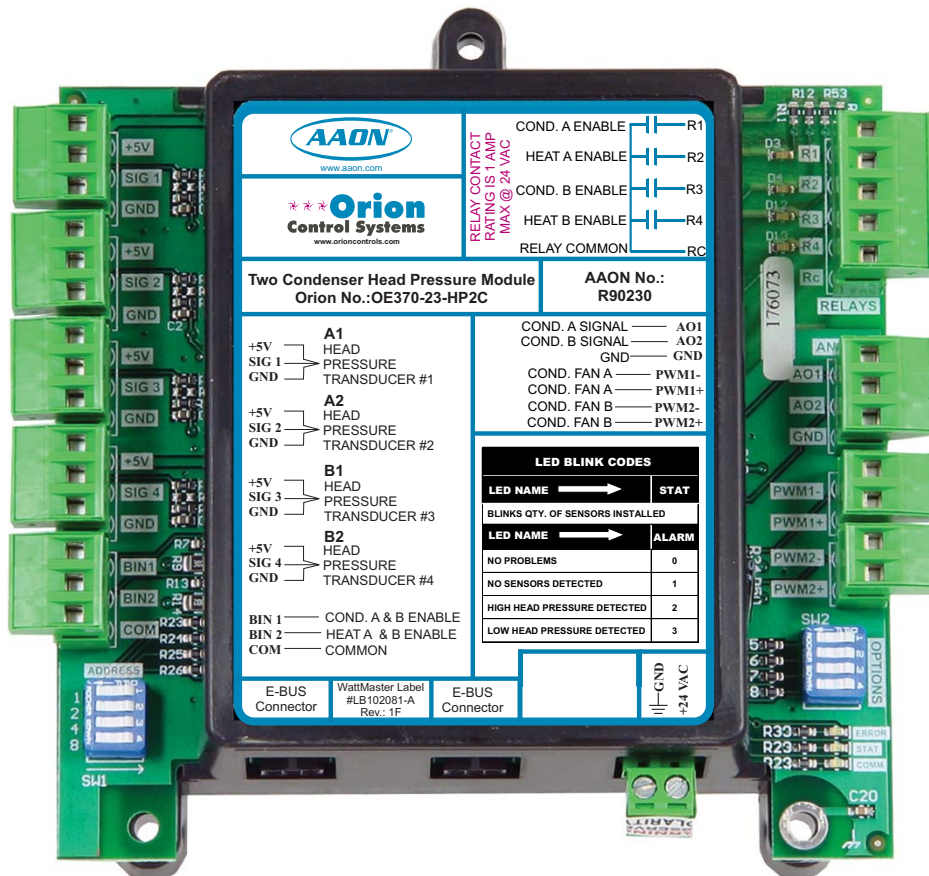




Tulsa

Factory Packaged Controls

# Two Condenser Head Pressure Module Technical Guide



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| PART NUMBER CROSS REFERENCE TABLE        |                       |        |
|--|-----------------------|--------|
| PART DESCRIPTION                         | ORION                 | AAON   |
| VCM-X Two Condenser Head Pressure Module | OE370-23-HP2C         | R90230 |
| VCM-X Modular E-BUS Controller - Tulsa   | OE332-23E-VCMX-MOD-A  | V07150 |
| VCM-X Modular Controller - Tulsa         | OE332-23-VCMX-MOD-A   | R90800 |
| VCM-X WSHP E-BUS Controller - Tulsa      | OE332-23E-VCMX-WSHP-A | V07140 |
| VCM-X WSHP Controller - Tulsa            | OE332-23-VCMX-WSHP-A  | R90810 |
| SA E-BUS Controller - Tulsa              | OE332-23E-SA-A        | V07160 |
| SA Controller - Tulsa                    | OE332-23-SA-A         | R96070 |
| SA Expansion Module - Tulsa              | OE333-23-SA-A         | R96180 |
| E-BUS Distribution Module - Tulsa        | OE365-23-EBD-A        | R82930 |



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# Two Condenser Head Pressure Module

## Installation & Wiring

### Environmental Requirements

The Two Condenser Head Pressure Module needs to be installed in an environment that can maintain a temperature range between -30°F and 150°F and not exceed 90% RH levels (non-condensing).

### Mounting

The Two Condenser Head Pressure Module is housed in a plastic enclosure. It is designed to be mounted by using the 3 mounting holes in the enclosure base. It is important to mount the module in a location that is free from extreme high or low temperatures, moisture, dust, and dirt. Be careful not to damage the electronic components when mounting the module.

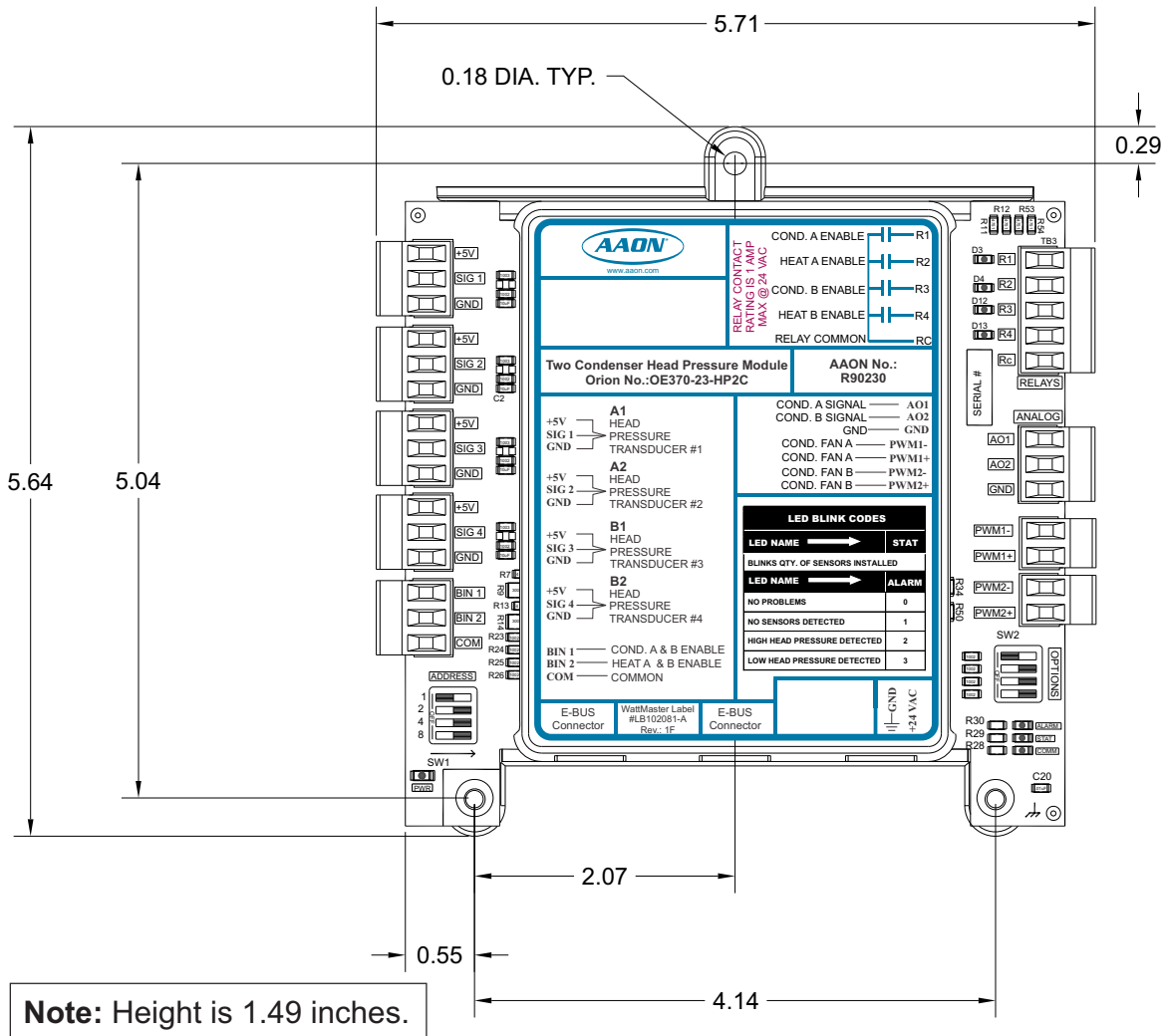
See **Figure 2** for Module dimensions (in inches).

