Warmup

Plug-In Power Connection Kit Installation Instructions

(CRDS-15-GFCI)

For use with Warmup WSR Parallel Self-Regulating Cable
Non-hazardous locations

Model	WSR-**<a>**W-**<c>**-**<XXX>d**				
Code	WSR-**<a><b>**W-**<c>**-**<XXX>d**				
	<a> = 5, 8, 10 W/ft *W/ft insulated pipe* *@50°F (10°C)*	***<b> = 9, 12, 15 W/ft*** *W/ft in water* *@32°F (0°C)*	***<c> = 1 / 2*** *1 = 110-120 V AC* *2 = 208-277 V AC*	***<XXX> = 250, 500 or 1000ft*** *Cable length*	**<d> = CR** *Outer jacket material*

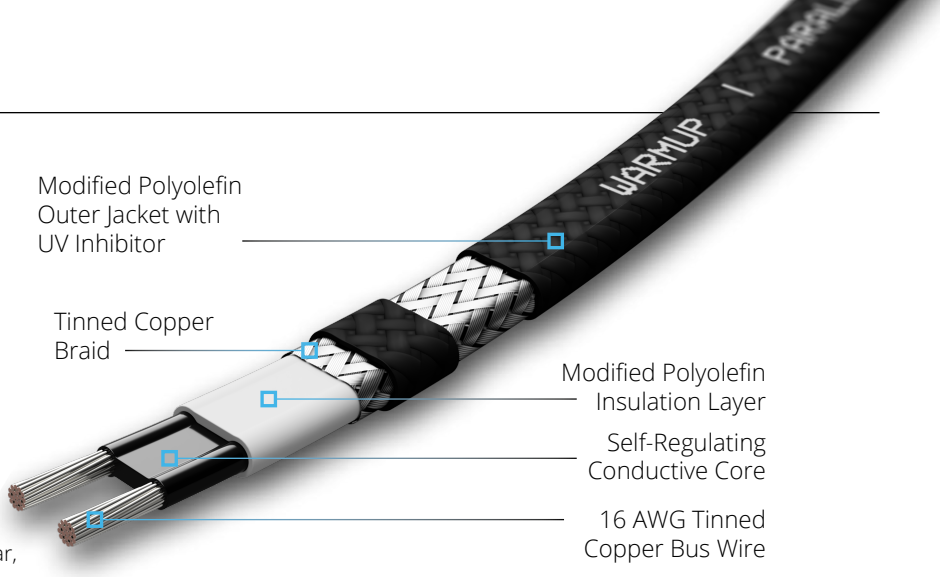
C SA US
268591

Kit & Cable Description

Warmup's Plug-in Power Connection Kit [CRDS-15-GFCI] is a plug-in, power connection kit with an integrated Class A 5mA ground-fault-circuit interrupter [GFCI] for Warmup's WSR 120V Self-Regulating Cable which allows it to be connected directly to a standard 120 V grounded receptacle. The kit connection features a 5-15P attachment plug certified for use with a ≤12A maximum circuit size.

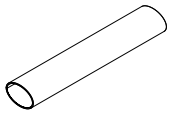
Warmup's WSR self-regulating cable features an advanced positive temperature coefficient [PTC] self-regulating core is positioned between two 16 AWG multi-strand tinned copper bus wires. These are then insulated with a modified polyolefin layer which is wrapped in a tinned copper braid for grounding.

The cable's outer jacket, made from modified polyolefin, ensures superior resistance to UV, abrasion, chemical, and mechanical wear, enhancing durability in harsh conditions.

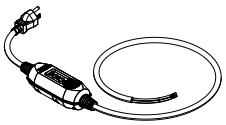
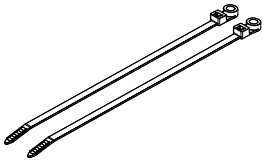
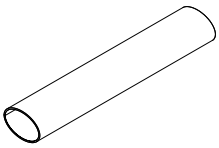
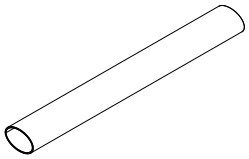
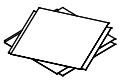
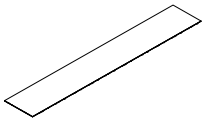
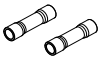


Kit Components

End Termination Kit

1 x Heat-Shrink Tube Ø ⅞" x 5 ⅛" (21 mm x 130 mm)	
1 x Braided Sleeve 4" (100 mm)	
1 x Heat-Shrink Cap Ø ⅝" x 1 ⅜" (15 mm x 35 mm)	

CRDS-15-GFCI Kit

1 x CRDS-15-GFCI		2 x Heat Shrink Tube Ø ⅛" x 1" Ø 4.5mm x 25mm	
1 x Heat Shrink Tube Ø ⅜" x 1 ⅜" Ø 10 mm x 35 mm		2 x Screw Mount Zip Tie 7 ½" 190mm	
1 x Heat-Shrink Tube Ø ½" x 1" Ø 14 mm x 25 mm		1 x Heat-Shrink Tube Ø ⅞" x 5 ⅛" Ø 21 mm x 130 mm	
1 x Heat-Shrink Tube Ø ⅞" x 7 ⅞" Ø 21 mm x 200 mm		4 x Mastic Squares	
1 x Cloth Tape 1" x 5 ⅞" 25mm x 150mm		1 x Warning Label	
2 x Insulated Crimps Ø ¼" x 1" Ø 6 mm x 24 mm		1 x Uninsulated Crimp Ø ¼" x ⅝" Ø 5.5 mm x 15 mm	

Receiving, Storing And Handling

- Identify components against the packing list to ensure the proper type and quantity has been received check corresponding documentation.
- Inspect components for damage incurred during shipping.
- Components should be checked to verify catalogue type, power rating, voltage rating, and quantity.
- Components should be examined to verify compatibility with the environmental elements that might be encountered. Special consideration should be given to the area of installation (indoor versus outdoor) and where applicable, the components should be appropriately rated for the intended application. Refer to the kit markings.
- Components should be stored in clean, dry areas and should not be released to the field until they are needed for construction so as to minimize inadvertent damage.

