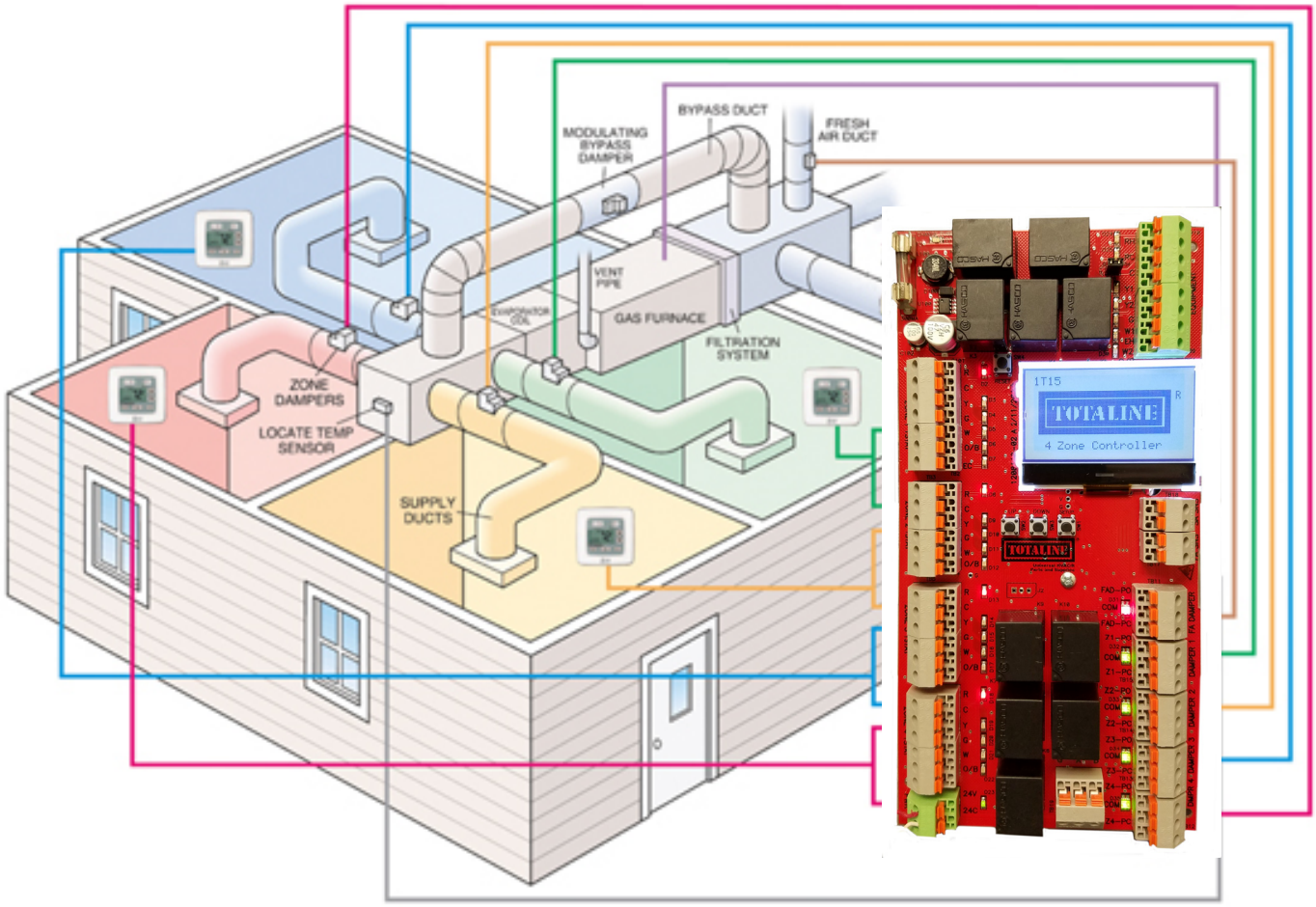
TOTALINE®

Universal HVAC/R
Parts and Supplies

TL-EZ4F 4-Zone Controller



READ THIS GUIDE BEFORE INSTALLING CONTROLLER

Zone Controller Installation and Start Up Guide

Input Ratings:

Voltage: 18-40 VAC 50/60 HZ transformer of 40 VA or more

Current Draw:

Zone Controller: 10 VA

PO/PC Dampers: 3 VA

PC/SR Dampers: 8VA

PO/SR Dampers: 8 VA

All VA specifications at 24 VAC

Fuse:

5 x 20mm 30 ma Slo-Blo

Temperature Ratings:

Shipping: -20° to 150° F

Operating: -20° to 165° F

Humidity Ratings:

5% to 95% RH non-condensing

Wiring:

18-gauge SOLID wire

CONFIGURATION OPTIONS

Option #01	Set board function - Master or Slave
Option #02	Set slave address
Option #03	Set system type
Option #04	NOT USED/FOR FUTURE USE
Option #05	Set equipment stage (two-stage system ONLY)
Option #06	Set thermostat type (heat pump system ONLY)
Option #07	Set reversing valve actuation
Option #08	NOT USED/FOR FUTURE USE
Option #09	Set gas high temp cutout (gas and electric furnace ONLY)
Option #10	Set low temp cutout
Option #11	Set heat pump high temp cutout (heat pump system ONLY)
Option #12	Set aux. heat cut-in temp (single-stage heat pump ONLY)
Option #13	Set aux. heat cut-in time (single-stage heat pump ONLY)
Option #14	Set economizer mode - on or off
Option #15	Set economizer temperature setpoint (ONLY if economizer turned ON)
Option #16	Set fresh air minutes per hour (ONLY if economizer turned OFF)
Option #17	Set fresh air sensor mode - on or off (ONLY if fresh air minutes are greater than ZERO)
Option #18	Set fresh air low-temp lockout (ONLY if fresh air sensor mode is ON)
Option #19	Set fresh air high-temp lockout (ONLY if fresh air sensor mode is ON)
Option #20	Set dual fuel heat pump outdoor low-temp lockout (dual fuel system ONLY)
Option #21	Set second stage lockout - on or off (two-stage equipment ONLY)
Option #22	Set zone 1 priority
Option #23	Set auto changeover time - 10 or 15 minutes
Option #24	Disable aux. heat staging above 40 degrees outside air (heat pump systems ONLY)
Option #25	Allow zone 1 thermostat staging (two-stage systems ONLY)

MOUNTING

Mount the Totaline controller near the HVAC equipment. It can be mounted on a wall, stud, roof tress or the supply ductwork. It can be mounted in any orientation, including flat on top of the supply plenum. When mounting in a vertical position it should be leveled for a good appearance.

1. Remove the clear lid from the enclosure.
2. Place the controller in the desired position and use the base as a template to mark the hole locations.
3. Attach the controller to the surface with the appropriate screws (not included). If attaching the controller to drywall or ductboard, use hollow wall anchors to secure in place.

POWER

The TL Series System **REQUIRES A SEPARATE 24 VAC TRANSFORMER** (not included) for powering the TL Series controller, zone thermostats and dampers. It is recommended to install a fuse on the 24 VAC output from the transformer.

DO NOT ATTEMPT TO POWER THE CONTROLLER FROM THE TRANSFORMER IN THE INDOOR UNIT!

TRANSFORMER SIZING

The 24 volt transformer must be sized and fused based on the controller, the total dampers and the thermostats.

TL Series Device	Power
TL-EZ4F Controller	10 VA
Power Open/Power Close Damper	3 VA
Spring Return Damper	8 VA
Typical Thermostat	2 VA

EXAMPLE: Transformer Calculation:

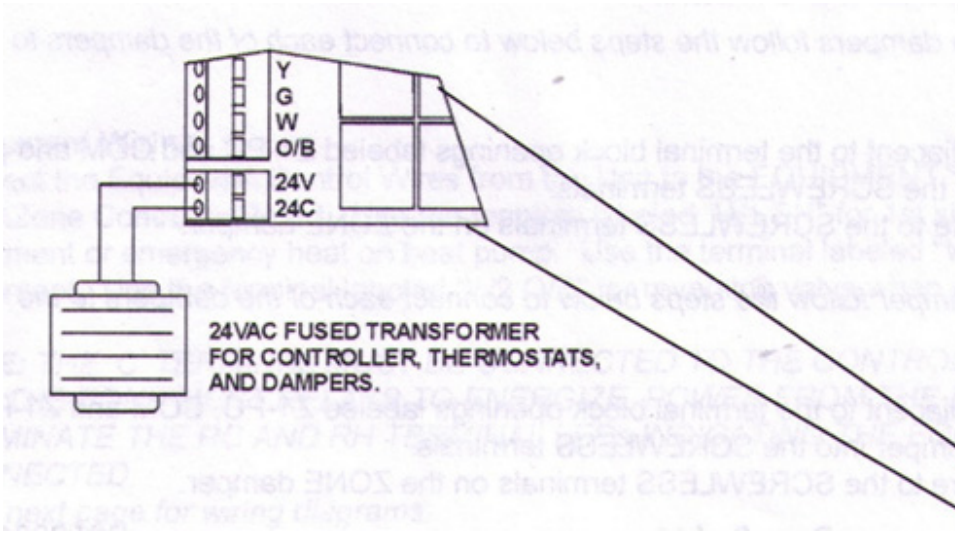
1 TL Series TL-EZ4F (10 VA)
+ 4 POC Dampers (3 VA X 4)
+ 4 Thermostats (2 VA X 4)
= 30 VA Total

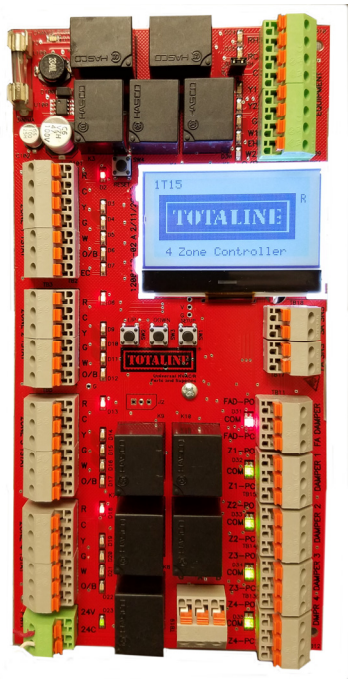
FUSE SIZING RULE OF THUMB

Transformer VA	Fuse Size
40	2 amp
75	3 amp
100	4 amp

CAUTION: Voltage Hazard. Can cause electrical shock or equipment damage. Disconnect power before beginning installation. Wire entire zone panel before applying transformer power.

