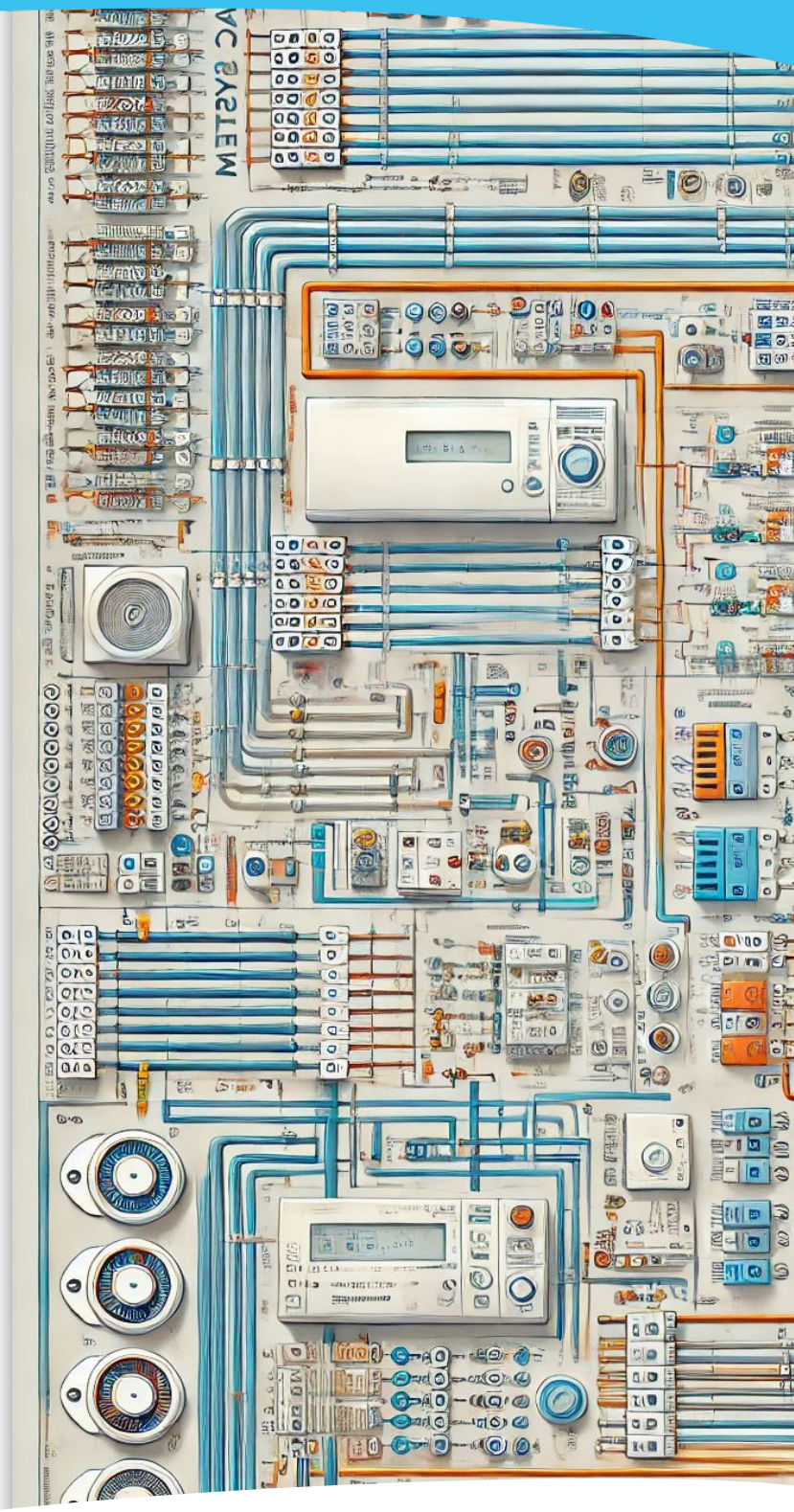
FLAIR

Wiring Diagrams

For Flair Products and Solutions



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We're Here to Help

CONTACT FLAIR

For dedicated dealer phone and email support, login or register.

Existing Flair Pro?
Login to the Pro Portal for contact information.

PRO PORTAL
flair.co/pros

Not yet a Flair Pro?
Complete the Pro registration and a member of our team will be in touch.

PRO REGISTRATION
flair.co/register

1.1 About This Document

Purpose

This document provides detailed instructions for wiring Flair Products including the Bridge Pro, Smart Vents and the Puck/Puck Pro.

Audience

This document is intended for:

- **HVAC Contractors:** Professionals responsible for installing and maintaining heating/cooling systems.
- **System Integrators:** Those configuring heating/cooling solutions with Flair products.
- **Advanced Users:** Homeowners with technical expertise who wish to optimize their heating/cooling systems.

Scope

This document covers:

- Wiring for boiler based staged heating systems and their various configurations.
- Wiring for electric baseboard heating systems and their various configurations.
- Wiring and wiring installation guidance for Smart Vent systems.

NOTE: This document does not include detailed instructions for setting up Flair solutions, Flair app configuration, product specifications etc. Those materials are available at the Pro Training Center.

PRO TRAINING
flair.co/protraining

A Note On Safety

Always turn off breakers and unplug equipment prior to installation and wiring of Flair or third party equipment regardless of voltage and other safety precautions. Always use proper personal protective equipment (PPE) including but not limited to eye protection, insulated tools, gloves, etc.

ANY AND ALL WORK IS DONE ON AN INDEPENDENT BASIS FROM STANDARD EULER INC. (DBA FLAIR), "FLAIR", WITH FLAIR ASSUMING NO LIABILITY, INDEMNITY, OR RESPONSIBILITY FOR INJURY, DEATH, DAMAGE, ETC. FOR FULL WARRANTY AND END USER LICENSE AGREEMENTS, SEE FLAIR.CO/LEGAL

1.2 Puck Powering Options

Battery Power Option

The Puck and Puck 2 can be powered by 2 x AAA batteries (included).

Note: Battery powered Pucks require a Flair Bridge or Bridge Pro for communication between Flair devices and the hvacOS™ backend platform.

BRIDGE / BRIDGE PRO SPECS

flair.co/bp-spec

Puck 2



2 x AAA Batteries (Supplied)

Puck (Original)



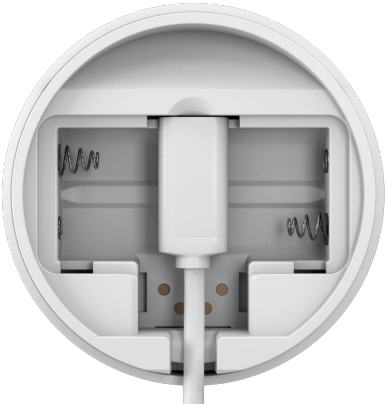
2 x AAA Batteries (Supplied)

USB Power Option

The Puck and Puck 2 can also be powered via USB. The Puck uses Micro-USB and the Puck 2 uses USB-C (cable and power adapter included for both).

Note: USB power is required for "Solo Mode" on the Puck 2. "Solo Mode" does not require a Flair Bridge or Bridge Pro for communication between Flair devices and the hvacOS™ backend platform.

Puck 2



USB-C Cable & Adapter (Supplied)

Puck (Original)

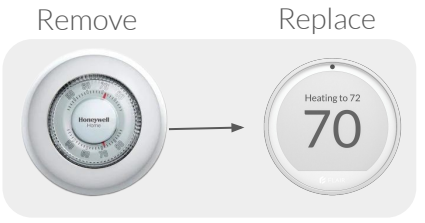


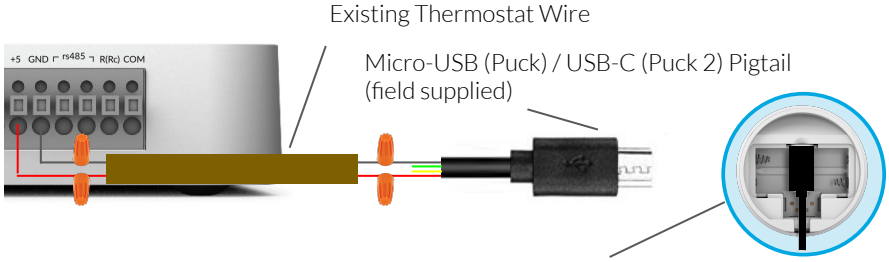
Micro-USB Cable & Adapter (Supplied)

Bridge Pro Power - Using Existing Thermostat Wire

For Flair Staged Heating and Smart Heating Solutions, Pucks can be powered by the Bridge Pro utilizing existing thermostat wire runs. After removing the old thermostat, connect the +5 and GND from the Bridge Pro to the USB pigtail as shown (Micro-USB pigtail for Puck 1 or USB-C pigtail for Puck 2). Pigtails are field supplied.

Note - ensure the data lines on the USB pigtail are not connected to anything, including themselves.





Backside of Puck 2 with USB-C replacing batteries

1.3 Wiring Guidance for Flair Devices

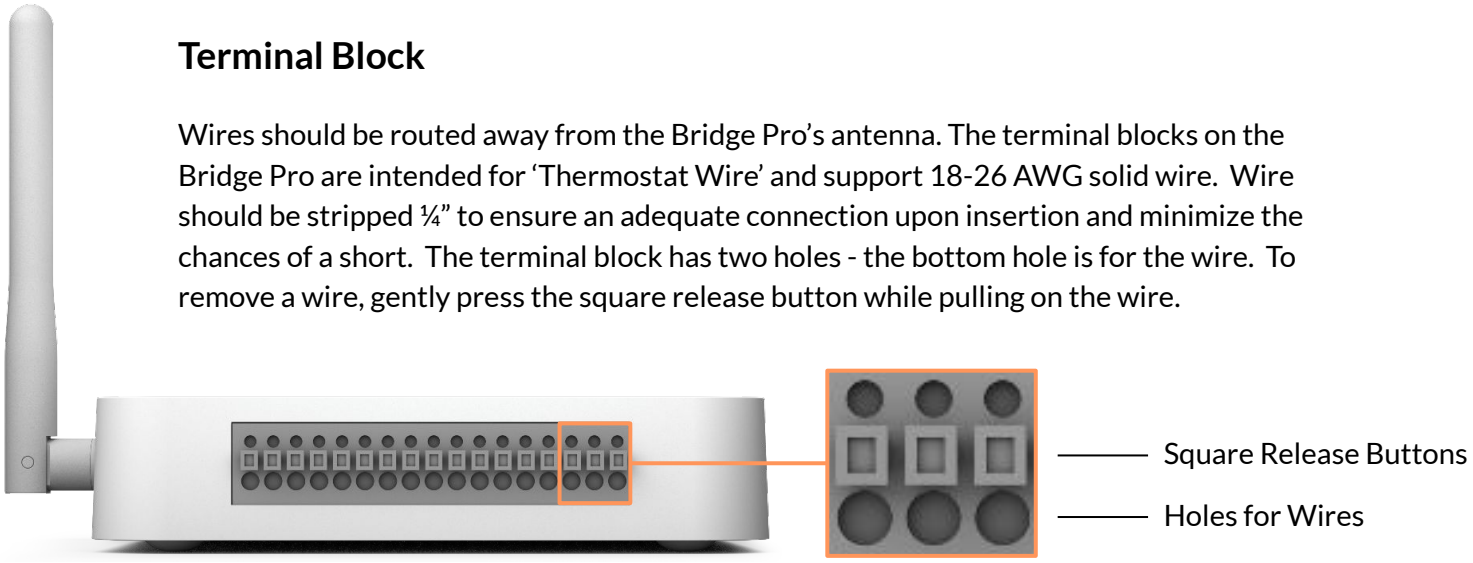
Bridge Pro Wiring and Terminal Block

Powering the Bridge Pro

The Bridge Pro can be powered either by USB-C or via 24 VAC.

Terminal Block

Wires should be routed away from the Bridge Pro's antenna. The terminal blocks on the Bridge Pro are intended for 'Thermostat Wire' and support 18-26 AWG solid wire. Wire should be stripped ¼" to ensure an adequate connection upon insertion and minimize the chances of a short. The terminal block has two holes - the bottom hole is for the wire. To remove a wire, gently press the square release button while pulling on the wire.



Smart Vent Wiring

Power the Smart Vent

The Smart Vent is designed to accept 20 AWG, plenum rated wire. Smart Vents can be wired together in parallel to a common transformer but should not be wired in series. Refer to the 'Hardwired Power for Smart Vents' section for additional details and guidance.

2.1 Boilers - “Lockout” Configuration

“Lockout” configuration is **one** of the recommended options for **Staged Heating**.
Don’t use for **Smart Heating Control**.

Overview

In this configuration, the Bridge Pro is “locking out” each boiler zone based on the systems staged heating settings in the Flair app. Electrically, think of the Bridge Pro as an additional relay in series with the thermostat such that a call for heat will only cause the zone to heat if both the thermostat is calling for heat and if the Bridge Pro ‘unlocks’ the zone.

This configuration leaves existing boiler thermostats in place and is compatible with any 24 VAC thermostat, smart or otherwise.

This diagram depicts a 7 zone boiler system, the maximum number of zones that a single Bridge Pro can support.