Tools Required For Installation

- Pliers
- Crimping Tool
- Wire cutters
- Heat Gun
- Utility knife
- Measuring tape
- Glass cloth tape

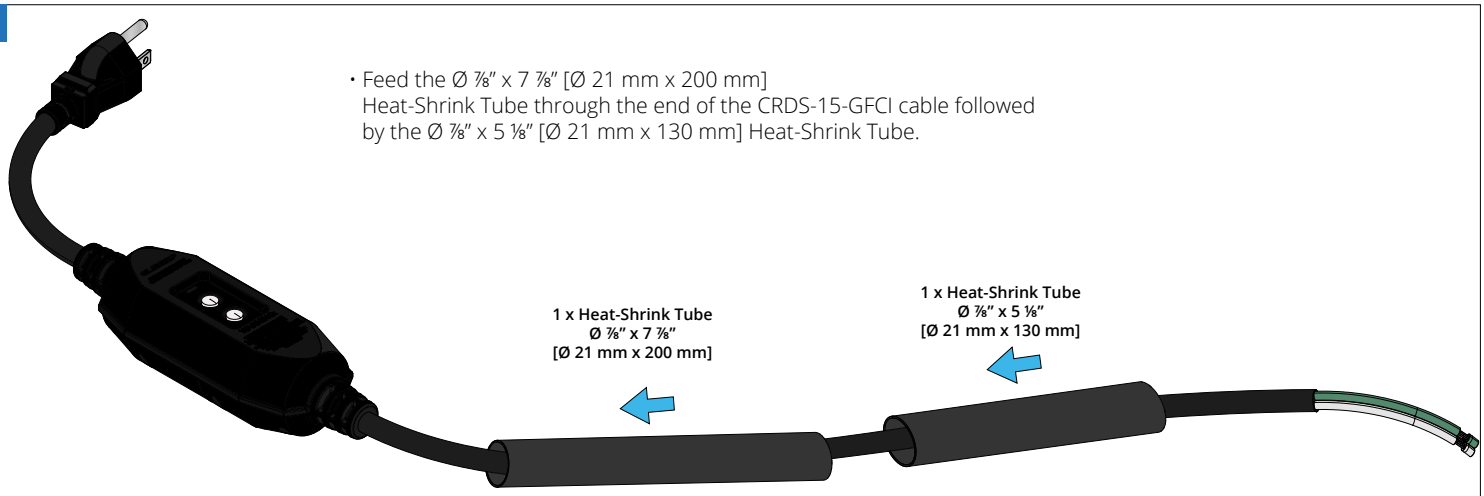
Additional Materials Required

- Grounded, UL Listed 15-amp, 120-Volt receptacle (receptacle must be approved for wet locations if exposed to weather)
- Your chosen application may require additional components; for example, tapes for pipe applications; Roof clips and/or downspout hangers for roof and gutter de-icing applications.

Please read these instructions carefully before beginning installation.
Failure to do so could result in electric shock or fire.
CAUTION: a ground fault protection device must be used with this heating device
ATTENTION : ce produit doit être utilisé avec une protection de mise à la terre

