



Model 4500-9-SS1

Splice Kit for 4600 and 4660

Settlement Systems

Instruction Manual

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1. INTRODUCTION

GEOKON Model 4500-9-SS1 Splice Kits are designed for splicing settlement system twin-tubing and vented cable. This kit offers a quick and permanent solution used to create and encapsulate a splice.

Splice kits for standard cable, armored cable, and high temperature cable are also available. View the manuals of available splice kit models at geokon.com/Cables.

2. COMPONENTS

Each kit consists of two Swagelok tube fittings, two barbed plastic tube unions, Posi-Lock connectors, and an epoxy kit. The epoxy kit includes epoxy compound, a wooden mixing paddle, two foam stoppers, a clamshell enclosure, a blue plastic cap (metal components are not used), and a mesh sleeve (not used).



FIGURE 1: Swageloks



FIGURE 2: Barbed Tube Unions



FIGURE 3: Posi-Lock Connectors



FIGURE 4: Epoxy Kit

3. INSTALLATION

3.1 REPLACING A TRANSDUCER

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

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

3.1.1 LIQUID LINE

Extreme care must be exercised during this operation.

1. Carefully strip a section of the outer (yellow) jacket off 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.
2. The new sensor should have the union already attached and ready to accept the tubing. Check to see that the sections of exposed tubing (including the part that must be prepared for the connection) will be short enough to fit into the splicing kit, and the outer jacket will be in the epoxy when finished

Important! Be sure that the reservoir water level is maintained during the splicing operation and that the balance tube is disconnected from the top of the reservoir.

3. Cut one of the tubes about 50 mm (2") beyond the yellow jacket and immediately block the end so that no fluid can flow.
4. Place the nut and ferrule pack over the end of the tube, and then block the flow.
5. 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 it off with the small syringe provided with the sensor.
6. Attach the previously cut tube with the nut and ferrule to the sensor union with fluid flowing from the reservoir to avoid any air being trapped in the joint (See Appendix A for Swagelok instructions).
7. Repeat Step 3 through 6 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 while removing the cap from the union and letting a small amount of liquid flow from the union. Next, block that flow and let a little flow from the tube to be attached. Attach the tube, allowing a little fluid to flow while making the connection. Tighten the Swagelok union.

3.1.2 SPLICING THE CABLE

1. Cut the cable with vent tube from the faulty sensor.
2. Strip the jacket back approximately 50 to 76 mm (2 to 3").
3. Strip about 13 mm (1/2") of the wire insulation from the four conductors.
4. Strip the new sensor wires back in the same manner.
5. Following the Posi-Lock connector instructions shown in Figure 5, connect the individual conductors of the two cables together. Make sure to connect color to color and connect the ground wires together. When tightening the Posi-Lock connectors, tighten finger tight only.



FIGURE 5: Posi-Lock Connector Guide

6. Using the supplied polycarbonate barbed fitting, connect the two ends of the vent tube.
7. Take readings at the readout station to make sure the sensor and the thermistor are reading properly.
8. Put the two foam stoppers around the two ends of the cables and place the whole assembly inside the clamshell enclosure. Firmly close the enclosure.

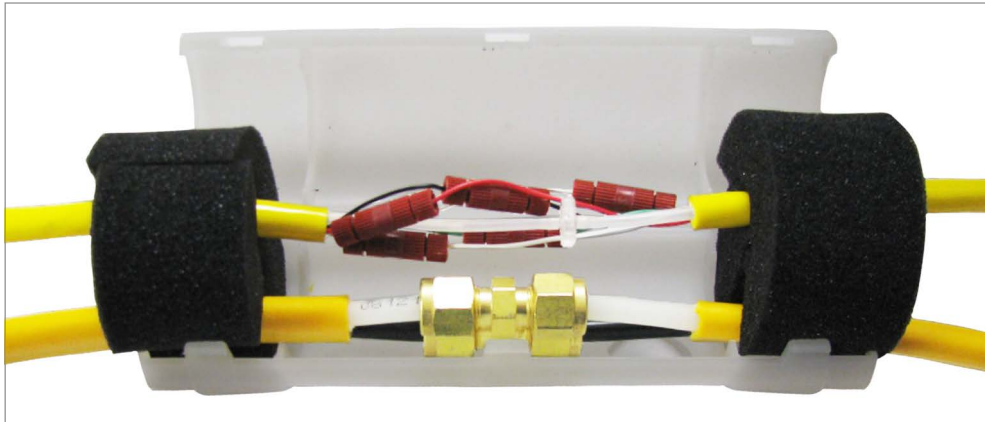


FIGURE 6: Completed Assembly Prior to Encapsulating

3.1.3 PREPARE THE EPOXY AND ENCASE THE SPLICE

Preview all steps below before mixing. The following steps must be performed quickly to prevent premature curing.

Caution! Wear disposable gloves when working with epoxy.

1. Mix the epoxy kit according to the mixing steps on the instructions provided with the kit.
2. Fill the enclosure with epoxy through the spout on the side. Slightly tilt the enclosure as it is filling to let the air pockets escape.
3. When the enclosure is full, put a bit of epoxy on the outer rim of the blue cap where it will contact the enclosure. Place the blue cap over the pouring spout.
4. Allow a few hours for the epoxy to cure. The cable splice is now complete.