STAGED HEATING GUIDE

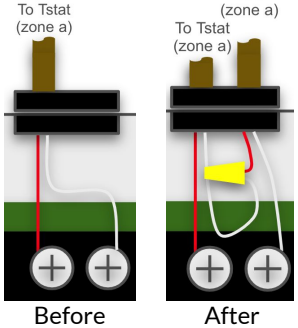
flair.co/staged-heating-guide

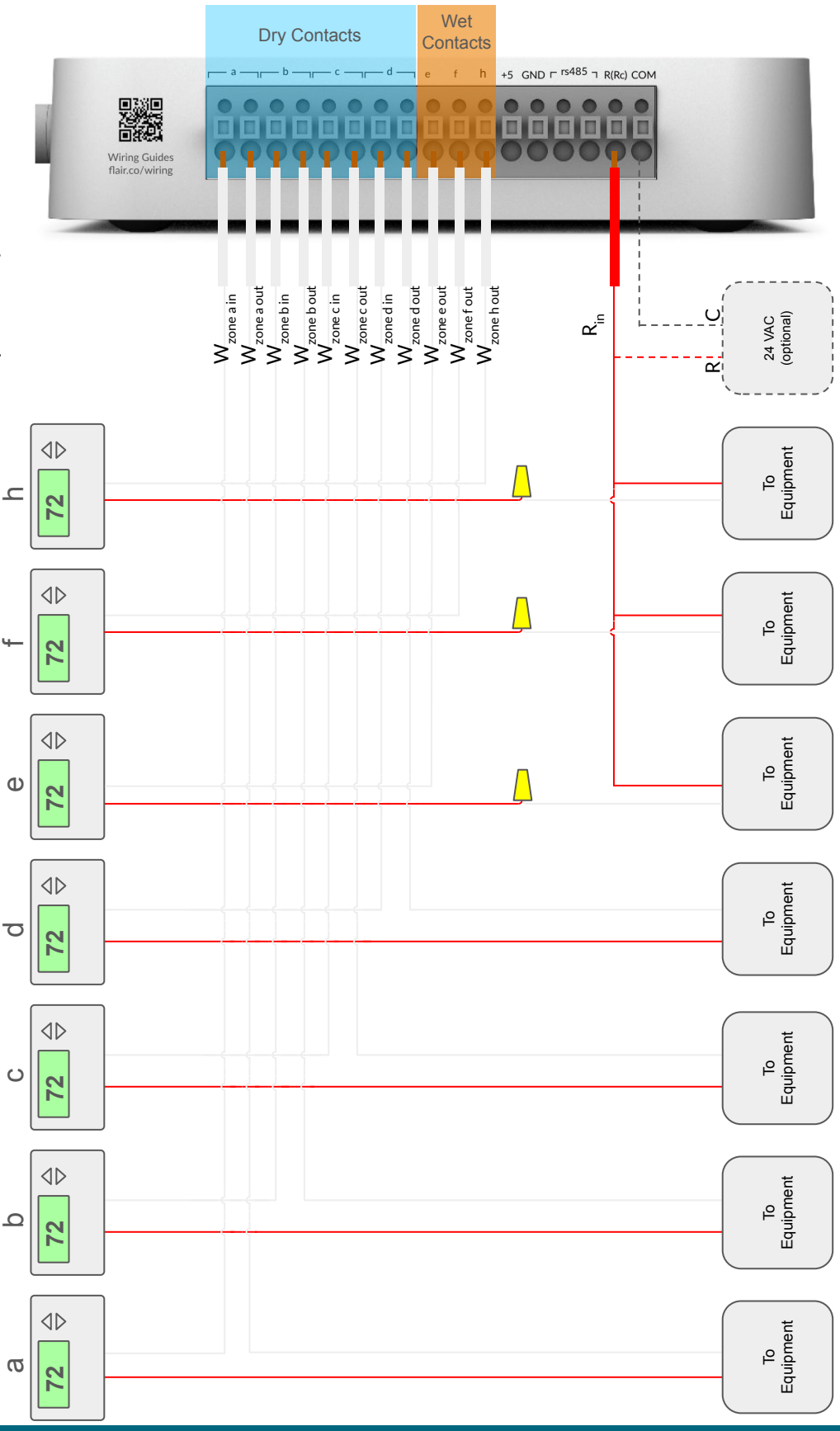
BRIDGE PRO SPECS

flair.co/bp-spec

Splice Example for Zones A-D

Example of splicing the Bridge Pro into thermostat wiring. In this example, we splice in at the zone control board thermostat connection.





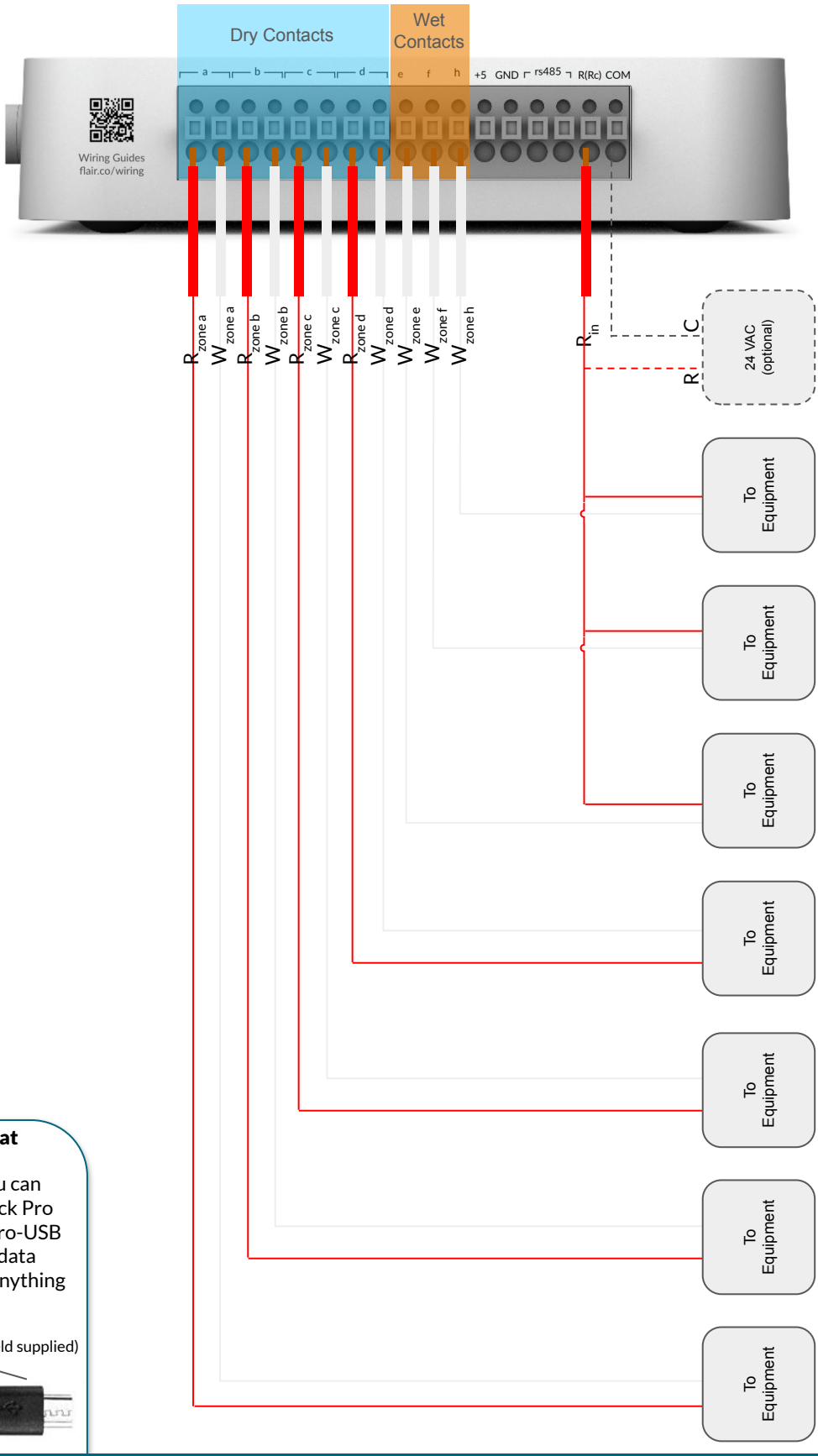
2.2 Boilers - “Controller” Configuration

“Controller” configuration is **one** of the recommended options for **Staged Heating** and **the** recommended option for **Smart Heating Control**.

Overview

In this configuration, the Bridge Pro in combination with Puck Pros serve as the thermostat system for both the DHPs and Boiler system, selecting which system to use based on the staged heating settings in the Flair app.

This diagram depicts a 7 zone boiler system, the maximum number of zones that a single Bridge Pro can support.



STAGED HEATING GUIDE

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Step-by-Step Installation & Staged Heating Operations

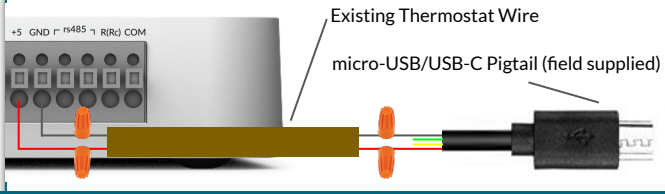
BRIDGE PRO SPECS

flair.co/bp-spec

Detailed Bridge Pro Specifications

Optional Puck Power via Existing Thermostat Wire and Bridge Pro

If you are removing an existing boiler thermostat, you can utilize the existing wire pull to power one Puck or Puck Pro using the +5 and GND from the Bridge Pro and a micro-USB (Puck 1) or USB-C (Puck 2) pigtail. Note - ensure the data lines on the micro-USB pigtail are not connected to anything



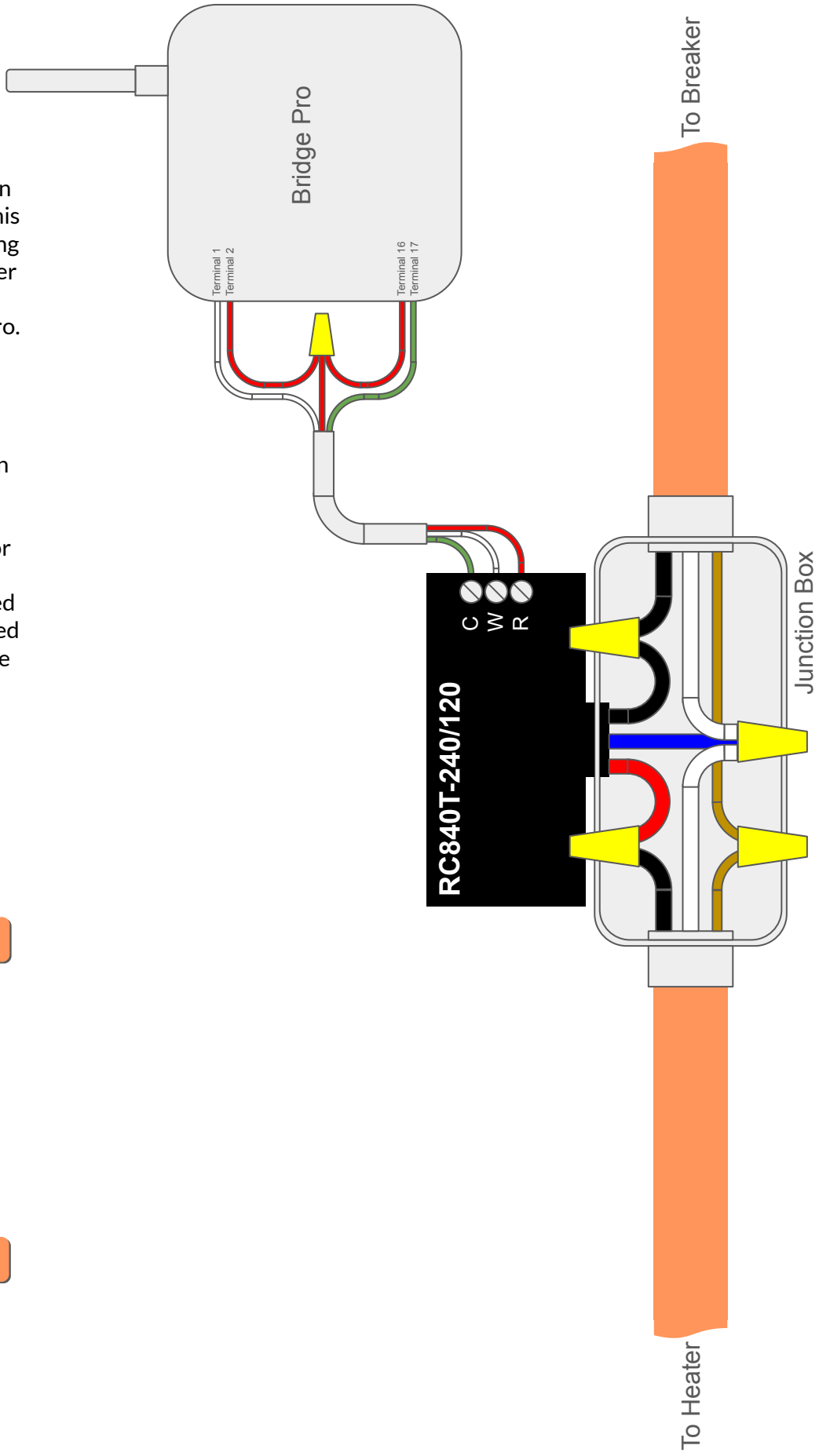
2.3 Electric Baseboard Heaters - One Zone

Overview

In this diagram, the Bridge Pro is working with a single 24 VAC controlled line level relay to switch an electric baseboard heater zone. In this diagram, the Bridge Pro is also running off of the internal 24 VAC transformer in the RC840T thus no USB power needs to be supplied to the Bridge Pro.

