is active.
- RED ZONE 1** The ZONE 1 LED will illuminate solid to indicate that damper(s) is energized open, and the Zone is active.
- RED FAN** The FAN LED will illuminate solid to indicate a demand for fan operation, during COOLING, HEATING, PURGE, or CONTINUOUS FAN.
- RED Y2** The Y2 LED illuminates solid to indicate 2nd stage of COOLING is energized in Gas mode.
The Y2 LED illuminates solid to indicate 2nd stage of HEATING is energized in Heat Pump mode.
- RED Y1** The Y1 LED illuminates solid to indicate 1st stage of COOLING is energized in GAS/HYDRONIC or HEAT PUMP mode.
The Y1 LED illuminates solid to indicate 1st stage HEATING in HEAT PUMP MODE.
- RED W1/B** The W1/B LED illuminates solid to indicate 1st stage of HEATING is energized in Gas/Hydronic mode.
The W1/B LED illuminates solid to indicate 'B' reversing valve is energized in HEAT PUMP operation.
- RED W2/E** The W2/E LED illuminates solid to indicate 2nd or 3rd stage of HEATING is energized in GAS/HYDRONIC or HEAT PUMP mode.
The W2/E LED illuminates solid to indicate EMERGENCY HEAT is energized in HEAT PUMP mode.

NOTES:

BMPlus3000 3 Zone Main Module

Rugged 10 pin
Expansion Header

Protective
header cap not
shown for clarity

User Friendly
Adjustable
Potentiometers

Rugged Damper
Motor Terminal
Blocks

Dual Function
Reset
Button

Thermal Circuit
Breaker

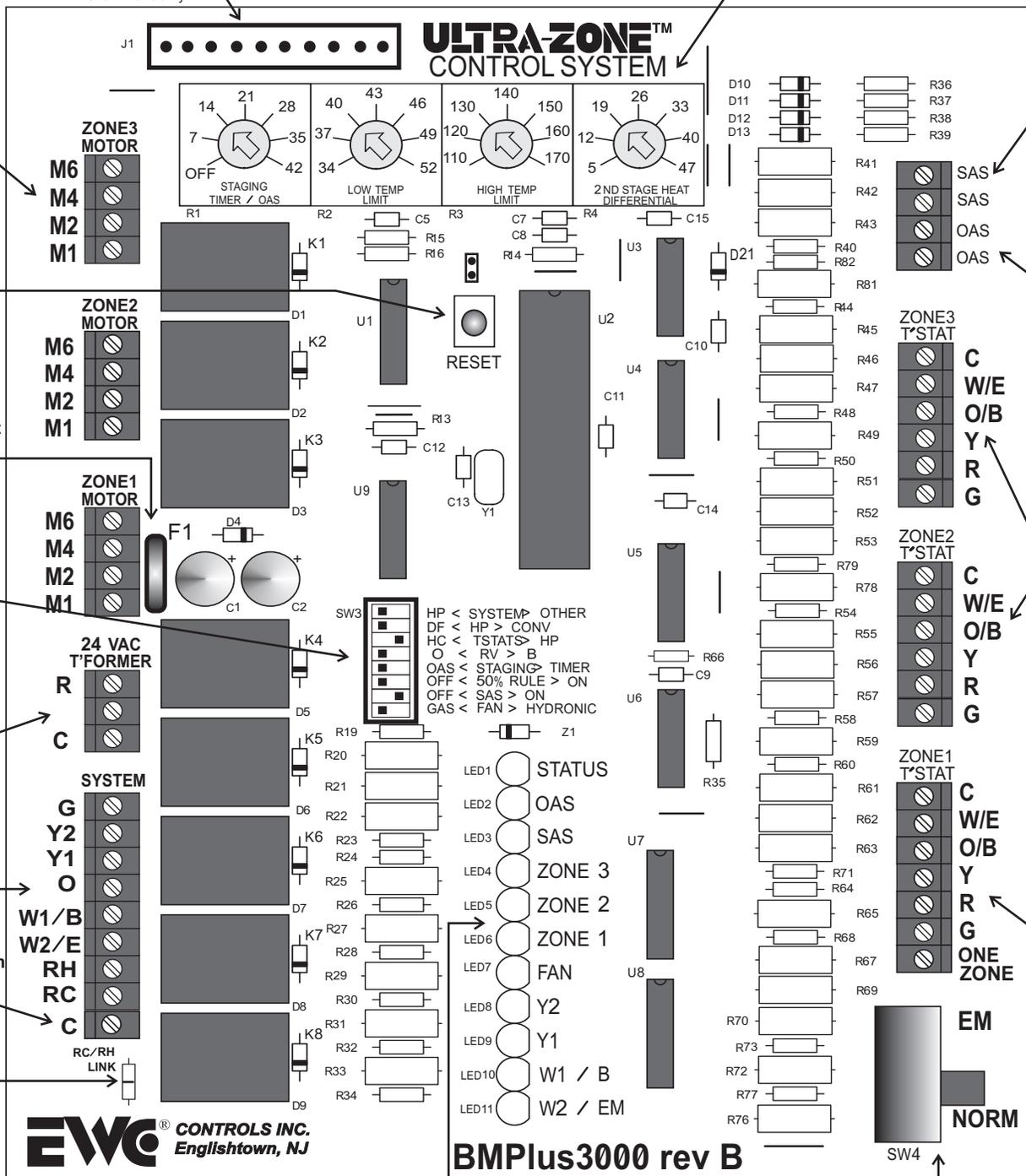
Easy Setup
8 switch Bank

Polarized
Power Input
Terminals

Isolated HVAC
System
Terminal
Block

Isolated Common
terminal. Useful
when HVAC
troubleshooting

On-Board
CUTTABLE
Rc/Rh Link



Supply Air
Sensor
Connections

Outdoor Air
Sensor
Connections

Rugged
Thermostat
Terminal
Blocks

Multi
Functional
Zone 1
Thermostat
Terminal
Block

Figure 19

System Status LED's

On-Board
Emergency Switch

The **BMPlus 3000** Zone Control System includes Module to Module Factory Wiring. We power up the Expansion Modules for you. The **XM2** Expansion module includes a Status LED and Damper Status LED's.

See page 11 and 12 for drawing representations of a 5 and 7 zone system and appropriate dip switch settings.

All you have to do is:

1. Set the dip switches to your specific application.
2. Connect your thermostats, dampers and system wiring.
3. Power up the Main Module
4. Check System Operation.
5. Enjoy.

Setting the XM2 Expansion Panel DIP Switches

Each expansion module has a 2 position DIP switch. Factory set to insure the main module recognizes each expansion module in the proper sequence.

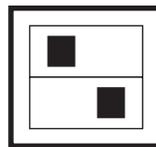
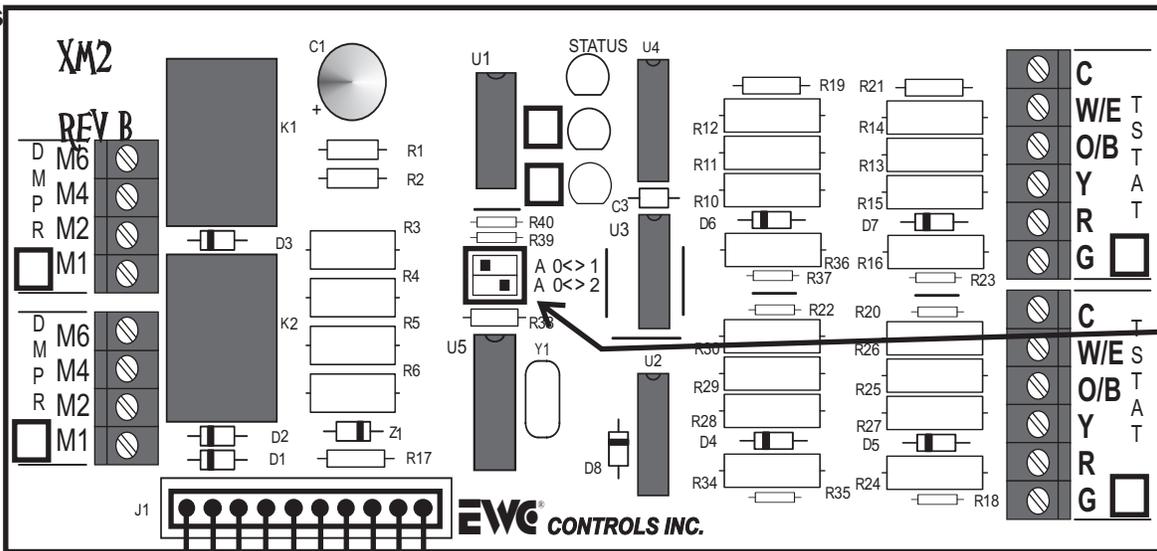
FACTORY SUPPLIED POWER & DATA POLARIZED BUS CABLE

Protective header caps not shown for clarity

DO NOT CONNECT OR DISCONNECT BUS CABLE WHILE THE PANEL IS POWERED.

