CEILING SYSTEM Installation Guide

Whether you're a contractor, architect, builder or homeowner, creating the perfect indoor environment has always been an ultimate challenge. ThermaRay, is the world 's #1 name in thermal comfort. Please take the time to read this installation guide carefully before you begin. Remember, accurate measurements are the key to success for a proper installation!

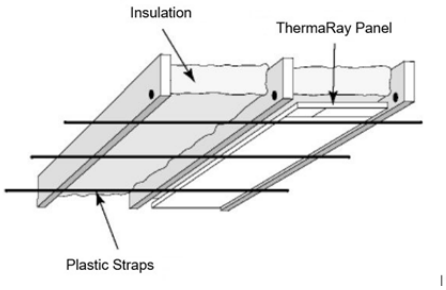


Diagram 1. ThermaRay panels slide into position easily, below the insulation and above the plastic strapping. The insulation is permitted to come in direct contact with the panel. There is maximum insulation level of R60 that may be installed above the panel. For residential construction consult the local building code for recommended minimum insulation values in your area. It is highly recommended to insulate between floors to obtain maximum efficiency and comfort.

MECHANICAL INSTALLATION

ThermaRay panels are placed between the ceiling framing members, or between the furring strips if the ceiling is cross-furred. Panels are to be installed in open, unobstructed ceiling areas and never above partitions, cupboards, lighting fixtures, track lighting, acoustic tiles, decorative ceiling beams or other items, which may restrict the heat transfer of the panels or where the panels may be subject to physical damage.

During installation the panels can be temporarily held in place by plastic strapping, available from the distributor. ***(See Diagram 1)*** The suspension system enables the panels to be secured until electrical connections can be made, and the finished ceiling installed. Use 3/8 inch (10mm) or longer staples or screws to secure plastic strapping to the underside of framing members or furring strips.

The number of panels needed in an area must equal or exceed the heat-loss calculation for that same area.

This equipment shall be installed only by qualified personnel who are familiar with the construction and operation of the system and the risks involved.

BRANCH CIRCUIT CONNECTION

ThermaRay panels are connected in parallel to the branch circuit. Canadian installation shall be made according with these instructions and to the provision of Section 62 of the Canadian Electrical Code, part 1 and to regulations of all authorities having jurisdiction. U.S. installations are to be made in accordance with these instructions and article 424-part J of the National Electrical Code, ANSI/NFAA 70 and local codes where applicable. Installations outside North America should conform to applicable local codes. The heater load, once determined, can be divided into as many circuits as needed. 12 AWG (2.0 mm) copper 2-conductor, non-metallic sheathed cable is recommended for installation of panels. When determining the number of branch circuits required to accommodate the heating load, note that the branch circuit must be de-rated in accordance with either the Canadian Electrical Code, National Electrical Code, or local codes as applicable. It is not recommended that wire size greater than 12 AWG (2.0 mm) be used to connect the panels to the branch circuit. After the panels are secured in place and the number of branch circuits determined, they are connected to the branch circuit. For proper performance ensure the supply voltage matches the voltage stamped on the panel. **DO NOT connect heating panel to a higher voltage.** Connection to lower voltages is permitted but will cause the panel to operate at a reduced wattage and may lead to a system with insufficient capacity to heat the intended area. The supply wire of 12 AWG (2.0 mm) 2- conductor non-metallic cable is connected to the transient lead (pigtail lead) of the heater panels with 3M Scotchlok® self-stripping electrical tap connectors (Type 567), ***(See Diagram 2).*** Upon completion of the wiring assembly, the panel connections are visible and available for inspection by local authorities.

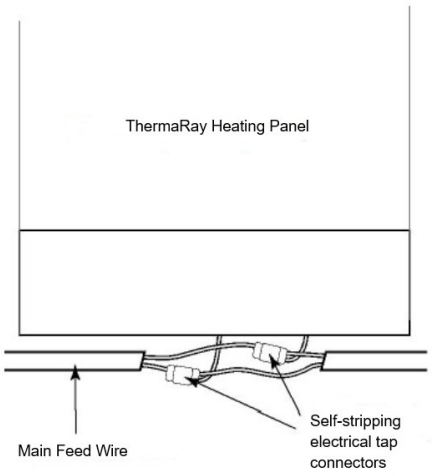
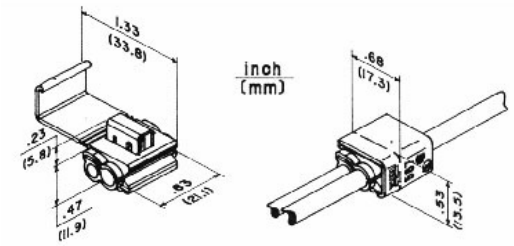
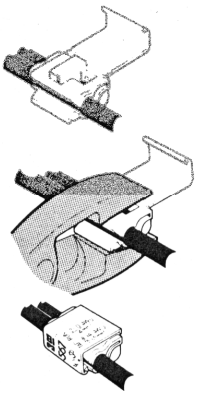


Diagram 2. Connecting the main feed to the individual panel is easily done using tap-on connectors. Note that ONLY the outer insulation jacket of the main feed is removed.



