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24VAC HARMONY

User Guide

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0.4	June 15, 2026	Updated draft	E. Tholl	Updated wiring documents and screen/button descriptions.
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1 Product Description

1.1 Overview

The TEKTELIC HARMONY Thermostat is 24VAC powered, Class C LoRaWAN device designed for monitoring and controlling temperature in commercial, light industrial, or workplace environments. It integrates environmental sensing, user interface, and control functionality into a single compact unit.

HARMONY is designed to be independently mounted from and connected to new or existing HVAC systems. It provides for a system with intelligence and, therefore, increased heating/cooling efficiency, comfort, flexibility, and reliability.

HARMONY's primary function is to monitor environmental conditions such as temperature, humidity, CO_2 concentration, and ambient light, and control HVAC equipment based on user-defined setpoints. The device supports both local control via a high-resolution LCD and touch-sensing buttons. HARMONY also supports remote configuration and management via LoRaWAN.

HARMONY supports two general purpose I/O ports which can be used for:

- ECM fan speed control,
- a room presence detect switch,
- heat/cool mode auto change over,
- air filter alarm,
- or other functions.

HARMONY is equipped with a 3.5" LCD screen for displaying:

- Current temperature and humidity
- Temperature setpoint
- Operating mode (e.g., heating, cooling)
- Fan speed
- Date and time

Table 1-1 presents the available HARMONY models.

Table 1-1: Thermostat Models

Model	Description
T0009604	HARMONY

Figure 1-1 and Figure 1-2 illustrate the front and rear view of HARMONY.

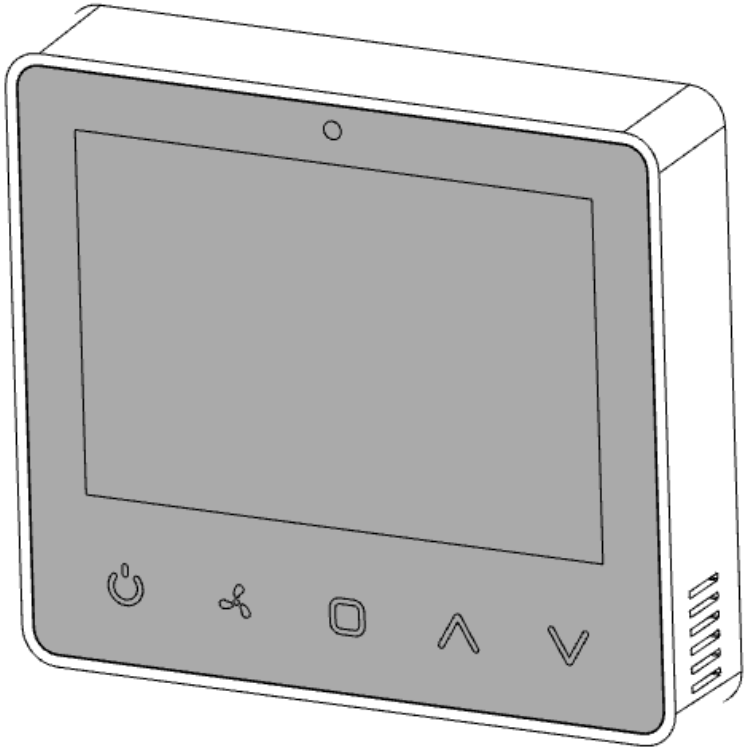


Figure 1-1: HARMONY Front View

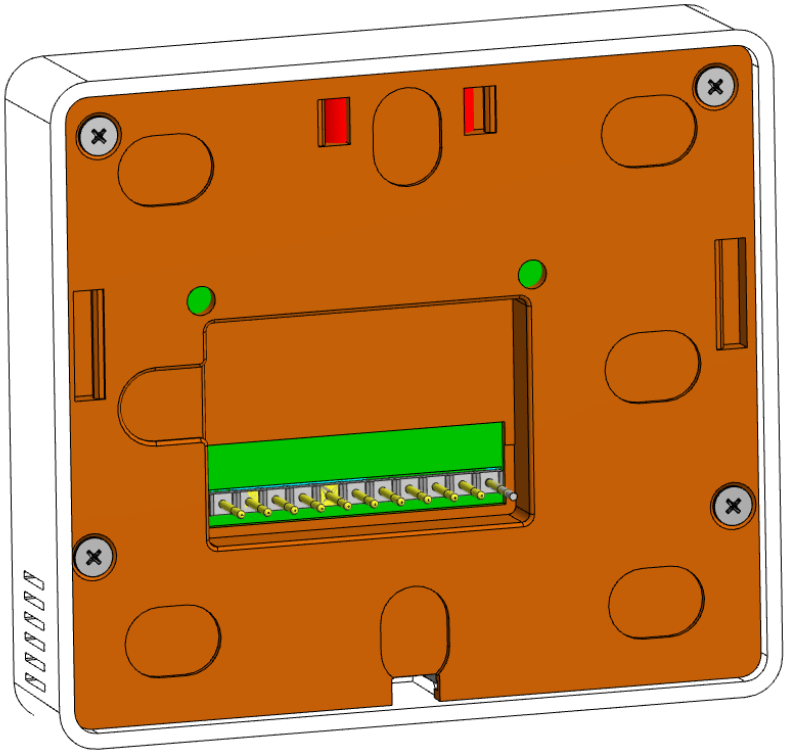


Figure 1-2: HARMONY Rear View

1.2 Specifications

HARMONY specifications are listed Table 1-2.