Provide Over-Current Protection
To Line Voltage
24 vac transformer

BMPlus5000



DIP switch settings for 1st Expansion panel. Zones 4 & 5

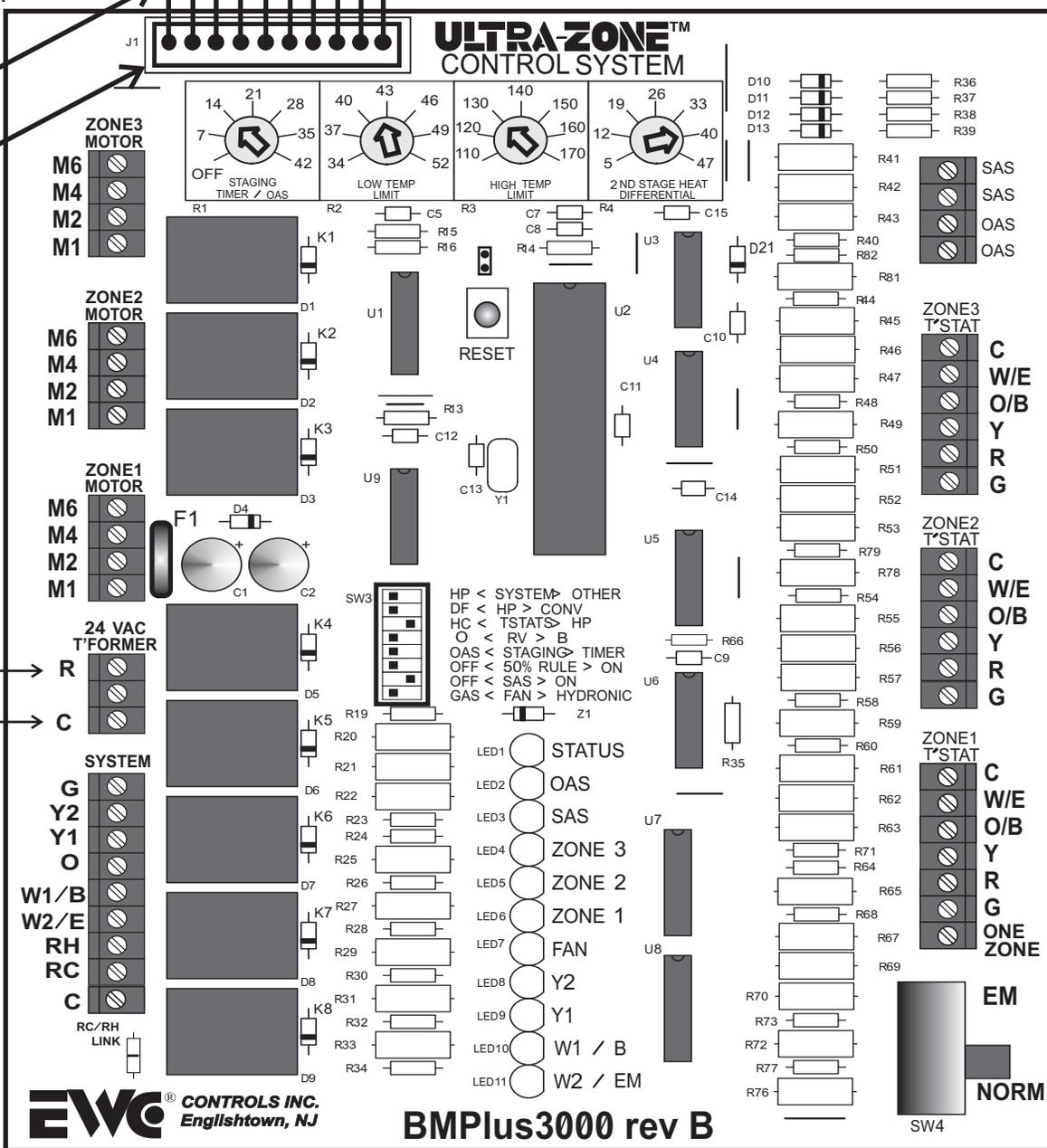
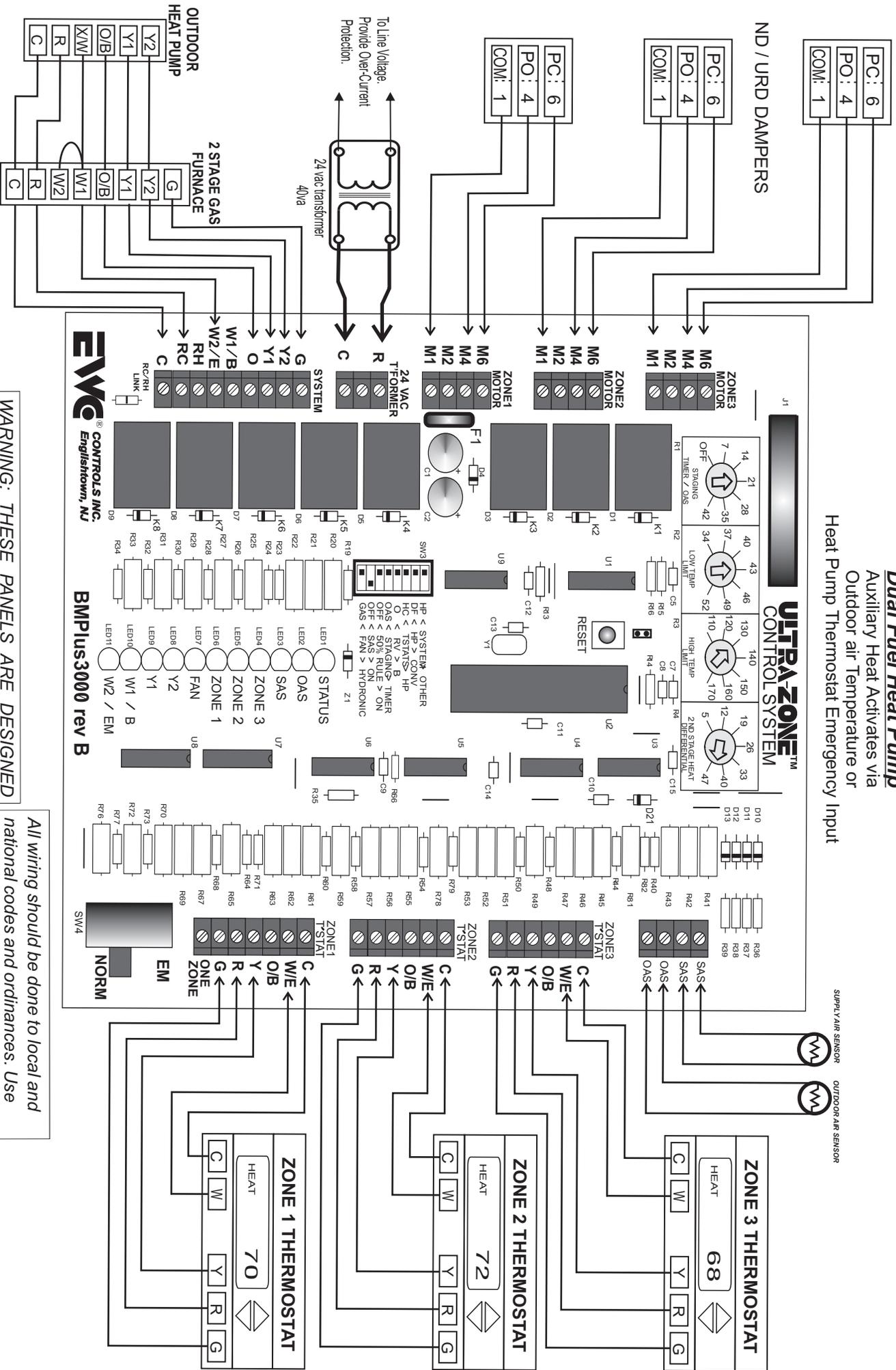


