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1 Splicing Un-armored Cable of Various Sizes

Geokon Kit Model 4500-9

(Using a 3M Scotchcast™ Model 82-A1 Splice Kit)

Splice kit contents:

Strip cable jacket 4” to 6”:
Cut conductors in staggered pattern and strip ends 3/8”:

Crimp butt connectors to cable #1:

Crimp butt connectors to cable #2:
Gently twist cable and lay in one mold half, with splice area centered:

Place second mold half over the first and snap together firmly:

Wrap the ends of the mold body with the supplied Scotch 23 tape:
Place pouring spouts in mold body holes. Mix supplied epoxy per package instructions and fill mold body:

Allow epoxy to solidify and cool:

Removing the poring spouts after the epoxy has cured completes the splice:
2. Splicing Armored Cable to Unarmored Cable

Geokon Kit Model 4500-9-HDF2

1. Separate the removable end cap from the tube by removing the three #10-32 x 3/8” long hex socket head cap screws.

2. Loosen the cable fitting nut on the tube and slide the black 02-500PEI armored cable through the fitting and out through the open end of the tube.

3. First, strip the black outer jacket back approximately 1 ½” (40mm). Now, bend the exposed armor over the outer jacket. Next, remove the paper and two layers of PVC insulation jack material to expose the 2 pair conductors and shield. Cut the gage (red & black) and thermistor (green & white) wires and shield to an acceptable length and then strip the insulation back approximately 3/8” (8mm).
4. Next, loosen the cable fitting nut on the removable end cap and slide the un-armored 02-250V6 blue cable through the fitting and out through the open end.

5. Strip the blue cable outer jack back to expose 2 pair conductors and shield. Cut the gage (red & black) and thermistor (green & white) wires and shield to an acceptable length and then strip the insulation back approximately 3/8" (8mm).

6. Use butt splices and a crimping tool to connect the cables together color to color including the bare shield. (Alternatively, the cable conductors can be soldered together.)

7. Hold the tube and pull the cable to position the butt splices in the center of the tube. Tighten the cable fitting nut on the tube end.

8. Mix one container of part A and one container of part B epoxy together. Now, position the tube vertically and fill the tube with mixed epoxy, stopping when the epoxy is approximately ¾” (19mm) from the open end of the tube.

9. Slide the removable end cap into the tube and reinstall the three #10-32 x 3/8” long hex socket head cap screws.

10. Tighten the cable fitting nut on the removable end cap, to secure the cable.

11. Allow 8 hours (minimum) for the epoxy to cure before installing.
3. Splicing Armored Cable to Armored Cable

Geokon Model 4500-9-HDF1

Figure 2. Splicing armored cable

1. Separate the removable end cap from the tube by removing the three #10-32 x 3/8” long hex socket head cap screws.

2. Loosen the cable fitting nut on the tube and slide the black 02-500PEI armored cable through the fitting and Kellums grip and out through the open end of the tube.

3. First, strip the black outer jacket back approximately 1 ½” (40mm). Now, bend the exposed armor over the outer jacket. Next, remove the paper and two layers of PVC insulation jack material to expose the 2 pair conductors and shield. Cut the gage (red & black) and thermistor (green & white) wires and shield to an acceptable length and then strip the insulation back approximately 3/8” (8mm).

4. Next, loosen the cable fitting nut on the removable end cap and slide the armored 02-500PEI armored cable through the fitting and Kellums grip and out through the open end.

5. Again strip the black outer jacket back approximately 1 ½” (40mm). Now, bend the exposed armor over the outer jacket. Next, remove the paper and two layers of PVC insulation jack material to expose the 2 pair conductors and shield. Cut the gage (red & black) and thermistor (green & white) wires and shield to an acceptable length and then strip the insulation back approximately 3/8” (8mm).

6. Use butt splices and a crimping tool to connect the cables together color to color including the bare shield. (Alternatively, the cable conductors can be soldered together.)

7. Hold the tube and pull the cable to position the butt splices in the center of the tube. Tighten the cable fitting nut on the tube end.
8 Using a **3M Scotchcast™ Model 82-A1 Splice Kit**, Mix one container of part A and one container of part B epoxy together. Now, position the tube vertically and fill the tube with mixed epoxy, stopping when the epoxy is approximately ¾” (19mm) from the open end of the tube.