### Power Supply

The Two Condenser Head Pressure Module requires a 24 VAC power connection with an appropriate VA rating.

If you will be connecting the Two Condenser Head Pressure Module to any of the VCM-X series or SA series controllers, one of the most important checks to make before powering up the system for the first time is to make sure that the controller is configured properly for your application. Refer to the *VCM-X Controller Technical Guide*, *VCM-X Modular E-BUS Controller Technical Guide*, *SA Controller Technical Guide*, or *SA E-BUS Controller Technical Guide* for more information.

**WARNING:** Observe polarity! All boards must be wired GND-to-GND and 24 VAC-to-VAC. Failure to observe polarity could result in damage to the boards.



**Figure 2: Two Condenser Head Pressure Module Dimensions**

# Two Condenser Head Pressure Module

## Installation & Wiring

### Important Wiring Considerations

Please read carefully and apply the following information when wiring the Two Condenser Head Pressure Module:

1. To operate the Two Condenser Head Pressure Module, you must connect power to the 24 VAC input terminal block.
2. Each Pressure Transducer must have its own 18-gauge shielded twisted pair cable. The Drain Wire must be the "Gnd" signal for the transducer.
3. When the 2-10 VDC Analog Output is being used to control the Condenser Fan Speed or Water Valve Percentage, the cable must be 18-gauge shielded wire, and the Drain Wire must be the "Gnd" signal.

4. If the Pulse Width Modulation (PWM) Output is being used to directly control the ECM 142 motor, the wires do not need to be shielded and can be any 18-gauge wire.
5. Check all wiring leads at the terminal block for tightness. Be sure that wire strands do not stick out and touch adjacent terminals. Confirm that all transducers required for your system are mounted in the appropriate location and wired into the correct terminals.

**WARNING:** Be sure all controllers and modules are powered down before connecting or disconnecting HSSC cables.

**NOTE:** ALL RELAY OUTPUTS ARE NORMALLY OPEN AND RATED FOR 24 VAC POWER ONLY - 1 AMP MAXIMUM LOAD

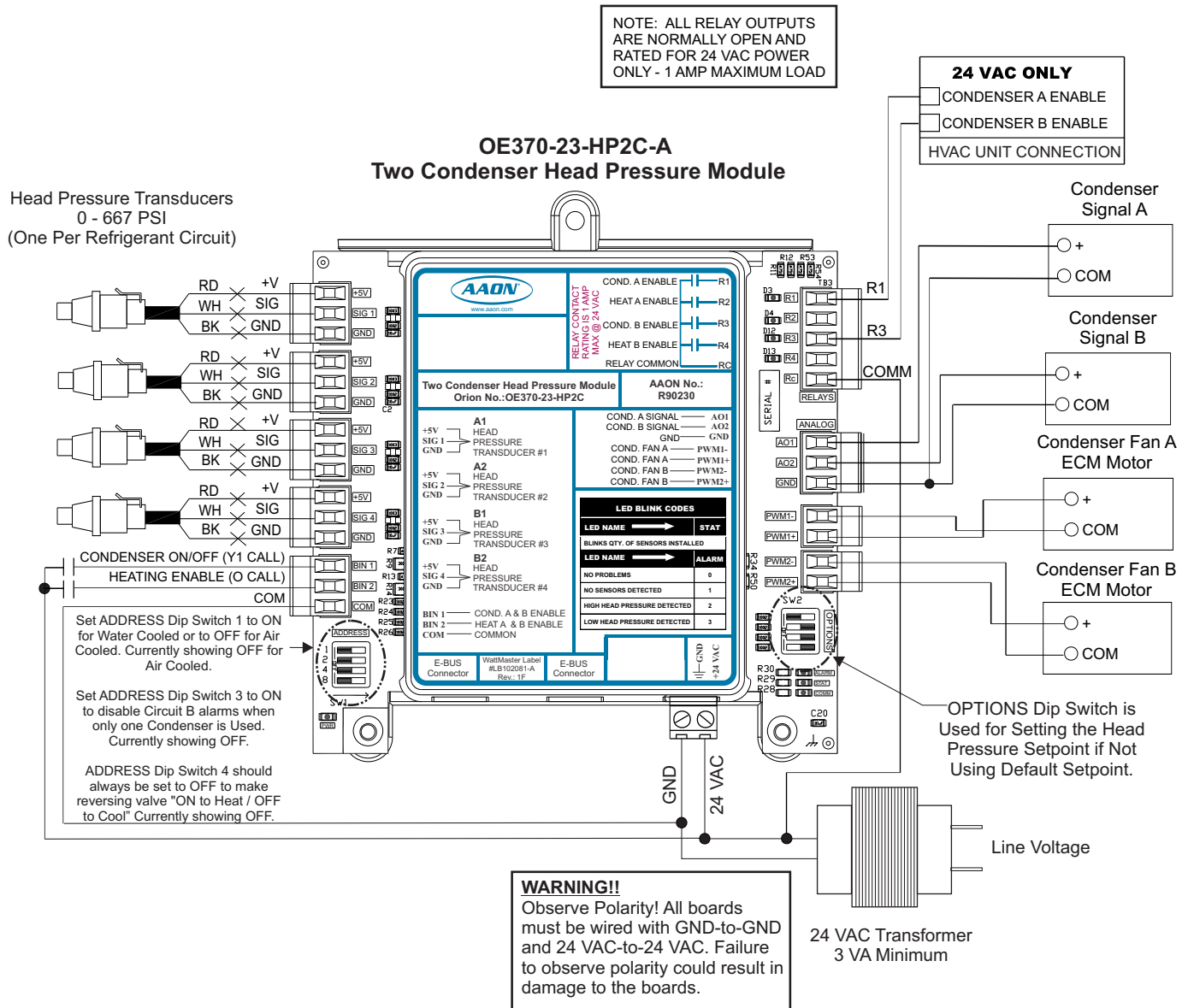


Figure 3: Two Condenser Head Pressure Module Wiring Diagram (Stand-Alone)

