



DUCOTERRA® *SolaRay* Electric Infrared Heating Ceiling Panels

- *Attractive low-profile appearance*
- *High performance materials*
- *Multiple Sizes and Mounting Options*
- *Made in the USA*

Ducoterra's *SolaRay* infrared radiant ceiling panels are cost-effective, efficient heating solutions for both residential and commercial environments and are easily installed in either new or existing construction. *SolaRay* panels are ideal for augmenting heating in conjunction with ductless heat pumps or forced air systems, or for heating entire homes.

SolaRay panels are ideal alternatives for:

- Baseboard and wall heater alternative or replacement
- Remodel projects without existing ductwork (garages, guest houses, basements add-on rooms)
- Areas with drafts, many windows, or with "cold spots"
- Washrooms, shower rooms and other spaces with high ventilation rates

IMPORTANT INSTRUCTIONS

When using electrical appliances, basic precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

- 1) **Read all instructions before installing and using this heater.**
 - 2) **To prevent possible electrical shock, disconnect ALL power coming to the heater at main service panel before wiring or servicing**
 - 3) **Extreme caution is necessary when any heater is used by or near children or invalids and whenever the heater is left operating and unattended.**
 - 4) **Do not operate any heater after it malfunctions. Disconnect power at service panel and have heater inspected by a reputable electrician before reusing.**
 - 5) **Panels are intended for ceiling installation only. Do not install on walls, floor, etc. Do not use outdoors.**
 - 6) **To disconnect heater, turn controls to off, and turn off power to heater circuit at main disconnect panel.**
 - 7) **A heater has hot and arcing or sparking parts inside. Do not use it in areas where gasoline, paint, or flammable vapors or liquids are used or stored.**
 - 8) **Use this heater only as described in this manual. Any other use not recommended by the manufacturer may cause fire, electric shock, or injury to persons.**
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1. Introduction

Ducoterra's *SolaRay* panels are designed to heat living and working spaces rapidly and efficiently by radiant heating. Like the sun, these panels will create a warm environment for all people and objects within line of sight of the panel surface. They are designed to be surface mounted on ceilings or for installation in a T-bar grid.

2. Installation Layout Guidelines

In a standard 8' ceiling room, these heating panels will cover approximately 10 times the floor square footage as panel size (e.g. a 2x4 panel will cover approximately 48 to 80 square feet of floor space). They may be installed at zero clearance to adjoining walls and adjacent panels,

but optimal coverage is obtained by spacing the panels to cover the floor space efficiently.

As maximum panel efficiency is obtained within a 45 degree angle of the panels, spacing panels 2' off walls and approximately 4' from other panels will generally cover a room sufficiently. Panels may need to be positioned differently or installed at higher/lower wattage densities depending on specific room configurations, insulation, heating requirements, and other factors.

3. Environment Insulation Requirements

For proper functionality, the heated space should be insulated appropriately. Optimal panel operation is achieved if walls and ceilings are insulated according to ASHRAE 189 standards in accordance with your local



climate zone. Heating panel connection box must not be covered with insulation material after installation. Insulation in panel has an R value of 10.

4. Wiring Requirements and Guidelines

Heating panel has two 10" 12 AWG leads for connecting to standard #12 power supply with wire-nut inside attached connection box. See appropriate wiring diagrams for details (Figure 3 below).

! WARNING: To avoid the risk of electrical shock, personal injury or death, disconnect all electrical power before installing or performing maintenance on this panel.

The wiring, installation, and electrical hookup of this panel must conform to local and national codes. The use of GFCI circuits in high moisture areas is recommended. Total wattage of heating panels per circuit must not exceed 80% of circuit capacity.

5. Thermostats

Panels should be installed in conjunction with a line voltage or 24V thermostat. Measure voltage and branch circuit amperage to determine wattage and panel circuit load. The thermostat should be located in the same room on a side wall and not directly under the ceiling panel.

6. Surface Mounting Guidelines

Panels may be mounted to joists, wood, or other penetrable surfaces using appropriate hardware. Included in our installation kit are toggle bolts to attach the panels to standard drywall ceilings. Alternatively, the mounting holes are designed to accommodate #8 – 2" pan head screws. Joint between panel and mounting surface should be sealed with heat resistant (rated to a minimum of 100C) caulking for maximum performance. Surface of panel may be painted with a quality acrylic water based flat paint to customize appearances. (See Figure 1 below)