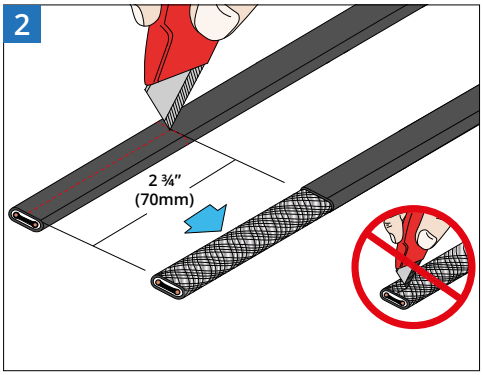
- Before installation, servicing or maintenance, the cables MUST be de-energized. The branch-circuit switch or circuit breaker supplying the equipment shall be placed in the OPEN (OFF) position and secured with a lockout device. This lockable disconnecting means shall simultaneously disconnect all ungrounded conductors and must comply with NEC/CEC requirements.
- To reduce the risk of shock or fire ground-fault equipment protection with a 30mA trip level must be installed on each heating cable branch circuit.
- The self-regulating cable and its components must be installed in accordance with the National Electrical Code [NEC] and Canadian Electrical Code [CEC] and any other applicable national and local codes. Review their requirements prior to installation.
- When installation is complete, an insulation resistance test should be conducted with a test voltage of at least 500 V dc using a megohmmeter between the self-regulating cable bus wires and the metallic braid. IEEE 515.1 recommends that the test voltage for polymer insulated heating cables be 2500 Vdc. Minimum resistance should be 20 MΩ. After the application of thermal insulation, the measured value of the entire branch circuit should not be less than 5 MΩ.
- The tinned copper braid must be connected to a suitable grounding/earthing terminal.
- Bus wires will short if they contact each other. Keep bus wires separated. Damage to the bus wires can result in overheating or short circuits. Take care when removing the jacket or core insulation to prevent damage to the braid or bus wires.
- Do not replace or substitute components. Only the components supplied in the CRDS-15-GFCI are approved for use. Using incompatible components may cause, electric shock, or dielectric failure, and will void all approvals and certifications.
- Ensure you have the correct type of Warmup components for your installation. To maintain cCSAus compliance, only Warmup approved components may be used with WSR Self-Regulating Cable.
- The equipment [cable and components] shall be installed such that the cable is protected from mechanical damage. The cable shall not be subjected to tension or torque.
- Ensure that you have the correct type and size of self-regulating cable for your installation (wattage output and voltage rating). Ensure that connection kits and cable ends are kept dry before and during installation.
- Connections should not be located in an area where moisture is present and should not be located at the lowest point of downspouts.
- The minimum bending radius of the cable is 1¼" (30 mm). Do not bend on the narrow axis.
- DO NOT connect power to the cable while it is on the reel.
- The minimum installation temperature for the cable is -4°F (-20°C) when use with integral component kits and -40°F (-40°C) when use with enclosure kits.
- The presence of the self-regulating cable shall be made evident by the posting of waning signs where clearly visible. For Roof & Gutter applications apply with supplied warning label on circuit breaker panels, contactor panels and junction boxes. For Pipe Trace applications, warning labels at intervals not exceeding 6 m (20 ft) along the pipeline or vessel and on or adjacent to equipment in the piping system that requires periodic servicing.
- Person(s) involved in the installation, testing and maintenance of self-regulating heating systems shall be suitably trained in all special techniques required. Installations are intended to be carried out under the supervision of a qualified persons.
- The person(s) responsible for installation shall verify that the installation and inspection are performed by personnel who are trained, qualified, and knowledgeable in trace heating systems. The installation and inspection shall be in accordance with Warmup's design documents, product recommendations, and installation instructions.
- The proposed installation shall be verified for the proper selection of self-regulating cable and component systems identified for the application. Warmup's documentation shall be reviewed for specific installation requirements and the proposed installation shall be verified that the heating system is compatible with the environment.
- Leave these installation instructions with the user for future reference. The self-regulating heating system [cable and components] documentation shall be retained for each self-regulating heating circuit for as long as the system is in use.
- The CRDS-15-GFCI instructions must be used with reference to the installation instructions for the WSR Self-Regulating cable.

1



- Feed the Ø ⅞" x 7 ⅞" [Ø 21 mm x 200 mm] Heat-Shrink Tube through the end of the CRDS-15-GFCI cable followed by the Ø ⅞" x 5 ⅛" [Ø 21 mm x 130 mm] Heat-Shrink Tube.

2



- Measure and mark approximately 2 ¾" (70mm) from the end of the heating cable on the outer jacket.
- Lightly score the outer jacket as shown, ensuring you DO NOT cut the ground braid or inner jacket. Bend the cable to break the outer jacket.

NOTE: It is better to do multiple shallow scores to the outer jacket than go too deep and cut the braid.

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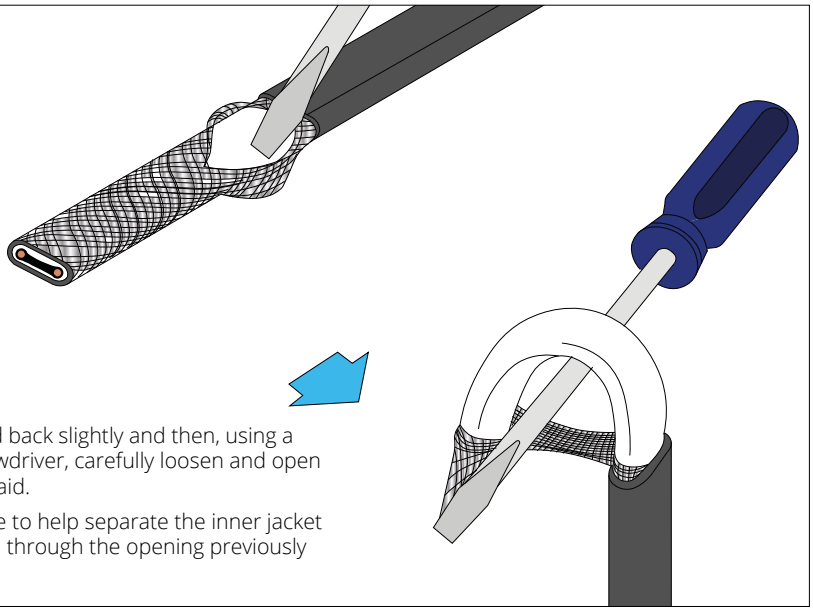

- Push the braid back slightly and then, using a flat-head screwdriver, carefully loosen and open the ground braid.
- Bend the cable to help separate the inner jacket from the braid through the opening previously made.