Table 1-2: HARMONY Specifications

Parameter	Specification
Use Environment	Indoor, residential, commercial, and light industrial
Form Factor	Fixed wall mount, permanently connected
Operating Temperature	0 to +55 °C ambient
Environmental Rating	IP30
Dimensions	98 x 86 x 19 mm (W x H x T)
Weight	145 g
Power Source	24 VAC 50/60 Hz, SELV or PELV, Class 2 power source required
Air Interface	LoRa
Safety	Class A Operating Control
Relay Controlled Line Outputs	6 outputs, 1 A resistive maximum each
General Purpose I/O	Two 24 VAC “C” referenced configurable analog or digital I/O ports • 0-10 V ECM fan control • NTC read • Open/closed contact read for air filter alarm, occupancy switch, etc.
User Interface	5 capacitive touch control buttons 3.5” diagonal e-ink screen
Mounting	Mounting plate for standard electrical wall box sizes Mounting plate for flush wall mounting Tool (e.g. flat screw driver) access release clip on bottom for installation and service
Connection Terminals	Rear located removeable screw terminal block • 3.5 mm pitch • 11 terminals • #28-16 AWG copper conductors solid or stranded • 4.5 mm strip length • 0.2 to 0.25 Nm torque

2 Product Installation

2.1 Safety Instructions

The following safety measures must be followed:

⚠ For indoor use only (IP 30 protection level for use in a pollution degree 2 environment)

⚠ For use at altitude up to 4,000 m

⚠ All installations must be in accordance with applicable local and national electrical regulations and codes.

2.2 Mounting

2.2.1 Interface

HARMONY is designed to support installation on standard AC wall boxes or directly to a wall surface where no wall box is present. The unit is supplied with a wall plate suitable for the intended application. Contact TEKTELIC if a specialized mounting plate is required.

A terminal block is attached to and mounted with the wall mounting plate. Once the wire connections have been completed and the wall plate has been secured to the wall or wall box, HARMONY may be installed or removed as needed without disconnecting the field wiring.

2.2.2 Installation

To install HARMONY, hang the top edge of the unit on the wall mount top edge tabs at a slight angle and then rotate HARMONY down onto the wall plate until the bottom center clasp snaps into place as illustrated in the figure below.

2.2.3 Removal

To remove HARMONY, apply upward pressure to the bottom center clasp using a flat screwdriver which will allow rotation of HARMONY away from the mounting plate and off of the top edge tabs.

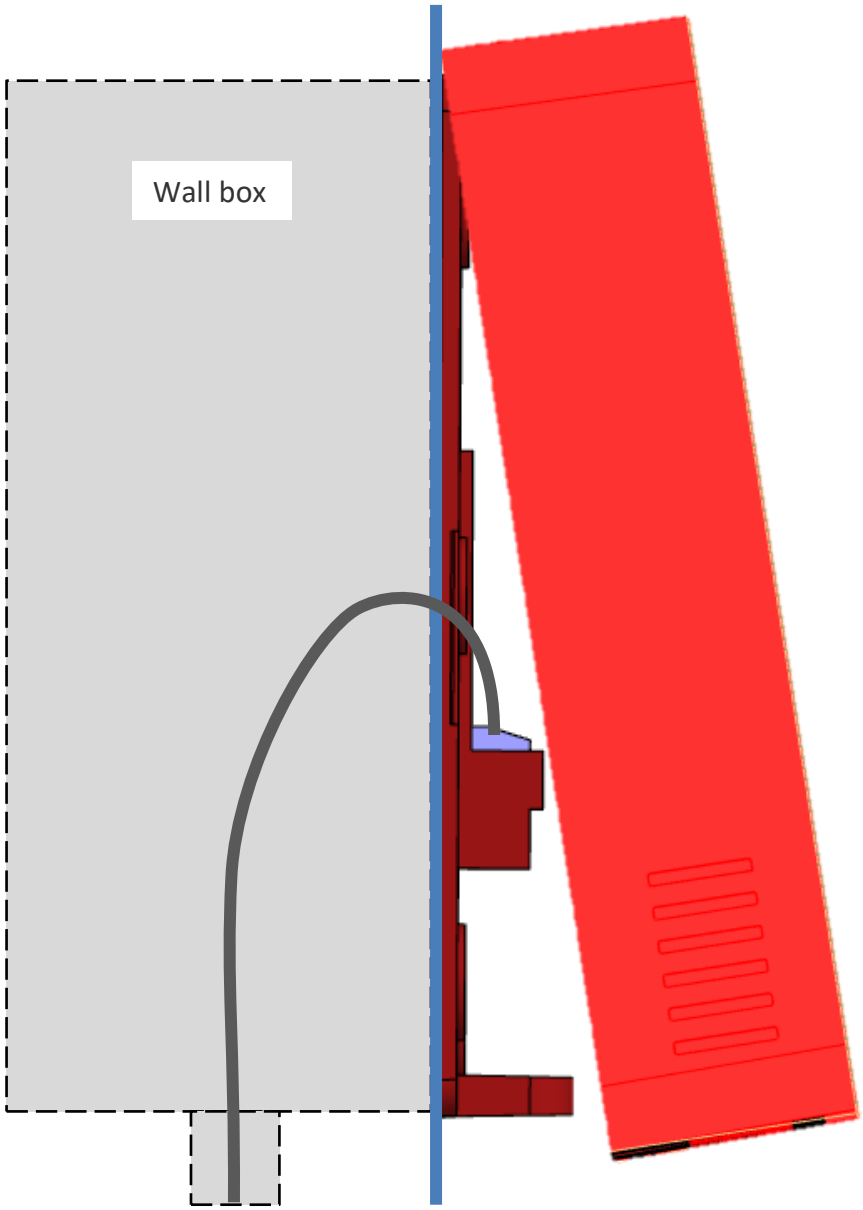


Figure 2-1: HARMONY Mounting to the Wall Plate

2.2.4 Location and Orientation

It is recommended that HARMONY be mounted approximately 1.5 m above the floor on an interior wall. Avoid mounting near heat sources, air vents, windows, or doors, or in locations exposed to direct sunlight.

HARMONY must be mounted in the orientation shown in Figure 2-2.

