

DEF-Trac[®]

Design and Installation Guide

June 2023



megaFlex[®]

DEF-Trac®

Featuring a Flexible Corrugated Stainless Steel Core



 **OmegaFlex**®

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1. USER WARNINGS

The OmegaFlex® DEF-Trac® flexible piping system must only be installed or serviced by a qualified installer who has been trained by an OmegaFlex® authorized trainer. The use of nontrained personnel or any deviations from these instructions could result in damage to or leakage of the system.

▲ WARNING!

Leakage of fluid from the DEF-Trac® flexible piping system could cause contamination of the ground and/or ground water, and possibly cause bodily injury. These installation instructions and all applicable codes and regulations must be strictly followed.

This document provides the user with general instructions for the design and installation of DEF-Trac® flexible piping systems. Sound engineering principles and compliance with applicable codes and regulations must be exercised for the proper design and installation of the DEF-Trac® flexible piping system. The installation instructions and procedures contained in this Design Guide must be strictly followed in order to provide a safe and effective flexible piping system or system modification.

This information deals primarily with DEF-Trac® flexible piping system. Other components may have their own individual installation instructions provided by the equipment manufacturer. The installation instructions provided by all component manufacturers must be followed for the piping system to operate safely as designed.

At the completion of work this installation information must be given to the site operator or owner.

1.1 DEF-TRAC® FLEXIBLE PIPING SYSTEM

DEF-Trac® flexible piping system addresses the emerging needs of the DEF supply industry. Unaffected by corrosive effects of DEF, DEF-Trac® insulated flexible piping systems are manufactured from corrugated 316L stainless steel, and supplied in long coils to streamline the installation of the distribution piping from the storage of the dispensing pumps.

2. DESIGN SPECIFICATIONS

Maximum Operating Pressure: 50 psig
 Maximum Test Pressure: 75 psig
 Operating Temperature Range: -20°F to +120°F

**Table 1
 Technical Specifications**

SIZE NOMINAL ID	PART NO.	MINIMUM BEND RADIUS (INCHES)	WT/FT (LBS)	NOMINAL OD (INCHES)
1"	DF-FSP-16	7	0.30	1.41
1½"	DF-FSP-24	12	0.50	1.93
2"	DF-FSP-32	14	0.75	2.51
1"	DF-FSPHT-16	18	1.10	2.65
1½"	DF-FSPHT-24	30	1.40	3.15
2"	DF-FSPHT-32	35	1.85	3.50

3. INSPECTION / HANDLING / STORAGE

Inspect all piping, fittings and components when they arrive at the job site. Any piping that has been cut, crushed, or otherwise subjected to physical damage during transportation or storage shall be discarded and never used. The piping and fittings shall be handled in such a manner that will not cause any damage. Keep all components in the original packaging until ready for use. Inspect fittings prior to installation.

4. TOOLS REQUIRED FOR INSTALLATION

DEF-Trac® flexible piping systems can be installed utilizing standard hand tools (Figure 4-1).

- Adjustable wrenches or pipe wrenches
- Utility knife
- Tubing cutter with sharp wheel
- Heat gun
- 5/16" hex nut driver or slotted screwdriver

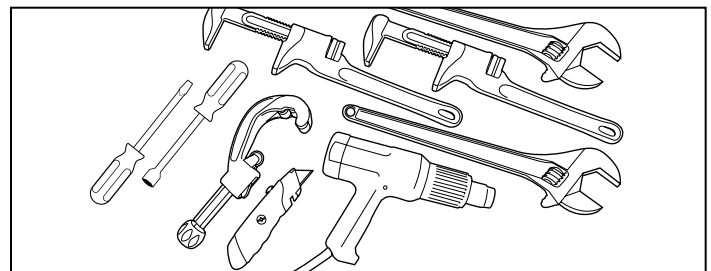


Figure 4-1

5. DEF-TRAC / INSULATED – HEAT TRACED FITTING ASSEMBLY PROCEDURE WITH HEAT SHRINKSLEEVES

FITTING ASSEMBLY PROCEDURE with Heat Shrink Sleeves

▲ CAUTION

- DEF-Trac® flexible piping system is manufactured using Thermon BSX 3-1 (1" DEF-Trac®) & BSX 5-1 (1½" & 2" DEF-Trac®) heat trace.
- Thermon BSX 3-1, & BSX 5-1 heat trace can only be powered using 120vac.
- Per NEC Article 427-22, all heat tracing circuits must have GFI – equipment protection on the circuit.
- DEF-Trac® controller P/N# DF-FPT130 has the EPD (30MA GFI trip) protection built in.

5.1. CUT TO LENGTH / REMOVE JACKET FOR FITTING ATTACHMENT

Determine the proper rough-cut length, cut with a reciprocating saw. After measuring and making the cut for the overall length, remove a minimum of 20 inches of the outer most black jacket and insulation. **Some installations require more outer jacket and insulation to be removed. Refer to Table 2 for jacket removal examples.** (Figure 5-1).

NOTE

Some installations require more inner jacket to be removed. Refer to table 2 for inner jacket removal examples.

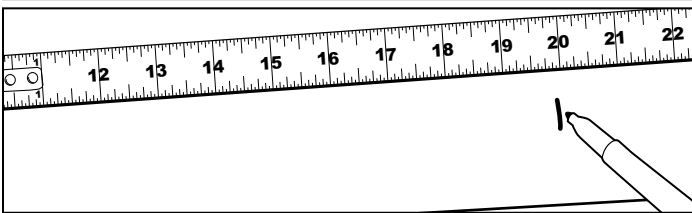


Figure 5-1

Cut through the black plastic layer using a utility knife and remove (Figure 5-2).

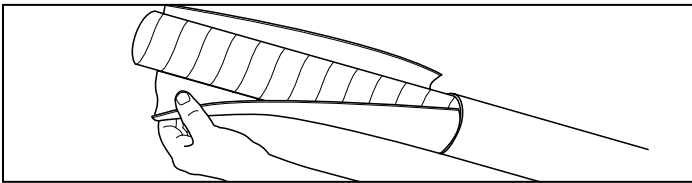


Figure 5-2

Cut through the insulation and remove. Do not remove the innermost black jacket. Use care to avoid any damage to the heat trace and corrugated piping while removing the insulation (Figure 5-3).

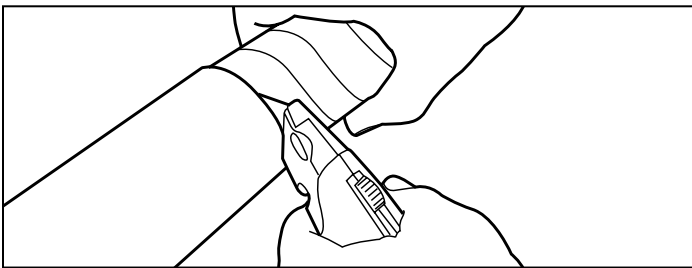


Figure 5-3

CAUTION

Heat trace is helically wound on piping. Use care when cutting jacket and insulation.

Stripped end with helically wound cable (Figure 5-4) and fully stripped end with cable unwound (Figure 5-5).

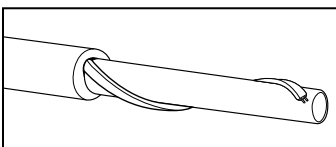


Figure 5-4

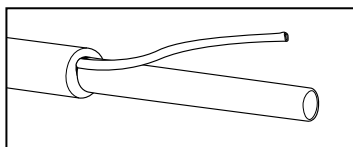


Figure 5-5

5.2. SEAL HEAT SHRINK SLEEVE (OUTER JACKET)

Slide up the heat shrink sleeve to cover the tubing bundle. About 1/2 of the sleeve should be covering the tubing bundle and 1/2 should be on the corrugated piping with innermost black jacket. The heat trace cable must be underneath the heat shrink sleeve. Using a heat gun, carefully shrink down the sleeve without overheating the inner jacket (Figure 5-6).

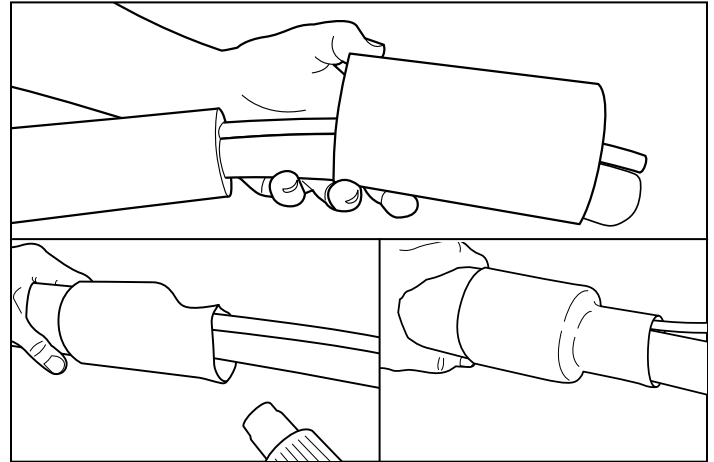


Figure 5-6

5.3. PRECISION CUT

From the end of the pipe measure a minimum of 11" and place a mark. Using a utility knife carefully remove innermost black jacket, exposing the stainless-steel piping. **Some installations require more inner jacket to be removed. Refer to Table 2 for inner jacket removal examples.** (Figure 5-7).

NOTE

Some installations require more inner jacket to be removed. Refer to table 2 for inner jacket removal examples.

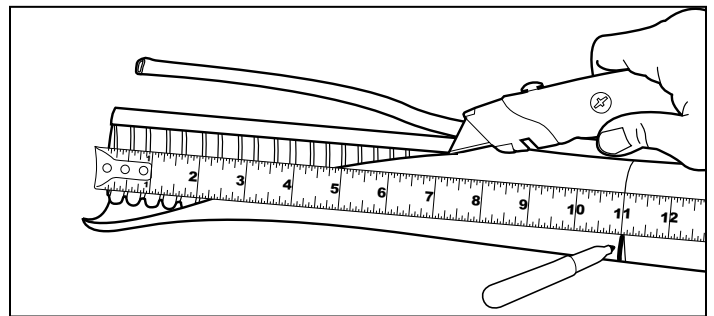


Figure 5-7

Table 2
Examples of Strip Back Lengths per/situation

Outer Jacket	Inner Jacket	Situation
20"	11"	Minimum Strip Back
60"	12"	In UDC Sump
30"	21"	In Tank Sump
36"	27"	Canopy top across NPT TEE
68"	24"	Sweep Up into Y fitting

Important Information Follow All Instructions

Slide the nut over the core until it bottoms out on the black jacket. Place a mark on the top of the first two corrugations past where the split rings will sit (Figure 5-8).

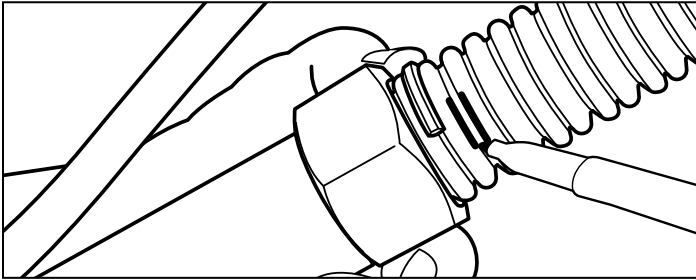


Figure 5-8

Remove the nut and cut through the corrugated piping using a tubing cutter with a sharp wheel. Cut must be centered in the valley between the two marked corrugations (Figure 5-9).

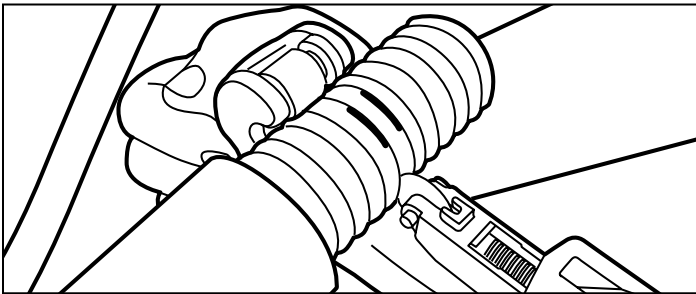


Figure 5-9

Use full circular strokes in one direction and tighten roller pressure slightly after each revolution. DO NOT over-tighten roller which may flatten tube.

5.4. HEAT SHRINK SLEEVE (Inner Jacket)

Slide the inner jacket heat shrink sleeve over the corrugated piping and underneath the heat trace cable (Figure 5-10).

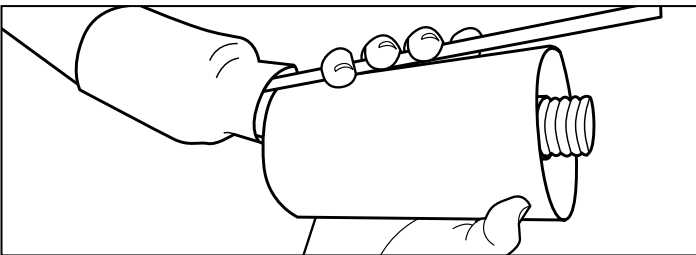


Figure 5-10

5.5. INSTALL FITTING NUT

Slide nut over cut tube end (Figure 5-11).

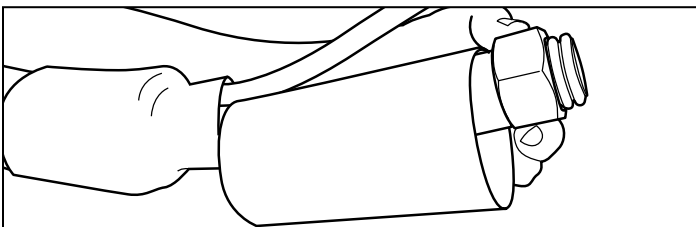


Figure 5-11

Place two split-rings into the valley of the first corrugation. Slide nut forward to trap the split rings (Figure 5-12).

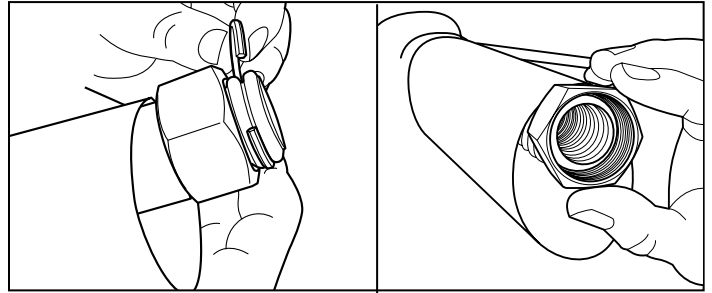


Figure 5-12

5.6. TIGHTEN FITTING

Thread the adapter into the mating piece of equipment (elbow, tee, valve etc.). Thread the nut into the adaptor and engage threads. Note that the fitting is designed to form a leak tight seat on the stainless tubing as you tighten the fitting. Using appropriate wrenches; tighten the fitting until the adaptor bottoms and the resistance to wrenching increases greatly. Tighten the nut and adaptor to the torque listed in Table 3.

**Table 3
Minimum Torque Requirements**

Size	Minimum Torque
1"	150 ft-lbs
1½"	275 ft-lbs
2"	300 ft-lbs

Note the relation between the hex flats at this point and continue to tighten for two additional hex flats (one-third turn) to obtain required torque and final leak tight seal. The flare has now been created on the tubing end creating the metal to metal seal (Figure 5-13).

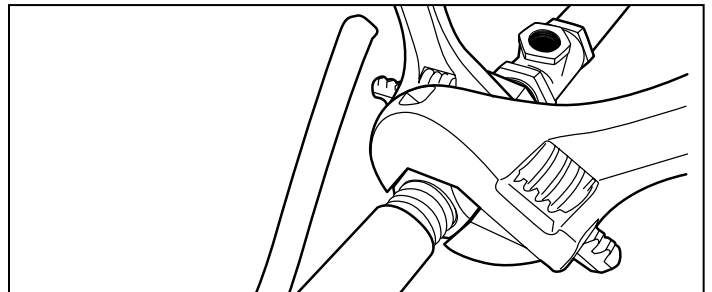


Figure 5-13

SEALANTS ARE ONLY TO BE USED ON THE PIPE THREAD.

▲ CAUTION

Do not use any thread sealants on the straight threads, the grease on the sealing seat is to lubricate the connector when tightening. If for any reason the grease is removed, lithium based grease applied to the sealing surface will be adequate.

5.7. TIGHTNESS TESTING

Before shrinking the heat shrink sleeve over the nut, and prior to backfilling, the piping system must be isolated from the tanks and subjected to a pipe tightness test.

DEF-Trac® flexible piping system is recommended to be pressurized with air to a maximum of 25 psi. Maintain this pressure for one hour ensuring there is no drop in pressure. Additionally spray fitting with a non-corrosive leak check solution and look for bubbles. Once all heat shrink sleeves (inner and outer) are completed a 75psig max pressure test can be completed if required by code.

5.8. SEAL HEAT SHRINK SLEEVE (INNER JACKET)

Slide up the heat shrink sleeve to fully cover the back hex nut. Using a heat gun, carefully shrink down the sleeve without overheating the inner jacket (Figure 5-13).

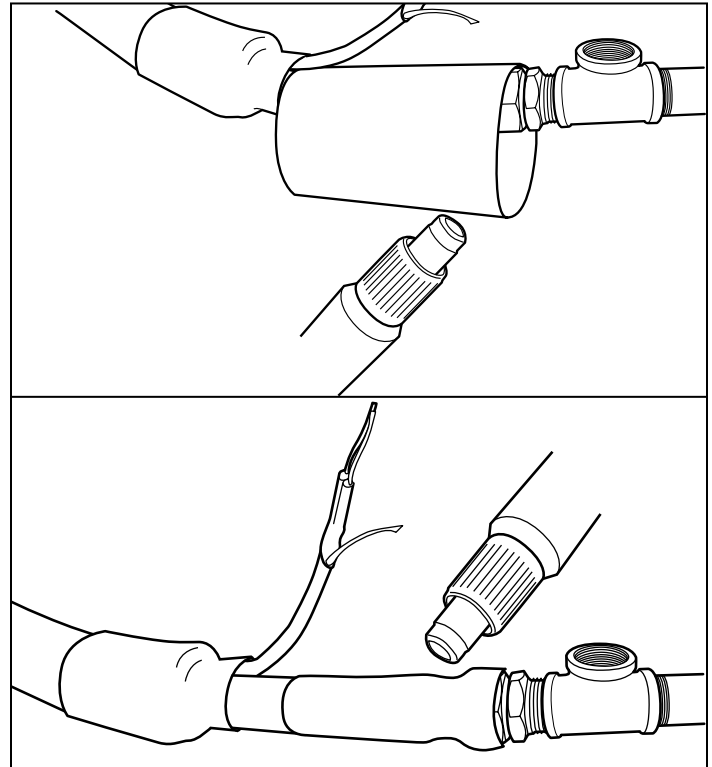


Figure 5-13

TYPICAL INSULATED HEAT-TRACED END CONFIGURATION (Figure 5-14)

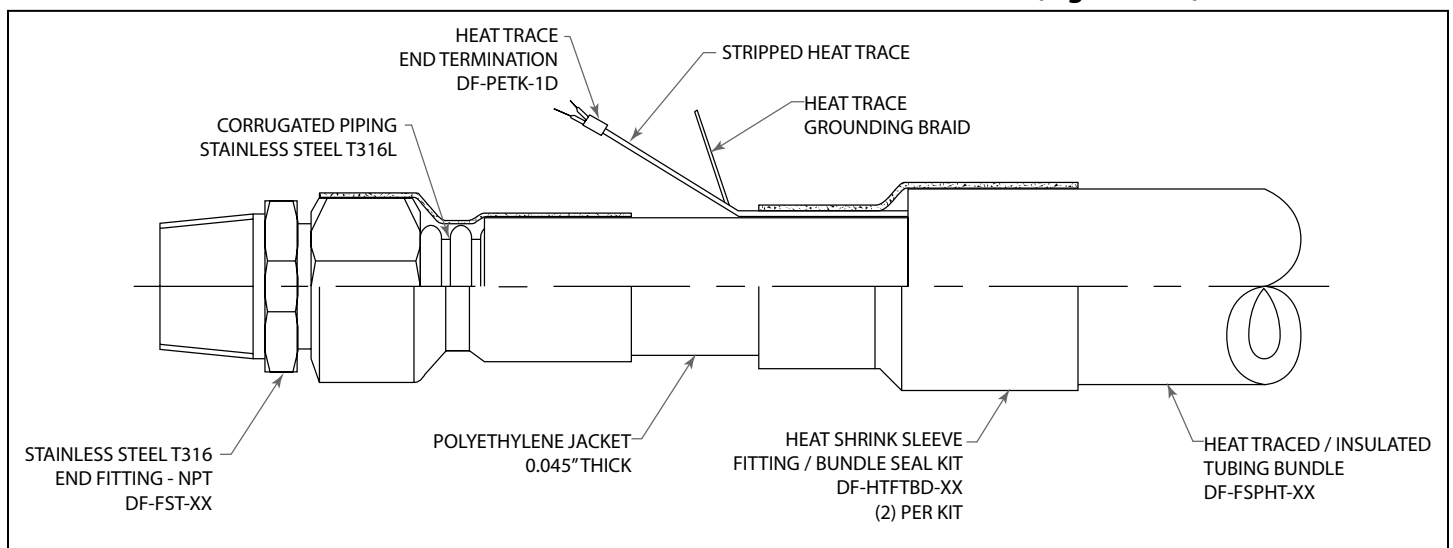


Figure 5-14

▲ CAUTION

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- Thermon BSX 3-1, & BSX 5-1 heat trace can only be powered using 120vac.
- Per NEC Article 427-22, all heat tracing circuits must have GFI – equipment protection on the circuit.
- DEF-Trac® controller P/N# DF-FPT130 has the EPD (30MA GFI trip) protection built in.

6. DEF-Trac / UN-INSULATED, NON-HEAT TRACED

6.1. CUT TO LENGTH / REMOVE JACKET FOR FITTING ATTACHMENT

Determine the proper rough cut length, cut with a reciprocating saw. Remove the black jacket exposing 5" of bare corrugated piping (Figure 6-1).

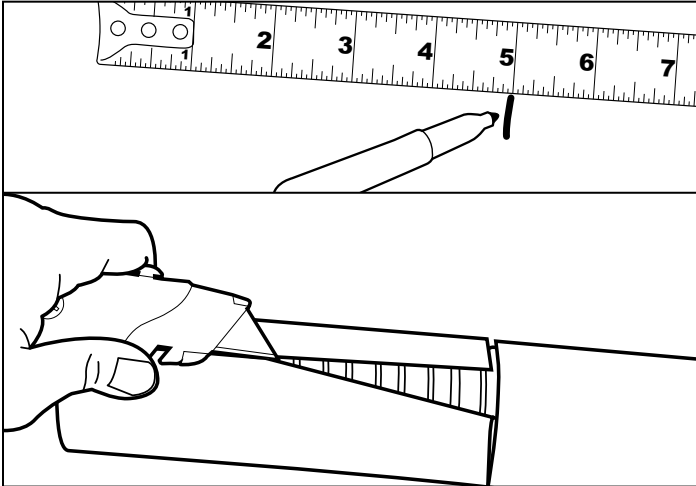


Figure 6-1

Slide the nut over the core until it bottoms out on the black jacket. Place a mark on top of the first two corrugations past where the split rings will sit (Figure 6-2).

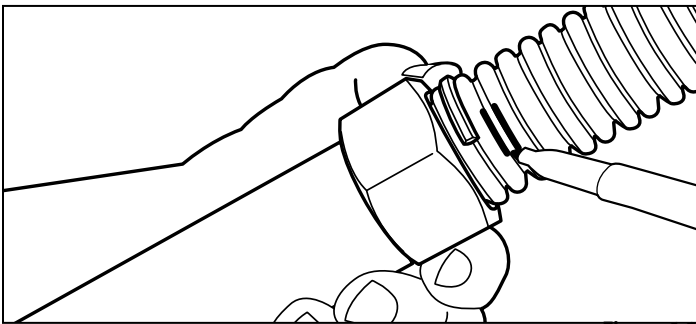


Figure 6-2

Remove the nut and cut through the corrugated piping using a tubing cutter with a sharp wheel. Cut must be centered in the valley between the two marked corrugations (Figure 6-3).

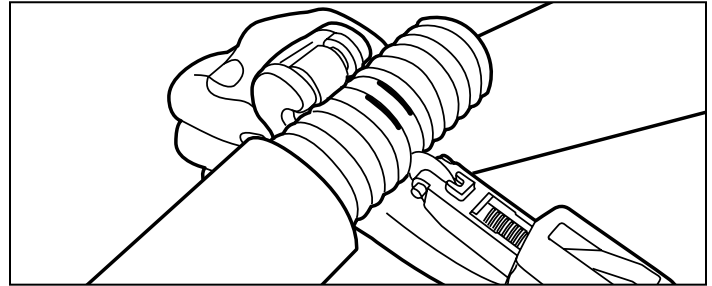


Figure 6-3

Use full circular strokes in one direction and tighten roller pressure slightly after several revolutions. DO NOT over tighten roller which may flatten tube.

6.2. HEAT SHRINK SLEEVE

Slide on one heat shrink sleeve (Figure 6-4).

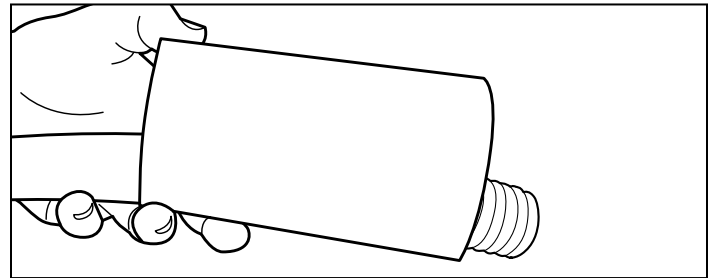


Figure 6-4

6.3. INSTALL FITTING NUT

Slide nut over cut tube end (Figure 6-5).

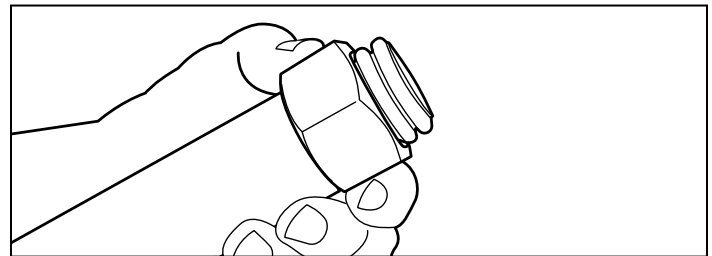


Figure 6-5

Place two split-rings into the valley of the first corrugation. Slide nut forward to trap the split rings (Figure 6-6).

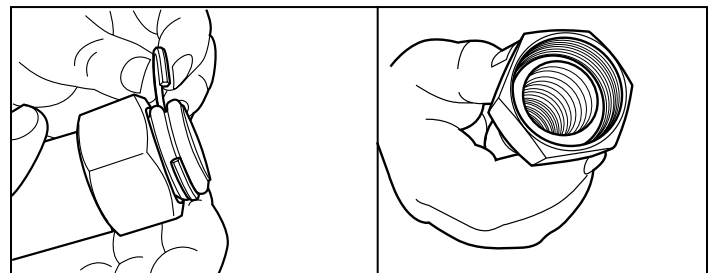


Figure 6-6

6.4. TIGHTEN FITTING

Thread the adapter into the mating piece of equipment (elbow, tee, valve etc.). Thread the nut into the adaptor and engage threads. Note that the fitting is designed to form a leak tight seat on the stainless tubing as you tighten the fitting. Using appropriate wrenches; tighten the fitting until the adaptor bottoms and the resistance to wrenching increases greatly. Tighten the nut and adaptor to the torque listed in Table 4.