If a line level thermostat is inline between the line level relay and the heater itself, then the system should be configured as a 'Lockout' system in the app.

If there is no line level thermostat (for instance, if a prior line level stat was removed, the connections wire nutted together, and the junction box covered with a blank), then the zone should be configured as a 'Controller'.



STAGED HEATING GUIDE

flair.co/staged-heating-guide

Step-by-Step Installation & Staged Heating Operations

BRIDGE PRO SPECS

flair.co/bp-spec

Detailed Bridge Pro Specifications

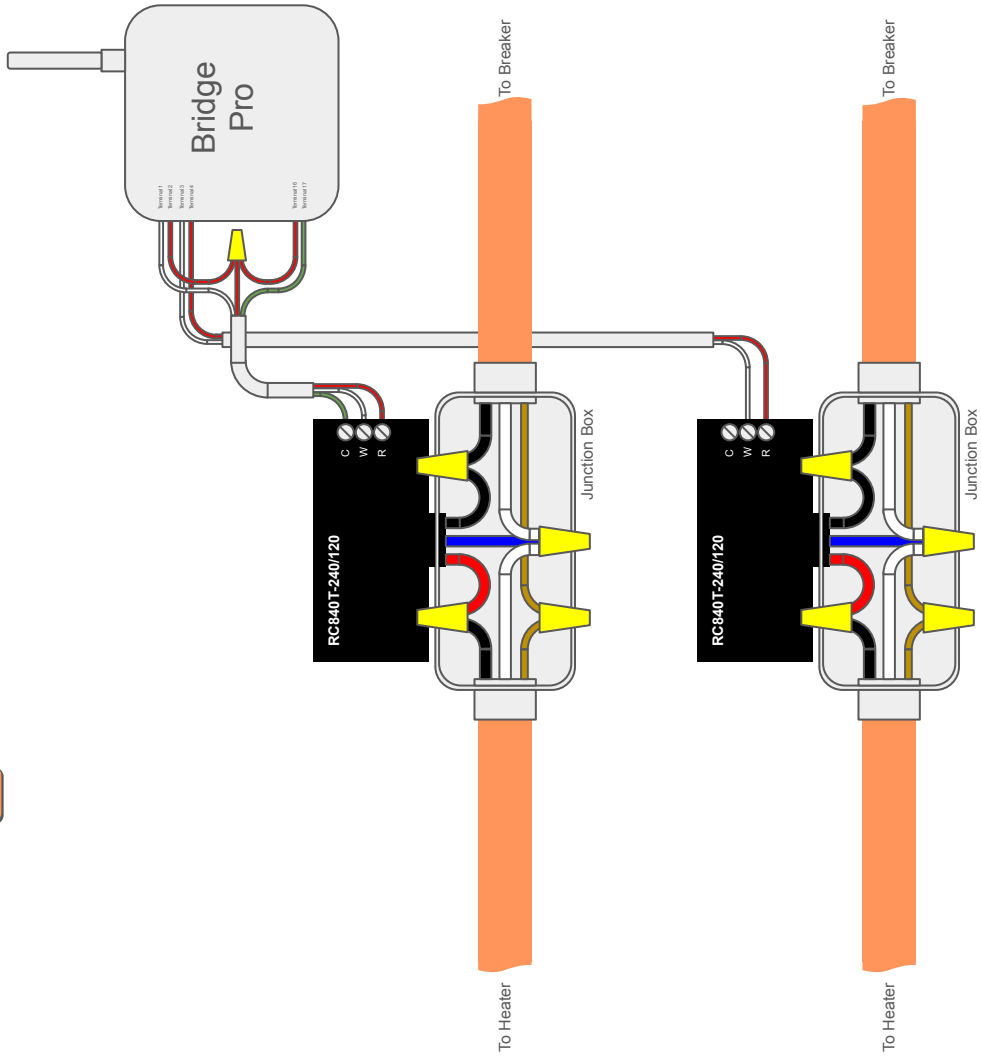
2.4 Electric Baseboard Heaters - Two Zones

Overview

In this diagram, the Bridge Pro is working with two 24 VAC controlled line level relays to switch two electric baseboard heater zones. In this diagram, the Bridge Pro is also running off of the internal 24 VAC transformer in the RC840T thus no USB power needs to be supplied to the Bridge Pro. Note that after the first relay, the Common ('C') connection on the second line level relay is left disconnected.

If a line level thermostat is inline between the line level relay and the heater itself, then the system should be configured as a 'Lockout' system in the app.

If there is no line level thermostat (for instance, if a prior line level stat was removed, the connections wire nutted together, and the junction box covered with a blank), then the zone should be configured as a 'Controller'.



STAGED HEATING GUIDE

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Step-by-Step Installation & Staged Heating Operations

BRIDGE PRO SPECS

flair.co/bp-spec

Detailed Bridge Pro Specifications

2.5 Electric Baseboard Heaters - Two Zones

With External Transformer

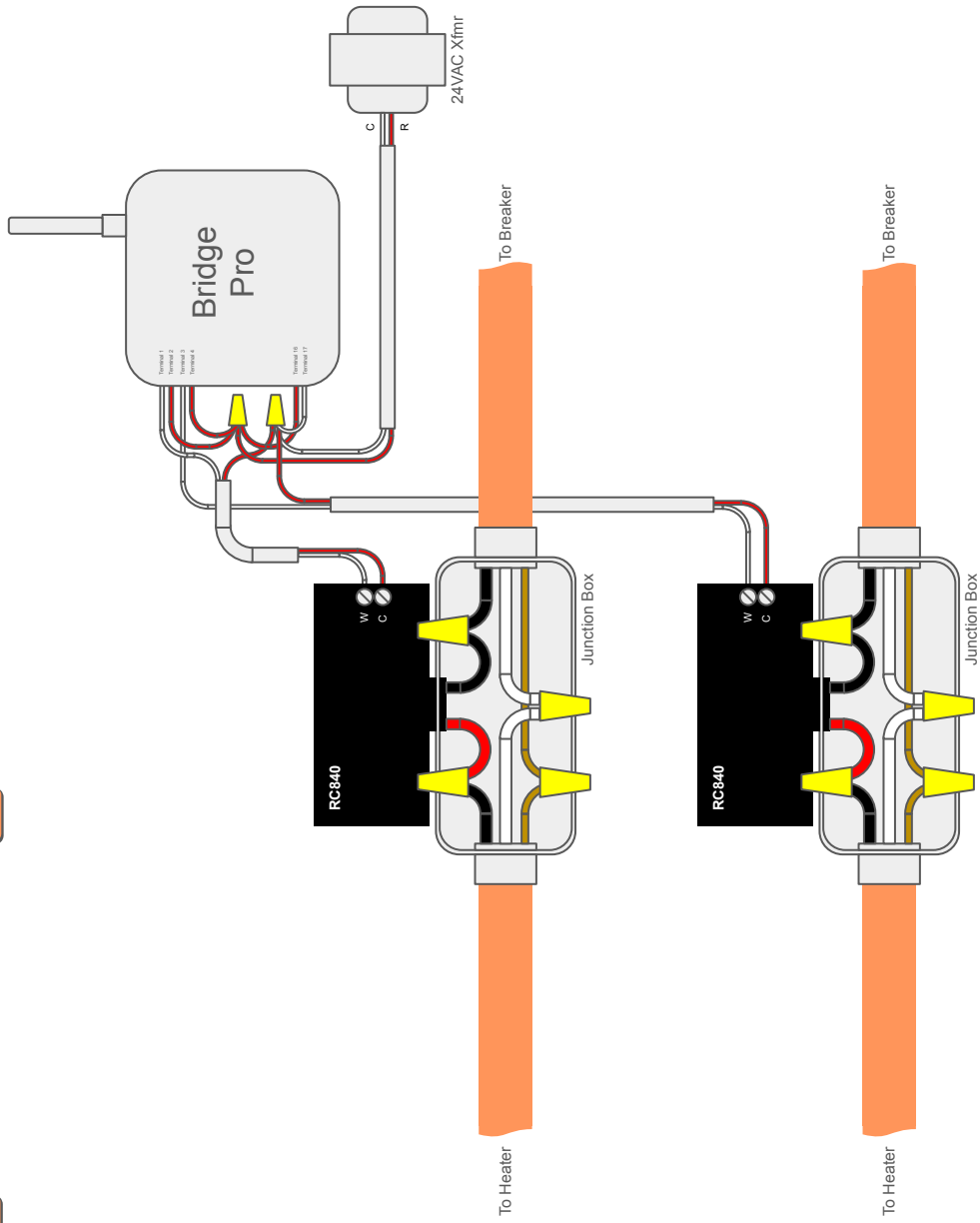
Overview

In this diagram, the Bridge Pro is working with two 24 VAC controlled line level relay to switch an electric baseboard heater zone. In this diagram, the Bridge Pro is also running off of an external 24 VAC unlike the prior diagrams.

The advantage of this configuration is that the same line level relay can be used regardless of whether the electric heater is 120 VAC or 240 VAC.

If a line level thermostat is inline between the line level relay and the heater itself, then the system should be configured as a 'Lockout' system in the App.

If there is no line level thermostat (for instance, if a prior line level stat was removed, the connections wire nutted together, and the junction box covered with a blank), then the zone should be configured as a 'Controller'.



STAGED HEATING GUIDE

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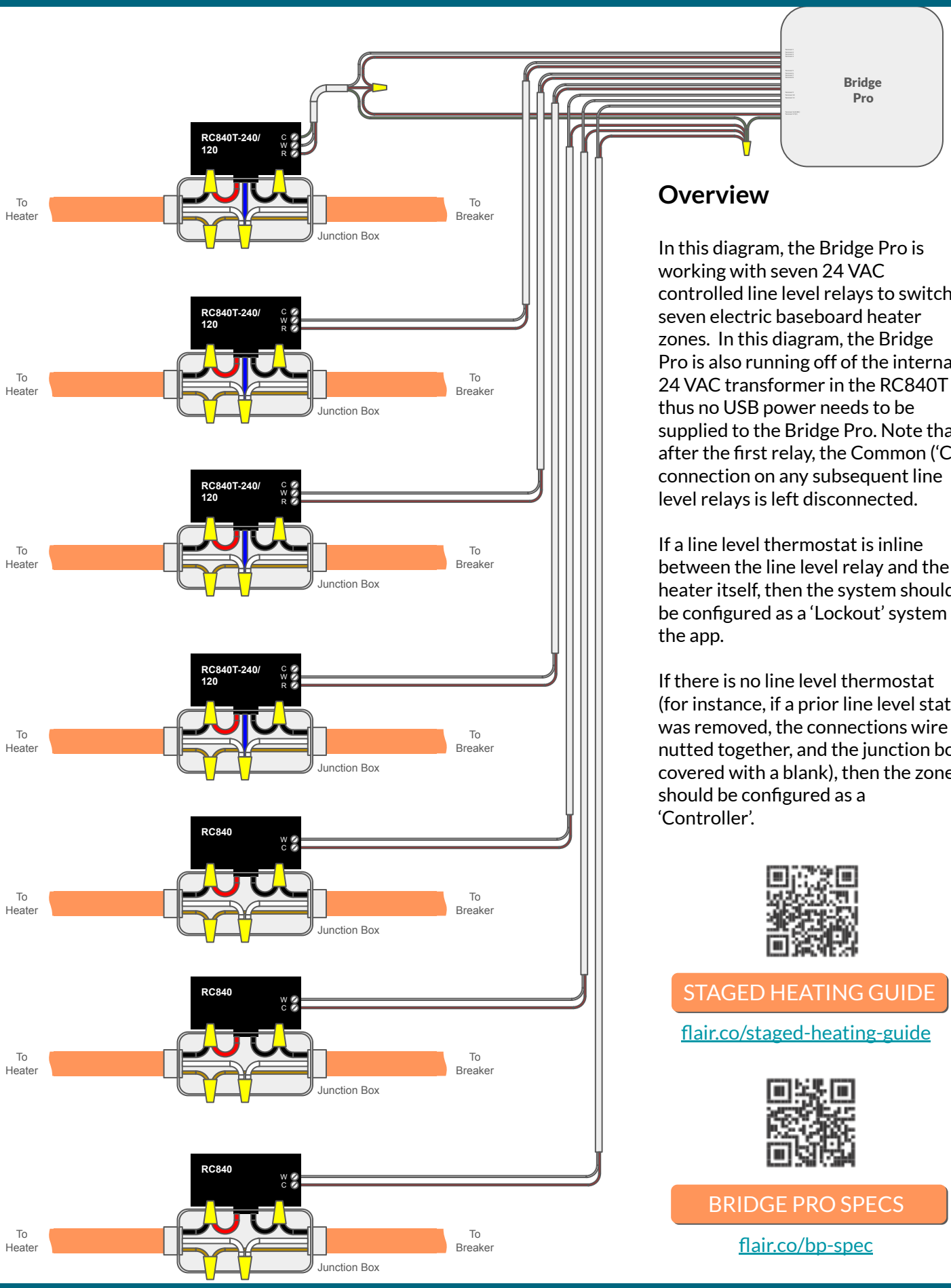
Step-by-Step Installation & Staged Heating Operations

BRIDGE PRO SPECS

flair.co/bp-spec

Detailed Bridge Pro Specifications

2.6 Electric Baseboard Heaters - Seven Zones



Overview

In this diagram, the Bridge Pro is working with seven 24 VAC controlled line level relays to switch seven electric baseboard heater zones. In this diagram, the Bridge Pro is also running off of the internal 24 VAC transformer in the RC840T thus no USB power needs to be supplied to the Bridge Pro. Note that after the first relay, the Common ('C') connection on any subsequent line level relays is left disconnected.