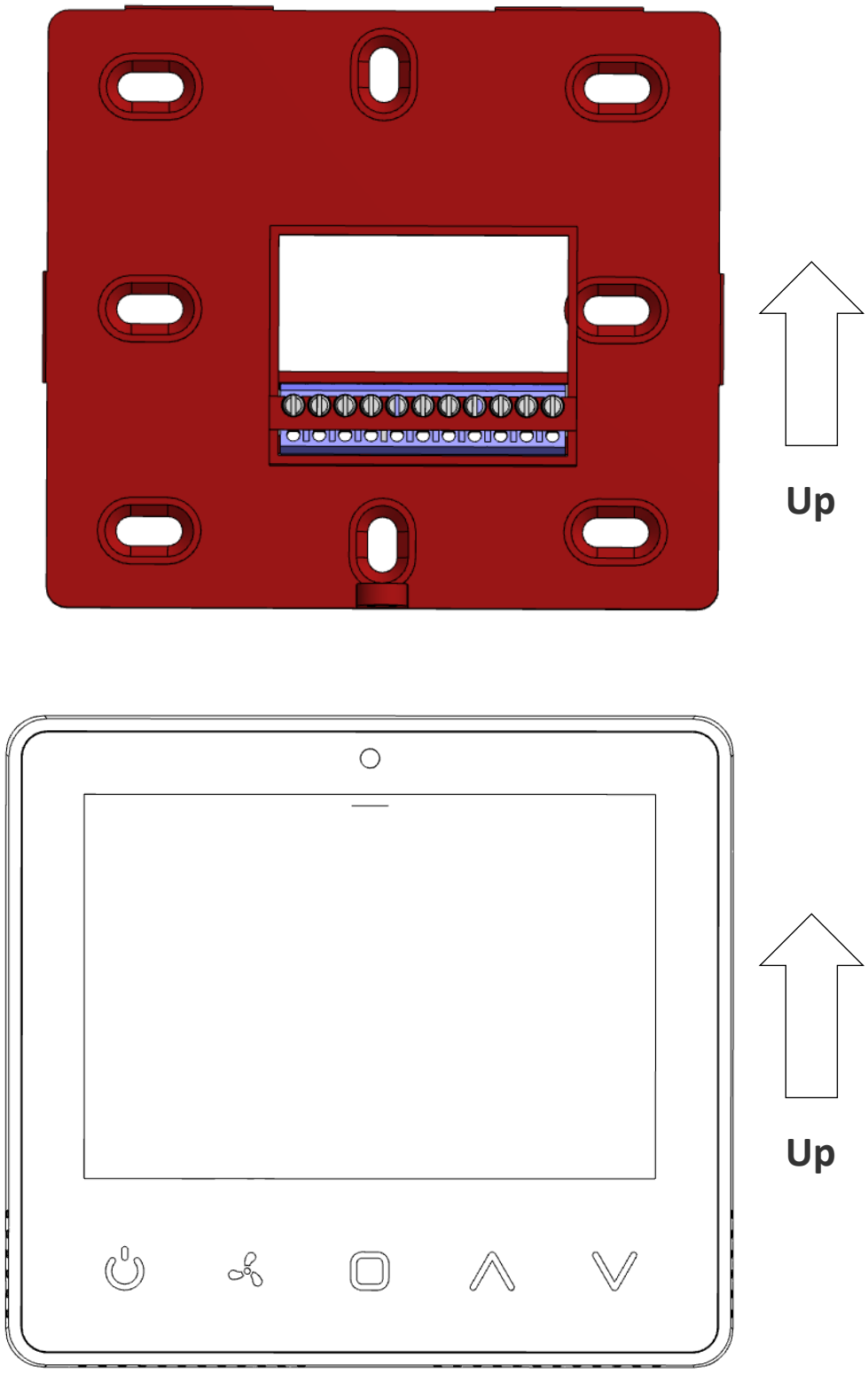


Figure 2-2: Wall Mounting Plate and HARMONY Mounting Orientation

2.3 Electrical Connection

2.3.1 C-Wire

HARMONY is powered by the HVAC equipment's 24 VAC power supply and requires both a 24 VAC power connection (R, RC, or RH) and a common return (C) connection. Contact TEKTELIC if a C wire is not available.

2.3.2 R, RC, RH

The HARMONY thermostat provides separate RC and RH terminals to support systems with either a common or separate heating and cooling power source. For installations where the heating and cooling systems are powered from the same source, the installer shall connect the RC and RH terminals together and connect the system R (or RC or RH) wire to the appropriate power terminal. For installations having separate RC and RH power sources, the RC and RH terminals shall remain electrically isolated. The W1 and W2 terminals are powered from the RH supply, while the remaining controlled terminals are powered from the RC supply and referenced to the C terminal.

2.3.3 Wire Termination

HARMONY is designed with a terminal block which serves as the interface for external electrical connections.

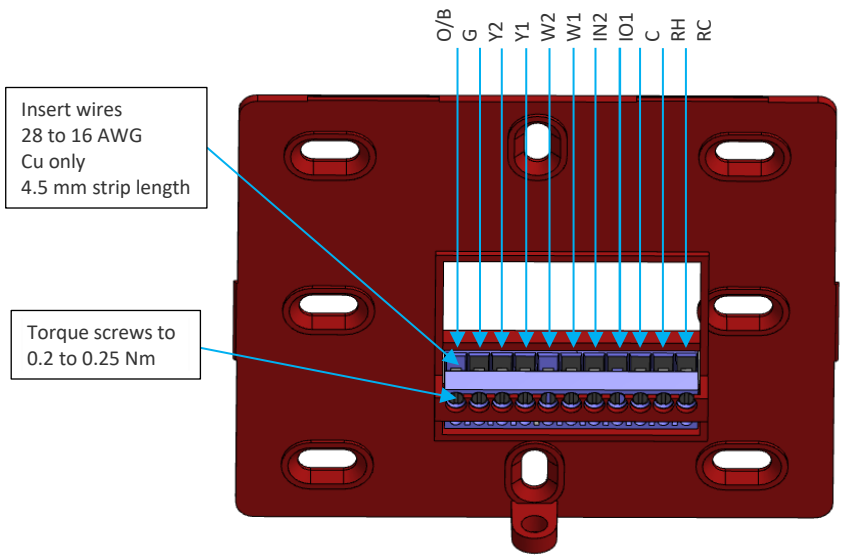


Figure 2-3: Wall Mounting Plate and Terminal Block Connections

The following table provides a general description of the terminal functions.

