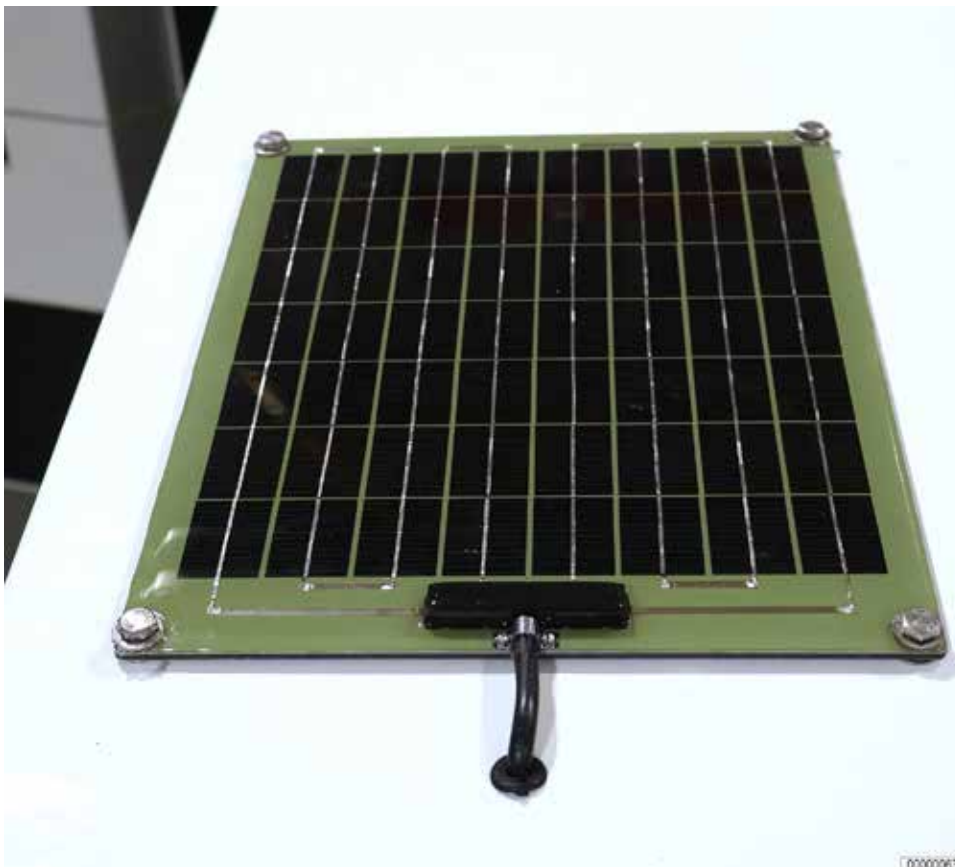




Installation Instructions

DGK180F\FU\FP Solar Panel



Kit Contents:

- (1) 24v-12 Watt Solar Panel w\24v Pulse Charger



- (1) 1/4-20x1 " stainless steel bolt
- (4) 1/4-20x3/4 " stainless steel bolts
- (8) 1/4-20 stainless steel flat washers
- (4) 1/4-20 stainless steel lock nuts.
- (2) 8-32x3/4 " stainless steel screws
- (2) 8-32 stainless steel flat washers
- (2) 8-32 stainless steel lock nuts
- (1) M8x1.25x20mm stainless steel bolt



- (1) 1/2"x 6" Black Heat Shrink Tubing
- (2) 18-22 ga Heat Shrink Butt Connectors
- (1) 1/8"x7/16" Grommet
- Black Cable Ties



- (4) Adhesive backed cable tie mounting pads



- (1) DGK180F\FU\FP Solar Panel Installation Template
- (1) DGK180F\FU\FP Solar Panel Pulse Charger Installation Template

Tools & Materials Required:

