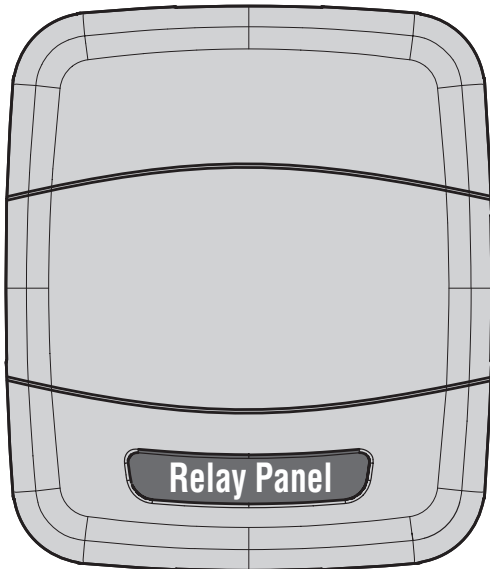


## Installation Guide

Other Installation Guides may be necessary, based on system configuration.  
A list of other system components is shown below.



BAY24VRPAC52DA

<b>1</b>	<b>Thermostat</b> (required) *ZONE950AC52ZA
<b>2</b>	<b>Relay Panel</b> For use with 24V or communicating indoor unit and 24V controlled outdoor unit
<b>3</b>	Zone Panel (optional)
<b>4</b>	Zone Sensor with Display (optional)
<b>5</b>	Zone Sensor (optional)
<b>6</b>	Zone Dampers (optional)

\* A or T

ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES

IMPORTANT — This Document is customer property and is to remain with this unit.

These instructions do not cover all variations in systems or provide for every possible contingency to be met in connection with the installation. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your installing dealer or local distributor.

### Section 1. Safety

#### **WARNING**

This information is intended for use by individuals possessing adequate backgrounds of electrical and mechanical experience. Any attempt to repair a central air conditioning product may result in personal injury and/or property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

#### **WARNING**

**LIVE ELECTRICAL COMPONENTS!**  
During installation, testing, servicing, and troubleshooting of this product, it may be necessary to work with live electrical components. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

### Table of Contents

<b>Section 1. Safety</b> .....	<b>1</b>
<b>Section 2. General Information</b> .....	<b>2</b>
<b>Section 3. Installation</b> .....	<b>3</b>
<b>Section 4. Terminal Locations &amp; Identification</b> .....	<b>6</b>
<b>Section 5. Field Wiring Diagrams</b> .....	<b>8</b>
<b>Section 6. LED Indicators</b> .....	<b>11</b>
<b>Section 7. Troubleshooting</b> .....	<b>12</b>

## Section 2. General Information

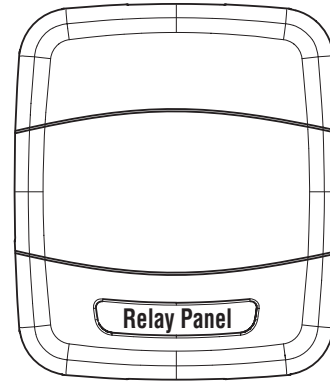
### 2.1 Overview

The Relay Panel is a wall mounted low voltage panel that enables the communicating \*ZONE950 thermostat to operate with 24 VAC HVAC equipment. Only three wires are required from the thermostat to the Relay Panel.

This Relay Panel controls the operation of heating, cooling, heat pump and dual fuel systems.

For specific wiring applications, see Field Wiring Diagrams.

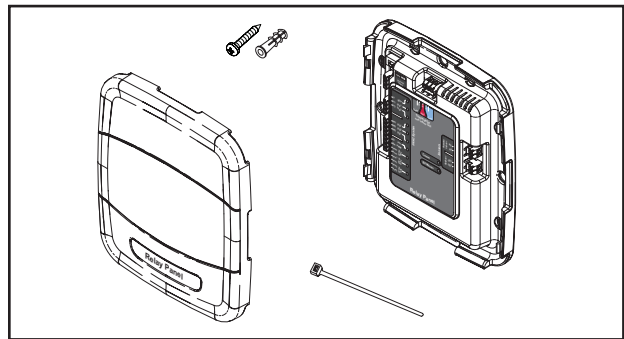
\*A or T



### 2.2 Contents in Box

The following parts are included in product model BAY24VRPAC52DA:

- 1 - Relay Panel cover
- 1 - Relay Panel base
- 4 - Mounting screws/anchors
- 4 - Wire ties
- 1 - Installation Guide



### 2.3 Optional Accessories

Sensor	Description
ZZSENSAL0400AA	Indoor Temperature Sensor
BAYSEN01ATEMPA	Outdoor Temperature Sensor

### 2.4 Specifications

Specification	Description
Product Model:	BAY24VRPAC52DA
Product:	Relay Panel for use with 24V indoor systems
Size:	8.0" width x 9.3" height x 1.9" depth
Storage Temperature:	-40° to 175°F, 5% - 95% RH non-condensing
Operating Temperature:	-40° to 150°F, 5% - 95% RH non-condensing
Input Power:	24 VAC from HVAC System (Range: 18-32 VAC)
Power Consumption:	4VA* (See the following table for system transformer sizing guidelines.)
Wire usage:	Minimum 18 gauge NEC approved control wiring
HVAC System Type Compatible:	Standard (gas/electric), Heat Pump, Dual Fuel
Multistage System Compatible:	Standard HVAC Systems: 3-stage heating, 2-stage cooling Heat Pump Systems: 5-stage heating (2-compressor, 3 aux heat), 2-stage cooling
LEDs:	11 green, 1 amber
Communications:	12 VDC

## 2.5 System Transformer Sizing Guidelines

OD Unit Type	Indoor Unit Type			
	Comm Furnace	Comm Air Handler	24V Furnace	24V Air Handler
	Minimum Indoor 24V Control Power Transformer Size, VA*			
Communicating Heat Pump	35	35	See Below	
Communicating Air Conditioner	35	35		
24Volt-Controlled Single Stage Heat Pump	35	40	35	40
24Volt-Controlled Single Stage Air Conditioner	35	40	35	40
24Volt-Controlled 2-Stage Single Compressor Heat Pump	65	75	65	75
24Volt-Controlled 2-Stage Single Compressor Air Conditioner	50	40	50	40
24Volt-Controlled 2-Stage Dual Compressor Heat Pump	50	75	50	75
24Volt-Controlled 2-Stage Dual Compressor Air Conditioner	35	40	35	40

\*Note: The VA rating of all 24V field-installed accessories must be added to the above for sizing indoor unit control transformers or the accessories must be powered separately.