Figure 20

BMPlus 3000 Wiring Diagram

Dual Fuel Heat Pump

Auxiliary Heat Activates via
Outdoor air Temperature or
Heat Pump Thermostat Emergency Input



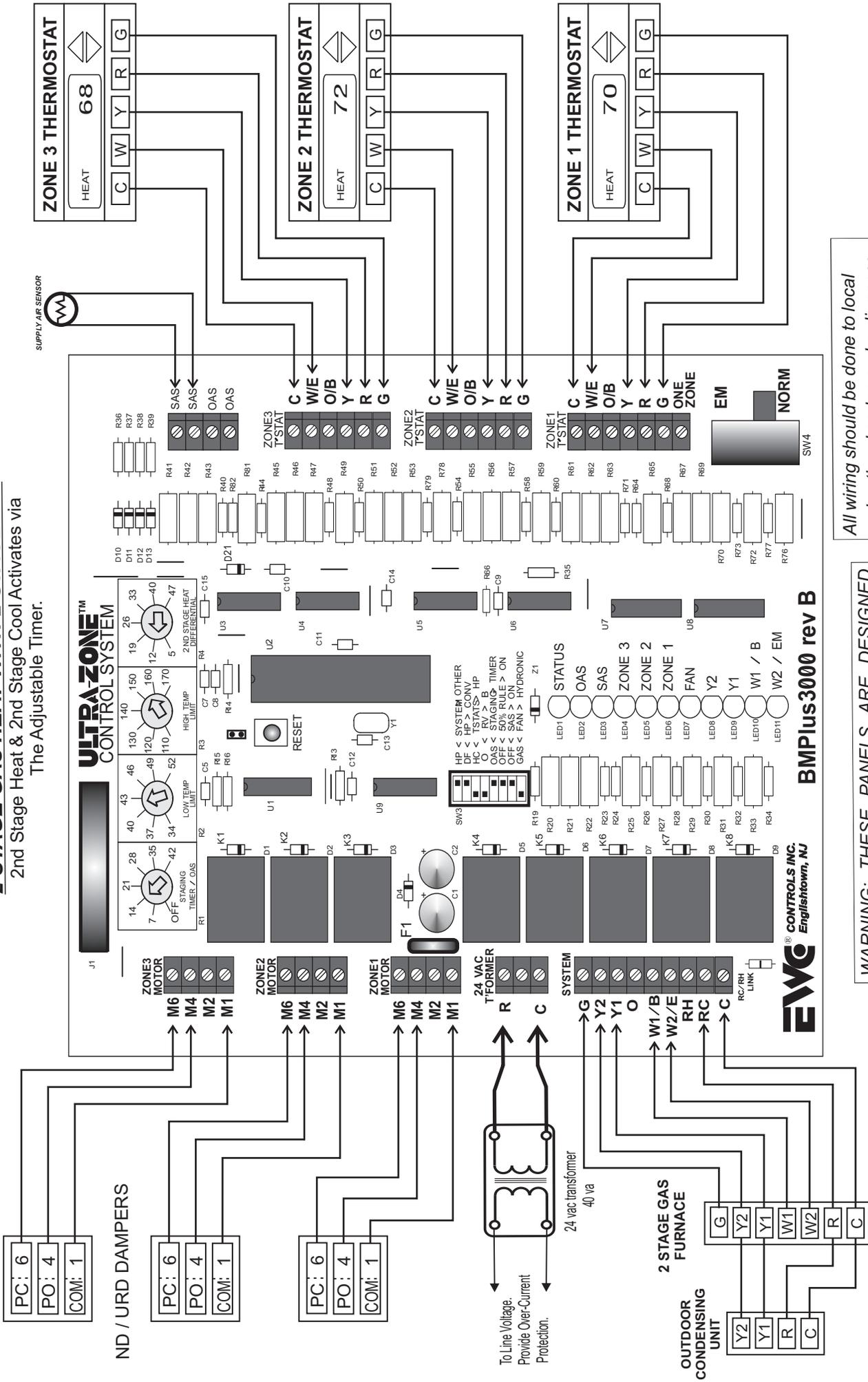
WARNING: THESE PANELS ARE DESIGNED FOR USE WITH 24VAC. DO NOT USE OTHER VOLTAGES! USE CAUTION TO AVOID ELECTRIC SHOCK OR EQUIPMENT DAMAGE.