- Masking tape
- Electrical tape
- Measuring tape
- Scissors
- Safety knife
- Center punch
- Deburring tool
- 1/8" drill bit
- 3/16" drill bit
- 5/16" drill bit
- 13/64" drill bit
- Drill (electric or cordless)
- 11/32 socket & 1/4 drive
- 10 mm socket - 3/8 drive
- 17 mm socket - 3/8 drive
- 3/8 impact driver with 3" extension
- 13 mm combination ratchet wrench
- #2 Phillips screwdriver
- Needle Nose Pliers
- Wire cutter\stripper & crimper
- Heat Gun or equivalent
- Clear silicone sealant

NOTES

INSTALLATION INSTRUCTIONS

- Step 1: Verify Kit Contents
- Step 2: Read through installation instructions before beginning the procedure.
- Step 3: Release the Left Enclosure door latch, then open both left enclosure doors. (Figure 1)



Figure 1

- Step 4: Remove nut and washer securing NEGATIVE battery cable to NEGATIVE terminal using a 13mm wrench. (Figure 2)



Figure 2

- Step 5: Position the negative battery cable out of the way, then reinstall washer and nut to battery terminal. (Figure 3)



Figure 3

- Step 6: Prepare the Solar Panel Template (included with kit) for use by using scissors or safety knife; cut along dashed lines as indicated.

- **Step 7:** Place the Solar Panel Template on the Top Enclosure surface. Using the notes and arrows on template, align the Left Side Edge of the template with the Bolts as shown, and the Bottom of the template with the Left Side Edge as shown. Secure in place with masking tape. (Figure 4)

- **Step 8:** Using center punch and hole location indicated on template, transfer hole center locations to the Top Enclosure surface.

NOTE: All drilling is intended to be done with template remaining taped in place.

- **Step 9:** Drill a pilot hole in all five (5) hole locations using 1/8" drill bit and drill.
- **Step 10:** Enlarge all five (5) holes using 5/16" drill bit and drill.
- **Step 11:** Enlarge Grommet hole using 7/16" drill bit and drill.
- **Step 12:** Remove and discard the template.
- **Step 13:** Deburr all holes.
- **Step 14:** Install grommet into 7/16" grommet hole. Make certain the grommet edges sit flush with surface. (Figure 5)

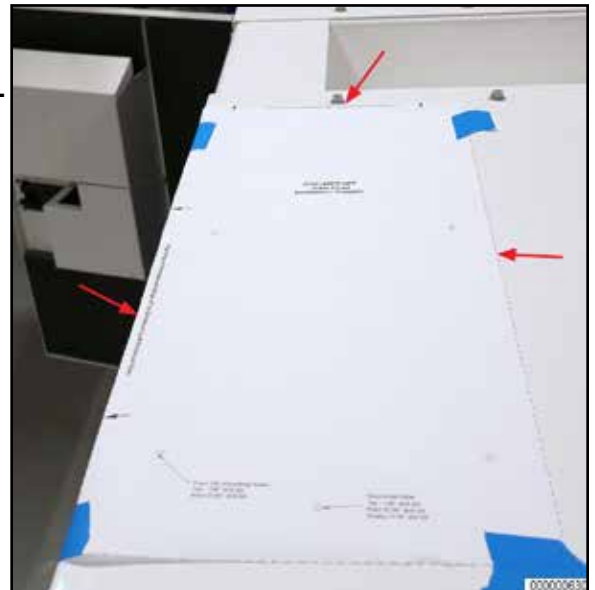


Figure 4

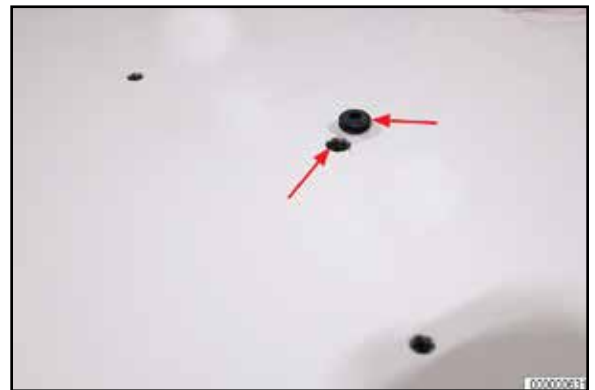


Figure 5

- **Step 15:** Using a 10 mm 3/8 drive socket and wrench or driver, remove six (6) bolts securing the Left Enclosure Duct Panel. Retain the bolts and cover for reinstallation. (Figure 6)



Figure 6

- **Step 16:** Using scissors or utility knife, remove a 1" square portion of foam insulation from the under side of the Top Enclosure around each of the five (5) holes drilled in Step 10.