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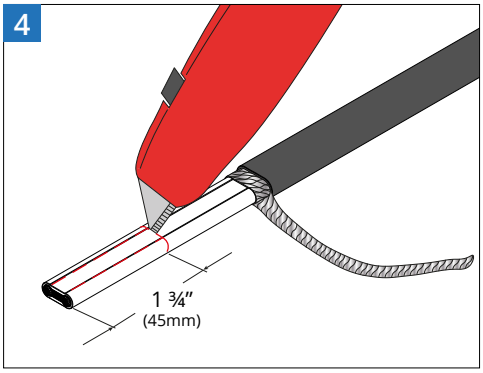

- Straighten the ground braid and leave to one side.
- Measure and mark approximately 1 ¾" [45mm] down the inner insulation.
- Slice the inner insulation layer as shown. Bend the cable to break the inner jacket and remove.

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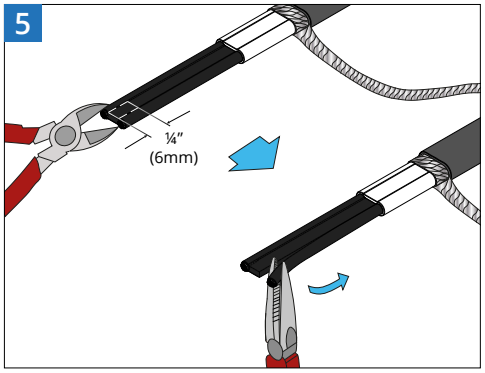

- Using wire cutters, create a ¼" (6mm) cut as close to and parallel with the bus wires.
- Using pliers, peel back the bus wire from the exposed length of self-regulating conductive core down to the inner insulation.

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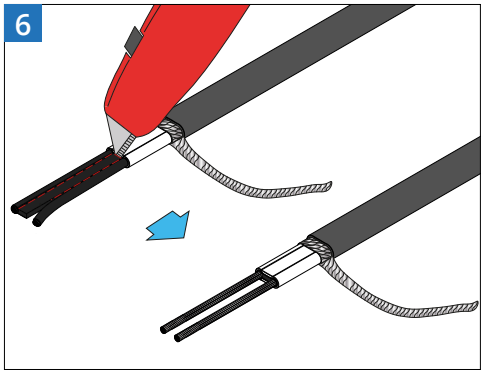

- Carefully slice and remove the self-regulating conductive core with the utility knife, ensuring you DO NOT CUT the bus wires.
- Ensure all of the core and any remaining materials are removed from the bus wires.

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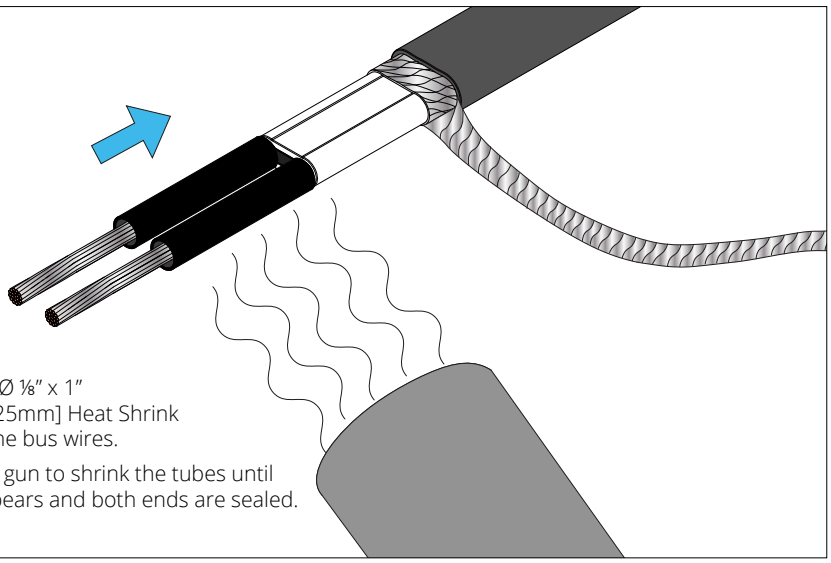
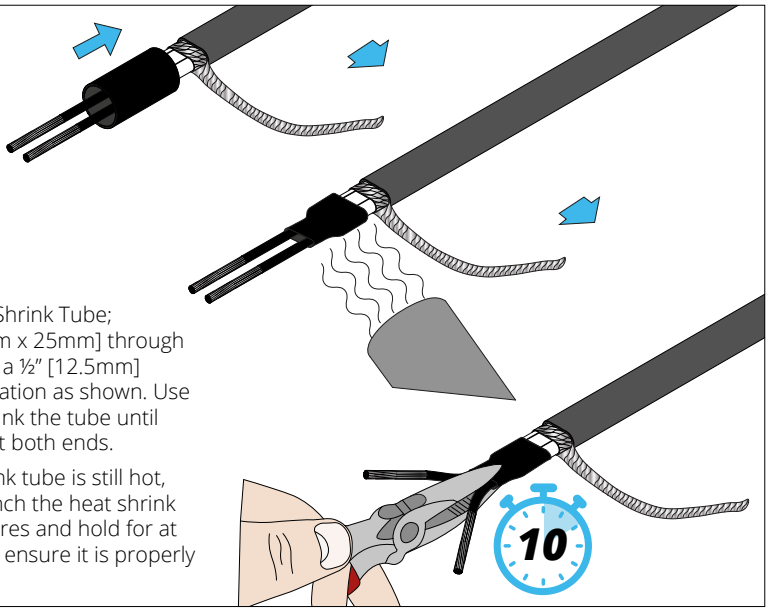


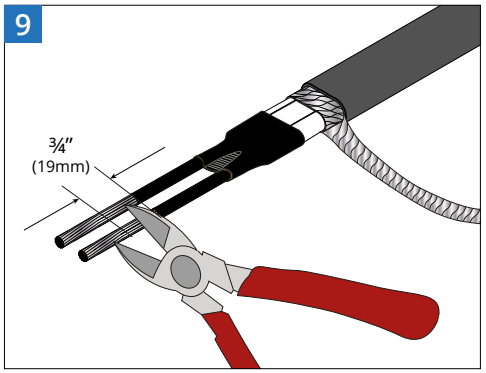
- Slide the 2 x Ø ⅛" x 1" [Ø 4.5mm x 25mm] Heat Shrink tubes onto the bus wires.
- Use the heat gun to shrink the tubes until adhesive appears and both ends are sealed.

