Assembly Instructions for 60W Three Piece Solar Panel Sets

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Supplies Needed:

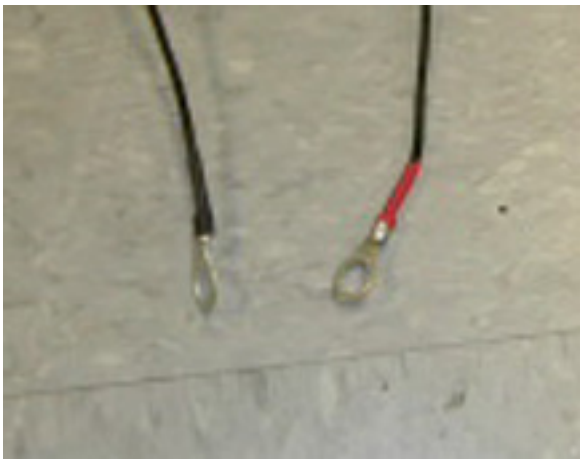
3 Solar panels
Solarex MSX-20L
Vendor:
Southwest P.V. System.
4089 Valley Oak Dr., Loveland,
CO 80538
Tel: 970-635-3099

6 Connectors
P72 or SAE Plug
Seelye Eqpt Specialists
616-547-9430

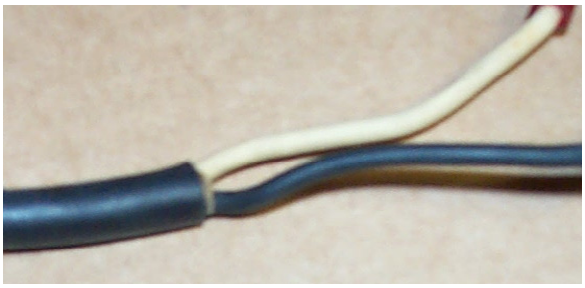
1 Solar regulator
ASC Specialty Concepts
Model ASC 12/4
Remote Power Inc.
4585 McIntyre St.
Golden, CO 80403
Tel: (303) 427-4900
Fax: (303) 271-7184

1 Solar panel bag

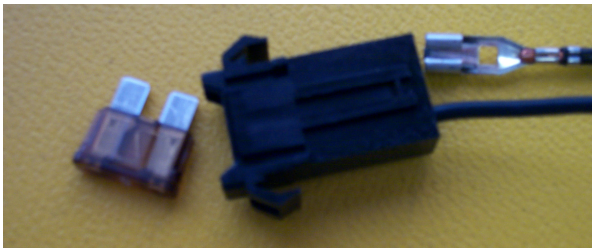
Supplies Needed



Ring terminals and
corresponding red and
black boots



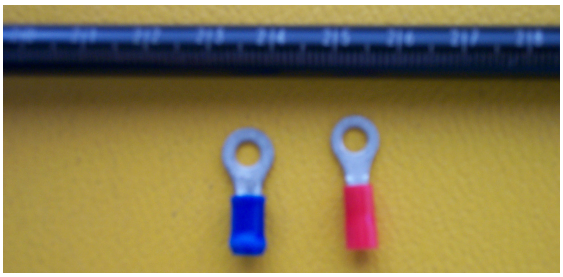
Insulated wires
(set of 2 with connecting insulation)
27” to connect connectors
48” to connect to ring terminals



Fuses, fuse holders
& wire connectors
1 per set & one 5 Amp button fuse

Basic insulated wire ~5”
1 per fuse (22 gauge, red)

Supplies (continued)