**Table 4
Minimum Torque Requirements**

Size	Minimum Torque
1"	150 ft-lbs
1½"	275 ft-lbs
2"	300 ft-lbs

Note the relation between the hex flats at this point and continue to tighten for two additional hex flats (one-third turn) to obtain required torque and final leak tight seal. The flare has now been created on the tubing end creating the metal to metal seal (Figure 6-7).

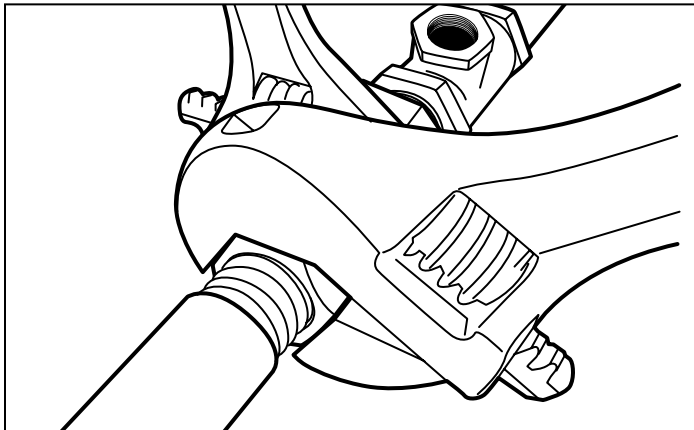


Figure 6-7

SEALANTS ARE ONLY TO BE USED ON THE PIPE THREAD.

▲ CAUTION

Do not use any thread sealants on the straight threads, the grease on the sealing seat is to lubricate the connector when tightening. If for any reason the grease is removed, lithium based grease applied to the sealing surface will be adequate.

6.5. TIGHTNESS TESTING

Before shrinking the heat shrink sleeve over the nut, and prior to backfilling, the piping system must be isolated from the tanks and subjected to a pipe tightness test.

DEF-Trac® flexible piping system is recommended to be pressurized with air to a maximum of 25 psi. Maintain this pressure for one hour ensuring there is no drop in pressure. Additionally, spray fitting with a non-corrosive leak check solution and look for bubbles. Once all heat shrink sleeves are completed a 75psig max pressure test can be completed if required by code.

6.6. SEAL HEAT SHRINK SLEEVE

Slide up the heat shrink sleeve to fully cover the back hex nut. Using a heat gun, carefully shrink down the sleeve without overheating the inner jacket (Figure 6-8).

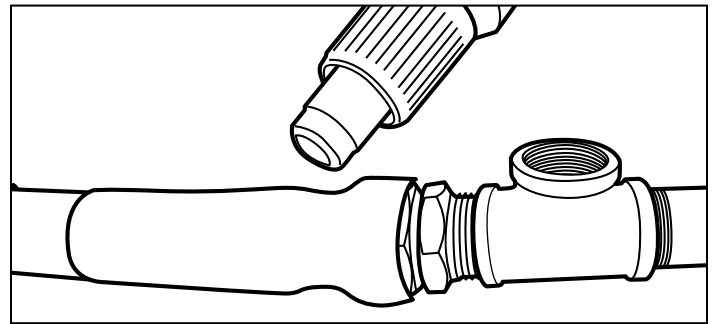


Figure 6-8

TYPICAL UN-INSULATED END CONFIGURATION (Figure 6-9)

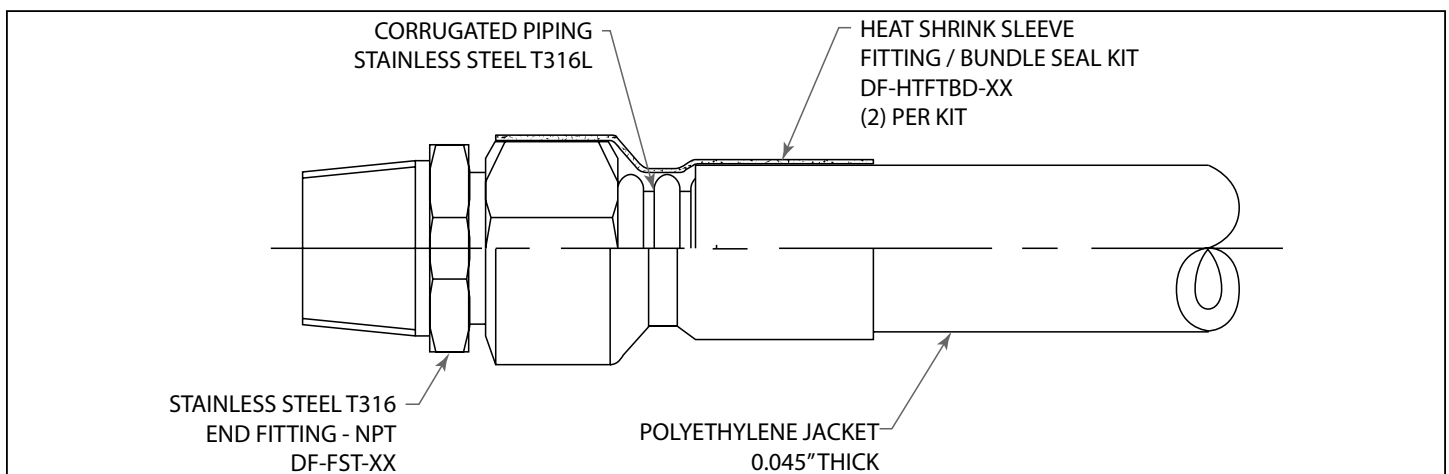


Figure 6-9

FITTING ASSEMBLY PROCEDURE with Fitted Rubber Seals

7. DEF-Trac / INSULATED – HEAT TRACED

▲ CAUTION

- DEF-Trac® flexible piping system is manufactured using Thermon BSX 3-1 (1" DEF-Trac®) & BSX 5-1 (1½" & 2" DEF-Trac®) heat trace.
- Thermon BSX 3-1, & BSX 5-1 heat trace can only be powered using 120vac.
- Per NEC Article 427-22, all heat tracing circuits must have GFI – equipment protection on the circuit.
- DEF-Trac® controller p/n# DF-FPT130 has the epd (30ma GFI trip) protection built in.

7.1. CUT TO LENGTH / REMOVE JACKET FOR FITTING ATTACHMENT

Determine the proper rough-cut length, cut with a reciprocating saw. After measuring and making the cut for the overall length, remove a minimum of 20 inches of the outer most black jacket and insulation. **Some installations require more outer jacket and insulation to be removed. Refer to Table 5 for jacket removal examples** (Figure 7-1).

NOTE

Some installations require more inner jacket to be removed. Refer to tables 2 for inner jacket removal examples.

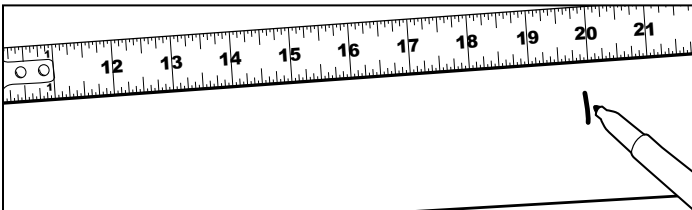


Figure 7-1

Cut through the black plastic layer using a utility knife and remove (Figure 7-2).

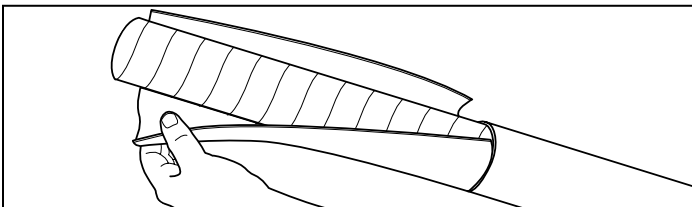


Figure 7-2

Table 5
Examples of Strip Back Lengths per/situation

Outer Jacket	Inner Jacket	Situation
20"	11"	Minimum Strip Back
60"	12"	In UDC Sump
30"	21"	In Tank Sump
36"	27"	Canopy top across NPT TEE
68"	24"	Sweep Up into Y fitting

Cut through the insulation and remove. Do not remove the innermost black jacket. Use care to avoid any damage to the heat trace and corrugated piping while removing the insulation (Figure 7-3).

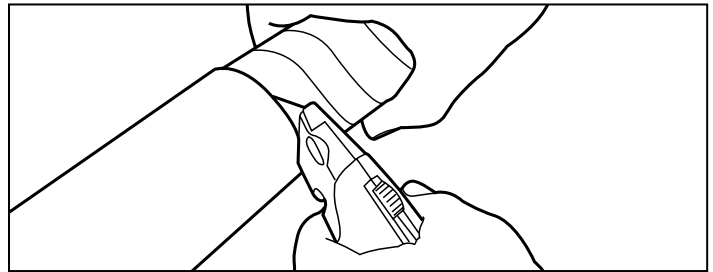


Figure 7-3

▲ CAUTION

Heat trace is helically wound on piping. Use care when cutting jacket and insulation.

Stripped end with helically wound cable (Figure 7-4) and fully stripped end with cable unwound (Figure 7-5).

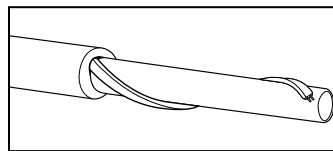


Figure 7-4

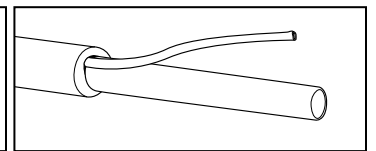


Figure 7-5

7.2. OUTER JACKET RUBBER SEAL

Slide the outer jacket rubber seal to cover tubing bundle. Guide the heat trace cable through the heat trace rubber port. Ensure heat trace does not kink, bind, or fold over while pulling through heat trace rubber port (Figure 7-6).

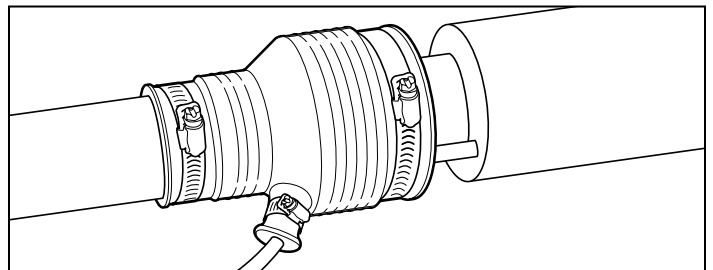


Figure 7-6

Apply ample amount of RTV sealant to outer jacket tubing bundle (Figure 7-7).

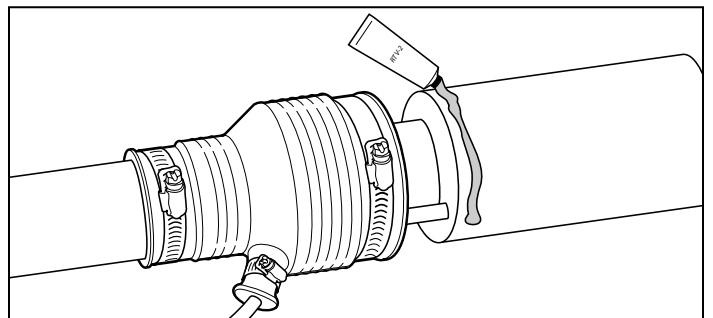


Figure 7-7

Important Information Follow All Instructions

Slide outer jacket rubber seal onto tubing bundle until it bottoms out and tighten band clamps. The excess RTV sealant can be smoothed using your finger (Figure 7-8).

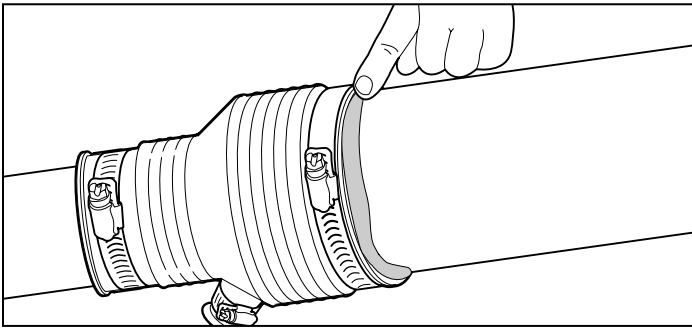


Figure 7-8

Apply a bead of RTV sealant on the front side of the outer jacket rubber seal. Smooth RTV using your finger (Figure 7-9).

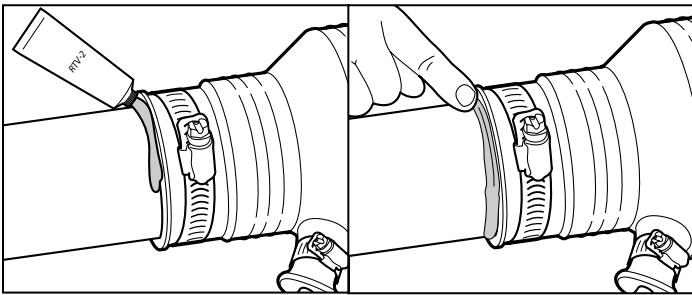


Figure 7-9

Apply RTV sealant around heat trace cable and smooth excess RTV using your finger (Figure 7-10).

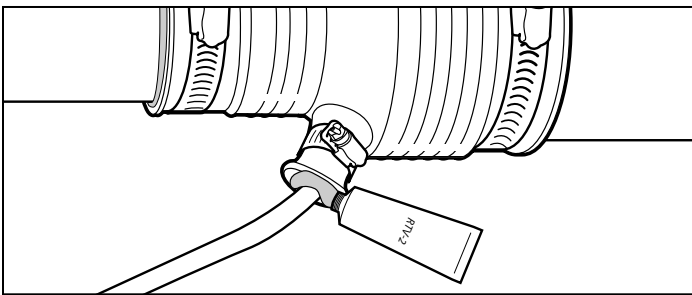


Figure 7-10

7.3. PRECISION CUT

From the end of the pipe measure a minimum of 11" and place a mark. Using a utility knife carefully remove innermost black jacket, exposing the stainless-steel piping. **Some installations require more inner jacket to be removed. Refer to Table 6 for inner jacket removal examples.** (Figure 7-11).

NOTE

Some installations require more inner jacket to be removed. Refer to table 6 for inner jacket removal examples.

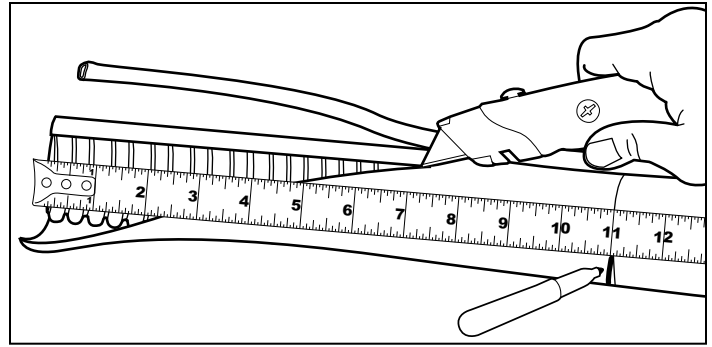


Figure 7-11

Slide the nut over the core until it bottoms out on the black jacket. Place a mark on the top of the first two corrugations past where the split rings will sit (Figure 7-12).

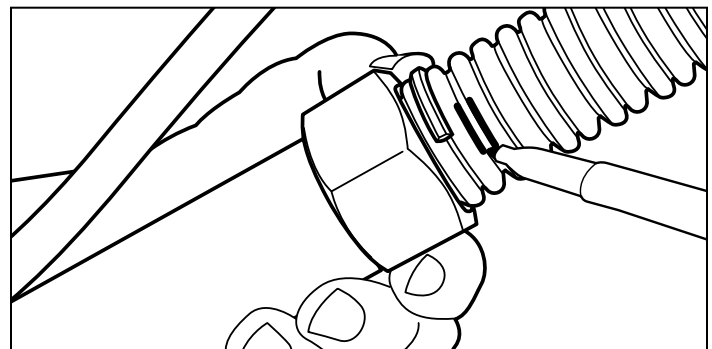


Figure 7-12

Remove the nut and cut through the corrugated piping using a tubing cutter with a sharp wheel. Cut must be centered in the valley between the two marked corrugations (Figure 7-13).

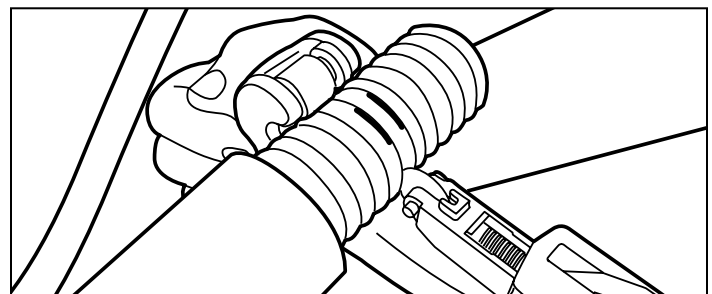


Figure 7-13

Use full circular strokes in one direction and tighten roller pressure slightly after each revolution. DO NOT over-tighten roller which may flatten tube.

Table 6
Examples of Strip Back Lengths per/situation

Outer Jacket	Inner Jacket	Situation
20"	11"	Minimum Strip Back
60"	12"	In UDC Sump
30"	21"	In Tank Sump
36"	27"	Canopy top across NPT TEE
68"	24"	Sweep Up into Y fitting

INSTALL FITTING NUT

Slide hex rubber seal onto pipe (Figure 7-14).

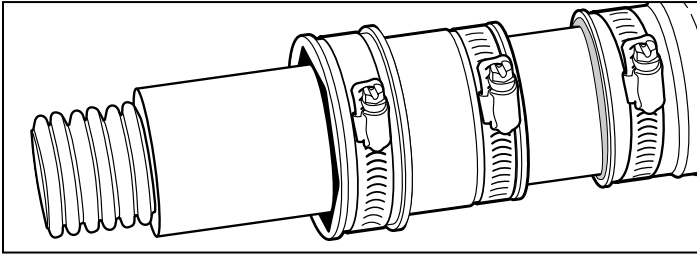


Figure 7-14

Place hex nut onto pipe (Figure 7-15).

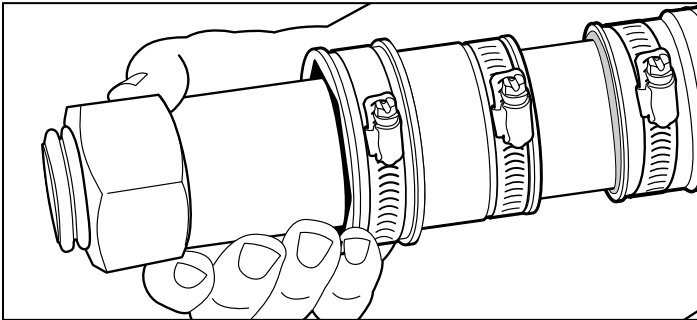


Figure 7-15

Place two split-rings into the valley of the first corrugation (Figure 7-16).

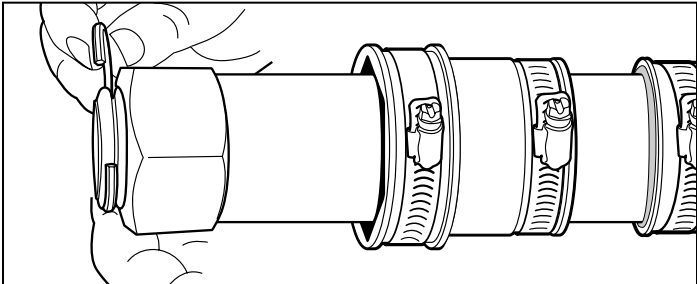


Figure 7-16

7.4. TIGHTEN FITTING

Thread the adapter into the mating piece of equipment (elbow, tee, valve etc.). Thread the nut into the adapter and engage threads. Note that the fitting is designed to form a leak tight seat on the stainless tubing as you tighten the fitting. Using appropriate wrenches; tighten the fitting until the adapter bottoms and the resistance to wrenching increases greatly. Tighten the nut and adapter to the torque listed in Table 7.

**Table 7
Minimum Torque Requirements**

Size	Minimum Torque
1"	150 ft-lbs
1½"	275 ft-lbs
2"	300 ft-lbs

Note the relation between the hex flats at this point and continue to tighten for two additional hex flats (one-third turn) to obtain required torque and final leak tight seal. The flare has now been created on the tubing end creating the metal to metal seal (Figure 7-17).

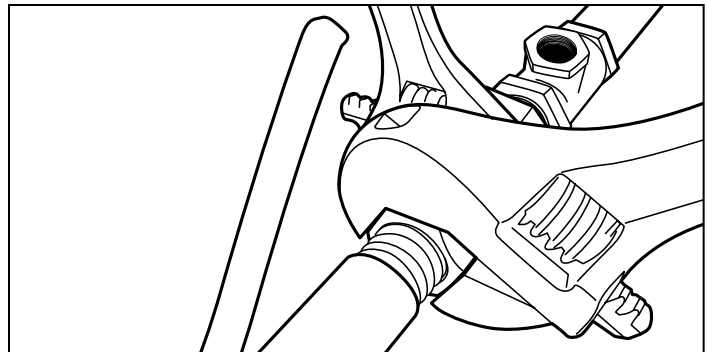


Figure 7-17

SEALANTS ARE ONLY TO BE USED ON THE PIPE THREAD.

▲ CAUTION

Do not use any thread sealants on the straight threads, the grease on the sealing seat is to lubricate the connector when tightening. If for any reason the grease is removed, lithium based grease applied to the sealing surface will be adequate.

7.5. TIGHTNESS TESTING

Before fastening the inner jacket rubber seal over the nut, and prior to backfilling, the piping system must be isolated from the tanks and subjected to a pipe tightness test.

DEF-Trac® flexible piping system is recommended to be pressurized with air to a maximum of 25 psi. Maintain this pressure for one hour ensuring there is no drop in pressure. Additionally spray fitting with a non-corrosive leak check solution and look for bubbles. Once all rubber seals (inner and outer) are completed a 75psig max pressure test can be completed if required by code.

7.6. FASTEN HEX RUBBER SEAL

Apply RTV sealant to primary jacket and hex nut (Figure 7-18).

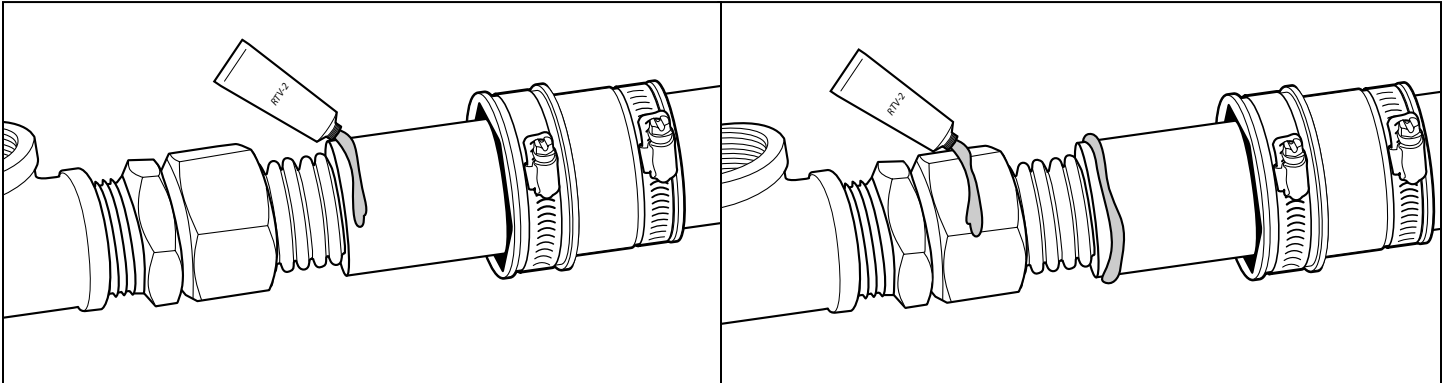


Figure 7-18

Slide hex rubber seal over hex nut and tighten band clamps. Smooth excess RTV using your finger (Figure 7-19).

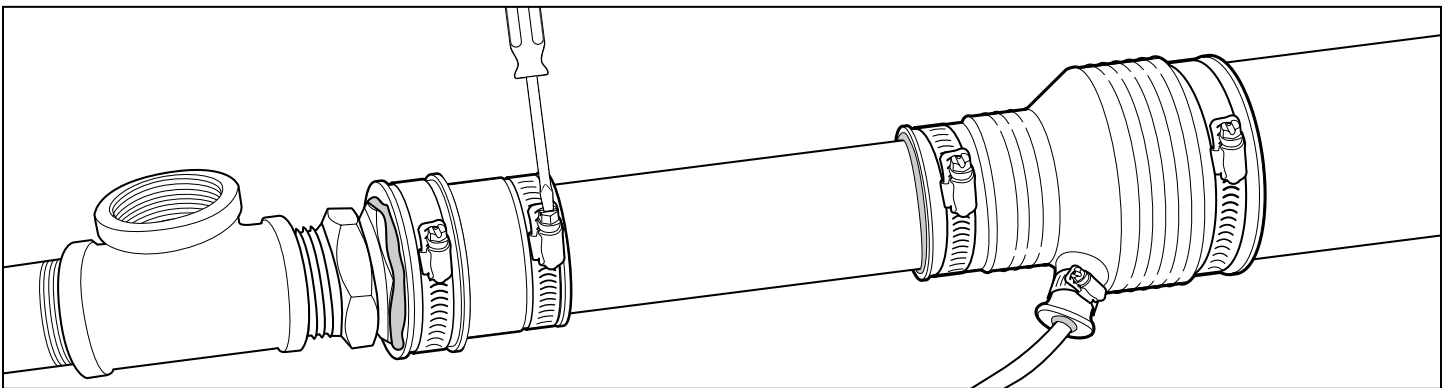


Figure 7-19

TYPICAL INSULATED HEAT-TRACED END CONFIGURATION – Band clamps removed for clarity. (Figure 7-20)

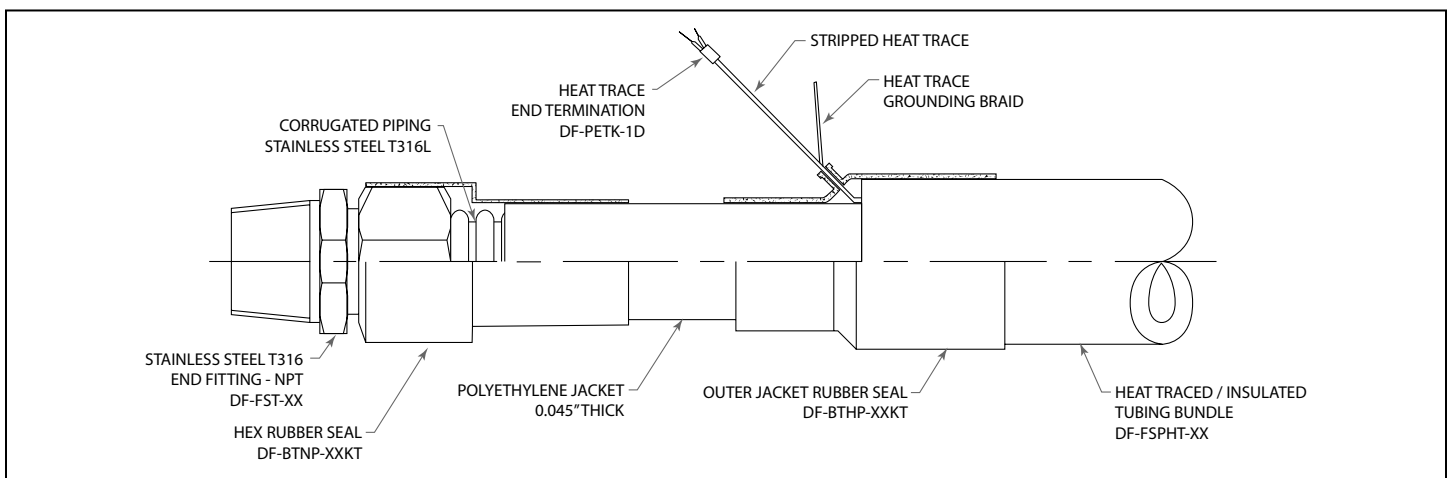


Figure 7-20

▲ CAUTION

- DEF-Trac® flexible piping system is manufactured using Thermon BSX 3-1 (1" DEF-Trac) & BSX 5-1 (1½" & 2" DEF-Trac) heat trace.
- Thermon BSX 3-1, & BSX 5-1 heat trace can only be powered using 120vac.
- Per NEC Article 427-22, all heat tracing circuits must have GFI – equipment protection on the circuit.
- DEF-Trac® controller P/N# DF-FPT130 has the EPD (30MA GFI trip) protection built in.