# Two Condenser Head Pressure Module

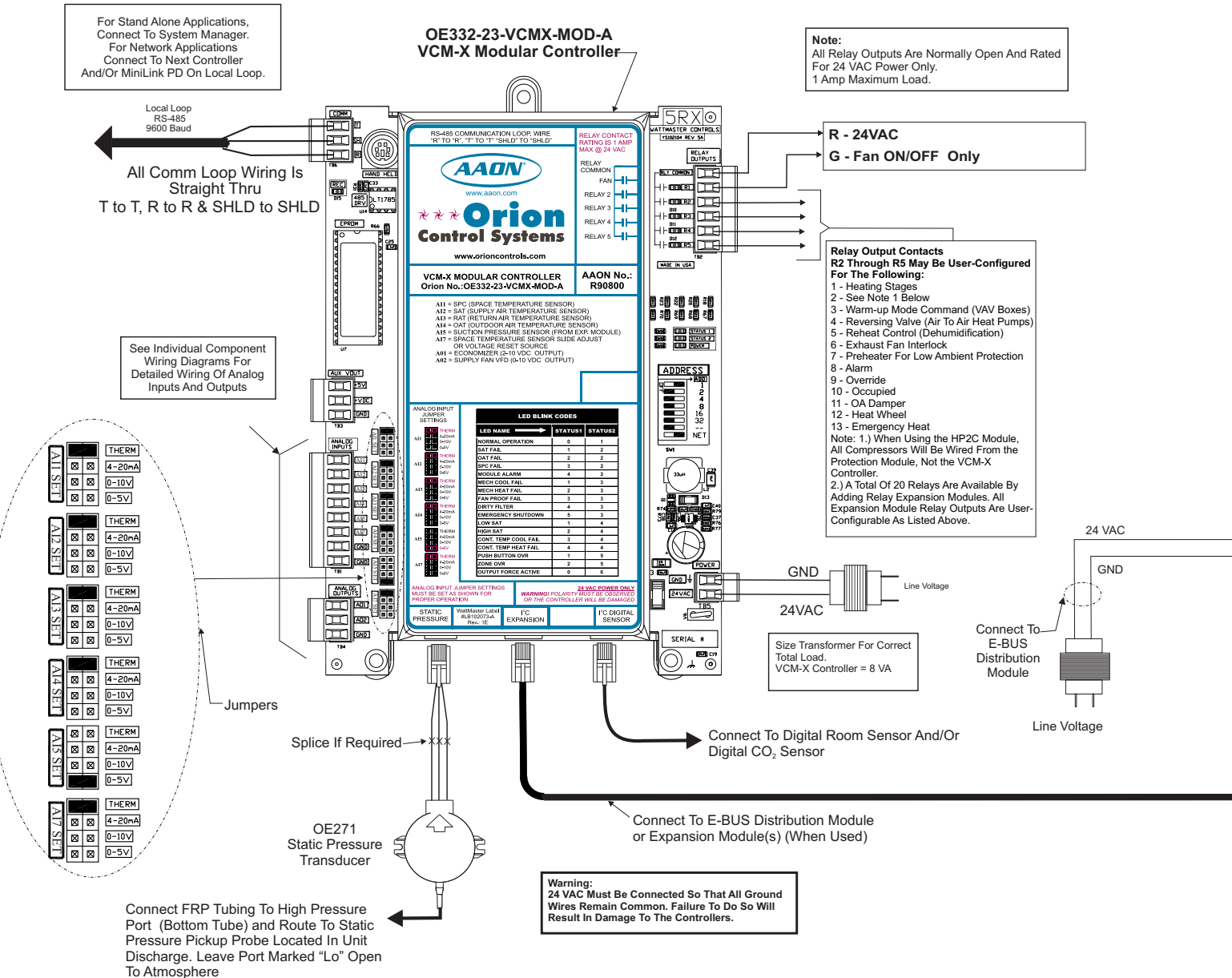
## VCM-X Controller to Two Condenser Head Pressure Module Wiring

### VCM-X Modular, VCM-X WSHP or SA Controller to Two Condenser Head Pressure Module Wiring

Up to (2) Two Condenser Head Pressure Modules can be daisy-chained together and connected to the E-BUS Distribution Module using a modular HSSC cable. The Two Condenser Head Pressure Module requires a 24 VAC power connection with an appropriate VA rating.

The E-BUS Distribution Module connects to the VCM-X Modular Controller, VCM-X WSHP Controller, VCM-X Expansion Module, SA Controller, SA Expansion Module, or 12 Relay Expansion Module using the I<sup>2</sup>C port. See **Figure 4** below for wiring.

Any E-BUS Module can be connected to each of the four E-BUS Distribution Module's output ports or can be daisy-chained together using HSSC cables.



**Figure 4: VCM-X WSHP Controller to Two Condenser Head Pressure Module Wiring Diagram**





# Two Condenser Head Pressure Module E-BUS Controller to Two Condenser Head Pressure Module Wiring

**WARNING:** Be sure all controllers and modules are powered down before connecting or disconnecting HSSC cables.

For Stand Alone Applications, Connect To System Manager. For Network Applications Connect To Next Controller And/Or MiniLink PD On Local Loop.

Local Loop RS-485 9600 Baud

All Comm Loop Wiring Is Straight Thru T to T, R to R & SHLD to SHLD

HSSC Cable Connect To VCM-X E-BUS Port

See Individual Component Wiring Diagrams For Detailed Wiring Of Analog Inputs And

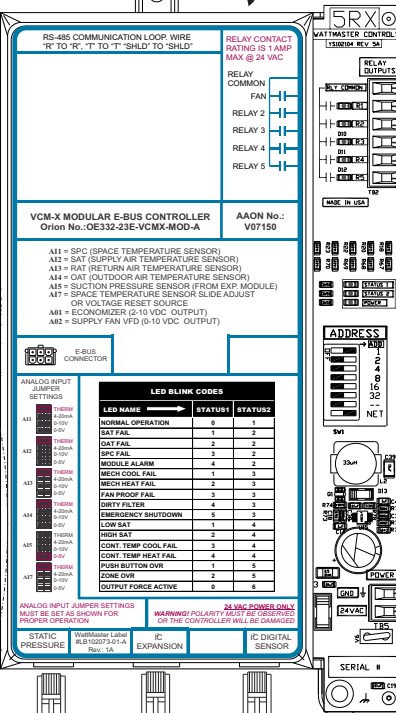
Jumpers

Splice If Required

OE271 Static Pressure Transducer

Connect FRP Tubing To High Pressure Port (Bottom Tube) and Route To Static Pressure Pickup Probe Located In Unit Discharge. Leave Port Marked "Lo" Open To Atmosphere

## OE332-23E-VCMX-MOD-A VCM-X Modular E-BUS Controller



**Note:** All Relay Outputs Are Normally Open And Rated For 24 VAC Power Only. 1 Amp Maximum Load.

R - 24VAC  
G - Fan ON/OFF Only

Relay Output Contacts R2 Through R5 May Be User-Configured For The Following:

- 1 - Heating Stages
- 2 - Cooling Stages
- 3 - Warm-up Mode Command (VAV Boxes)
- 4 - Reversing Valve (Air To Air Heat Pumps)
- 5 - Reheat Control (Dehumidification)
- 6 - Exhaust Fan Interlock
- 7 - Preheater For Low Ambient Protection
- 8 - Alarm
- 9 - Override
- 10 - Occupied
- 11 - OA Damper
- 12 - Heat Wheel
- 13 - Emergency Heat

Note: 1.) When Using the HP2C Module, All Compressors Will Be Wired From the Protection Module, Not the VCM-X Controller. Note: A Total Of 20 Relays Are Available By Adding Relay Expansion Modules. All Expansion Module Relay Outputs Are User Configurable As Listed Above.