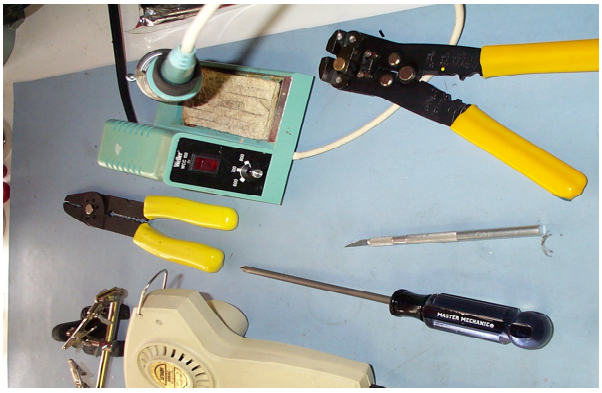


Ring connectors
Vinyl insulated, 4 per regulator
(2 red and 2 black or blue, size 8)

Heat shrink
(3 small red ~1” length, 3 small black ~1” length
1 medium red & 1 medium black ~2”
4 big black [1 ~4”] [3~3”])

Zip ties
One for each panel and two for each regulator/fuse holder

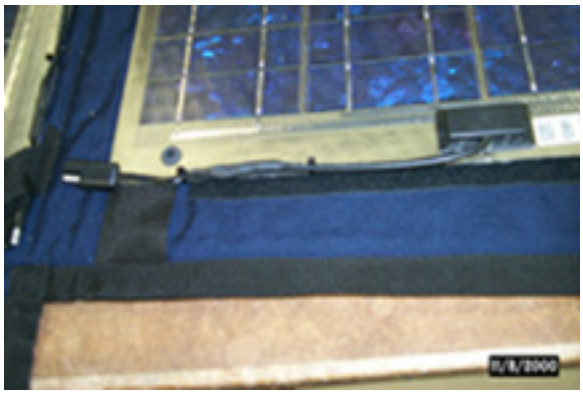
Tools needed:



Crimping tool
Soldering iron & solder
Wire stripper
Exacto knife
Screwdriver
Heat gun
Clip stand (optional)

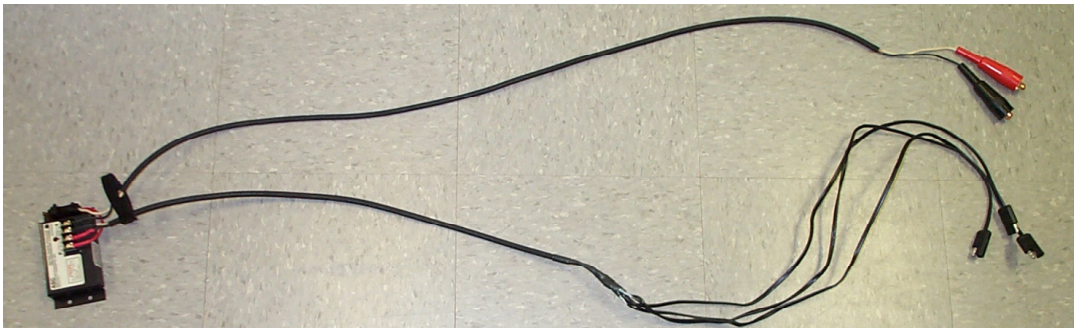
Step 1: Solar panel wire preparation

a. Cut cable and connector cable length in order to have the connector just past the corner of solar panel
b. Attach white solar panel wire to smooth connector wire
c. Attach black solar panel wire to ribbed black connector wire
d. Pre-place heat shrink over wires (small red, small black, and ~3” big black)
e. Solder wires together
f. Put heat shrink over soldered connections to cover bare wire
g. Put heat shrink over entire connection area
h. Attach cable to side of panel with zip tie as shown. See picture below:



Step 2: Cable preparation

The solar regulator has two positive and two negative terminals, as shown. The battery set is connected to ring terminals and the array set is connected to the solar panels. The positive terminal that is connected to the ring terminal has a fuse.



