

HomeWorks Palladiom HVAC Solution

Add a Palladiom HVAC solution to a HomeWorks system for convenient and aesthetically pleasing control of temperature and for intuitive heating and cooling adjustments.

Features

HomeWorks Palladiom Thermostat

- Compatible with HomeWorks systems using either QS or QSX processors.
- Aesthetically coordinates with Palladiom keypads.
- Available in plastic, glass and metal finishes. See **Colors and Finishes** at the end of the document for more information.
- Backlit screen and buttons that include Dynamic Backlight Management (DBM) to automatically adjust backlight intensity based on ambient lighting conditions.
- Ability to support separate heating and cooling equipment on one thermostat.¹
- Displays temperature in Fahrenheit or Celsius.
- Uses Lutron QS link for power and communication with other QS devices.
- Ships with a sealed wallbox for use in new or existing constructions, specifically for hollow walls that may have air movement in the wall cavity.
- IEC SELV/NEC® Class 2 for 24–36 V $\overline{\text{---}}$.

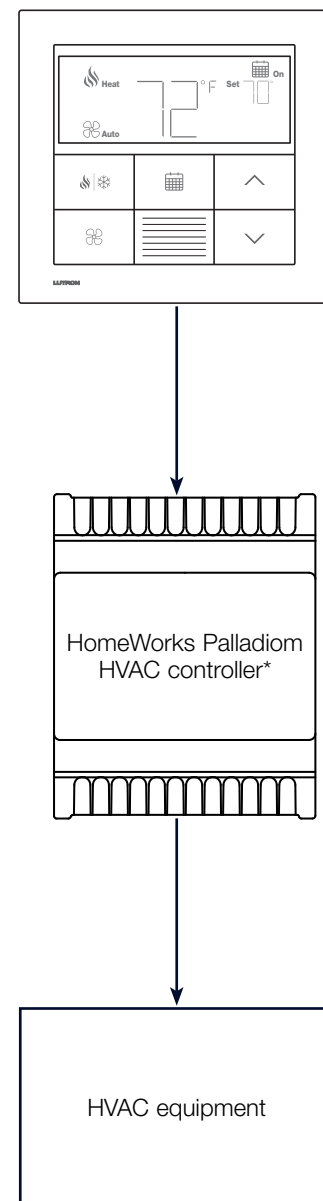
HomeWorks Palladiom HVAC Controller

- Works with most residential HVAC systems.
- Utilizes commonly used control wiring and 24 V from HVAC equipment transformer or other power supply rated 12–24 V \sim 50 / 60 Hz, 24 V $\overline{\text{---}}$, \pm 10%, SELV.
- Supports an optional wired remote temperature sensor to allow for flexibility regarding thermostat installation location. The wired remote temperature sensor is used instead of the internal thermostat sensor.
- Continues operation if communication with the Palladiom thermostat is interrupted (requires wired temperature sensor).

System

- System features programmed in HomeWorks software.
- 7-day programmable schedule.
- Schedule events based on time of day or astronomic time.
- Local hold button overrides system HVAC schedules.
- Select alternate setpoints to save energy while on vacation.
- Up to 64 HVAC zones per system.
- Up to 4 Palladiom thermostats per zone (one master thermostat and up to three companion thermostats). The master thermostat connects directly to the HVAC controller. Users can adjust setpoints, operating mode and fan mode from any thermostat.²
- Up to 32 Palladiom thermostats per link.
- Palladiom thermostat continues operation if communication with the HomeWorks system is interrupted.
- Ability to lock out local button control via HomeWorks system configuration.
- Dynamic temperature averaging allows up to 4 thermostat sensors and 4 Remote HVAC controller sensors (up to one remote sensor per HVAC Controller) to be average temperature controlled on 1 zone dynamically via preset actions such as timeclock, occupancy or button press.³
- Palladiom thermostat sensor temperature available for third-party integration via Lutron's LEAP API.³

HomeWorks Palladiom thermostat



*For VRV/VRF applications, use the interfaces on page 3.

¹ Available in thermostat version 2.00 or later.

² Available in thermostat version 4.00 or later.

³ Available in thermostat version 3.00 or later.

HomeWorks Palladiom HVAC Solution

Model Numbers

HQWT-T-HW-XXX¹-A – HomeWorks Palladiom thermostat (includes corresponding wallbox and color trim ring kit)

SMC55-RESI-2 – HomeWorks Palladiom HVAC controller (includes wire harness LR-HVAC-WIRE-120)

LR-TEMP-FLSH – Wired flush mount sensor (optional remote temperature sensor)

Compatibility

The HomeWorks Palladiom HVAC controller works with residential HVAC systems including:

- Conventional forced air systems using gas, electric, or oil heat, as well as compressor-based cooling-only as split systems or packaged units.
- Heat pumps with or without auxiliary heat²
- Fan coil units. Connect the controller's fan-speed outputs to a fan motor relay control board. Do not connect the controller directly to fan motors.
- Hydronic or electric underfloor heating³
- Specific VRV/VRF systems (see **VRV/VRF Systems** on page 3). Room temperature will be reported by the VRV/VRF equipment and displayed on the thermostat.
- A combination of one heating system and one cooling system. Example: Radiant floor heating and VRF cooling⁴

Typical System Configurations

Control wiring is done via conventional isolated relays for stage capacity control. Typical system configurations:

Heat/Cool Stages (Relays)

- 1 heat / 1 cool conventional (W_1, Y_1, G)
- 1 heat / 1 cool heat pump (O/B, Y_1, G)²
- 1 heat conventional (with or without fan [G]) (W_1)
- 1 cool conventional (Y_1, G)
- 2 heat / 1 cool heat pump (2 stage compressor, no auxiliary heat) (O/B, Y_1, Y_2, G)²
- 2 heat / 1 cool heat pump (1 stage compressor + 1 auxiliary heat) (O/B, Y_1, Aux, G)²
- 2 heat / 2 cool conventional (W_1, Y_1, Y_2, W_2, G)²
- 2 heat / 1 cool conventional (W_1, Y_1, W_2, G)²
- 1 heat / 2 cool conventional (W_1, Y_1, Y_2, G)²
- 2 heat / 2 cool heat pump (2 stage compressor, no auxiliary heat) (O/B, Y_1, Y_2, G)²
- 3 heat / 2 cool heat pump (2 stage compressor + 1 auxiliary heat) (O/B, Y_1, Y_2, Aux, G)²
- 1 heat / no cool radiant hydronic or electric floor (relay) (W_1)⁵
- 1 heat / no cool radiant hydronic or electric floor (0 – 10 V₌₌₌ proportional)⁵

Fan Coil Units

- 2-pipe, On/Off valve, 3-speed fan with changeover sensor (valve, G_1, G_2, G_3)
- 2-pipe, On/Off valve, 0–10 V₌₌₌ controlled fan with changeover sensor (valve, 0–10 V₌₌₌ fan)
- 2-pipe, 0–10 V₌₌₌ valve, 3-speed fan with changeover sensor (0–10 V₌₌₌ valve, G_1, G_2, G_3)
- 2-pipe, 0–10 V₌₌₌ valve, 0–10 V₌₌₌ controlled fan with changeover sensor (0–10 V₌₌₌ valve, 0–10 V₌₌₌ fan)
- 4-pipe, On/Off valve, 3-speed fan (hot valve, cold valve, G_1, G_2, G_3)
- 4-pipe, On/Off valve, 0–10 V₌₌₌ controlled fan (hot valve, cold valve, 0–10 V₌₌₌ fan)
- 4-pipe, 0–10 V₌₌₌ valve, 3-speed fan (0–10 V₌₌₌ hot valve, 0–10 V₌₌₌ cold valve, G_1, G_2, G_3)
- 4-pipe, 0–10 V₌₌₌ valve, 0–10 V₌₌₌ controlled fan (0–10 V₌₌₌ hot valve, 0–10 V₌₌₌ cold valve, 0–10 V₌₌₌ fan)

¹ "XXX" in the model number represents color/finish code. See **Colors and Finishes** section at the end of the document for more information.

² Included with SMC55-HWQS 7420 or newer and SMC55-RESI version 7302 or newer. The software version of the controller can be found on the top right corner of the unit label.

³ Included in SMC55-HWQS version 7412 or later.

⁴ Available with thermostat version 3.00 or later.

⁵ Included in SMC55-HWQS version 7420 or later.

HomeWorks Palladiom HVAC Solution

VRV/VRF Systems

The HomeWorks Palladiom thermostat can be used to control the VRV/VRF systems listed below. Please contact a Lutron representative for regional availability.

Daikin® VRV Systems

Requires one of these hardware options:

- HomeWorks Palladiom thermostat and CoolAutomation™ CoolPlug interface.¹ See Application Note #650 (048650) at www.lutron.com
 - Daikin® indoor unit requires a P1 / P2 connection.
- HomeWorks Palladiom thermostat and Airzone™ Aidoo Pro interface.¹ See Application Note at www.airzonecontrol.com/na/en/³
- HomeWorks Palladiom thermostat with HomeWorks processor and CoolAutomation™ CoolMasterNet interface.^{1, 2} See Application Note #650 (048650) at www.lutron.com
- HomeWorks Palladiom thermostat with HomeWorks processor and Airzone™ Webserver HUB interface.^{1, 3} See Application Note at www.airzonecontrol.com/na/en/

Mitsubishi® VRF Systems

Requires one of these hardware options:

- HomeWorks Palladiom thermostat and Mitsubishi® Procon A1M interface.¹ See Application Note #585 (048585) at www.lutron.com
 - Mitsubishi® indoor unit requires CN105 connection.
- HomeWorks Palladiom thermostat and Airzone™ Aidoo Pro interface.¹ See Application Note at www.airzonecontrol.com/na/en/³
- HomeWorks Palladiom thermostat with HomeWorks processor and CoolAutomation™ interface.¹ See Application Note #650 (048650) at www.lutron.com
- HomeWorks Palladiom thermostat with HomeWorks Palladiom HVAC controller and Mitsubishi® thermostat controller interface.¹ See Application Note #585 (048585) at www.lutron.com
- HomeWorks Palladiom thermostat with HomeWorks processor and Airzone™ Webserver HUB interface.^{1, 3} See Application Note at www.airzonecontrol.com/na/en/

LG® VRF Systems

Requires one of these hardware options:

- HomeWorks Palladiom thermostat and LG® PDRYCB500 interface.¹ See Application Note #627 (048627) at www.lutron.com
 - Contact LG® engineering for a list of compatible LG® indoor units.
- HomeWorks Palladiom thermostat and Airzone™ Aidoo Pro interface.¹ See Application Note at www.airzonecontrol.com/na/en/³
- HomeWorks Palladiom thermostat with HomeWorks processor and CoolAutomation™ interface.¹ See Application Note #650 (048650) at www.lutron.com
- HomeWorks Palladiom thermostat with HomeWorks Palladiom HVAC controller and LG® thermostat controller interface.¹ See Application Note #627 (048627) at www.lutron.com^{*}
- HomeWorks Palladiom thermostat with HomeWorks processor and Airzone™ Webserver HUB interface.^{1, 3} See Application Note at www.airzonecontrol.com/na/en/

Underfloor Heating Systems with Heatmiser Interface

Requires:

- HomeWorks Palladiom thermostat with HomeWorks processor and Heatmiser interface.¹ See [Heatmiser HVAC Integration with HomeWorks](#) document.

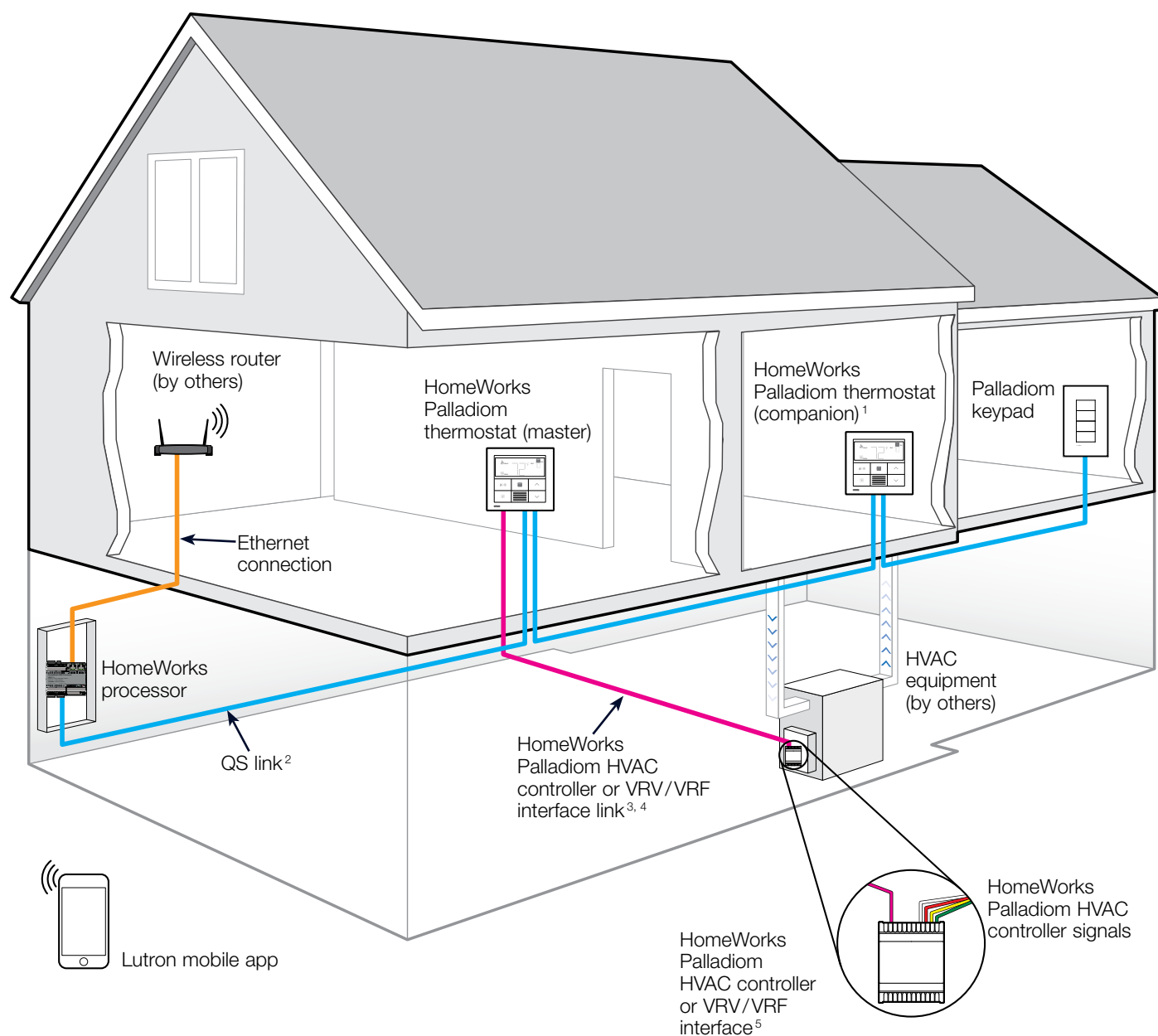
¹ Provided by others.