8. DEF-Trac® / UN-INSULATED, NON-HEAT TRACED

8.1. CUT TO LENGTH / REMOVE JACKET FOR FITTING ATTACHMENT

Determine the proper cut length, cut with a reciprocating saw. Remove the black jacket exposing 5" of bare corrugated piping (Figure 8-1).

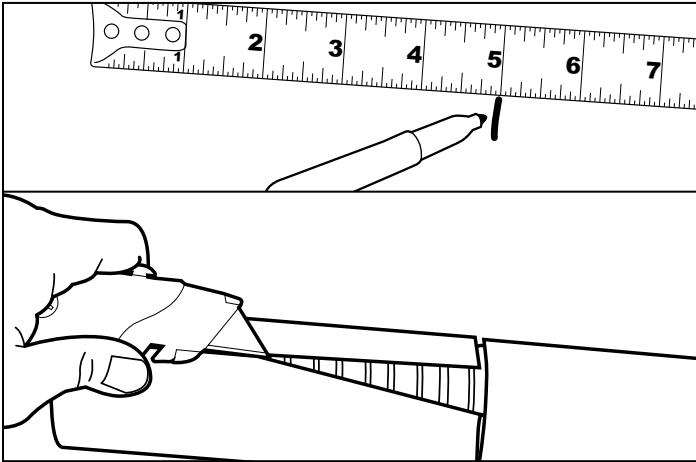


Figure 8-1

Slide the nut over the core until it bottoms out on the black jacket. Place a mark on top of the first two corrugations past where the split rings will sit (Figure 8-2).

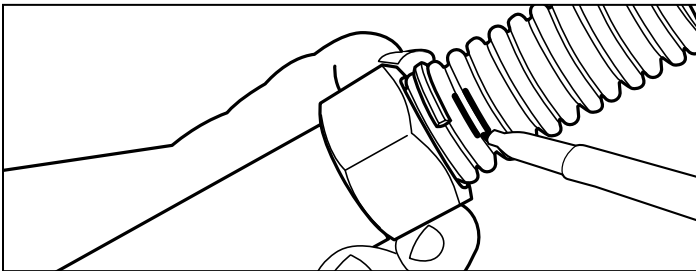


Figure 8-2

Remove the nut and cut through the corrugated piping using a tubing cutter with a sharp wheel. Cut must be centered in the valley between the two marked corrugations (Figure 8-3).

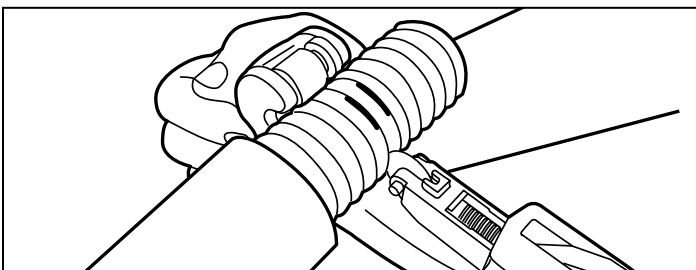


Figure 8-3

Use full circular strokes in one direction and tighten roller pressure slightly after several revolutions. DO NOT over tighten roller which may flatten tube.

8.2. INSTALL FITTING NUT

Slide hex rubber seal onto pipe and slide nut over the cut tube end (Figure 8-4).

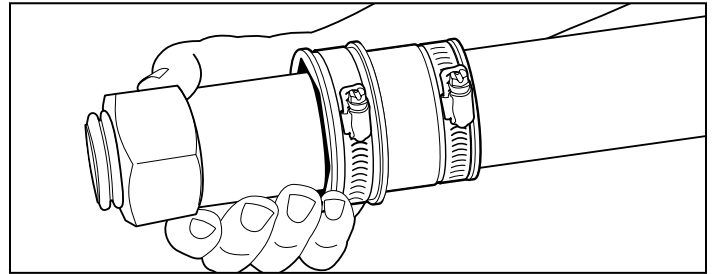


Figure 8-4

Place two split-rings into the valley of the first corrugation. Slide nut forward to trap the split rings (Figure 8-5).

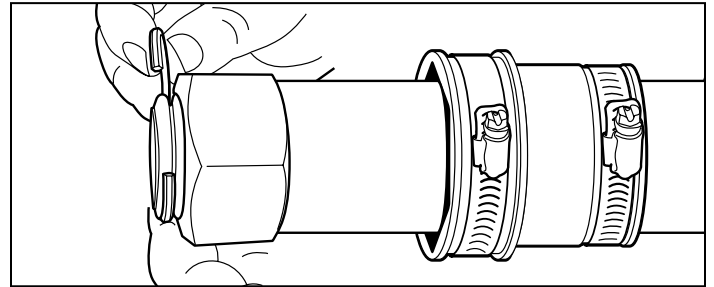


Figure 8-5

8.3. TIGHTEN FITTING

Thread the adapter into the mating piece of equipment (elbow, tee, valve etc.). Thread the nut into the adapter and engage threads. Note that the fitting is designed to form a leak tight seat on the stainless tubing as you tighten the fitting. Using appropriate wrenches; tighten the fitting until the adapter bottoms and the resistance to wrenching increases greatly. Tighten the nut and adapter to the torque listed in Table 8.

Table 8
Minimum Torque Requirements

Size	Minimum Torque
1"	150 ft-lbs
1½"	275 ft-lbs
2"	300 ft-lbs

Important Information Follow All Instructions

Note the relation between the hex flats at this point and continue to tighten for two additional hex flats (one-third turn) to obtain required torque and final leak tight seal. The flare has now been formed on the tubing end, creating the metal to metal seal (Figure 8-6).

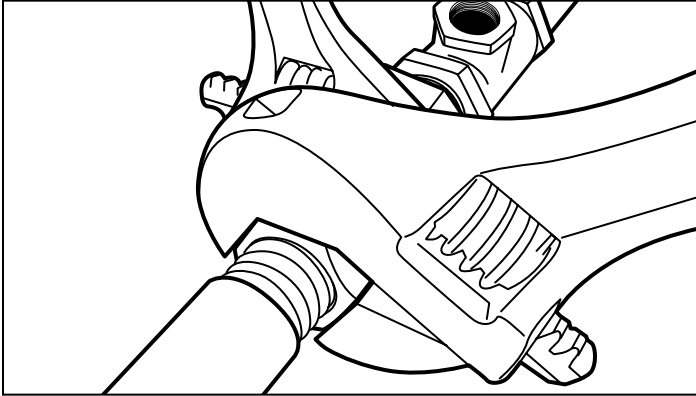


Figure 8-6

SEALANTS ARE ONLY TO BE USED ON THE PIPE THREAD.

▲ CAUTION

Do not use any thread sealants on the straight threads, the grease on the sealing seat is to lubricate the connector when tightening. If for any reason the grease is removed, lithium based grease applied to the sealing surface will be adequate.

8.4. TIGHTNESS TESTING

Before fastening the inner jacket rubber seal over the nut, and prior to backfilling, the piping system must be isolated from the tanks and subjected to a pipe tightness test.

DEF-Trac® flexible piping system is recommended to be pressurized with air to a maximum of 25 psi. Maintain this pressure for one hour ensuring there is no drop in pressure. Additionally, spray fitting with a non-corrosive leak check solution and look for bubbles. Once all rubber seals are completed a 75psig max pressure test can be completed if required by code.

8.5. FASTEN HEX RUBBER SEAL

Apply RTV sealant to primary jacket (Figure 8-7).

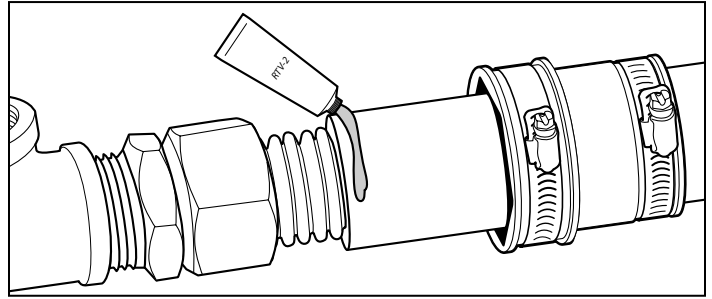


Figure 8-7

Apply RTV sealant to hex nut (Figure 8-8).

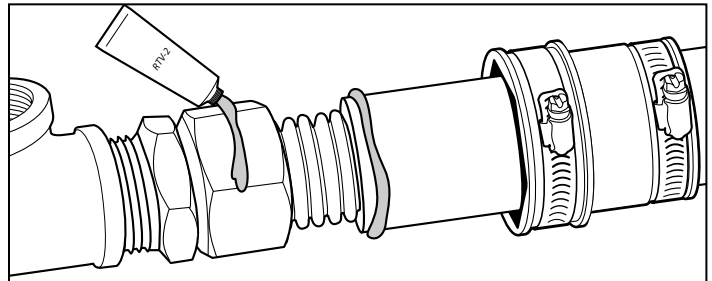


Figure 8-8

Slide hex rubber seal over hex nut and tighten band clamps. Smooth excess RTV using your finger (Figure 8-9).

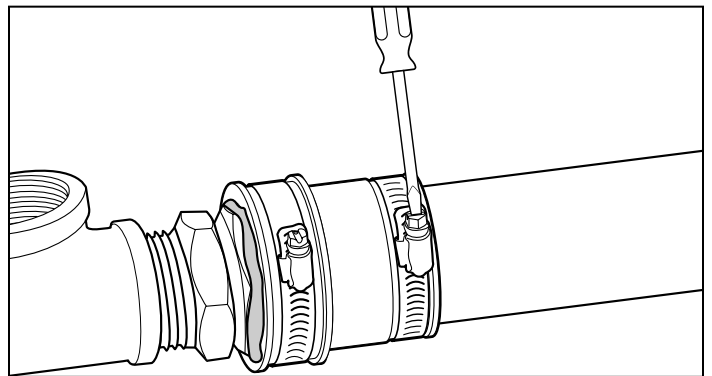


Figure 8-9

TYPICAL UN-INSULATED END CONFIGURATION – Band clamps removed for clarity. (Figure 8-10)

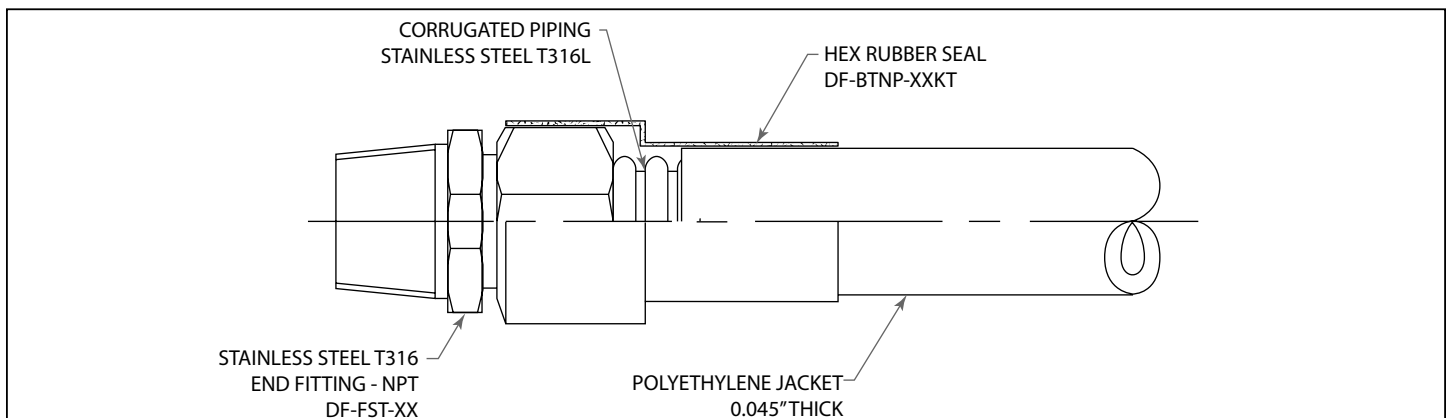


Figure 8-10

9. DEF-Trac® CHASE PIPE ENTRY PROCEDURE

9.1. PREPARE DISPENSER SUMP / ENTRY FITTING

Properly prepare dispenser sump for entry fitting according to manufacturer's recommendation (Figure 9-1).

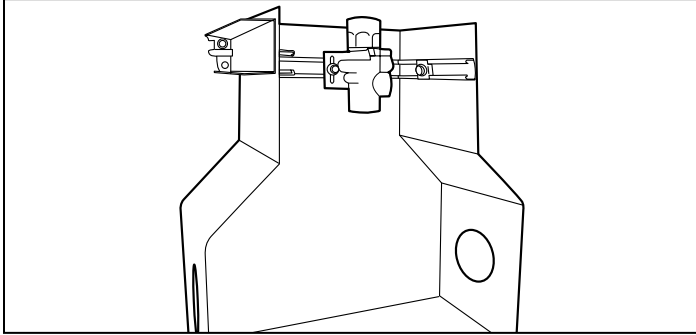


Figure 9-1

Install entry fitting according to manufacturer's recommendation (DPM, Inc. entry fitting kit inverted for chase pipe entry, OmegaFlex Part Number DF-CP-ENT) (Figure 9-2).

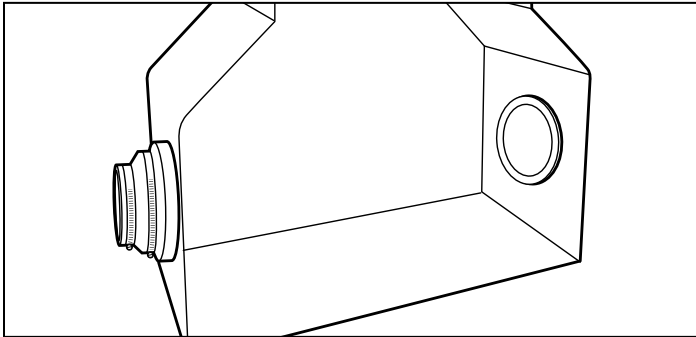


Figure 9-2

9.2. CUT TO LENGTH / REMOVE JACKET FOR FITTING ATTACHMENT

Thread DEF-Trac® adapters into ancillary fitting. Determine the layout and center of the dispenser (Figure 9-3).

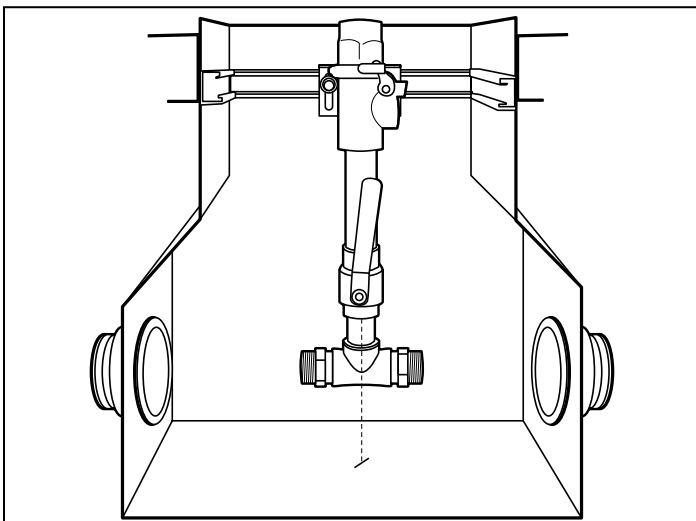


Figure 9-3

Determine the insulation cut length needed to allow for the heat trace wire to wrap around the piping riser and into the top of the containment sump (approximately 60-65"). Start cutting back the insulation a minimum of 6" from the outside sump wall. This will allow enough room to install the internal chase pipe boot (Figure 9-4).

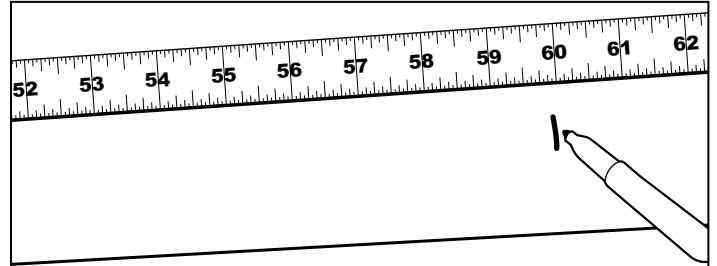


Figure 9-4

Follow proper insulation cut back procedure to remove outer insulation (page 10). Do not remove the innermost black jacket. Use care to avoid any damage to the heat trace and corrugated piping while removing the insulation (Figure 9-5).

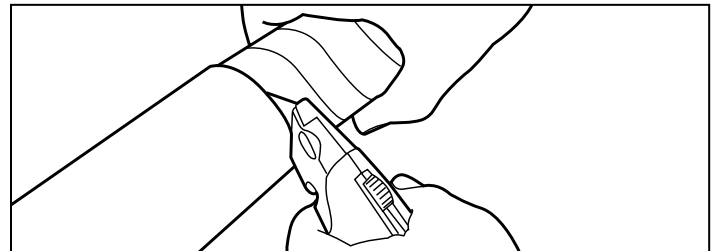
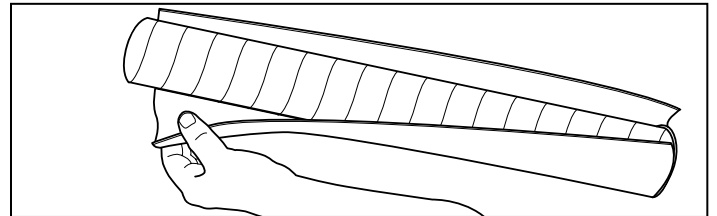


Figure 9-5

▲ CAUTION

Heat trace is helically wound on piping. Use care when cutting jacket and insulation.

Stripped end with helically wound cable (Figure 9-6) and fully stripped end with cable unwound (Figure 9-7).

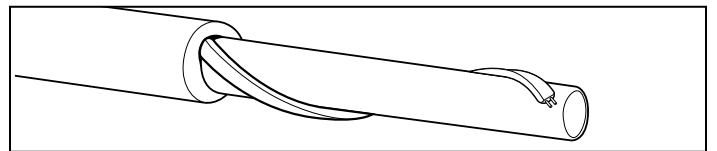


Figure 9-6

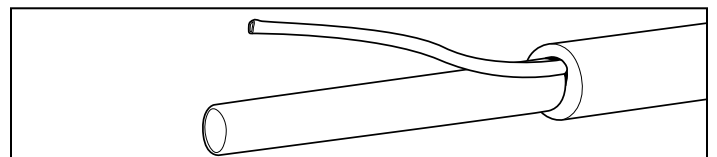


Figure 9-7

9.3. ROUGH CUT

Determine the innermost black jacket cut back length. Mock up DEF-Trac® flexible piping system through the chase pipe, and mark the inner black jacket allowing enough room for installation of split rings and hex nut (Figure 9-8).

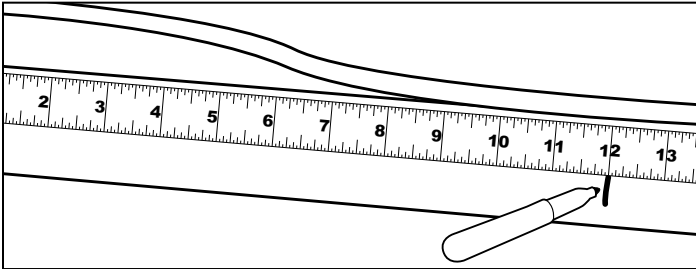


Figure 9-8

NOTE

When determining the cut back length ensure, the rubber hex boot covers all exposed stainless corrugated piping.

Remove innermost black jacket leaving 12" of bare corrugated piping exposed (Figure 9-9).

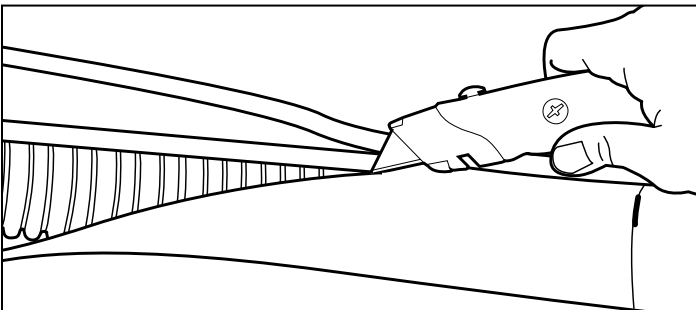


Figure 9-9

Rough cut exposed stainless steel core at the center point of ancillary fittings (Figure 9-10).

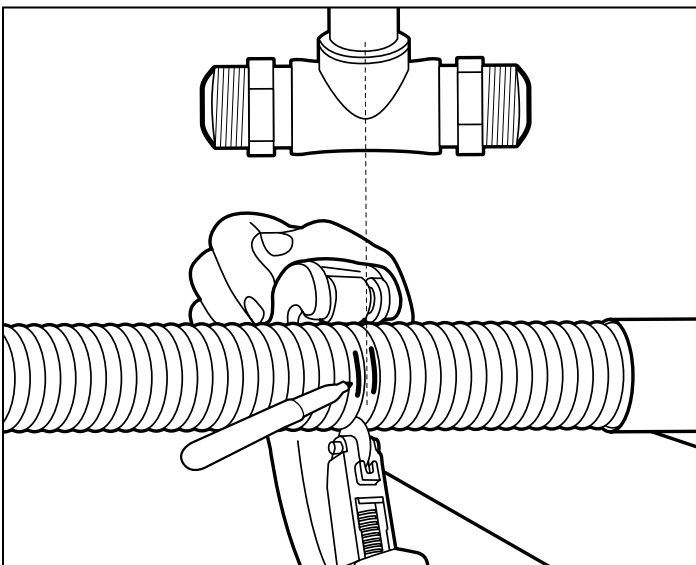


Figure 9-10

Slide the insulation bundle sleeve over the core and slide heat trace through port (Figure 9-11).

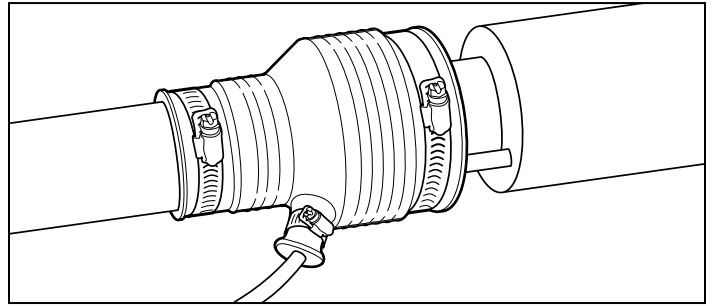


Figure 9-11

Properly seal insulation bundle sleeve and heat trace port using RTV sealant and tighten all band clamps (Figure 9-12).

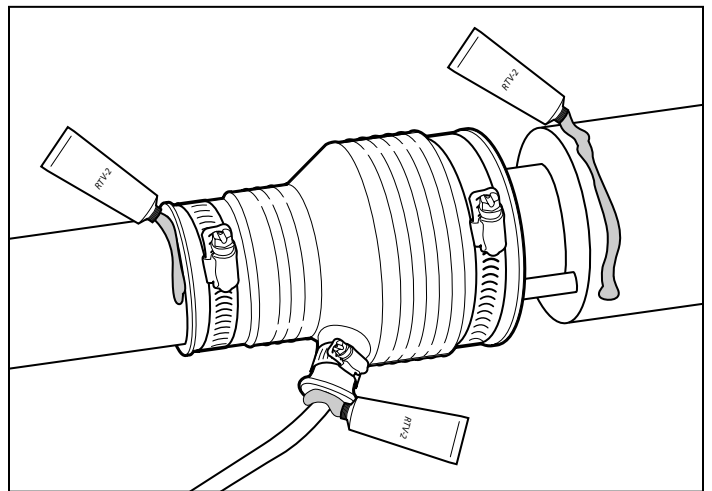


Figure 9-12

9.4. CHASE PIPE

Prepare chase piping for sump connection by installing the duct seal in between the 6th & 7th corrugation of the chase piping (Figure 9-13).

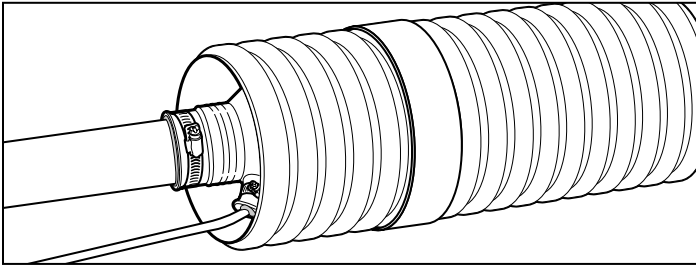


Figure 9-13

Slide chase piping into entry fitting and securely tighten external clamps on outer chase pipe boot (Figure 9-14).

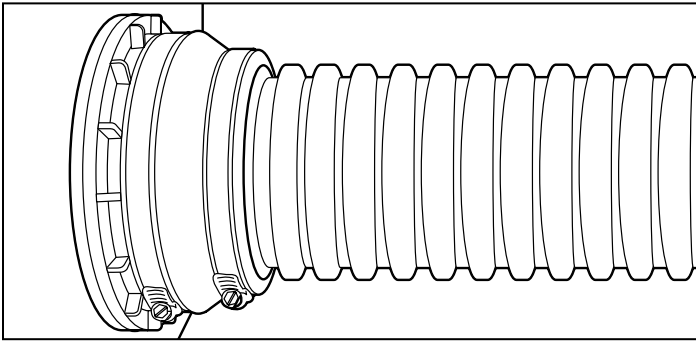


Figure 9-14

Install chase pipe crush guard on inner portion of chase pipe. Verify at least 3 corrugation of the chase pipe is exposed passed the inner portion of the entry fitting (Figure 9-15).

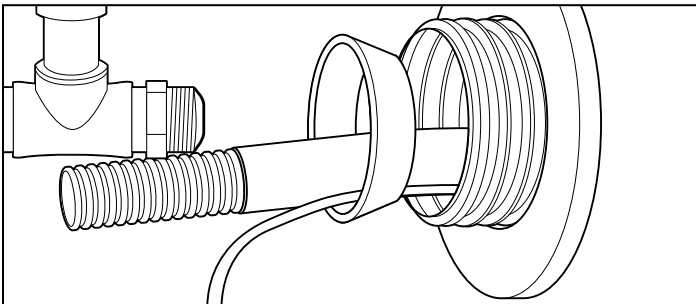


Figure 9-15

Slide the inner chase pipe boot over the core and slide heat trace through port (Figure 9-16).

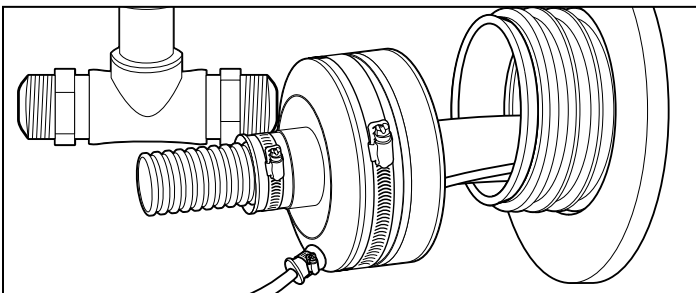


Figure 9-16

Attach inner chase pipe boot to exposed chase pipe and tighten all band clamps (Figure 9-17).