24VAC Line Voltage  
GND

Size Transformer For Correct Total Load. VCM-X Controller = 8 VA

Connect To Digital Room Sensor And/Or Digital CO<sub>2</sub> Sensor

Connect To Expansion Module(s) (When Used)

**Warning:** 24 VAC Must Be Connected So That All Ground Wires Remain Common. Failure To Do So Will Result In Damage To The Controllers.

Figure 5, cont.: VCM-X E-BUS Controller to Two Condenser Head Pressure Module Wiring Diagram

# Two Condenser Head Pressure Module

## Stand-Alone Wiring

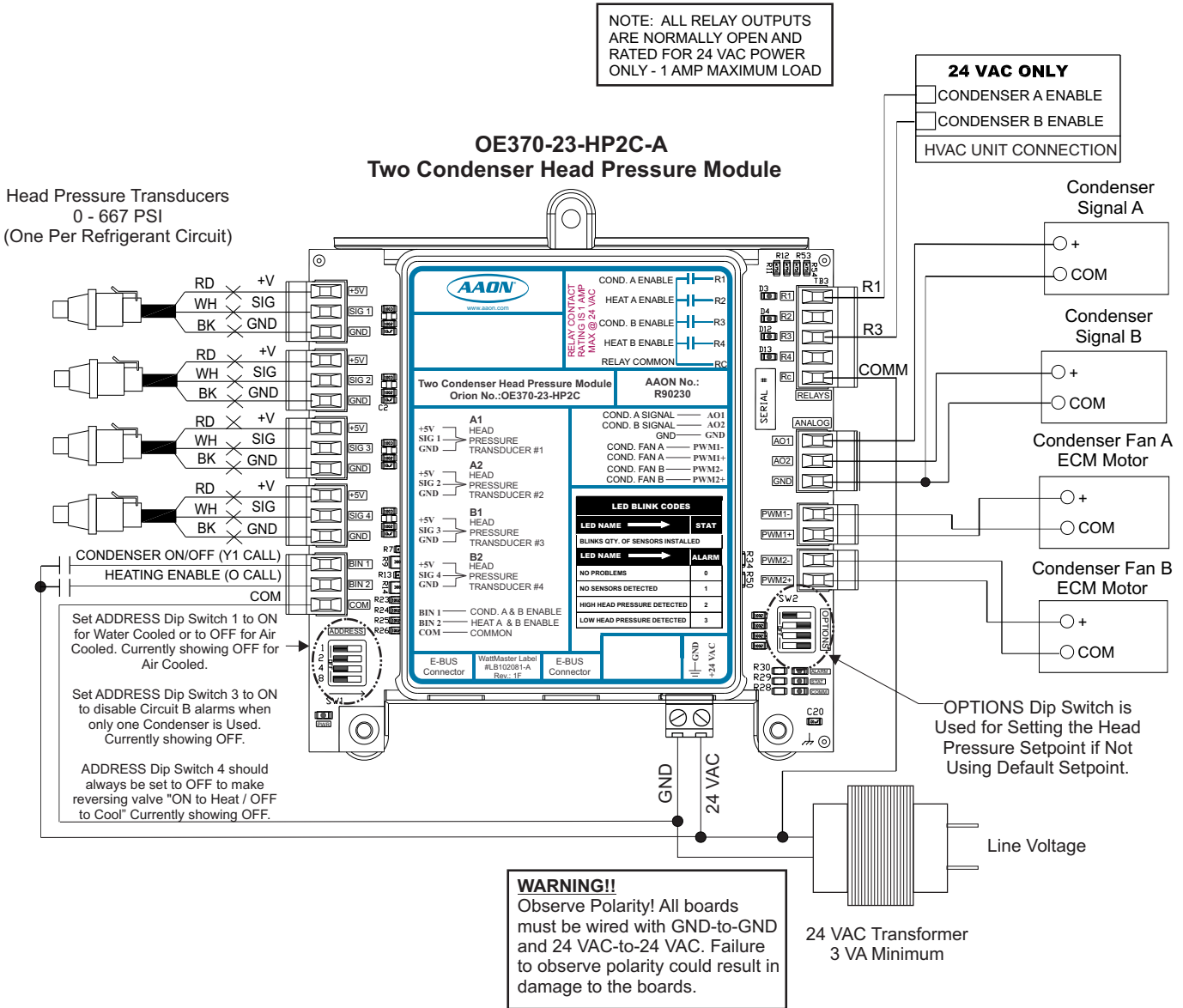
### Stand-Alone Wiring

To operate the Two Condenser Head Pressure Module as Stand Alone, connect the Module to a 24 VAC connection with an appropriate VA rating. See **Figure 6** for wiring.

Check all wiring leads at the terminal block for tightness. Be sure that wire strands do not stick out and touch adjacent terminals. Confirm that all transducers required for your system are mounted in the appropriate location and wired into the correct terminals.

### Condenser Type Selection

As shown in **Figure 6**, set ADDRESS dip switch 1 to ON for water cooled or to OFF for air cooled. Refer to page 11 for further instructions.



**Figure 6: Two Condenser Head Pressure Module as Stand-Alone**

### General

The following inputs and outputs are available on the Two Condenser Head Pressure Module. See **Table 1** below to reference the Input/Output Map.

| Binary Inputs                     |  |
|-----------------------------------|--|
| 1                                 | Condenser Fans A & B On/Off (24 VAC Wet Input)                 |
| 2                                 | Heating Enable A & B (24 VAC Wet Input)                        |
| Binary Outputs                    |  |
| 1                                 | Condenser A Enable Relay (Dry Contact Output Rated for 24 VAC) |
| 2                                 | Heating Enable A (Dry Contact Output Rated for 24 VAC)         |
| 3                                 | Condenser B Enable Relay (Dry Contact Output Rated for 24 VAC) |
| 4                                 | Heating Enable B (Dry Contact Output Rated for 24 VAC)         |
| Analog Inputs                     |  |
| 1                                 | Head Pressure #1 (0-667 PSI Sensor)                            |
| 2                                 | Head Pressure #2 (0-667 PSI Sensor)                            |
| 3                                 | Head Pressure #3 (0-667 PSI Sensor)                            |
| 4                                 | Head Pressure #4 (0-667 PSI Sensor)                            |
| Analog Outputs (0-10 or 2-10 VDC) |  |
| 1                                 | Condenser Signal A (AOUT 1)                                    |
| 2                                 | Condenser Signal B (AOUT 2)                                    |
| PWM Output                        |  |
| 1                                 | ECM 142 PWM Input (0-100% Duty Cycle)                          |
| 2                                 | ECM 142 PWM Input (0-100% Duty Cycle)                          |

**Table 1: Two Condenser Head Pressure Module Inputs & Outputs**

### Stand-Alone Input Commands

#### Condenser On/Off

A 24 volt signal to Binary Input #1 initiates the Condenser Enable function. Typically, the source for this signal is the “Y” call from the thermostat calling for a compressor to run.