- **Step 17:** In preparation to attaching the solar panel to the Top Enclosure, select the four (4) 1/4-20x3/4" bolts. Place a pea size bead of silicone RTV sealant to the underside of each of the 1/4-20 bolt heads as shown. (Figure 7)

Note: The kit includes a 1/4-20x1" bolt that is not used in this application and can be discarded.



Figure 7

- **Step 18:** Remove the Solar Panel from the packaging; the set panel onto the Top Enclosure.
- **Step 19:** Uncoil power cable and using measuring tape, measure out approximately 24 inches as shown. Cut power cable with wire cutters. **DO NOT DISCARD** remaining portion of power cable - it will be used later in the installation. (Figure 8)

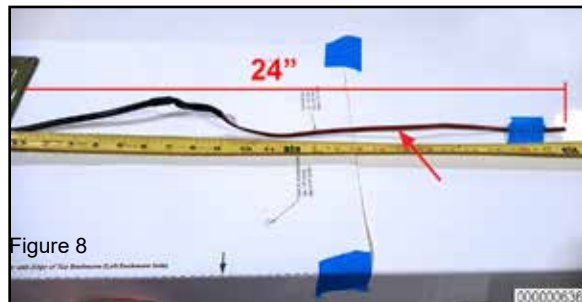


Figure 8

- **Step 20:** Insert Power Cable (attached to solar panel) into the grommet, pushing the cable through till approximately an inch and a half (1-1/2") is remaining. (Figure 9)

NOTE: If the power cable is difficult to push through the grommet, use of a lubricant such as glass cleaner or alcohol on the cable can be used.

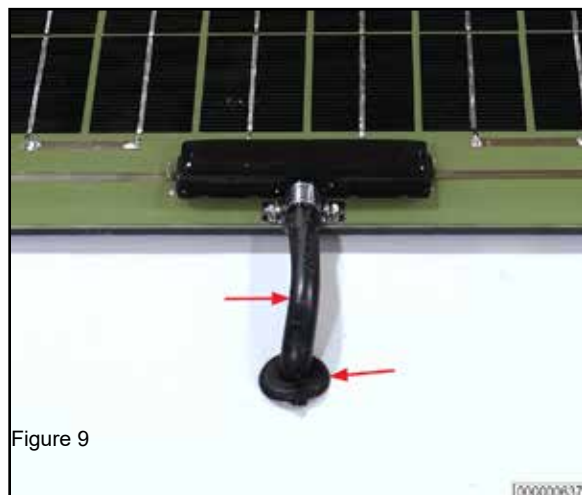


Figure 9

- **Step 21: Attach solar panel to Top Enclosure.** Using the four (4) 1/4-20x3/4" stainless steel bolts along with four (4) 1/4-20 stainless steel flat washers on top of the solar panel mounting holes and four (4) 1/4-20 stainless steel flat washers under the solar panel mounting holes, and securing to the underside of top enclosure with four (4) stainless steel 1/4-20 locknuts. **DO NOT OVERTIGHTEN** - Snug the bolts and locknuts only. (Figure 10)

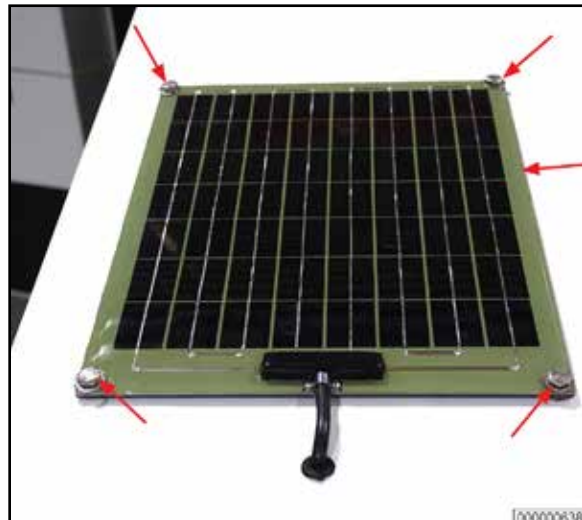


Figure 10

- **Step 22: Reattach the Left Enclosure Duct Panel** using a 10mm 3/8 drive socket and wratchet wrench or driver, and the six (6) previously removed bolts (Figure 11)