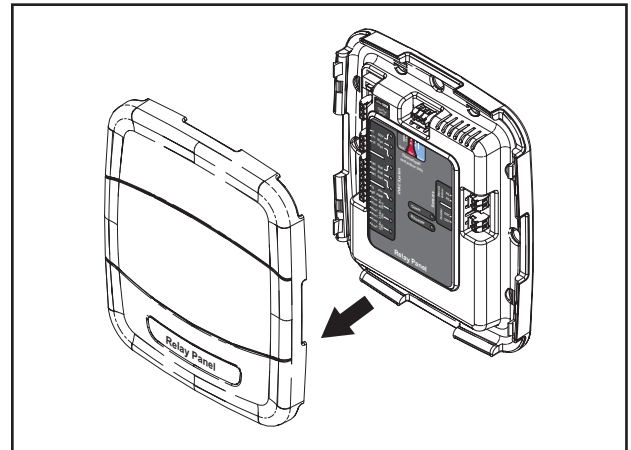
## Section 3. Installation

### Unit Location Considerations

The unit's rugged design allows installation in closet, attic or other non-condensing locations free from obstructions or other hazards.

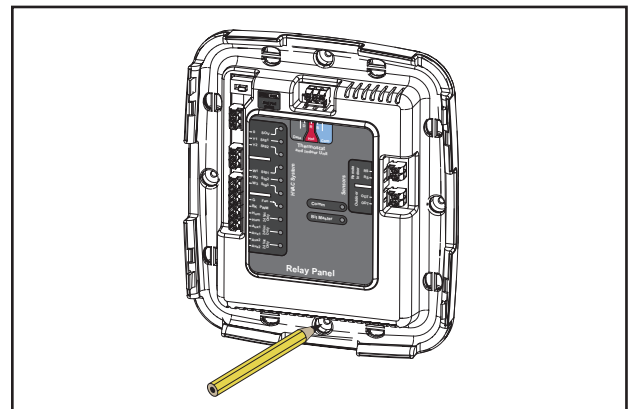
### 1 Remove Cover

Remove cover by grasping at edges and gently pulling the cover straight towards you. It should release without much effort.

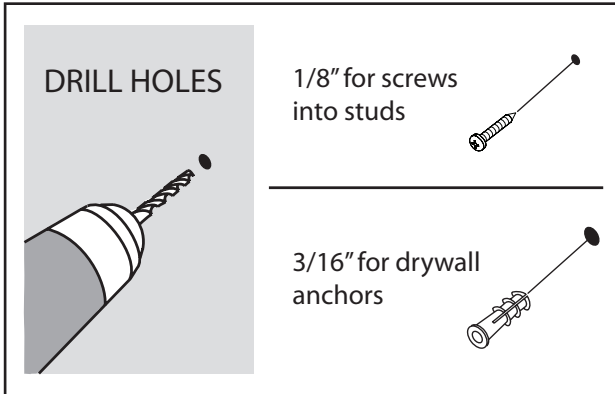


### 2 Mark Mounting Location

Mark four holes on the wall using the base as a template. A level may be used to ensure accuracy.



### 3 Mount Panel

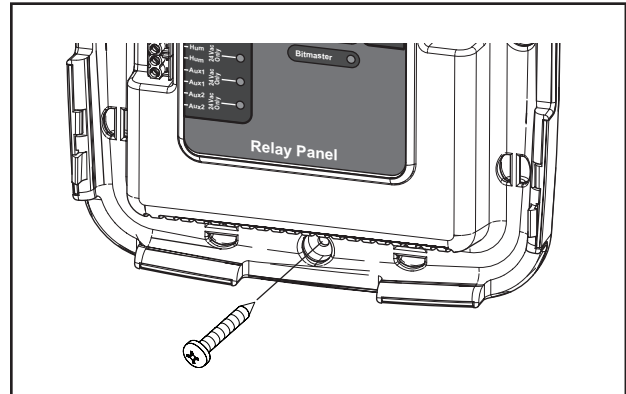


**Mounting to studs:** Drill 1/8" pilot holes in the four locations marked above.

**Mounting to drywall:**

If mounting to drywall with no studs behind it, enlarge pilot holes to 3/16" for anchors (included with the relay panel).

Gently tap anchors into the holes.



Attach base to wall using four screws provided. Do not overtighten.

### 4 General Wiring Information

**⚠ WARNING**

**LIVE ELECTRICAL COMPONENTS!**  
During installation, testing, servicing, and troubleshooting of this product, it may be necessary to work with live electrical components. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

**⚠ CAUTION**

**CAUTION: EQUIPMENT DAMAGE HAZARD** - Improper wiring can lead to equipment damage. Follow the terminal connection information carefully to ensure the control is wired properly. After wires are secure, bare wires **MUST NOT** touch each other. See the Field Wiring Diagrams for specific system applications.

Wires may enter the Relay Panel through openings on each corner and at the center of each side.

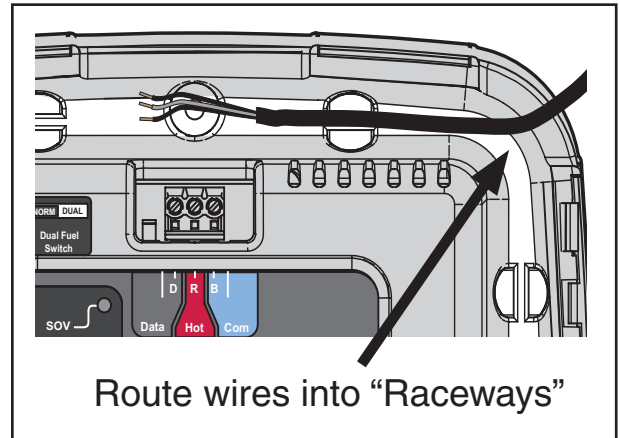
Necessary wire lengths should be considered when determining entry points.

