

CHK-100-120, CHK-100-240

(Kit description: TYPE - SQUARE FOOTAGE- VOLTAGE, Example: Carbonic Heat Kit-120 square feet-120 volt system.)

These kits are all supplied with the Carbonic Heat Film, a J-2 Harness, an A-2 Adder, and eight (8) pieces of Edge Sealing Tape. This will be enough material to complete an 80-100 square foot room. A Crimping Tool (part #CHP-01), scissors, tape measure, wire cutters/strippers, and a Volt meter will be needed to complete your job. Please follow the steps in the General Installation Instructions on pages #24 thru #32.



CHK-200-240

(Kit description: TYPE - SQUARE FOOTAGE- VOLTAGE, Example: Carbonic Heat Kit-200 square feet-240 volt system.)



These kits are all supplied with the Carbonic Heat Film, two (2) J-4 Harnesses and sixteen (16) pieces of Edge Sealing Tape. This is enough material to complete a 200 square foot room or two 100 square foot rooms. Required for the job will be a Crimping Tool (part #CHP-01), scissors, tape measure, wire cutters/strippers, and a Volt meter. Please follow the steps in the General Installation Guide on pages #24 thru #32.

GENERAL INSTALLATION INSTRUCTIONS

LAYOUT

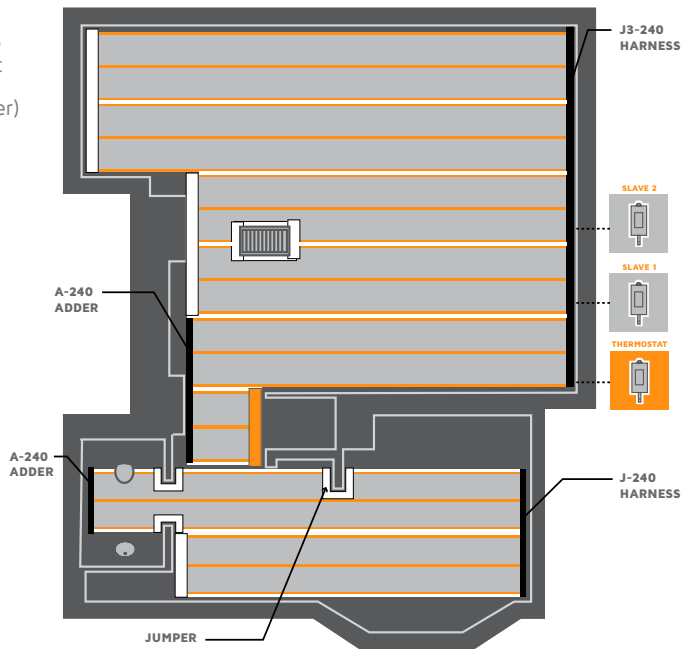
The installation of Carbonic Heat Film begins with planning a layout for the Heating Film. This helps the installer understand how much Heating Film will be needed, and which (and how many) Wiring Harnesses, Jumpers, Adders, and extra Edge Sealing Tape might be needed. Additionally, a pre-planned layout will determine thermostat (and possibly slave thermostat) locations.

FIRST, DETERMINE THE NUMBER OF SQUARE FEET OF HEATING FILM THAT ARE REQUIRED FOR THE INSTALLATION. THIS WILL HELP TO DETERMINE THE VOLTAGE NEEDED FOR THE INSTALLATION.

The Heating Film is capable of running on 120 volts or 240 volts. Installations using 120 volts are limited to 100 square feet of Heating Film per dedicated 15 amp circuit. Installations using 240 volts are capable of a maximum 200 square feet of Heating Film per a dedicated 15 amp circuit. Each circuit can be controlled individually by using a standard individual thermostat for complete zone control, or up to ten circuits (maximum 2000 sq-ft) may be controlled from one master thermostat.