Connect the transformer to the 24V and 24C inputs on the zone control board.





Wiring

Install thermostats using instructions provided with thermostats.

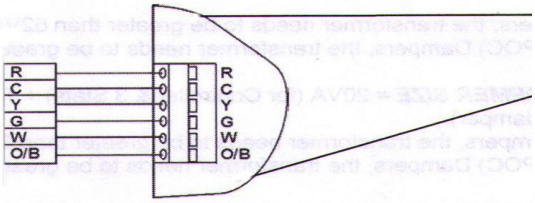
TL Series is compatible with most thermostats that have a common connection or are battery operated. TL Series will use time and supply air temperature to automatically manage staging. This eliminates the need for multi-stage thermostats.

On *HEAT PUMP* equipment *ONLY*, either Gas/Electric or Heat Pump thermostats can be used. It is recommended to use a Heat Pump thermostat with an Emergency Heat switch on Zone 1 for all heat pump installations. An emergency heat call can ONLY be initiated from the ZONE 1 THERMOSTAT.

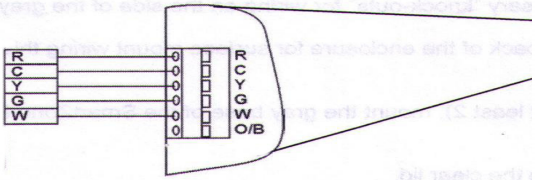
1. Connect either single stage gas/electric or heat pump thermostats to each terminal blocks labeled **Zone 1 TSTAT**, **Zone 2 TSTAT**, **Zone 3 TSTAT** and **Zone 4 TSTAT**.
2. The Zone 1 TSTAT will operate Damper 1. The Zone 2 TSTAT will operate Damper 2, etc.
3. Using 18 Gauge Solid Thermostat Wire, strip 1/2 inch of insulation from each wire. Hold down the orange button and push the thermostat wire into the SCREWLESS terminals on the control board.
4. Connect the other end of the thermostat wire to the corresponding terminals on the thermostat.
5. To use the **EC** terminal on the Zone 1 TSTAT, a separate switch must be used to supply 24 VAC to this terminal. You may also use a 2-stage thermostat on Zone 1 ONLY if you want to control Zone 1 staging by connecting Y2 from the the thermostat to the **EC** terminal on the Zone 1 terminal block. (See Option #25)

HEAT PUMP THERMOSTAT



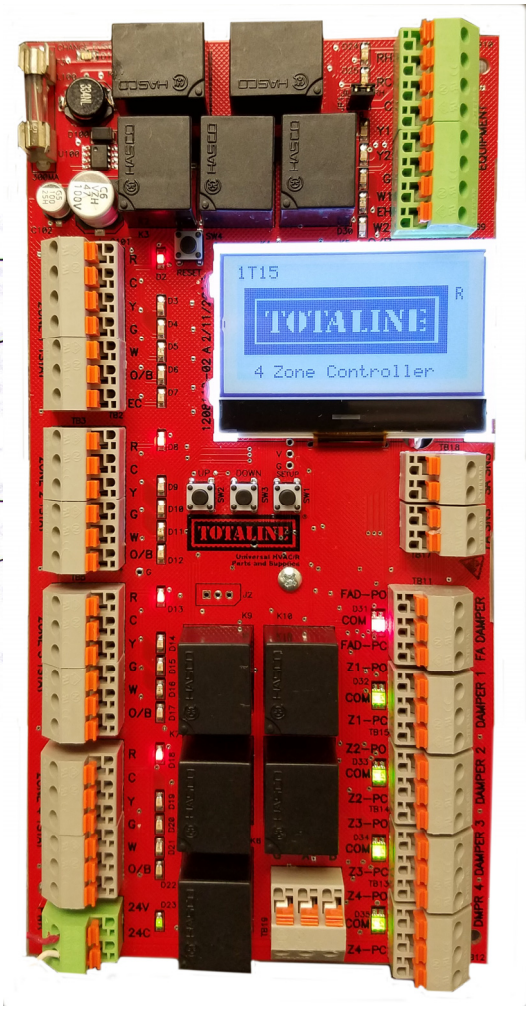






GAS/ELECTRIC THERMOSTAT

CONNECT GAS/ELECTRIC OR HEAT PUMP THERMOSTATS TO ZONE 3 AND ZONE 4



Wiring

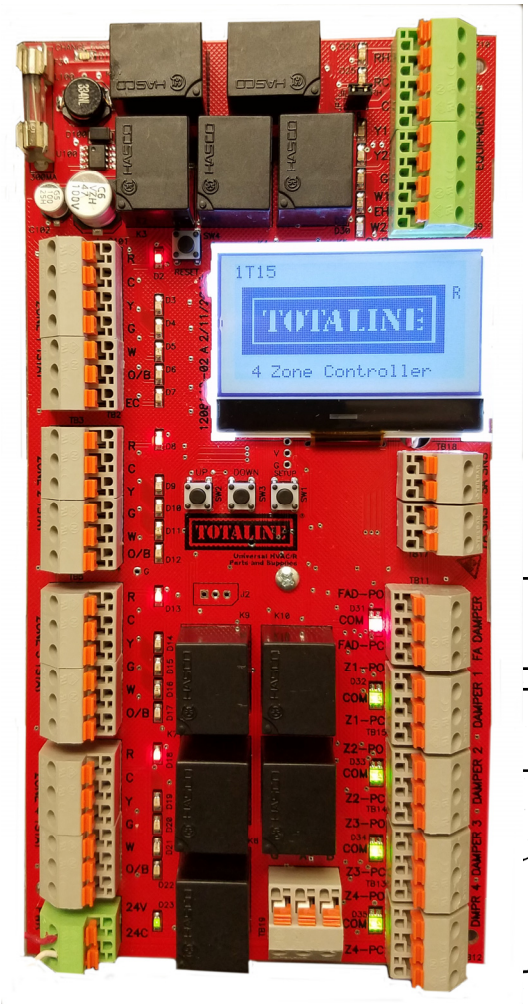
TL Series will operate either 2-Wire Power Close/Spring Open dampers, or 3-Wire Power Open/Power Close dampers.

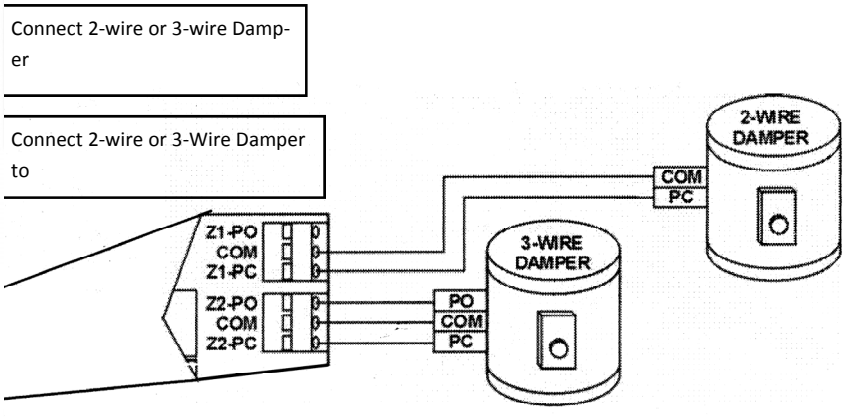
Power Close/Spring Open 2-Wire Dampers

1. Use 18/2 or 18/3 solid core wire.
2. Strip 1/2 inch of insulation from each wire.
3. Hold down the orange button on the Damper 1 terminal block labeled **Z1-PC** and **COM** and push the two wires for the zone damper into the SCREWLESS terminals.
4. Connect the other end of the wires to the SCREWLESS terminals on the zone damper.
5. Repeat steps 3 and 4 for the Zone 2 damper.

Power Open/Power Close 3-Wire Dampers

1. Use 18/3 solid core wire
2. Strip 1/2 inch of insulation from each wire.
3. Hold down the orange button on the Damper 1 terminal block and push the three wires for the zone damper into the SCREWLESS terminals. Use *WHITE* for Common (C), *GREEN* for Power Open (PO) and *RED* for Power Close (PC).
4. Connect the other end of the wires to the terminals on the zone damper, using the same color code.
5. Repeat steps 3 and 4 for the Zone 2 damper.





Wiring

Supply Air Temperature Sensor (SAS)

Sensor Placement (Location)

Gas/Electric - Electric/Electric - The SAS should be located in the Supply Air Plenum where it will sense AVERAGE air temperature within the Plenum. The ideal placement is 2 to 4 feet beyond the evaporator coil. Make sure the sensor is in the air stream and secured properly.

Heat Pump - The SAS should be located inside the air handler cabinet AFTER the evaporator coil but BEFORE the blower. Make sure the sensor is in the air stream and properly secured.

Return Air Sensor (RAS)

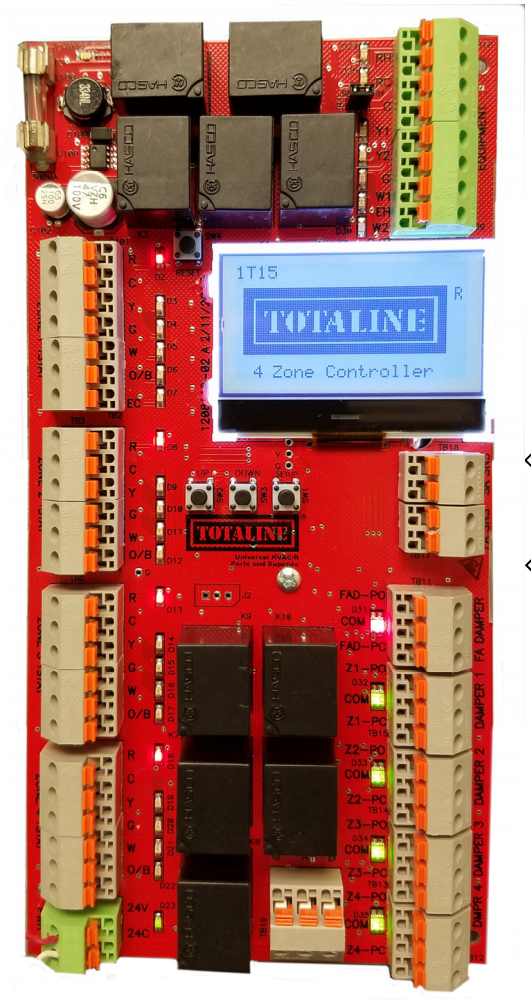
Sensor Placement (Location)

The RAS should be located in the return air plenum before the blower or evaporator coil section where it will sense the AVERAGE return air temperature entering the air handler or furnace. Make sure the sensor is in the air stream and properly secured.