Wires may enter at any of 8 locations



## 5 Routing Wires

Run wires within the recessed wire “raceway”. Be sure there is ample length to reach the connectors.

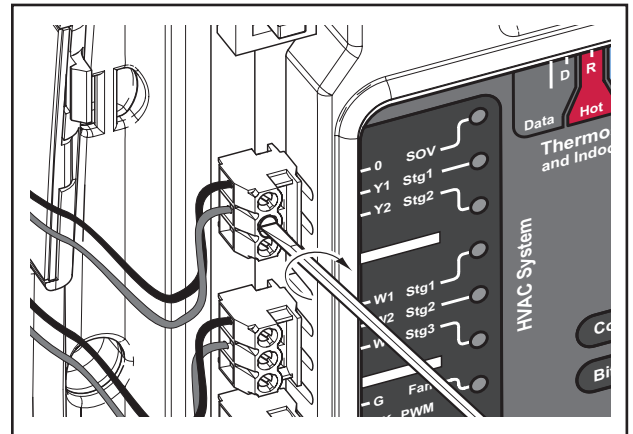


## 6 Attaching Wires

Using 1/8" blade screwdriver, attach all wires securely to the proper terminals on the Relay Panel.

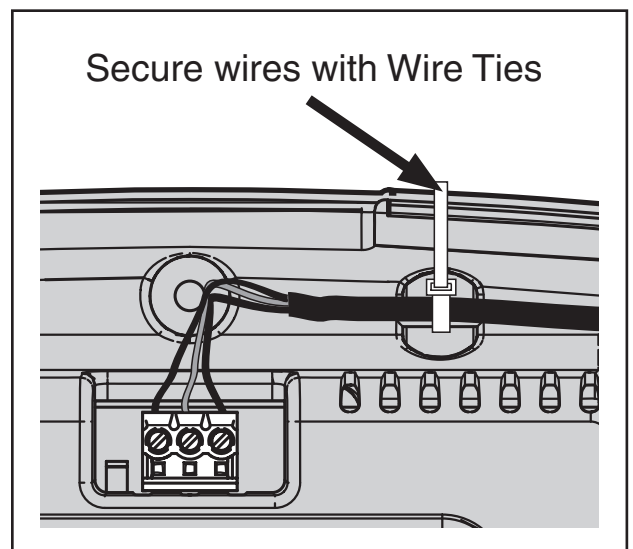
Refer to the following section for detailed terminal information.

(See the Field Wiring Diagrams section for common system configurations.)



## 7 Securing Wires

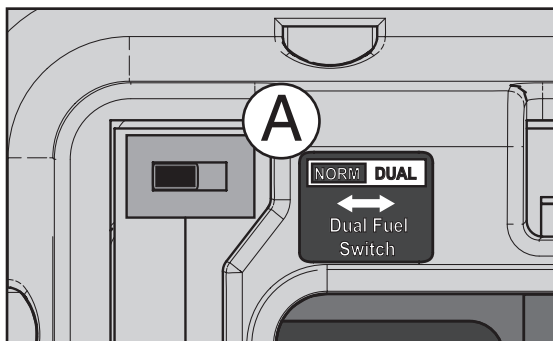
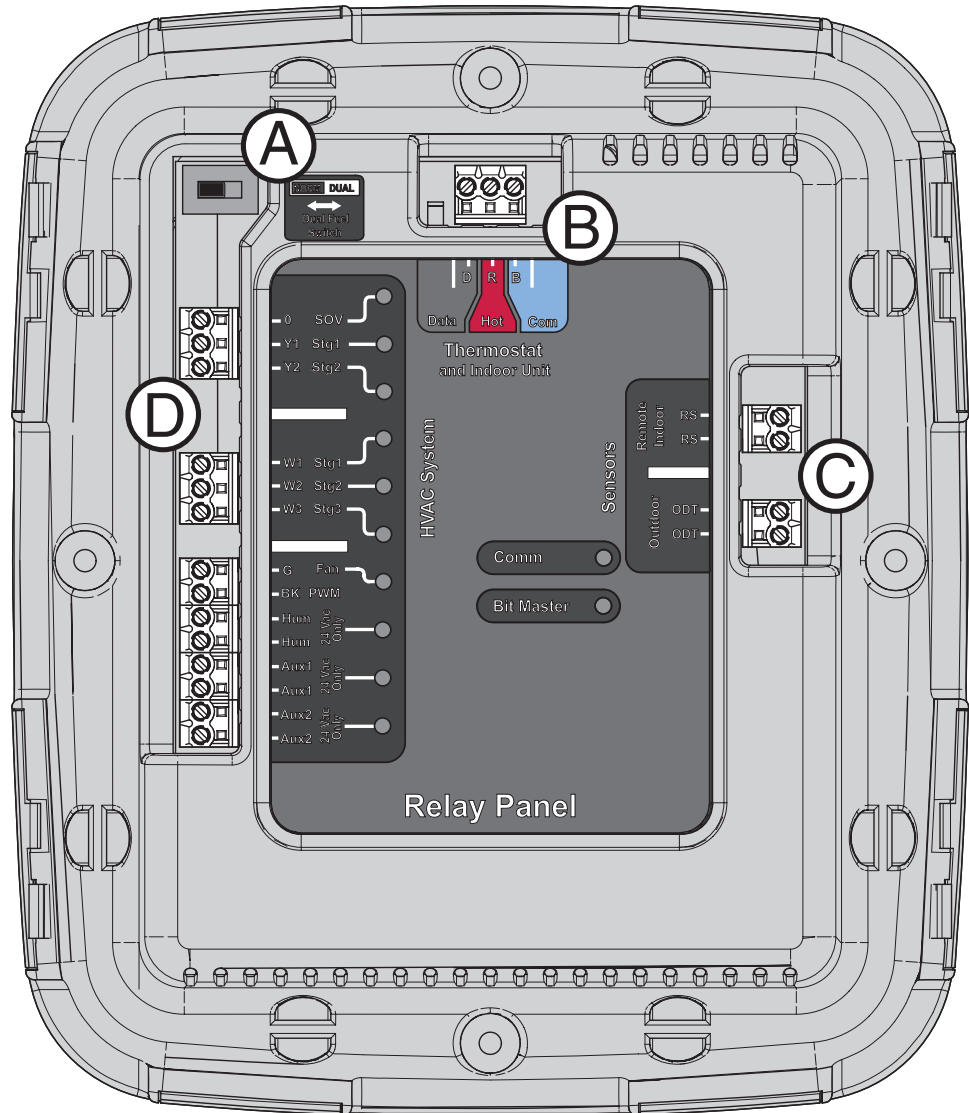
Secure all wires with the supplied wire ties to ensure that wires are kept in place and not strained.