² For information about additional CoolAutomation™ interfaces, see www.coolautomation.com

³ For information about additional Airzone™ interfaces, see www.airzonecontrol.com/na/en/

HomeWorks Palladiom HVAC Solution

System Diagram



¹ Companion thermostats require a HomeWorks processor and master thermostat.

² For wiring details, see **QS Link** section on page 12.

³ For wiring details, see **HomeWorks Palladiom HVAC Controller Link** section on page 13.

⁴ Link can also be used for direct control of VRV/VRF interfaces (e.g., LG[®], CoolAutomation[™], Airzone[™], Mitsubishi[®]).

⁵ See page 3 for more information when using VRV/VRF interfaces in VRV/VRF systems.

HomeWorks Palladiom HVAC Solution

Technical Specifications

HomeWorks Palladiom Thermostat

Model Number	HQWT-T-HW-XXX*-A
Regulatory Approvals	cULus, FCC Part 15, ICES-003, NOM, CE, UKCA, RoHS.
Operating Voltage	24–36 V \equiv IEC SELV / NEC \circ Class 2 Power provided by QS link power supply.
Typical Power Consumption	10 mA at 24 V \equiv
Maximum Power Consumption	60 mA at 24 V \equiv <i>Test conditions:</i> Backlight on full. 3 Power Draw Units (PDUs). For more information, see Power Draw Units on the QS Link (P/N 369405) at www.lutron.com .
Environment	<i>Ambient operating temperature:</i> 32 °F to 104°F (0 °C to 40 °C) 5% to 90% relative humidity (non-condensing). Indoor use only. IP20 Rating
Communications	Thermostat communicates with the HomeWorks system via 4-wire QS link protocol. It also communicates with the HomeWorks Palladiom HVAC controller and VRV/VRF interfaces via 3-wire HomeWorks Palladiom HVAC controller link.
Room Temperature Sensor	<i>Temperature display range:</i> 32 °F to 99 °F (0 °C to 37 °C) <i>Temperature setpoint range:</i> 50 °F to 90 °F (10 °C to 32 °C) (programmable) <i>Accuracy:</i> At 70 °F: < +/- 1 °F At 25 °C: < +/- 0.5 °C
Power Failure Memory	Should power be interrupted, the thermostat will retain all settings when power is restored.
Mounting	Mount on a clean, dry, interior wall approximately 4 ft to 5 ft (1.2 m to 1.5 m) above the floor. See Mounting section for more information.
Wiring	IEC SELV/NEC \circ Class 2: 24–36 V \equiv 22 AWG (0.5 mm ²) and 18 AWG (0.75 mm ²) solid wiring.
Limited Warranty	www.lutron.com/warranty or call 1.844.LUTRON1 for a printed copy

*“XXX” in the model number represents color/finish code. See **Colors and Finishes** section at the end of the document for more information.

HomeWorks Palladiom HVAC Solution

Technical Specifications (continued)

HomeWorks Palladiom HVAC Controller

Model Number	SMC55-RESI-2
Regulatory Approvals	cULus, FCC Part 15, ICES-003, NOM, CE, UKCA, RoHS.
Operating Voltage	12–24 V~ 50 / 60 Hz, 24 V=, +/- 10%, SELV
Maximum Relay Rating	(5) SPST relays, Normally Open rated for: 2 A at 24 V~/100 V~/120 V~/220 - 240 V~ general purpose 2 FLA/12 LRA at 100 V~/120 V~/220 - 240 V~ motor load For more information, refer to the installation instructions.
Maximum Power Consumption	4 W/6 VA
Environment	<i>Ambient operating temperature:</i> –4 °F to 122 °F (–20 °C to 50 °C) 10% to 90% relative humidity (non-condensing). Indoor use only. IP20 Rating
Communications	HomeWorks Palladiom HVAC controller communicates with the HomeWorks Palladiom thermostat using a 3-wire Modbus protocol.
Power Failure Memory	Should power be interrupted, the HomeWorks Palladiom HVAC controller will retain system configuration settings when power is restored.
Mounting	Preferred for DIN rail mounting in an enclosure. Install and operate this equipment in a listed NEMA Type-1 enclosure or IP20 rated enclosure with conformance to IEC 61439-3 (or equivalent standard). See Mounting section for more information.
Wiring	<i>HomeWorks Palladiom HVAC Controller:</i> LR-HVAC-WIRE-120 required wire harness (included). For relay outputs, use wires at least 20 AWG (0.5 mm ²) with a temperature rating of at least 176 °F (80 °C). Power line and output circuits must be wired and fused in compliance with local and national regulatory requirements for the rated current and voltage of the particular equipment. <i>Wired Flush Mount Sensor:</i> IEC SELV/PELV/NEC® Class 2; 22 AWG (0.5 mm ²) twisted, shielded pair wiring. Maximum wire length is 100 ft (30.5 m).
Limited Warranty	www.lutron.com/warranty or call 1.844.LUTRON1 for a printed copy

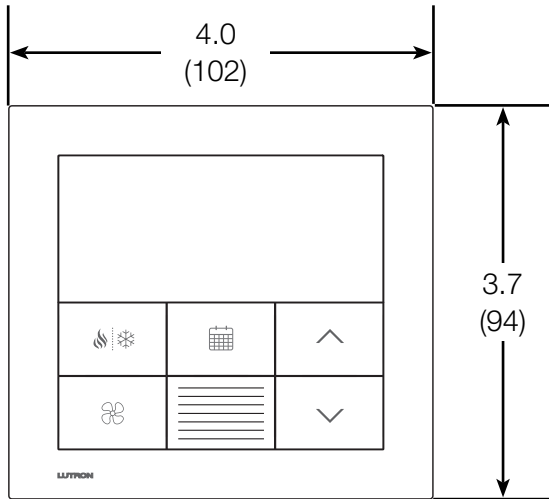
HomeWorks Palladiom HVAC Solution

Dimensions

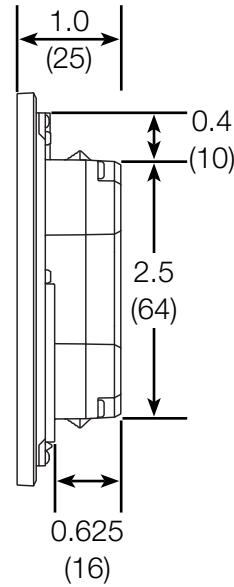
All dimensions shown as: in (mm)

HomeWorks Palladiom Thermostat

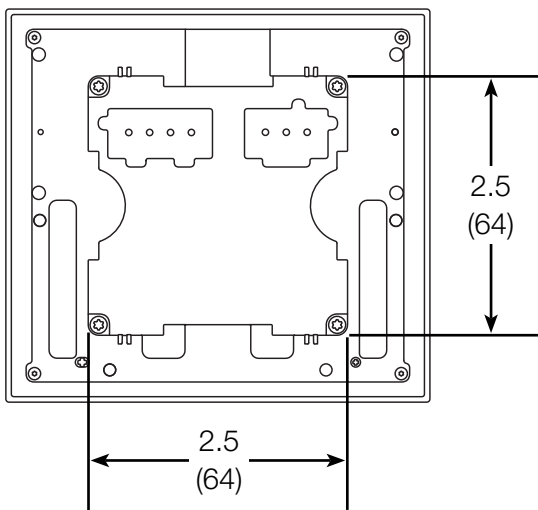
Front View



Side View



Rear View



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HomeWorks Palladiom HVAC Solution

Dimensions (continued)

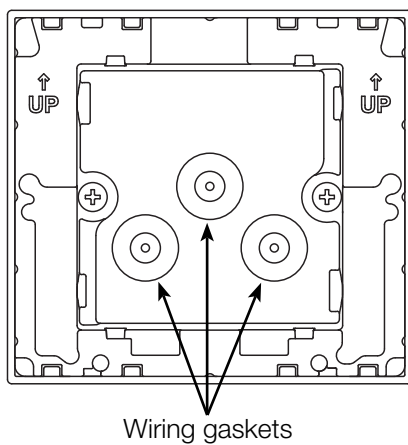
All dimensions shown as: in (mm)

Wallboxes and Wallbox Adapters

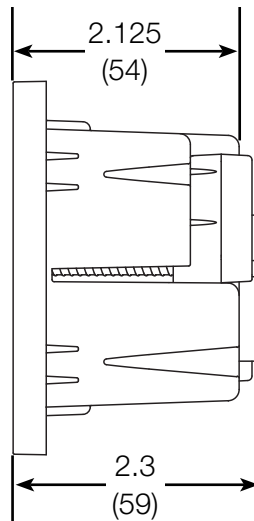
Sealed Wallbox and Color Trim Ring (included)

Both the sealed wallbox and color trim ring are included with the thermostat to be installed unless solid masonry or poured concrete walls are used.

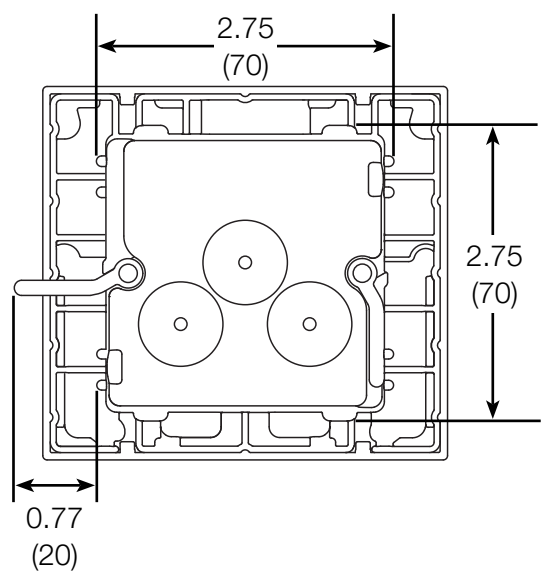
Front View



Side View



Rear View

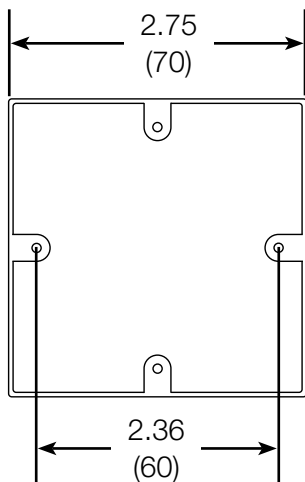


EBB-1-SQ (sold separately) and Corresponding Wallbox Adapter (included)

Square, metal wallbox (sold separately) for use with solid masonry or poured concrete walls with no airflow. Corresponding wallbox adapter included with the thermostat. A pack of 15 wallboxes can be purchased by ordering Lutron model number EBB-15-SQ.