OPTIONAL Fresh Air/Outdoor Air Sensor (FAS)

Sensor Placement (Location)

The OAS should be located under the eave of the structure or under a ledge on the outdoor unit where it will not be in direct sunlight. Secure the sensor in place and connect to the controller with thermostat wire and the included plug-in connector.



PLUG IN SUPPLY AIR SENSOR HERE

PLUG IN FRESH AIR OR RETURN AIR SENSOR HERE

TL Series Link Cable

If using the TL-EZ4F controller as an expansion module, or as the Master board in a multiple-board system use 18/3 thermostat wire. Strip back wire and connect each end to the 3-pole plug located at the bottom of the board. MAKE SURE THE SAME COLOR WIRE IS CONNECTED TO EACH POLE ON BOTH PLUGS. The TL Series system can be expanded to a total of 9 slave and 1 master controller for a maximum of 40 zones.

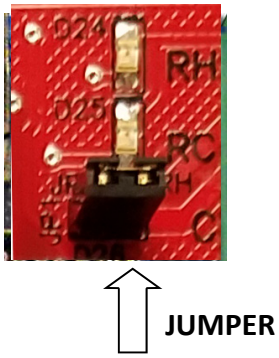
PLUG IN TL SERIES LINK CABLE HERE IF USING AS AN EXPANSION BOARD

Wiring

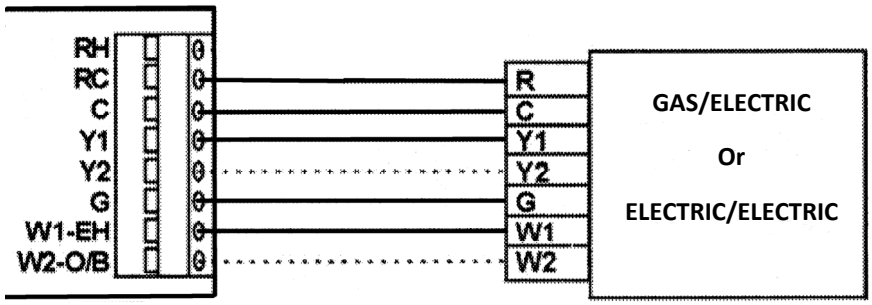
A/C - Gas Furnace and A/C - Electric Furnace

Using 18 gauge solid thermostat wire, connect the Equipment Control Wires from the Indoor Unit to the *EQUIPMENT* terminal block on the top right corner of the TL Series Controller. Use the terminal labeled ***W1/EH*** for first stage heat. If using a two-stage furnace, connect ***W2/OB*** to **W2** on the indoor equipment. Connect **R** from the equipment to ***RC*** on the TL Series Controller. Connect **C** from the equipment to ***C*** on the TL Series Controller. THE **C** TERMINAL FROM THE EQUIPMENT MUST BE CONNECTED TO THE CONTROLLER FROM THE EQUIPMENT FOR THE **RC** AND **RH** LED'S TO ILLUMINATE. POWER FROM THE EQUIPMENT TRANSFORMER WILL ILLUMINATE THE **RC** AND **RH** TERMINAL LED'S, INDICATING THE EQUIPMENT TRANSFORMER IS CONNECTED.

NOTE: IF USING A TWO-TRANSFORMER SYSTEM, WITH SEPARATE COOLING AND HEATING TRANSFORMERS, CONNECT THE **R** FROM THE COOLING TRANSFORMER TO ***RC*** ON THE CONTROLLER. CONNECT THE **R** FROM THE HEATING TRANSFORMER TO ***RH*** ON THE CONTROLLERS. REMOVE THE BLACK JUMPER LOCATED JUST BELOW THE RC/RH LED'S TO SEPARATE THE POWER INPUTS.



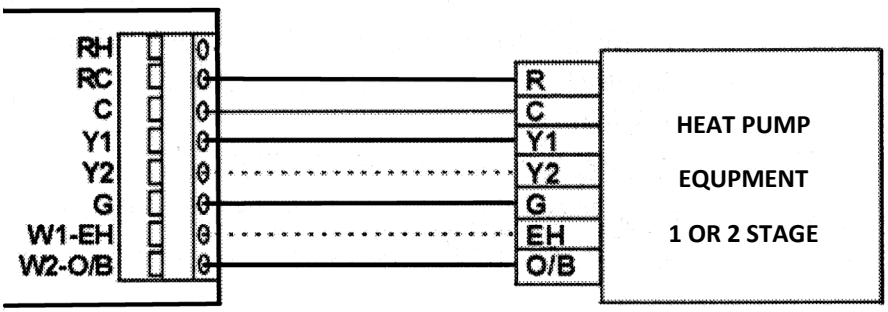
JUMPER



Electric Heat Pump

Using 18 gauge solid thermostat wire, connect the Equipment Control Wires from the Indoor Unit to the *EQUIPMENT* terminal Block on the top right corner of the TL Series Controller. Use the terminal labeled ***W1/EH*** for the auxiliary heat strips. Connect the ***W2/OB*** terminal to the **O/B** terminal on the equipment (REVERSING VALVE). Connect **R** from the equipment to ***RC*** on the TL Series Controller. Connect **C** from the equipment to ***C*** on the TL Series Controller. THE **C** TERMINAL FROM THE EQUIPMENT MUST BE CONNECTED TO THE CONTROLLER FROM THE EQUIPMENT FOR THE **RC** AND **RH** LED'S TO ILLUMINATE. POWER FROM THE EQUIPMENT TRANSFORMER WILL ILLUMINATE THE **RC** AND **RH** TERMINAL LED'S, INDICATING THE EQUIPMENT TRANSFORMER IS CONNECTED AND WORKING.

NOTE: The jumper for **RH/RC** should **NOT** be removed on a heat pump system.



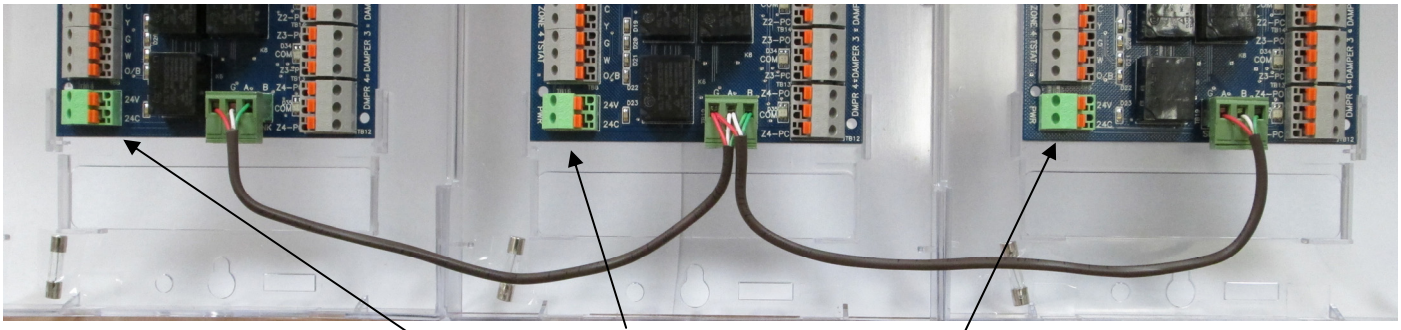
When using the **TL-EZ2F** or **TL-EZ4F** as an expansion module (Slave) you must connect 24 VAC input power to the slave controller(s). Power IS NOT supplied by the communication cable. If using only one transformer to supply the master and slave controllers, calculate the power needed for all boards, thermostats and damper actuators to determine the correct size. (See Page 2 in the Installation Guide) On larger installations, more than one transformer may be needed.

A communication cable must be installed via the 3-pole plug-in connector at the bottom of the board. Use standard 18-3 thermostat wire. NO CAT5 CABLE IS NEEDED. If installing more than one expansion module, daisy chain the wiring from each controller to the next. BE SURE AND CONNECT THE SAME COLOR WIRE IN EACH POSITION!

(Example - Red wire in all left positions, White wire in all center positions, Green wire in all right positions)

After all wiring is complete, turn on the 24 VAC input power to all of the controllers. On the slave controller, push the setup button. Change the board type to "SLAVE". Press the setup button again to set the slave address.
The default slave address is 1. (If installing more than one expansion controller, each controller will need its own address. The second expansion controller will be address 2 and so on, up to 9 expansion controllers). Press the setup button and set the equipment type. (If setting up for electric heat pump or dual fuel, the menu will ask you to set the thermostat type for each zone). Press the setup button to exit the configuration menu. The display will show that the controller is a "SLAVE" and will show "COMM" at the bottom of the display. If "NO COMM" is displayed, check communication wiring connections.

After the slave controller(s) are configured, press the RESET button on all of the controllers. This will clear the communication bus and allow the slave controllers to make equipment calls.



CONNECT 24 VAC TO ALL CONTROLLERS

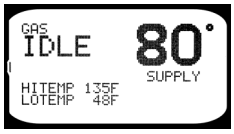
Configuration and Setup

The TL-EZ4F TL Series Controller has a state of the art microprocessor for reliable control of the equipment and zone dampers. The simple step by step setup eliminates the need for confusing dip switches. The full status back-lit LCD display guides you thru each step of the setup process. Depending on the type of equipment selected, the display will show you each available option for the system type selected.

Make sure that all wiring for the thermostats, zone dampers and equipment is complete. The **RH** and **RC** led's should be illuminated. The GREEN connector from the Supply Air Sensor (SAS) should be plugged firmly into the receptacle marked SA SNS on the controller. If using a Return Air Sensor (RAS) or Fresh Air Sensor (OAS) the GREEN connector should be firmly plugged into the receptacle marked FA SNS on the controller. If using the controller as an expansion module, the GREEN 3-pole connector should be firmly plugged into the receptacle marked TL Series LINK at the bottom of the controller. Apply power from the 24VAC transformer connected to the **PWR** connector on the controller. The controller will power up and display a splash screen on the LCD display. The red **R** led's for all thermostats and the green led's for all dampers will illuminate. The display will then show the factory default settings for the controller.

IF YOU GO PAST THE DESIRED SETUP OPTION, PRESS THE RESET BUTTON TO START OVER.