3M567 Self Stripping Electrical Tap Connectors



INSTRUCTIONS

Use only with insulated wire. Do not strip insulation.

1. Slip circuit (run) wire into side slot. Insert fixture (tap) wire up to stop.
2. Make connection with 9" electrician's (lineman's) pliers, by driving "U" contact down flush with top of connector.
3. Close hinged cover until it locks.

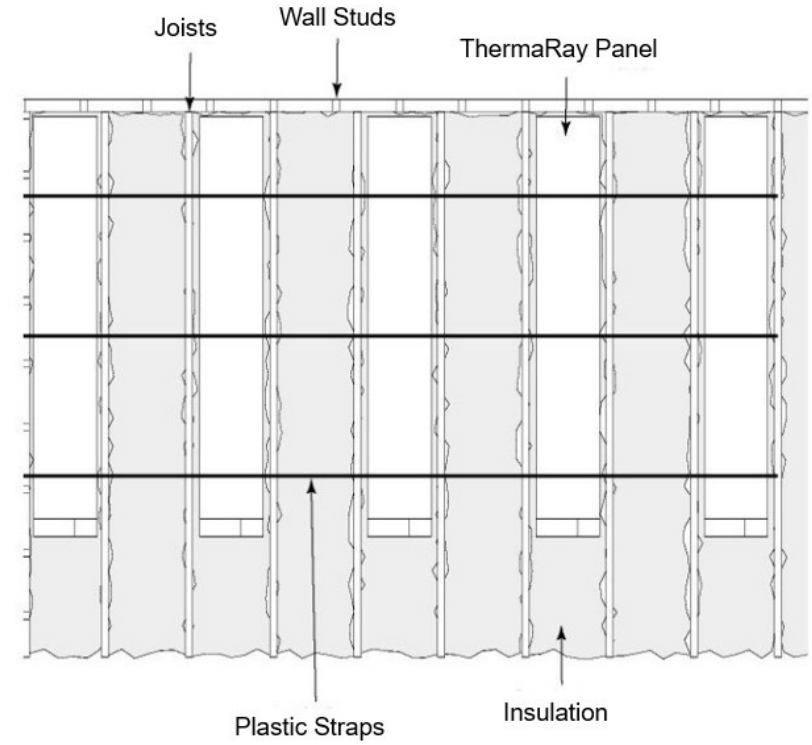
PANEL OPERATION TEST

Each heater has been individually checked at the factory. After panel installation, the entire circuit should be tested, to check the on-site electrical work. Two methods of testing will be discussed in the following paragraphs.

Full Power Available – Apply rated voltage to the heater load circuit. Branch loads are to be read with a suitable ammeter. The ammeter value should be the same as that calculated for the heating load and, if the values agree, all panels are operating. If the values do not agree, installation should be re-checked. For a physical check without a meter, it is only necessary to feel the panels. If they are warm, they are working.

Without Power Available – This check of the panel installation requires the use and knowledge of an ohm meter. A resistance measurement is taken at the load circuit, Knowing the total heater load of the panel in watts and heater rated voltage, a simple calculation will give the same values as that read on the ohm meter.

View from below



Example: for the branch circuit of 1500 watts and panel rated voltage of 240, the resistance will be 38.4 ohms:

$$\text{Formula: } \frac{\text{Voltage} \times \text{Voltage}}{\text{Wattage}} = \text{resistance in ohms, Example: } \frac{240 \times 240}{1500} = 38.4 \text{ ohms}$$

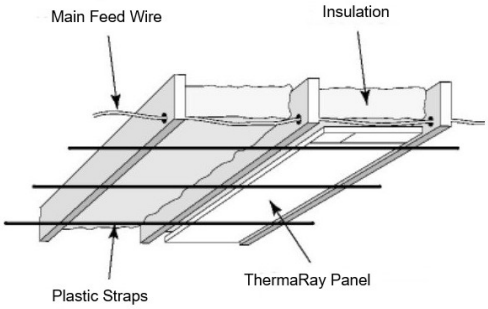


Diagram 3. The main feed wire is run in through the joists, as shown above. Proper positioning of the main feed wire results in easy connecting.