#### Heating Enable A & B On/Off

A 24 volt signal to Binary Input #2 initiates the Heating Enable A & B On function. Typically, the source for this signal is the “O” call from the thermostat. A signal on this input indicates the reversing valve has been energized and that the unit is in the Heating Mode.

#### Head Pressure Setpoint

The Head Pressure Setpoint is set using the OPTIONS Dip Switches. See **Table 2**. The Default Setpoint for an Air Cooled Condenser is 340 for 410-A refrigerant. The Default Setpoint for a Water Cooled Condenser is 235 for 410-A refrigerant. Set the OPTIONS Dip Switch to 0 if using these Default Settings. In addition, if using the Default Settings, you must set the Address Dip Switch. See “ADDRESS Dip Switch” below. **You must cycle power after setting Dip Switch values.**

NOTE: The only setpoint available for adjustment by the contractor is the **Head Pressure Setpoint**. The rest of the setpoints described can only be changed by the factory.

#### ADDRESS Dip Switch Settings for Condenser Type Selection

When using the OPTIONS Dip Switch to set the Head Pressure Setpoint, you must also set the ADDRESS Dip Switch to designate the type of condenser you are using.

Set ADDRESS Dip Switch 1 to ON for a Water Cooled Condenser or to OFF for an Air Cooled Condenser.

If set to ON for a Water Cooled Condenser, the Analog Condenser Output Signal will be 2-10 VDC for the Water Valve. If set to OFF for an Air Cooled Condenser, the Analog Condenser Output Signal will be 0-10 VDC for the Condenser Fan.

**You must cycle power after setting Dip Switch values.** See **Figure 6** for ADDRESS Dip Switch location and **Table 3** for Setting information.

## Sequence of Operation

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### Input Commands (VCM-X Connection)

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#### Condenser On/Off

Instead of a hard wired input signal to the Condenser Enable input, the VCM-X Modular Controller, VCM-X WSHP Controller, or SA Controller communicates to the Module via E-BUS communications. This signal indicates the compressor(s) are called to run and drives the condenser A & B On/Off function.

#### Heating Enable A & B On/Off

As with the Condenser Signal On/Off function, the VCM-X Modular Controller, VCM-X WSHP Controller, or SA Controller communicates to the Module via E-BUS communications and signals that the reversing valve has been energized and that heating has been enabled.

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NOTE: When the term “ON” is used, it means there is either 24 VAC on the appropriate Binary Input or a call-to-run signal is being received from a VCM-X series or SA series controller. When the term “OFF” is used, it means there is either 0 VAC on the appropriate Binary Input or the call-to-run signal from a VCM-X series or SA series controller has been removed.

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#### Sensor Reading Routine

The Two Condenser Head Pressure Module is used on units with two physically separate condenser sections. Up to two Head Pressure Sensors can be monitored in each section. The highest of the two readings in each section will be used to control the condenser fan(s) in that section.

Air from the condenser fan(s) in each section flows through both condenser coils. As a result, if you modulate the fan(s) based on the highest reading, you will have enough air flow for both coils.

The highest reading of Head Pressure Sensors 1 & 2 controls Condenser Fan A. The highest reading of Head Pressure Sensors 3 & 4 controls Condenser Fan B.

### Modes of Operation

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#### OFF Mode

The Head Pressure Control Board is in the OFF Mode when the Condenser Input Signal is “OFF”. In this mode, all relays are off, the Analog Output is 0 VDC, and the PWM Output is 0% Duty Cycle.

#### Cooling Mode

The Head Pressure Control board is in the Cooling Mode when the Condenser Input Signal is “ON” and the Heating Enable signal is “OFF”. The Condenser Enable Relays will energize to enable the Condenser Fans or Water Valves. In a water system, the Water Flow Valve will start at 75% for 3 minutes. In an air system, the Condenser Signal will go to 50% for 30 seconds. The Condenser Output Signals will then automatically adjust between 0 and 100% to maintain the desired Head Pressure Setpoint. The Condenser Output Signals can be a 0-10 VDC, 2-10 VDC or 0-100% PWM signal provided by the appropriate output. Both outputs mirror each other.

#### Heat Pump Mode

The Head Pressure Control Module is in the Heat Pump Mode when the Condenser Input Signal is “ON” and the Heating Enable signal is “ON”. In this mode, the Heating Enable Relays will energize and the Condenser Output Signals will go to 100% and remain there until the Heating Enable signal is removed.

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NOTE: The Heating enable outputs are for indication only and are not wired to anything.

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| OPTIONS Dip Switch Settings | Head Pressure Setpoint |                        |
|-----------------------------|------------------------|------------------------|
|                             | Air Cooled Condenser   | Water Cooled Condenser |
| Binary Value                | R410-A                 | R410-A                 |
| <b>0</b>                    | <b>340 (DEFAULT)</b>   | <b>235 (DEFAULT)</b>   |
| <b>1</b>                    | <b>260</b>             | <b>210</b>             |
| <b>2</b>                    | <b>270</b>             | <b>220</b>             |
| <b>3</b>                    | <b>280</b>             | <b>230</b>             |
| <b>4</b>                    | <b>290</b>             | <b>240</b>             |
| <b>5</b>                    | <b>300</b>             | <b>250</b>             |
| <b>6</b>                    | <b>310</b>             | <b>260</b>             |
| <b>7</b>                    | <b>320</b>             | <b>270</b>             |
| <b>8</b>                    | <b>330</b>             | <b>280</b>             |
| <b>9</b>                    | <b>340</b>             | <b>290</b>             |
| <b>10</b>                   | <b>350</b>             | <b>300</b>             |
| <b>11</b>                   | <b>360</b>             | <b>310</b>             |
| <b>12</b>                   | <b>370</b>             | <b>320</b>             |
| <b>13</b>                   | <b>380</b>             | <b>330</b>             |
| <b>14</b>                   | <b>390</b>             | <b>340</b>             |
| <b>15</b>                   | <b>400</b>             | <b>350</b>             |

**Table 2: OPTIONS Dip Switch/Head Pressure Setpoint Settings for Stand-Alone Operation**

| ADDRESS Dip Switch 1 & 2 Settings                           |            |            |  |
|---|------------|------------|--|
| Switch 1  | Switch 2   | Default SP | Description of Default Head Pressure Setpoint          |
| <b>OFF</b>  | <b>OFF</b> | <b>340</b> | <b>Air Cooled Condenser using R410-A Refrigerant</b>   |
| <b>ON</b>   | <b>OFF</b> | <b>235</b> | <b>Water Cooled Condenser using R410-A Refrigerant</b> |
| <b>Switch 1 determines Air or Water Cooled Condenser</b>    |            |            |  |
| NOTE: You must cycle power after setting Dip Switch values. |            |            |  |