If a line level thermostat is inline between the line level relay and the heater itself, then the system should be configured as a 'Lockout' system in the app.

If there is no line level thermostat (for instance, if a prior line level stat was removed, the connections wire nutted together, and the junction box covered with a blank), then the zone should be configured as a 'Controller'.

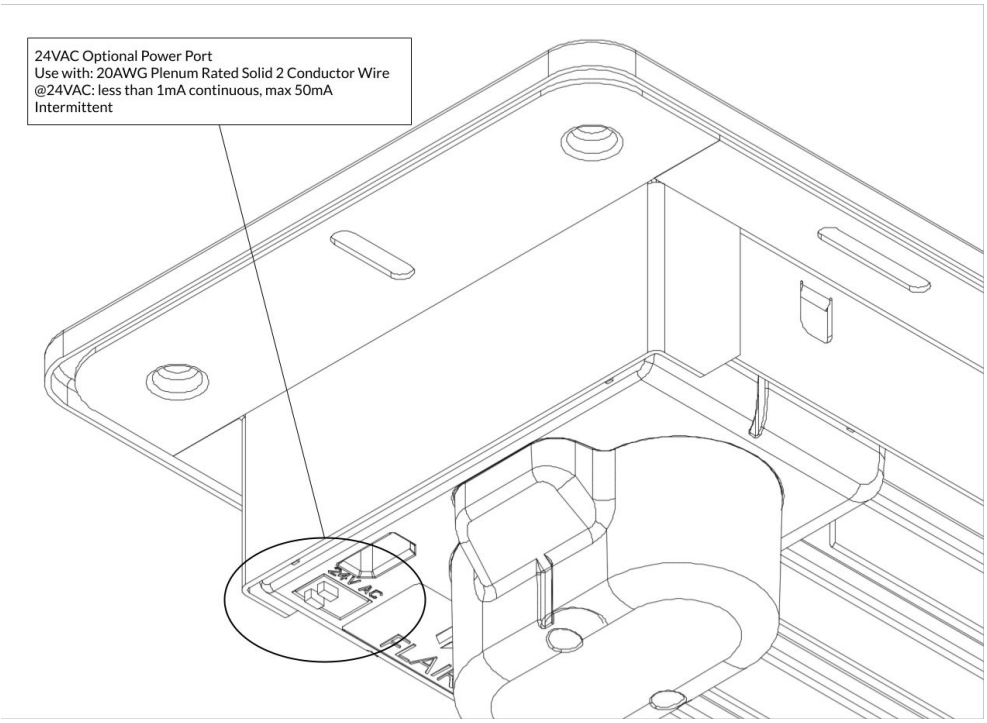
STAGED HEATING GUIDE

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BRIDGE PRO SPECS

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3.1 Hardwired Power for Smart Vents



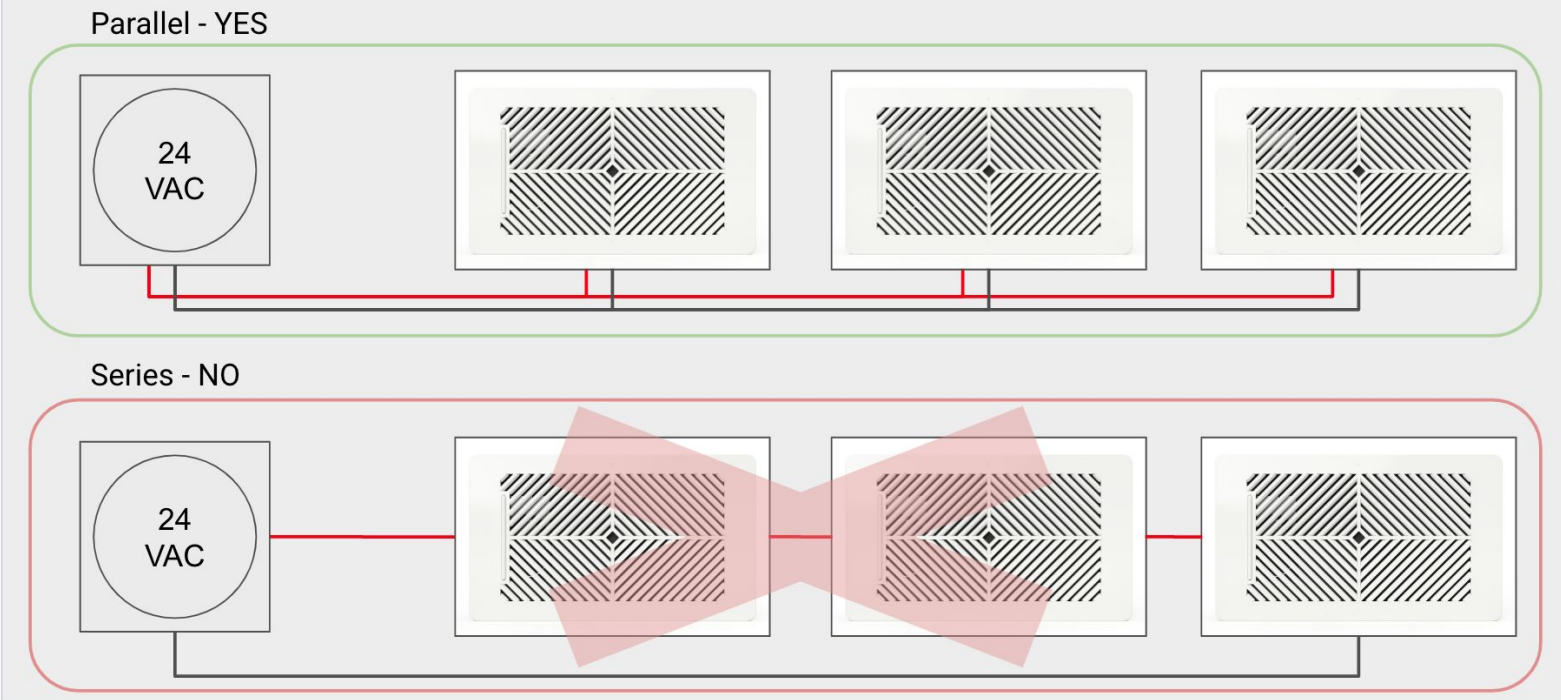
Installation

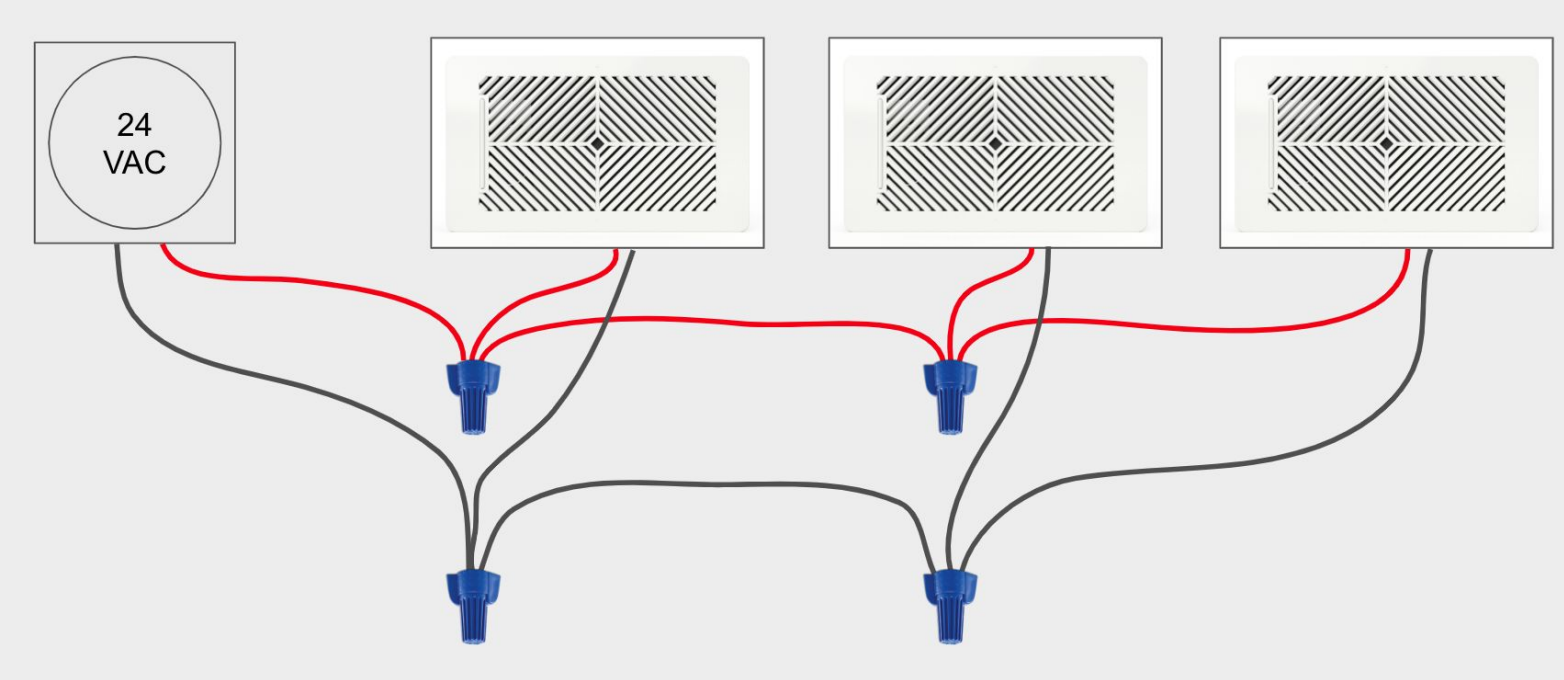
1. Drill hole in boot or duct near vent, where convenient. Hole size should be large enough for 20 AWG Plenum Rated Solid (2 Conductor) wire.
2. Slide 20 AWG Plenum Rated Solid (2 Conductor) wire through hole into boot.
3. Pull enough through to reach back of vent (boot dependent) - if you pull some extra, you can trim it later. When pulling the wire through, be careful to avoid stripping the wire on the metal boot or duct as this could lead to a short.
4. Using high quality Duct Tape or Mastic, seal the hole around the wire and the hole in the duct or boot.
5. Strip insulation and insert each conductor into the 24 VAC port on the back side of the Smart Vent (either wire can go in either hole, polarity does not matter).
6. If there is excessive wire in the boot or duct, trim the wire and repeat step 5. Ensure that the wire doesn't interfere with the louvre movement. Also ensure the two wires are fully separated and cannot short near the vent terminal block. In case of excess exposed wire at the vent terminal block, press the release buttons on the terminal block and pull the wire out. Trim exposed wire as needed and reinsert.
7. Connect the other end of wire to a 24V AC transformer/power supply (note that you will **not** need to wire to the ground pin/terminal if one is available).
8. Assemble battery related parts on vent according to regular installation process - there is no need to install the actual batteries.
9. Continue with regular installation and setup process.
10. Plug in or power 24 VAC power supply/transformer.

Electrical Notes

- Flair Vents operate with very low power requirements and operate at different times hence a 40VA (@24 VAC) will suffice for in excess of 10 vents. Beyond 10 vents, it is recommended that you consider additional power supplies due to the length of the wire runs becoming very long.
- Grounding is not needed.
- Max length from transformer to Smart Vent should be 100 ft or less if using 20 AWG copper. If using aluminum or steel, please keep distances shorter.