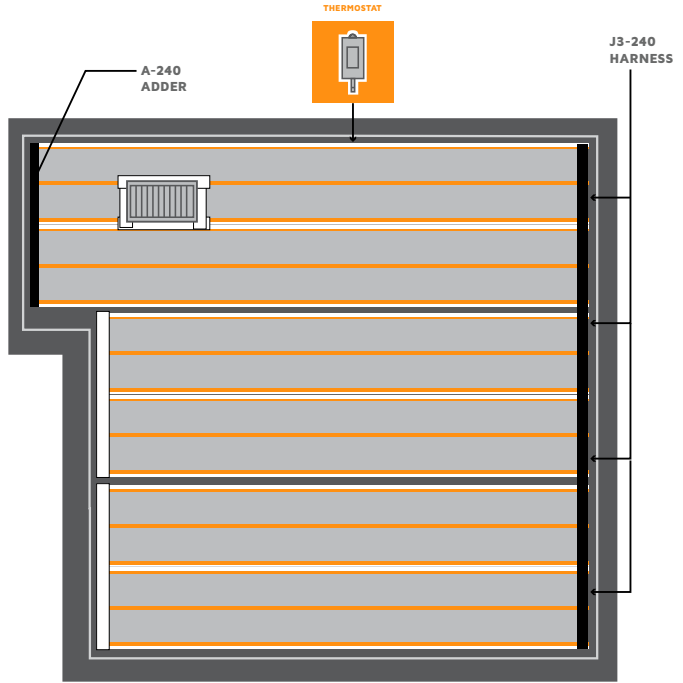
EXAMPLE OF A 400 SQ-FT SYSTEM.

- Qty 1 Master thermostat
- Qty 2 Slave units
- Qty 1 JP-60 (60" Jumper)
- Qty 2 A-240 Adder
- Qty 1 J-240 Harness
- Qty 1 J3-240 Harness



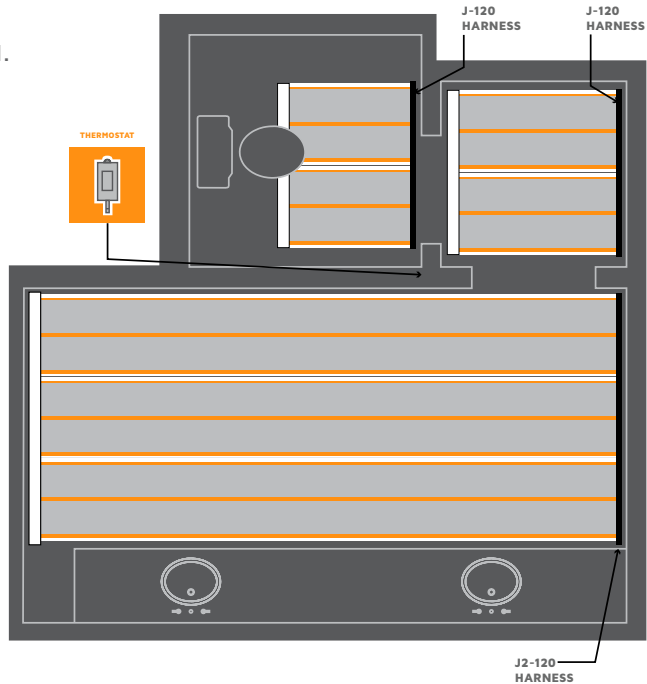
EXAMPLE OF A 200 SQ-FT SYSTEM.

- Qty 1 Thermostat
- Qty 1 A-240 Adder
- Qty 1 J3-240 Harness

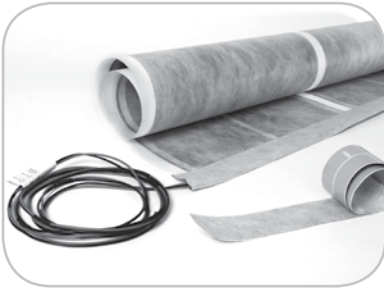


EXAMPLE OF A 100 SQ-FT SYSTEM.