Press the **SETUP** button to enter the configuration mode. The screen will display the **SETUP MENU** and **OPTION #01 - SET BOARD FUNCTION.** The factory default is **MASTER**. If using the controller as an expansion module, press the **UP** or **DOWN** button to change to **SLAVE.** Press the **SETUP** button to proceed to the next option. (**NOTE:** If using the controller as an expansion module, the next selection will be **OPTION #02 - SET SLAVE ADDRESS**. Each expansion board will have its own address, numbered 1 thru 9. The default address is 1. If using more than one expansion board, the second expansion board will be address 2 and so on, up to 9 expansion boards.) Press the **SETUP** button to proceed to the next option.









A/C - GAS HEAT AND A/C - ELECTRIC HEAT

OPTION #03 - SET SYSTEM TYPE The default setting is **A/C - GAS HEAT**. Use the up button to select **A/C - ELEC HEAT**. Press the **SETUP** button to proceed to the next option.



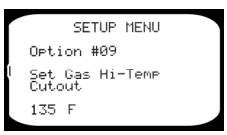


OPTION #05 - SET OUTDOOR UNIT SPEED The default setting is **1-SPEED**. Press the **UP** or **DOWN** button to change to **2-SPEED.** Press the **SETUP** button to proceed to the next option.





OPTION #09 - SET HI-TEMP CUT-OUT The default setting is **135 F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **125 F** to **150 F.** Press the **SETUP** button to proceed to the next option.



NOTE: When using electric furnace, the HI-TEMP CUT-OUT should be set no higher than 125° F.

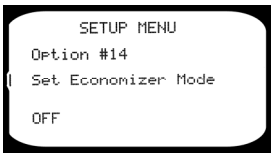
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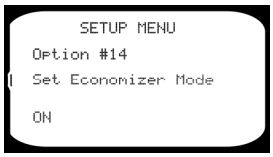
Configuration and Setup

OPTION #10 - SET LO-TEMP CUTOUT The default setting is **48° F.** Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **42° F** to **52° F**. Press the **SETUP** button to proceed to the next option.



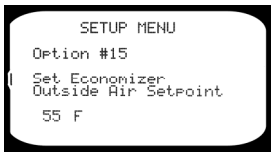
OPTION #14 - SET ECONOMIZER MODE The default setting is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. Press the **SETUP** button to proceed to the next option.



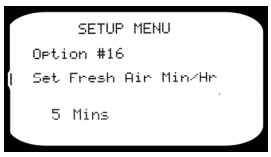


NOTE: If economizer mode is <u>OFF</u>, the next option is OPTION #16.
If economizer mode is <u>ON</u>, the next option is OPTION #15.

OPTION #15 - SET ECONOMIZER OUTSIDE SETPOINT - The default setting is **55° F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **50° F** to **75° F**. Press the **SETUP** button to proceed to the next option.

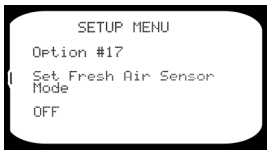


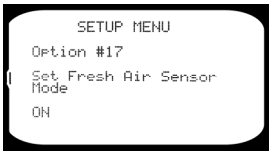
OPTION #16 - SET FRESH AIR MIN/HR The factory default is **0** minutes. Press the **UP** button to add fresh air minutes. The adjustable range is **0** to **60** minutes per hour, adjustable in **5 minute** increments. **NOTE: THIS OPTION IS <u>ONLY</u> AVAILABLE IF OPTION #14 (ECONOMIZER) IS TURNED <u>OFF</u>.** Press the **SETUP** button to proceed to the next option.



NOTE: If fresh air minutes are GREATER than ZERO (0) then the next option will be OPTION #17.
If fresh air minutes are set at ZERO (0), and the Equipment Stage is set for 1-Stage, then the next option will be OPTION #22.
If the Equipment Stage is set for 2-Stage, the next option will be OPTION #21

OPTION #17 - SET FRESH AIR SENSOR MODE The factory default is **OFF**. Press the **UP** or **DOWN** button to turn the sensor **ON**. (**NOTE:** If there is no sensor detected plugged into the FA SNS receptacle on the controller, the controller will display **INSTALL FA SENSOR)**. After the sensor is plugged in, press the **RESET** button to clear the error message. Press the **SETUP** button several times until **OPTION #17** appears on the display. Press the **SETUP** button to turn the sensor **ON.** Press the setup button to proceed to the next option.





NOTE: If the fresh air sensor mode is set to ON, then the next option will be OPTION #18.
If the fresh air sensor mode is set to OFF, and the Equipment Stage is set for 1-Stage, then the next option will be OPTION #22. If the Equipment Stage is set for 2-Stage, then the next option will be OPTION #21.

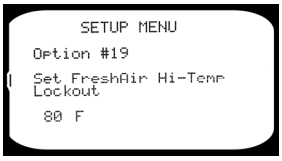
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Configuration and Setup

OPTION #18 - SET FRESH AIR LO-TEMP LOCKOUT The factory default is **20° F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **20° F** to **40° F**. Press the **SETUP** button to proceed to the next option.

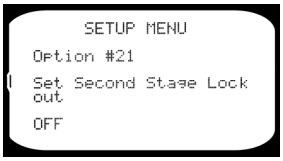


OPTION #19 - SET FRESH AIR HI-TEMP LOCKOUT The factory default is **80° F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **60°** to **100° F**. Press the **SETUP** button to proceed to the next option.



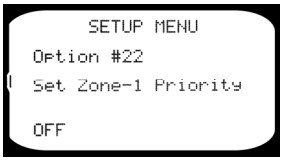
NOTE: If the Equipment Stage is set for 1-Stage, the next option will be OPTION #22.
If the Equipment Stage is set for 2-Stage, the next option will be OPTON #21.

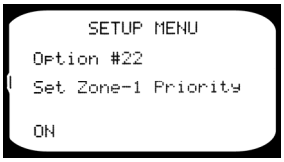
OPTION #21 - SET SECOND STAGE LOCKOUT The factory default is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this option is turned **ON**, the controller **WILL NOT ENERGIZE 2ND STAGE** if only **ONE ZONE** is calling. Press the **SETUP** button to proceed to the next option.





OPTION #22 - SET ZONE 1 PRIORITY The factory default is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this option is turned on, any call from the **ZONE 1 THERMOSTAT** will override any call from the ZONE 2, 3 or 4 THERMOSTAT. If a call exists on any thermostat other than the ZONE 1 THERMOSTAT, and an opposing call is made from the ZONE 1 THERMOSTAT, the system will immediately to into a **3-minute PURGE** and then will turn on the equipment based on the call from the ZONE 1 THERMOSTAT. Press the **SETUP** button to proceed to the next option.





OPTION #23 - SET AUTO CHANGEOVER TIME The factory default is **10 minutes**. Press the up or down button to change the setting to **15 MINUTES**. This setting determines the amount of time that elapses after an opposing call occurs and the system changes over to the opposing call. Press the **SETUP** button to proceed.





NOTE: If the equipment stage is set for 1-STAGE, pressing the SETUP button will exit the configuration mode.
If the equipment stage is set for 2-STAGE then the setup will proceed to OPTION #25.

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Configuration and Setup

OPTION #25 - ALLOW ZONE 1 THERMOSTAT STAGING The default setting is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this setting is **ON**, the controller will accept a 2nd stage call from the Zone 1 Thermostat. **NOTE: When this option is turned ON, Zone 1 will DISREGARD 2ND STAGE LOCKOUT if Option #21 is turned ON.**



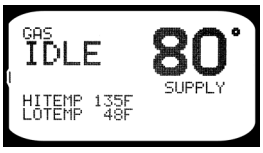


NOTE: This option will only be available if Option #05 is set for 2-STAGE.

Press the **SETUP** button to exit the configuration mode.

ELECTRIC HEAT PUMP - ELECTRIC AUXILLIARY HEAT

Press the **SETUP** button to enter the configuration mode. The screen will display the **SETUP MENU** AND **OPTION #03 - SET SYSTEM TYPE**. The default setting is **A/C - GAS ELECTRIC**. Press the **UP** button twice to change the system to **ELECTRIC HEAT PUMP.** Press the **SETUP** button to proceed to the next option.



SYSTEM IDLE SCREEN





OPTION #05 - SET OUTDOOR UNIT SPEED The default setting is **1-SPEED**. If using single stage equipment, press the **SETUP** button to proceed to the next option. If using 2-stage equipment, press the **UP** or **DOWN** button to select **2-SPEED**. Press the **SETUP** button to proceed to the next option.





OPTION #06 - SET THERMOSTAT 1 TYPE The default setting is **GAS/ELECTRIC**. Press the **UP** or **DOWN** button to change to **HEAT PUMP**. Press the **SETUP** button to **SET THERMOSTAT 2 TYPE**. Repeat for the **Zone 3** and **Zone 4** Thermostats The default setting is **GAS/ELECTRIC**. Press the **UP** or **DOWN** button to change to **HEAT PUMP**. Press the **SETUP** button to proceed to the next option.





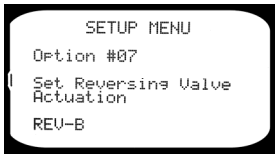




NOTE: A heat pump thermostat with an emergency heat switch MUST be installed on Zone 1 to manually turn on auxiliary heat.

OPTION #07 - SET REVERSING VALVE ACTUATION The default setting is **REV-O**. Press the **UP** or **DOWN** button to change to **REV-B**. **NOTE:** When set as **REV-O**, the reversing valve will energize in COOLING. When set as **REV-B**, the reversing valve will energize in HEATING. Press the **SETUP** button to proceed to the next option.

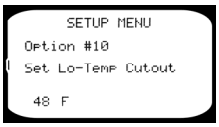




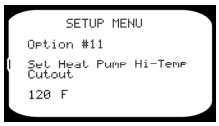
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Configuration and Setup

OPTION #10 - SET LO-TEMP CUTOUT The default setting is **48 F.** Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **42 F** to **52 F**. Press the **SETUP** button to proceed to the next option.



OPTION #11 - SET HEAT PUMP HI-TEMP CUTOUT The default setting is **120 F**. Press the **UP** or **DOWN** button to change the setting. The adjustable range is **110 F - 125 F**. Press the **SETUP** button to proceed to the next option.



NOTE: If Option #05 is set for 1-STAGE, the next option will be OPTION #12.
If Option #05 is set for 2-STAGE, the next option will be OPTION #14.

OPTION #12 - SET AUX HEAT CUT-IN TEMP The default is **90 F**. Press the **UP** or **DOWN** button to change the setting. The adjustable range is **90 - 100 F**. Press the **SETUP** button to proceed to the next option.