FIGURE 7: Completed Assembly

3.2 ADDING AN EXTENSION TO A SENSOR ASSEMBLY

Connect the supplied section of tubing to the reservoir. This should be done with the liquid flowing from the reservoir in the same way as described in Section 3.1.1.

After connecting the extension to the reservoir, the splice to the existing tubing bundle and cable should be made as described in Section 3.1.2. 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 functional before completing the splice.

Prepare the epoxy and encase the splice as described in Section 3.1.3.

APPENDIX A. SWAGELOK TUBE FITTING INSTRUCTIONS

These instructions apply to one inch (25 mm) and smaller fittings.

A.1 INSTALLATION

1. Fully insert the tube into the fitting until it bumps against the shoulder.

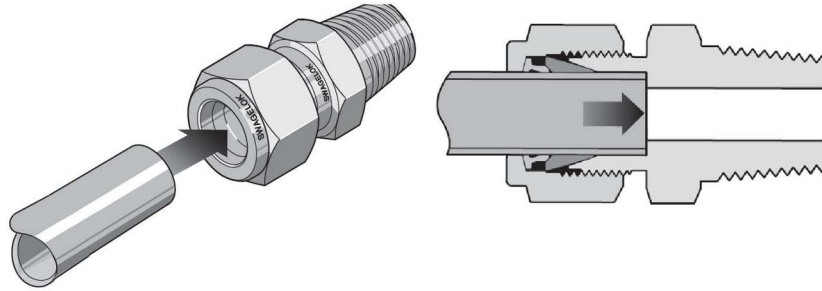


FIGURE 8: Tube Insertion

2. Rotate the nut until it is finger tight. (For high-pressure applications as well as high-safety-factor systems, further tighten the nut until the tube will not turn by hand or move axially in the fitting.)
3. Mark the nut at the six o'clock position.

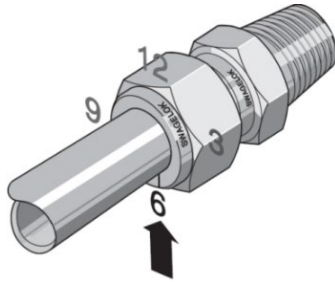


FIGURE 9: Make a Mark at Six O'clock

4. While holding the fitting body steady, tighten the nut one and one quarter turns, until the mark is at the nine o'clock position.

Note: For 1/16-inch, 1/8-inch, 3/16-inch, and 2, 3, and 4 mm fittings, tighten the nut three-quarters of a turn until the mark is at the three o'clock position.

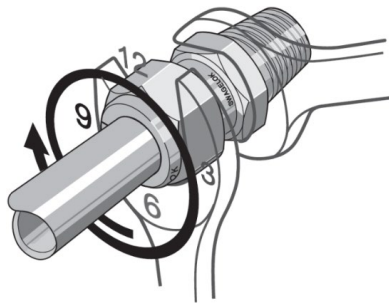


FIGURE 10: Tighten One and One-Quarter Turns

A.2 REASSEMBLY INSTRUCTIONS

Swagelok tube fittings may be disassembled and reassembled many times.

Warning! Always depressurize the system before disassembling a Swagelok tube fitting.

1. Prior to disassembly, mark the tube at the back of the nut, then make a line along the nut and fitting body flats. **These marks will be used during reassembly to ensure the nut is returned to its current position.**

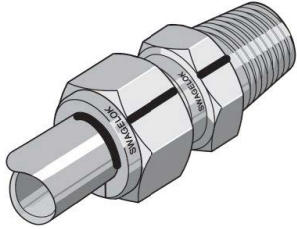


FIGURE 11: Marks for Reassembly

2. Disassemble the fitting.
3. Inspect the ferrules for damage and replace if necessary. If the ferrules are replaced the connector should be treated as a new assembly. Refer to the section above for installation instructions.
4. Reassemble the fitting by inserting the tube with pre-swaged ferrules into the fitting until the front ferrule seats against the fitting body.

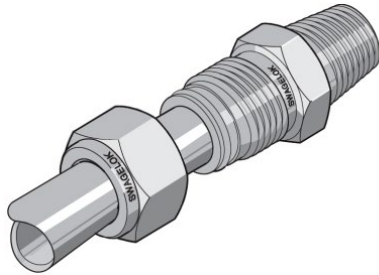


FIGURE 12: Ferrules Seated Against Fitting Body

5. While holding the fitting body steady, rotate the nut with a wrench to the previous position as indicated by the marks on the tube and the connector. At this point, there will be a significant increase in resistance.
6. Tighten the nut slightly.

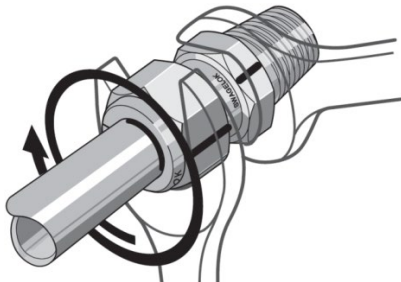


FIGURE 13: Tighten Nut Slightly

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