**Table 3: ADDRESS Dip Switch 1 Condenser Type Settings**

## Two Condenser Head Pressure Module

### Sequence of Operation

| ADDRESS Dip Switch 2 Settings |   |
|-------------------------------|---|
| Switch                        | Description   |
| OFF                           | Address 1 if Using (2) Head Pressure Modules<br>(Set to OFF if using only (1) Head Pressure Module) |
| ON                            | Address 2 if Using (2) Head Pressure Modules  |

**Table 4: ADDRESS Dip Switch Address Settings When Connected to VCM-X / SA**

| ADDRESS Dip Switch 3 Settings |  |
|-------------------------------|--|
| Switch 3                      | Description  |
| OFF                           | Enable Circuit B Alarm                                   |
| ON                            | Disable Circuit B Alarm when only one condenser is used. |

**Table 5: ADDRESS Dip Switch 3 Settings**

| ADDRESS Dip Switch 4 Settings                                   |   |
|---|---|
| Switch 3  | Description                             |
| OFF   | Reversing Valve On to Heat/ Off to Cool |
| ON  | Reversing Valve On to Cool/ Off to Heat |
| This Dip Switch should be set to OFF for AAON Tulsa operations. |   |

**Table 6: ADDRESS Dip Switch 4 Settings for Reversing Valve**

## Head Pressure Module Valve/Fan Position Troubleshooting

If configured for Water valve:

Aout Signal is 2 to 10 volts.

2 volts = 0% valve position or fully closed

10 volts = 100% valve position or fully open

PWM signal is not used for water valve but does modulate.

At Startup for cooling, valve will open to 75% or 8 volts for 3 minutes then will modulate every 30 seconds to try to maintain head pressure setpoint.

For heating, valve will open and stay at 100%

If configured for Air Condensor Fan:

Aout Signal is 0 to 10 volts.

Minimum fan speed is 1.5 volts. ( 15%)

Maximum fan speed is 10 volts. ( 100%)

Anything less than 1.5 volts the fan will be off.

PWM signal is 0 to 100%

PWM+ (to ground) will always read 24 vdc.

PWM- (to ground) can be measured for volts dc and this formula will tell you the percentage signal:  $(24 - \text{measured value})/24$  (measured value = PWM- to ground)

PWM-

0 volts = 100% fan speed

6 volts = 75% fan speed

12 volts = 50% fan speed

18 volts = 25% fan speed

20.4 volts = 15% fan speed

Above 20.4 volts = 0% fan speed

At Startup for cooling, fan will start at 50% then will modulate every 30 seconds to try to maintain head pressure setpoint.

For heating, valve will open and stay at 100%

Safeties:

If head pressure signal is above 500 psig, fan will go to 100% (high pressure safety).

If head pressure signal is below 1 psig, fan will go to 100% (assuming bad sensor).

## Troubleshooting

### Troubleshooting for Stand Alone Mode

If you suspect or encounter general problems during operation of the Two Condenser Head Pressure Module while in Stand Alone Mode, follow the Troubleshooting Flowchart in **Figure 7** below.

Head Pressure Control  
Troubleshooting Flowchart  
(Stand Alone Mode)

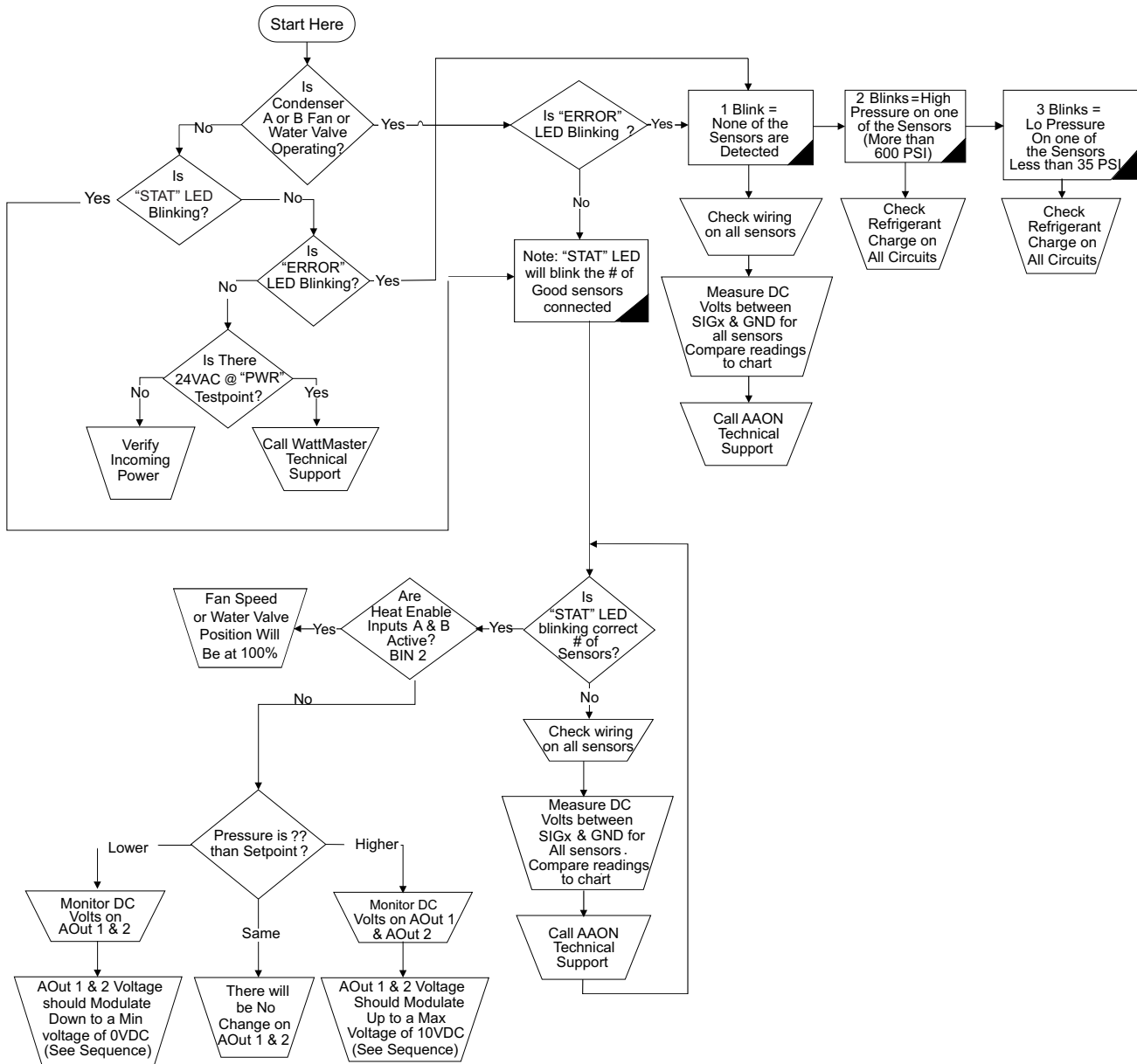


Figure 7: Two Condenser Head Pressure Module Troubleshooting Diagram

## Pressure Transducer Troubleshooting

If you suspect there is a problem with the Module related to pressure transducer measurements, reference **Table 7** below.