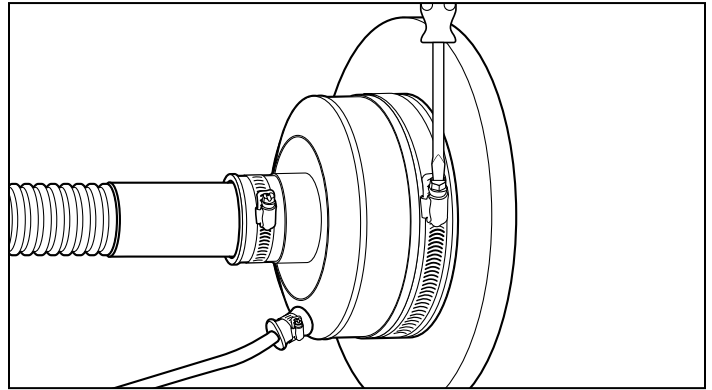


Figure 9-17

9.5. PRECISION CUT

Align DEF-Trac® flexible piping system to DEF-Trac® adapter and place split ring in corrugation closest to rounded AutoFlare seat. Place a mark in the valley of the next corrugation past the split ring and follow proper precision cut procedure (page 11) (Figure 9-18).

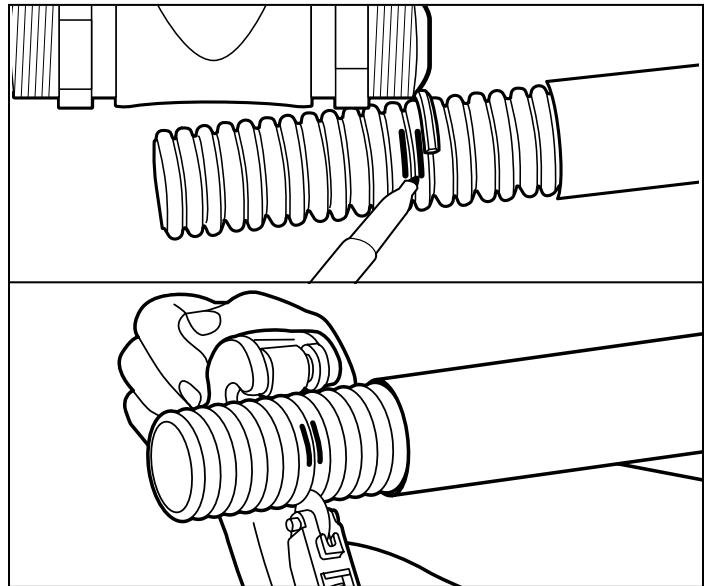


Figure 9-18

Slide rubber hex boot over core and install hex nut and split rings per proper installation procedure (page 12) (Figure 9-19).

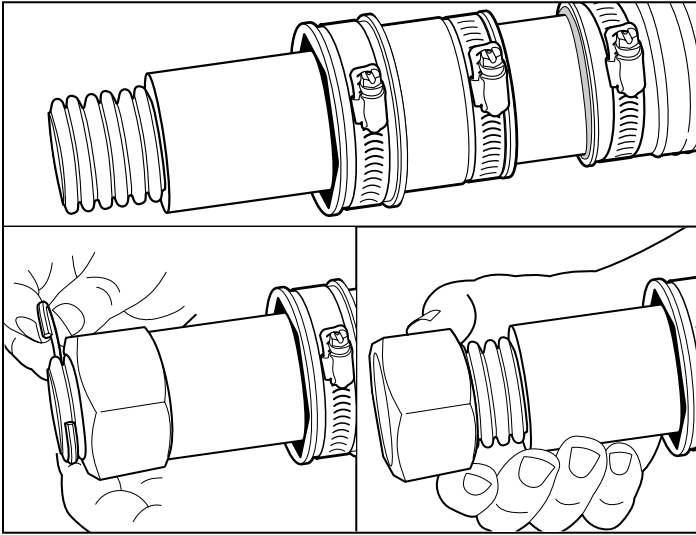


Figure 9-19

Thread the nut into the adapter and engage threads. Use appropriate wrenches and tighten the fitting until the adapter bottoms and the resistance to wrenching increases greatly. Tighten the nut and adapter to the torque listed in Table 9 (Figure 9-20).

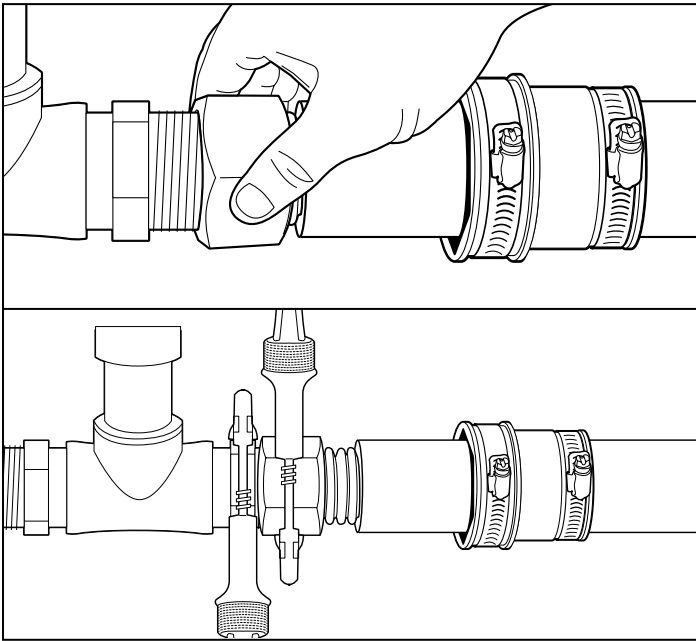


Figure 9-20

Table 9
Minimum Torque Requirements

Size	Minimum Torque
1"	150 ft-lbs
1½"	275 ft-lbs
2"	300 ft-lbs

Note the relation between the hex flats at this point and continue to tighten for two additional hex flats (one-third turn) to obtain required torque and final leak tight seal. The flare has now been created on the tubing end creating the metal to metal seal.

9.6. TIGHTNESS TESTING

Before tightening the rubber hex nut boot and prior to backfilling, the piping system must be isolated from the tanks and subjected to a pipe test.

DEF-Trac® flexible piping system it is recommended to be pressurized with air to a maximum of 25 psi. Maintain this pressure for one hour ensuring there is no drop in pressure. Additionally, spray fitting with a non-corrosive leak check solution and look for bubbles. Once all rubber seals (inner and outer) are completed a 75psig max pressure test can be completed if required by code (Figure 9-21).

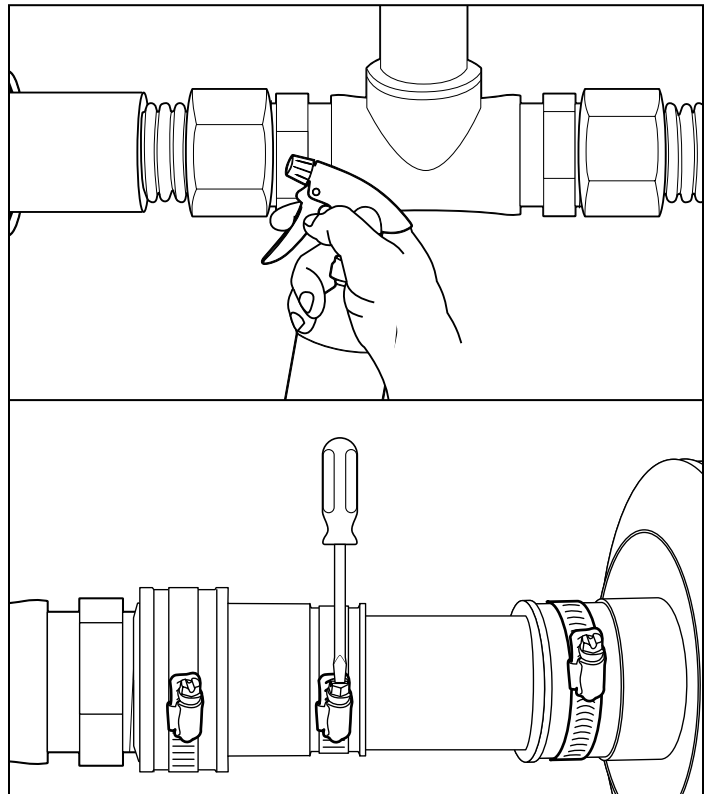


Figure 9-21

9.7. APPLY RTV SEALANT

After tightening all inner rubber boots and performing a tightness test, apply RTV sealant at all rubber boot connections and heat trace ports (Figure 9-22).

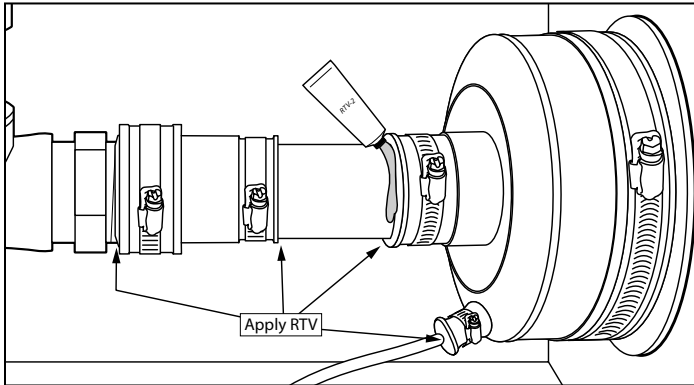


Figure 9-22

9.8. TERMINATE HEAT TRACE

Wrap heat trace around piping riser and ancillary equipment and follow proper heat trace termination guidelines (page 25 if splicing in DS/DE or page 27 for power terminations) (Figure 9-23).

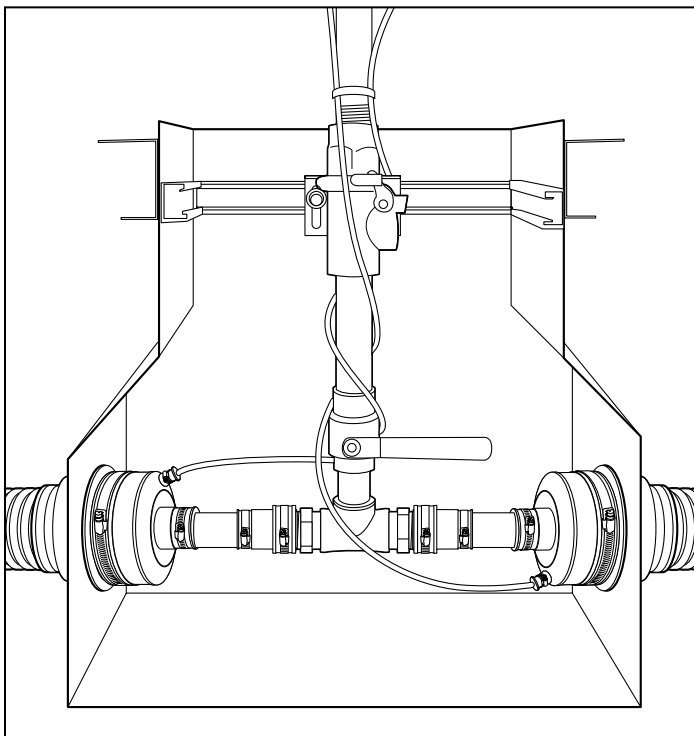


Figure 9-23

10. DEF-Trac® PIPE CHASING, PIPE BURIAL, TRENCHING, BACKFILL AND CLAMPING REQUIREMENTS

- It is recommended to encase the DEF-Trac® flexible piping system in a suitable HDPE corrugated chase pipe (rock guard); to facilitate installation and if necessary removal of pipe at a later date. 1" and 1½" DEF-Trac will easily fit into a 4" ID chase; 2" will require a 5" chase. The chase pipe shall be installed per the manufactures recommendations.
- Additionally, DEF-Trac® flexible piping system can be direct buried. If so, provide a trench width equal to the pipe diameter plus six inches on each side. Separate multiple lines by at least 4 inches. The distance between any piping and the trench excavation walls must be at least 6 inches.
- For an installation of three 2" diameter pipes, the trench would be 26" wide and a minimum of 26" deep.
- Whenever possible, product lines should be run in a single trench between the tank area and pump dispenser island area. Where more than one trench is required, piping should not cross over each other or cross over underground tanks.
- The trench bottom must be sloped uniformly from the dispensers back to the tanks or sumps at a minimum slope of 1/8 inch per foot and be free of any sharp or protruding hard objects. The trench bottom must be graded with a minimum of six inches of backfill such as washed sand, or pea gravel.
- For backfilling, provide a minimum of 18 inches of clean backfill between the top of the pipe and unpaved ground surfaces. A minimum of 4 inches of clean backfill is required between the top of the pipe and reinforced concrete pavement (4 inches thick minimum) and a minimum of 8 inches of backfill is required between the top of the pipe and asphalt pavement (2 inches thick minimum).
- DEF-Trac can be installed outdoors above ground. Typically DEF-Trac® flexible piping system is mounted in PVC piping or to a unistrut which provides continuous support. Clamping to the unistrut is accomplished utilizing a rubber coated hose clamp. Care must be taken to ensure the piping can not be punctured, crushed or damaged in any way.

▲ CAUTION

- Native back fill materials must never be used.

11. DEF-Trac® PIPE SWEEP INTO Y FITTING INSTRUCTIONS

11.1 CUT TO LENGTH

Cut chase pipe to proper length.

11.2 ROUGH CUT

Rough cut DEF-Trac piping to the length of the chase pipe plus 10 feet.

11.3 CUT TO LENGTH/REMOVE JACKET FOR FITTING ATTACHMENT

Thread DEF-Trac® flexible piping system end fitting into the DEF-Trac® stainless steel “Y” fitting (Figure 11.1)

From the end of rough-cut strip back the outer jacket 68”, then from the end of rough-cut strip back inner jacket 24” (**Refer to Figures 7.1 Follow instructions, the Cut to Length/Remove Jacket for Fitting Attachment**). Ensure the rubber bundle boot is contained within the chase pipe allowing the rubber chase pipe fitting to be installed.

11.4 OUTER JACKET RUBBER SEAL

Refer to Section 7.2 Follow instructions, Outer jacket Rubber Seal.

11.5 TIGHTEN FITTING

Refer to Section 7.4 Follow instructions, Tighten Fitting.

11.6 TIGHTNESS TESTING

Refer to Section 7.5. Follow instructions, Tightness Testing

11.7 FASTEN HEX RUBBER SEAL

Refer to Section 7.6 Follow instructions, Fasten Hex Rubber Seal.

11.8 DF-DS/DE TERMINATOR, SPLICE TERMINATION KIT FOR INSTRUCTION ON SPLICING HEAT TRACE TOGETHER

Refer to Section(s) 15.8 (15.1-15.8.7) DF-DS/DE Terminator, Splice Termination Kit for instruction on splicing heat trace together.

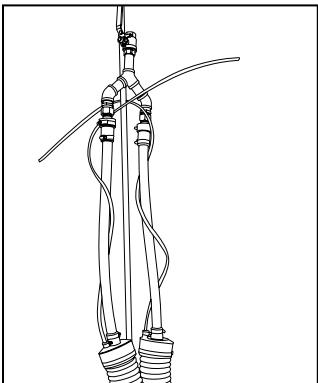


Figure 11.1

Examples of Y Fitting Sweep Configuration

12. ROUTINE MAINTENANCE AND VISUAL INSPECTION

It is recommended that a visual inspection of the inside of all containment sumps, be completed, at least once per month. Leaks collected in containment sumps must be reported immediately and investigated by the site owner. If leakage or damage to the piping system is suspected, OmegaFlex must be notified immediately.

All sumps must be kept free of fuel, water and debris.

13. ACCESSORIES

All Thermon accessories must be installed per the manufacturers instructions. Omega Flex recommends DPM Entry Boots for sump penetrations, see Table 10 for DPM Entry Boots part numbers.

Table 10
DPM Entry Boots for DEF-Trac® Piping

Size	Pipe		DPM Part #
1"	DF-FSP-16		B3.5-1.5
1½"	DF-FSP-24	DEF-Trac	B3.5-2.0
2"	DF-FSP-32	Un-insulated	B3.5-2.5
1"	DF-FSPHT-16		B3.5-2.7
1½"	DF-FSPHT-24	DEF-Trac Insulated & Heat Traced	B5-3.0
2"	DF-FSPHT-32		B5-3.6

14. USE OF PRESSURE RELIEF VALVES

Due to temperature extremes, the pipe can become over pressurized due to thermal expansion of the internal media. If the DEF-Trac® flexible piping system portion of a system can become isolated by means of a check valve or solenoid valve; it is recommended to install a pressure relief valve which drains to tank in line with the DEF-Trac® flexible piping system. This will prevent the over pressurization of the piping.

▲ CAUTION

- DEF-Trac® flexible piping system is manufactured using Thermon BSX 3-1 (1" DEF-Trac®) & BSX 5-1 (1½" & 2" DEF-Trac®) heat trace.
- Thermon BSX 3-1, & BSX 5-1 heat trace can only be powered using 120vac.
- Mandatory GFI EPD circuit breaker
- Per NEC Article 427-22, all heat tracing circuits must have GFI – equipment protection on the circuit.
- DEF-Trac® controller P/N# DF-FPT130 has the EPD (30MA GFI trip) protection built in.

15. DEF-Trac® HEAT TRACING INSTALLATION AND TROUBLESHOOTING GUIDE

Installation checklist (pages 49-50) must be faxed to OmegaFlex at 610-524-6484

Warranty is conditional upon receipt of installation check list.

▲ WARNING

Self-Regulating Cable must be installed by a qualified electrician. All installation and test instructions must be followed. Improper installation can result in property damage, serious injury, or death due to electric shock. Please contact OmegaFlex at 1-800-355-1038 with any installation or operating questions.

- DEF-Trac® flexible piping system is manufactured using Thermon BSX 3-1 (1" DEF-Trac) & BSX 5-1 (1½" & 2" DEF-Trac) heat trace.
- Thermon BSX 3-1, & BSX 5-1 heat trace can only be powered using 120VAC.
- Per NEC article 427-22, all heat tracing circuits must have GFI – equipment protection on the circuit.
- DEF-Trac® controller P/N# DF-FPT130 has the EPD (30MA GFI trip) protection built in.
- Please read these installation instructions and all instructions included with kits prior to installation and observe all warnings. Visually inspect for damage. The heat trace, including braid, must not be cut, nicked or worn. **DO NOT USE DAMAGED CABLE.**
- Install heat trace in accordance with the prevailing electric code.
- Heat trace for classified areas should be tagged for specific classifications.
- All related components and controls should be properly rated for the specified location classification.
- Each self-regulating heat trace circuit will require at least one power connection kit (sold separately) which includes one end termination. All heat trace ends must be properly terminated per the instructions.

Electrical Codes: Sections 427 (pipelines and vessels) and 500 (classified locations) of the National Electrical Code (NEC), and Part 1 of the Canadian Electrical Code, Sections 18 (hazardous locations) and 62 (Fixed Electric Space and Surface Heating), govern the installation of electrical heat-tracing systems. All heat-tracing-system installations must be in compliance with these and any other applicable national or local codes.

- Thermon heat-tracing systems must be installed correctly to ensure proper operation and to prevent shock and fire. Read these important warnings and carefully follow all the installation instructions.
- To minimize the potential for arcing and fire caused by product damage or improper installation use ground fault protection. The National Electrical Code (NEC) and Canadian Electrical Code (CEC) require ground fault protection of equipment for each branch circuit supplying electric heat tracing.
- Installation must comply with Thermon requirements and be installed in accordance with the NEC, CEC, or any other applicable national and local codes.
- Approvals and performance of the heat-tracing systems are based on the use of Thermon specified parts only. Do not substitute parts or use vinyl electrical tape.
- Bus wires will short if they contact each other. Keep bus wires separated.
- Components and cable ends must be kept dry before and during installation.
- The black heating cable core and fibers are conductive and can short. They must be properly insulated and kept dry.
- Damaged bus wires can overheat or short. Do not break bus wire strands when preparing the cable for connection.

▲ ELECTRIC SHOCK HAZARD

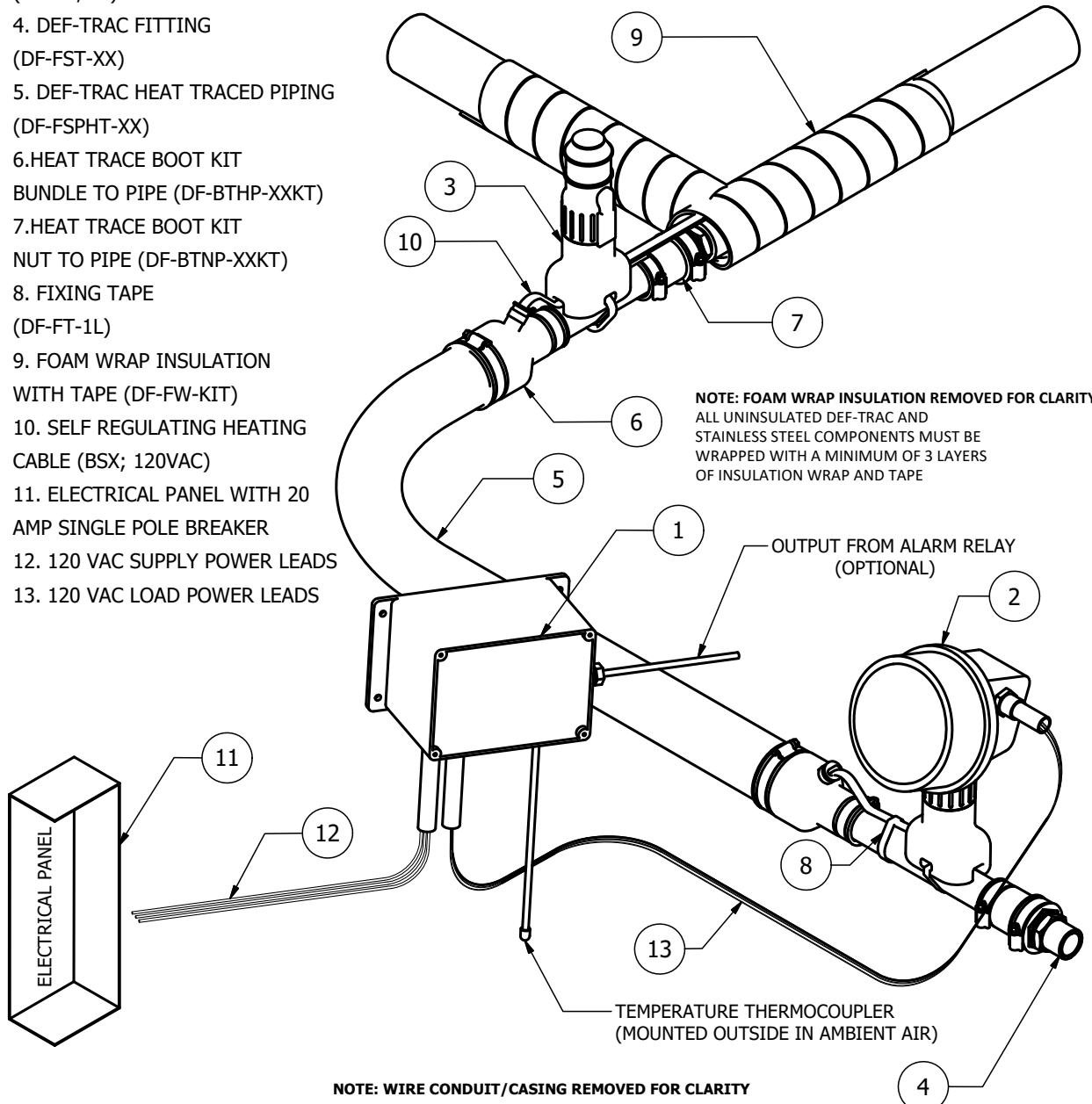
Any heat trace with an insulation resistance reading less than 20 MEGOHMS before installation must not be installed.

▲ WARNING

The maximum length of any circuit cannot be longer than 200 ft.

15.1 Typical DEF-Trac Heat Traced / Insulated Layout

1. HEAT TRACE CONTROLLER (DF-FPT130)
2. TERMINATOR POWER CONNECTION KIT (DF-DP) PETK KIT USED FOR CONNECTION
3. HEAT TRACE TERMINATION ENCLOSURE (DF-DS/DE) SCKT KIT USED FOR CONNECTION
4. DEF-TRAC FITTING (DF-FST-XX)
5. DEF-TRAC HEAT TRACED PIPING (DF-FSPHT-XX)
6. HEAT TRACE BOOT KIT BUNDLE TO PIPE (DF-BTHP-XXKT)
7. HEAT TRACE BOOT KIT NUT TO PIPE (DF-BTNP-XXKT)
8. FIXING TAPE (DF-FT-1L)
9. FOAM WRAP INSULATION WITH TAPE (DF-FW-KIT)
10. SELF REGULATING HEATING CABLE (BSX; 120VAC)
11. ELECTRICAL PANEL WITH 20 AMP SINGLE POLE BREAKER
12. 120 VAC SUPPLY POWER LEADS
13. 120 VAC LOAD POWER LEADS



NOTE: FOAM WRAP INSULATION REMOVED FOR CLARITY
 ALL UNINSULATED DEF-TRAC AND STAINLESS STEEL COMPONENTS MUST BE WRAPPED WITH A MINIMUM OF 3 LAYERS OF INSULATION WRAP AND TAPE

NOTE: WIRE CONDUIT/CASING REMOVED FOR CLARITY

NOTE
 This is a guide for layout only; follow all Thermon instructions for proper wiring, connection and installation requirements.

15.2 DEF-TRAC HEAT TRACE ACCESSORIES

1. **Trace Controller With Thermocoupler**—(OmegaFlex Part Number DF-FTP130) Used to control a single heating circuit or as pilot control of a contactor switching multiple heat tracing circuits. Typically installed near a building or structure out of direct sunlight.
2. **Terminator Power Connection Kit** – (OmegaFlex Part Number DF-DP) Used to provide the power connection or can also be used as a splice kit if terminal block connections are required by code. Heat trace connections are made utilizing the cable termination kit (OmegaFlex Part Number DF-PETK-1D / sold separately).
3. **Terminator Splice Kit** – (Omega Flex, Inc. Part Number DF-DS/DE) Used to provide splice connection at tee's or can be used as end of circuit termination. For a tee splice, heat trace connections are made utilizing the cable splice kit (Omega Flex, Inc. Part Number DF-SCTK-1D / sold separately). End of circuit heat trace connections are made utilizing the cable termination kit (Omega Flex, Inc. Part Number DF-PETK-1D / sold separately).
4. **DEF-Trac End Fitting** – (Omega Flex, Inc. Part Number DF-FST-xx) Field attachable stainless steel end fitting with NPT thread.
5. **DEF-Trac Heat Traced Piping** – (Omega Flex, Inc. Part Number DF-FSPHT-xx) Flexible stainless steel corrugated piping, insulated and heat traced.
6. **Rubber Seal** – (Omega Flex, Inc. Part Number DF-BTNP-xxKT, DF-BTHP-xxKT and DF-BTHD-xxKT) Provides sealing onto the outer insulated jacket as well as over the back hex nut of the DEF-Trac fitting.
7. **Fixing Tape** – (Omega Flex, Inc. Part Number DF-FT-1L) Used to attach the heat trace to the un-insulated piping, tees, valve or end attachments.
8. **Insulation Wrap** - Minimum of three layers of approved insulation wrap/tape must be applied to any un-insulated stainless steel pipe and components.

EPD (Equipment Protection Device) Circuit Breakers for ground fault Protection in NF Panelboards

How EPDs Operate

An EPD compares outgoing load currents with returning currents to determine if there is leakage of current to ground. If it detects a ground fault greater than 30 mA, the EPD will trip and display the “red flag” on the trip indicator.