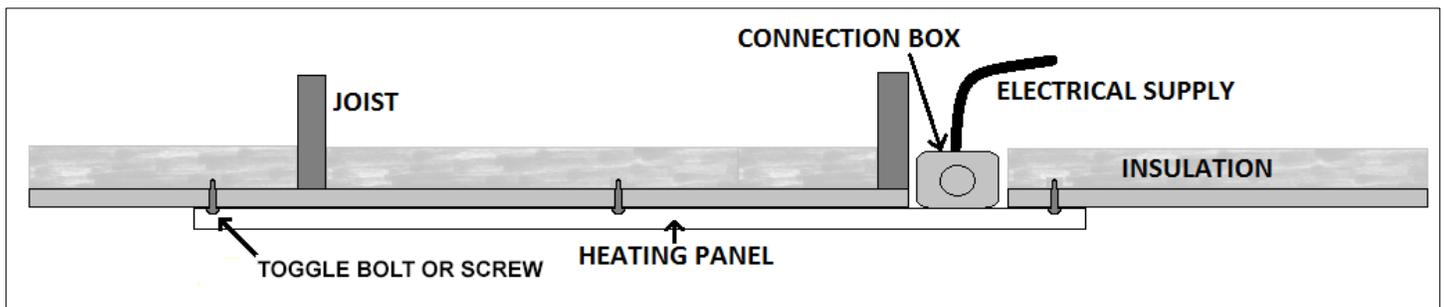
! WARNING: DO NOT puncture panel with screws, nails, or any other device. Panel must be mounted only through the provided mounting holes.

SURFACE MOUNTING INSTALLATION

! Be sure electricity is turned off at main switch before wiring to prevent possible injury from electric shock.

1. Cut appropriately sized hole for panel connection box and insure clearance from insulating material.
2. Attach connection box to back of panel using provided hardware.
3. Attach power supply leads to the panel leads in connection box.
4. Position on ceiling in desired mounting location.
5. Attach panel to ceiling using provided mounting toggle bolts and washers or alternatively screws for wood ceilings
6. Insert plastic caps to close mounting holes after allowing time to adjust installation if necessary. Caps are non-removable.

Figure 1 – Surface Mounting



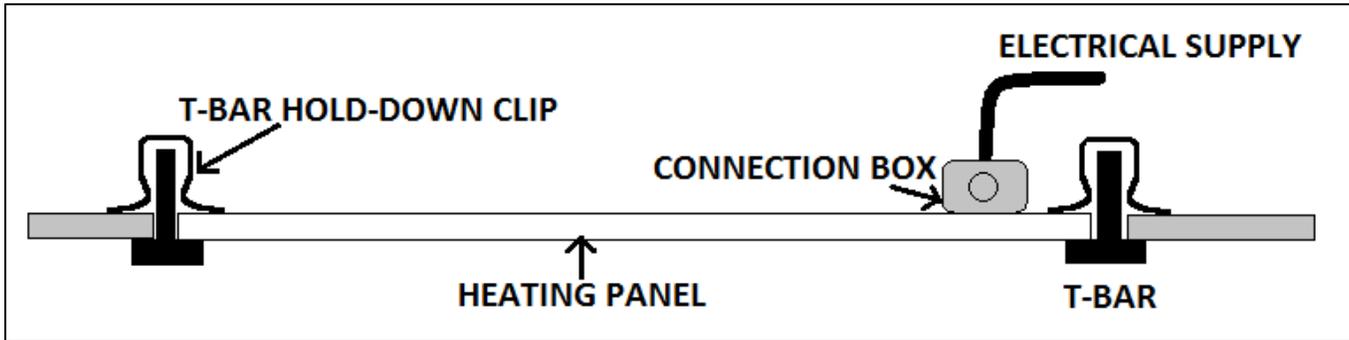
SEE SCHEMATIC ON LAST PAGE FOR ADDITIONAL DETAILS ON SURFACE MOUNTING



T-BAR MOUNTING INSTALLATION

1. Attach connection box to back of panel using provided hardware.
2. Lay panel onto the T-Bar grid and secure with hold-down clips (not included) if necessary.
3. Attach power supply leads to the panel leads in connection box.