| Pressure Sensor Chart |          |         |          |
|-----------------------|----------|---------|----------|
| Voltage               | Pressure | Voltage | Pressure |
| 0.5                   | 0        | 2.6     | 350      |
| 0.6                   | 17       | 2.7     | 367      |
| 0.7                   | 33       | 2.8     | 384      |
| 0.8                   | 50       | 2.9     | 400      |
| 0.9                   | 67       | 3.0     | 417      |
| 1.0                   | 83       | 3.1     | 434      |
| 1.1                   | 100      | 3.2     | 450      |
| 1.2                   | 117      | 3.3     | 467      |
| 1.3                   | 133      | 3.4     | 484      |
| 1.4                   | 150      | 3.5     | 500      |
| 1.5                   | 167      | 3.6     | 517      |
| 1.6                   | 183      | 3.7     | 534      |
| 1.7                   | 200      | 3.8     | 550      |
| 1.8                   | 217      | 3.9     | 567      |
| 1.9                   | 233      | 4.0     | 584      |
| 2.0                   | 250      | 4.1     | 600      |
| 2.1                   | 267      | 4.2     | 617      |
| 2.2                   | 283      | 4.3     | 634      |
| 2.3                   | 300      | 4.4     | 650      |
| 2.4                   | 317      | 4.5     | 667      |
| 2.5                   | 334      |         |          |

**Table 7: Two Condenser Head Pressure Module Transducer Chart**

# Two Condenser Head Pressure Module

## Troubleshooting

### Using LEDs to Verify Operation

The Two Condenser Head Pressure Module is equipped with LEDs that can be used to verify operation and perform troubleshooting. There are LEDs for communication, operation modes, diagnostic codes, and relays. The Two Condenser Head Pressure Module has eight LEDs—one for power, one for operation status, one for communication, one for alarms, and four for compressor relays. See **Figure 8** for the LED locations. The LEDs associated with these inputs and outputs allow you to see what is active without using a voltmeter.

#### ① Status LEDs

“**COMM**” - This LED will light up to indicate Communications with the VCM-X series or SA series controller. If Communications are established, the COMM LED will blink. You should not see this LED light up in stand-alone mode, because there would be no communications with the VCM-X series or SA series controller.

“**ALARM**” - This is the diagnostic blink code LED. It will light up and blink out diagnostic codes. See **Table 8** below for Diagnostic Blink Code descriptions. The blink code descriptions are also located on the Module’s front cover.

| No. of Blinks | Status                      |
|---------------|-----------------------------|
| 0             | No Problems                 |
| 1             | No Sensors Detected         |
| 2             | High Head Pressure Detected |
| 3             | Low Head Pressure Detected  |

**Table 8: ALARM LED Blink Codes**

“**STAT**” - This is the status blink code LED. It will light up and first blink the address of the Module. It will then blink out the quantity of sensors installed. See **Table 9** below for Status Blink Code descriptions. The blink code descriptions are also located on the Module’s front cover.

| No. of Blinks | Status                               |
|---------------|--------------------------------------|
| Random        | Blinks Quantity of Sensors Installed |

**Table 9: STAT LED Blink Codes**

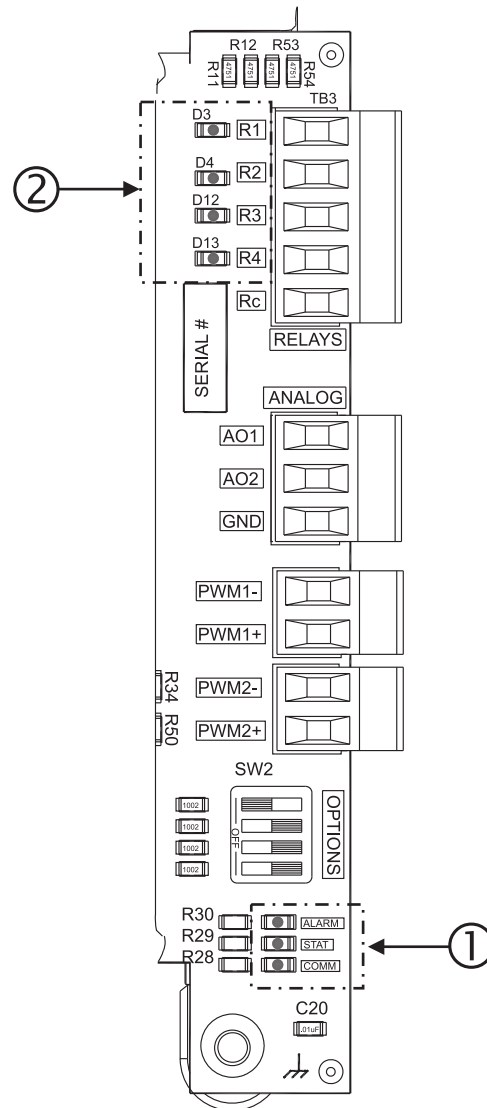
#### ② Module LEDs

“**R1**” - This LED will light up whenever Condenser A Enable Relay is enabled and will stay lit as long as the relay is active.

“**R2**” - This LED will light up when the Heating Enable A is enabled and will stay lit as long as the Heating Enable A is active.

“**R3**” - This LED will light up whenever Condenser B Enable Relay is enabled and will stay lit as long as the relay is active.

“**R4**” - This LED will light up when the Heating Enable B is enabled and will stay lit as long as the Heating Enable B is active.



### LED Diagnostics

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**“PWR” LED:** When the Two Condenser Head Pressure Module is powered up, the PWR LED (located below the address switches) should light up and stay on continuously. If it does not light up, check to be sure that the power wiring is connected to the board, the connections are tight, and the VCM-X series or SA series controller is powered. If after making all these checks, the PWR LED does not light up, the module is probably defective.

**“COMM” LED:** When the Two Condenser Head Pressure Module is powered up while in Stand Alone Mode, the COMM LED does not light up. When the module is connected to a VCM-X series or SA series controller, the COMM LED should light up, indicating Communications. Each time Communications are detected, this LED should continuously blink on and off, for a half second. This LED should never stop checking for a Communications signal. If it does not light up, check to be sure that the power wiring is connected to the board, the connections are tight, and the VCM-X series or SA series controller is powered. If after making all these checks, the COMM LED does not light up, the board is probably defective.

**“STAT” LED:** As previously described, when the module is first powered up, the STAT LED will blink out the number of installed sensors

**“ALARM” LED:** As previously described, this LED will blink on and off to indicate alarms and diagnostics.

### Other Checks

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NOTE: The Two Condenser Head Pressure Module contains no user-serviceable parts. Contact qualified technical personnel if your module is not operating correctly.