- Qty 1 Thermostat
- Qty 2 J-120 Harness
- Qty 1 J2-120 Harness



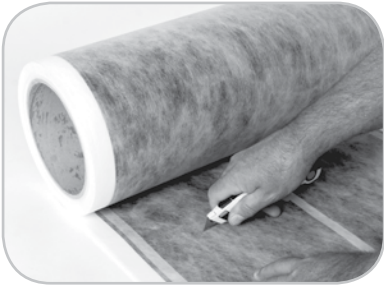
INSTALLING THE HEATING FILM



1. Carefully plan the layout of the Heating Film for the installation.

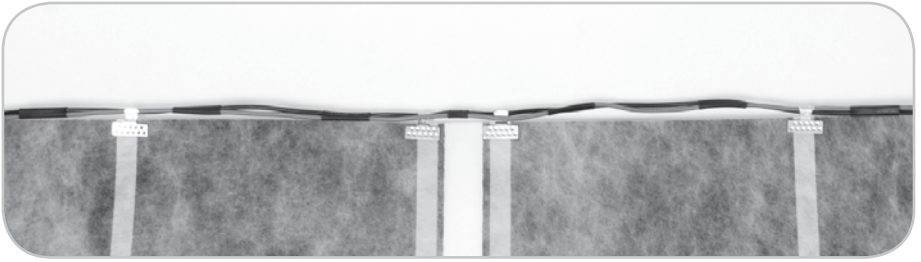
2. Cut the Heating Film to length required.

3. Cut any holes or notches according to the installation plan (toilet flanges, electrical outlets, floor registers, doors, etc.). Sheets of Heating Film may be laid out, side-by-side and then wired together. White, non-heating areas (nailing strips) are allowed to be trimmed off the material as needed. The Heating Film can be installed with some space between sheets, if deemed necessary; however it should be noted that “cold spots” will form if the gap is too great for the thermal heat expansion to overlap.



The thermal expansion for this product is up to three (3) inches from the edge of the active heating area.

- 1. UNDER NO CIRCUMSTANCES SHOULD THE ACTIVE AREAS (GRAY) OF THE HEATING FILM BE ALLOWED TO OVERLAP ITSELF OR ONTO ADJACENT PIECES OF HEATING FILM.**
- 2. ANY TRIMMING OF THE HEATING FILM THAT INCLUDES GRAY (ACTIVE HEATING) AREAS MUST BE TAPED WITH THE EDGE SEALING TAPE.**
- 3. THE HEATING FILM MAY NOT BE INSTALLED WITHIN TEN (10) INCHES OF ANY DRAIN, INCLUDING TOILET FLANGES.**
- 4. NATIONAL ELECTRIC CODE FORBIDS THE PLACEMENT OF NAILS, STAPLES, OR OTHER FASTENERS THROUGH THE CARBON “GRAY” HEATING AREA OR COPPER BUS BAR ZONES.**
- 5. IF A NAIL OR STAPLE IS ACCIDENTALLY PLACED THROUGH ANY OF THESE AREAS, THE PENETRATION MUST BE REMOVED, AND THE HOLE NEEDS TO BE TAPED ON BOTH SIDES WITH THE EDGE SEALING TAPE.**

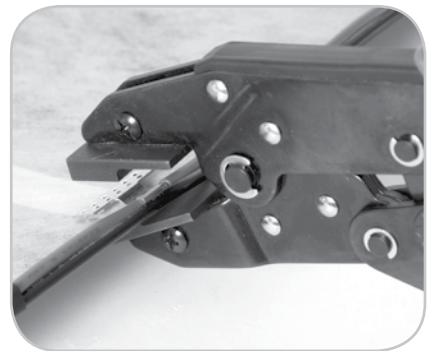


HARNESS, ADDERS, AND JUMPERS

A Crimping Tool (CHP-01) must be used to attach Harnesses, Adders, and Jumpers to the Heating Film.

First attach the center Terminal Crimps on the Harness so the spacing will stay “true” to the center of the Heating Film. This is extremely important when setting up to use a Multi-sheet Harness or a Multi-sheet Adder. Failure to do so will result in misalignment of the sheets and the installation won’t be able to continue until the spacing issue is corrected. It is important to note that there are six (6) Terminal Crimps per sheet for 120 volt and four (4) Terminal Crimps per sheet for 240 volt system.

The crimping terminals have 11 lance “bayonets” that are designed to pierce the outer insulation layer of the Heating Film and make connection with the copper bus bars. The Crimping Terminal is wider than the copper bus bar so it is not necessary for all the bayonets to pierce the copper bus bars, but care should be taken to have as many of the bayonets pierce the copper bus bars as possible. When finished , the Crimping Terminal must lay flat against the Heating Film and the bayonets must protrude through to the female side of the Crimping Terminal to be properly crimped.