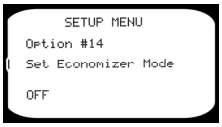
NOTE: This option only available on 1-STAGE systems.

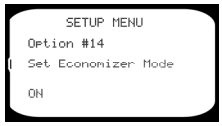
OPTION #13 - SET AUX HEAT CUTIN TIME The default is **6 Mins**. Press the **UP** or **DOWN** button to change the setting. The adjustable range is **3 - 6 Mins**. Press the **SETUP** button to proceed to the next step.



NOTE: This option only available on 1-STAGE systems.

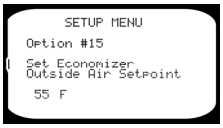
OPTION #14 - SET ECONOMIZER MODE The default setting is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. Press the **SETUP** button to proceed to the next option.



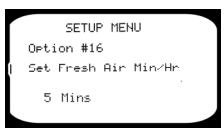


NOTE: If economizer mode is <u>OFF</u>, the next option is OPTION #16.
If economizer mode is <u>ON</u>, the next option is OPTION #15.

OPTION #15 - SET ECONOMIZER OUTSIDE SETPOINT - The default setting is **55° F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **50° F** to **75° F**. Press the **SETUP** button to proceed to the next option.



OPTION #16 - SET FRESH AIR MIN/HR The factory default is **0** minutes. Press the **UP** button to add fresh air minutes. The adjustable range is **0** to **60** minutes per hour, adjustable in **5 minute** increments. **NOTE: THIS OPTION IS <u>ONLY</u> AVAILABLE IF OPTION #14 (ECONOMIZER) IS TURNED <u>OFF</u>.** Press the **SETUP** button to proceed to the next option.



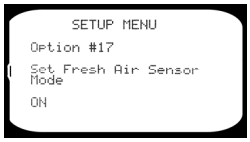
NOTE: If fresh air minutes are GREATER than ZERO (0) then the next option will be OPTION #17.
If fresh air minutes are set at ZERO (0), and the Equipment Stage is set for 1-Stage, then the next option will be OPTION #22.
If the Equipment Stage is set for 2-Stage, the next option will be OPTION #21

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Configuration and Setup

OPTION #17 - SET FRESH AIR SENSOR MODE The factory default is **OFF**. Press the **UP** or **DOWN** button to turn the sensor **ON**. (**NOTE:** If there is no sensor detected plugged into the FA SNS receptacle on the controller, the controller will display **INSTALL FA SENSOR)**. After the sensor is plugged in, press the **RESET** button to clear the error message. Press the **SETUP** button several times until **OPTION #17** appears on the display. Press the **SETUP** button to turn the sensor **ON.** Press the setup button to proceed to the next option.



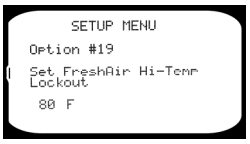


NOTE: If the fresh air sensor mode is set to ON, then the next option will be OPTION #18.
If the fresh air sensor mode is set to OFF, and the Equipment Stage is set for 1-Stage, then the next option will be OPTION #22. If the Equipment Stage is set for 2-Stage, then the next option will be OPTION #21.

OPTION #18 - SET FRESH AIR LO-TEMP LOCKOUT The factory default is **20° F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **20° F** to **40° F**. Press the **SETUP** button to proceed to the next option.

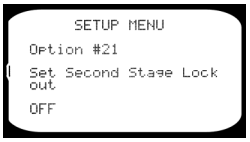


OPTION #19 - SET FRESH AIR HI-TEMP LOCKOUT The factory default is **80° F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **60°** to **100° F**. Press the **SETUP** button to proceed to the next option.



NOTE: If the Equipment Stage is set for 1-Stage, the next option will be OPTION #22.
If the Equipment Stage is set for 2-Stage, the next option will be OPTON #21.

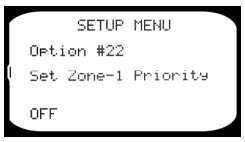
OPTION #21 - SET SECOND STAGE LOCKOUT The factory default is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this option is turned **ON**, the controller **WILL NOT ENERGIZE 2ND STAGE** if only **ONE ZONE** is calling. Press the **SETUP** button to proceed to the next option.

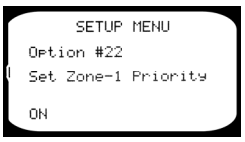




NOTE: This option will only appear if Option #05 is set for 2-STAGE equipment.

OPTION #22 - SET ZONE 1 PRIORITY The factory default is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this option is turned on, any call from the **ZONE 1 THERMOSTAT** will override any call from the ZONE 2, 3 or 4 THERMOSTAT. If a call exists on any thermostat other than the ZONE 1 THERMOSTAT, and an opposing call is made from the ZONE 1 THERMOSTAT, the system will immediately to into a **3-minute PURGE** and then will turn on the equipment based on the call from the ZONE 1 THERMOSTAT. Press the **SETUP** button to proceed to the next option.





Configuration and Setup

OPTION #23 - SET AUTO CHANGEOVER TIME The factory default is **10 minutes**. Press the up or down button to change the setting to **15 MINUTES**. This setting determines the amount of time that elapses after an opposing call occurs and the system changes over to the opposing call. Press the **SETUP** button to proceed.





OPTION #24 - DISABLE AUX HEAT STAGING ABOVE 40 DEG The default setting is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this feature is turned **ON**, the controller WILL NOT stage on Auxiliary Heat if the OUTDOOR TEMPERATURE is above **40° F.**





NOTE: This option REQUIRES the use of a FRESH AIR SENSOR connected to the controller.

OPTION #25 - ALLOW ZONE 1 THERMOSTAT STAGING The default setting is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this setting is **ON**, the controller will accept a 2nd stage call from the Zone 1 Thermostat. **NOTE: When this option is turned ON, Zone 1 will DISREGARD 2ND STAGE LOCKOUT if Option #21 is turned ON.**



NOTE: This option will only be available if Option #05 is set for 2-STAGE.

Press the **SETUP** button to exit the configuration mode.

DUAL FUEL HEAT PUMP

Press the **SETUP** button TWO TIMES to enter the configuration mode. The screen will display the **SETUP MENU** AND **OPTION #03 - SET SYSTEM TYPE**. The default setting is **A/C - GAS ELECTRIC**. Press the **UP** button three times to change the system to **DUAL FUEL HEAT PUMP. NOTE: The outdoor FRESH AIR SENSOR MUST be plugged into the controller to configure for DUAL FUEL HEAT PUMP. If the sensor is NOT plugged in, the screen will display INST FA SNSR FOR DFHP. After installing the FRESH AIR SENSOR, press the RESET button to re-enter the configuration mode.**



Press the **SETUP** button to proceed to the next option.

OPTION #05 - SET OUTDOOR UNIT SPEED The default setting is **1-SPEED**. Press the **UP** or **DOWN** button to change to **2-SPEED.**





Press the **SETUP** button to proceed to the next option.

Configuration and Setup

OPTION #06 - SET THERMOSTAT 1 TYPE The default setting is **GAS/ELECTRIC**. Press the **UP** or **DOWN** button to change to **HEAT PUMP**. Press the **SETUP** button to **SET THERMOSTAT 2, 3 & 4 TYPE**. The default setting is **GAS/ELECTRIC**. Press the **UP** or **DOWN** button to change to **HEAT PUMP**. Press the **SETUP** button to proceed to the next option.



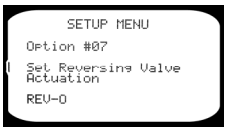


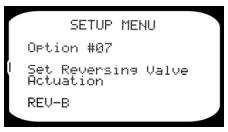




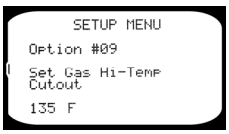
NOTE: A heat pump thermostat with an emergency heat switch MUST be installed on Zone 1 to manually turn on auxiliary heat.

OPTION #07 - SET REVERSING VALVE ACTUATION The default setting is **REV-O**. Press the **UP** or **DOWN** button to change to **REV-B**. **NOTE:** When set as **REV-O**, the reversing valve will energize in COOLING. When set as **REV-B**, the reversing valve will energize in HEATING. Press the **SETUP** button to proceed to the next option.

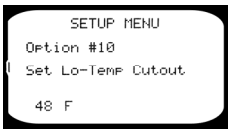




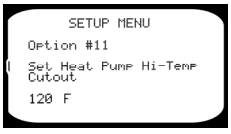
OPTION #09 - SET GAS HI-TEMP CUT-OUT The default setting is **135 F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **125 F** to **150 F.** Press the **SETUP** button to proceed to the next option.



OPTION #10 - SET LO-TEMP CUTOUT The default setting is **48° F.** Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **42° F** to **52° F**. Press the **SETUP** button to proceed to the next option.



OPTION #11 - SET HEAT PUMP HI-TEMP CUTOUT The default setting is **120 F**. Press the **UP** or **DOWN** button to change the setting. The adjustable range is **110 F - 125 F**. Press the **SETUP** button to proceed to the next option.



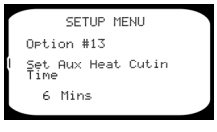
NOTE: If Option #05 is set for 1-STAGE, the next option will be OPTION #12.
If Option #05 is set for 2-STAGE, the next option will be OPTION #14.

OPTION #12 - SET AUX HEAT CUT-IN TEMP The default is **90 F**. Press the **UP** or **DOWN** button to change the setting. The adjustable range is **90 - 100 F**. Press the **SETUP** button to proceed to the next option.



NOTE: This option only available on 1-STAGE systems.

OPTION #13 - SET AUX HEAT CUTIN TIME The default is **6 Mins**. Press the **UP** or **DOWN** button to change the setting. The adjustable range is **3 - 6 Mins**. Press the **SETUP** button to proceed to the next step.

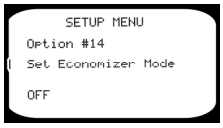


NOTE: This option only available on 1-STAGE systems.

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Configuration and Setup

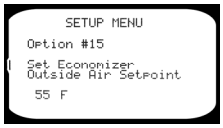
OPTION #14 - SET ECONOMIZER MODE The default setting is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. Press the **SETUP** button to proceed to the next option.



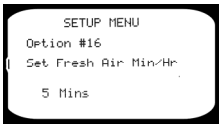


NOTE: If economizer mode is <u>OFF</u>, the next option is OPTION #16.
If economizer mode is <u>ON</u>, the next option is OPTION #15.