Figure 11

- **Step 23: Locate the DGK180F\FU\FP Solar Pulse Charger Mounting Template;** prepare it for use by cutting it out using scissors or safety knife.
- **Step 24: Position and tape in place the Solar Pulse Charger Mounting template on the Left Air Cleaner Stand Bracket as shown.** (Figure 12)
- **Step 25: Using center punch, indicate hole locations.**
- **Step 26: Use 11/64" drill bit and drill to create solar pulse charge mounting holes through template.** Remove and discard template.
- **Step 27: Deburr mounting holes.**

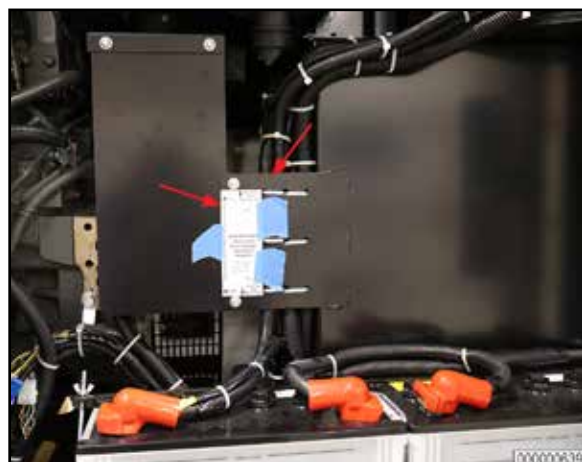


Figure 12

- **Step 28:** Attach the Solar Pulse Charger to the Left Air Cleaner Stand Bracket using two (2) stainless steel 8-32x3/4" bolts, flat washers and locknuts using 11/32" socket and driver and #2 Phillips screwdriver. **DO NOT OVERTIGHTEN** - Snug bolts and nuts. (Figure 13)



Figure 13

- **Step 29:** Measure approximately 34 inches of power wire from the Solar Pulse Charger and cut the cable once again. (Figure 14)



Figure 14

- **Step 30:** Using wire strippers, remove approximately 3/16 of an inch of insulation from the solar panel red and black wire power cable. Take care not to cut through into either of the wires.
- **Step 31:** Place a "Butt" connectors (supplied in kit) over the exposed ends of each wire from Solar Panel and using a wire crimper, secure the butt connectors to each wire. (Figure 15)
- **Step 32:** Using a heat gun or similar, heat up and shrink the crimped ends of the wires.
- **Step 33:** Place a 1/2"x 6" piece heat shrink tube (supplied in kit) over the wires prior to making the final crimping.

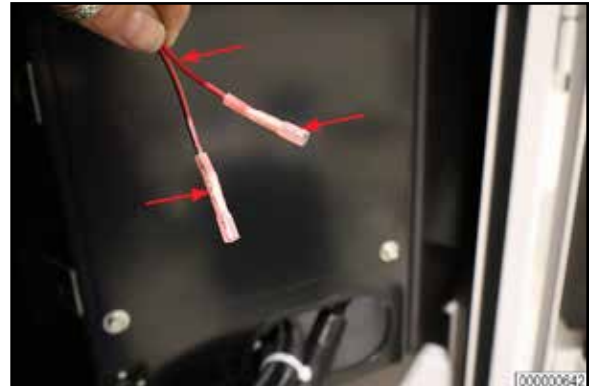


Figure 15

- **Step 34:** Using wire strippers, remove approximately 3/16 of an inch of insulation from the solar pulse charger red and black wire power cable. Take care not to cut through into either of the wires.
- **Step 35:** Match up the wire colors (polarity), inserting the bare wires into each butt and using a wire crimper, secure the butt connectors to each wire. (Figure 16)
- **Step 36:** Using a heat gun or similar, heat up and shrink the crimped ends of the wires.