Step 2 (continued)

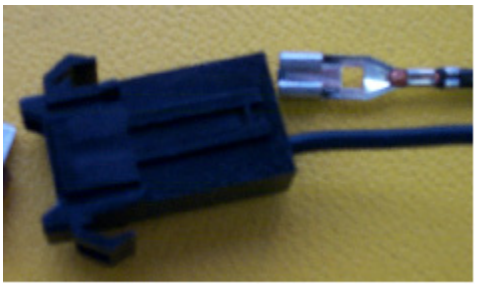
a. Strip the ~48” cable of the outermost insulation carefully with an Exacto knife at a length of 4-5” from one end, and 2-3” on the other end. Warning: Do not damage the insulation of the two inner cables.
b. Carefully strip the ~27” cable of the outermost insulation at a length of 2” on one end, and 2-3” on the other end. Warning: Do not damage the insulation of the two inner cables.

Step 3: Ring terminal connections

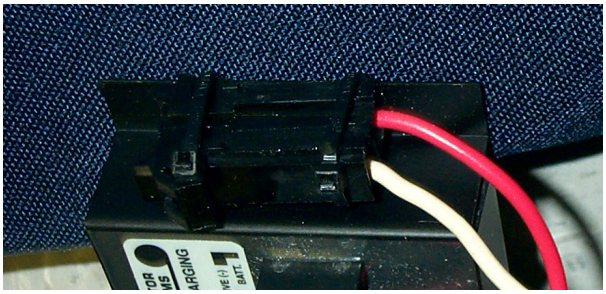
a. The ring terminals are attached to the 4-5” free end of the ~48” cable.
b. Strip the ends of the wires (~ ½ inch)
c. Put the boots on the wires (red on white and black on black)
d. Twist the bare ends of the wires
e. Pre-place shrink wrap over wires
f. Crimp wires in ring terminals
g. Solder connections
h. Put shrink wrap over connection area
i. Slide the boots over the rings

Step 4: Regulator/fuse box connections

a. Locate the 2-3” free end of the double insulated ~48” cable
b. Strip the end of the negative (black) wire
c. Attach a ring connector by soldering and crimping
d. Attach ring connector directly to the regulator at the **(-)** Batt (far right) terminal
e. Strip the end of the positive (white) wire
f. Attach a fuse box connector with a crimping tool
g. Plug connector into fuse holder



h. Strip each end of the red single insulated wire (~ ½ inch)
i. Attach a ring connector (red) by soldering and crimping
j. Attach ring connector directly to the regulator at the **(+)** Batt (far left) terminal
k. Attach a fuse holder connector with crimping tool to the other end of the wire
l. Plug connector into fuse box
m. Attach the fuse holder to the regulator with two zip ties as shown in the picture below