8



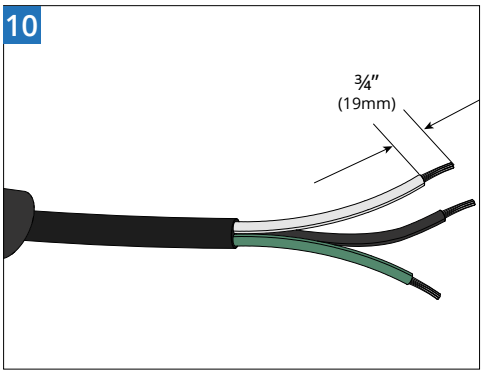
- Place the 1 x Heat-Shrink Tube; Ø ½" x 1" [Ø 12.5mm x 25mm] through both bus wires and a ½" [12.5mm] over the inner insulation as shown. Use the heat gun to shrink the tube until adhesive appears at both ends.
- While the heat shrink tube is still hot, use the pliers to pinch the heat shrink between the bus wires and hold for at least 10 seconds to ensure it is properly sealed.

9



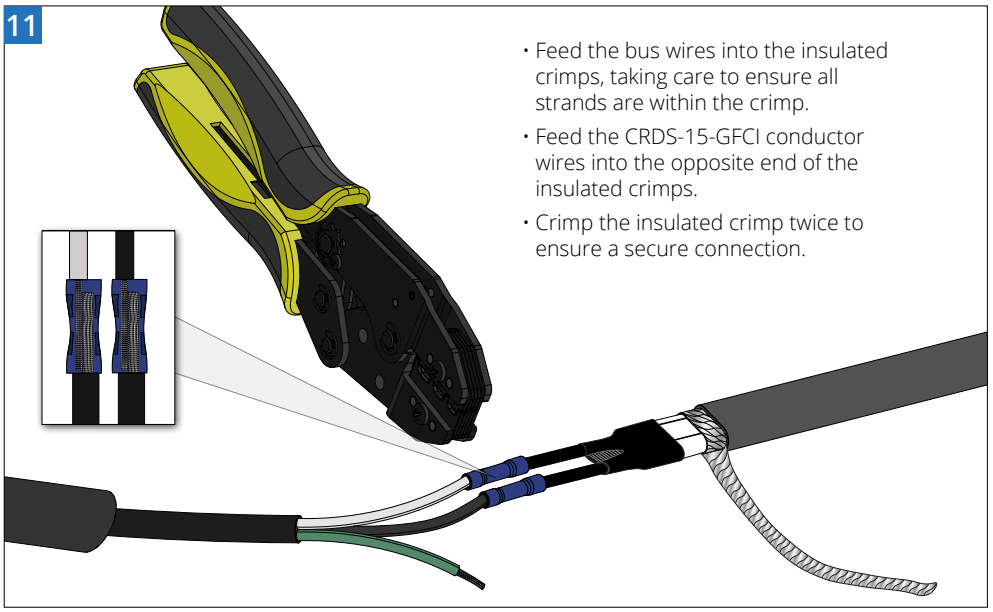
- Snip the bus wires so that there is ¾" (19mm) exposed.

10



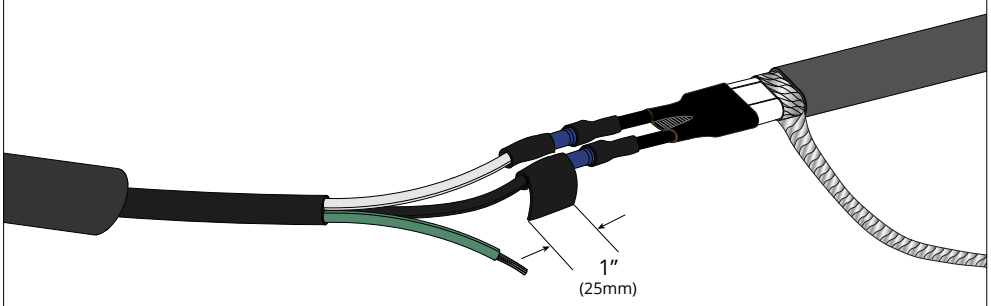
- Strip the insulation from CRDS-15-GFCI cables so that there is ¾" (19mm) conductors exposed.

11



- Feed the bus wires into the insulated crimps, taking care to ensure all strands are within the crimp.
- Feed the CRDS-15-GFCI conductor wires into the opposite end of the insulated crimps.
- Crimp the insulated crimp twice to ensure a secure connection.