3.1 Hardwired Power for Smart Vents





STAGED HEATING GUIDE

flair.co/staged-heating-guide

Step-by-Step Installation & Staged Heating Operations

BRIDGE PRO SPECS

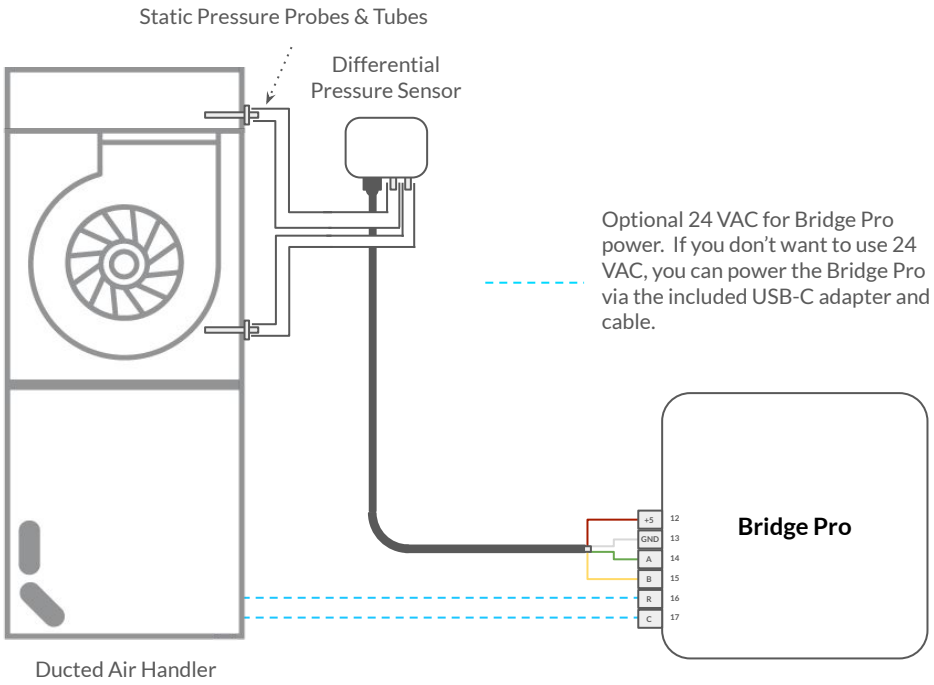
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Detailed Bridge Pro Specifications

3.2 Static Pressure Kit and Bridge Pro

Overview

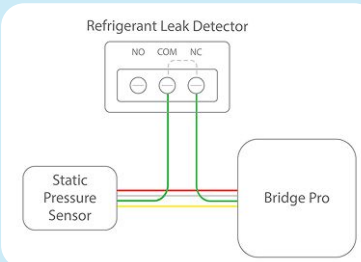
In this diagram, the Bridge Pro and Static Pressure Kit are connected to read the static pressure of a ducted air handler for use in a Pro Level Zoning and Air Balancing solution. The Bridge Pro can optionally be powered by the air handlers 24 VAC supply.



A2L Refrigerant Support

For HVAC systems utilizing A2L refrigerants, air handlers must be equipped with refrigerant leak detection and zoning systems must open all dampers during a leak event.

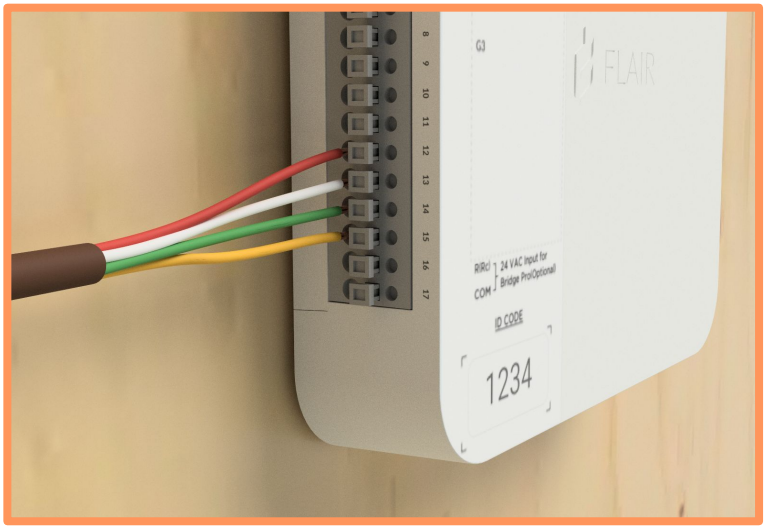
In order to respond to leaks, data line 'A' (pin 14 on Bridge Pro) between the Differential Pressure Sensor and the Bridge Pro must be routed through the air handler's COM and NC terminals on the systems leak detection sensor system.



Flair Differential Pressure Sensor Wiring



Flair Bridge Pro Wiring



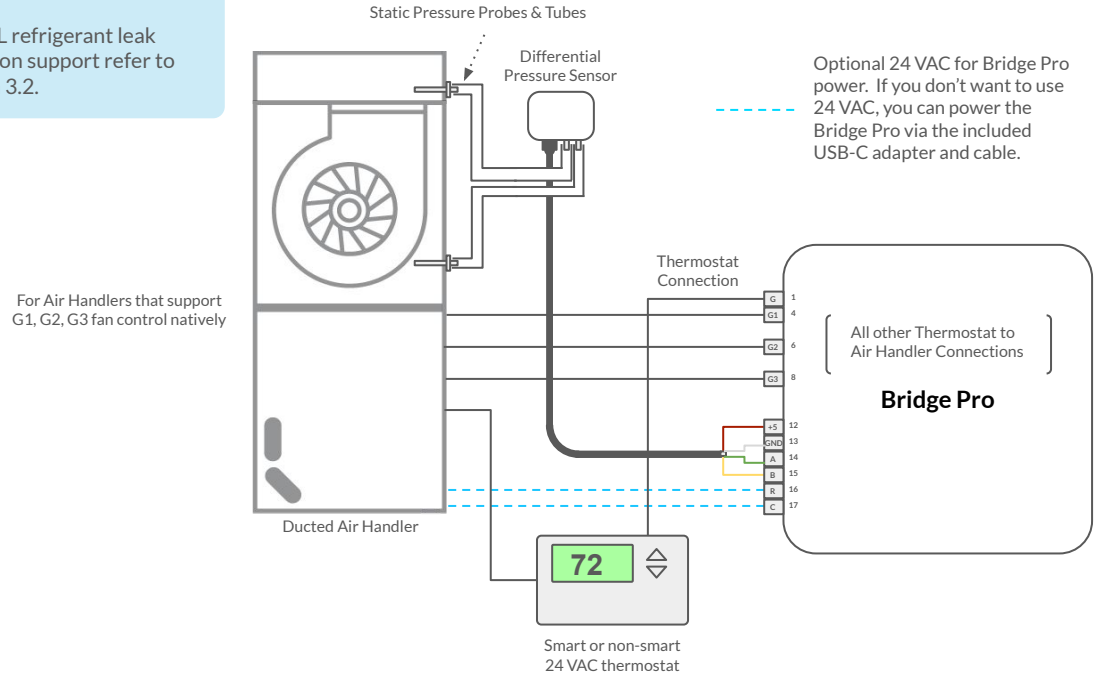
3.3 Multi Speed Fan & Static Pressure - **Without** 24 VAC/Thermostat Adapter

Overview

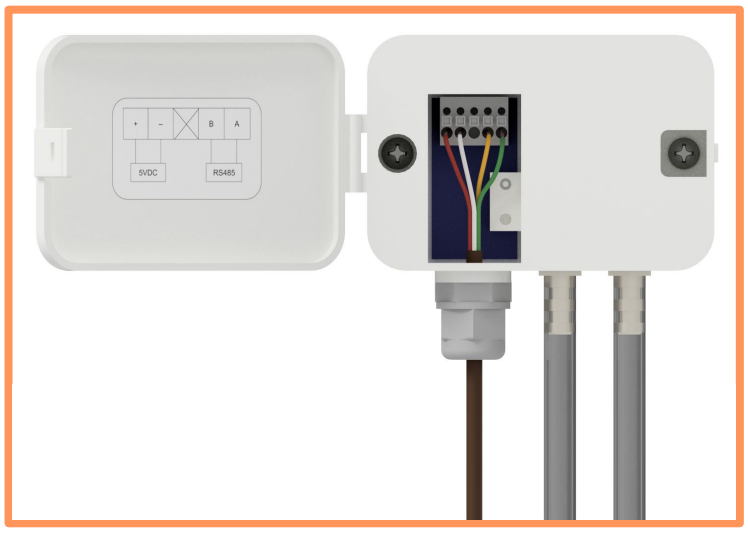
In this diagram, the Bridge Pro and Static Pressure Kit are connected to read the static pressure of a ducted air handler for use in a Pro Level Zoning and Air Balancing solution. The Bridge Pro can optionally be powered by the air handlers 24 VAC supply.

Additionally, the thermostat's G (fan) call is routed through the Bridge Pro which in turn generates a G1 (Low), G2 (Medium), or G3 (High) call for air handlers that natively support multi speed fan control.

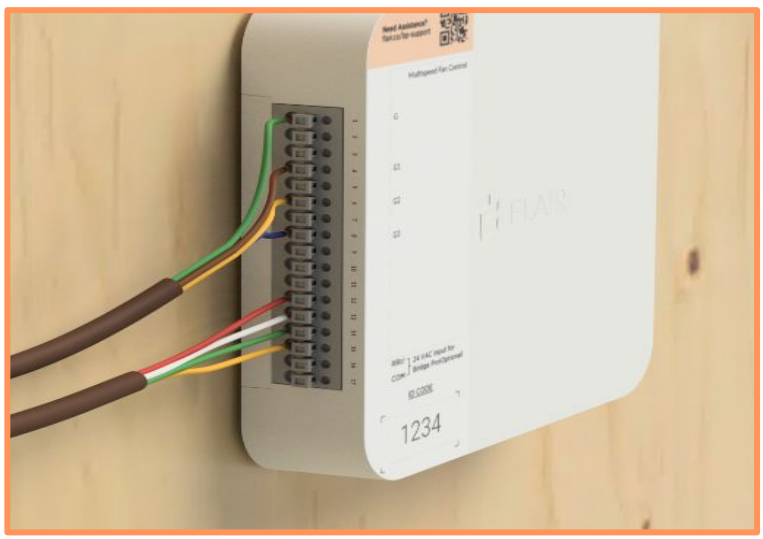
Note:
For A2L refrigerant leak detection support refer to section 3.2.



Flair Differential Pressure Sensor Wiring



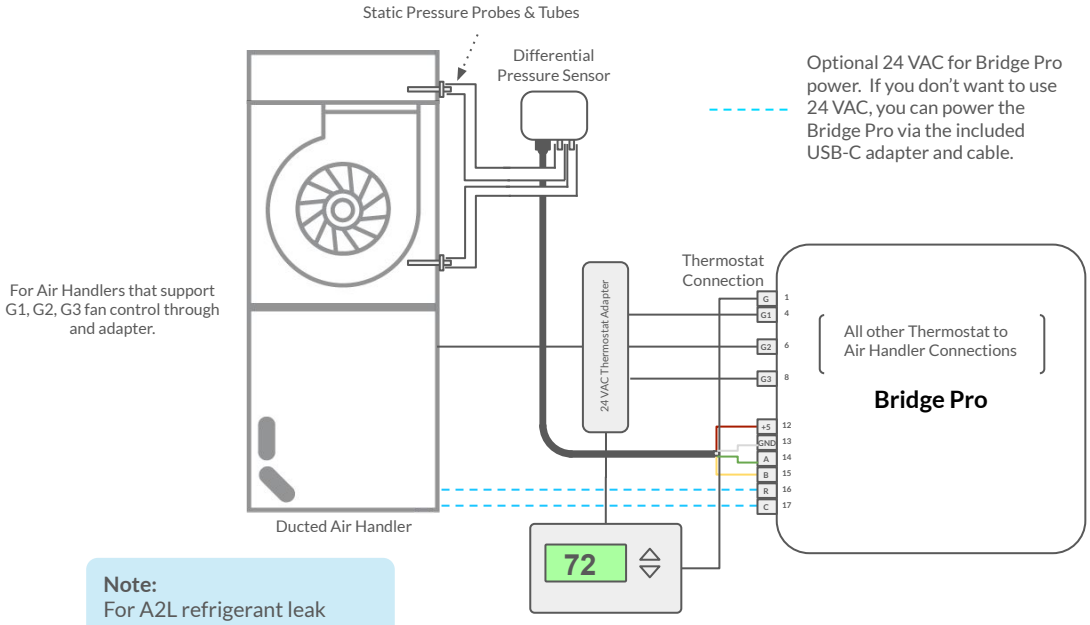
Flair Bridge Pro Wiring



3.3 Multi Speed Fan & Static Pressure - **With** 24 VAC/Thermostat Adapter

Overview

In this diagram, the Bridge Pro and Static Pressure Kit are connected to read the static pressure of a ducted air handler for use in a Pro Level Zoning and Air Balancing solution. The Bridge Pro can optionally be powered by the air handlers 24 VAC supply.
Additionally, the thermostat's G (fan) call is routed through the Bridge Pro which in turn generates a G1 (Low), G2 (Medium), or G3 (High) call for air handlers that support multi speed fan control through their 24 VAC/Thermostat Adapter.



Note:
For A2L refrigerant leak detection support refer to section 3.2.