TESTING THE CONNECTION AND HEATING FILM; MEASURING OHM'S

Measure the ohms (resistance) by connecting the red and black wires from the "cold lead" using a volt meter. Compare this measured value to the "calculated" OHM's in Step #2.

The integrity of the installation can be tested simply by measuring the resistance of the red and black cold lead wires prior to running the cold leads up through the conduit to the wall junction box. The following simple formula will provide you the CALCULATED RESISTANCE for the Heating Film installation. These calculations are based upon an average installed product temperature. These values will fluctuate +/- 20% based upon the ambient temperature in the environment in which the product is operating.

NOTE: TO AVOID ELECTRICAL SHOCK, YOU MUST NOT CONNECT THE THERMOSTAT AND/OR A SLAVE UNIT TO THE COLD LEADS UNTIL THE TAPING PROCEDURE HAS BEEN COMPLETED (SEE NEXT STEP).

The following formulas are voltage specific and are based on the linear length of the installed film. The value "R" represents the calculated resistance (ohms). The value "L" represents the Total linear length of Heating Film.

FOR 120 VOLT INSTALLATIONS, USE THIS FORMULA:

$$R = \frac{218}{L}$$

Example: A typical 10' X 10' (100 sq-ft) room will have approximately three sheets, for a total of 30 linear feet of Heating Film. Divide 218 by 30, yielding a calculated ohms reading of 7.27.

FOR 240 VOLT INSTALLATIONS, USE THIS FORMULA:

$$R = \frac{872}{L}$$

Example: A typical 10' X 10' (100 sq-ft) room will have approximately three sheets, for a total of 30 linear feet of Heating Film. Divide 872 by 30, yielding a calculated ohms reading of 29.07.

1 linear foot of Heating Film = 3.38 square feet of Heating Film. The linear feet calculated is taken as full width (40.6 inches) of Carbonic Heat Film. If a sheet is cut in half (20.30 inches), along the center white strip cut line, then the "linear feet" is half the length.

OHM'S TESTING



A DIGITAL multi-meter is required to perform the resistance test. Analog meters (which have a needle rather than digital readout) are not recommended, as they do not provide accurate enough reading when calculating the formulas.

1. Calculate Resistance (ohms) as shown on the previous page #28.
2. Set the meter for the reading resistance in ohms – the symbol is Ω .
3. Touch the meter's probes to the red and black cold lead wires from the Harness.
4. Read the resistance from the digital display.
5. Compare "calculated resistance" to "real time resistance"

If any Terminal Crimp connection was missed, the result will be that the resistance measurement will be significantly HIGHER than the calculated resistance. If the MEASURED resistance exceeds 20% of the calculated resistance, then the connections should be checked for proper contact of the Crimping Terminals to the copper bus bars. Resistance should be recorded and a second resistance test should be performed after the flooring installation to verify that no damage has occurred to the Heating Film or Harness during the installation.

APPLYING THE EDGE SEALING TAPE

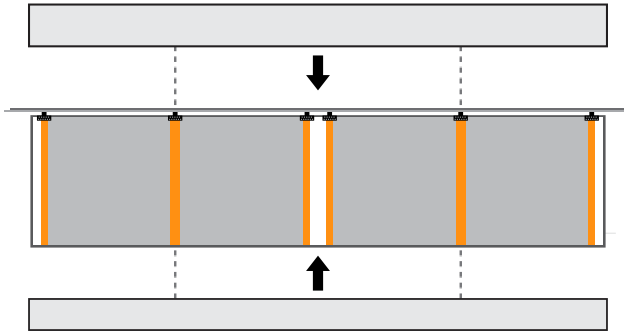


Use the Edge Sealing Tape (provided in Kits) to seal both ends of the Heating Film. The Edge Sealing Tape comes in two different widths (4.8" wide and 2.4" wide). The 4.8" wide tape is designed to seal the edge of the sheet to which the Harness or Adder is attached. The 2.4" wide tape is to seal the edge of the sheet that does not have a Harness or Adder attached, or any section of the Heating Film that has been cut as part of the installation process. Simply

attach one edge of the Tape on one side of the sheet and fold over the other half, thereby sealing each end of the Heating Film. You may need to purchase additional Edge Sealing Tape (part #EST-4.8-42) to enable you to completely tape over and cover/seal any holes that have been cut into the Heating Film (for angles, sockets, islands, etc.).