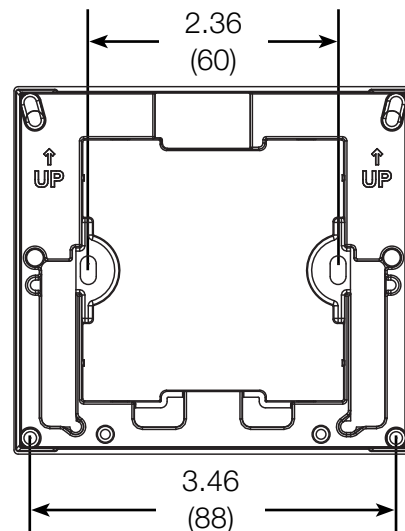
Front View

Wallbox



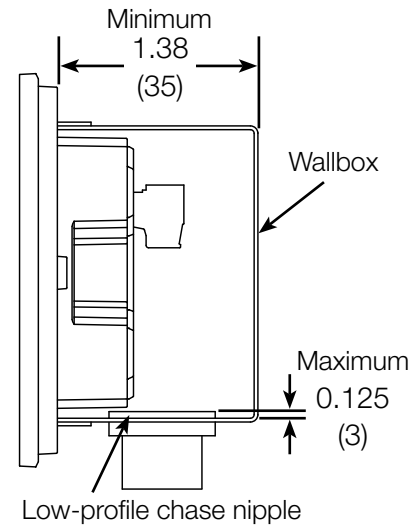
Front View

Adapter



Side View

Thermostat, adapter, and metal wallbox



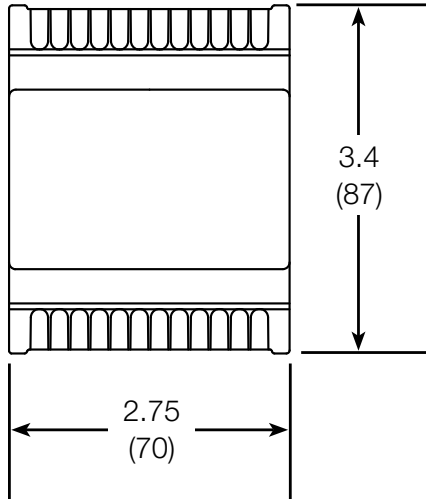
HomeWorks Palladiom HVAC Solution

Dimensions (continued)

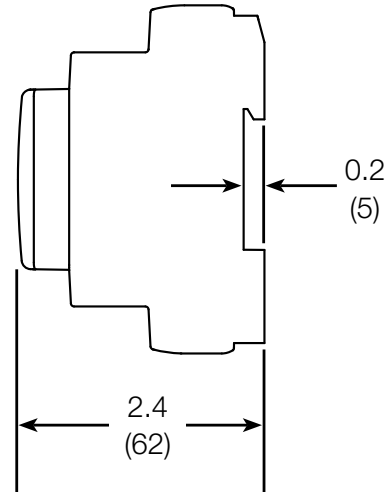
All dimensions shown as: in (mm)

HomeWorks Palladiom HVAC Controller

Front View



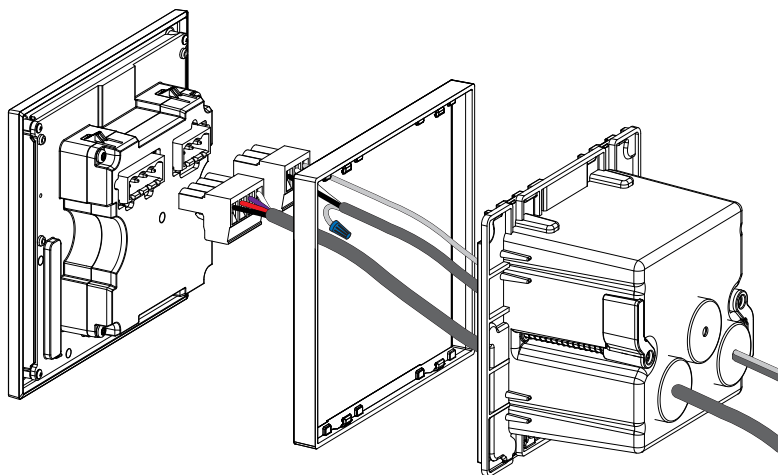
Side View



HomeWorks Palladiom HVAC Solution

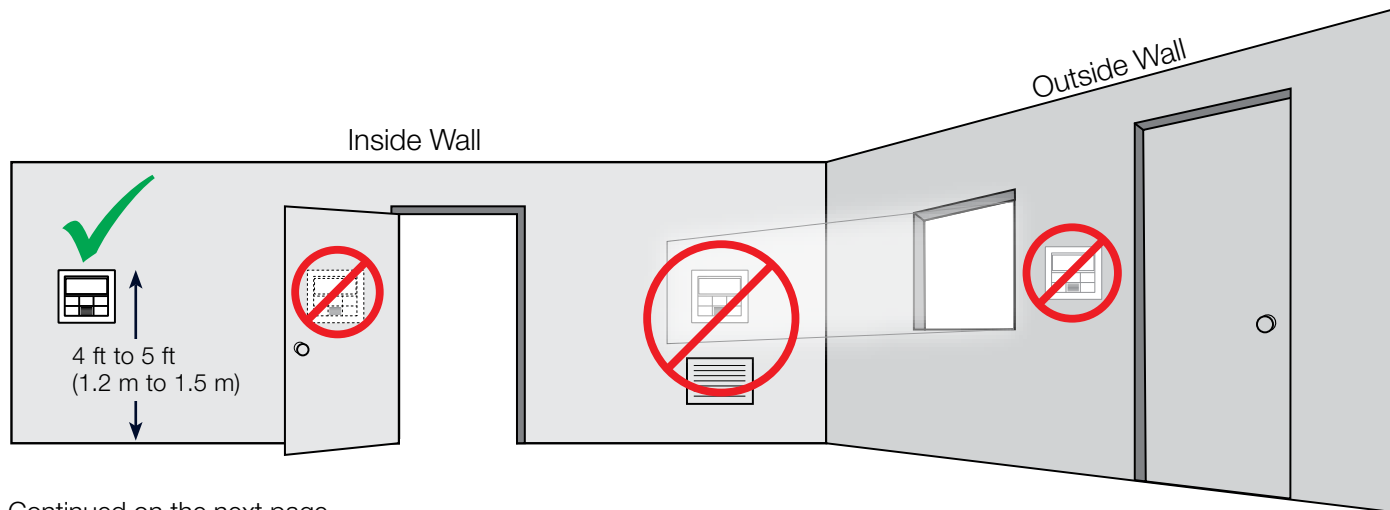
Mounting

HomeWorks Palladiom Thermostat



- Mount on a clean, dry, interior wall.
- Mount approximately 4 ft to 5 ft (1.2 m to 1.5 m) above the floor. Follow all local and national codes.
- Mount on a wall without pipes, chimneys, or ducts.
- Mount on a wall with good visibility and control access.
- Do not mount on an exterior wall, close to a window, next to a door, or areas with drafts.
- Do not mount in direct airflow from supply and return registers/grilles.
- Do not expose to water (e.g., drips or splashes) or mount in a damp area.
- Do not mount within 4 ft (1.2 m) of heating sources (e.g., direct sunlight, light bulbs, etc.).
- Do not mount in areas with poor circulation (e.g., niches, alcoves, behind curtains, or behind doors).
- Do not mount within 0.75 in (19 mm) of Palladiom keypads.

Note: If it is not possible to follow these guidelines, the use of an indoor remote temperature sensor is recommended. For more information, see **Remote Temperature Sensor** section on page 29.



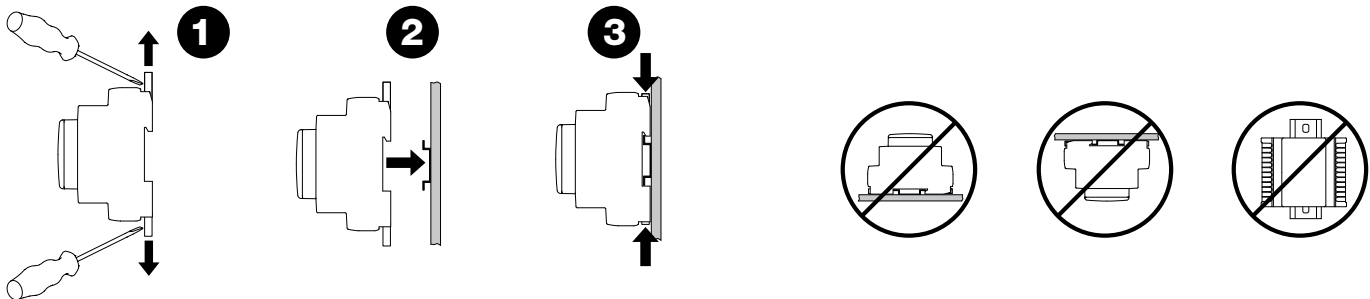
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HomeWorks Palladiom HVAC Solution

Mounting (continued)

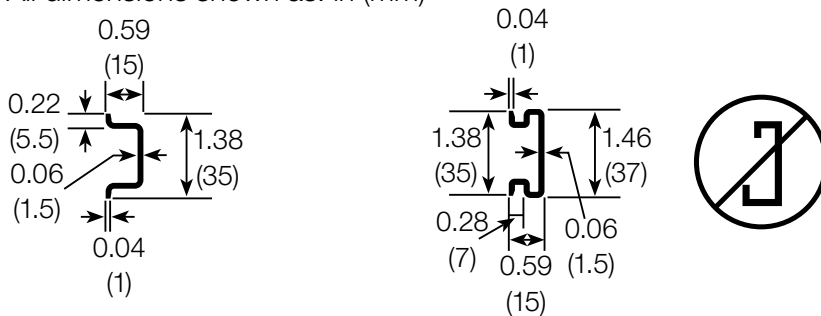
HomeWorks Palladiom HVAC Controller

The HomeWorks Palladiom HVAC controller must be installed in a listed NEMA Type-1 enclosure or IP20 rated enclosure with conformance to IEC 61439-3 (or equivalent standard). Enclosure must meet the minimum clearance requirements. Enclosure should be secured by a keyed or tooled locking mechanism. All pertinent state, regional, and local safety regulations must be observed when installing and using this product. Use metal enclosures to improve the electromagnetic immunity of the controller system. The preferred installation is DIN rail mounting and requires a 4 DIN wide mounting location. For DIN rail installation, follow the steps below:



Acceptable DIN Rail Dimensions

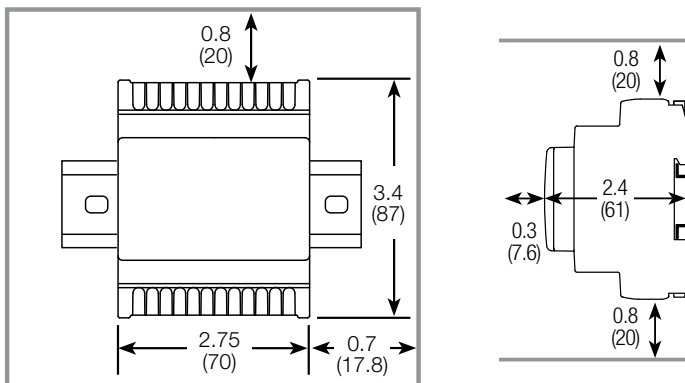
All dimensions shown as: in (mm)



Minimum Clearances

The HVAC controller must be installed in an enclosure with the clearances shown below.

All dimensions shown as: in (mm)



Note: Multiple HomeWorks Palladiom HVAC controllers can be mounted next to each other.

Customer Assistance:
1.844.LUTRON1 (U.S.A./Canada)
+44.(0)20.7680.4481 (Europe)

HomeWorks Palladiom HVAC Solution

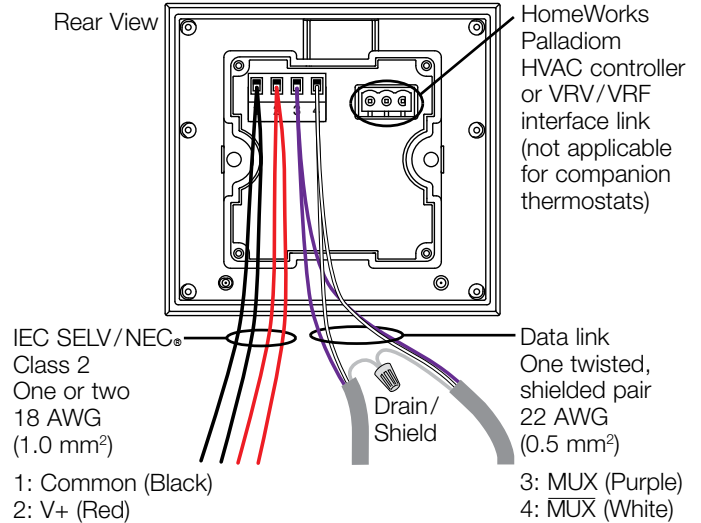
Wiring

QS Link

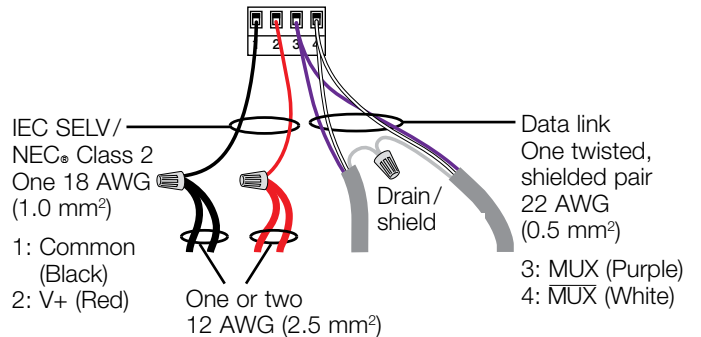
- Use IEC SELV/NEC® Class 2 (24–36 V_{AC}) wiring to connect the thermostat to the QS link for power and communication.
- Connect two 22 AWG (0.5 mm²) shielded, twisted pair wires to terminals 3 and 4. Shielding (drain) of the twisted pair wires must be connected together as shown, but do not connect the shielding to earth/ground or the thermostat and do not allow it to contact the grounded wallbox.
- Connect the appropriate size wires to terminals 1 and 2 for power, according to your link length (see table below).
- Connect Drain/Shield as shown. Do not connect to Ground (Earth) or the thermostat. Connect the bare drain wires and cut off the outside shield.

Note: Use appropriate wire connecting devices as specified by local codes.