Terminal	Description	Notes
RC	Cooling system 24 VAC power supply	Thermostat module is always powered from RC and C Y1, Y1, G, & O/B are always powered from RC When powered from the same source, RC and RH must be externally connected by the installer
RH	Heating system 24 VAC power supply	W1 & W2 are powered from RH When powered from separate sources, RC and RH must remain electrically isolated
C	Power return common	Return for thermostat module power
W1	Heat stage 1	
W2	Heat stage 2	Reassigned for some systems
Y1	Cool stage 1	
Y2	Cool stage 2	Reassigned for some systems
G	Fan	
O/B	Heat pump reversing valve	O – reverse valve for cooling, B – reverse valve for heating Reassigned for some systems

2.3.4 System Connection Examples

Some connection examples are illustrated in the following diagrams. Many more options are available upon request.

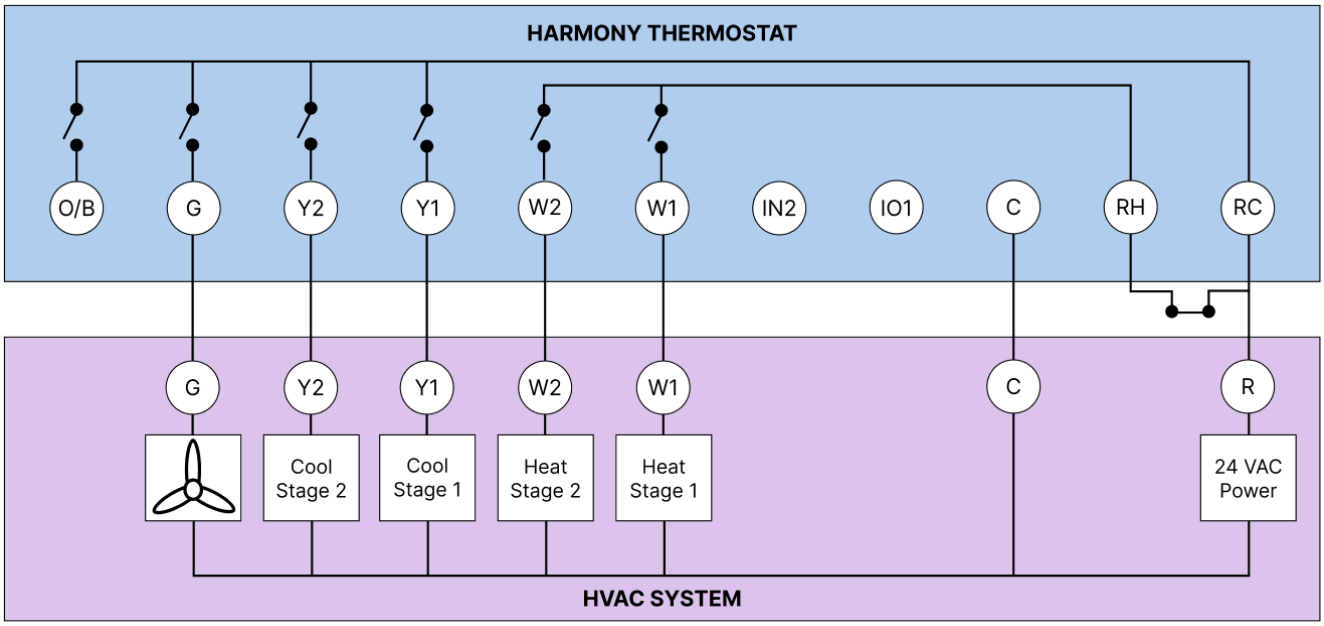


Figure 2-4: Up to Two Stage Conventional Heating & Cooling System

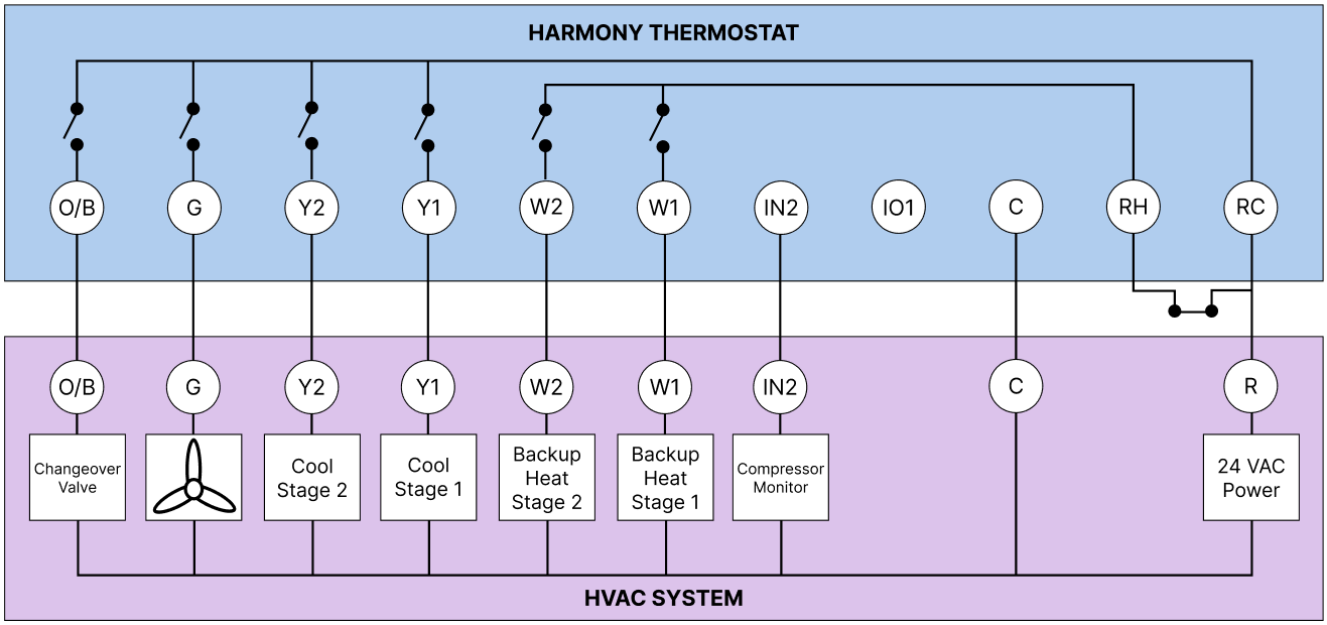