TAPE

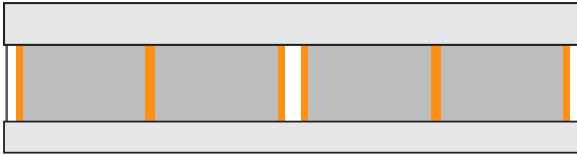
STEP 1



TAPE MUST BE APPLIED TO BOTH SIDES OF THE FILM DURING TAPING

FINISH

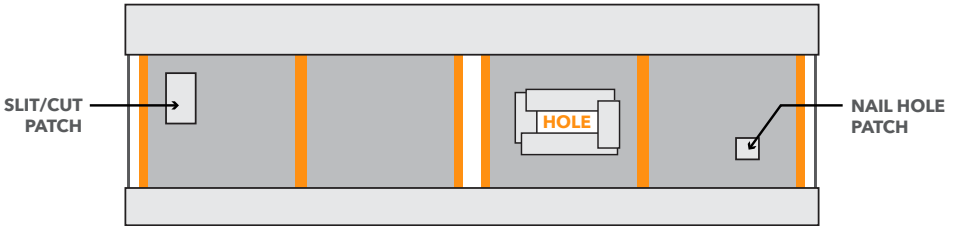
STEP 2



TAPE MUST BE APPLIED TO BOTH SIDES OF THE FILM DURING TAPING

APPLICATIONS

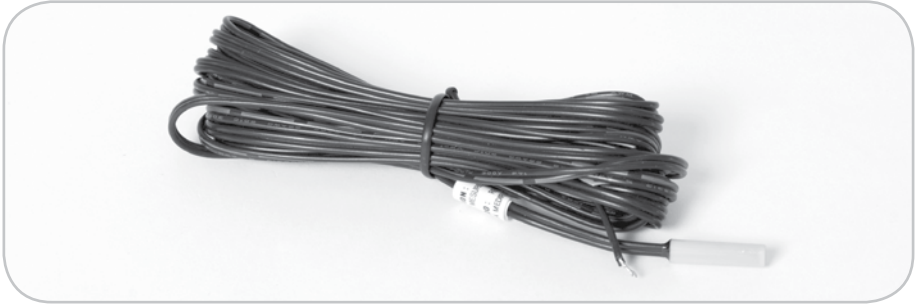
FOR PATCHING HOLES, SLITS, CUTS, SCRAPES
AND ANY EXPOSED GRAY AREA EDGES



TAPE MUST BE APPLIED TO BOTH SIDES OF THE FILM DURING TAPING

NOTE: FAILURE TO PERFORM THIS STEP WILL RESULT IN CONDUCTION OF ELECTRICITY FROM THE OPEN ENDS OF THE COPPER BUS BARS WHEN EMBEDDED IN THINSET. DO NOT SUBSTITUTE TAPE.

INSTALLING THE FLOOR SENSOR AND RUNNING THE COLD LEADS UP WALL



Each thermostat includes a floor sensor. Install the sensor perpendicular to the wall at least 12 inches from the wall and not near other sources of heat. The sensor MUST be either mounted on one of the white, non-heat producing strips or placed BETWEEN sheets of Heating Film. Do NOT place floor sensor directly on the heating area. The sensor should be taped to the sheet using a piece of Edge Sealing Tape. The sensor wire is to be run to the conduit and up to the thermostat junction box. It is not uncommon to route a channel across the non-heat generating areas within the sub-floor so that the sensor is in a more level position to aid with the subsequent installation of the floor covering.

NOTE: CHECK WITH YOUR FLOORING MANUFACTURER FOR MAXIMUM TEMPERATURE RATING THAT IS APPROPRIATE FOR YOUR FLOORING AND SET YOUR THERMOSTAT ACCORDINGLY.