NOTE

Unlike residential GFCIs (ground fault circuit interrupters), EPDs are not designed for people protection (UL943 Class A calls for protection above 6 mA). EPDs are designed to meet the UL1053 standard for equipment protection. Although not designed for people protection, they do create a safer environment by reducing the potential for hazards associated with ground faults including fires, and equipment malfunction.

15.3 DF-SCTK-1D SPLICE CONNECTION TERMINATION KIT

Installation Precautions

- To minimize the potential for arcing and fire caused by product damage or improper installation use ground-fault protection. The National Electrical Code (NEC) and Canadian Electrical Code (CEC) require ground-fault protection of equipment for each branch circuit supplying electric heat tracing.
- Installation must comply with Thermon requirements and be installed in accordance with the NEC, CEC, or any other applicable national and local codes.
- Component approvals and performance ratings are based on the use of Thermon specified parts only.
- De-energize all power sources before opening enclosure.
- Keep ends of heating cable and kit components dry before and during installation.

Installation Steps

15.3.1. REMOVE JACKET

Measure back 3" from the end and remove outer jacket using a utility knife (Figure 15-1).

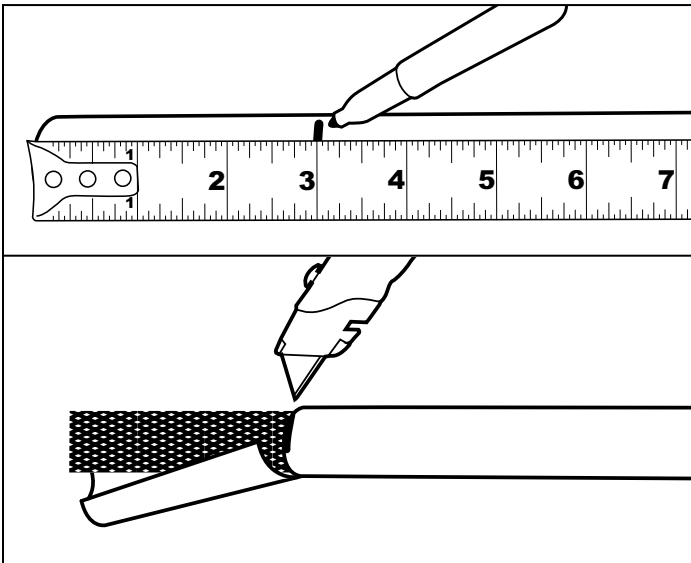


Figure 15-1

▲ CAUTION

Do not damage the metallic braid.

15.3.2. SEPARATE METALLIC BRAID AND FORM A PIGTAIL (Figure 15-2)

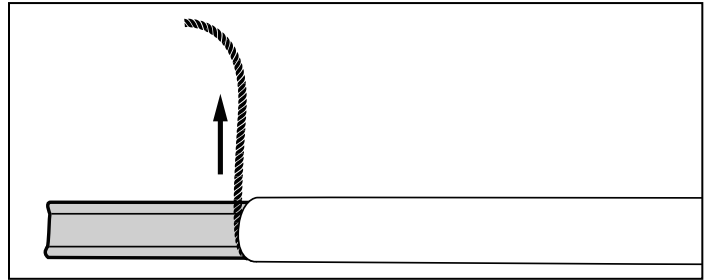


Figure 15-2

15.3.3. EXPOSE HEAT TRACE

Measure 2" of primary insulation jacket and expose the black heat trace matrix (Figure 15-3).

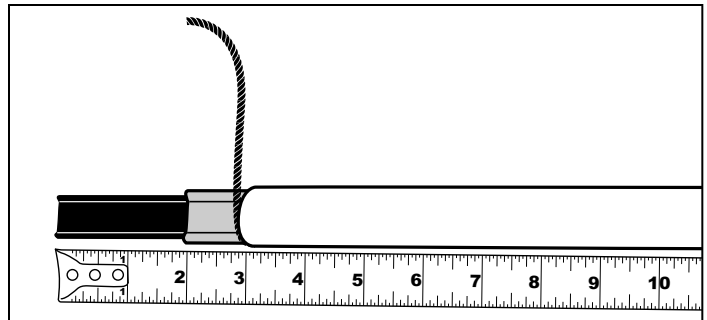


Figure 15-3

15.3.4. EXPOSE THE BUS WIRE LEADS

Skive both edges of the heat trace matrix and expose the bus wire leads (Figure 15-4).

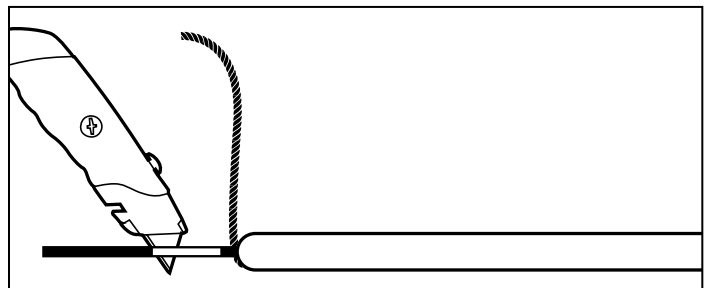


Figure 15-4

Cut V-notch in matrix and pull bus wires from matrix. Cut and remove center matrix (Figure 15-5).

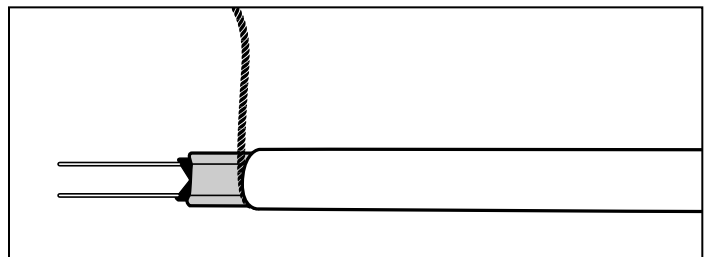


Figure 15-5

15.3.5. APPLY SEALANT

Apply an ample amount of the RTV-2 sealant to heat trace cable (Figure 15-6).

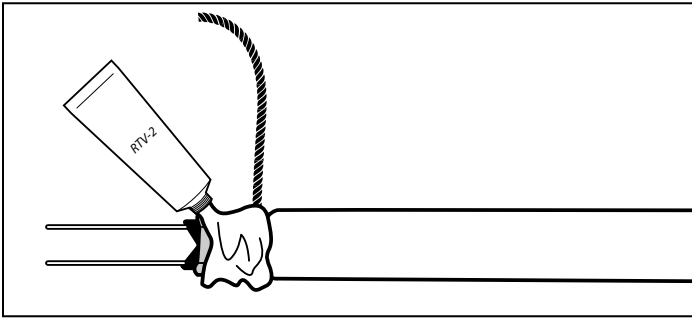


Figure 15-6

15.3.6. INSERT INTO SCTK BOOT

Insert exposed bus wires into SCTK boot. (Figure 15-7)

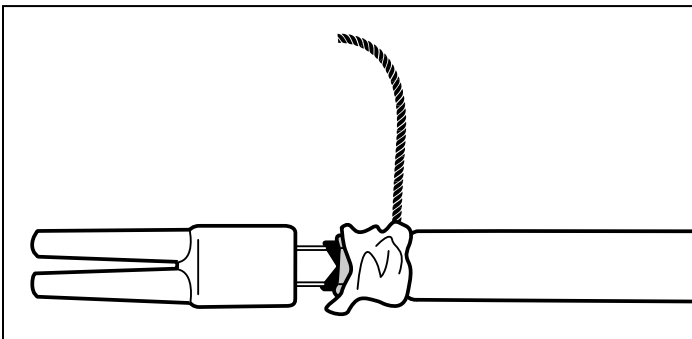


Figure 15-7

SCTK termination boot should look as depicted below (Figure 15-8).

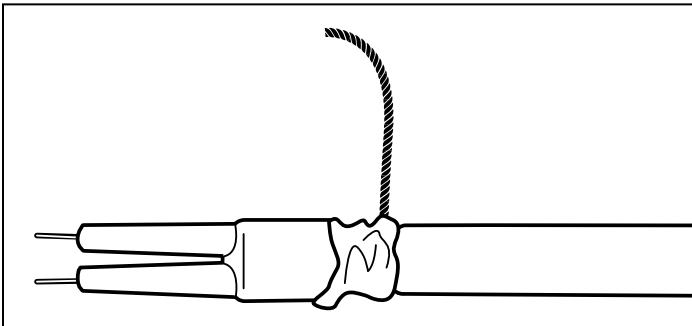


Figure 15-8

Template for Splice Boot Termination (Figure 15-9)

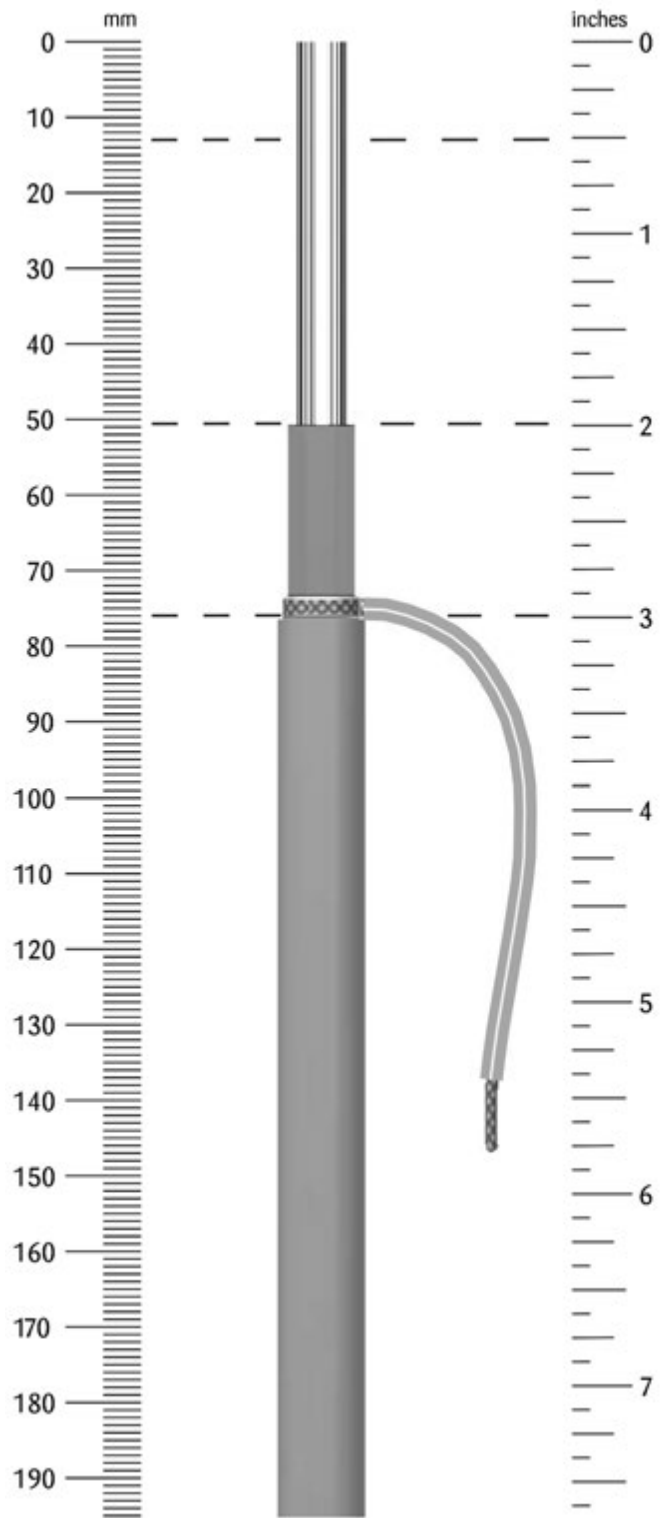


Figure 15-9

15.4 DF-PETK-1D POWER TERMINATION KIT

Installation Procedure

- To minimize the potential for arcing and fire caused by product damage or improper installation use ground-fault protection. The National Electrical Code (NEC) and Canadian Electrical Code (CEC) require ground-fault protection of equipment for each branch circuit supplying electric heat tracing.
- Installation must comply with Thermon requirements and be installed in accordance with the NEC, CEC, or any other applicable national and local codes.
- Component approvals and performance ratings are based on the use of Thermon specified parts only.
- De-energize all power sources before opening enclosure.
- Keep ends of heating cable and kit components dry before and during installation.

Installation Steps

15.4.1. REMOVE JACKET

Measure back 6" from the end and remove over jacket using a utility knife (Figure 15-10).

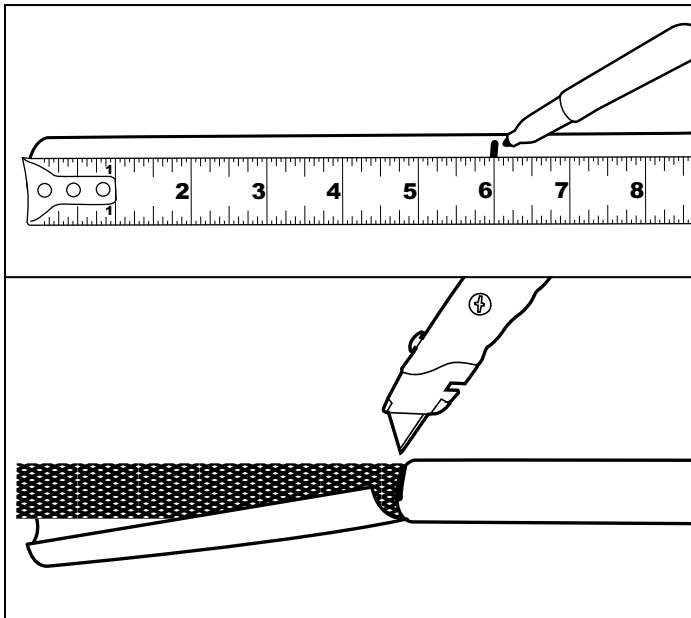


Figure 15-10

⚠ CAUTION

Do not damage the metallic braid.

15.4.2. SEPARATE METALLIC BRAID AND FORM A PIGTAIL (Figure 15-11)

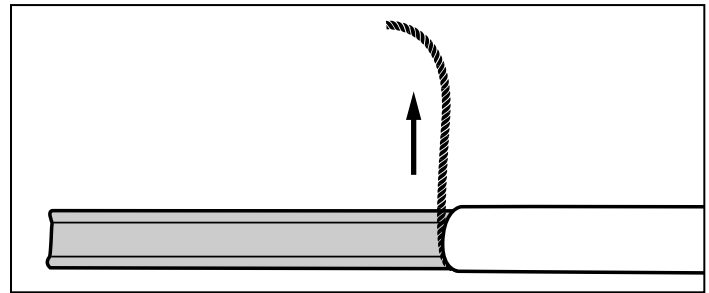


Figure 15-11

15.4.3. EXPOSE HEAT TRACE

Measure 4 5/8" of primary insulation jacket and expose the black heat trace matrix (Figure 15-12).

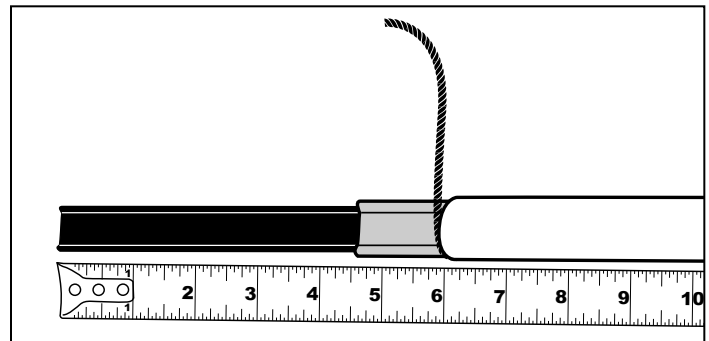


Figure 15-12

15.4.4. EXPOSE THE BUS WIRE LEADS

Skive both edges of the heat trace matrix and expose the bus wire leads (Figure 15-13).

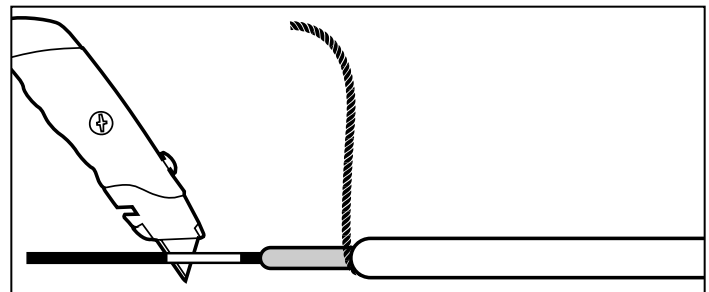


Figure 15-13

Cut V-notch in matrix and pull bus wires from matrix. Cut and remove center matrix (Figure 15-14).

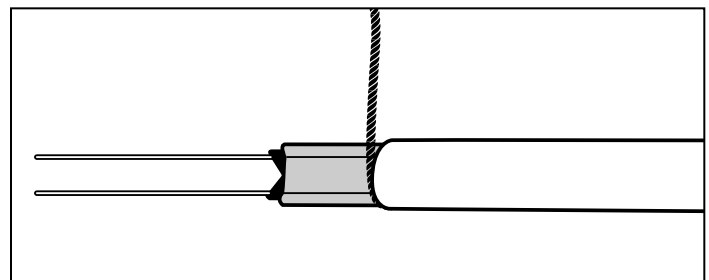


Figure 15-14

15.4.5. APPLY SEALANT

Apply an ample amount of the RTV-2 sealant to heat trace cable (Figure 15-15).

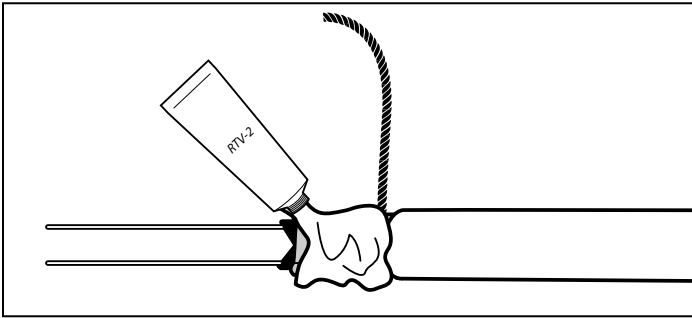


Figure 15-15

15.4.6. INSERT WIRES

Insert exposed bus wires into PETK boot (Figure 15-16).

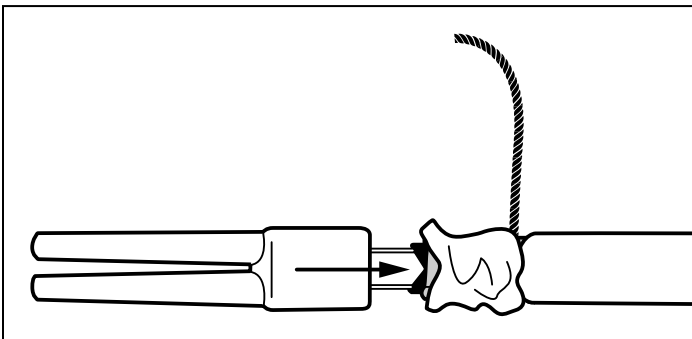


Figure 15-16

PETK termination boot should look as depicted below (Figure 15-17).

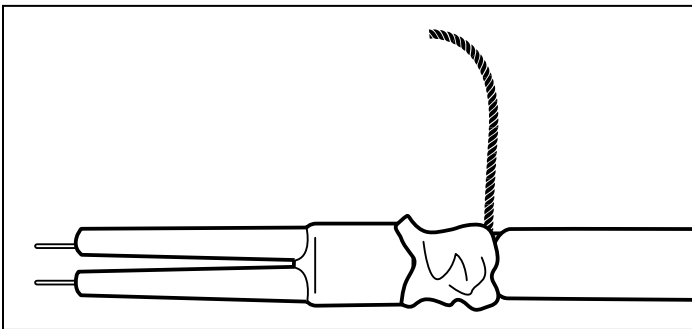


Figure 15-17

Template For Power Connection Boot Termination (Figure 15-18)

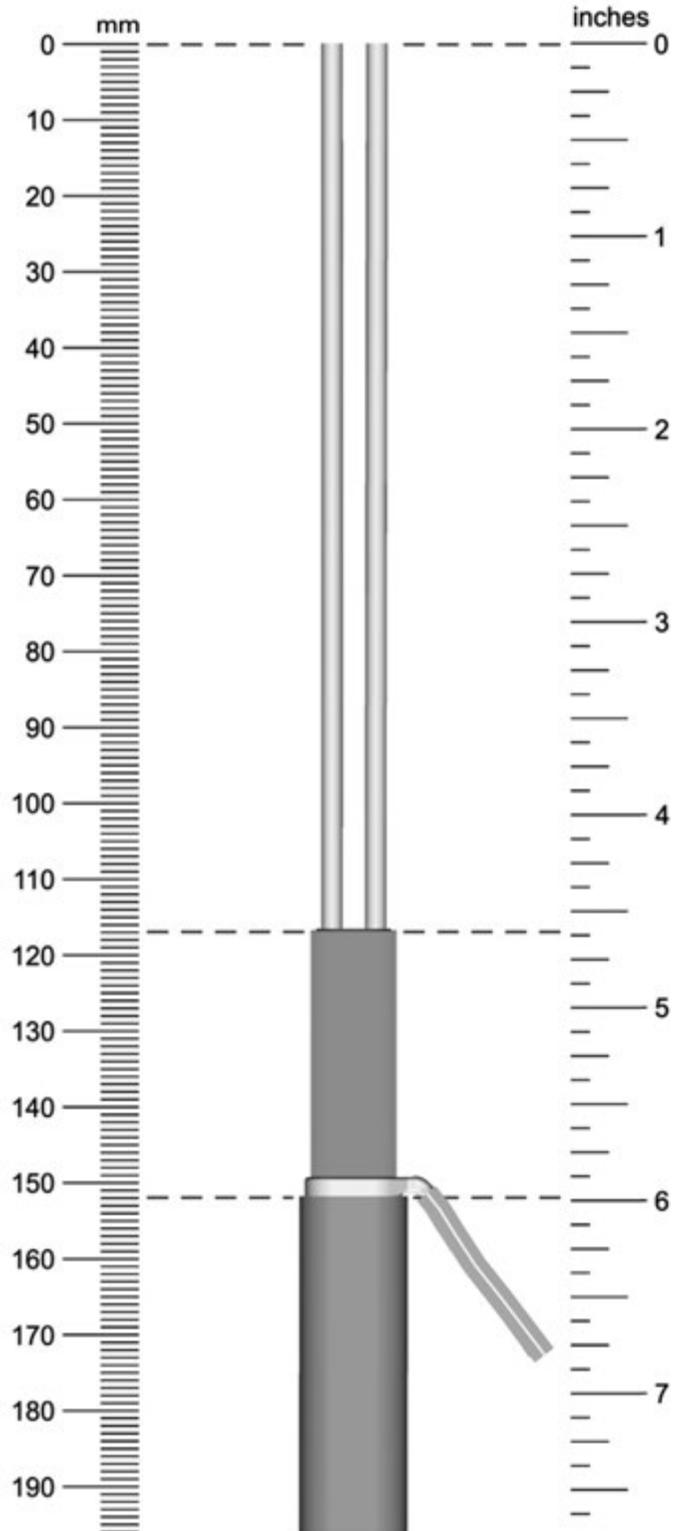


Figure 15-18

15.5 DF-PETK-1D POWER END TERMINATION KIT

Installation Steps

15.5.1. REMOVE JACKET

Measure back ½" from the end and remove over jacket using a utility knife (Figure 15-19).

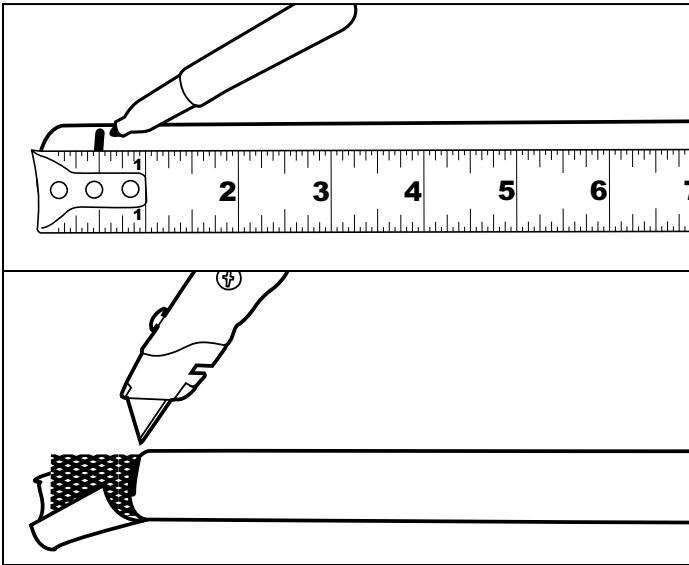


Figure 15-19

15.5.2. REMOVE METALLIC BRAID

Separate metallic braid and **completely** remove (Figure 15-20).

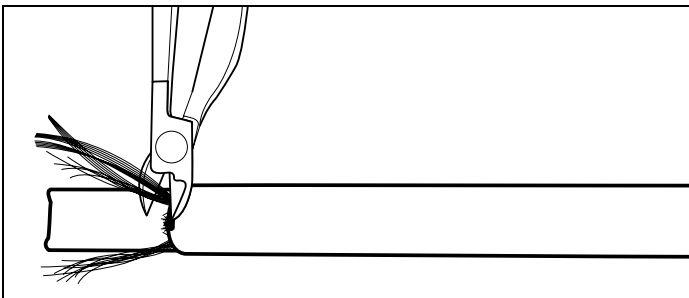


Figure 15-20

15.5.3. APPLY SEALANT

Apply an ample amount of the RTV-2 sealant to heat trace cable (Figure 15-21).

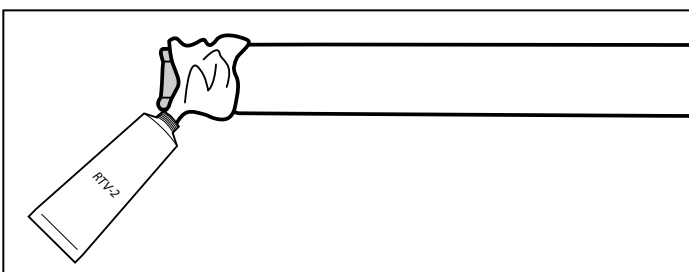


Figure 15-21

15.5.4. INSERT INTO PETK END TERMINATION BOOT

Insert exposed heat trace into PETK end termination boot (Figure 15-22).

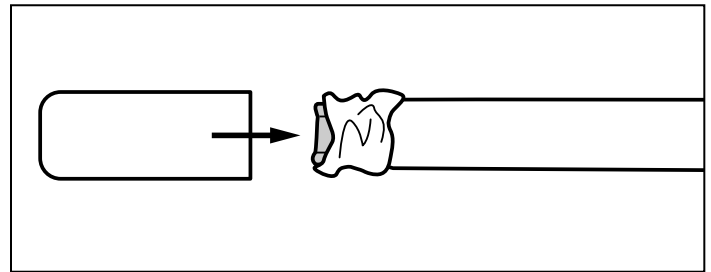


Figure 15-22

PETK termination boot should look as depicted below (Figure 15-23).