FIGURE 2 – T-Bar Mounting



WIRING DIAGRAMS

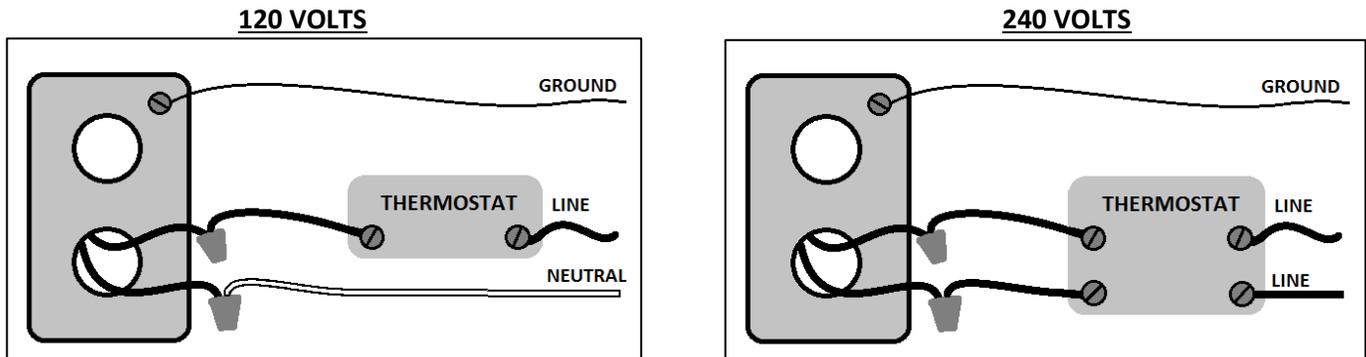


Figure 3 – Thermostat wiring connections for panels

! WARNING: Panel must NOT be wired to higher voltage than label voltage. Verify that the power supply voltage coming to the heater matches the voltage printed on the heater label.

TESTING INSTALLATION

After installation, the heating circuit should be checked to ensure all panels have been installed properly and are functioning normally. With power available, measure the branch load with an amp meter. The amp meter value should agree with calculated load – if not, recheck the installation. A physical check of operation can also be made – with power to the panels, they should be warm to the touch and prolonged contact should be uncomfortable.

If no power is available to test the circuit, the use of an ohmmeter is required. Measure the resistance of the load circuit, isolated from other circuits. The measured resistance of the heating circuit should match the calculated resistance. The resistance can be calculated with the following formula:

$$Resistance = \frac{Volts * Volts}{Watts}$$



HEATING PANEL OPERATION

Ensure panels have been properly installed prior to operation. Radiant heat ceiling panels function best in a zone heating configuration. Use a programmable thermostat to apply appropriate setbacks to spaces that are unoccupied. Optimal comfort with a radiant system is typically obtained at air temperatures of around 60-62F.

It is recommended that the panels are dusted and cleaned with a damp cloth every 6 months. Do not use harsh cleaners or abrasives or damage to panel surface may result. Do not lubricate. Make sure to disconnect power to panels at breaker box before cleaning and allow panel to reach room temperature.

! WARNING: Panel contains no user serviceable parts and opening the heating unit will void the warranty.

HEATING PANEL MAINTENANCE

Ducoterra heating panels require no maintenance and carry a Lifetime warranty. An occasional dusting & wipe down with a damp cloth every 6 months to maintain appearances is all that is necessary. Do not use harsh cleaners or abrasives or damage to panel surface may result. Make sure to disconnect power to panels at breaker box before cleaning and allow panel to reach room temperature. If your panel ceases to operate at any time during the warranty period, contact Ducoterra to obtain a replacement panel at no charge (installation and shipping costs not covered).

LIMITED WARRANTY

Ducoterra's *SolaRay* radiant ceiling panels are warranted to the original owner against all defects in workmanship and materials for the lifetime of the product. This warranty applies only for normal use of the product, and shall not be effective for products or parts which do not function properly due to misuse, alteration, installation, accident, negligence, misapplication, modification, improper installation (including improper operating voltage) or maintenance, or if any product or part has been serviced or repaired by other than DUCOTERRA.

THE ABOVE WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. DUCOTERRA LLC WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES ARISING WITH RESPECT TO THE PRODUCT, WHETHER BASED UPON NEGLIGENCE, TORT, STRICT LIABILITY, OR CONTRACT. IN NO EVENT SHALL THIS WARRANTY REQUIRE MORE THAN THE REPAIR OR REPLACEMENT OF ANY PART OR PARTS WHICH ARE FOUND TO BE DEFECTIVE WITHIN THE EFFECTIVE PERIOD OF THE WARRANTY. NO REFUNDS WILL BE GIVEN. IF REPLACEMENT PARTS FOR DEFECTIVE MATERIALS ARE NOT AVAILABLE, DUCOTERRA RESERVES THE RIGHT TO MAKE PRODUCT SUBSTITUTIONS IN LIEU OF REPAIR OR REPLACEMENT.