## Section 4. Terminal Locations and Identification

Refer to the following diagrams for descriptions of each terminal.

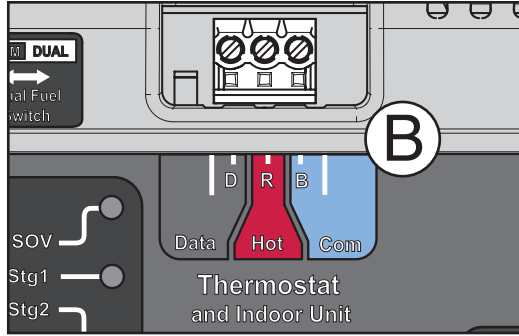
KEY	Terminal Identification
(A)	Dual Fuel Switch
(B)	Thermostat
(C)	Optional Remote Sensors
(D)	HVAC System



(A) Dual Fuel Switch	
Switch Position	Description
NORM	For HP or conventional Heat/Cool systems.
DUAL	For dual fuel systems.

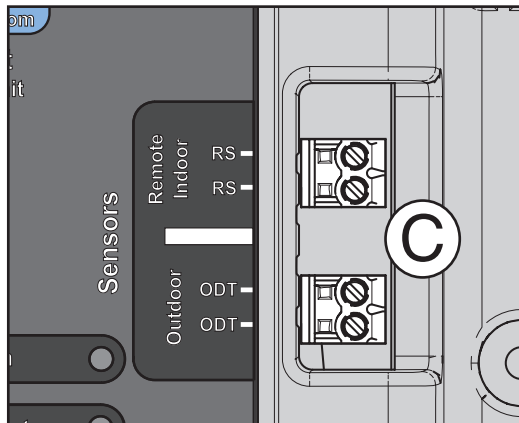
This switch ships in the NORM position by default. Refer to the following section for complete Field Wiring Diagrams.

For convenience, you may record the color of each wire used in the blanks provided.



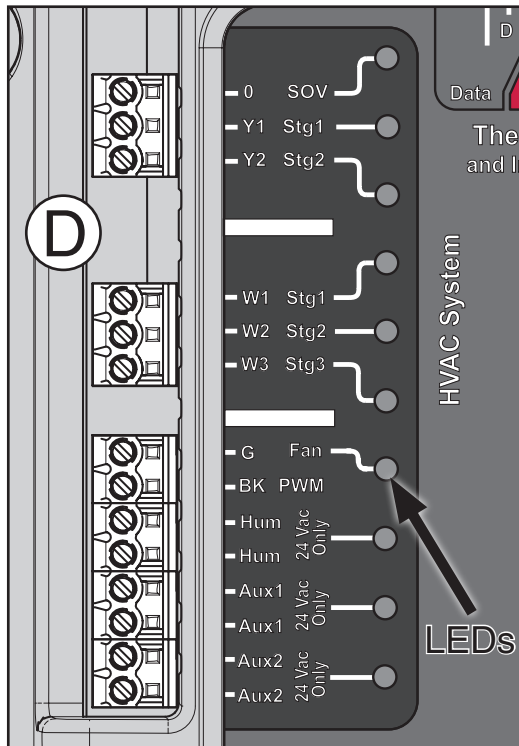
B Thermostat and Indoor Unit Connections		
Terminal Name	Description	Color Used:
D - Data	Data	
R - Hot	24 V hot	
B - Com	24 V common	

**Note:** R & B must receive 24 volts from the indoor unit transformer.



C Optional Remote Sensor Connections		
Terminal Name	Description	Color Used:
Remote Indoor	RS	Remote Indoor temp sensor ZZSENSAL0400AA
	RS	
Outdoor	ODT	Outdoor temp sensor BAYSEN01ATEMPA
	ODT	

**Note:** The Relay Panel uses 5 VDC to obtain temperature feedback from remote sensors. Do not run these sensors in a wiring bundle that contains 24 volts AC. See remote sensor literature for troubleshooting.



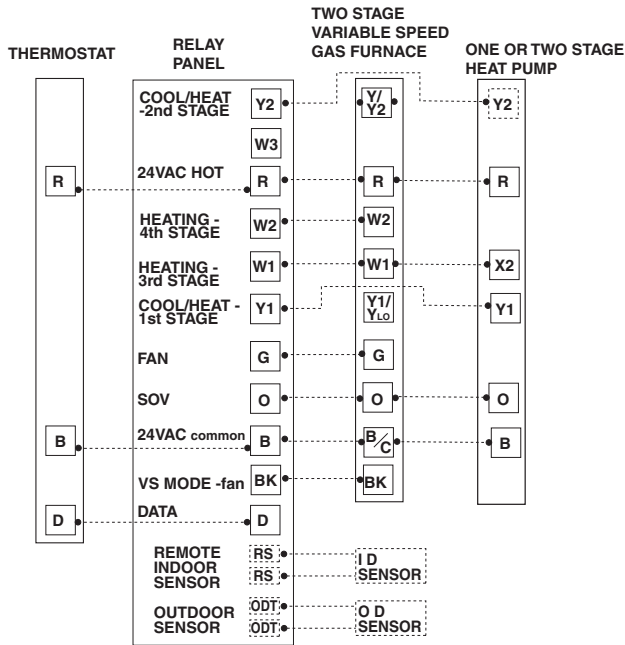
D HVAC System Connections		
Terminal Name	Description	Color Used:
O - SOV	Switch Over Valve	
Y1 - Stg1	First Stage Compressor	
Y2 - Stg2	Second Stage Compressor	
W1 - Stg1	First Stage Heating	
W2 - Stg2	Second Stage Heating	
W3 - Stg3	Third Stage Heating	
G - Fan	Indoor Blower	
BK - PWM	PWM Signal for indoor blower modulation	
Hum*	Humidifier Contact	
Hum*	Humidifier Contact	
Aux 1	Future Expansion	---
Aux 1	Future Expansion	---
Aux 2	Future Expansion	---
Aux 2	Future Expansion	---