9 Slide the removable end cap into the tube and reinstall the three #10-32 x 3/8” long hex socket head cap screws.

10 Tighten the cable fitting nut on the removable end cap, to secure the cable.

11 Allow 8 hours (minimum) for the epoxy to cure before installing.

4. Splicing Cable and Tubing for Model 4650

**Settlement Sensors**

**Geokon Kit Model 4500-9-SS1**

These splice kits are for splicing settlement system twin-tubing and vented cable
4.1 Replacing a transducer.

The most critical aspect of this operation is making sure that no air is allowed to get into the liquid lines and no liquid gets into the vent line.

The first step is to remove the faulty sensor by cutting both the liquid line and the cable from the faulty sensor using the following procedure:

**Splicing the Liquid line**

Extreme care must be exercised during this operation. The first step is to carefully strip off a section of the outer (yellow) jacket from the tubing bundle in preparation for splicing to the new sensor. This is a somewhat delicate operation as the jacket is tightly wrapped around the inner tubes. Practice the operation first on a waste piece of tubing bundle. Be careful not to cut the liquid tubes.

The new sensor should be completely filled with liquid and have the tube unions already attached and ready to accept the old tubing. Check to see that the lengths of exposed new tubing plus the part of the old tubing that you must prepare for the connection will be short enough to fit into the splicing kit and that the outer jacket will also be in the epoxy when finished.

Be sure that the reservoir level is maintained during the splicing operation, disconnecting the balance tube and top cap from the top of the reservoir will make it easier to add liquid.

1. Cut one of the liquid tubes about 2” beyond the yellow jacket and immediately block the end so that no fluid can flow.

2. Place the correct nut and ferrule pack over the end of this tube and again block the flow.

3. Next, remove the cap from one of the lines on the replacement sensor and make sure the fluid is right at the top of the exposed tube. If the fluid is not there, top this up with the small syringe provided with the sensors.

4. Now, attach the previously cut tube with the nut and ferrule to the union with fluid flowing from the reservoir to avoid any air being trapped in the joint. New connections with Swagelok fittings require that the nut be tightened one full turn past the point at which the nut is finger tight.

5. The next operation is to repeat steps 1-4 with the other tube, with one exception: Before making the connection with the tube and the union, keep the tube with the nut and ferrule blocked and remove the cap from the union and let a small amount of liquid flow from the union before making the connection. Then block that flow and let a little liquid flow from the tube to be attached, and then attach the tube, allowing a little fluid to flow while making the connection. Tighten the Swagelok nut the one full turn.
Splicing the cable.

Cut the cable from the faulty sensor and strip the jacket back approximately 2-3”. The cable has 4 conductors and a drain (bare) wire and the vent tube. The wire insulation should be stripped about ¼” in preparation for crimping together with the wires from the new sensor. Strip the new sensor wires back the same way.

Crimp the wires together using the special crimper and test each connection for strength.

Now, using the supplied Clippard Mini-barb fitting, connect the two ends of the vent tube.

Following this, take readings at the readout station to make sure the sensor and its thermistor are reading properly. If so, then place the cable in its epoxy splice kit and make the splice following the instructions shown in Section 1.

Now place the tubing bundle in its epoxy splice kit and make the splice following the instructions shown in Section 1.

4.2 Adding an extension to a sensor assembly.

The first step in this operation is to connect the supplied section of tubing to the reservoir. This should be done with the liquid flowing from the reservoir in the same way that the operation is done when replacing a sensor described previously.

After connecting the extension to the reservoir, the splice to the existing tubing bundle and cable should be made as in the connection for a replacement sensor. Be sure to remove the equalization line from the reservoir during this operation and keep liquid in the reservoir at all times.

Remember that for all tubing splices the prime concern is preventing air from getting into the liquid lines, or liquid into the vent line, and making sure that all electrical connections are good before finishing the splices.

The splices should be allowed a couple of hours to cure before placing fill and compacting over them.