STANDARD MODEL SPECIFICATIONS

Model #	Volts	Watts	Amps	BTUs	Dimensions	Mounting Holes	Weight (lbs.)
120AIP2-200	120	200	1.6	682	22.50" x 23.75" x 1/2"	4 holes - 21.00"W 22.25"L	8.5
240AIP2-200	240	200	0.8	682	22.50" x 23.75" x 1/2"	4 holes - 21.00"W 22.25"L	8.5
120AIP2-250	120	250	2.0	853	22.50" x 23.75" x 1/2"	4 holes - 21.00"W 22.25"L	8.5
240AIP2-250	240	250	1.0	853	22.50" x 23.75" x 1/2"	4 holes - 21.00"W 22.25"L	8.5
120AIP3-300	120	300	2.5	1,023	22.50" x 35.75" x 1/2"	6 holes - 21.00"W 17.125"L	12.5
240AIP3-300	240	300	1.2	1,023	22.50" x 35.75" x 1/2"	6 holes - 21.00"W 17.125"L	12.5
120AIP3-375	120	375	3.1	1,279	22.50" x 35.75" x 1/2"	6 holes - 21.00"W 17.125"L	12.5
240AIP3-375	240	375	1.5	1,279	22.50" x 35.75" x 1/2"	6 holes - 21.00"W 17.125"L	12.5
120AIP4-400	120	400	3.3	1,365	22.50" x 47.75" x 1/2"	6 holes - 21.00"W 23.125"L	16.0
240AIP4-400	240	400	1.6	1,365	22.50" x 47.75" x 1/2"	6 holes - 21.00"W 23.125"L	16.0
120AIP4-500	120	500	4.1	1,706	22.50" x 47.75" x 1/2"	6 holes - 21.00"W 23.125"L	16.0
208AIP4-500	208	500	2.4	1,706	22.50" x 47.75" x 1/2"	6 holes - 21.00"W 23.125"L	16.0
240AIP4-500	240	500	2.0	1,706	22.50" x 47.75" x 1/2"	6 holes - 21.00"W 23.125"L	16.0
120DIP4-500	120	500	4.1	1,706	23.75" X 47.75" X 1.0"	No Holes	16.0
208DIP4-500	208	500	2.4	1,706	23.75" X 47.75" X 1.0"	No Holes	16.0
240DIP4-500	240	500	2.0	1,706	23.75" X 47.75" X 1.0"	No Holes	16.0
277DIP4-500	277	500	1.8	1,706	23.75" X 47.75" X 1.0"	No Holes	16.0
120AIP4-750	120	750	6.2	2,559	22.50" X 47.75" X 1/2"	6 holes - 21.00"W 23.125"L	16.0
208AIP4-750	208	750	3.6	2,559	22.50" X 47.75" x 1/2"	6 holes - 21.00"W 23.125"L	16.0
240AIP4-750	240	750	3.1	2,559	22.50" X 47.75" x 1/2"	6 holes - 21.00"W 23.125"L	16.0
120DIP4-750	120	750	6.2	2,559	23.75" X 47.75" X 1.0"	No Holes	16.0
208DIP4-750	208	750	3.6	2,559	23.75" X 47.75" X 1.0"	No Holes	16.0
240DIP4-750	240	750	3.1	2,559	23.75" X 47.75" X 1.0"	No Holes	16.0
277DIP4-750	277	750	2.7	2,559	23.75" X 47.75" X 1.0"	No Holes	16.0
120AIP6-600	120	600	5.0	2,047	22.50" x 71.75" x 1/2"	8 holes - 21.00"W 23.417"L	24.0
240AIP6-600	240	600	2.5	2,047	22.50" x 71.75" x 1/2"	8 holes - 21.00"W 23.417"L	24.0
120AIP6-750	120	750	6.2	2,559	22.50" x 71.75" x 1/2"	8 holes - 21.00"W 23.417"L	24.0
208AIP6-750	208	750	3.6	2,559	22.50" x 71.75" x 1/2"	8 holes - 21.00"W 23.417"L	24.0
240AIP6-750	240	750	3.1	2,559	22.50" x 71.75" x 1/2"	8 holes - 21.00"W 23.417"L	24.0
120AIP6-1000	120	1000	8.3	3,413	22.50" x 71.75" x 1/2"	8 holes - 21.00"W 23.417"L	24.0
208AIP6-1000	208	1000	4.8	3,413	22.50" x 71.75" x 1/2"	8 holes - 21.00"W 23.417"L	24.0
240AIP6-1000	240	1000	4.2	3,413	22.50" x 71.75" x 1/2"	8 holes - 21.00"W 23.417"L	24.0
277AIP6-1000	277	1000	3.6	3,413	22.50" x 71.75" x 1/2"	8 holes - 21.00"W 23.417"L	24.0

INCLUDED COMPONENTS

- Radiant heating panel
- Heavy duty toggle bolts
- Covers for mounting holes
- User documentation



SolaRay Infrared Radiant Ceiling Panel Schematic and Assembly Details

Shown below is a SolaRay 2' X 4' panel schematic. The location of the Handybox is the same for all panels.
Spacing between holes is as shown in the Standard Model Specifications table.