Link Wiring < 500 ft (153 m)



Link Wiring 500 ft to 2000 ft (153 m to 610 m)



QS Link Wire Sizes (check compatibility in your area)

QS Link Wiring Length	Wire Gauge	Lutron Cable Part Number
< 500 ft (153 m)	Power (terminals 1 and 2) 1 pair 18 AWG (1.0 mm ²)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm ²)	
500 ft to 2000 ft (153 m to 610 m)	Power (terminals 1 and 2) 1 pair 12 AWG (4.0 mm ²) <i>This will not fit in terminal. Connect as shown above.</i>	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm ²)	

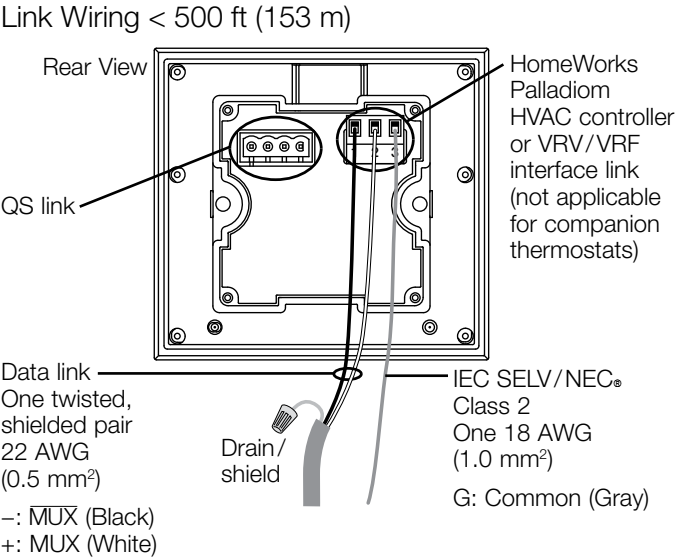
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HomeWorks Palladiom HVAC Solution

Wiring (continued)

HomeWorks Palladiom HVAC controller link

- The HomeWorks Palladiom HVAC controller comes with a 3-wire harness in the LR-HVAC-WIRE-120 package. This is to be used on the HomeWorks Palladiom HVAC controller link to the thermostat.
- The 3-wire harness can be extended up to 500 ft (153 m) using one 18 AWG (1.0 mm²) and 1 pair 22 AWG (0.5 mm²) twisted, shielded wire. See table below and diagrams to right.
- Do not connect the drain/shield wire to earth/ground or to the thermostat and do not allow it to contact the grounded wallbox



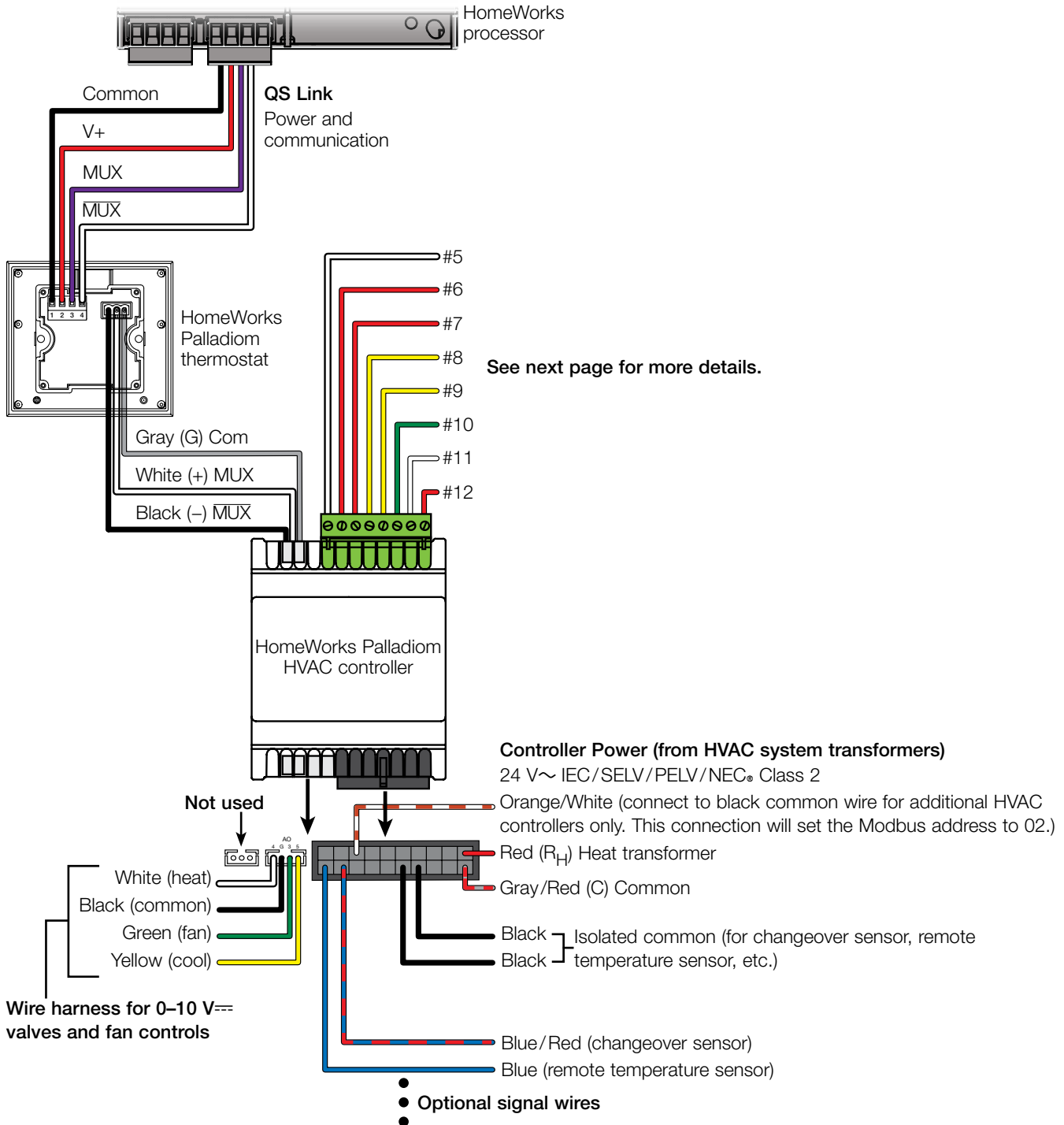
HomeWorks Palladiom HVAC Controller Link Wire Sizes (check compatibility in your area)

HomeWorks Palladiom HVAC Controller Link Wiring Length	Wire Gauge	Lutron Cable Part Number
< 500 ft (153 m)	Power (COM [G]) One 18 AWG (1.0 mm²)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (MUX and MUX) One twisted, shielded pair 22 AWG (0.5 mm²)	

HomeWorks Palladiom HVAC Solution

Wiring (continued)

HomeWorks Palladiom HVAC controller link (continued)



Note: Wire harnesses can be extended using 18 AWG or 22 AWG (1.0 mm² or 0.5 mm²) wire. Use twisted pair, shielded cables to extend analog I/O and HomeWorks Palladiom HVAC controller links. See previous page.

Note: All terminal blocks are removable.

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1.844.LUTRON1 (U.S.A./Canada)
+44.(0)20.7680.4481 (Europe)

HomeWorks Palladiom HVAC Solution

Wiring (continued)

HomeWorks Palladiom HVAC controller link (continued)

Relay Terminals SPST (NO) 2 A at 24 V~/100 V~/120 V~/220-240 V~ general purpose SPST (NO) 2FLA/12LRA 100 V~/120 V~/220-240 V~				
Terminal	Conventional	Heat Pump*	Fan Coil Unit	Radiant Floor
#5	Heat stage 1 (W_1)	Changeover heat pump valve (O/B)	Hot valve (H_{VALVE})	Hot valve (H_{VALVE})
#6	Heating stage 1 transformer (R_H)	Heating transformer (R_H)	Heat valve transformer (R_H) or Valve transformer (R)	Heat valve transformer (R_H)
#7	Cooling/compressor transformer (R_C)	Cooling transformer (R_C)	Fan transformer (R_{FAN})	–
#8	Compressor stage 1 (Y_1)	Compressor stage 1 (Y_1)	Fan high (G_3) [‡]	–
#9	Compressor stage 2 (Y_2) [*]	Compressor stage 2 (Y_2)	Fan medium (G_2) [‡]	–
#10	Fan (G) [‡]	Fan (G) [‡]	Fan low (G_1) [‡]	–
#11	Heat stage 2 (W_2) [*]	Auxiliary heat (AUX)	Cold valve (C_{VALVE})	–
#12	Heating stage 2 transformer (R_{H2}) [*]	Auxiliary heat transformer (R_{AUX})	Cold valve transformer (R_C)	–

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HomeWorks Palladiom HVAC Solution

Wiring (continued)







Signal Wiring Guide


Terminal	Description
W ₁	1 st stage heat relay
O/B	Changeover valve relay for heat pumps
H _{VALVE}	Hot valve for 4-pipe fan coil units
R _H	Heating power—Connect to secondary side of heating system transformer ¹
R	Valve transformer
R _C	Cooling/compressor power—Connect to secondary side of cooling system transformer ²
R _{FAN}	Fan transformer
Y ₁	1 st stage compressor relay
Y ₂	2 nd stage compressor relay
G (G ₃ , G ₂ , G ₁)	Fan relay (fan high, fan medium, and fan low for fan coil units) ³
W ₂	2 nd stage heat relay
AUX	Auxiliary heat relay
C _{VALVE}	Cold valve for 4-pipe fan coil units
R _{H2}	2 nd stage heat power—Connect to secondary side of second heating system transformer
R _{AUX}	Auxiliary heat power—Connect to secondary side of auxiliary system transformer
Valve	Single valve control for 2-pipe fan coil units
C	Required common wire from secondary side of transformer

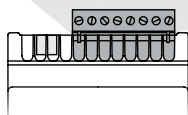
¹ Changeover valve transformer for heat pump systems. Heat stage 1 transformer for conventional systems.

² Compressor and fan transformer.

³ Do not connect the controller directly to fan motors. Connect the controller's fan-speed outputs to a fan motor relay control board.

		Cable Type					
							
Wire Size	AWG	24 to 14	22 to 14	2 x 24 to 18	2 x 24 to 16	2 x 22 to 18	2 x 20 to 16
	mm ²	0.2 to 2.5	0.25 to 2.5	2 x 0.2 to 1.0	2 x 0.2 to 1.5	2 x 0.25 to 1.0	2 x 0.5 to 1.5

 4.4 to 5.3 in-lb
(0.5 to 0.6 N•m)



Customer Assistance:
 1.844.LUTRON1 (U.S.A./Canada)
 +44.(0)20.7680.4481 (Europe)

HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams

Heat Pump Systems

Diagram 1: 1 heat stage/1 cool stage heat pump (1 compressor stage, no auxiliary heat)

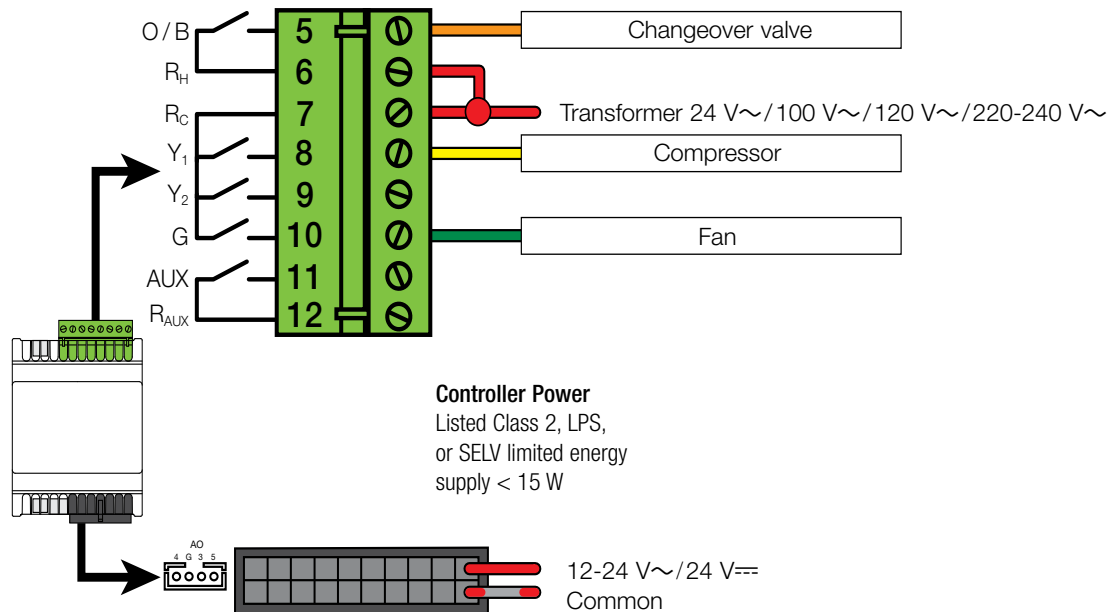
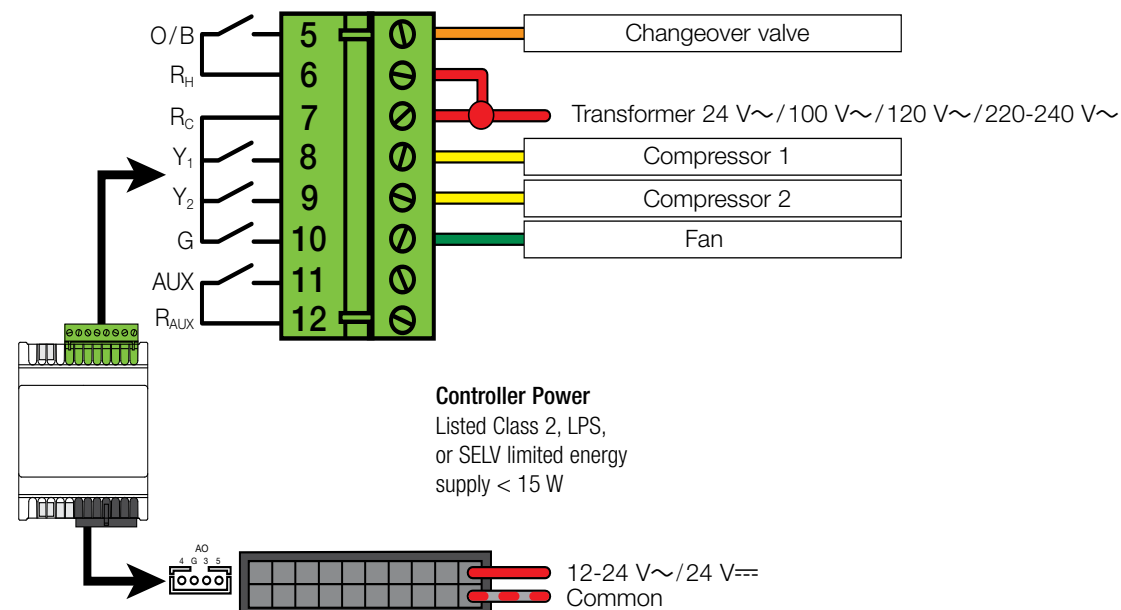


Diagram 2: 2 heat stages/2 cool stages heat pump (2 compressor stages, no auxiliary heat)



Continued on the next page...

HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Heat Pump Systems (continued)

Diagram 3: 2 heat stages/1 cool stage heat pump (1 compressor stage, 1 auxiliary heat)

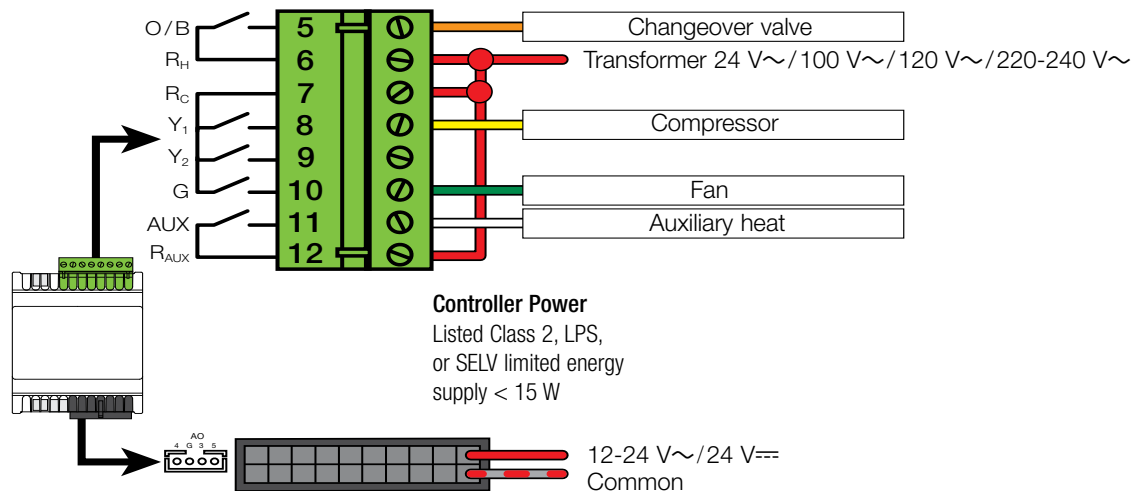
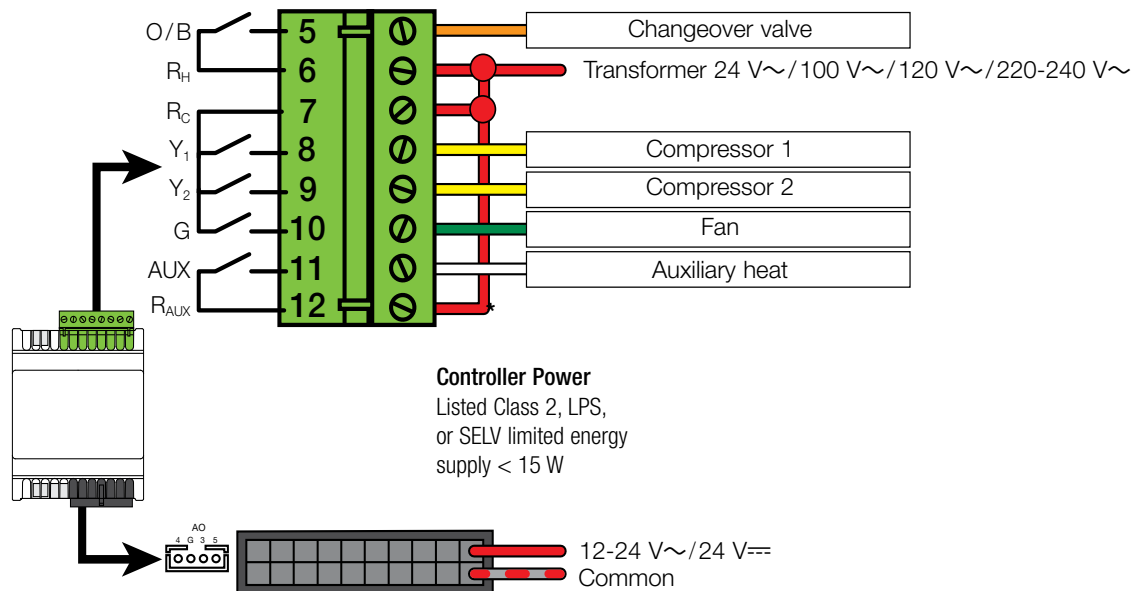


Diagram 4: 3 heat stages/2 cool stages heat pump (2 compressor stages, 1 auxiliary heat)



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HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Conventional Systems

Diagram 5: 1 heat stage/1 cool stage system (1 transformer)

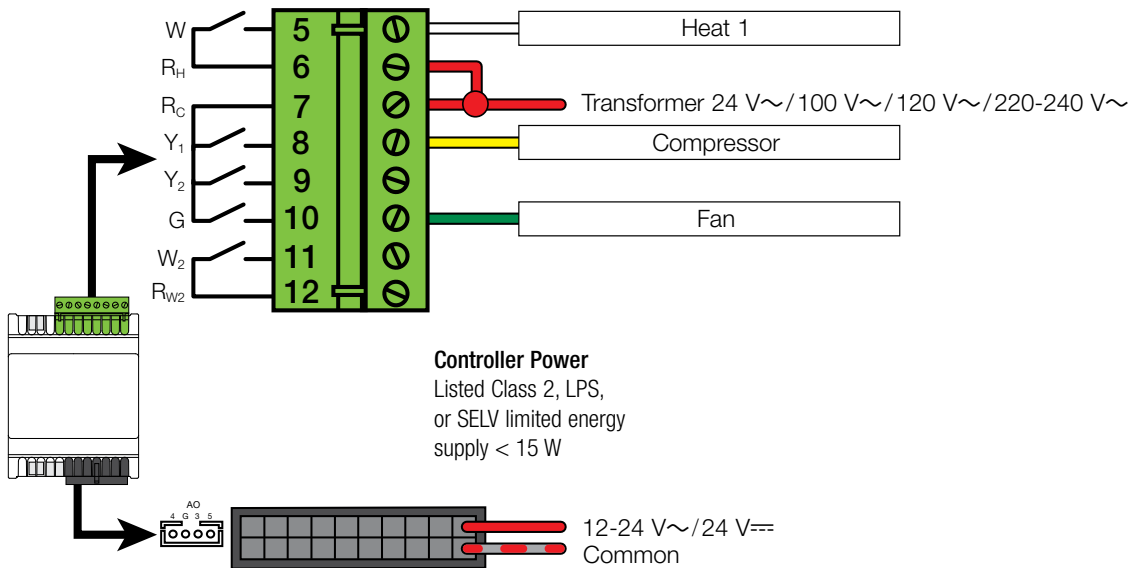
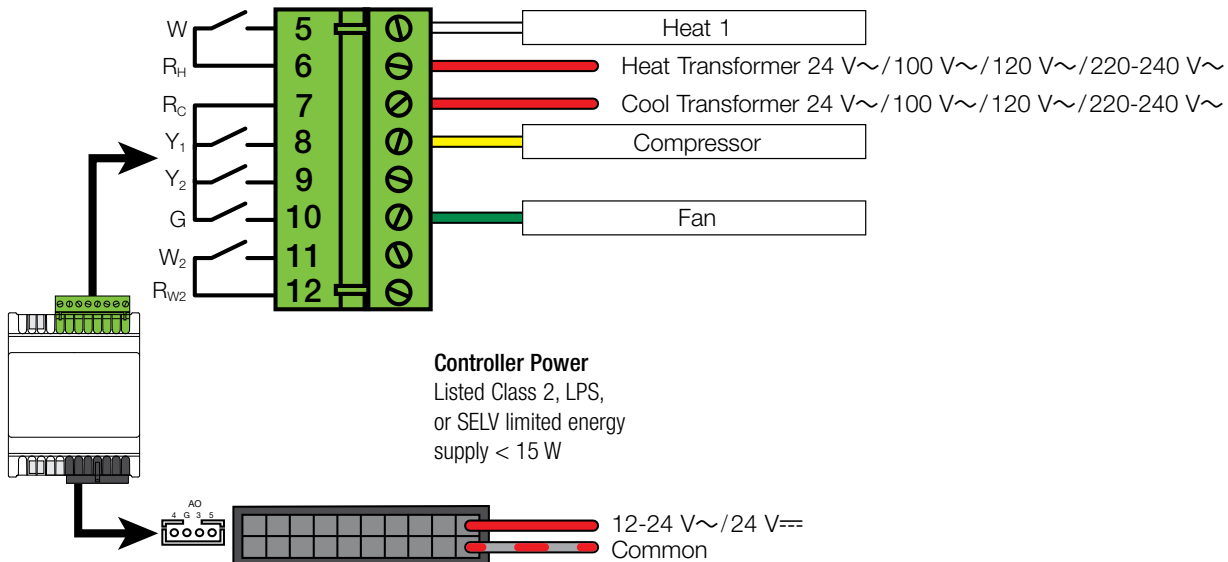


Diagram 6: 1 heat stage/1 cool stage system (2 transformers)



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HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Conventional Systems (continued)

Diagram 7: Heat only system with no fan

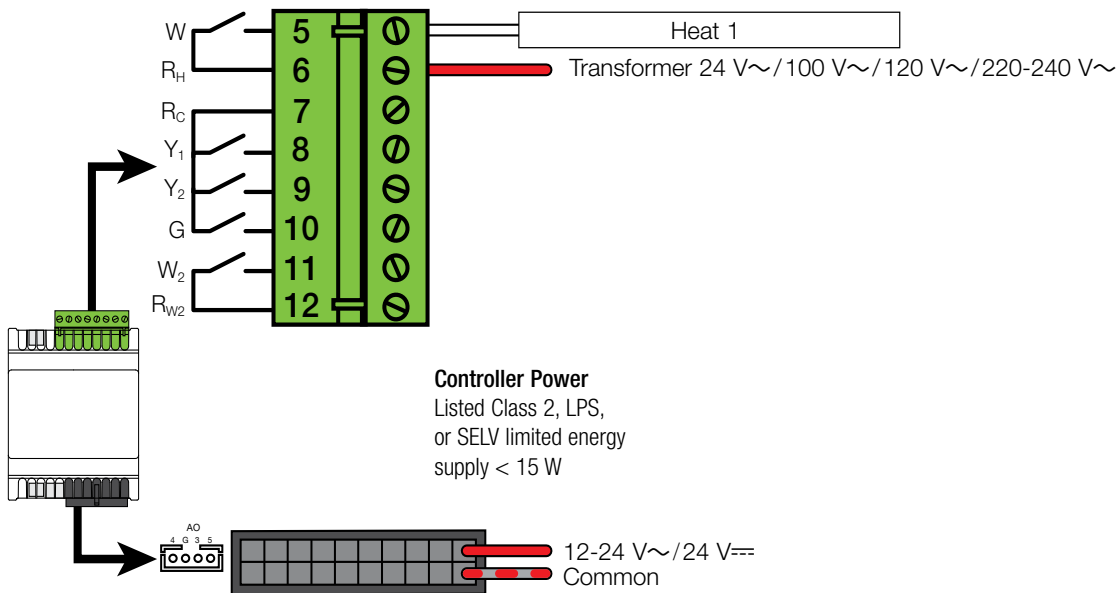
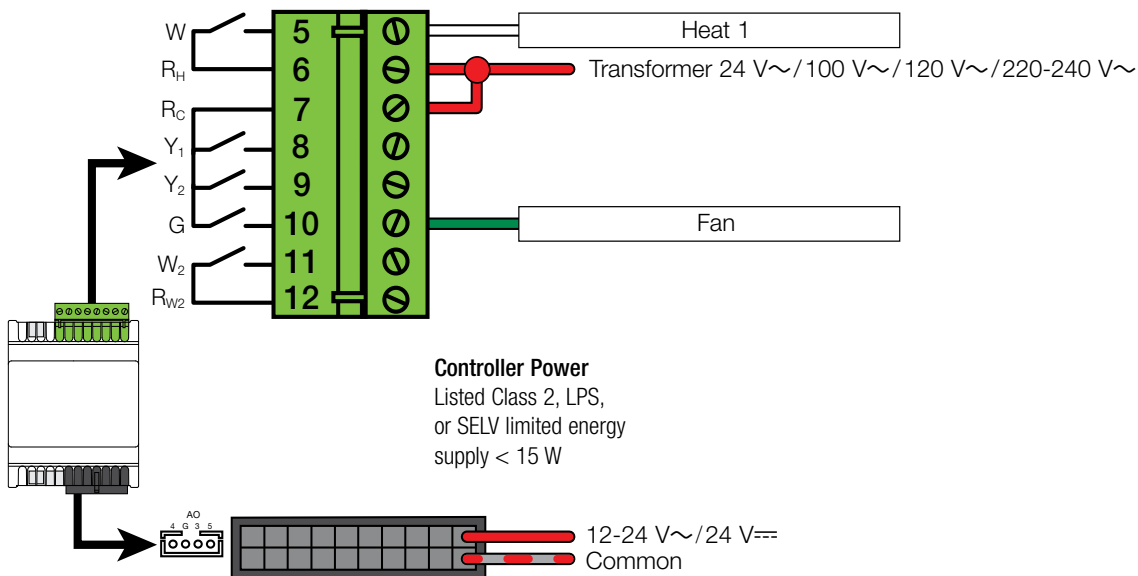