Figure 2-5: Up to Two Stage Heat Pump System

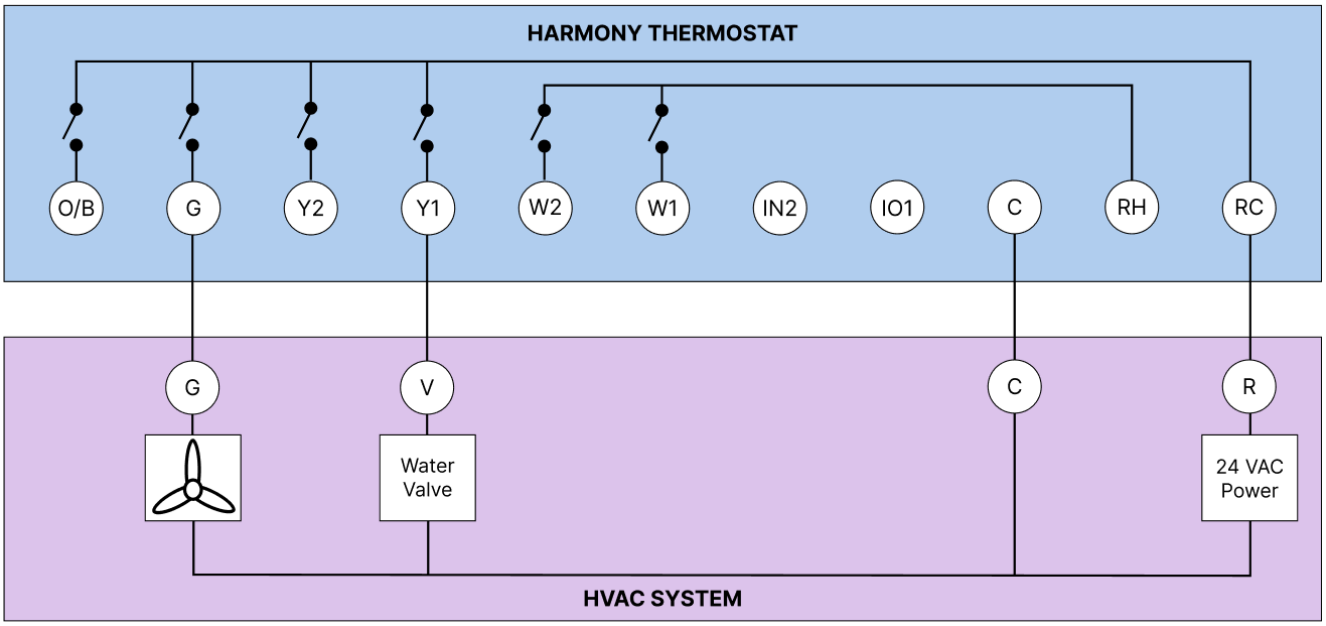


Figure 2-6: Two-Pipe Fan Coil System

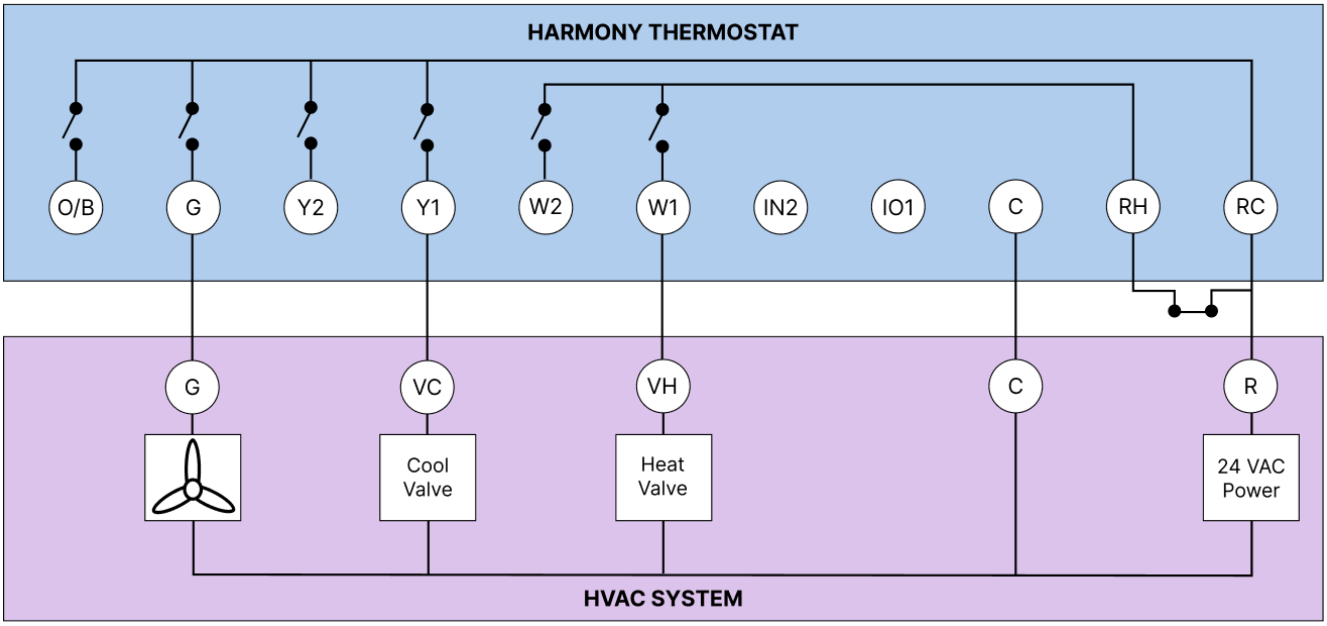


Figure 2-7: Four-Pipe Fan Coil System

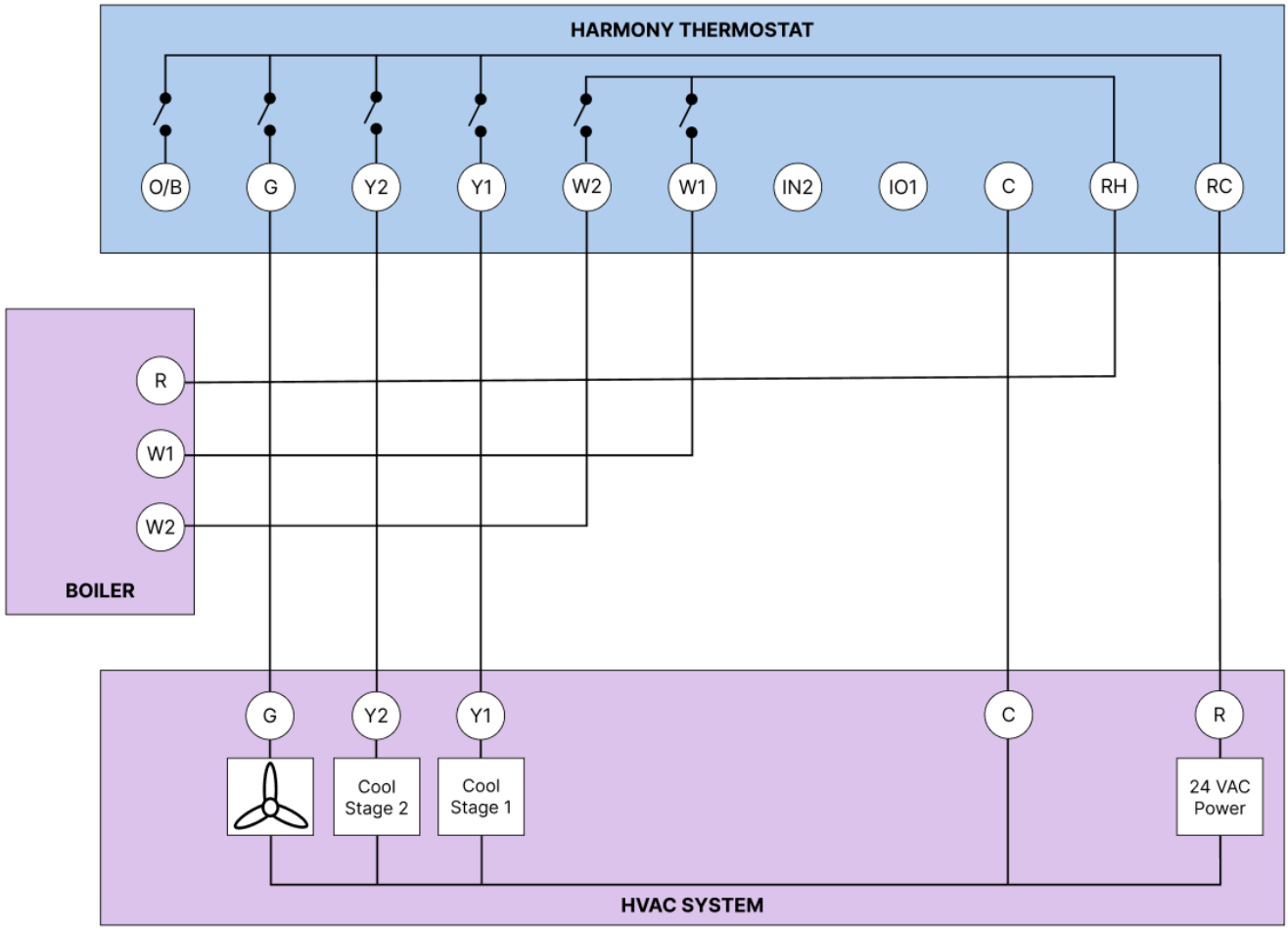


Figure 2-8: Combined Boiler System

3 Using HARMONY

HARMONY is equipped with five buttons that allow the user to interact with the display and control thermostat functions. Figure 3-1 and Figure 3-2 identify the LCD display elements and button functions.