Figure 16

- **Step 37:** Slide the shrink tubing over the butt connectors so that the butt connectors are approximately centered in the shrink tubing, then using a heat gun or similar, heat up and shrink the tubing over the wires. (Figure 17)

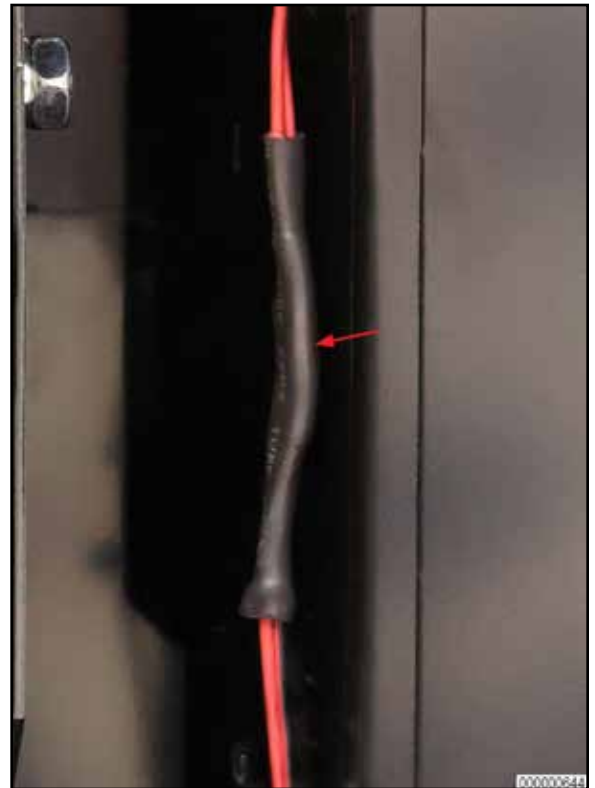


Figure 17

- **Step 38:** Position the four (4) adhesive backed cable tie mounting pads on the backside of the control cabinet as shown. Route the solar panel power wires along the backside of the control cabinet and secure in place using supplied cable ties as shown. (Figure 18)
- **Step 39:** Gather up the excess Solar Panel Power wire and secure it to existing wire harness as shown. (Figure 18)



Figure 18

- **Step 40:** Pull back the RED Positive Battery Terminal Cover to uncover the terminal; remove the bolt securing cables to POSITIVE side of battery using a 1/2 inch ratchet wrench or equivalent. Discard the bolt.
- **Step 41:** Route the RED (Positive) wire lead from the solar pulse charger connector through the RED Positive Terminal cover and combine with Positive battery cable on terminal. Secure red wire lead from pulse charger with positive battery cable using new bolt from kit and using a 13 mm ratchet wrench or equivalent. **DO NOT OVERTIGHTEN - Snug bolt (Figure 19)**



Figure 19

- **Step 42:** Return RED Positive terminal cover to its original position. (Figure 20)
- **Step 43:** Secure positive wire lead with fuse holder to existing cables with cable tie. Secure excess positive wire with cable tie. Remove excess cable tie ends (Figure 20)



Figure 20

- **Step 44:** Remove bolt and lockwasher from NEGATIVE battery terminal. Route NEGATIVE (BLACK) wire from Solar Pulse Charger to the NEGATIVE battery terminal. Reattach NEGATIVE battery cable to NEGATIVE battery terminal, adding the new negative wire lead from Solar Pulse Charger to Negative battery cable along with any other Negative leads. Secure the bolt and washer using a 13mm wrench. **DO NOT OVERTIGHTEN bolt - Snug only. (Figure 21)**



Figure 21

- **Step 45:** Secure excess **NEGATIVE** (black) wire to existing cable as shown. (Figure 22)
- **Step 46:** Remove excess cable tie material (tails) in all locations.
- **Step 47:** Close the Left Enclosure Doors, making sure the latch completely engages. (Figure 23)

The Solar Panel Installation is now complete



Figure 22



Figure 23