Diagram 8: Heat only system with fan



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HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Conventional Systems (continued)

Diagram 9: Cool only system

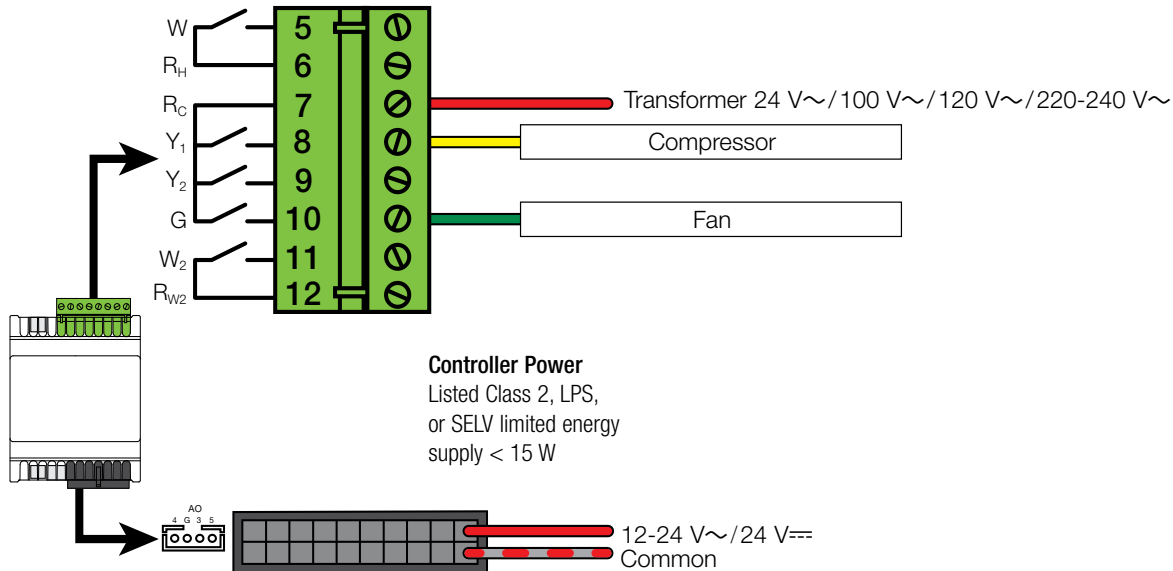
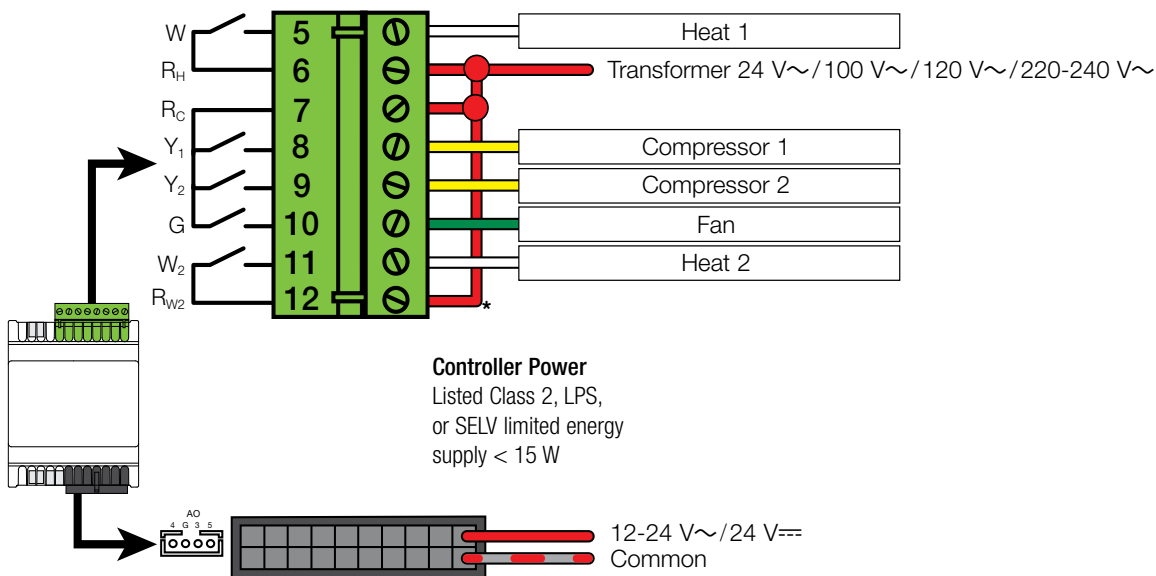


Diagram 10: 2 heat stages/2 cool stages system (1 transformer)



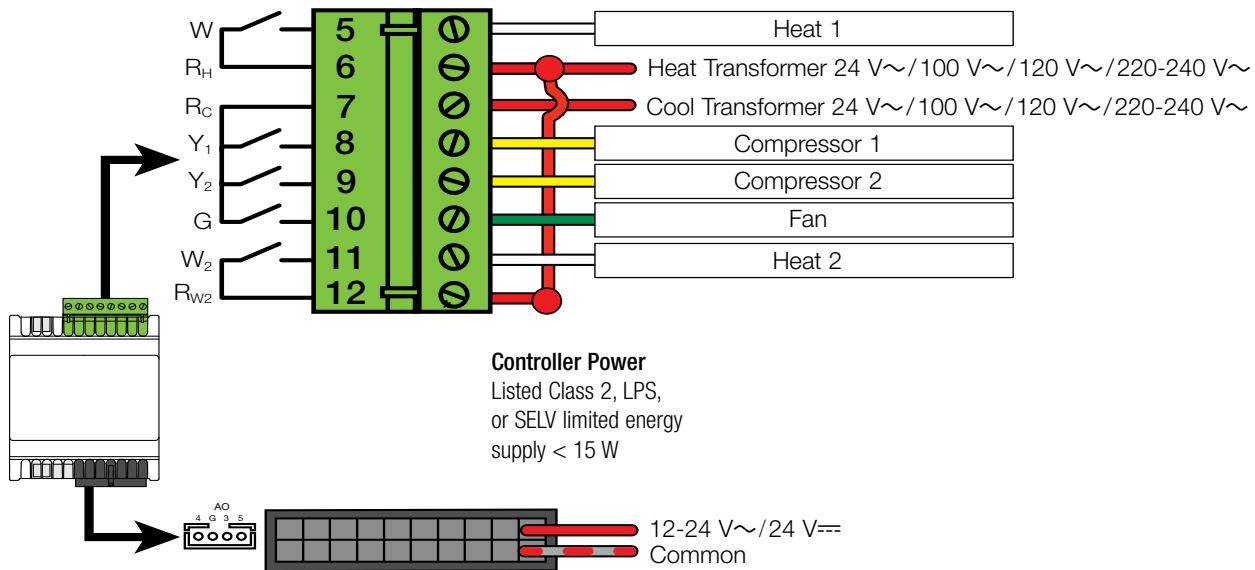
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HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Conventional Systems (continued)

Diagram 11: 2 heat stages/2 cool stages system (2 transformers)



Continued on the next page...

HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Fan Coil Units

Note: Wire the controller according to the diagram below that corresponds to the system, valve, and fan type of the FCU. For more information on wiring using a control board or interposing relays, see Application Note #678 (048678) at www.lutron.com. To extend relay life, each inductive load, driven by the relay contacts, must include a suppression device such as a peak limiter, RC circuit, or fly-back diode.

2-pipe Systems

Diagram 12: 2-pipe system, On/off valve, 3-speed fan, changeover sensor

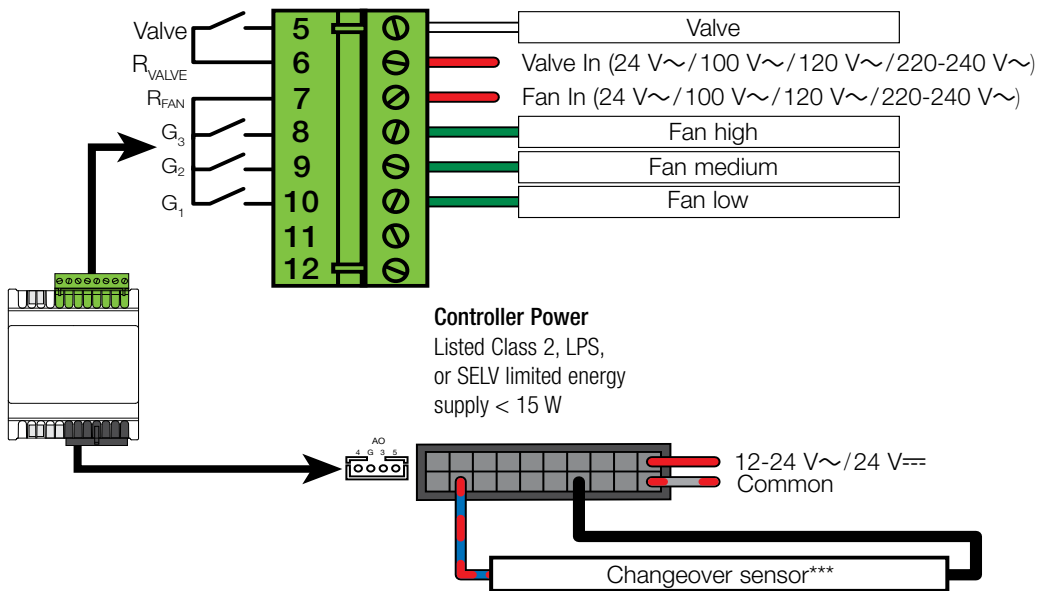
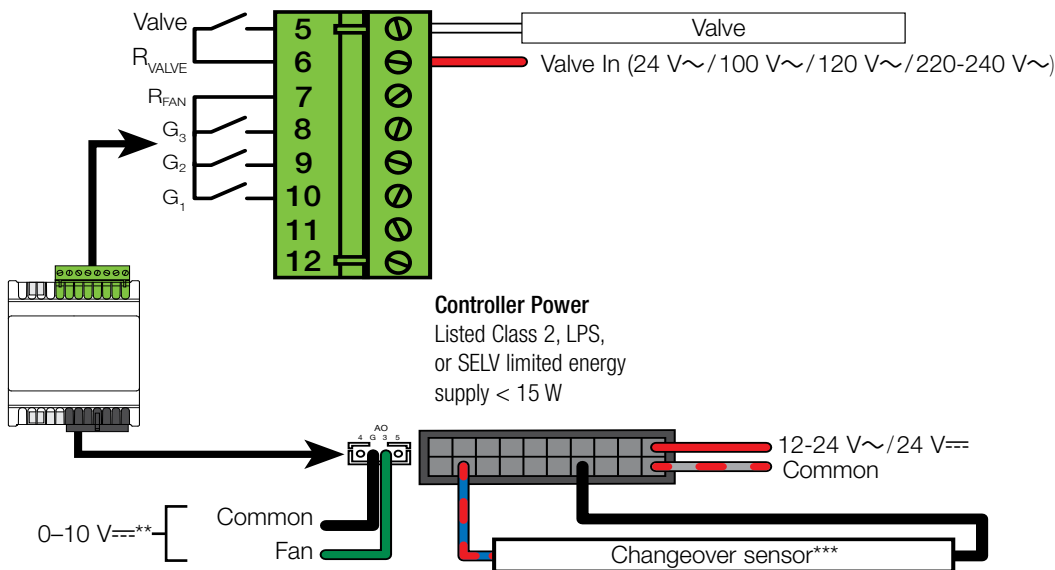


Diagram 13: 2-pipe system, On/off valve, 0–10 V== controlled fan, changeover sensor



** When using 0–10 V== fan or valve control, a different power supply must be used to power the Palladiom HVAC controller and the 0–10 V== fan/valve actuators. For more information, see Application Note #651 (048651) at www.lutron.com

***Sensor is only required with 2-pipe systems that provide both heating and cooling through the same valve. Semitec 103AT or equivalent – NTC 10 k at 25 °C

HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Fan Coil Units (continued)

2-pipe Systems (continued)