All wiring should be done to local and national codes and ordinances. Use color-coded, multi-conductor wire. Wire number to number or letter to letter on each control.

BMPPlus 3000 Wiring Diagram

2 STAGE GAS HEAT WITH 2 STAGE A/C

2nd Stage Heat & 2nd Stage Cool Activates via The Adjustable Timer.



All wiring should be done to local and national codes and ordinances. Use color-coded, multi-conductor wire. Wire number to number or letter to letter on each control.

WARNING: THESE PANELS ARE DESIGNED FOR USE WITH 24VAC. DO NOT USE OTHER VOLTAGES! USE CAUTION TO AVOID ELECTRIC SHOCK OR EQUIPMENT DAMAGE.

T R O U B L E S H O O T I N G

SYMPTOM	SOLUTIONS
LED'S are responding properly but HVAC system is malfunctioning.	Check HVAC system wiring for proper connections. Check HVAC system wiring for shorts/miswiring. Check HVAC System. Refer to Technical Bulletin for correct Setup/Wiring/Dip Switch settings.
LED's are not responding properly and HVAC system is malfunctioning.	Check HVAC system wiring for shorts/miswiring. Check HVAC system wiring for proper connections. Check HVAC thermostat for proper connections. Refer to Technical Bulletin for correct Setup/Wiring/Dip Switch settings.
LED's illuminate and HVAC system functions normally but dampers do not respond.	Check damper motor wiring for proper connections. Check damper motor 24vac transformer voltage/fuse/BMPlus circuit breaker. Check damper motor wiring for shorts/miswiring. Refer to Technical Bulletin for correct Setup/Wiring.
REFER TO THE DAMPER MOTOR TESTING PAGE 9	
LED's do not illuminate and HVAC system does not respond.	Check HVAC & BMPlus system transformer supply voltage. Check HVAC & BMPlus system 24vac transformer voltage, fuse & the BMPlusB circuit breaker. Check HVAC & BMPlus system wiring for shorts/miswiring.

CHECK YOUR WIRING

DETECTING 24vac SHORTS	SYMPTOMS: Module(s) appear to be dead!
HVAC system not responding and BMPLUS 3000 LED's are off.	If 24vac short has occurred, 24vac will be present at the <i>BMPlus 3000 Module Input terminals R & C</i> ; but 24vac will not be present at the <i>Thermostat R&C</i> .
Dampers not responding and THE BMPLUS 3000 LED's are off.	SOLUTIONS: Remove 24vac power from BMPlus 3000 and allow circuit breaker to cool! Find and repair short(s) in damper and/or thermostat field wiring. Restore 24 vac power.
ISOLATING 24vac SHORTS	
<i>F1 circuit breaker protects the BMPlus 3000 and reacts to a short in the damper motor or thermostat component and field wiring.</i>	Disconnect the wire(s) from the 'R' terminals on the <i>BMPlus 3000 thermostat terminal blocks</i> , and the "M2/M4/M6" terminals on the BMPlus 3000 damper motor terminal blocks. Restore power. If the short is no longer present, Ohm out the thermostat and damper field wiring for shorts/misconnections. Replace or repair wires as necessary. Restore power. Module(s) will resume operation.

TESTING THERMOSTATS

Check to make sure that the thermostat Rc and Rh terminals are connected together, unless your application requires separation of these circuits.

Use the (C) Common terminal provided at each thermostat terminal block to wire up full 24 vac hard-wired thermostats.

You should reference the (C) Common terminal when troubleshooting incoming thermostat demand signals, even if no wire is connected there.

Make sure that you wire and configure your thermostats for the correct application. Most thermostats built today can be field configured to operate as regular Heat/ Cool type or as Heat Pump type. Remember that you can use regular Heat/Cool thermostats on the BMPlus 3000 for Heat Pump applications.

TECHNICAL SUPPORT

EWC Controls provides superior toll free Troubleshooting Support for the BMPlus 3000 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 BMPlus 3000 and other ULTRA-ZONE products..

When calling for Technical Support, please have a multi-meter, pocket screwdriver, and wire cutter/stripper handy.