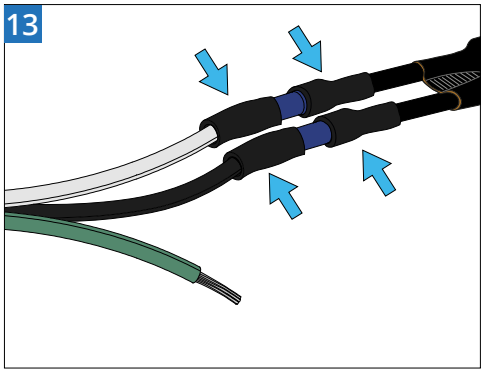
12



- Remove the release paper from the mastic strips.
- Wrap the mastic strips around the crimps and cables, positioning them halfway between the CRDS-15-GFCI conductors and the insulated crimps to form a watertight seal.

  NOTE: Ensure all release paper has been removed from the mastic strips before application.

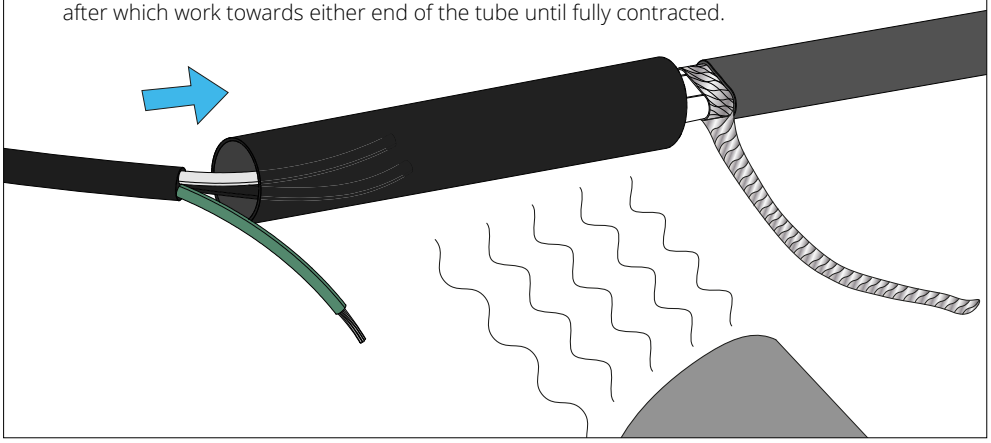
13



- Press the Mastic Strips together.

14

- Slide the Ø ⅞" x 5 ⅛" (Ø 21 mm x 130mm) Heat-Shrink Tube over the crimped bus wires and CRDS-15-GFCI cables.
- Apply the heat to the centre of the heat shrink initially until the tube begins to contract after which work towards either end of the tube until fully contracted.



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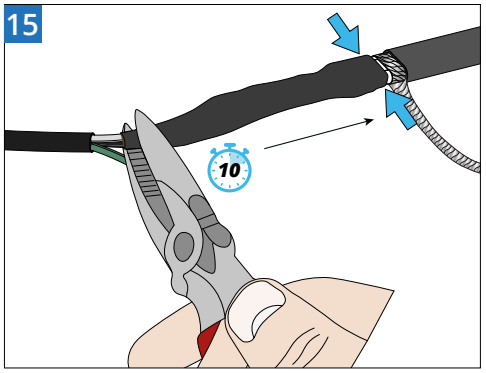
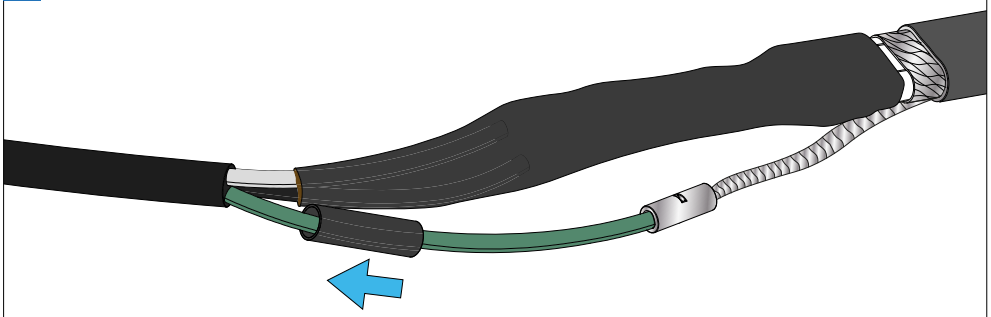


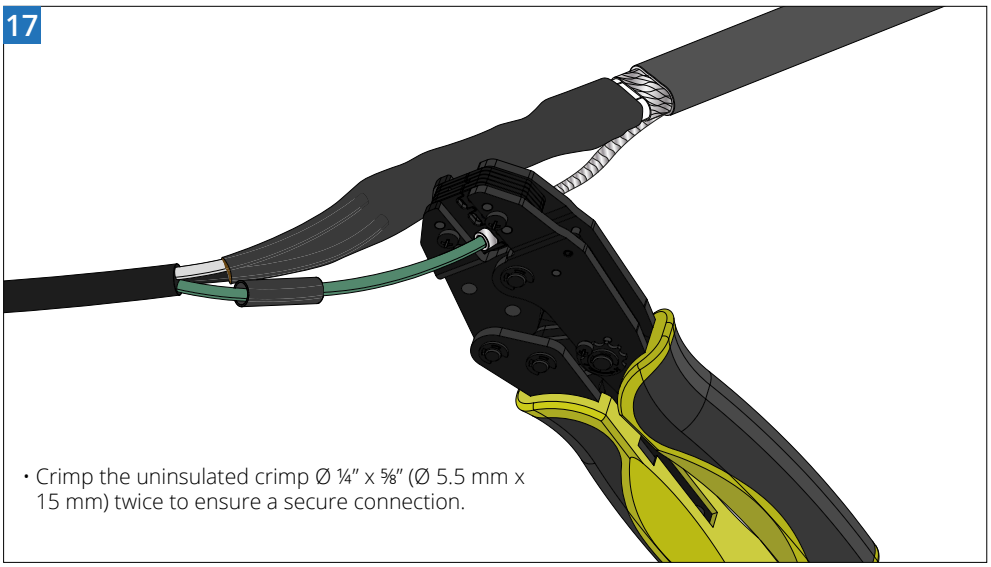
- Once the adhesive from the heat shrink appears at both ends, pinch the end and hold for 10 seconds to ensure it is properly sealed. Repeat for the opposite side of the heat shrink.