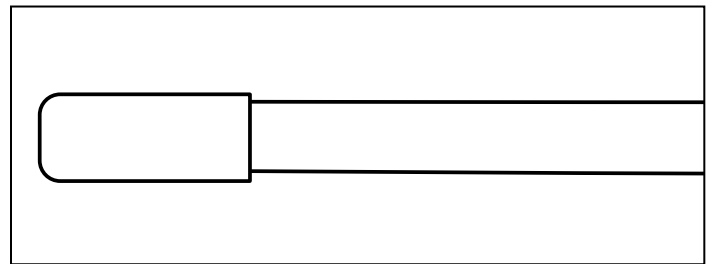


Figure 15-23

End Cap Termination Template (Figure 15-24)

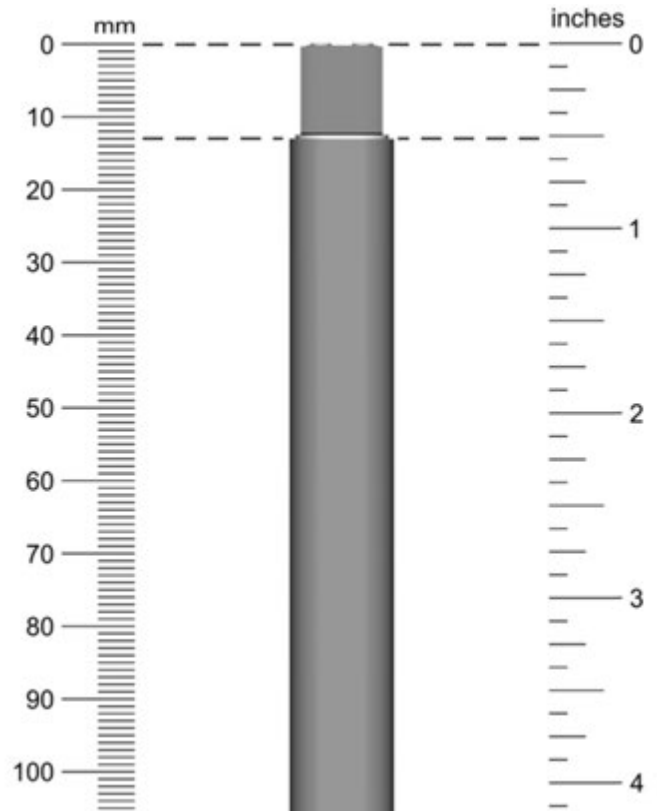


Figure 15-24

15.6 HEAT TRACE CONTROLLER AND THERMOCOUPLE

Quick Reference Installation

(This Section 15.6 is documentation from a third party, ETI, regarding their TRACON product ("TRACON"). Section 15.6 is applicable only if your purchase includes TRACON. All warranties with respect to TRACON come directly from ETI, and no express or implied warranties from Omega Flex, Inc. apply.)



PACKING LIST

QTY.	PART NO.	DESCRIPTION
1	25169	TRACON MODEL FPT 130 Single-Point Freeze Protection Heat-Trace Control
1	25076	Temperature Sensor
1	25298	FPT 130 Quick-Reference Installation Guide (this document)
-	25165	TRACON MODEL FPT-130 Installation & Operation Manual
Available online at: networketi.com/product-manuals		

PRIOR TO INSTALLATION

1. Read these installation instructions and manual prior to beginning installation.
2. Install this device only if you are a qualified electrician trained to perform such work.
3. Before beginning installation, lay out the system components, the heat trace cable and the temperature probe in their approximate locations to visualize the system and evaluate exact component and junction box placement, as well as required cable and conduit lengths.

Install the FPT on a fixed, flat, vertical surface using the unit's mounting flanges. The mounting flanges accommodate 1/4" or 6.3 mm fasteners.

The FPT 130's nonmetallic enclosure has one 1.046" hole for conduit entry; this can hold both power and load wiring.

Use only Listed Type 4X IP66 liquid-tight conduit hubs or cable glands. Connect the hub to the conduit system before connecting the hub to the enclosure.

The unit comes with two installed liquid-tight cable glands. One of these fittings is for the temperature sensor cable, and the other is for the alarm relay cable.

The cable glands can accommodate cable diameters 0.08" to 0.24" (2 mm to 6 mm). The temperature sensor may be located up to 2,000' (610m) from the FPT.

There is a removable electrical insulation divider that must be in place when there is power applied to the unit. All leads should be terminated; no unsecured leads should be left inside the wiring compartment.

INSTALLATION

The FPT 130 Automatic Heat-Trace Control should be installed by a qualified, licensed electrician. Installation must conform to all applicable local and national electrical codes and laws. The unit's NEMA 4X IP66 enclosure allows for indoor or outdoor applications.

The FPT 130 controller has an ambient operating temperature range of -40 °F to 131 °F (-40 °C to 55 °C). To avoid potential internal condensation mount the unit out of direct sunlight.

QUICK-REFERENCE INSTALLATION GUIDE

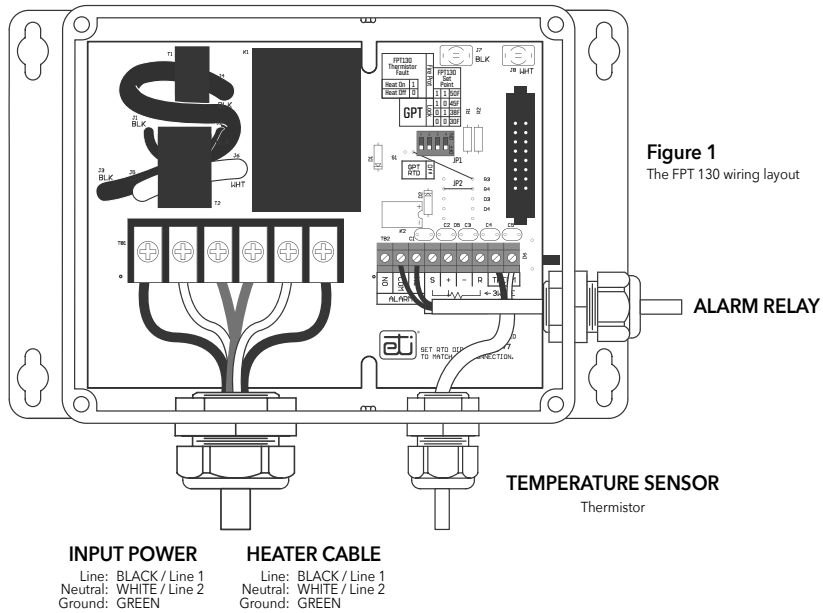


Figure 1
The FPT 130 wiring layout

FIGURE 1. The FPT 130 wiring layout.

NOTE:

Perform the following steps with the circuit breaker to the unit OFF. The TRACON FPT 130 is permanently connected equipment and does not have an internal disconnect device. When power is applied, the system will start.

1. INSTALL THE CONTROL BOX

Use the box itself as a template to determine the mounting hole footprint. Install the box to a solid, stable surface capable of supporting four times the weight of the box, or about 20 pounds. Use all four mounting holes. Install the control box to the wall using heavy-duty 1/4" or 6.3 mm fasteners long enough to fasten the box securely. Do not fully tighten mounting hardware at this time. Leave the mounting hardware loose enough to work the conduit into place. Hardware will be fully tightened following installation of the conduit.

2. CONNECT THE SUPPLY AND LOAD

Feed the Input Supply (Input Power) and the Load (Heater Cable) through the Conduit Entry Hole in the enclosure as shown, then connect the leads, as shown in the Figure 3. Line is black; neutral is white; ground is green.

Note: Both the power and the load require a #10 AWG wire.

3. INSTALL THE TEMPERATURE SENSOR

The FPT 130 comes with a thermistor temperature sensor with a 20 ft. jacketed cable that has an operating range of -40 °F to 230 °F (-40 °C to 110 °C). Refer to Figure 4.

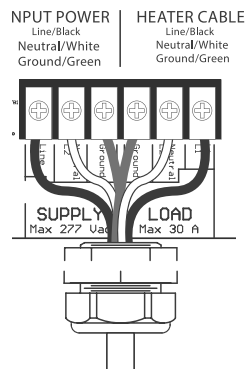


FIGURE 3.
Contractor connections.

QUICK-REFERENCE INSTALLATION GUIDE

4. INSTALL THE EXTERNAL ALARM

An alarm or power-off condition can be communicated by either opening or closing a relay contact. It is important to make the proper alarm relay connections to achieve the desired result. The middle terminal labeled COM (Common) is used in both wiring configurations. Connect one alarm relay lead to the COM terminal. If the system needs a contact to close to signal an alarm or power-off condition, connect the other alarm relay lead to the NC (Normally Closed) terminal.

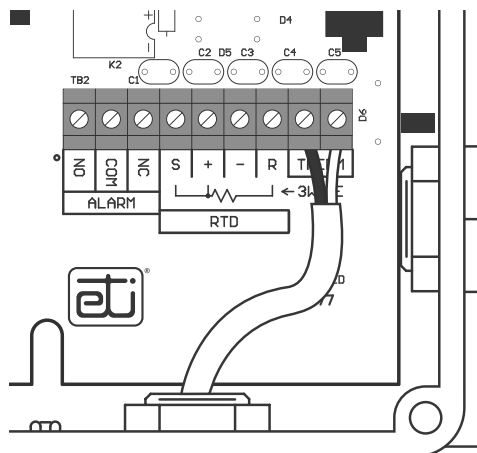


FIGURE 4. Thermistor sensor connection

Note: At this point the circuit breaker to the unit can be turned on providing power to the unit.

6. SETUP AND SETTINGS EDITING

Please refer to the FPT 130 Manual for comprehensive instructions for Setup and Settings Editing.

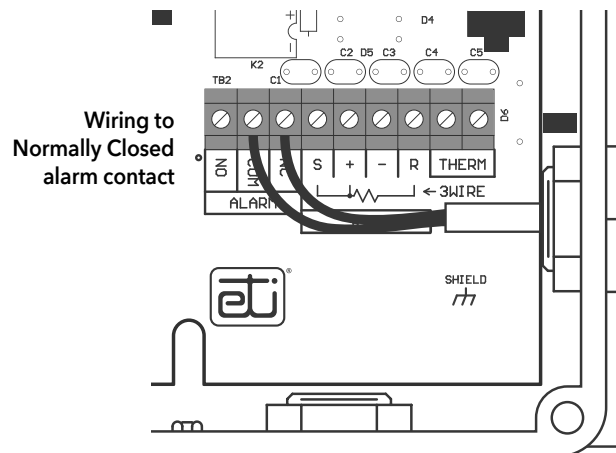


FIGURE 5. External alarm connection

If the system needs a contact to open to signal an alarm or power-off condition, then connect the other alarm relay lead to the NO (Normally Open) terminal.

If the unit has power, and there are no alarm conditions then the NO and COM terminals will be connected. If the unit loses power or an alarm condition occurs then the NC and COM terminals will be connected. Refer to Figure 5.

5. INSTALL THE CONDUIT AND FULLY TIGHTEN HARDWARE

Install the conduit runs to the control box. Use only Listed Type 4X IP66 liquid-tight conduit hubs. With cabling routed through conduit and conduit is secure, fully tighten the control box mounting hardware and re-assemble control box panels and cover in their original location.

QUICK-REFERENCE INSTALLATION GUIDE



Pilot Duty

The FPT 130 Automatic Heat-Trace Control with GFEP cannot be used for Pilot Duty applications.



Resistive Load Usage Only

This product is not for use with Inductive loads. Inductive loads may create nuisance tripping of the Ground-Fault Equipment Protection circuit.



Abnormal Odor or Smoke

In the event of smoke or a burning or abnormal odor, immediately interrupt power to the unit by turning off the circuit breaker protecting the unit.



Electrical Shock / Fire Hazard

Any installation involving electric heater wiring must be grounded to earth to protect against shock and fire hazard. Suitable ground fault detection and interrupting systems must be in use at all times to reduce shock and fire hazard and to protect equipment.



Electric wiring to heating elements must be installed in accordance with National Electrical Code (NEC)/Canadian Electrical Code requirements, as well as all other local and applicable electrical codes and any thirdparty standards. This product is intended for commercial and industrial applications. Follow the installation instructions contained in this manual and those provided by the heater manufacturer.

Size the circuit breaker appropriately for the expected load and inrush current. The maximum rated current for the FPT 130 is 30 amps with resistive load.

Heater loads and their controls should not share a circuit branch with other types of equipment. A shared circuit may result in electromagnetic interference that can affect

system operation.

Make certain that the heater shield is properly grounded. Failure to do so may result in damage to the equipment or fire.

Following installation and prior to beginning system operation, refer to and perform the Post-Installation Test described in this manual.

CONTACTING CUSTOMER SERVICE

For assistance, contact Customer Service. Office hours are from 8:00 AM until 5:00 PM ET.

Email: info@networketi.com

Web: networketi.com

Mail: ETI
1850 North Sheridan Street
South Bend, IN 46628

LIMITED WARRANTY

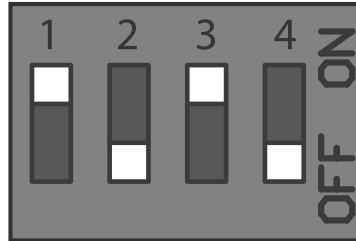
ETI's two year limited warranty covering defects in workmanship and materials applies. Contact Customer Service for complete warranty information.

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QUICK-REFERENCE INSTALLATION GUIDE

Default settings



Temperature Sensor Fault Mode



Energize Heaters if the sensor fails



De-energize Heaters if the sensor fails

Fire Protection Mode



Fire Protection ON



Fire Protection OFF

Temperature Setpoint



50 °F



45 °F



38 °F



30 °F

Note: The DIP switches are read at power-up. If any DIP switch is changed while the unit is on, then the power needs to be turned off and on again for the new setting to take effect.

FPT130 Thermistor Fault		Fire Prot	FPT130 Set Point		
Heat On	1		1	1	50F
Heat Off	0	GPT Lock	1	0	45F
			0	1	38F
			0	0	30F

15.7 DF-DP/Terminator POWER CONNECTION KIT

Installation Procedure

The following installation procedures are suggested guidelines for the installation of termination connection systems.

15.7.1. LOCATE CONNECTION

Cut end of cable at angle to aid in piercing grommet (Figure 15-25).

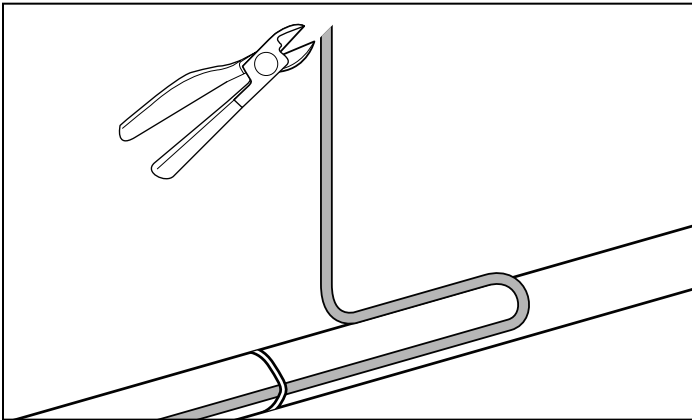


Figure 15-25

15.7.2. INSERT CABLE INTO BASE

Insert cable into the base of DF/DP Terminator. If mounting on bottom of pipe, punch out weep hole (Figure 15-26).

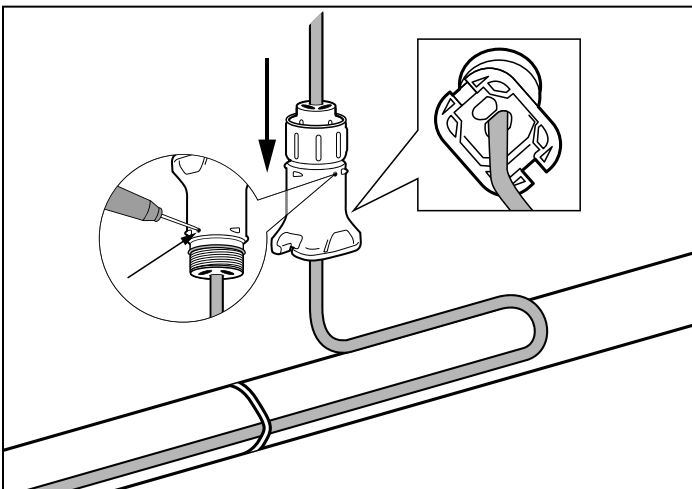


Figure 15-26

15.7.3. ROUTE CABLE

Slide base toward pipe and route cable through support base entry (Figure 15-27).

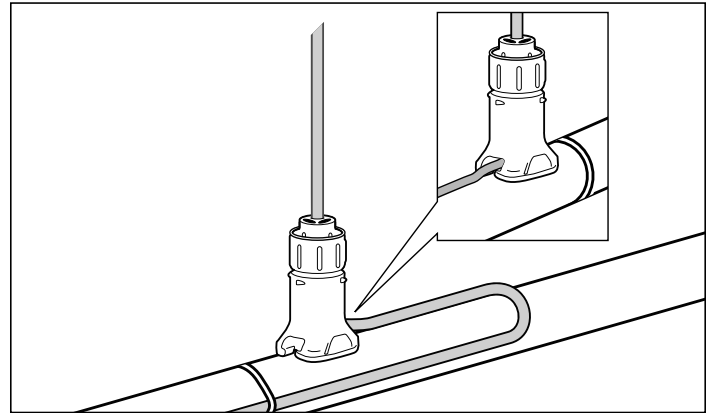


Figure 15-27

15.7.4. INSERT BANDING GUIDE

Insert banding guide into base and snap into place (Figure 15-28).

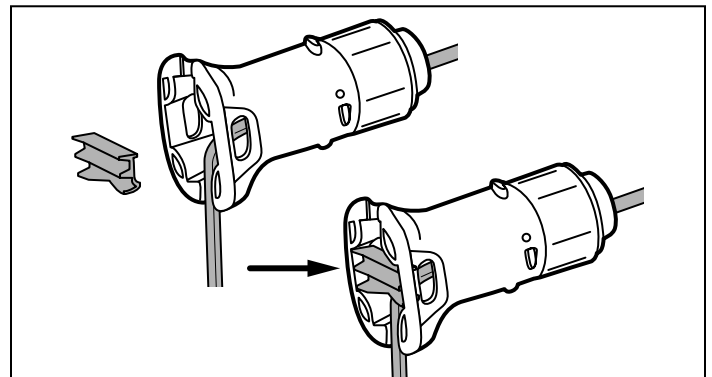


Figure 15-28

15.7.5. MOUNT BASE

Mount base to pipe using pipe band. Do not band over cable (Figure 15-29).

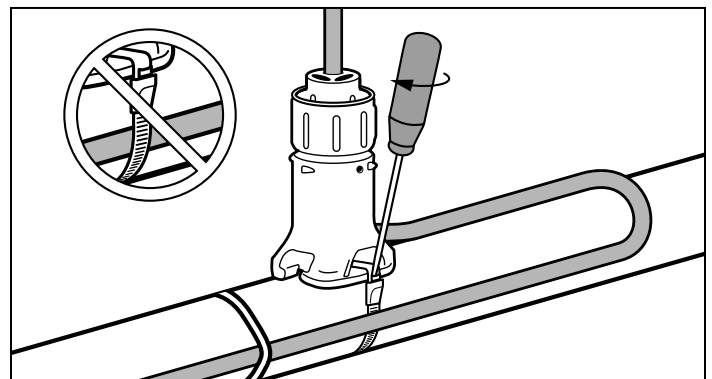


Figure 15-29

15.7.6. EXPOSE CABLE

Cut angle off BSX heat trace cable and expose ample amount in order to prepare end termination (Figure 15-30).

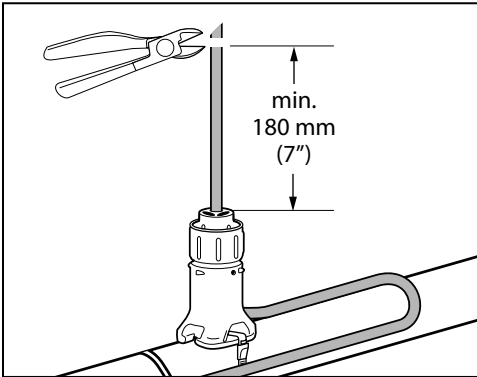


Figure 15-30

15.7.7. TERMINATE CABLE

Terminate BSX cable with appropriate PETK termination kit. Refer to PETK installation instructions (Figure 15-31).

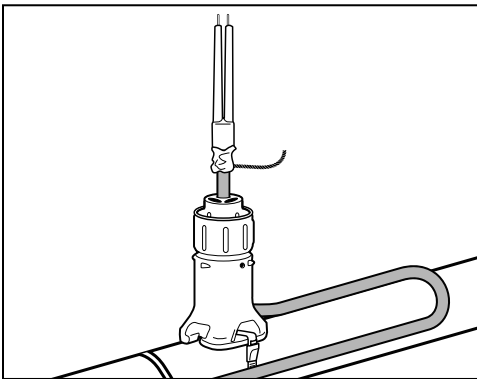


Figure 15-31

15.7.8. MOUNT TOP OF DF/DP

Mount top of DF/DP on base. Make sure to align slots to properly orient junction box base. Tighten inner lock nut securely (Figure 15-32).

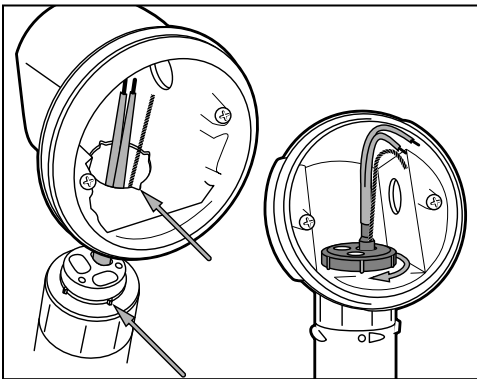


Figure 15-32

15.7.9. INSTALL POWER CONNECTION FITTINGS

Install power connection fittings (user supplied) and pull in power and ground wires (Figure 15-33).

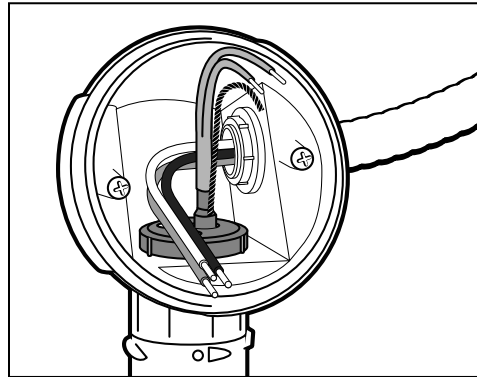


Figure 15-33

15.7.10. INSTALL QUICK MOUNT TERMINAL BLOCKS (Figure 15-34)

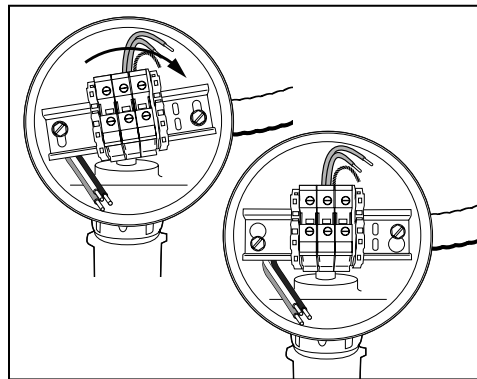


Figure 15-34

15.7.11. COMPLETE SYSTEM WIRING

Typical Wiring Detail For DF-DP Terminator

1. DF-PETK-1D Power termination kit
2. Metallic ground braid wire
3. Power/Ground Leads from heat trace controller (DF-FPT130) (Figure 15-35)

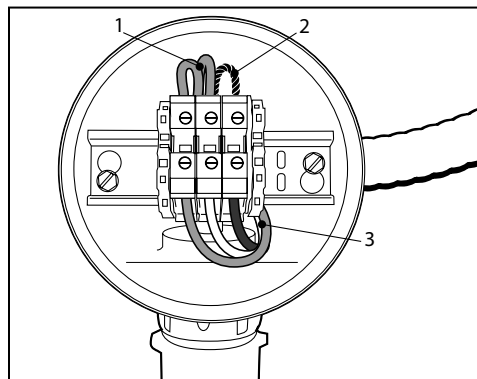


Figure 15-35

15.8 DF-DS/DE TERMINATOR SPLICE TERMINATION KIT

Installation Procedure

The following installation procedures are suggested guidelines for the installation of DF-DS/DE splice termination kit.

15.8.1. INSERT HEAT TRACE CABLES INTO BASE

Insert BSX heat trace cables into the bottom of the DF-DS/DE splice terminator base. Cut each end at an angle to aid in piercing the rubber grommet. If mounting on bottom of pipe, punch out weep hole (Figure 15-36).

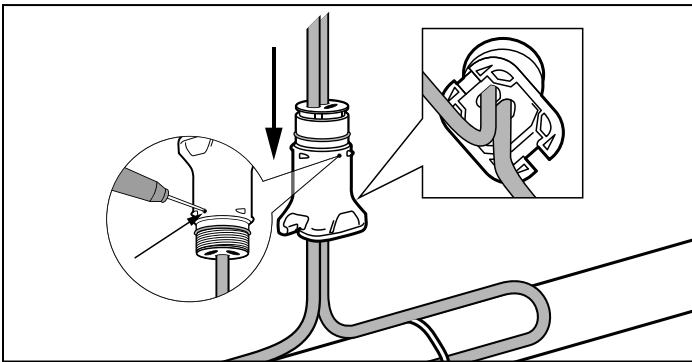


Figure 15-36

15.8.2. ROUTE CABLE

Slide DF-DS/DE base toward pipe and route cables through support base entry (Figure 15-37).

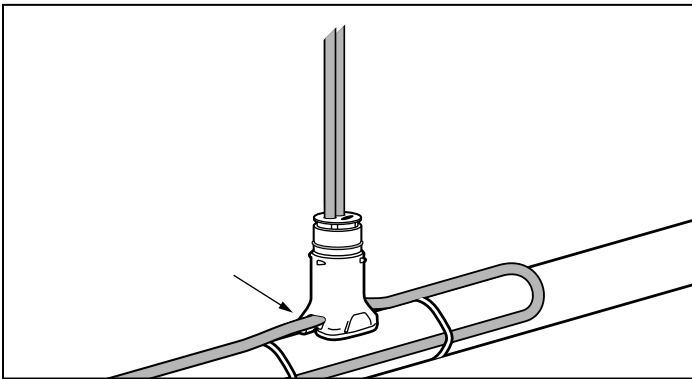


Figure 15-37

15.8.3. INSERT BANDING GUIDE

Insert banding guide into base and snap into place (Figure 15-38).

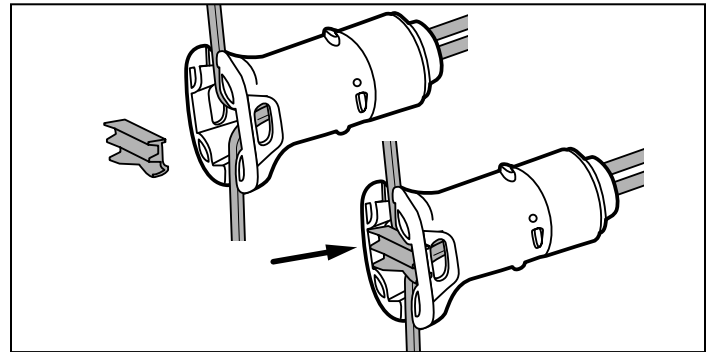


Figure 15-38

15.8.4. MOUNT BASE

Mount base to pipe using pipe band. Do not band over cable (Figure 15-39).

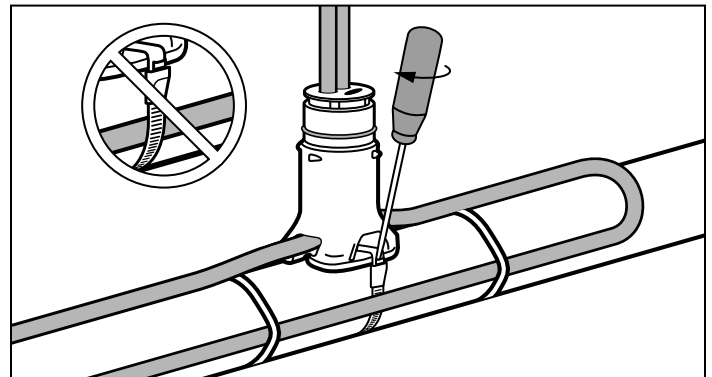


Figure 15-39

15.8.5. TERMINATE CABLES

Terminate cables with appropriate SCKT termination kit. Refer to kit installation instructions (Figure 15-40).