OPTION #15 - SET ECONOMIZER OUTSIDE SETPOINT - The default setting is **55° F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **50° F** to **75° F**. Press the **SETUP** button to proceed to the next option.

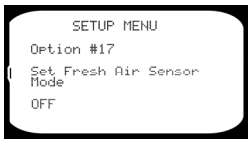


OPTION #16 - SET FRESH AIR MIN/HR The factory default is **0** minutes. Press the **UP** button to add fresh air minutes. The adjustable range is **0** to **60** minutes per hour, adjustable in **5 minute** increments. **NOTE: THIS OPTION IS <u>ONLY</u> AVAILABLE IF OPTION #14 (ECONOMIZER) IS TURNED <u>OFF</u>.** Press the **SETUP** button to proceed to the next option.



NOTE: If fresh air minutes are GREATER than ZERO (5-60) then the next option will be OPTION #17.
If fresh air minutes are set at ZERO (0), and the Equipment Stage is set for 1-Stage, then the next option will be OPTION #22.
If the Equipment Stage is set for 2-Stage, the next option will be OPTION #21

OPTION #17 - SET FRESH AIR SENSOR MODE The factory default is **OFF**. Press the **UP** or **DOWN** button to turn the sensor **ON**. (**NOTE:** If there is no sensor detected plugged into the FA SNS receptacle on the controller, the controller will display **INSTALL FA SENSOR)**. After the sensor is plugged in, press the **RESET** button to clear the error message. Press the **SETUP** button several times until **OPTION #17** appears on the display. Press the **SETUP** button to turn the sensor **ON.**

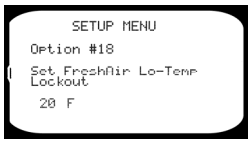




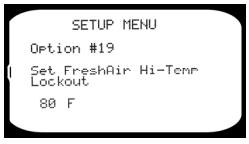
NOTE: If the fresh air sensor mode is set to ON, then the next option will be OPTION #18.
If the fresh air sensor mode is set to OFF, and the Equipment Stage is set for 1-Stage, then the next option will be OPTION #22.
If the Equipment Stage is set for 2-Stage, then the next option will be OPTION #21.

Press the **SETUP** button to proceed to the next option.

OPTION #18 - SET FRESH AIR LO-TEMP LOCKOUT The factory default is **20° F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **20° F** to **40° F**. Press the **SETUP** button to proceed to the next option.



OPTION #19 - SET FRESH AIR HI-TEMP LOCKOUT The factory default is **80° F**. Press the **UP** or **DOWN** button to change the temperature. The adjustable range is **60°** to **100° F**. Press the **SETUP** button to proceed to the next option.

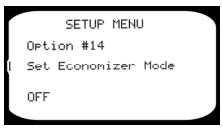


NOTE: If the Equipment Stage is set for 1-Stage, the next option will be OPTION #22.
If the Equipment Stage is set for 2-Stage, the next option will be OPTON #21.

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Configuration and Setup

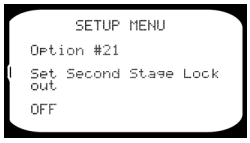
OPTION #20 - SET DUAL FUEL HP OUTDOOR LO-TEMP LOCKOUT The factory default is **30° F**. Press the **UP** or **DOWN** button to change. The adjustable range is **20° - 45° F**. Press the **SETUP** button to proceed to the next option.



NOTE: The controller will display F/A and the outdoor temperature

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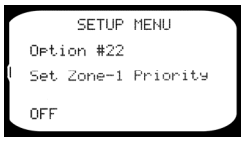
OPTION #21 - SET SECOND STAGE LOCKOUT The factory default is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this option is turned **ON**, the controller **WILL NOT ENERGIZE 2ND STAGE** if only **ONE ZONE** is calling. Press the **SETUP** button to proceed to the next option.

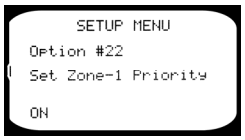




NOTE: This option will only appear if Option #05 is set for 2-STAGE equipment.

OPTION #22 - SET ZONE 1 PRIORITY The factory default is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this option is turned on, any call from the **ZONE 1 THERMOSTAT** will override any call from the ZONE 2 THERMOSTAT. If a call exists on the ZONE 2 THERMOSTAT and an opposing call is made from the ZONE 1 THERMOSTAT, the system will immediately to into a **3-minute PURGE** and then will turn on the equipment based on the call from the ZONE 1 THERMOSTAT. Press the **SETUP** button to proceed to the next option.





OPTION #23 - SET AUTO CHANGEOVER TIME The factory default is **10 minutes**. Press the up or down button to change the setting to **15 MINUTES**. This setting determines the amount of time that elapses after an opposing call occurs and the system changes over to the opposing call. Press the **SETUP** button to proceed.





OPTION #24 - DISABLE AUX HEAT STAGING ABOVE 40 DEG The default setting is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this feature is turned **ON**, the controller WILL NOT STAGE on Auxiliary Heat if the OUTDOOR TEMPERATURE is above **40° F.**



Press the **SETUP** button to proceed to the next option.

OPTION #25 - ALLOW ZONE 1 THERMOSTAT STAGING The default setting is **OFF**. Press the **UP** or **DOWN** button to turn **ON**. When this setting is **ON**, the controller will accept a 2nd stage call from the Zone 1 Thermostat. **NOTE: When this option is turned ON, Zone 1 will DISREGARD 2ND STAGE LOCKOUT if Option #21 is turned ON.**



NOTE: This option will only be available if Option #05 is set for 2-STAGE.

Press the **SETUP** button to exit the configuration mode.

SEQUENCE OF OPERATION

SINGLE STAGE COOLING (A/C AND HEAT PUMP)

On any cooling call from one of the thermostats, the controller will energize the **Y1** and **G** outputs to the equipment. A 3-minute MINIMUM RUN TIMER will be displayed. The damper for the zone calling will remain open, and the damper for the zone NOT calling will close. During this call, if the other zone makes a cooling call, the zone damper will open. When a thermostat becomes satisfied, and if a call exists from the other thermostat, the damper on the satisfied zone will close. Once the other thermostat becomes satisfied, the controller will de-energize the **Y1** and **G** outputs to the equipment, and both dampers will open. (system idle)

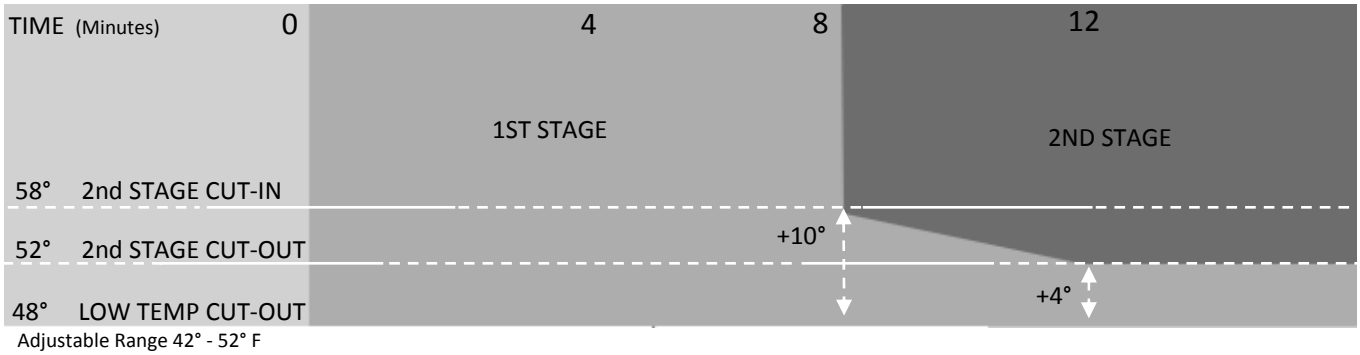
LOW TEMP CUTOUT

During a cooling call, if the Supply Air Temperature falls BELOW the LOW TEMP CUTOUT temperature, the controller will de-energize the **Y1** output to the equipment and will leave the **G** output energized. A 3-minute DELAY TIMER will be displayed. After the 3-minute delay, if the Supply Air Temperature has risen ABOVE the LOW TEMP CUTOUT temperature, the controller will re-energize the **Y1** output to the equipment.

TWO STAGE COOLING (A/C AND HEAT PUMP)

The EZ2F TL Series Controller utilizes built in intelligent TL Series Staging. This allows the use of single stage thermostats on both zones. The controller will energize and de-energize second stage based on elapsed run time and the supply air temperature. On an initial call for cooling, the controller will energize the **Y1** and **G** outputs to the equipment. A 3-minute MINIMUM RUN TIMER will be displayed. After an initial run time of 8 MINUTES, if the supply air temperature has not fallen to at least 10 DEGREES above the LOW TEMP CUTOUT, the controller will energize the **Y2** output to the equipment. The system will run in second stage cooling until the supply air temperature falls to within 4 DEGREES of the LOW TEMP CUTOUT. The controller will then turn off the **Y2** output to the equipment. After a 3-minute delay, if the supply air temperature has risen to 10 DEGREES above the LOW TEMP CUTOUT, the controller will re-energize **Y2** to the equipment. turns off the outputs to the equipment. This staging will continue until the thermostat is satisfied and the controller turns off the outputs to the equipment.