16



- Next slide the Ø ⅜" x 1 ⅜" (Ø 10 mm x 35 mm) Heat-Shrink Tube over the CRDS-15-GFCI ground cable.
- Then place the uninsulated crimp Ø ¼" x ⅝" (Ø 5.5 mm x 15 mm) onto the CRDS-15-GFCI ground cable and then feed the WSR ground braid into the crimp, taking care to ensure all strands are within the crimp..

17



- Crimp the uninsulated crimp Ø ¼" x ⅝" (Ø 5.5 mm x 15 mm) twice to ensure a secure connection.

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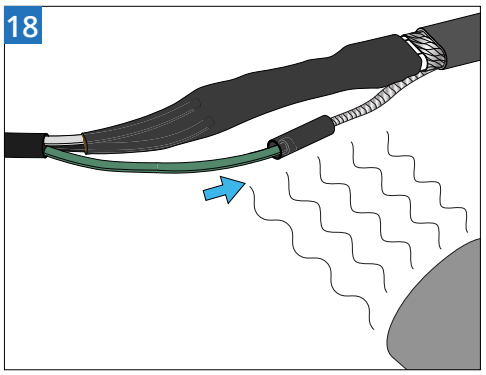
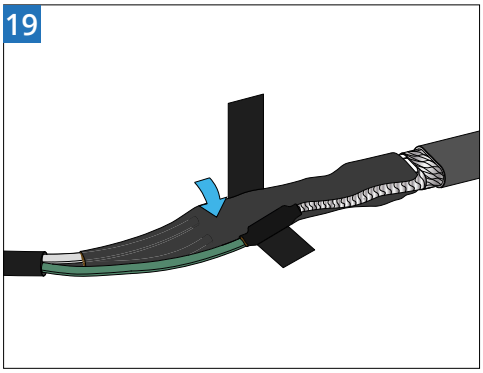


- Slide the Ø ⅜" x 1 ⅜" (Ø 10 mm x 35 mm) Heat-Shrink Tube back over the uninsulated crimp.
- Apply the heat to the heat shrink until the tube begins to contract and adhesive is seen from both ends.

19



- Position the small heat shrink against the large heat shrink.
- Wrap the Cloth Tape 1" x 5 ⅞" (25mm x 150mm} around the joint to hold it in position.

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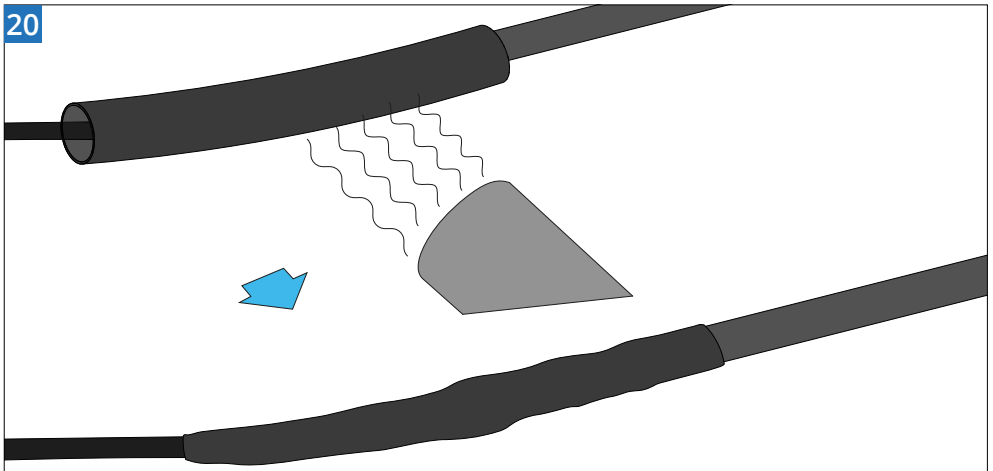
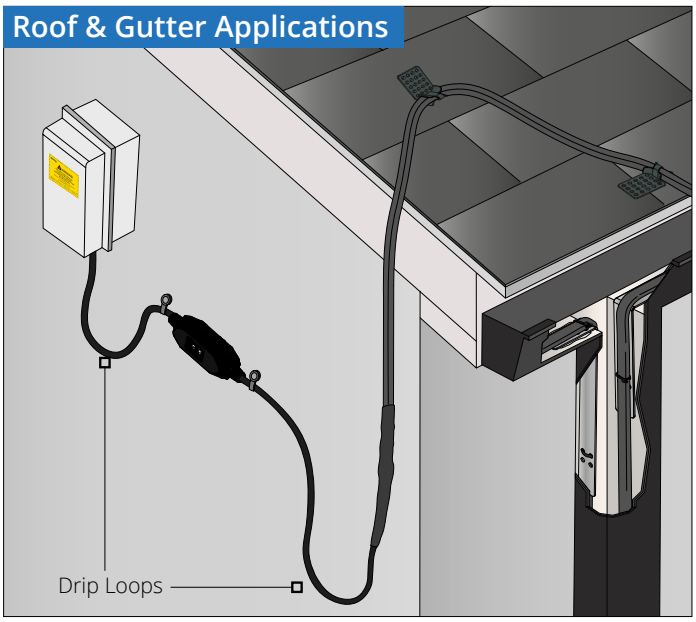