Diagram 14: 2-pipe system, 0–10 V_{DC} valve, 3-speed fan, changeover sensor

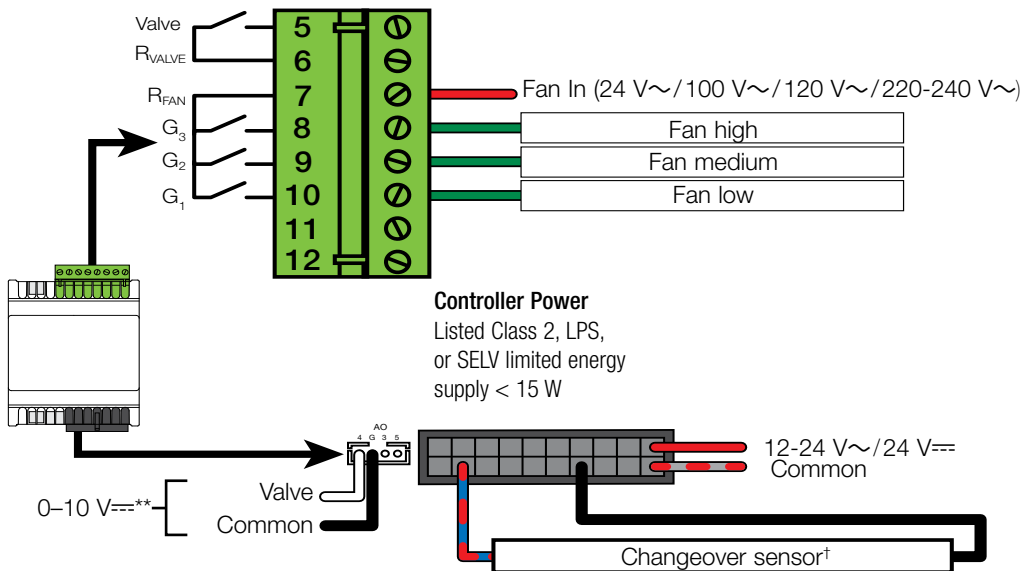
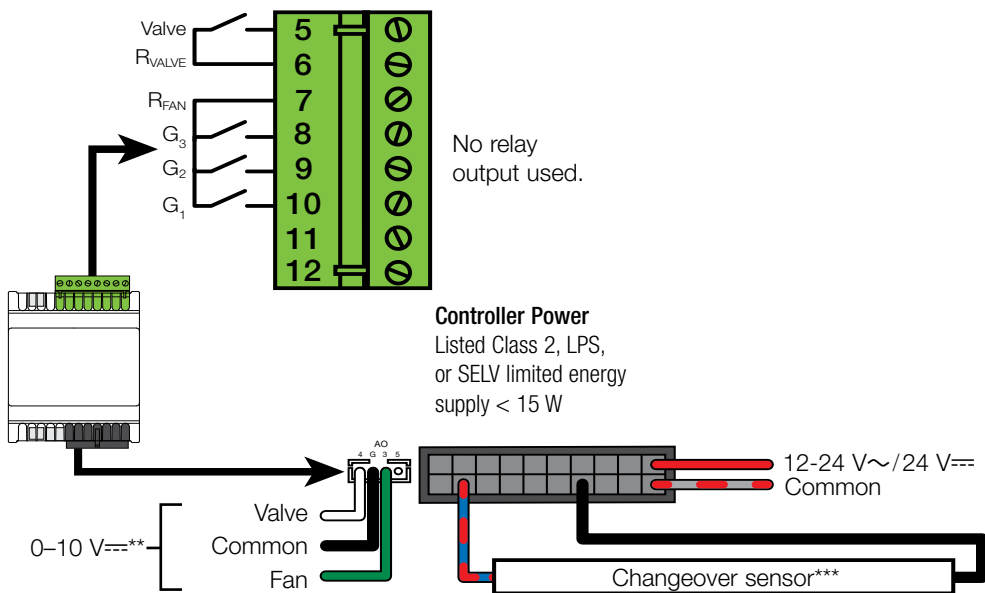


Diagram 15: 2-pipe system, 0–10 V_{DC} valve, 0–10 V_{DC} controlled fan, changeover sensor



** When using 0–10 V_{DC} fan or valve control, a different power supply must be used to power the Palladiom HVAC controller and the 0–10 V_{DC} fan/valve actuators. For more information, see Application Note #651 (048651) at www.lutron.com

*** Sensor is only required with 2-pipe systems that provide both heating and cooling through the same valve. Semitec 103AT or equivalent – NTC 10 k at 25 °C

HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Fan Coil Units (continued)

4-pipe Systems

Diagram 16: 4-pipe system, On/off valve, 3-speed fan

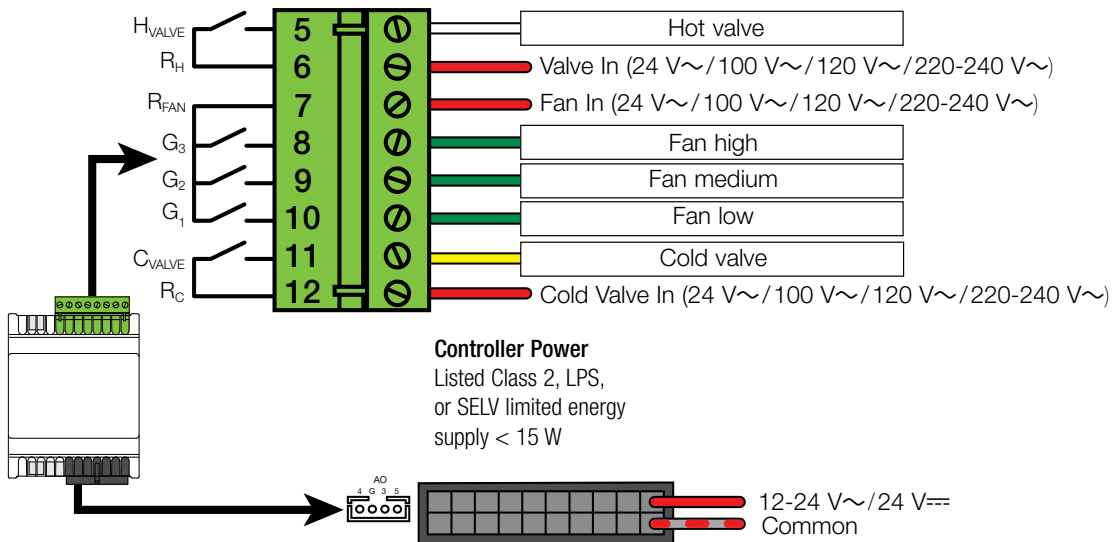
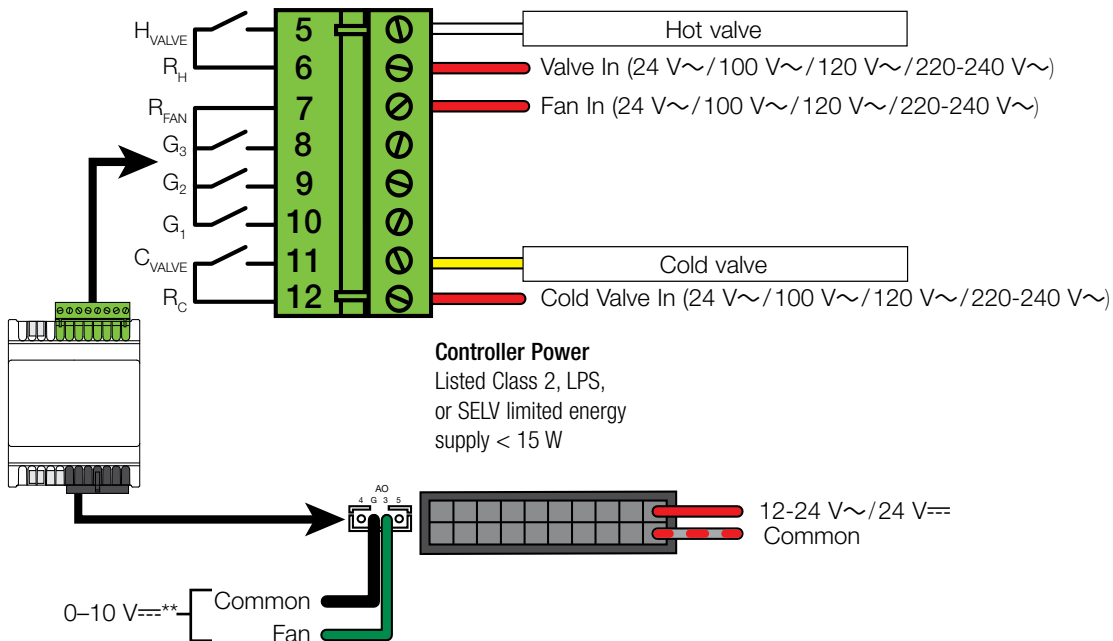


Diagram 17: 4-pipe system, On/off valve, 0–10 V_{DC} controlled fan



** When using 0–10 V_{DC} fan or valve control, a different power supply must be used to power the Palladiom HVAC controller and the 0–10 V_{DC} fan/valve actuators. For more information, see Application Note #651 (048651) at www.lutron.com

Continued on the next page...

HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Fan Coil Units (continued)

4-pipe Systems (continued)

Diagram 18: 4-pipe system, 0–10 V_{DC} valve, 3-speed fan

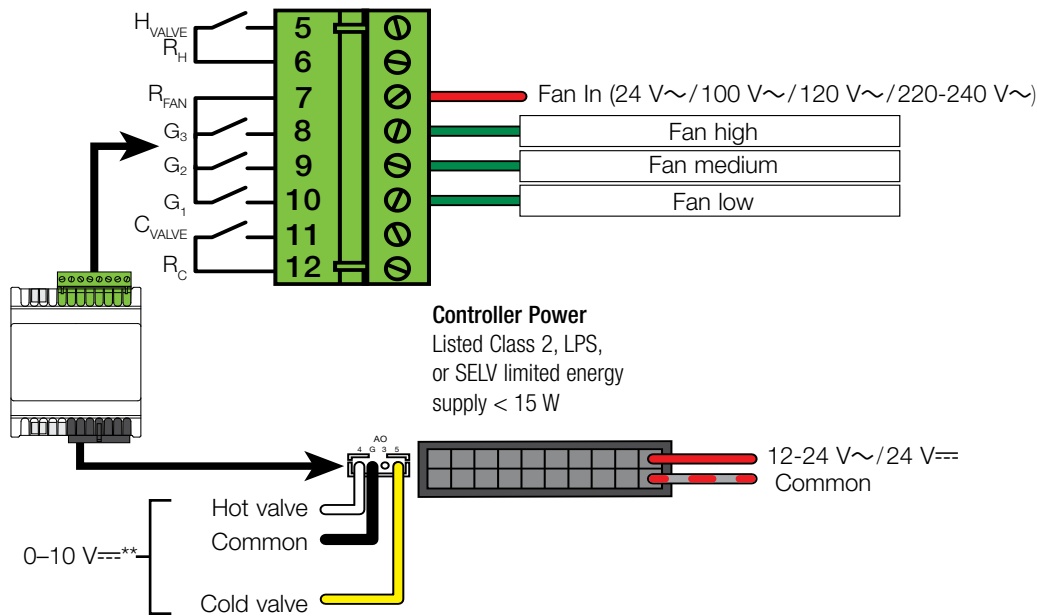
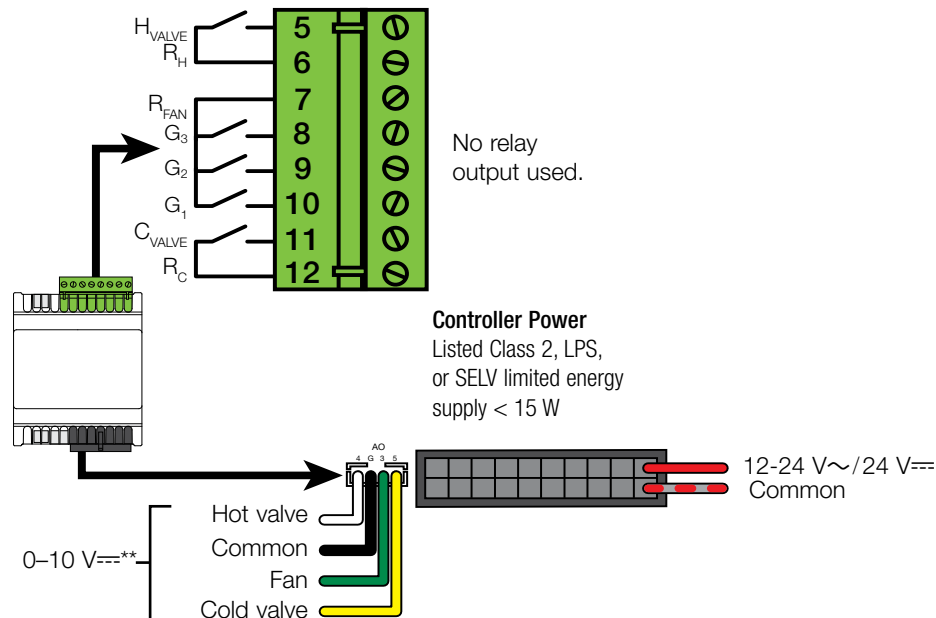


Diagram 19: 4-pipe system, 0–10 V_{DC} valve, 0–10 V_{DC} controlled fan



** When using 0–10 V_{DC} fan or valve control, a different power supply must be used to power the Palladiom HVAC controller and the 0–10 V_{DC} fan/valve actuators. For more information, see Application Note #651 (048651) at www.lutron.com

HomeWorks Palladiom HVAC Solution

HomeWorks Palladiom HVAC Controller Wiring Diagrams (continued)

