

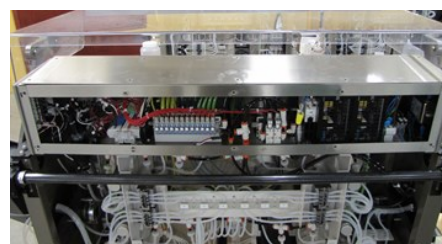
To replace an In-Line Heater on the ANKOM^{TDF} Dietary Fiber Analyzer, follow the steps below.

NOTE: The following items will be sent in a replacement package: New In-Line Heater (TDF28 or TDF28.1), 18 cable ties (Z10), 1 Splicing Connector (Z210), 4 panel screws (5626), acorn nuts 10/32 (8409), hex nuts w/ star washer 10/32 (167), white cable holders ¼" (Z462).

1. Turn off the instrument and unplug the power cord. Unscrew the 10 screws on the stainless steel back panel and remove. Set aside the panel and screws for reattachment later.



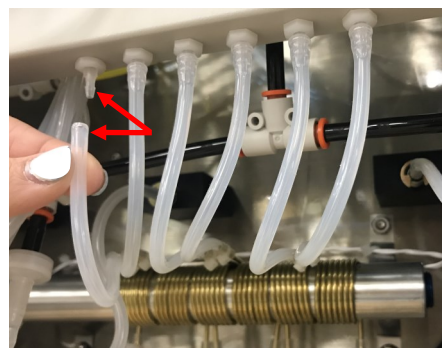
2. Unscrew the 7 screws on the stainless steel top panel and remove. Set screws and panel aside for reattachment later.



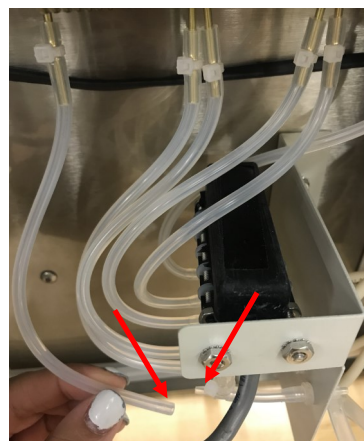
3. Unscrew the 6 acorn nuts securing the clear back plastic panel and remove. Set aside for reattachment later.



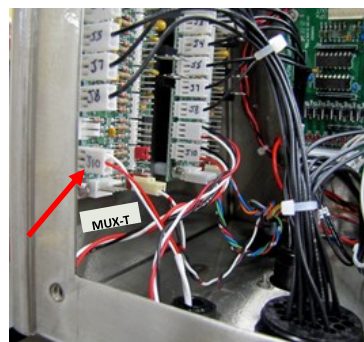
4. Remove the 6 tubes going from the In-Line Heater to the Tubing Support Panel. Only remove the ends connected to the barbs on the Tubing Support Panel (Red Arrows).



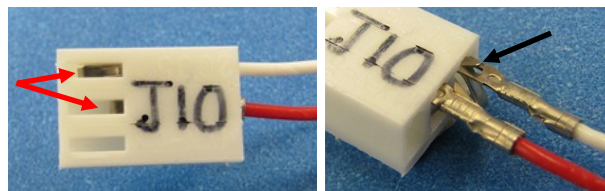
5. Remove the 6 tubes going from the downward pointing brass tubes on the In-Line Heater to the Pressure Sensor. Only remove the ends of the tubes that are connected to the Pressure Sensor barbs (Red Arrows).



6. Detach the white 3-pin connector labeled "J10" from the MUX-T circuit board.



7. Using a dental pick or a small screwdriver, depress the tabs (Black Arrow) inside the J10 connector in order to slide the two conductor out of the terminals (Red Arrows). Set aside the white J10 connector for later use.