**\*Note:** Hum terminals are dry contacts. Refer to humidifier's installer's guide.

# Section 5. Field Wiring Diagrams

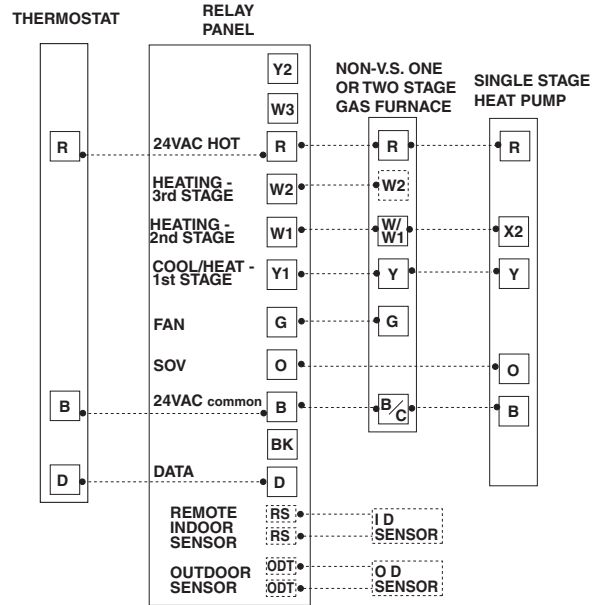
## DUAL FUEL

### DUAL FUEL VARIABLE SPEED GAS FURNACE



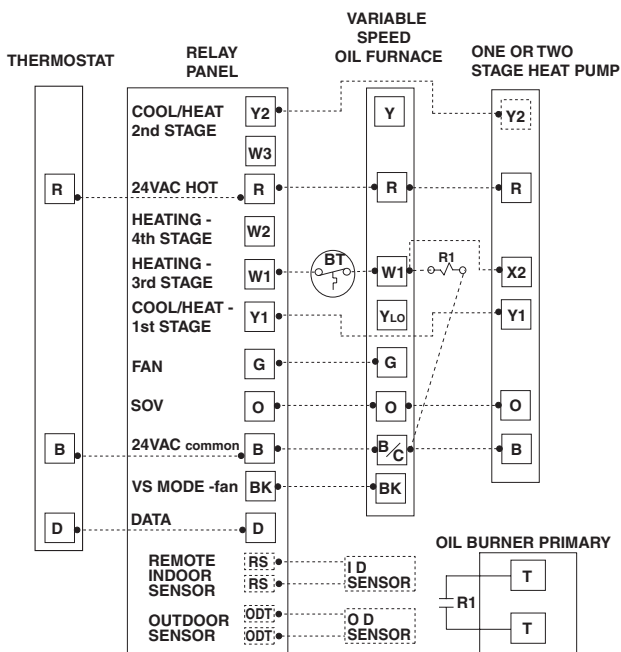
Note: Enable "BK" (turn on dehumidifier switch or cut "BK" jumper).  
 Note: Dual fuel switch on Relay Panel must be set to DUAL.  
 Note: Blower delay profiles must be turned off. See indoor unit service facts for details.

### DUAL FUEL NON-VARIABLE SPEED GAS FURNACE



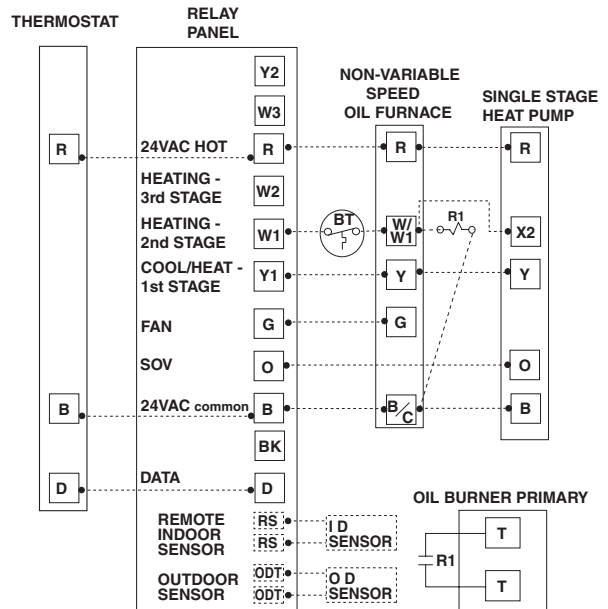
Note: Dual fuel switch on Relay Panel must be set to DUAL.

### DUAL FUEL WITH VARIABLE SPEED OIL FURNACE



Note: Remove the "R" to "BK" jumper at the low voltage control board.  
 Note: Cut the factory installed "R" to "O" jumper at the LVTB.  
 Note: Blower delay profiles must be turned off. See indoor unit service facts for details.  
 Note: Dual fuel switch on Relay Panel must be set to DUAL.  
 Note: BT (Bonnet Thermostat) model THT1248 (BAYSEN03ATEMPAA) required for dual fuel, oil furnace applications.