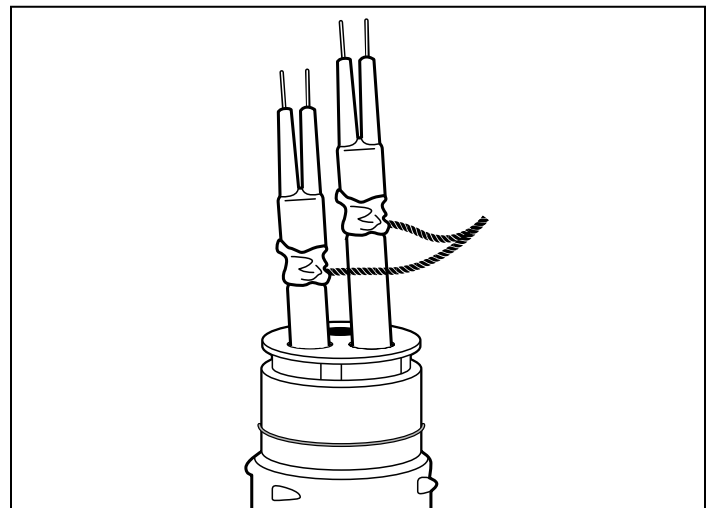


Figure 15-40

15.8.6. CONNECT BUS AND BRAID WIRES

Connect bus and braid wires using wire nuts (Figure 15-41).



Figure 15-41

15.8.7. TIGHTEN CAP SECURELY (Figure 15-42).

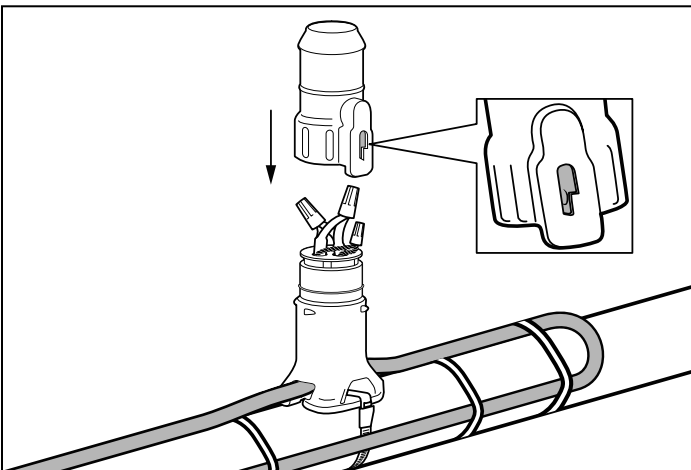


Figure 15-42

Completed DF-DS/DE splice kit (Figure 15-43).

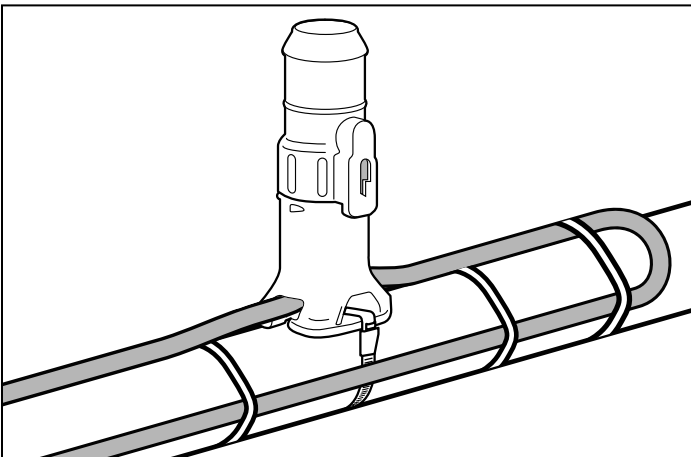


Figure 15-43

15.9 BEACON TERMINATOR DF-DE-B PIPE MOUNT LED END OF CIRCUIT LIGHT KIT

Installation Procedure

15.9.1. INSERT HEAT TRACE CABLES INTO BASE

Insert BSX heat trace cable into the base of the (DF-DE-B or DF-DE-B-FAK) splice terminator base. Cut each end at an angle to aid in piercing the rubber grommet. If mounting on bottom of pipe, punch out weep hole (Figure 15-44).

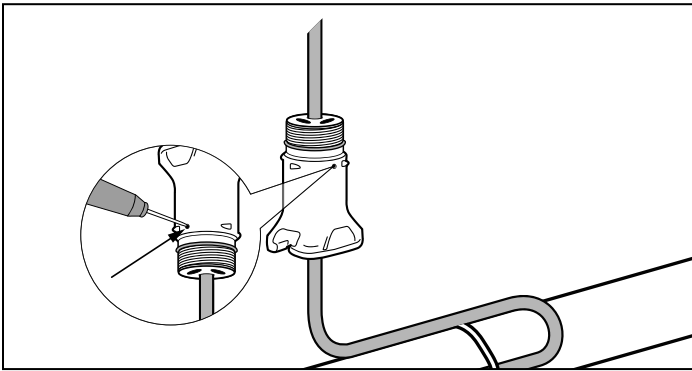


Figure 15-44

15.9.2. ROUTE CABLE

Slide DF-DE-B base toward pipe and route BSX cable through support base entry (Figure 15-45).

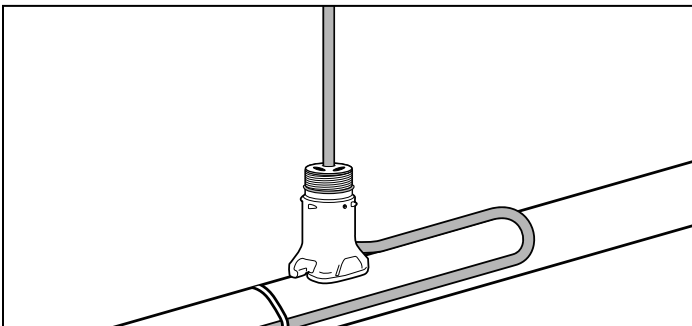


Figure 15-45

15.9.3. INSERT BANDING GUIDE

Insert banding guide into base and snap into place (Figure 15-46).

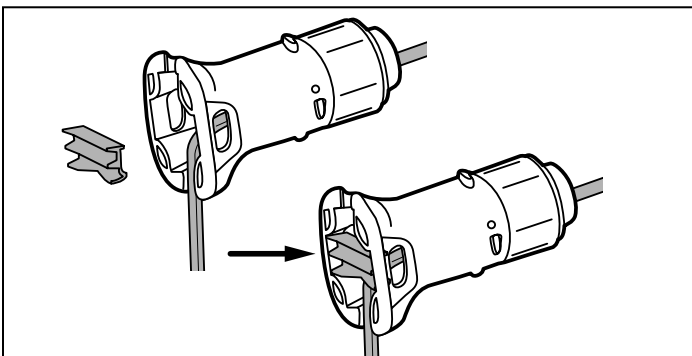


Figure 15-46

15.9.4. MOUNT BASE

Mount base to pipe using pipe band. Do not band over cable (Figure 15-47).

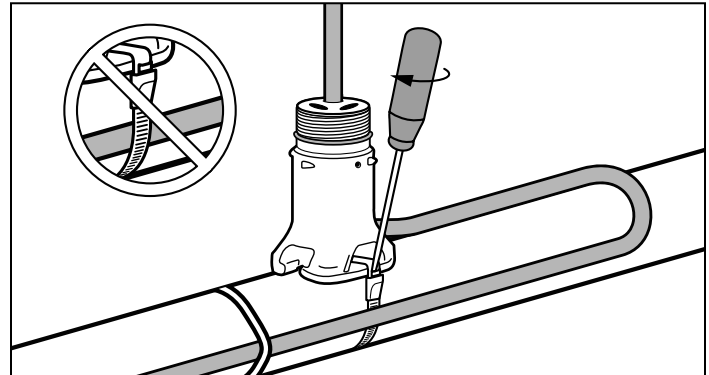


Figure 15-47

15.9.5. TERMINATE CABLE AND CONNECT BSX BUS WIRES

Terminate cable with appropriate SCTK termination kit. Refer to SCTK installation instructions. Connect BSX bus wires using wire nuts provided (Figure 15-48).

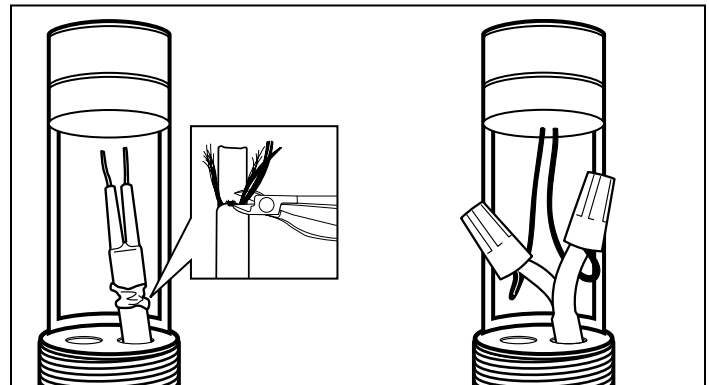


Figure 15-48

15.9.6. INSTALL COVER

Slide the light module cover over the light and tighten cap securely (Figure 15-49).

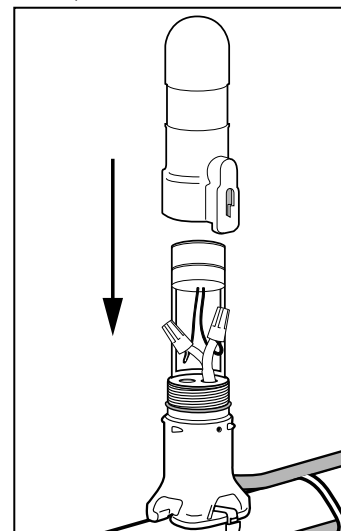


Figure 15-49

15.10 BEACON TERMINATOR
DF-DE-B-FAK FLAT MOUNT LED END OF CIRCUIT LIGHT KIT

Installation Procedure (Figure 15-50)

15.10.1. PIPE ENTRANCE TOP

1. Green light is on when heat trace is working
2. SCTK kit is used for installation of the flat mount beacon (DF-SCTK-1D)
3. Caulk the base of the beacon for weather resistance
4. Lube O-ring using white lithium/bearing grease
5. 8' of Thermon BSX 120 VAC self regulating heat trace cable (DF-BSX5-10J)
6. DEF-Trac® insulated piping (DF-FSPHT-XX-XXX)

15.10.2. PIPE ENTRANCE SIDE

1. Green light is on when heat trace is working
2. SCTK kit is used for installation of the flat mount beacon (DF-SCTK-1D)
3. Caulk the base of the beacon for weather resistance
4. Lube O-ring using white lithium/bearing grease
5. 8' of Thermon BSX 120 VAC self regulating heat trace cable (DF-BSX5-10J)
6. DEF-Trac® insulated piping (DF-FSPHT-XX-XXX)

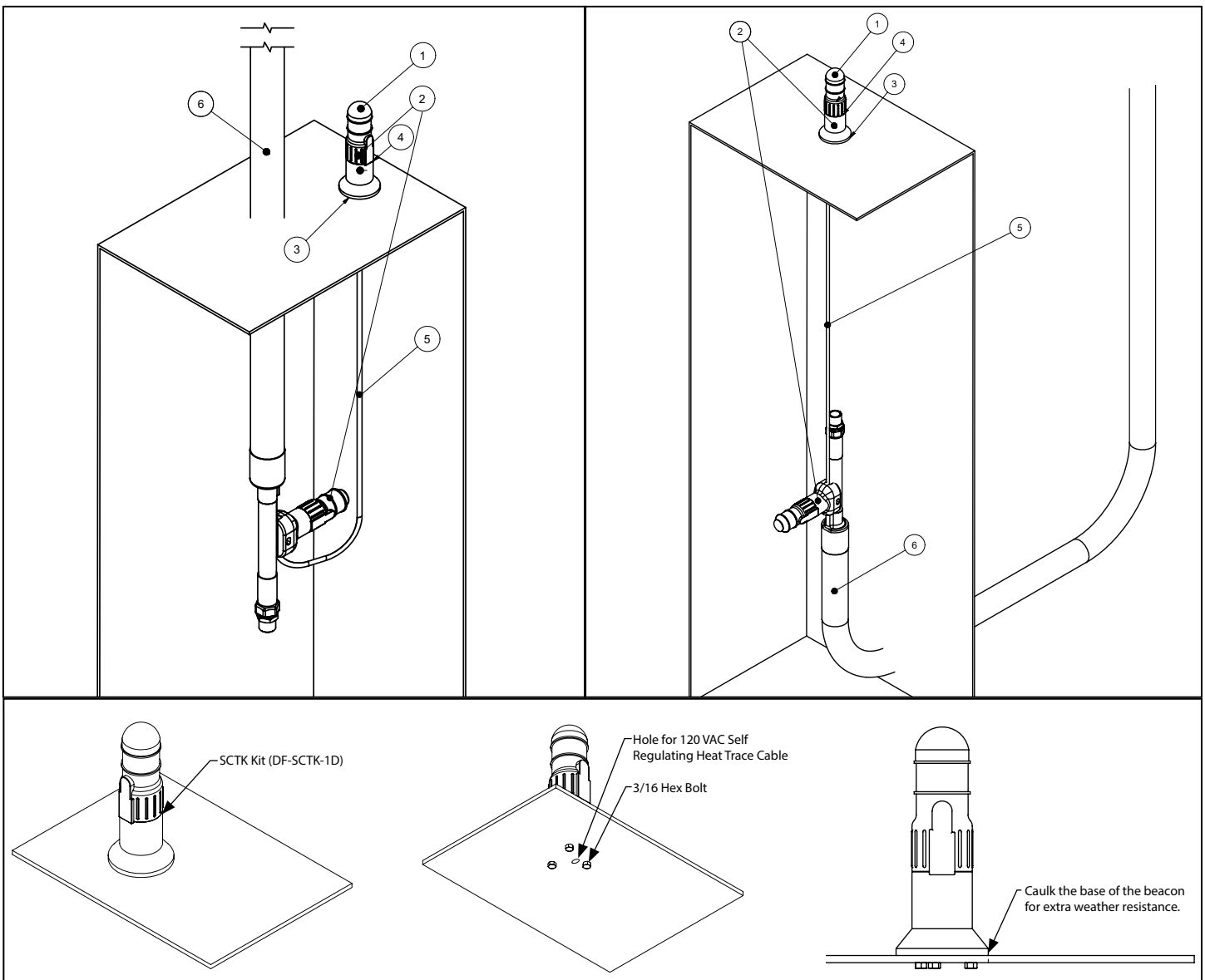


Figure 15-50

**15.10.3. TERMINATE CABLE AND CONNECT
BSX BUS WIRES**

Terminate cable with appropriate SCKT termination kit. Refer to SCKT installation instructions. Connect BSX bus wires using wire nuts provided (Figure 15-51).

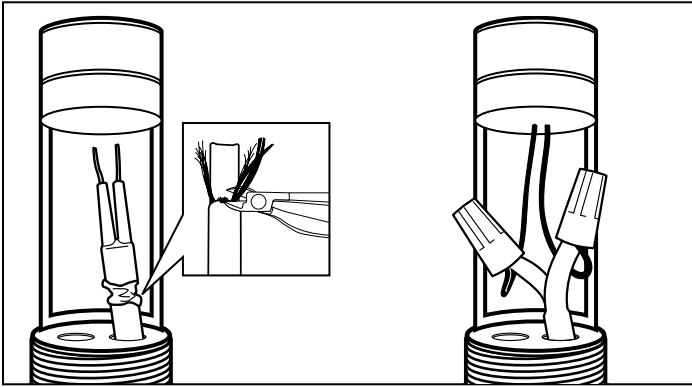


Figure 15-51

15.10.4. INSTALL COVER

Slide the light module cover over the light and tighten cap securely (Figure 15-52).

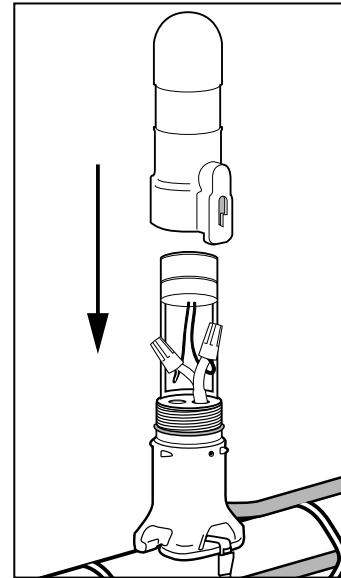


Figure 15-52

DF-DE-B-FAK (FLAT MOUNT) BASE DRILL HOLE TEMPLATE (Figure 15-53)

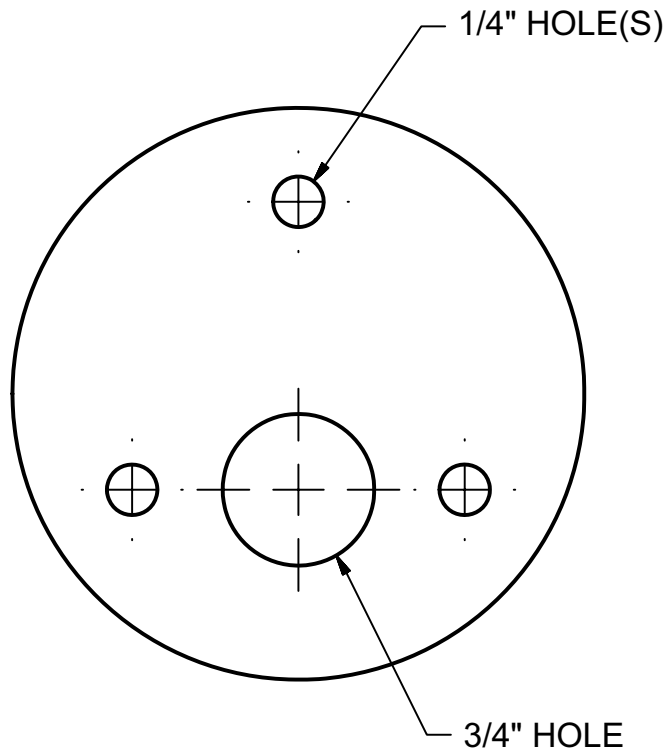


Figure 15-53

▲ WARNING

Field splice does not replace DS/DE termination kit. This procedure is for field repair under insulation only.

16. HEAT TRACE FIELD SPLICE PROCEDURE

MATERIALS (Figure 16-1):

- Thermon Splice Connection Termination Kit (SCTK)
- Scotch 130C Linerless Rubber Splicing Tape
- Scotch Super 88 Vinyl Electrical Tape
- Thomas & Betts 2RBS14X 16-14 Heat Shrink Butt Connector (2)
- Thomas & Betts 2RCS10X 12-10 Heat Shrink Butt Connector (1)

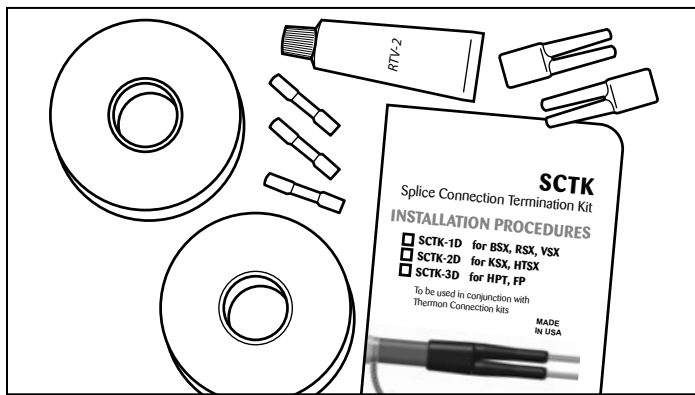


Figure 16-1

TOOLING (Figure 16-2):

- Heat Gun
- Electrical Crimper
- Cutting Pliers
- Utility Knife
- Tape Measure
- Small Flathead Screwdriver

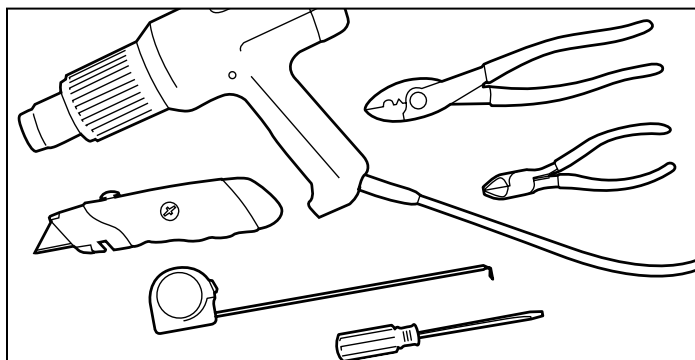


Figure 16-2

Installation Procedure

16.1. SPLICE END A (3" GROUND WIRE)

Cut and remove 3" of heating cable overjacket (Figure 16-3).

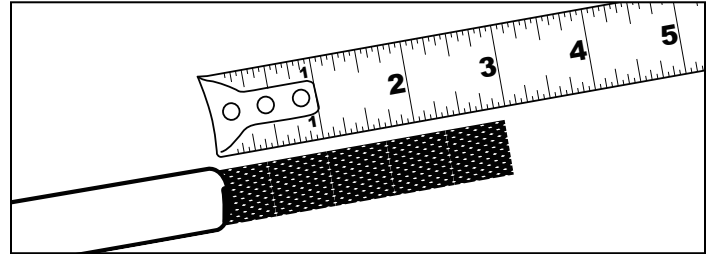


Figure 16-3

Separate braid strands at edge of overjacket and pull cable through opening in braid (Figure 16-4).

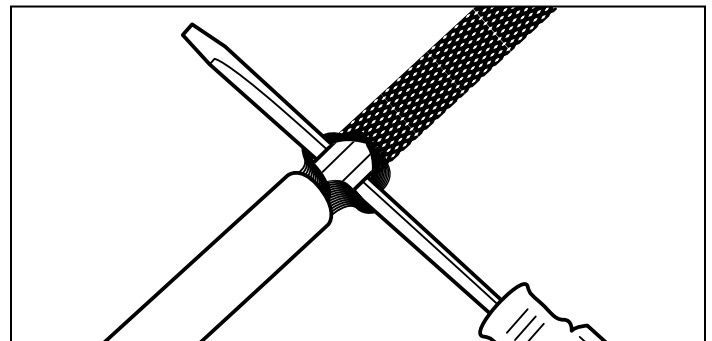


Figure 16-4

Twist braid into a pigtail. Trim ends of braid (Figure 16-5).

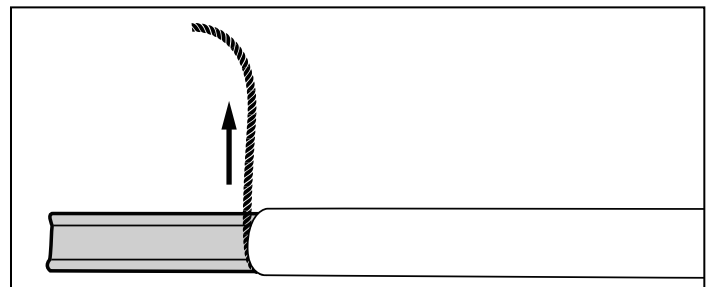


Figure 16-5

Cut and remove 2" of primary insulation jacket (Figure 16-6).

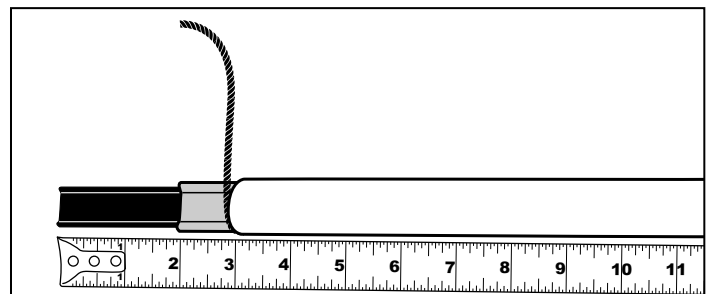


Figure 16-6

Strip both sides of the conductive matrix to expose each bus wire (Figure 16-7).

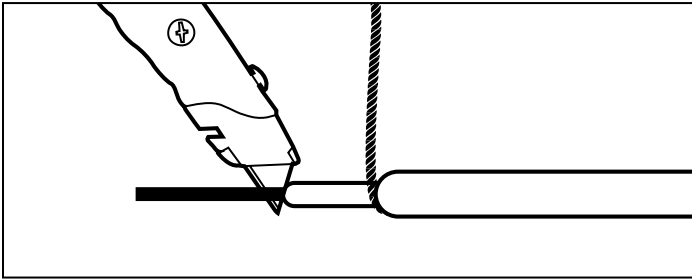


Figure 16-7

Separate bus wires from conductive matrix (Figure 16-8).

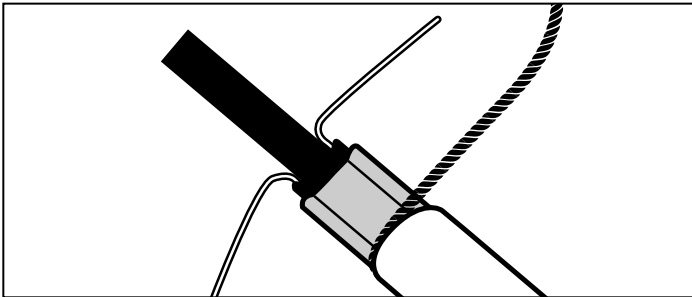


Figure 16-8

Cut off excess conductive matrix (Figure 16-9).

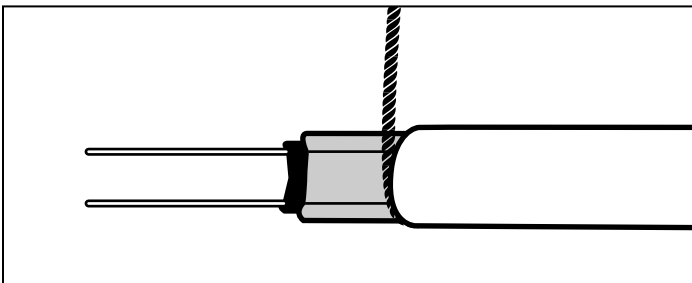


Figure 16-9

Apply a liberal amount of RTV sealant to the insulation boot (Figure 16-10).

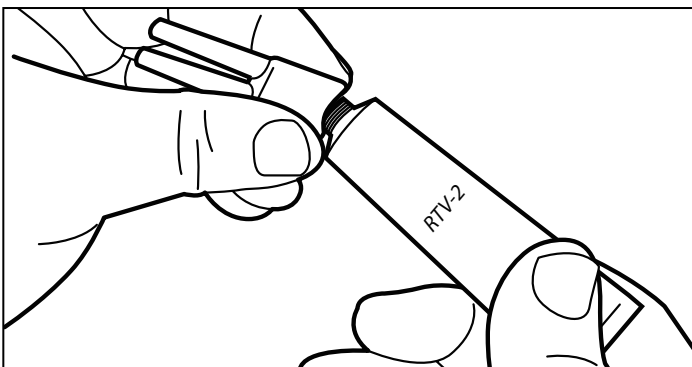


Figure 16-10

Slide boot onto the end of the cable (Figure 16-11).