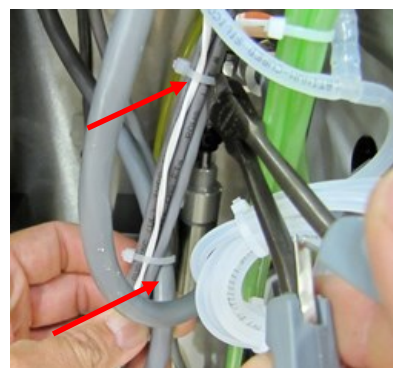
8. Loosen the black nut on the explosion proof fitting, located on the underside of the Electrical Enclosure, that the white thermistor wire runs through until the nut slides off.



9. Pull the white thermistor cable completely out of the black fitting and set aside nut for later use.



10. Carefully cut off both cable ties connecting the white thermistor cable to the gray cables on the left side of the back of the instrument **without damaging the insulation**.

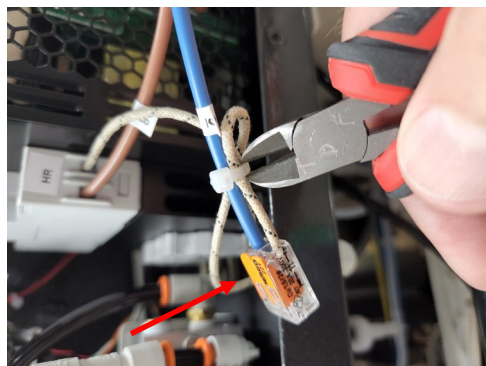


11. Pull the white thermistor cable out of the large grommet in the left gusset panel when facing the back of the instrument.



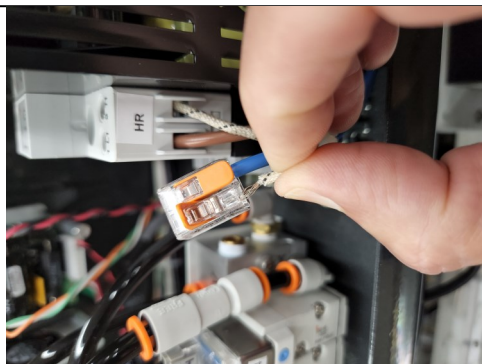
12. On the right side of the Electrical Enclosure, use wire cutters to carefully cut the cable tie that is holding the two white In-Line Heater conductors and the blue cable together, without damaging the insulation.

Note: Some instruments have a yellow wire nut instead of the Splicing Connector (Red Arrow).



13. Carefully remove the Splicing Connector by lifting the latch levers. Set the connector aside for later use.

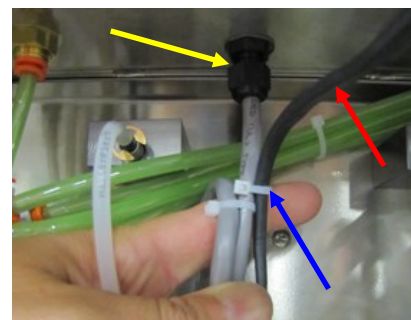
Note: When removing a wire nut, hold the wires while turning the nut counter-clockwise.



14. Use a small flathead screwdriver to **loosen** the In-Line Heater conductor going to the Heater Relay, labeled "HR" (Screw should not come all the way out).



15. Follow the black In-Line Heater cable (Red Arrow) down below the Heater Relay wire connector (Yellow Arrow). Carefully cut the cable tie (Blue Arrow) that holds the black cable from the In-Line Heater cartridge and the gray cable from the pump motor together (so the black cable is loose) without damaging the insulation.



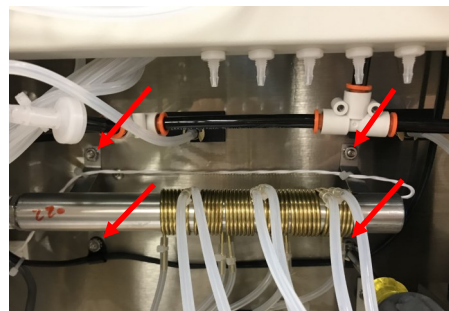
16. Near the left gusset panel, carefully cut the cable tie that holds the gray pressure sensor cable and the black In-Line Heater cables together.