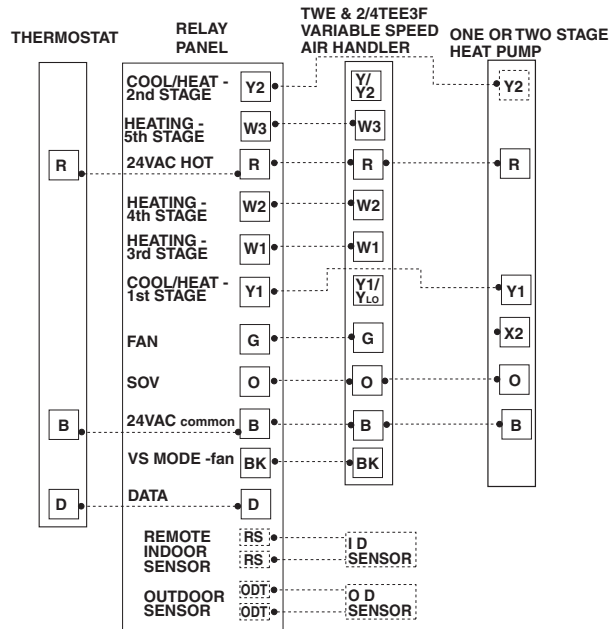
### DUAL FUEL WITH NON-VARIABLE SPEED OIL FURNACE



Note: Dual fuel switch on Relay Panel must be set to DUAL.  
 Note: BT (Bonnet Thermostat) model THT1248 (BAYSEN03ATEMPAA) required for dual fuel, oil furnace applications.

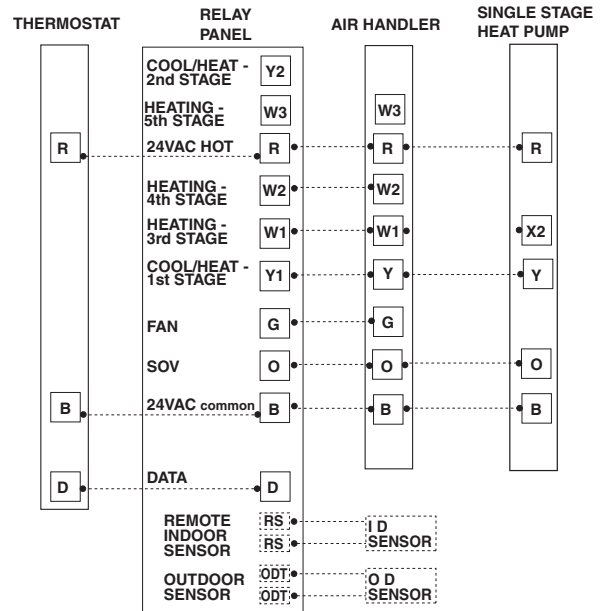
# HEAT PUMP

## HEAT PUMP WITH VARIABLE SPEED INDOOR Non-Communicating Air Handler

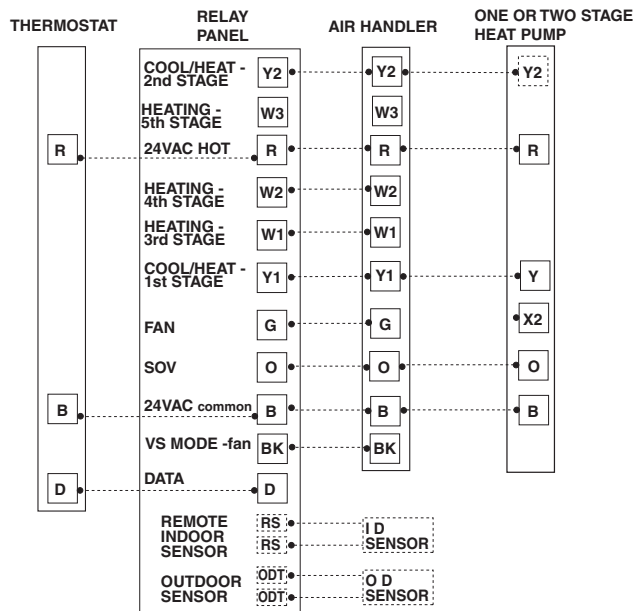


Note: Remove the "R" to "BK" jumper at the low voltage control board.  
 Note: DIP Switches 5 & 6 must be set to OFF on indoor unit.

## HEAT PUMP WITH NON-VARIABLE SPEED INDOOR

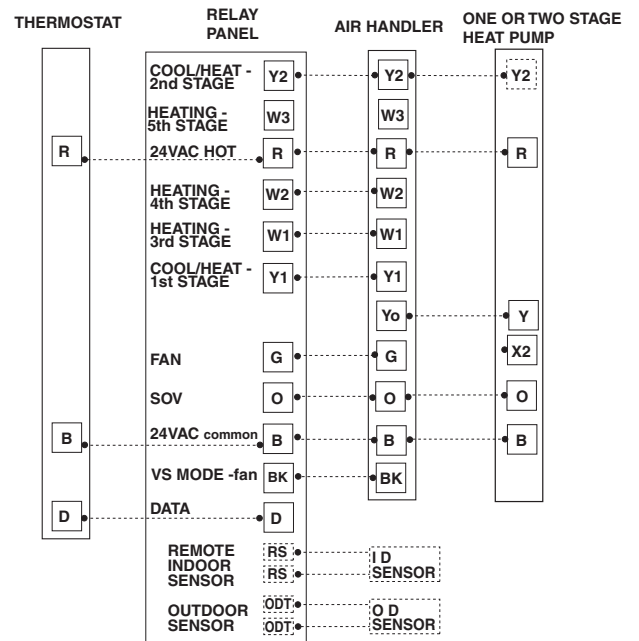


## HEAT PUMP WITH 2/4TEE3C Communicating Air Handler in 24 Volt Mode



Note: Remove the "R" to "BK" jumper at the low voltage control board.