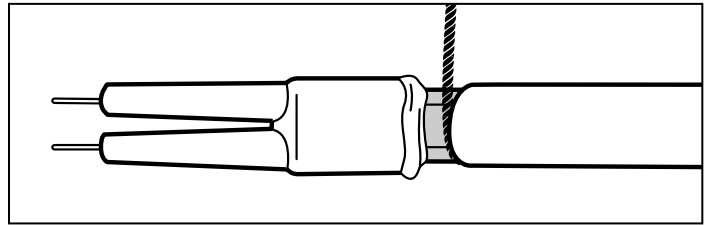


Figure 16-11

16.2. SPLICE END B (6" GROUND WIRE)

Cut and remove 6" of heating cable overjacket (Figure 16-12).

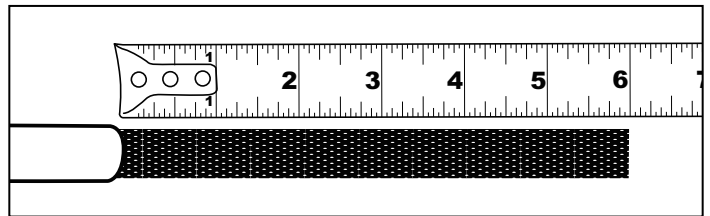


Figure 16-12

Separate braid strands at edge of overjacket and pull cable through opening in braid (Figure 16-13).

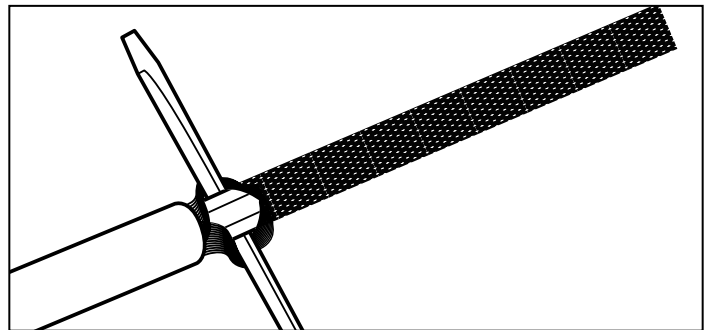


Figure 16-13

Twist braid into a pigtail. Trim ends of braid (Figure 16-14).

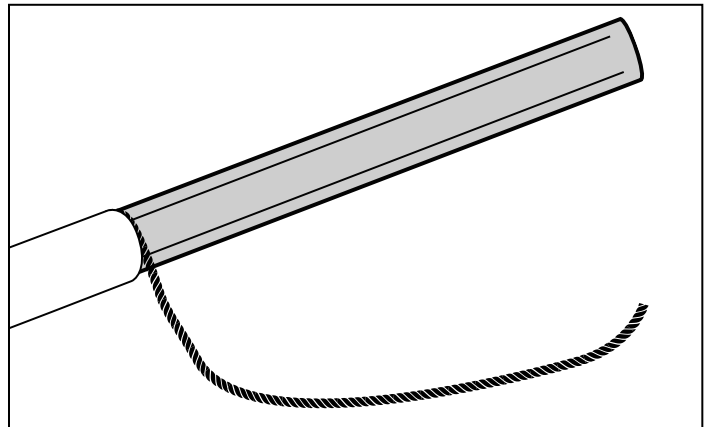


Figure 16-14

Cut off 3" of cable. Keep 6" ground wire (Figure 16-15).

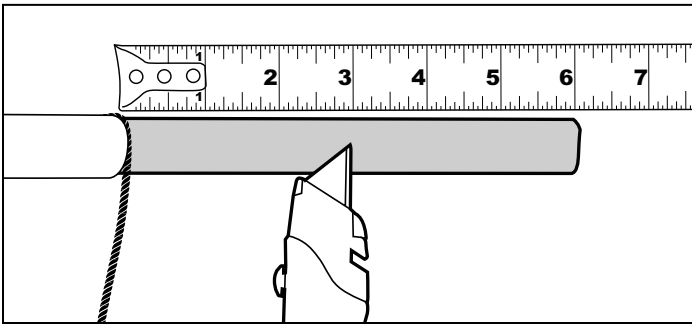


Figure 16-15

Cut and remove 2" of primary insulation jacket (Figure 16-16).

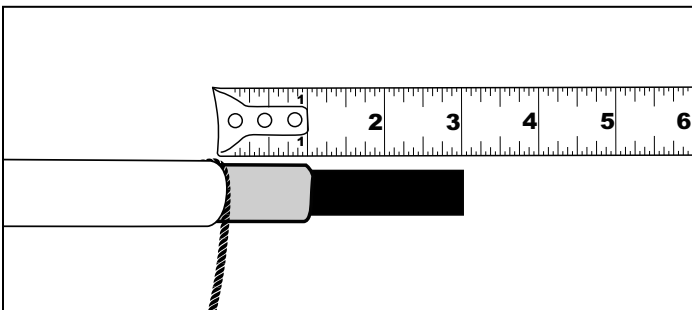


Figure 16-16

Strip both sides of the conductive matrix to expose each bus wire (Figure 16-17).

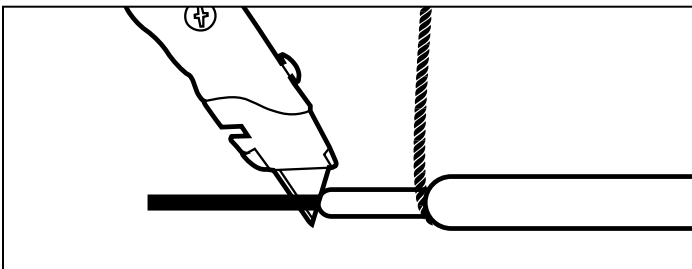


Figure 16-17

Separate bus wires from conductive matrix (Figure 16-18).

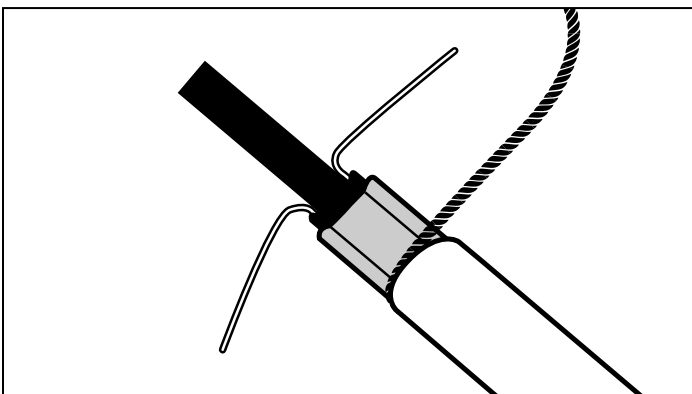


Figure 16-18

Cut off excess conductive matrix (Figure 16-19).

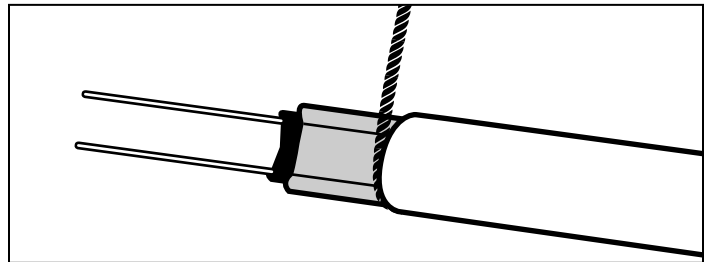


Figure 16-19

Apply a liberal amount of RTV sealant to the insulation boot (Figure 16-20).

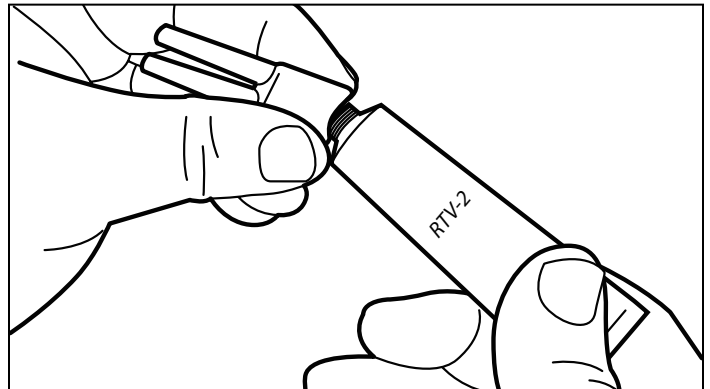


Figure 16-20

Slide boot onto the end of the cable (Figure 16-21).

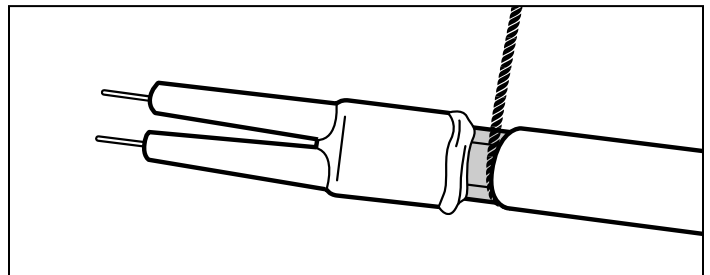


Figure 16-21

16.3. CONNECTION

Trim back all bus wires to 1/4" sticking out of both insulation boots (Figure 16-22).

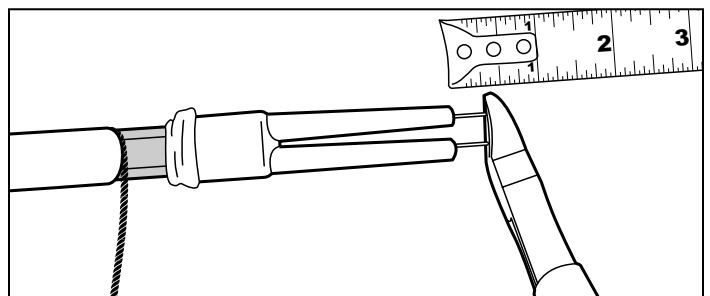


Figure 16-22

Important Information Follow All Instructions

Crimp butt connector to one bus wire on each section of heat trace using the insulated groove in the crimping pliers (Figure 16-23).

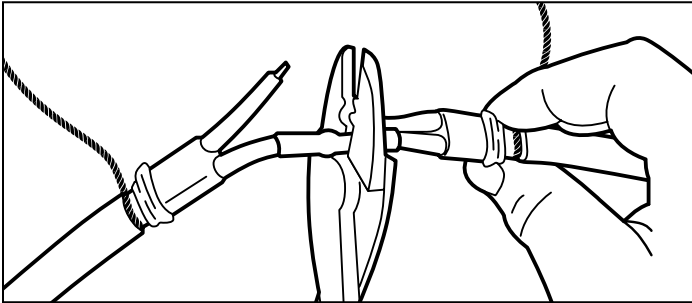


Figure 16-23

Use heat gun to shrink and seal butt connector (Figure 16-24).

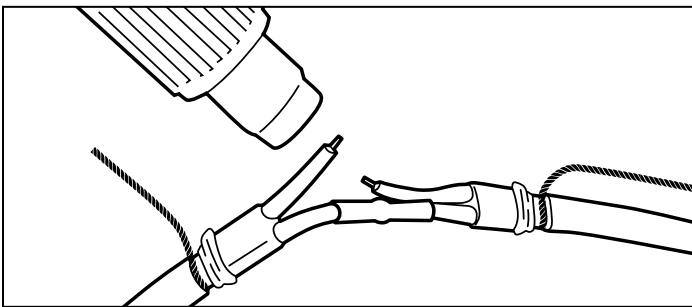


Figure 16-24

Wrap crimped connection in **Scotch 130C Linerless Rubber Splicing Tape**, stretching the tape and overlapping wraps ½ the width of the tape (Figure 16-25).

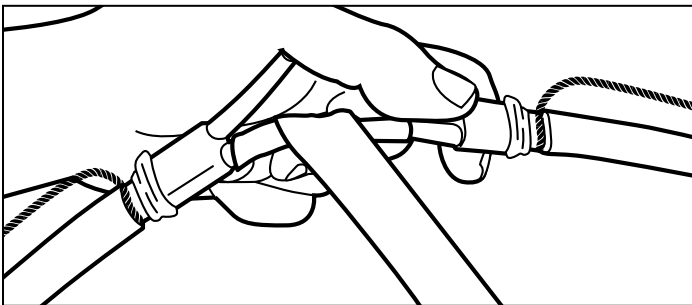


Figure 16-25

Crimp second pair of bus wires together (Figure 16-26).

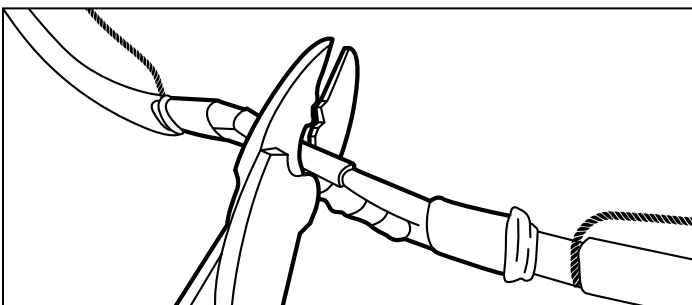


Figure 16-26

Use heat gun to shrink and seal butt connector (Figure 16-27).

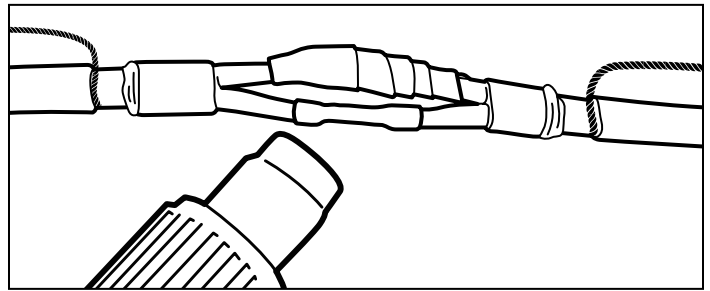


Figure 16-27

Wrap connected boots with **Scotch 130C Linerless Rubber Splicing Tape**, stretching the tape and overlapping wraps ½ the width of the tape. Keep the ground free (Figure 16-28).

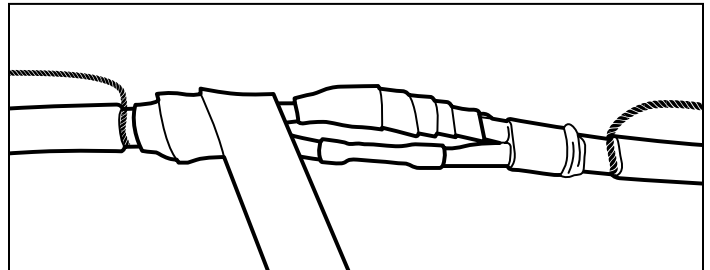


Figure 16-28

Apply crimp connector to short (3") pigtail (Figure 16-29).

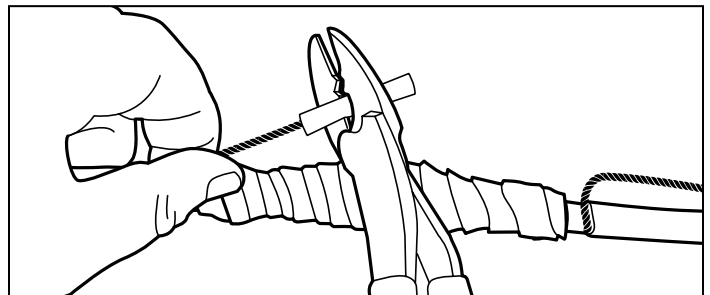


Figure 16-29

Cut necessary length of the long (6") pigtail to reach butt connector (Figure 16-30).

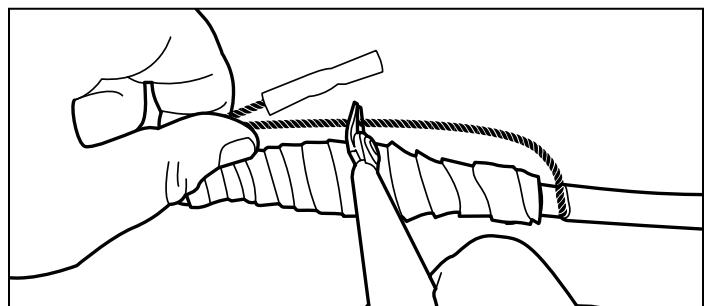


Figure 16-30

Connect pigtails and use heat gun to shrink and seal butt connector (Figure 16-31).

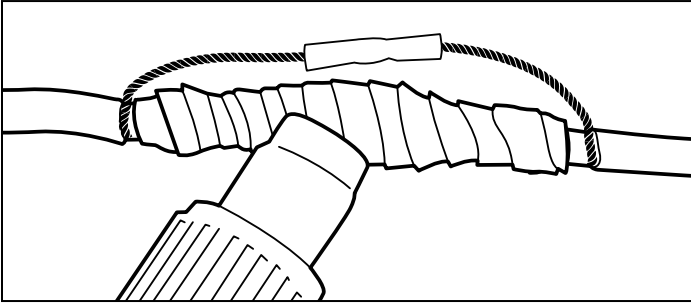


Figure 16-31

Wrap entire splice with **Scotch 130C Linerless Rubber Splicing Tape**, stretching the tape and overlapping wraps $\frac{1}{2}$ the width of the tape (Figure 16-32).

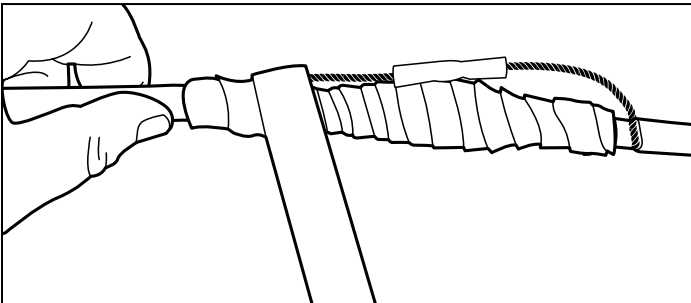


Figure 16-32

Wrap entire splice location with **Scotch Super 88 Vinyl Electrical Tape**, stretching the tape and overlapping wraps $\frac{1}{2}$ the width of the tape (Figure 16-33).

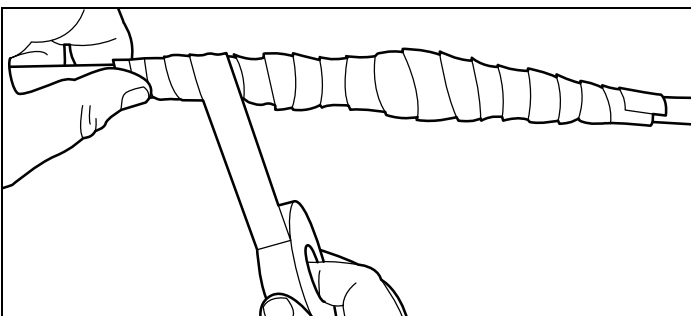


Figure 16-33

16.4. FINISHED SPLICE

Spliced, Insulated, Grounded and Sealed Heat Trace (Figure 16-34).

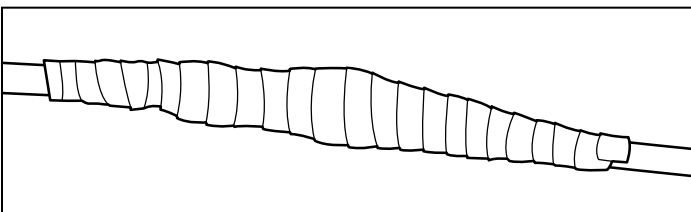


Figure 16-34

17. FINAL INSPECTION

The heating circuit can now be tested for proper operation. This includes measuring and recording the connected voltage, steady-state current draw, length and type of cable, ambient temperature and temperature of the pipe. The complete system (especially the thermal insulation) should now be visually inspected. Additional insulation should be applied snugly around pipe shoes or other heat sinks and sealed from the weather. Expansion joints on high temperature lines should be examined carefully. There may be exposed insulation where sections fit together or around flanges, valves, pipe hangers or connection kits; these locations should be sealed to prevent ingress of moisture. "Electric Heat Tracing" caution labels should be applied to the outer surface of the weather barrier at regular intervals of 10 feet (or as required by code or specification). The location of splices and end terminations should also be marked with splice and end termination caution labels.

18. THERMAL INSULATION

The value of properly installed and well-maintained thermal insulation cannot be overemphasized. Without the insulation, the heat loss is generally too high to be offset by a conventional heat tracing system.

Before the thermal insulation is installed on a heat-traced pipe, the tracing circuit should be tested for dielectric insulation resistance. This will ensure that the cable has not been damaged while exposed on the un-insulated pipe.

In addition to piping and in-line equipment such as pumps and valves, all heat sinks must be properly insulated. This includes pipe shoes, hangers, flanges and, in many cases, valve bonnets.

There are many different pipe insulation materials, each of which has advantages in particular applications. Regardless of the type or thickness of insulation used, a protective barrier should be installed. This protects the insulation from moisture intrusion and physical damage and helps ensure the proper performance of the heat tracing system.

NOTE

When rigid (non-compressible) materials are used, the inside diameter of the insulation is usually oversized to accommodate the heating cable on the pipe.

Insulating materials are very susceptible to water absorption, which dramatically increases the heat loss and should be replaced if the materials get wet.

19. CABLE TESTING

After a heat tracing circuit has been installed and fabricated, the heating cable should be tested to ensure electrical resistance integrity. The cable should be tested with at least a 1000 VDC megohmmeter (megger) between the heating cable bus wires and the heating cable metallic braid. After properly terminating the cable, connect the positive lead of the megger to the bus wires and the negative lead to the metallic braid. The minimum acceptable level for the megger reading for any polymer-insulated heat tracing cable is **20 megohms**. This test should be repeated after the installation is complete but prior to commissioning of the system. If during any test the meter readings vary by +/- 10% from the previous test, stop the installation and investigate. Please check for pinched or crushed cables, test splices, test power connections, test end terminations, and repair accordingly. Check for water in all junction boxes or conduit. Any faults should be repaired by a qualified electrician or factory technician.

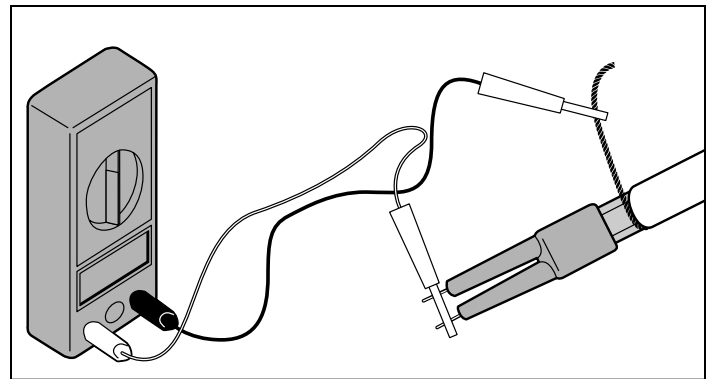


Figure 19-1

20. MAINTENANCE

Once the heat tracing system has been installed, an ongoing preventive maintenance program should be implemented using qualified personnel. Support documentation providing general information and an operating history of the specific circuits in the system should be maintained. The results of the operational testing described above form the testing "base line" or normal range. Subsequent measurements should be recorded periodically and compared to this base-line data to help identify potential malfunctions.

Important Information Follow All Instructions

21. DEF-Trac Piping Inspection Checklist (To be Completed Prior to Commissioning System)

RETURN TO OMEGAFLEX
FAX 610-524-6484

Site #	Date	Location Address	Reference Drawings
Circuit Information			
Run 1 Circuit Length	Panel No.		Circuit # 120v
Run 2 Circuit Length	Panel No.		Circuit # 120v
Ground Fault Protection Device (Type/MFG)			
Ground Fault Trip Setting (30mA Recommended)			
Site # Date: Location Address: Reference Drawings			
Number of Thermostats			Location
Thermostat Setting 1		Deg F	
Thermostat Setting 2		Deg F	
Electrical			
Dielectric Insulation Resistance Testing (megger) Refer to IEEE 515-1997 Section 7.9			
Test Voltage	20 Mohms Min - Use 1000 Vdc MEGGER		
Megger Value	20 Mohms Min - Use 1000 Vdc MEGGER		
Heater Supply Voltage			
Value at Power Source Circuit 1			
Value at Field Connection Circuit 1			
Value at Power Source Circuit 2			
Value at Field Connection Circuit 2			
Heater Circuit 1 Current Reading			
Amps Reading at 2-5 min			
Amps Reading at 15 min.			
Ground Fault Current			
Heater Circuit 2 Current Reading			
Amps Reading at 2-5 min			
Amps Reading at 15 min.			
Ground Fault Current			
Comments and Actions			

Important Information Follow All Instructions

RETURN TO OMEGAFLEX
FAX 610-524-6484

Visual Inspection

DEF Tank Sump	Yes	No
Installation of DP Terminator		
Perform megger test on Heat Trace Circuit		
Proper Installation of Cable terminations (PETK and SCKT)		
RTV Sealant used on terminations (PETK and SCKT)		
Heat Trace is not bent /crimped or cut		
Piping Bundle Rubber Seal installed		
Fitting Nut Rubber Seal installed		
No Exposed Stainless Steel on DEF-Trac Pipe		
DripStop 940 used on NPT pipe fittings		
Fittings Sprayed with Leak Check at Pressure Test		
Dispensers / Transition Sump <i>(Check Each Dispenser/Box for Compliance Below)</i>	Yes	No
Installation of DS/DE or DP Terminator		
Perform megger test on Heat Trace Circuit		
Proper Installation of Cable terminations (PETK and SCKT)		
RTV Sealant used on terminations (PETK and SCKT)		
Heat Trace is not bent /crimped or cut		
Piping Bundle Rubber Seal installed		
Fitting Nut Rubber Seal installed		
No Exposed Stainless Steel on DEF-Trac Pipe		
DripStop 940 used on NPT pipe fittings		
Fittings Sprayed with Leak Check at Pressure Test		
DE-B Beacon Installed		
Tightness Testing of Piping	Yes	No
Pressurized 25psi Test Performed		
Pressurized 75psi Test Performed		
Comments and Actions		
Site Electrician		
General Contractor		
Project Manager		

22. DEF-TRAC LIMITED WARRANTY AND DISCLAIMER

Omega Flex, Inc. (the "Manufacturer") warrants to the original owner at the original installation site that the OmegaFlex® DEF-Trac® products (the "Product") will be free from defects in material or workmanship for one (1) year from the date of shipment from the Manufacturer. If upon examination by the Manufacturer, the Product is shown to have a defect in material or workmanship during the warranty period, the Manufacturer will, at its option, either repair or replace that part of the Product which is shown to be defective or issue a credit for the amount of the defective product that may be applied to future orders of the Product.

THIS LIMITED WARRANTY DOES NOT APPLY:

- If the Product has been subjected to misuse or neglect, has been accidentally or intentionally damaged, or has been altered or modified in any way.
- If the Product has been repaired by anyone who is not a Manufacturer authorized service representative.
- If the Product has not been installed, maintained or operated in accordance with the current version of the DEF-Trac design and installation guide.
- If the Product has been installed with unauthorized third party components, except those components that are recommended for use with DEF-Trac in the DEF-Trac installation guide.
- To any costs or expenses incurred during investigation, removal or reinstallation of the defective Product, including without limitation any costs or expenses for clean-up, downtime, or lost profits.
- To any damage or impairment of the Product caused by any casualty, including without limitation fires, storms, floods, earthquakes, or acts of God.
- To any workmanship of the installer of the Product.

THIS LIMITED WARRANTY IS CONDITIONAL UPON:

- Receipt of a written warranty claim during the applicable warranty period.
- Installment of the Product by an individual who has received factory authorized training on the installation and proper use of DEF-Trac.
- All site and warranty registration forms are completed and received by the Manufacturer within 30 days of installation.
- The Manufacturer receives notice of warranty claim within 24 hours of any known or suspected failure of the Product.

Repair or replacement of any part under this Limited Warranty shall not extend the duration of the warranty with respect to such repaired or replaced part beyond the original stated warranty period.

IMPORTANT: LIMITATIONS OF LIABILITY

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For more information please visit our new website at www.doubletrac.net or call 1-800-355-1039.

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