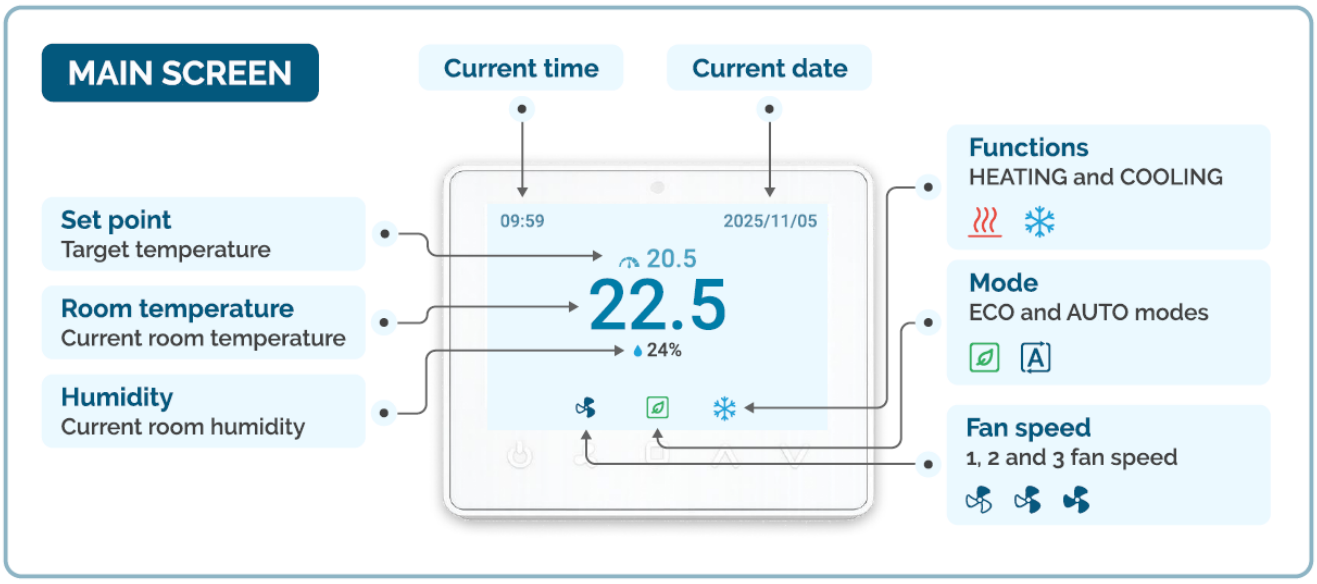


Figure 3-1: HARMONY Home Screen Elements

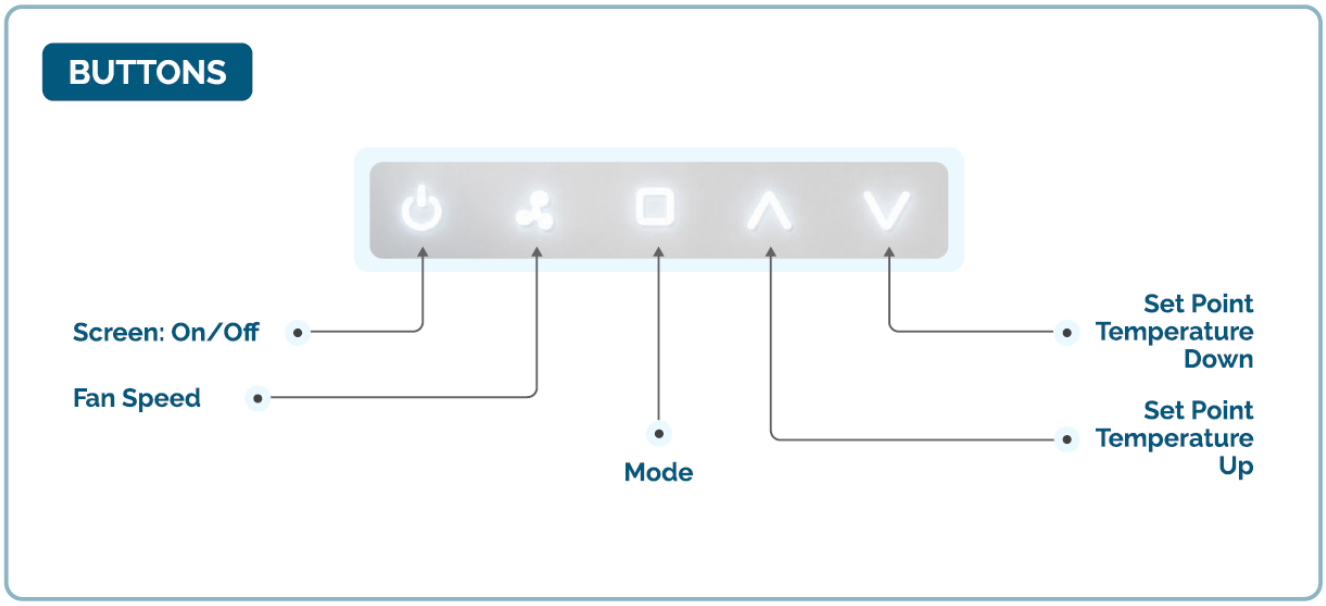


Figure 3-2: HARMONY Button Functions

3.1 Home Screen

The home screen displays the essential information; date, time, current temperature, humidity, temperature setpoint, mode, and fan speed as illustrated in Figure 3-3.



Figure 3-3: Home Screen

3.2 Powering the HARMONY Display

Press the power button to turn the HARMONY display and button backlight on or off.

The HARMONY display and button backlight will turn off automatically after 2 minutes of inactivity. Press the power button to reawaken the display.

Note: Turning the display off does **not** disable the thermostat or the HVAC system. HARMONY will continue to operate normally and maintain the configured temperature settings.

3.3 Adjusting Fan Speed

To adjust the fan operation, press the Fan button on HARMONY.

The available fan settings depend on the type of fan connected to HARMONY.

ECM Fan

For an ECM fan with speed control, the fan speed is shown by a fan icon with up to three blades displayed on the screen:

- 0 blades filled → Fan Off
- 1 blade filled → Low speed
- 2 blades filled → Medium speed

- 3 blades filled → High speed

Each press of the Fan button cycles through the available speeds in the following order:

Off → Low → Medium → High → Off

Single-Speed Fan

For a single-speed fan, the Fan button switches the fan between Off and On. Variable fan speed selection is not available.