NOTE: EXAMPLE BASED ON FACTORY DEFAULT SETTINGS



Adjustable Range 42° - 52° F

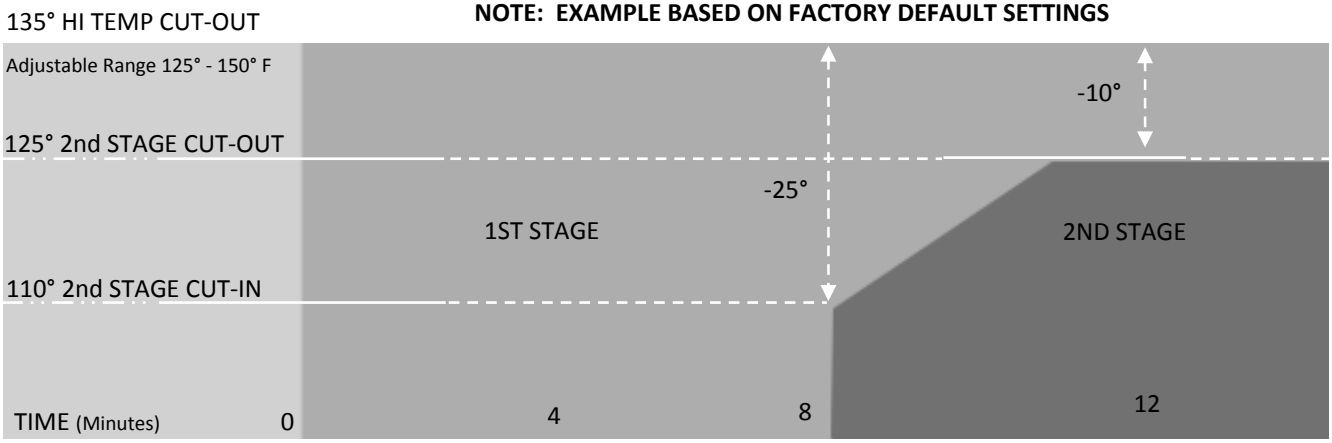
SEQUENCE OF OPERATION

SINGLE STAGE HEATING (GAS & ELECTRIC HEAT / NOT HEATPUMP)

On any heating call from one of the thermostats, the controller will energize the **W1** output to the equipment. After 90 SECONDS of initial run time, the controller will energize the **G** output to the equipment. If the supply air temperature rises above the HI TEMP CUTOUT setting, the controller will de-energize the **W1** output to the equipment. After a 3-minute time delay, if a call still exists and the supply air temperature has fallen below the HI TEMP CUTOUT, the controller will re-energize the **W1** output to the equipment.

TWO STAGE HEATING (GAS & ELECTRIC HEAT / NOT HEATPUMP)

On any heating call from one of the thermostats, the controller will energize the **W1** output to the equipment. After 90 SECONDS of initial run time, the controller will energize the **G** output to the equipment. After 8 MINUTES of initial run time, if the supply air temperature has not risen to at least 25 DEGREES BELOW the HI TEMP CUTOUT, the controller will energize **W2** to the equipment. The system will run in second stage heating until the supply air temperature rises to 10 DEGREES below the HI TEMP CUTOUT. The controller will then de-energize **W2**. If the supply air temperature falls to 25 DEGREES below the HI TEMP CUTOUT, the controller will re-energize **W2**. This staging will continue until the thermostat is satisfied and the controller turns off the equipment.



SEQUENCE OF OPERATION

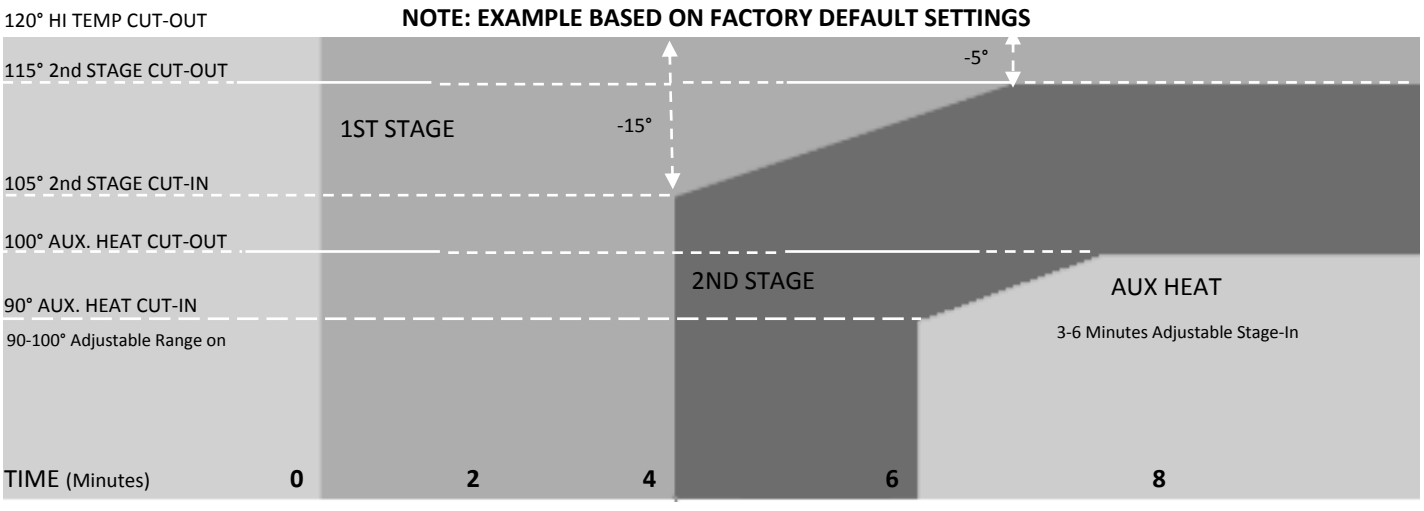
SINGLE STAGE HEATING - HEATPUMP

On any heating call from one of the thermostats (**Y** if using heat pump thermostats, **W** if using gas/electric thermostats) the controller will energize the **Y1** and **G** outputs to the equipment. A 3-minute minimum run timer will be displayed. After 6 MINUTES of initial run time (Factory default. Adjustable 3-6 minutes) if the supply air temperature has not reached 90 DEGREES (Factory default. Adjustable 90-100°) the controller will energize the **W1** output to the equipment (Auxiliary Heat). The equipment will continue to run in AUXILIARY HEAT until the supply air temperature rises to 10 DEGREES above the AUXILIARY HEAT CUT-IN TEMPERATURE. (Adjusts with Aux. Heat Cut-In Setting). The controller will continue to stage auxiliary heat on and off based on supply air temperature. If the supply air temperature rises above the HI TEMP CUT-OUT temperature, the controller will de-energize the **Y1** output to the equipment and leave the **G** output energized. A 3-minute compressor delay timer will be displayed. After 3 minutes, if the supply air temperature has fallen below the HI TEMP CUT-OUT temperature, the controller will re-energize the **Y1** output to the equipment. See staging chart below.

TWO STAGE HEATING - HEATPUMP

On any heating call from one of the thermostats (**Y** if using heatpump thermostats, **W** if using gas/electric thermostats) the controller will energize the **Y1** and **G** outputs to the equipment. After 4 minutes of initial run time, if the supply air temperature has not reached 105 DEGREES (15 degrees below the HIGH TEMP CUTOUT) , the controller will energize **Y2** to the equipment. **Y2** will remain energized until the supply air temperature reaches 115 DEGREES (5 degrees below the HIGH TEMP CUTOUT). The controller will then de-energize **Y2**. The controller will continue to stage Y2 on and off based on the supply air temperature. After 6 MINUTES of initial run time, if the supply air has not reached at least 90 DEGREES, the controller will energize **W1** to turn on auxiliary heat. **W1** will remain energized until the supply air temperature reaches 100 DEGREES (20 degrees below the HIGH TEMP CUTOUT). See staging chart below. **NOTE: AUX HEAT TIME AND TEMPERATURE STAGING IS NOT MANUALLY ADJUSTABLE ON TWO-SPEED HEAT PUMP EQUIPMENT. THE SECOND STAGE AND AUX HEAT STAGING TEMPERATURES MOVE UP AND DOWN BASED ON THE HIGH TEMP CUTOUT SETTING.**

ELECTRIC HEAT PUMP WITH ELECTRIC AUXILIARY HEAT (FACTORY DEFAULT TEMPERATURE SETTINGS)



SEQUENCE OF OPERATION

DUAL FUEL HEAT PUMP

SINGLE STAGE AND 2-STAGE COOLING

Single Stage and 2-Stage cooling operates the same on all system types. **REFER TO PAGE 16.**

SINGLE STAGE HEATING (DUAL FUEL HEAT PUMP)

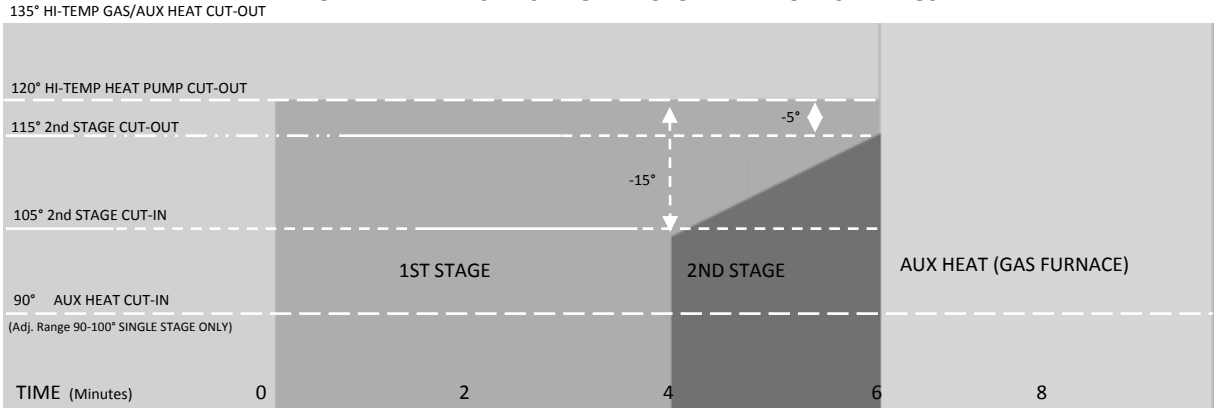
On any heating call from one of the thermostats (**Y** if using heat pump thermostats [**B** with **Y** if Option #07 is set to **B], W** if using gas/electric thermostats) the controller will energize the **Y1** and **G** [and **B** is Option #07 is set to **B]** outputs to the equipment. A 3-minute minimum run timer will be displayed. After 6 MINUTES of initial run time (Factory default. Adjustable 3-6 minutes) if the supply air temperature has not reached 90 DEGREES (Factory default. Adjustable 90-100°) the controller will de-energize the **Y1** output to the equipment and energize the **W1** output to the equipment (Auxiliary Heat). The equipment will continue to run in AUXILIARY HEAT until the thermostat(s) calling is satisfied. If the supply air temperature rises ABOVE the HIGH TEMP CUTOUT, the controller will turn off **W1** to the equipment. The fan will continue to run. After a 3-minute delay, if a call still exists and the supply air temperature has fallen BELOW the high temp cutout, the controller will re-energize **W1** to the equipment. **ONCE THE CONTROLLER HAS SWITCHED TO AUXILIARY HEAT, THE CONTROLLER WILL STAY IN AUXILIARY HEAT UNTIL ALL CALLS ARE SATISFIED.**

TWO STAGE HEATING (DUAL FUEL HEAT PUMP)