Radiant Floor

Diagram 20: On/off valve

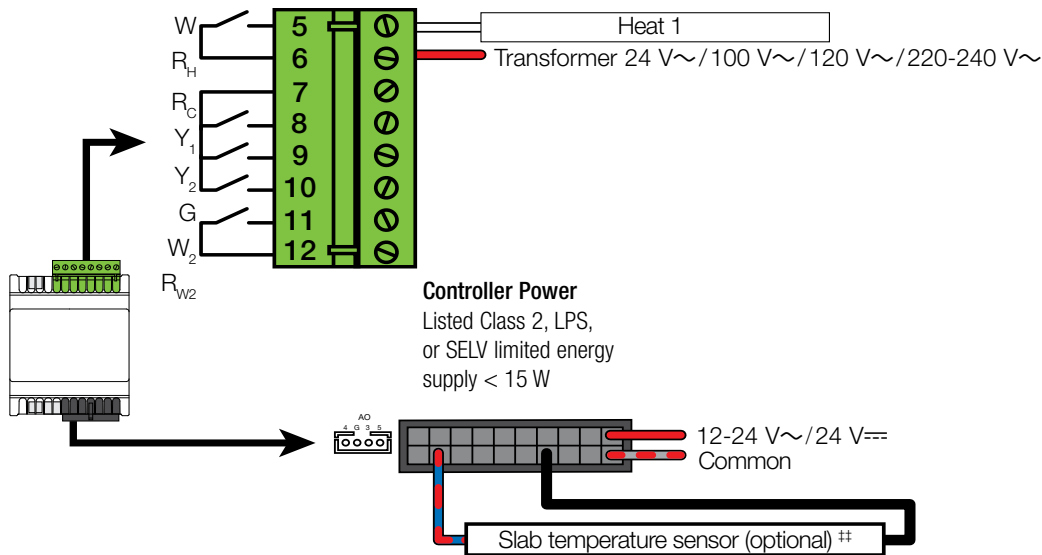
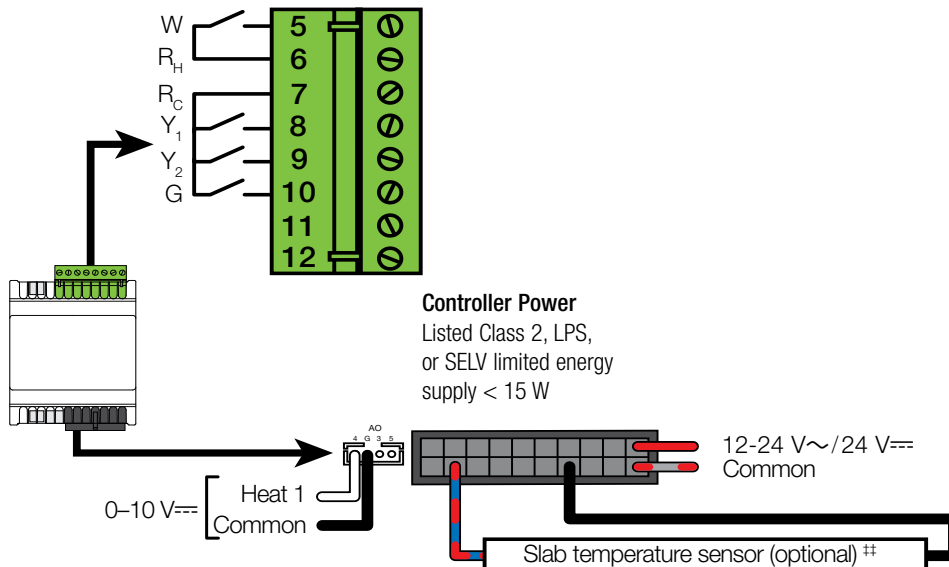


Diagram 21: 0–10 V== valve

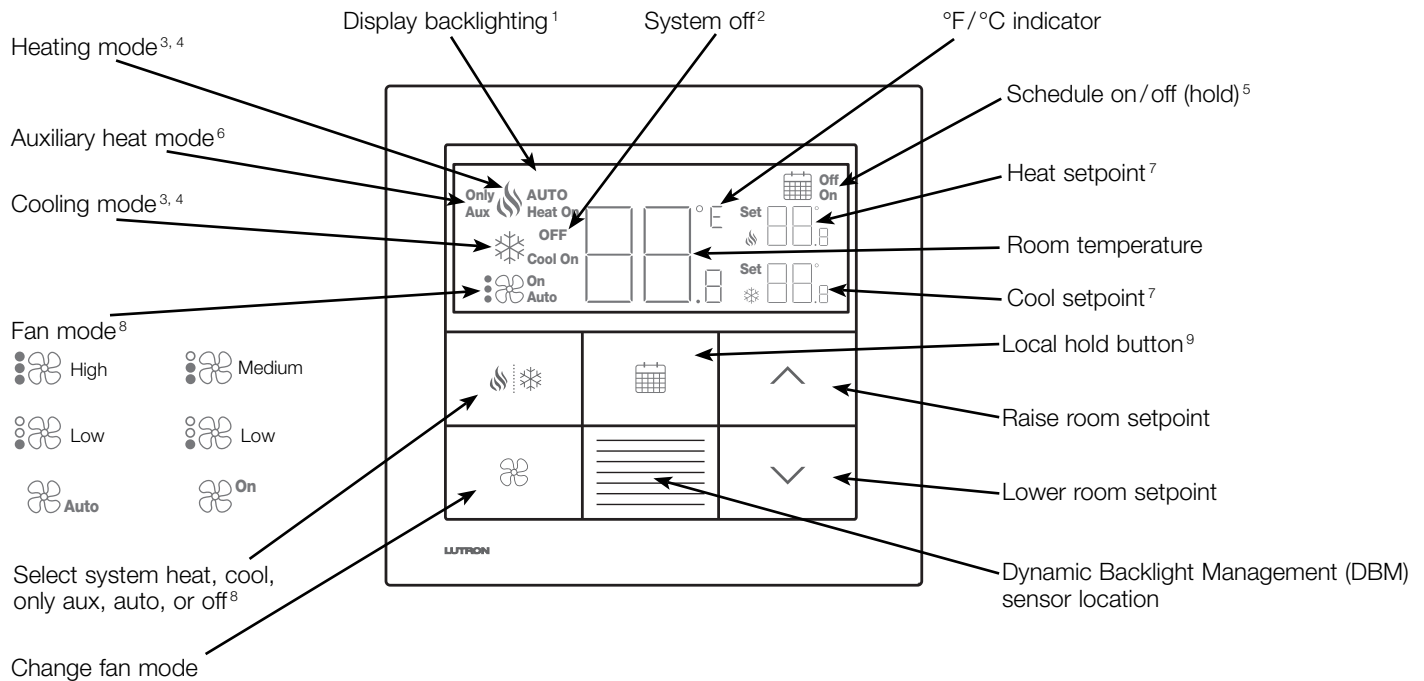


†† Use a thermistor type NTC, 10 kΩ at 25°C, or a thermistor with an equivalent temperature-resistance curve.

Temperature	°C	5	10	15	20	25	30	35
	°F	41	50	59	68	77	86	95
Resistance (kΩ)		22.05	17.96	14.69	12.09	10.00	8.31	6.94

HomeWorks Palladiom HVAC Solution

User Interface



¹ Turns on when any button is pressed. Turns off after 10 seconds of inactivity (programmable). Dynamic Backlight Management (DBM) automatically adjusts backlight intensity based on ambient lighting conditions.

² Room temperature and "OFF" are shown when system is off.

³ Icons are animated when system is actively heating/cooling.

⁴ Icons flash if system is temporarily delayed for HVAC equipment protection.

⁵ Indicates HVAC system timeclock event status.

⁶ "Aux" indicates that auxiliary heat is running with the other heat stages. "Only Aux" indicates that auxiliary heat is running without the other heat stages (emergency heat).

⁷ Display shows the heat or cool setpoint. The first raise/lower button press activates the LCD backlight. Additional raise/lower button presses adjust the setpoint.

⁸ Applicable modes are configurable via the HomeWorks software.

⁹ Enables/disables HVAC system timeclock events.

HomeWorks Palladiom HVAC Solution

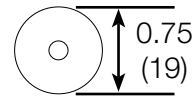
Remote Temperature Sensor

If it is not possible to follow the recommended mounting guidelines on page 10, use an indoor remote temperature sensor for proper temperature control. The remote temperature sensor must be enabled through advanced programming via the thermostat. There can be a maximum of one remote temperature sensor per HVAC Controller. Doing this will automatically disable the internal thermostat sensor. See the **HomeWorks Palladiom Thermostat Configuration Guide** (032498) at www.lutron.com

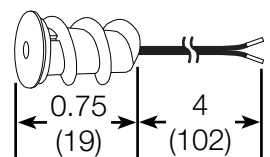
Wired Flush Mount Sensor (LR-TEMP-FLSH)

- Flush mount on wall in the area to be controlled.
- Field paintable to match decor.

Front View

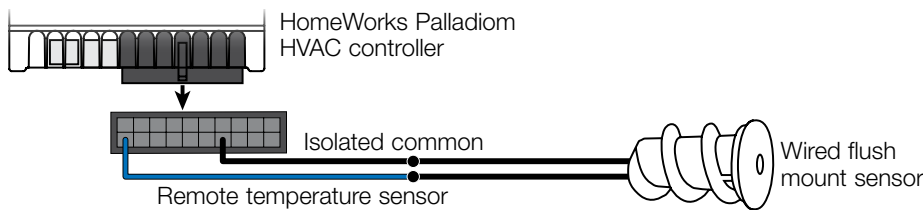


Side View



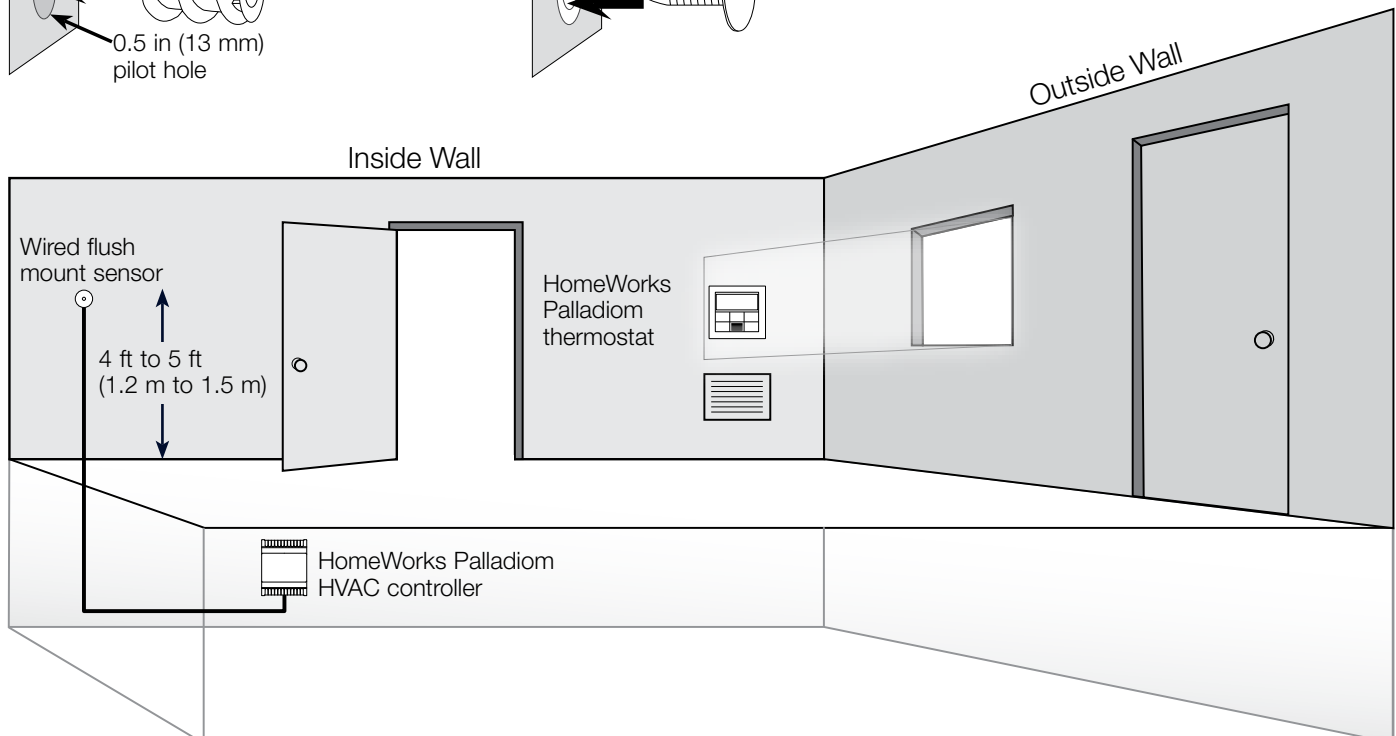
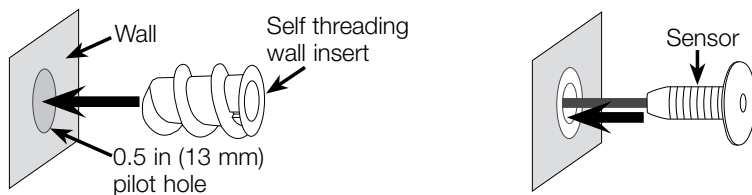
Wiring

Use 22 AWG (0.5 mm²) twisted, shielded pair wiring. Maximum wire length: 100 ft (30.5 m)



Mounting

Use appropriate mounting instructions from the **Mounting** section on page 10.





HomeWorks Palladiom HVAC Solution

Colors and Finishes (thermostat)


Architectural Matte Finishes

	Almond AL
	Beige BE
	Black BL
	Brown BR
	Gray GR
	Ivory IV
	Light Almond LA
	Sienna SI
	Taupe TP
	White WH

Glass Finishes

	Clear Black Glass CBL
	Clear White Glass CWH

Architectural Metal Finishes

	Antique Brass* QB
	Bright Brass BB
	Bright Chrome BC
	Bright Nickel BN
	Polished Graphite PG
	Satin Brass SB
	Satin Chrome SC
	Satin Nickel SN

Signature Metal Finishes

	Champagne CP
	Graphite GP

- Due to printing limitations, colors and finishes shown cannot be guaranteed to perfectly match actual product colors.
- PD-CK-1 (Architectural finishes) and SM-CK-DEMO (Signature Metal finishes) chip sample sets are available to represent these colors and finishes. Chips should not be used for exact matching of the color or finish.**

* Antique Brass is a handcrafted finish that is created by a manual relief process. This artisanal process can result in variations in luster, hue, and appearance.

** Contact Lutron prior to using any samples for matching of non-Lutron product.