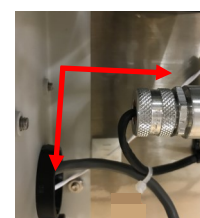
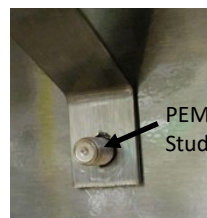
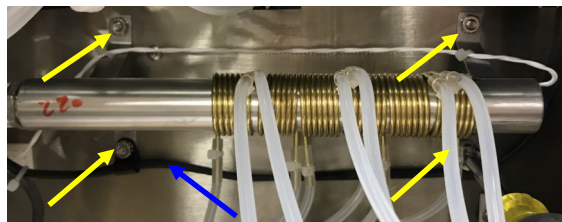
17. Remove the nut from the black explosion proof fitting and pull the In-Line Heater conductors through. Set the nut aside for later.



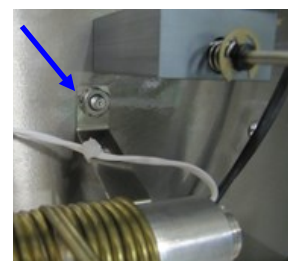
18. Unscrew the 4 nuts holding the In-Line Heater bracket in place and set aside for later. Remove the In-Line Heater from the instrument, being careful not to get it caught on the tubing. Pull out the white thermistor cable and the black In-Line Heater cartridge cable with it.



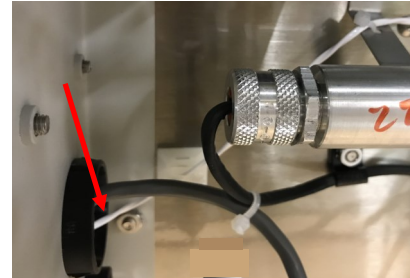
19. Insert the new replacement In-Line Heater onto the PEM studs (Yellow Arrows). Make sure the black cable (Blue Arrow) is coming out of the left side of the heater and running underneath the heater to the right (When facing the back of the instrument). The secured white thermistor cable should be positioned on the upper right bracket of the heater, running above the heater and out through the grommet in the left side of the gusset panel (Red Arrows).



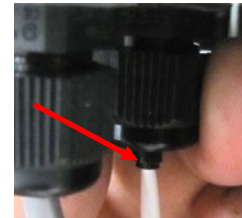
20. Fasten the top two brackets of the In-Line Heater to the PEM studs using two nuts w/ star washers (Blue Arrows). The star washers should be facing inside.



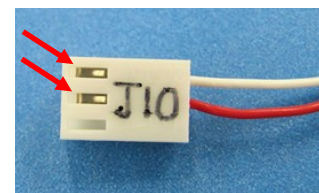
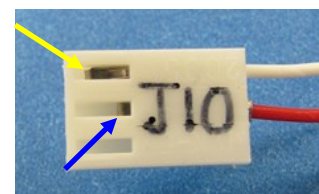
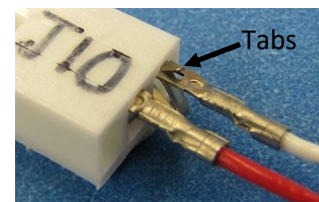
21. Feed the white thermistor cable through the large grommet on the left side gusset panel (When facing back of instrument).



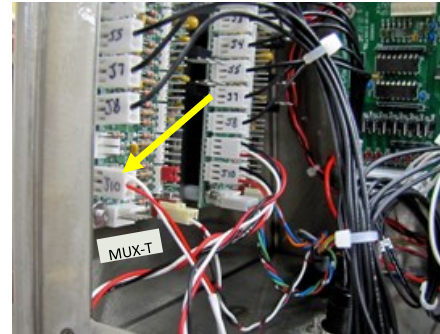
22. Put the black nut back on the white thermistor cable and insert the cable through the explosion proof fitting on the underside of the Electrical Enclosure on the left side.
BEFORE TIGHTENING: Ensure that the black insulated section of the cable is inserted in the fitting with just a slight portion of the bottom showing through (Red Arrow). This is to ensure that the nut tightens on the black insulated section because the white thermistor cable alone is too small a diameter for the fitting to hold the wire securely. **AFTER TIGHTENING:** Perform a pull test by gently tugging on the wire to make sure that it is secure.