Note: These fan settings apply when the system is idle (no heating or cooling is active).

Refer to Figure 3-1 for the corresponding fan icon displayed on HARMONY.

3.4 Selecting Mode

To toggle HARMONY's mode of operation, press the center square button. The available modes are Auto and Eco.

These modes determine the allowable temperature range around the setpoint. Auto mode maintains the temperature more closely, while Eco mode allows a wider range to help reduce energy consumption.

Auto mode is indicated by a combined heating/cooling icon on the display. Eco mode is indicated by a leaf icon.

In either mode, HARMONY will apply heating or cooling according to the over-the-air (OTA) configuration, which determines whether heating, cooling, or both are available.

Refer to Figure 3-1 for the corresponding mode icons displayed on HARMONY.

3.5 Changing Temperature

To change the temperature setpoint, press the up or down arrow buttons on HARMONY.

Each press adjusts the setpoint by 0.5 °C (default) or 1 °F, depending on the configured temperature units. The updated setpoint is shown near the top of the display.

4 Sensor Information

HARMONY includes several sensors that monitor indoor environmental conditions. These measurements help maintain comfort, improve energy efficiency, and provide information about indoor air quality.

4.1 Temperature Sensor

The temperature sensor measures the ambient air temperature in the room where HARMONY is installed.

This measurement is used by HARMONY to determine when heating or cooling should be activated in order to maintain the user-defined temperature setpoint.

Temperature measurement accuracy depends on proper installation. Refer to Sections 2.2.4 and 5.2 for installation and operating recommendations.

4.2 CO_2 Sensor

The CO_2 sensor measures the concentration of carbon dioxide in the indoor air, expressed in parts per million (ppm).

CO_2 levels can indicate how well a space is ventilated. Higher CO_2 levels may occur in occupied rooms with limited fresh air.

Table 4-1: Typical Indoor CO2 Ranges

CO2 Level	Air Quality
400-800 ppm	Excellent
800-1000 ppm	Good
1000-1500	Moderate
> 1500 ppm	Poor Ventilation

This information may be used by building systems to monitor indoor air quality or adjust ventilation.

4.3 Humidity Sensor

The humidity sensor measures the relative humidity (RH) of the indoor air.

Relative humidity indicates the amount of moisture in the air relative to the maximum moisture the air can hold at that temperature.

Table 4-2: Typical Comfort Ranges

Relative Humidity	Comfort Level
30-50%	Ideal indoor comfort

<30%	Air may feel dry
>60%	Air may feel humid and may promote mold growth

Maintaining proper humidity levels can improve comfort, health, and building efficiency.

4.4 Light Sensor

The light sensor measures the ambient light level near HARMONY.

This sensor can be used to:

- Detect day or night conditions
- Detect lights turned on/off in the room
- Adjust display brightness
- Support energy-saving or occupancy-based building controls

Light levels are detected automatically and do not require user adjustment.

5 Maintenance

HARMONY requires minimal maintenance to ensure reliable operation.

5.1 Cleaning

To clean HARMONY:

- Use a soft, dry cloth to wipe the display and outer surface.
- If necessary, slightly dampen the cloth with water.

Do not use:

- Chemical cleaners
- Abrasive materials
- Excess moisture

These may damage the display or enclosure.

5.2 Operating Environment

For optimal sensing performance, ensure HARMONY:

- Is not exposed to direct sunlight.
- Is not subject to direct airflow from air vents or drafts.
- Is not obstructed by furniture, curtains, or other objects that may restrict airflow around the device.

These conditions can affect the accuracy of the temperature and humidity measurements.

5.3 Software Updates

HARMONY may receive over-the-air (OTA) updates from the building management system. These updates may improve system performance, reliability, or functionality. No user action is required during these updates.

5.4 Service

HARMONY contains no user-serviceable components. If the device is not functioning correctly, contact TEKTELIC or your authorized service provider for assistance.

6 Troubleshooting

The table below lists common issues that may occur during normal operation and possible solutions.

Table 6-1 Troubleshooting Guide

Issue	Possible Cause	Solution
Display is off	Display has been turned off using the power button or turned off due to inactivity	Press the power button to turn the display back on
Temperature does not change after adjusting setpoint	HVAC systems may not have activated yet	Allow time for the system to respond to the new setpoint
Fan does not turn on when selected	Fan settings apply only when the system is idle	This behavior is normal depending on the HVAC configuration
Temperature reading seems inaccurate	Thermostat exposed to drafts, sunlight or heat sources	Ensure thermostat is installed away from vents, windows, and direct sunlight
Thermostat is not responding to button presses	Temporary system issue	Wait a few seconds and try again. If the issue persists, contact TEKTELIC or your authorized service provider for assistance
HVAC system is still running when display is turned off	Display power button does not control HVAC operation	This is normal. The power button only controls the display and backlight

If the issue persists after following the steps above, contact TEKTELIC or your authorized service provider for assistance.

7 Compliance and Certifications

This section is preliminary and subject to update pending completion of certification testing.

HARMONY is designed to comply with applicable regulatory and safety standards. Certification and compliance testing are planned for future product releases.

The following certifications are expected to be pursued:

- **FCC (Federal Communications Commission)** – United States
- **IC / ISED (Innovation, Science and Economic Development Canada)** – Canada
- **CSA E60730-1 and CSA E60730-2-9** – Canadian safety requirements
- **UL 60730-1 and UL 60730-2-9** – United States safety requirements
- **RoHS (Restriction of Hazardous Substances)** – Environmental compliance

These certifications ensure the device meets requirements related to electromagnetic compatibility (EMC), radio operation, safety, and environmental standards.

Compliance information, certification identifiers, and regulatory statements will be added to this document once testing and certification are completed.