- Slide the Ø ⅞" x 7 ⅞" (Ø 21 mm x 200 mm) heat shrink tube back, centering it over the joint.
- Apply the heat to the centre of the heat shrink initially until the tube begins to contract after which work towards either end of the tube until fully contracted and adhesive appears at both ends.

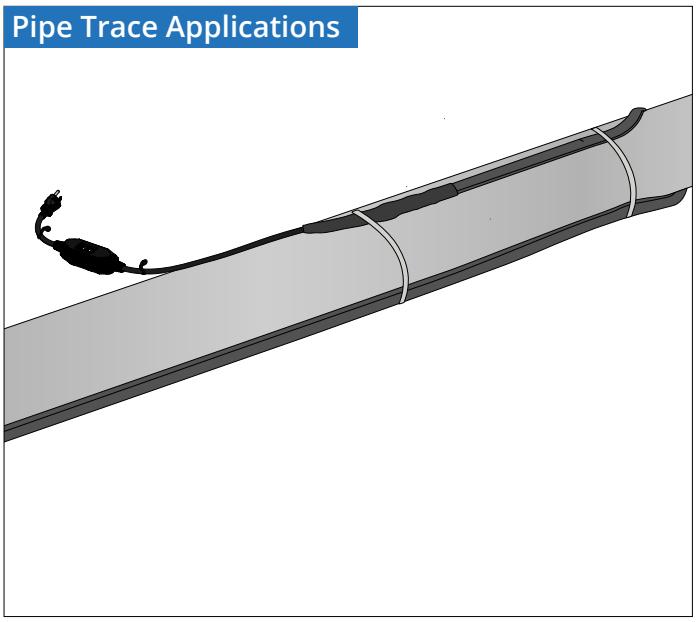
Roof & Gutter Applications



- Secure the CRDS-15-GFCI MUST to the exterior wall using UV-resistant clamp ties to provide strain relief and prevent damage to the receptacle and the CRDS-15-GFCI. The device and its splice connection must be high enough to avoid submersion in water, burial in snow or damage.
- Ensure you apply a drip loop to the cable to prevent water tracking into the CRDS-15-GFCI.
- Apply the Warning Label to the outside of the weatherproof receptacle.

  NOTE: To ensure compliance with NEC/CEC the CRDS-15-GFCI MUST only be connected to a 120 VAC, 15-Amp grounded receptacle rated for wet locations.

Pipe Trace Applications



- Secure the CRDS-15-GFCI MUST to the wall near the receptacle using UV-resistant clamp ties to provide strain relief and prevent damage to the receptacle and the CRDS-15-GFCI. The device and its splice connection must be high enough to avoid submersion in water, burial in snow or damage.
- Ensure you apply a drip loop to the cable to prevent water tracking into the CRDS-15-GFCI.
- Apply the Warning Label to the pipe insulation once installed. For pipe trace applications, warning labels must be intervals not exceeding 6m (20 ft) along the pipeline or vessel and on or adjacent to equipment in the piping system that requires periodic servicing.

  NOTE: To ensure compliance with NEC/CEC the CRDS-15-GFCI MUST only be connected to a 120 VAC, 15-Amp grounded receptacle rated for wet locations.

Maintenance

A system inspection for freeze protection systems is recommended before the winter season. Category II systems should be inspected annually. All observations and measured values (as appropriate) should be recorded on a log sheet.

Caution: Always consult the self-regulating cable heating system documentation [cable & components] prior to maintenance / repair / modification.

The full maintenance requirements, including maintenance log sheet, are detailed in the WSR Self-Regulating cable manual. The CRDS-15-GFCI instructions must be used with reference to the installation instructions for the WSR Self-Regulating cable manual. Some maintenance procedures for the CRDS-15-GFCI include:

- Junction boxes should be checked to verify that they are free of moisture and water.
  The thermal insulation and weather barrier should be inspected and repaired as needed.
- The electrical insulation resistance of each circuit should be measured and recorded.
- Major changes in insulation resistance or trace heater current should be resolved. In the event of an earth fault or over current interruption, the device shall not be reset until the cause of the trip has been investigated by qualified personnel.

Model	CRDS-15-GFCI
Operating Voltage	120 V AC
Maximum Circuit Size	≤12A
Connection	5-15P attachment plug
Minimum Recommended Installation Temperature	- 4°F (- 20°C)
Maximum Continuous Exposure Temperature	185°F (85°C)
Protection	Class A 5 mA Ground Fault Circuit Interrupter [GFCI]
Specific Weight	14 oz (400 g)

Contact

Warmup is available 24/7/365 at (888) 927-6333
For quotes, layouts and specific technical information contact us at:

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