23. Reinsert the white and red conductors into the white 3-pin connector labeled "J10". White conductor goes into the top slot and red conductor goes into the middle slot (When reading "J10"). Make sure the tabs on the wire terminals are facing upwards. Check that the terminal pins have been fully inserted (Yellow Arrow). If the terminal pins have not been fully inserted (Blue Arrow), it will be pushed back when inserted onto the pins on the circuit board. If not fully inserted, gently reinsert them until they reach the far end of the connector, snapping in completely. Fully inserted terminal pins are indicated by the Red Arrows. Once correctly inserted, perform a pull test on both the white and red conductors to ensure secure connection.



24. Reconnect the J10 connector onto the bottom left prongs on the MUX-T circuit board.



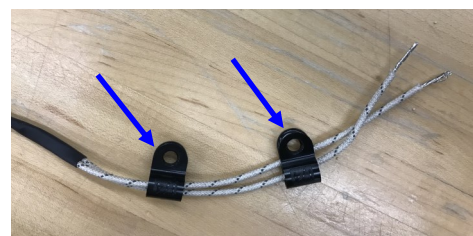
25. Fasten the white thermistor wire from the In-Line Heater to the 4 cables from the supply valves and the gray cable from the Pressure Sensor with a cable tie. There should be 6 wires altogether. Carefully cut off the excess cable tie without damaging any insulation.



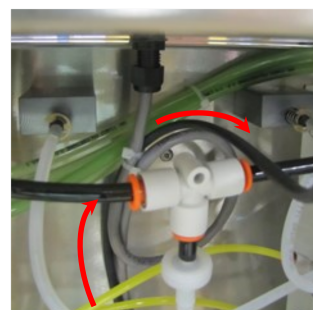
26. On the lower end of the same set of tied cables from the step above, cable tie the 6 cables to the 1 control box cable. There should be 7 cables altogether. Carefully trim excess cable tie without damaging any insulation.



27. Slide two Z462 cable holders onto the In-Line Heater cable (Blue Arrows). Insert the cable holders onto the 2 PEM studs underneath the In-Line Heater (Red Arrows). Screw the two remaining nuts back on, securing the bracket. make sure the star washers are facing inside.



28. Feed the black In-Line Heater cable up the back of the instrument behind all the cables, but in front of the green tubing.



29. Slide the black nut onto the In-Line heater cable and insert the cable through the explosion proof fitting on the underside of the Electrical Enclosure on the right side (Below HR wire connector).



30. Feed the cable through the explosion proof fitting until the black insulation shows through the top about 1". Ensure that the nut tightens on the black insulation so it does not damage the wire itself. Pull the wire gently to make sure it is secure.

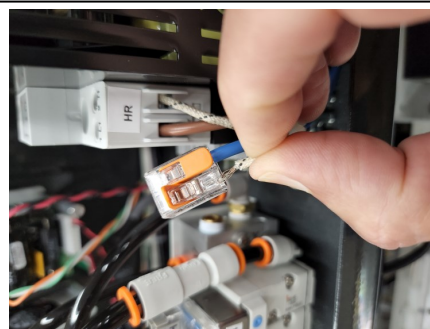


31. Use a cable tie to secure the black In-Line Heater cable to the gray pump motor cable as it was earlier on. Carefully cut off the excess from the cable tie.



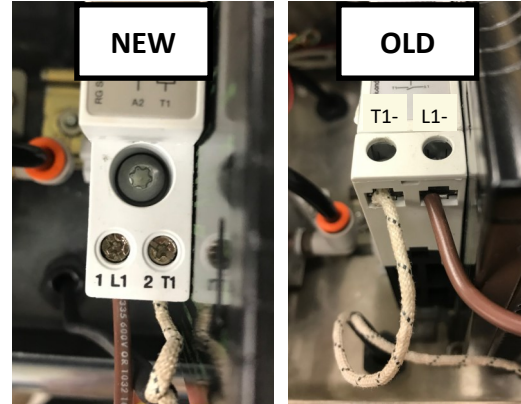
32. Insert one of the wires from the In-Line Heater cable and the loose blue cable into each side of the Splicing Connector. Gently tug on the wires to ensure a secure connection.