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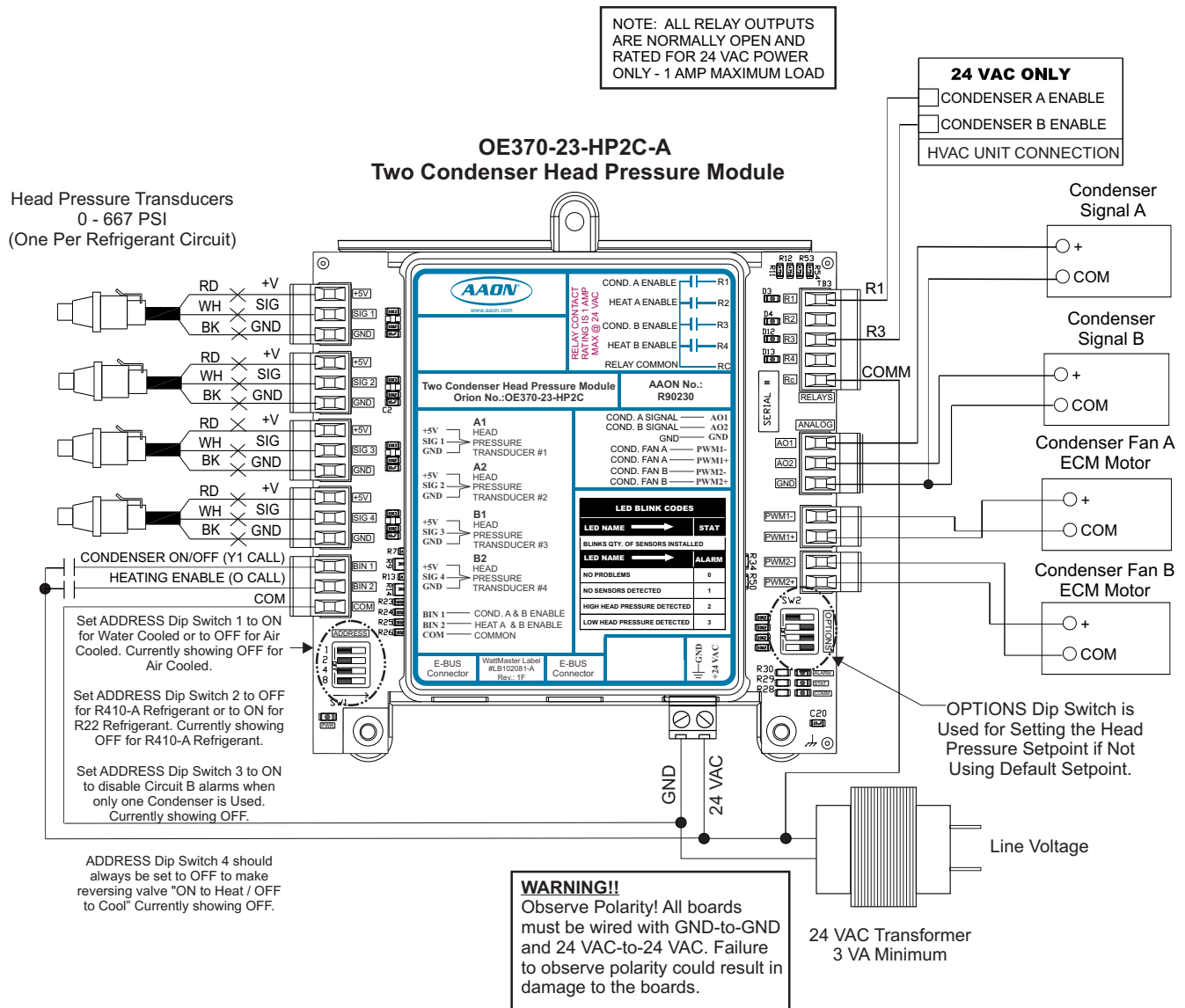


# Two Condenser Head Pressure Module

## Appendix for Version 1.04 and Earlier

### Stand-Alone Wiring

Versions 1.01 through 1.04 utilize Dipswitch 2 in stand-alone mode for refrigeration selection. See **Tables 10 & 11** for further information.



**Figure 10: Version 1.04 and Earlier One Condenser Head Pressure Module Wiring Diagram (Stand-Alone)**

## Two Condenser Head Pressure Module

### Appendix for Version 1.04 and Earlier

| OPTIONS Dip Switch Settings | Head Pressure Setpoint |                      |                        |                      |
|-----------------------------|------------------------|----------------------|------------------------|----------------------|
|                             | Air Cooled Condenser   |                      | Water Cooled Condenser |                      |
| Binary Value                | R410-A                 | R22                  | R410-A                 | R22                  |
| <b>0</b>                    | <b>340 (DEFAULT)</b>   | <b>200 (DEFAULT)</b> | <b>235 (DEFAULT)</b>   | <b>145 (DEFAULT)</b> |
| <b>1</b>                    | <b>260</b>             | <b>160</b>           | <b>210</b>             | <b>110</b>           |
| <b>2</b>                    | <b>270</b>             | <b>170</b>           | <b>220</b>             | <b>120</b>           |
| <b>3</b>                    | <b>280</b>             | <b>180</b>           | <b>230</b>             | <b>130</b>           |
| <b>4</b>                    | <b>290</b>             | <b>190</b>           | <b>240</b>             | <b>140</b>           |
| <b>5</b>                    | <b>300</b>             | <b>200</b>           | <b>250</b>             | <b>150</b>           |
| <b>6</b>                    | <b>310</b>             | <b>210</b>           | <b>260</b>             | <b>160</b>           |
| <b>7</b>                    | <b>320</b>             | <b>220</b>           | <b>270</b>             | <b>170</b>           |
| <b>8</b>                    | <b>330</b>             | <b>230</b>           | <b>280</b>             | <b>180</b>           |
| <b>9</b>                    | <b>340</b>             | <b>240</b>           | <b>290</b>             | <b>190</b>           |
| <b>10</b>                   | <b>350</b>             | <b>250</b>           | <b>300</b>             | <b>200</b>           |
| <b>11</b>                   | <b>360</b>             | <b>260</b>           | <b>310</b>             | <b>210</b>           |
| <b>12</b>                   | <b>370</b>             | <b>270</b>           | <b>320</b>             | <b>220</b>           |
| <b>13</b>                   | <b>380</b>             | <b>280</b>           | <b>330</b>             | <b>230</b>           |
| <b>14</b>                   | <b>390</b>             | <b>290</b>           | <b>340</b>             | <b>240</b>           |
| <b>15</b>                   | <b>400</b>             | <b>300</b>           | <b>350</b>             | <b>250</b>           |

NOTE: R22 refrigerant can only be used with the Two Condenser Head Pressure Module versions 1.01 through 1.04. You must cycle power after setting Dip Switch values.

**Table 10: OPTIONS Dip Switch/Head Pressure Setpoint Settings for Stand-Alone Operation**

| ADDRESS Dip Switch 1 & 2 Settings  |          |            |   |
|--|----------|------------|---|
| Switch 1   | Switch 2 | Default SP | Description of Default Head Pressure Setpoint   |
| OFF  | OFF      | 340        | Air Cooled Condenser using R410-A Refrigerant   |
| OFF  | ON       | 200        | Air Cooled Condenser using R22 Refrigerant      |
| ON   | OFF      | 235        | Water Cooled Condenser using R410-A Refrigerant |
| ON   | ON       | 145        | Water Cooled Condenser using R22 Refrigerant    |
| Switch 1 determines Air or Water Cooled Condenser  |          |            |   |
| Switch 2 determines R410-A or R22 refrigerant  |          |            |   |
| NOTE: R22 refrigerant can only be used with the Two Condenser Head Pressure Module versions 1.01 through 1.04. You must cycle power after setting Dip Switch values. |          |            |   |

**Table 11: ADDRESS Dip Switch Refrigerant and Condenser Type Settings for Stand-Alone Operation**



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