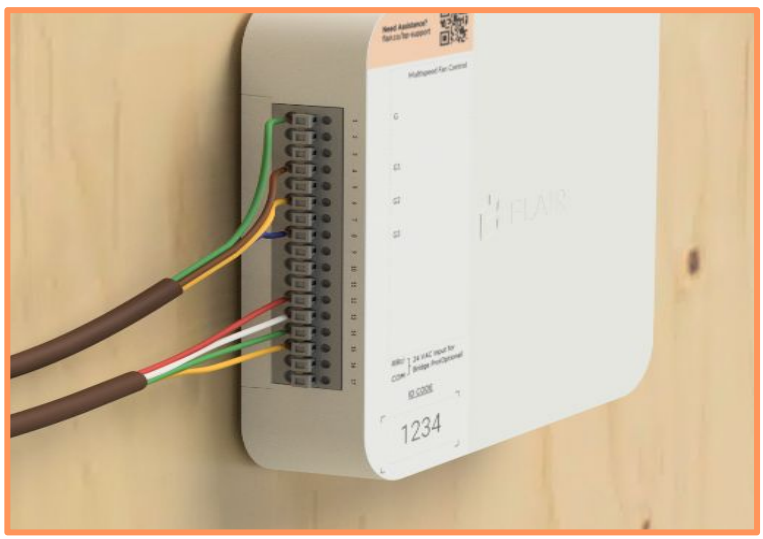
Example Adapters

- MITSUBISHI ELECTRIC — PAC-US445CN-1
- FUJITSU — FUJITSU UTY-TTRX
- SAMSUNG — SAMSUNG MIM-A60UN
- LG — LG PDRYCB320

Flair Differential Pressure Sensor Wiring



Flair Bridge Pro Wiring

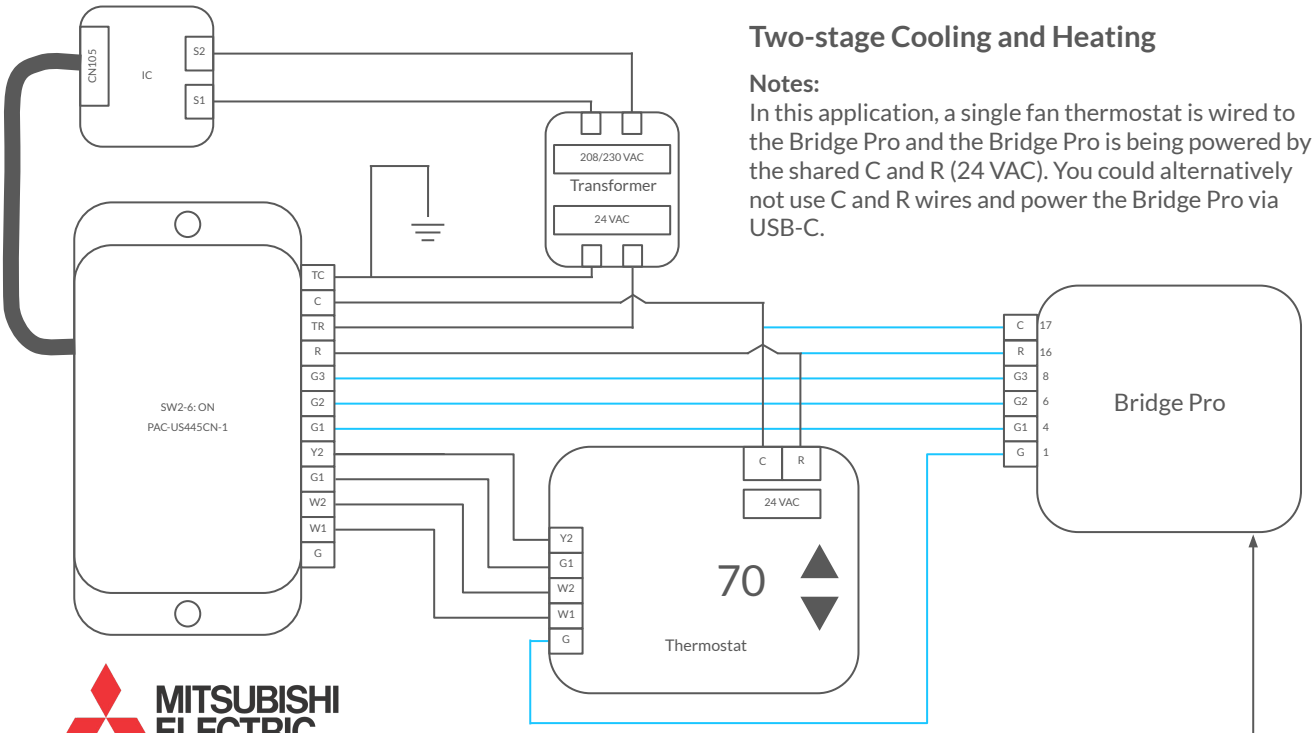


3.5 Mitsubishi Fan Control Wiring

Overview

In this diagram, the Bridge Pro and Static Pressure Kit are connected to read the static pressure of a ducted air handler for use in a Pro Level Zoning and Air Balancing solution. The Bridge Pro can optionally be powered by the air handlers 24 VAC supply as shown.

Additionally, the thermostat's G (fan) call is routed through the Bridge Pro which in turn generates a G1 (Low), G2 (Medium), or G3 (High) call for air handlers that support multi speed fan control through their 24 VAC /Thermostat Adapter.



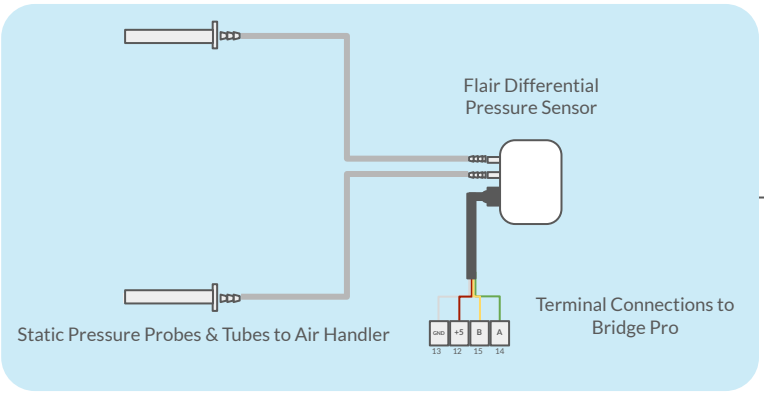
Two-stage Cooling and Heating

Notes:
In this application, a single fan thermostat is wired to the Bridge Pro and the Bridge Pro is being powered by the shared C and R (24 VAC). You could alternatively not use C and R wires and power the Bridge Pro via USB-C.

MITSUBISHI ELECTRIC

[Thermostat Interface PAC-US445CN-1]

Note:
For A2L refrigerant leak detection support refer to section 3.2.



Flair Static Pressure Kit

Note: Thermostat has to be set to conventional mode for optimum operation.



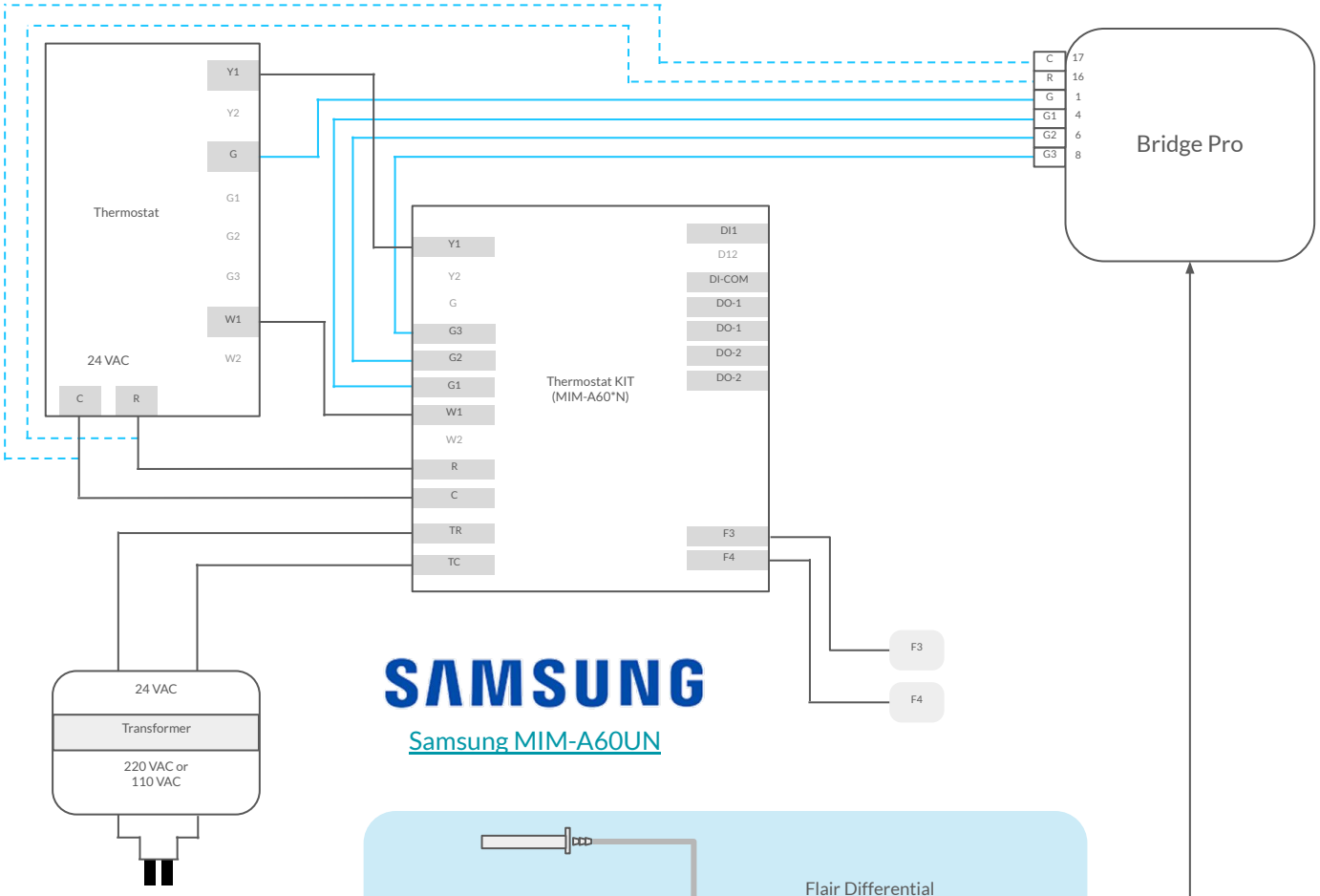
3.6 Samsung Fan Control Wiring

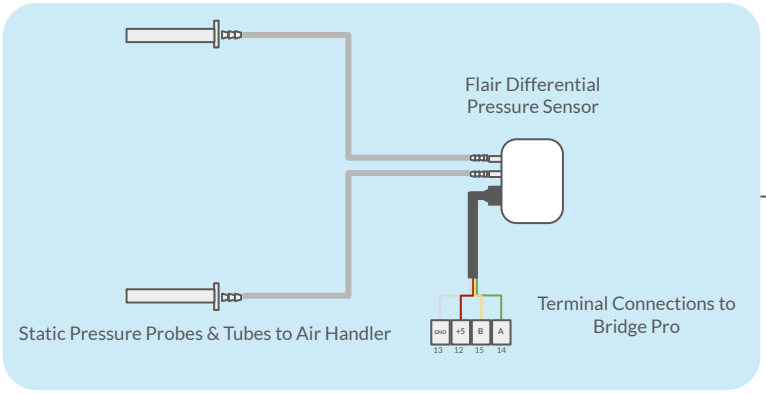
Overview

In this diagram, the Bridge Pro and Static Pressure Sensor are connected to read the static pressure of a ducted air handler for use in a Pro Smart Vent system. The Bridge Pro can optionally be powered by the air handlers 24 VAC supply as shown.

Additionally, the thermostat's G (fan) call is routed through the Bridge Pro which in turn generates a G1 (Low), G2 (Medium), or G3 (High) call for air handlers that support multi speed fan control through their 24 VAC /Thermostat Adapter.

Optional 24 VAC for Bridge Pro power.
If you don't want to use 24 VAC, you can power the Bridge Pro via the included USB-C adapter and cable.







Flair Static Pressure Kit

Note:
For A2L refrigerant leak detection support refer to section 3.2.

3.7 LG Fan Control Wiring

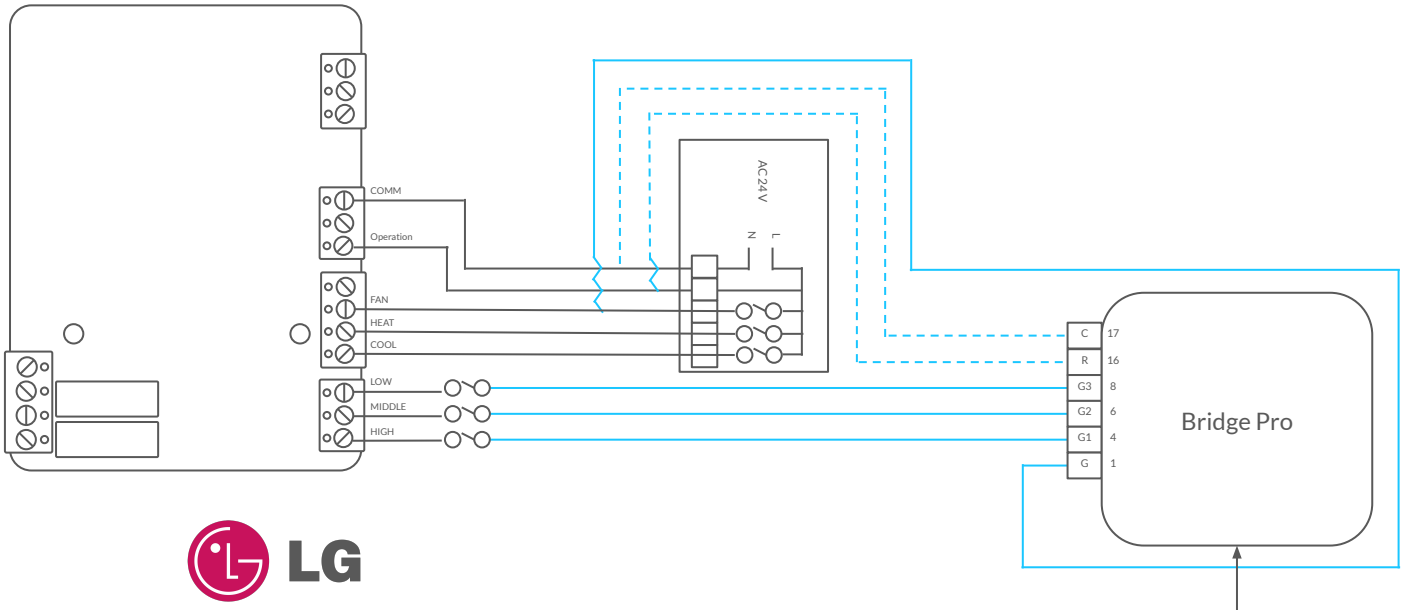
Overview

In this diagram, the Bridge Pro and Static Pressure Sensor are connected to read the static pressure of a ducted air handler for use in a Pro Smart Vent system. The Bridge Pro can optionally be powered by the air handlers 24 VAC supply as shown.