Note: When reusing a wire nut, twist the wires together, insert the wires into the wire nut and turn the nut clock-wise.



33. Insert the remaining In-Line Heater conductor into the HR wire connector labeled "T1", sliding the exposed part of the conductor underneath the metal tab.

IMPORTANT: The In-Line Heater conductor should always go in the "T1" spot, however, There are 2 models of the Heater Relay. On the OLD model, the "T1" spot is located on the LEFT. The NEW model has the "T1" spot on the RIGHT. The pictures in steps 34 and 35 show the NEW model of the Heater Relay.



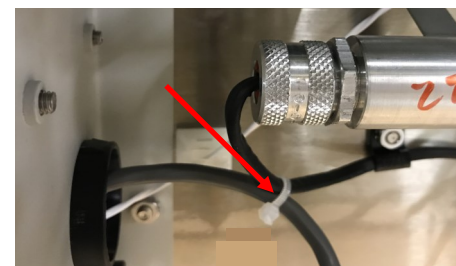
34. Tighten the screw with a flathead screwdriver to secure the wires in place. Gently tug on the wire to ensure it is secure.



35. Secure the blue cable and both In-Line Heater conductors together with a cable tie. Carefully cut off excess from cable tie without damaging any insulation.



36. Place a cable tie around the black In-Line Heater cable and the gray Pressure Sensor cable. Carefully cut off excess from the cable tie without damaging any insulation.



37. Perform a QC test to ensure the functionality of the newly installed In-Line Heater.

a. Plug in the instrument and turn the power back on

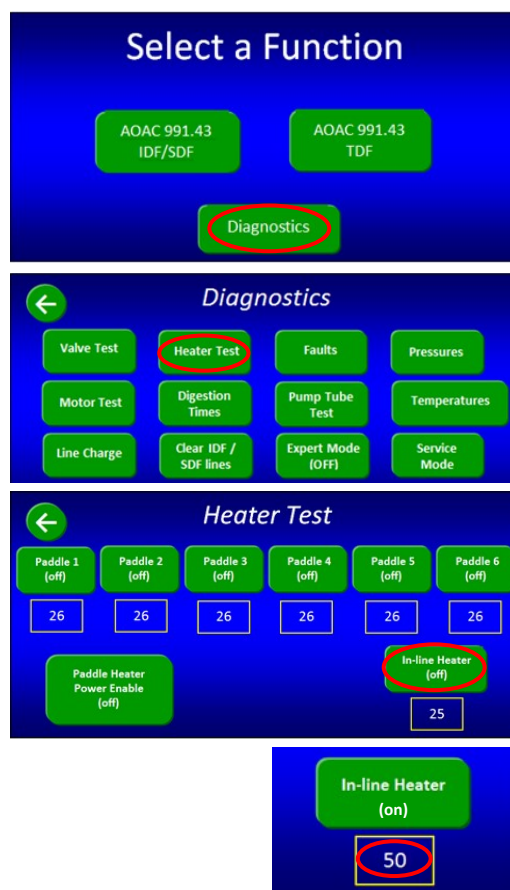
CAUTION: At this point the instrument is open and energized. Keep personnel away from open wires in the Electrical Enclosure.

b. On the bottom of the “Select a Function” screen, press the “Diagnostics” button.

c. On the “Diagnostics” screen, press the “Heater Test” button.

d. Once in the “Heater Test” screen, check that the In-Line Heater temperature is reading at room temperature.

e. Press the “In-Line Heater” button to turn it on. Temperature will start to rise. Once it reaches 50°C, press again to turn off.



38. Use an IR Gun pointed at the metal part of the In-Line Heater to confirm that it is warming up. With this completed, you are now ready to return your ANKOM^{TDF} Dietary Fiber Analyzer to service.



39. Reinstall the top stainless steel panels and the clear plastic back panel using the screws, nuts, and panels set aside from earlier.