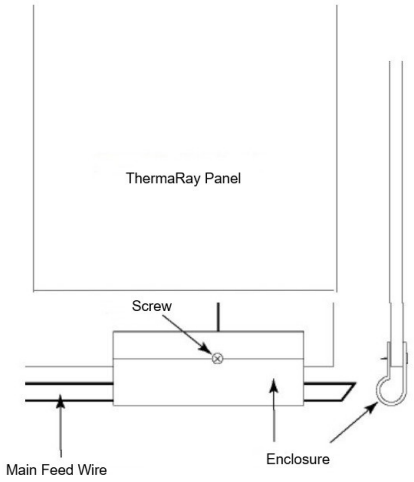


Diagram 4.

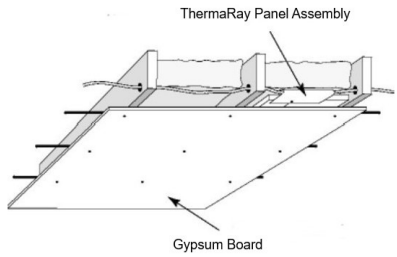


Diagram 5. As soon as the ThermaRay panels are connected to the main feed and the plaster-filled wiring closures are in place, the final installation of ceiling gypsum board or wood can begin.

FINAL INSTALLATION

After inspection and completion of the equipment check, the wiring enclosure (Endcap) is completely filled with drywall ready-mixed compound, quick-setting drywall compound, or fireproof caulking compound or expanding foam. The Endcap is then placed over the connector and slid onto the panel. Alternatively, a bulk-loading caulking gun, or the expanding foam may be used to completely fill the enclosure from each end, after it has been mechanically attached to the panel. ***(See Diagram 3)***

To attach the Endcap to the panel, slide the Endcap over the panel, connectors, and feed wire. Align the hole in the Endcap with the Fastener Line marked on the panel. The Fastener Line is located between (and marks the location of) the two cold panel connection leads. Then use the screw supplied with the Endcap to secure the Endcap to the panel. (Endcap, screw, and connectors are available from the distributor for each panel). ***(See Diagram 4)***

If a ceiling vapour barrier is used, it may be placed either above or below the panels. It can be placed between the panel and the finished gypsum ceiling. Should polyethylene vapour barriers be used, one certified to Canadian standard CAN/CGSB 51.34-M86 or equivalent is recommended.

Warning sticker must be attached to the electrical service panel. Ensure that all branch circuits supplying radiant heating are clearly marked as such.

Panel installation is now complete, and the finished gypsum board or wood can be directly attached to the ceiling framing members, or furring strips, completely enclosing the ThermaRay panel in the ceiling. It is recommended not to use a ceiling finish with an R-value of more than R5. (For wood ceilings this is usually 1/2 thickness or less). ***(See Diagram 5)***

CAUTION:

- Panels must be turned off before taping and/or painting ceiling and left off until joint compound has fully cured.
- ThermaRay panels must not be placed over wood framing members, partitions, cupboards, acoustic tiles, or other obstructions or where subject to physical damage or come in contact with plastic piping.
- Electrician should be consulted before ThermaRay ceiling is punctured or modified.
- Cellulose insulation is not recommended unless it meets Standard CGSB 510GP-60M or equivalent and must not contact face of heater panel.
- Use only copper conductor supply wire.
- Oil based paints are not recommended for ceiling applications.
- Do not install heating panels in a room over an unheated crawl space unless floor is properly insulated.
- Basement ceiling must be insulated for proper system performance.

Canada only - A Class A ground-fault circuit-interrupter shall be used with this heating device

CATALOGUE#	WATTS	LENGTH '	WIDTH "	WEIGHT LBS
RC8A130-240	130	8	9	10.2
RC6A095-240	95	6	9	7.7
RC4A070-240	70	4	9	5.1
RC8B175-240	175	8	12	13.6
RC7B150-240	150	7	12	11.9
RC6B130-240	130	6	12	10.2
RC5B105-240	105	5	12	8.5
RC4B085-240	85	4	12	6.8
RC3B070-240	70	3	12	5.1
RC8C260-240	260	8	18	20.4
RC7C230-240	230	7	18	17.9
RC6C195-240	195	6	18	15.3
RC5C160-240	160	5	18	12.8
RC4C130-240	130	4	18	10.2
RC3C095-240	95	3	18	7.7
RC2C070-240	70	2	18	5.1

120, 208, 220, 230, 277 and 347 volts are also available.

ACCESSORIES

PC-1	Endcaps regular
3M567	Connector for #12-2 wire
RC Strap	Strapping 400/ft
MC2	Metal endcap for installation with a metal conduit

Optional Controls

SC-10 Relay Panel	10–20-amp relays
SC-20 Relay Panel	20-20-amp relays
TH1144WF	Sinope Line Voltage Thermostat + Wi-Fi
TH1400WF	Sinope Low Voltage Thermostat + Wi-Fi
TH1400ZB	Zigbee Low Voltage Thermostat + Wi-Fi
GT130	Zibgee Gateway

Revised: Sept 23, 2026

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