Additionally, the thermostat's G (fan) call is routed through the Bridge Pro which in turn generates a G1 (Low), G2 (Medium), or G3 (High) call for air handlers that support multi speed fan control through their 24 VAC /Thermostat Adapter.

Optional 24 VAC for Bridge Pro power.
If you don't want to use 24 VAC, you can power the Bridge Pro via the included USB-C adapter and cable.

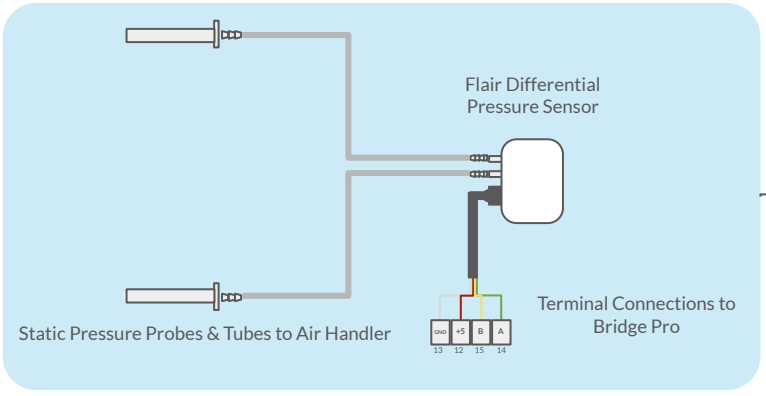
Wiring: For input contact voltage: DC 5-12 V, 24 V~



LG

PDRYCB320 Dry Contact for Thermostat

Notes:
This item is compatible with the following LG model numbers:
LVN**180**HV4 / LVN**181**HV4 / LVN**240**HV4 / LVN**241**HV4 / LVN**360**HV4 / LVN**361**HV4



Note:
For A2L refrigerant leak detection support refer to section 3.2.



Flair Static Pressure Kit

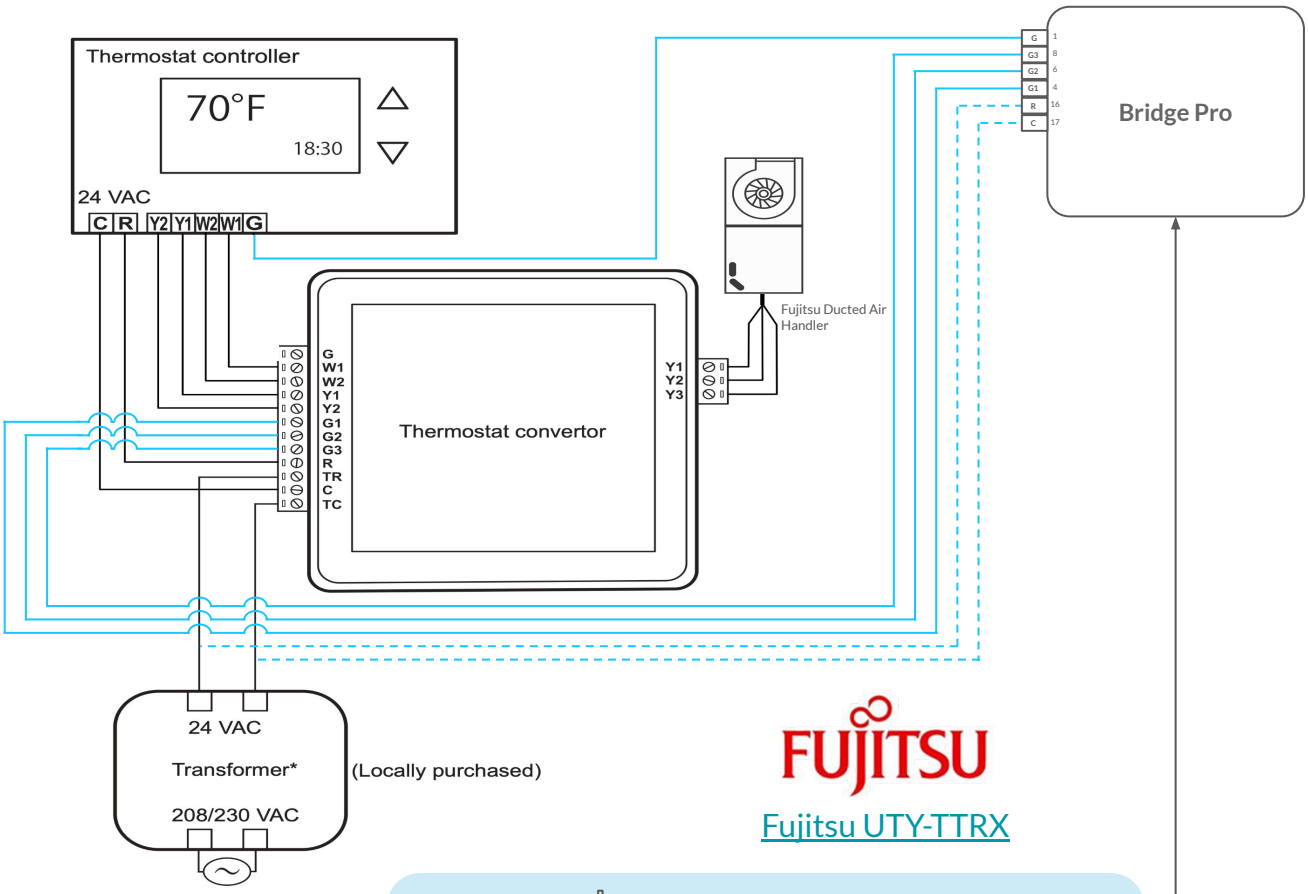
3.8 Fujitsu Fan Control Wiring

Overview

In this diagram, the Bridge Pro and Static Pressure Sensor are connected to read the static pressure of a ducted air handler for use in a Pro Smart Vent system. The Bridge Pro can optionally be powered by the air handlers 24 VAC supply as shown.

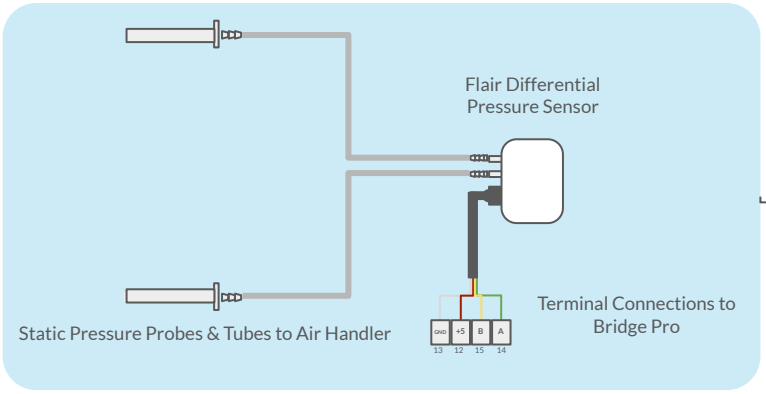
Additionally, the thermostat's G (fan) call is routed through the Bridge Pro which in turn generates a G1 (Low), G2 (Medium), or G3 (High) call for air handlers that support multi speed fan control through their 24 VAC /Thermostat Adapter.

Optional 24 VAC for Bridge Pro power.
If you don't want to use 24 VAC, you can power the Bridge Pro via the included USB-C adapter and cable.



FUJITSU

Fujitsu UTY-TTRX





Flair Static Pressure Kit

Note:
For A2L refrigerant leak detection support refer to section 3.2.

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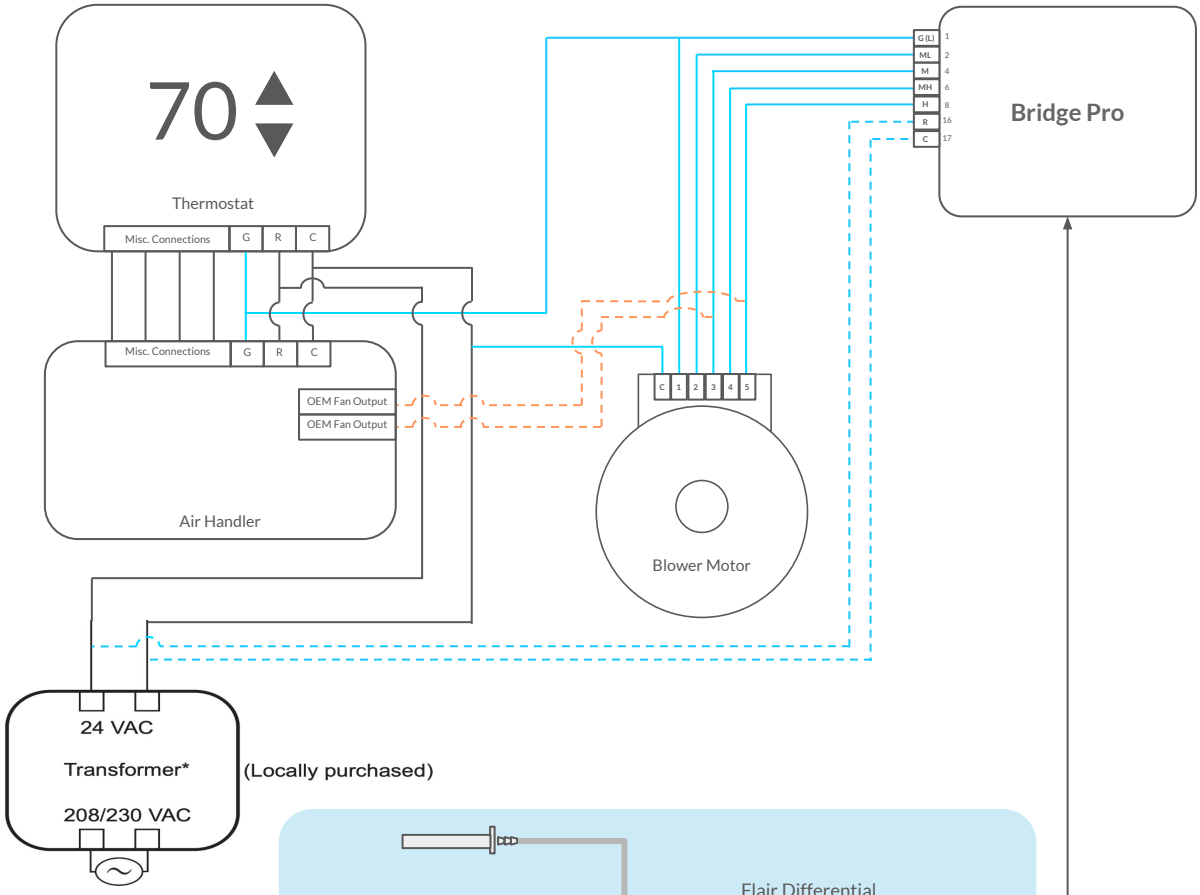
3.9 X13/Constant Torque Fan Control Wiring

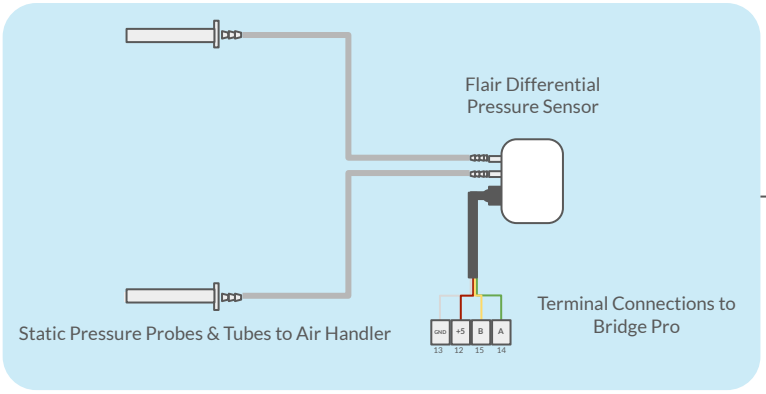
Overview

In this example, the thermostat's G (fan) call remains connected to the air handler and is also routed through Bridge Pro. Whenever G is energized, motor Tap 1 is energized as the Low speed. Bridge Pro progressively adds higher motor taps to select Medium Low, Medium, Medium High, or High airflow. Intended for compatible 5-tap X13-style constant-torque motors.