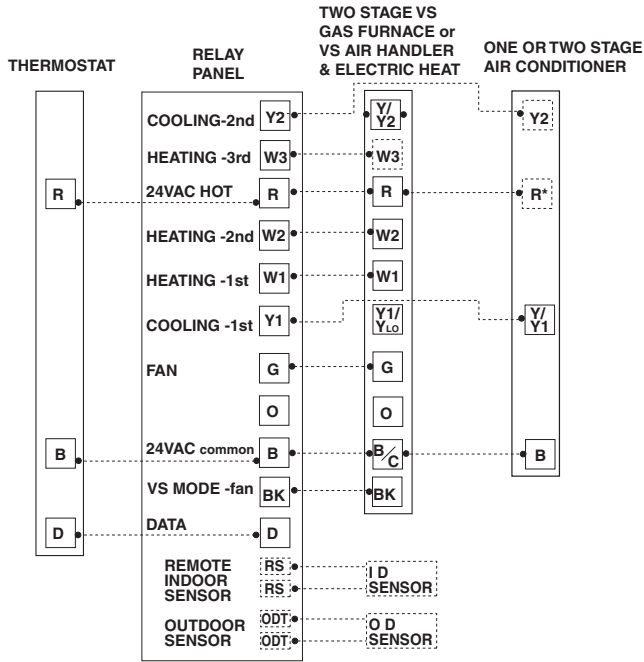
## HEAT PUMP WITH \*AM7 Air Handlers



Note: Cut the factory installed "BK" jumper at the indoor unit.

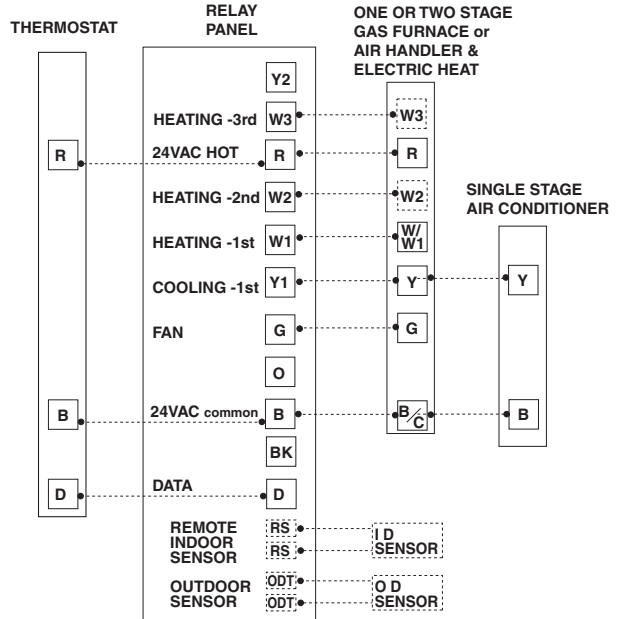
# HEAT/COOL

## COOLING WITH VARIABLE SPEED INDOOR

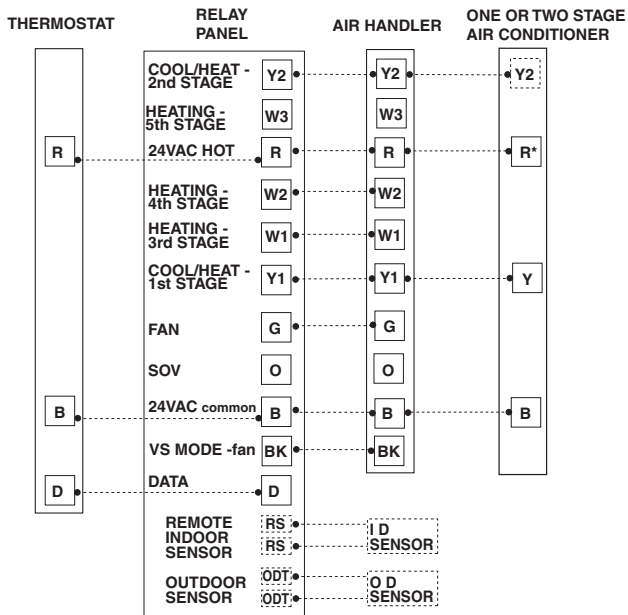


Note: Enable "BK" (turn on dehumidifier switch or cut "BK" jumper).  
 Note: "R" is only connected on two-compressor models

## COOLING WITH NON-VARIABLE SPEED INDOOR

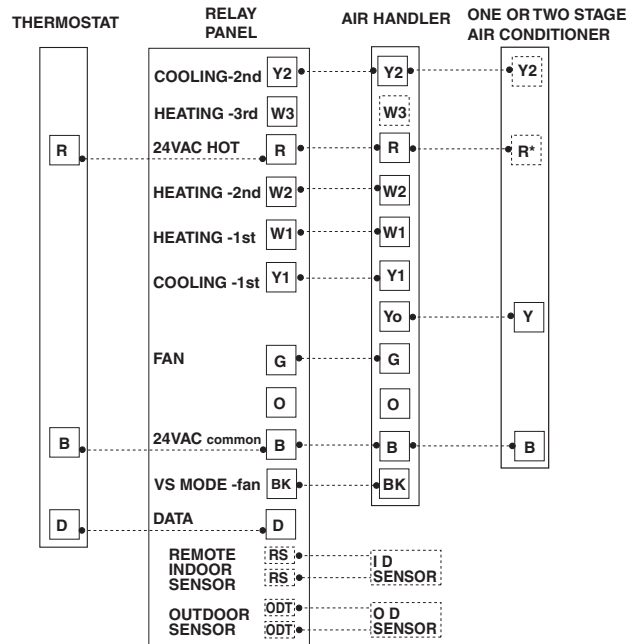


## COOLING WITH 2/4TEE3C Communicating Air Handler in 24 Volt Mode



Note: First stage blower air flow is set on air handler interface control board.  
 Note: Remove the "R" to "BK" jumper at the low voltage control.  
 Note: "R" is only connected on two-compressor models