On any heating call from one of the thermostats (**Y** if using heat pump thermostats [**B** with **Y** if Option #07 is set to **B], W** if using gas/electric thermostats) the controller will energize the **Y1** and **G** [and **B** is Option #07 is set to **B]** outputs to the equipment. After 4 minutes of initial run time, if the supply air temperature has not reached 105 DEGREES (15 degrees below the HIGH TEMP CUTOUT) , the controller will energize **Y2** to the equipment. **Y2** will remain energized until the supply air temperature reaches 115 DEGREES (5 degrees below the HIGH TEMP CUTOUT). The controller will then de-energize **Y2**. The controller will continue to stage Y2 on and off based on the supply air temperature. After 6 MINUTES of initial run time, if the supply air has not reached at least 90 DEGREES, the controller will de- energize **Y1** and Y2 and energize **W1** to turn on auxiliary heat. **W1** will remain energized until the thermostat(s) calling is satisfied. If the supply air temperature rises ABOVE the HIGH TEMP GAS CUTOUT, the controller will turn off **W1** to the equipment. The fan will continue to run. After a 3-minute delay, if a call still exists and the supply air temperature has fallen BELOW the high temp cutout, the controller will re-energize **W1** to the equipment. **ONCE THE CONTROLLER HAS SWITCHED TO AUXILIARY HEAT, THE CONTROLLER WILL STAY IN AUXILIARY HEAT UNTIL ALL CALLS ARE SATISFIED.**

NOTE: AUX HEAT TIME AND TEMPERATURE STAGING IS NOT MANUALLY ADJUSTABLE ON TWO-SPEED HEAT PUMP EQUIPMENT. THE SECOND STAGE AND AUX HEAT STAGING TEMPERATURES MOVE UP AND DOWN BASED ON THE HIGH TEMP CUTOUT SETTING.

NOTE: EXAMPLES BASED ON FACTORY DEFAULT SETTINGS



TL SERIES FEATURES

EXCLUSIVE EQUIPMENT TEST MODE

The TL Series Controller can be put into an EQUIPMENT TEST MODE by powering the controller. After the IDLE screen appears, hold down the RESET BUTTON, then hold down the SETUP BUTTON, release the RESET BUTTON and then release the SETUP BUTTON. The controller will display TEST - IDLE -EC. The controller will now only accept calls form the ZONE 1 thermostat, and will not operate the dampers. This allows the installer to set the bypass damper, check the refrigerant charge on the system and verify proper airflow thru the system. After all testing is complete, press and release the RESET button. The controller will reset and go into IDLE mode awaiting calls.

EMERGENCY HEAT - HEAT PUMP AND DUAL FUEL

Emergency heat can **ONLY** be initiated by a HEAT PUMP THERMOSTAT connected to the ZONE 1 thermostat input. A HEAT PUMP THERMOSTAT SHOULD **ALWAYS** be used for the ZONE 1 thermostat in heat pump applications. If the ZONE 1 thermostat calls for EMERGENCY HEAT, the TL Series controller will be **LOCKED** into emergency heat (AUX HEAY). **ANY** call for heat from either zone will turn on auxiliary heat. The controller can be **UNLOCKED** by making a call for compressor (heat or cool) from the Zone 1 thermostat.

AUTO CHANGEOVER

It is possible to have one zone calling for cooling and the other zone calling for heating (opposing calls). When an opposing call occurs, a CHANGEOVER TIMER (10 or 15 minutes - Adjustable) will display on the screen. After the timer has reached zero, the system will go into PURGE MODE for **3-MINUTES**. (See PURGE mode below). At the end of the 3-minute purge, the system will switch over to the other mode. If an opposing call still exists, the CHANGOVER TIMER will restart.

PURGE

Purge occurs whenever the system is running with only one zone calling, and the other zone makes an opposing call. After the changeover time has elapsed the controller turns off the equipment and leaves the fan (**G**) energized. The last zone calling will remain open during the **3 MINUTE** purge (countdown timer displayed on screen). This allows the temperature in the ductwork to equalize before starting the opposing call.

MINIMUM RUN TIME - COMPRESSOR

The TL Series Controller features a MINIMUM RUN TIME anytime **Y1** in energized to the equipment. This protects the compressor from damage caused by short-cycling. A 3-MINUTE MIN RUN timer is displayed on the screen each time the compressor is started.

TIME DELAY

The TL Series Controller features a TIME DELAY MODE that is designed to protect the compressor from short cycling. The time delay is initiated each time the compressor is de-energized. A 3-MINUTE DELAY timer will be displayed on the screen during this time. The compressor CANNOT be restarted until the timer has counted down to zero. In addition, if using a GAS FURNACE and the supply air temperature rises ABOVE the high temp limit, the controller will de-energize **W1** and keep **G** energized. A 3-MINUTE DELAY timer will be displayed on the screen during this time.

ECONOMY MODE

The ECONOMY MODE (**EC**) input on the ZONE 1 TSTAT connector allows the use of a switch, occupancy sensor or dry contact to apply 24 VAC input to the **EC** terminal to put the controller into ECONOMY MODE. This prevents ZONE 2 from making equipment calls. ZONE 2 will only be able to open and close the damper. Only ZONE 1 will be able to make equipment calls.

RH/RC JUMPER

The RH/RC Jumper is factory installed on the TL Series Controller. If the equipment requires separate transformers for heating and cooling, REMOVE the jumper [JP1] located next to the **"C"** equipment connector. **NOTE: The jumper should NOT be removed for heat pump systems.**

FRESH AIR CONTROL - OPTION#16

The TL Series EZ2F Controller features on board Fresh Air Control. A 2-wire or 3-wire damper may be used. The timer is adjustable from **5** to **60** minutes per hour in **5** minute increments. The controller will open the fresh air damper anytime the controller energizes the **G** terminal to the equipment as long as minutes per hour remain. At the end of the hour, if run time minutes still exist (displayed on screen), the controller will turn on the **G** terminal to the equipment, open the fresh air damper, leave the zone dampers open and run until the remaining minutes have elapsed.

EXCLUSIVE FRESH AIR SENSOR MODE - OPTION #17

An outdoor Fresh Air Sensor may be plugged into the controller. By turning on Option #17, a LOW (Option #18) and HIGH (Option #19) temperature limit for fresh air can be set. The low temp setting has a factory default setting of **20° F** and an adjustable range of **20° - 40° F**. The high-temp setting has a factory default setting of **80° F** and an adjustable range of **60° - 80° F**.

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TL SERIES FEATURES

EXPANSION MODE - SLAVE - OPTION #01

The EZ2F TL Series Controller can be used as a 2-zone expansion module for larger systems. Option #01 allows the controller to be set as a SLAVE expansion module. The zoning system can be expanded with up to 9 expansion modules, with a total capacity of 40 zones. Each SLAVE module requires an individual address (1-9) to be entered at Option #02. Communication is accomplished by use of a TL Series Link Cable plugged into the 3-pole TL Series Link receptacle at the bottom of each board. For systems with more than 1 expansion module, the communication cables are daisy-chained.

THERMOSTAT TYPE - OPTION #06

When using Heat Pump Equipment, the controller allows the use of either Single-Stage Gas/Electric OR Single-Stage Heat Pump thermostats. When electric heat pump or dual fuel system is selected as the System Type (Option #03) the controller will prompt to select what type of thermostat is being used. Calls from gas/electric thermostats are recognized by the controller and the appropriate equipment terminals are energized. **NOTE: A heat pump thermostat with an emergency heat switch is REQUIRED on Zone 1 in order to turn on EMERGENCY HEAT if needed. Once emergency heat has been initiated, the controller is "LATCHED" into emergency heat. All calls from ALL thermostat will turn on emergency (auxiliary) heat. The controller can only be "UNLATCHED" by making a compressor call (Y in either heating or cooling). After the board is unlatched, the controller reverts to normal heat pump operation.**

ECONOMIZER MODE - OPTION #14

When the Economizer Mode is turned on, the controller will open the economizer and turn on **G** to the equipment if the outdoor temperature is below the Economizer Outdoor Setpoint (Option #15 - **55° F** factory default. Adjustable range **50° - 75° F**). During the cooling call, if the outdoor temperature rises ABOVE the outdoor setpoint, the controller will close the economizer and turn on mechanical cooling.

DUAL FUEL LOW TEMP LOCKOUT - OPTION #20

When using Dual Fuel Equipment, a Fresh Air Sensor is REQUIRED for proper operation. Option #20 allows the setting of an Outdoor Lock-out Temperature that will prevent the heat pump from running in extremely low temperatures. The factory default setting is **30° F**. The adjustable range is **20° - 50° F**. When the outdoor temperature is BELOW the Lock-Out Temperature setting, the controller will turn on the gas furnace for all heating calls.

SECOND STAGE LOCKOUT - OPTION #21

On 2-stage systems, if Option #21 is enabled the controller will not go into second stage with only one zone calling. Both zones MUST be calling for the controller to bring on 2nd stage.

DISABLE AUX HEAT STAGING - HEAT PUMP AND DUAL FUEL HEATPUMP - OPTION #24

The EZ2F TL Series Controller has the ability disable automatic auxiliary heat staging if the outdoor temperature is above 40° F.

ZONE 1 THERMOSTAT STAGING - OPTION #25

On 2-stage systems, a 2-stage thermostat may be installed and used on Zone 1. When Option #25 is turned ON, the Zone 1 thermostat can initiate 2nd stage heating or cooling after an initial 1 minute minimum run time. This setting also overrides 2nd stage lockout (Option #21) for Zone 1.

ASHRAE 62.2

1 DETERMINE THE FRESH AIR CFM TO COMPLY WITH ASHRAE 62.2 USING THE TABLE BELOW OR THIS FORMULA:

[(TOTAL SQ. FT.) /100]
+[(# OF BEDROOMS+1) X 7.5]

FRESH AIR CFM

Floor Area	BEDROOMS				
	0-1	2-3	4-5	6-7	>7
< 1500	30	45	60	75	90
1501 - 3000	45	60	75	90	105
3001 - 4500	60	75	90	105	120
4501 - 6000	75	90	105	120	135
6001 - 7500	90	105	120	135	150
> 7500	105	120	135	150	165

2 MEASURE THE CFM PROVIDED BY THE FRESH AIR DAMPER WITH AN ANEMOMETER

3 CALCULATE FRESH AIR RUN TIME AND SET THIS NUMBER AT OPTION #16

$$\text{FRESH AIR RUN TIME} = 60 \times \frac{\text{FRESH AIR CFM}}{\text{MEASURED - CFM}}$$

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