Optional 24 VAC for Bridge Pro power.
If you don't want to use 24 VAC, you can power the Bridge Pro via the included USB-C adapter and cable.

Optional OEM Fan Outputs
Leave required factory heat/AUX fan outputs connected to the motor. On compatible 5-tap X13 motors, simultaneous tap calls are permitted and the highest active tap takes priority.





Note:
For A2L refrigerant leak detection support refer to section 3.2.



Flair Static Pressure Kit

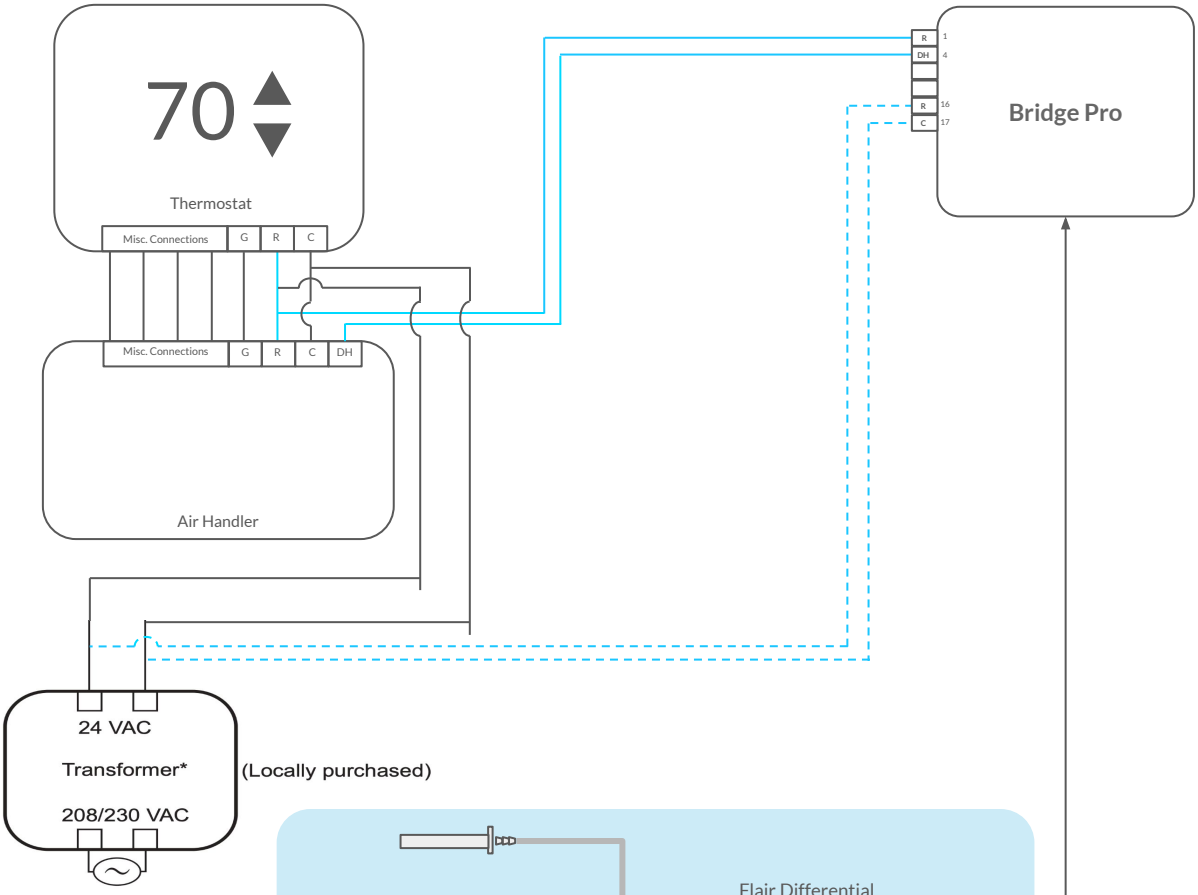
3.10 DH/DS/BK Fan Control Wiring

Overview

In this example, Bridge Pro and the Static Pressure Sensor monitor the static pressure of a ducted air handler for use with a Pro Smart Vent system or Damper Controls. The air handler's R is routed through Bridge Pro, which energizes or de-energizes the air handler's DH/DS/BK input to select normal or reduced airflow. Configure the DH/DS/BK input as active-high or active-low in the Flair app during setup.

Note: Do not connect the thermostat to DH/DS/BK when Bridge Pro is controlling this input.

Optional 24 VAC for Bridge Pro power.
If you don't want to use 24 VAC, you can power the Bridge Pro via the included USB-C adapter and cable.





Flair Static Pressure Kit

Note:
For A2L refrigerant leak detection support refer to section 3.2.

DRAFT

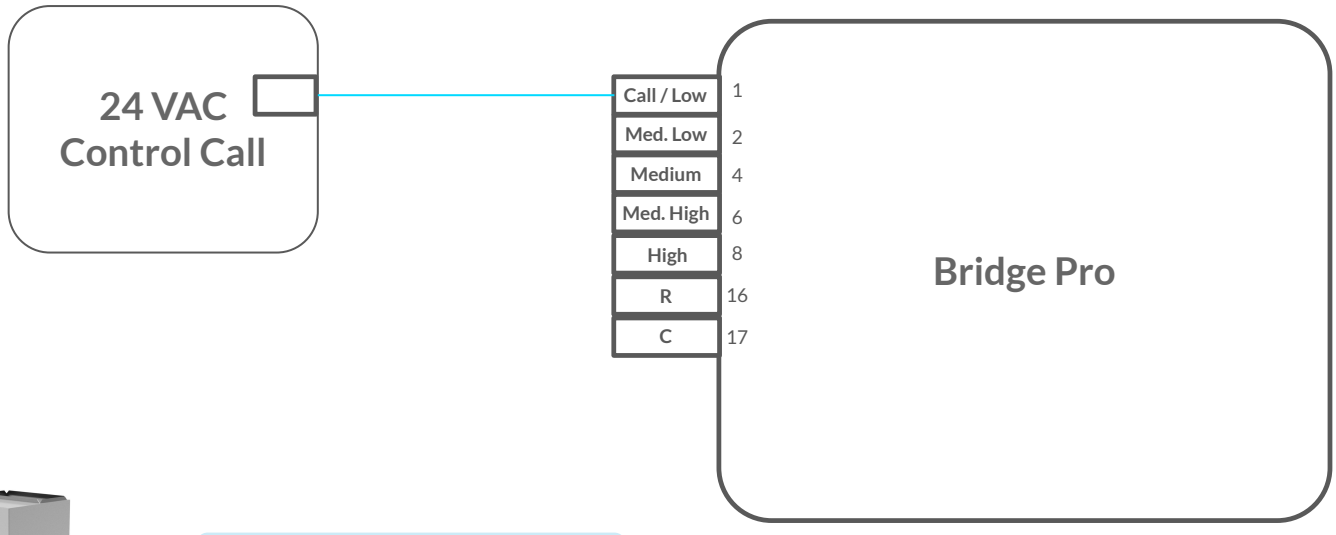
3.11 General Cumulative Fan/Staging Control

Overview

Some equipment selects higher fan speeds or stages by energizing multiple inputs simultaneously. In this configuration, Bridge Pro progressively energizes outputs according to the table below. Connect the applicable 24 VAC control call to terminal 1 on Bridge Pro. Supports 2–5 cumulative fan-speed or staging levels, depending on equipment.

Note: Use only with equipment that expects cumulative fan-input signaling, or where heating/cooling staging uses the same cumulative logic.

Requested Fan Speed/ Equipment Stage	Level 1	Level 2	Level 3	Level 4	Level 5
Off	Off	Off	Off	Off	Off
Level 1	On	Off	Off	Off	Off
Level 2	On	On	Off	Off	Off
Level 3	On	On	On	Off	Off
Level 4	On	On	On	On	Off
Level 5	On	On	On	On	On





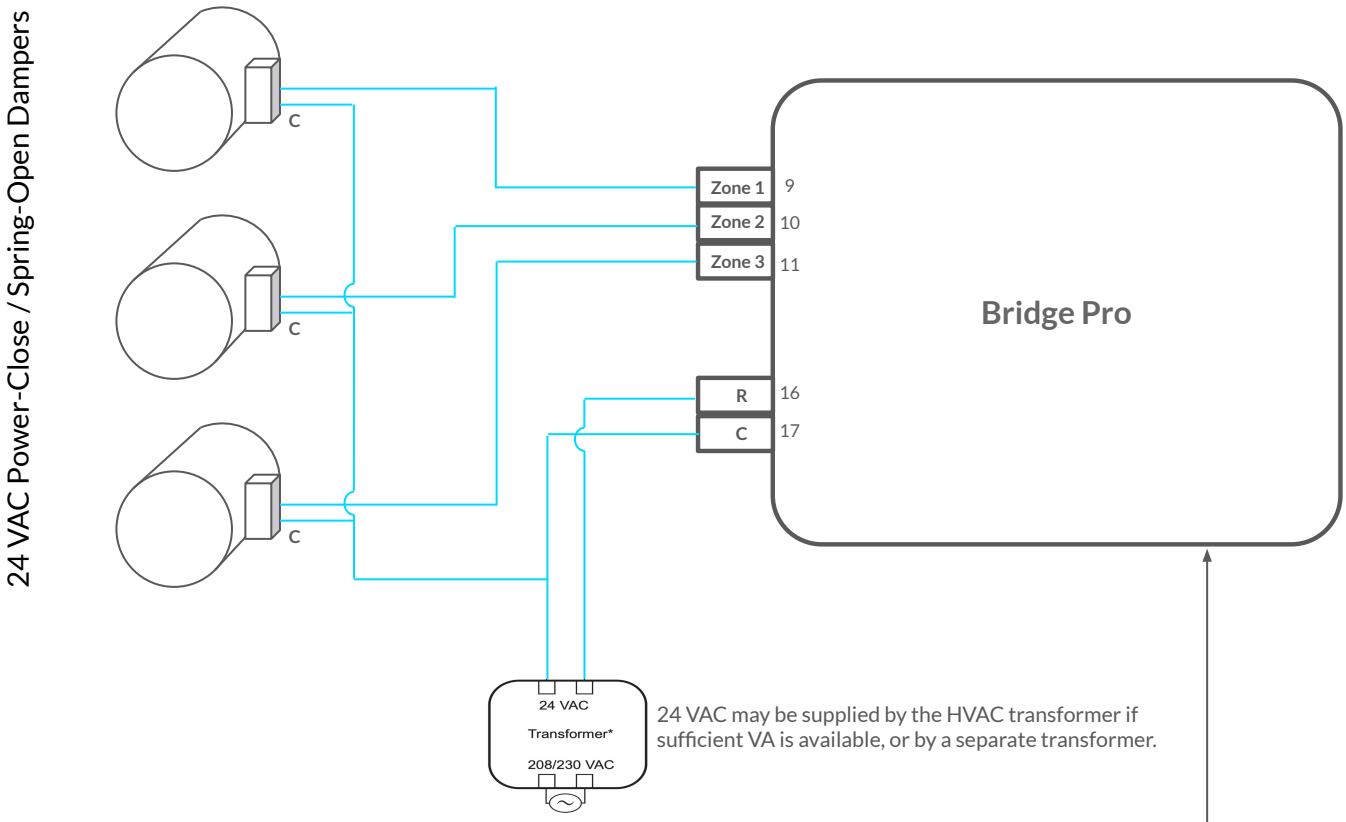
If using to drive Y1/Y2 type calls:
Ensure that the thermostat is configured to control only Y(1), thus allowing the Bridge Pro to control the Y1 and Y2 calls.

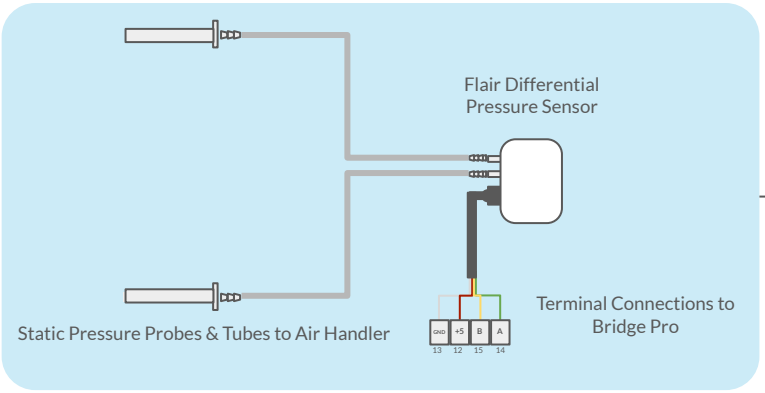
Connect outputs to the corresponding equipment inputs

3.12 Zone Damper Control

Overview

In this example, Bridge Pro and the Static Pressure Sensor are used with traditional zone dampers. Bridge Pro directly controls up to three 24 VAC power-close/spring-open dampers. Fan-control options are covered in the preceding diagrams; this page focuses only on zone-control wiring. Traditional zone dampers cannot be used in the same system as Flair Smart Vents.





Note:
For A2L refrigerant leak detection support refer to section 3.2.



Flair Static Pressure Kit