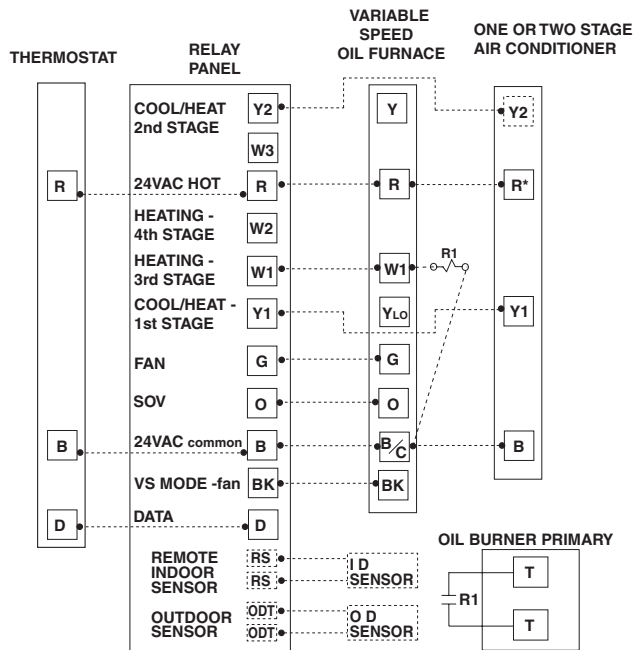
## COOLING WITH \*AM7 AIR HANDLERS



Note: Remove the factory installed "BK" jumper at the indoor unit.  
 Note: "R" is only connected on two-compressor models

# HEAT/COOL

## COOLING WITH VARIABLE SPEED OIL FURNACE



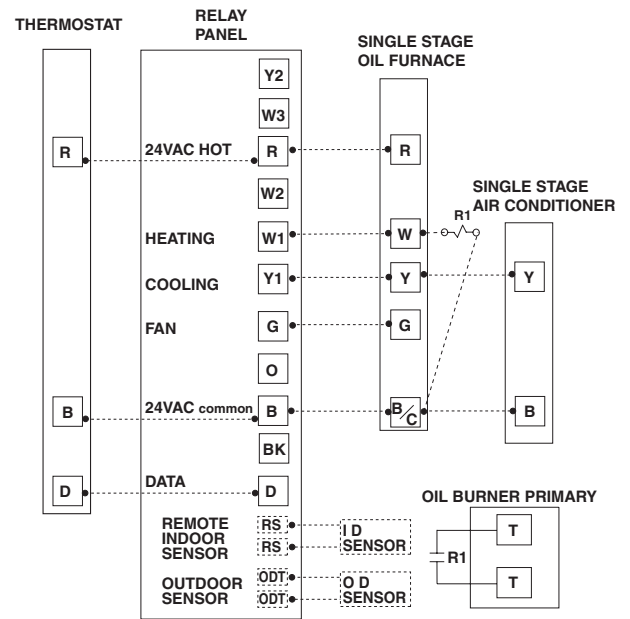
Note: Remove the "R" to "BK" jumper at the low voltage control board.

Note: Cut the factory installed "R" to "O" jumper at the LVTB.

Note: Blower delay profiles must be turned off. See indoor unit service facts for details.

Note: \*R is only connected on two-compressor models

## COOLING WITH NON-VARIABLE SPEED OIL FURNACE



## Section 6. LED Indicators

### Comm

Communication LED – Amber

- LED on when first powering up
- LED flashes number of communicating components in the system.
- (ex. communicating thermostat with relay panel will equal two flashes)

### Bit Master

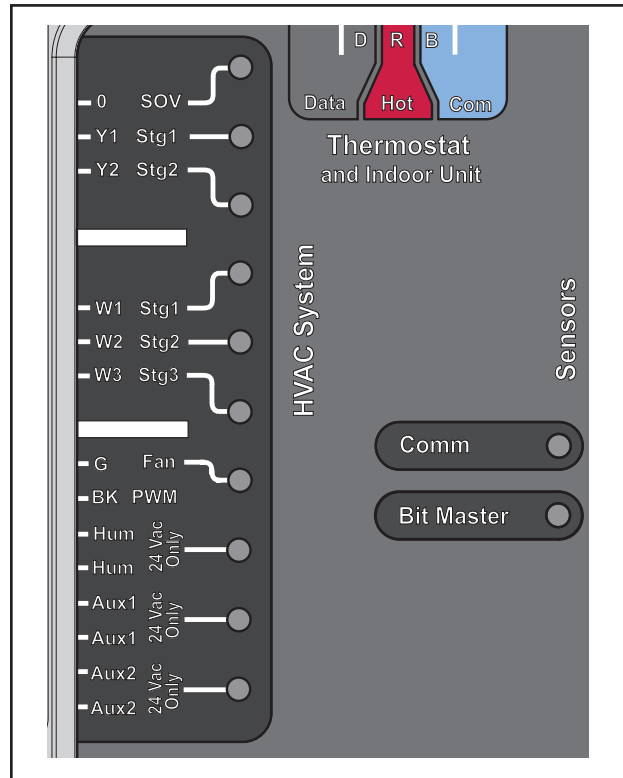
Bitmaster/Clock Signal LED – Green

- LED on when Clock is working

### HVAC System

HVAC System LEDs – Green

- A Green LED will illuminate when the relay is energized.



## Section 7. Troubleshooting

Troubleshooting		
Symptom	Possible Cause	Action
COMM LED is not flashing the appropriate number of devices	Loss of 24VAC between power (R) and common (B)	Check for proper incoming 24VAC power
	One or more communicating devices is not communicating <ul style="list-style-type: none"> <li>• ~12VDC between D &amp; B = Proper communication</li> <li>• ~16VDC between D &amp; B = Loss of communication</li> <li>• Less than ~12VDC between D &amp; B = shorted or no power</li> </ul>	Check for open or shorts in field wiring  Evaluate other communicating devices and use the service facts of that device if not communicating properly
Bit Master LED is off or fluttering	Loss of 24VAC between power (R) and common (B)	Check for proper incoming 24VAC power
	Loss of communication <ul style="list-style-type: none"> <li>• 0VDC between D &amp; B (shorted or no power)</li> <li>• Less than ~12VDC between D &amp; B (low level short)</li> </ul>	Check for shorted wire between data (D) and common (B) wires
HVAC System LED is not illuminating when Relay Panel is calling for a particular relay	Thermostat is not calling	Check the System Report screen at the thermostat to verify demand
	Relay Panel failed	Verify 24VAC between relay output terminal and common (B)  **Relay output contains snubber circuits; always check with a load applied