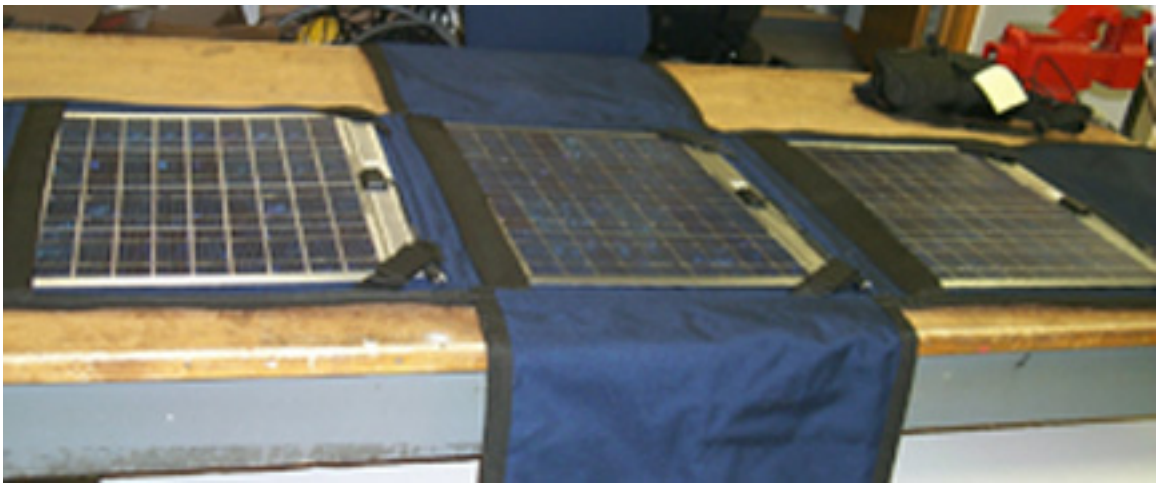
Step 5: Panel/regulator connections

a. Locate the 2” free end of the double insulated ~27” cable
b. Strip the end of the negative (black) wire
c. Strip the end of the positive (white) wire
d. Place heat shrink around for later cover and shrinking (medium red around positive, medium black around negative, and big ~4” around whole area)
e. Twist white wire to the three smooth connector wires
f. Twist black wire to the three ribbed black connector wires
g. Solder wires together
h. Apply heat to heat shrink over each soldered connection covering bare wire
i. Apply heat large heat shrink over the whole connection area

Step 6: Regulator/array connections

a. Locate the 2-3” free end of the double insulated ~27” cable
b. Strip the end of the negative (black) wire
c. Attach a ring connector by soldering and crimping
d. Attach ring connector directly to the regulator at the **(-)** Array terminal
e. Strip the end of the positive (white) wire
f. Attach a ring connector (red) by soldering and crimping
g. Attach ring connector directly to the regulator at the **(+)** Array terminal

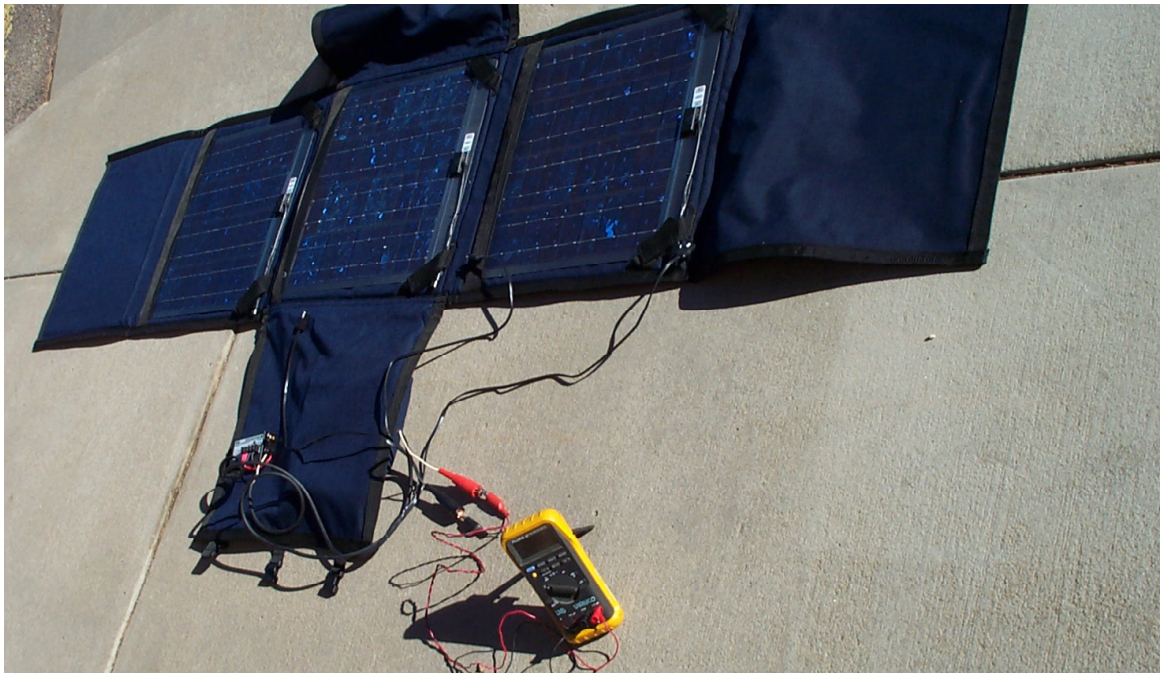
Step 7: Assembly



a. Place three solar panels in the bag (See picture above)
b. Put one fuse in fuse holder and a spare in the regulator pouch

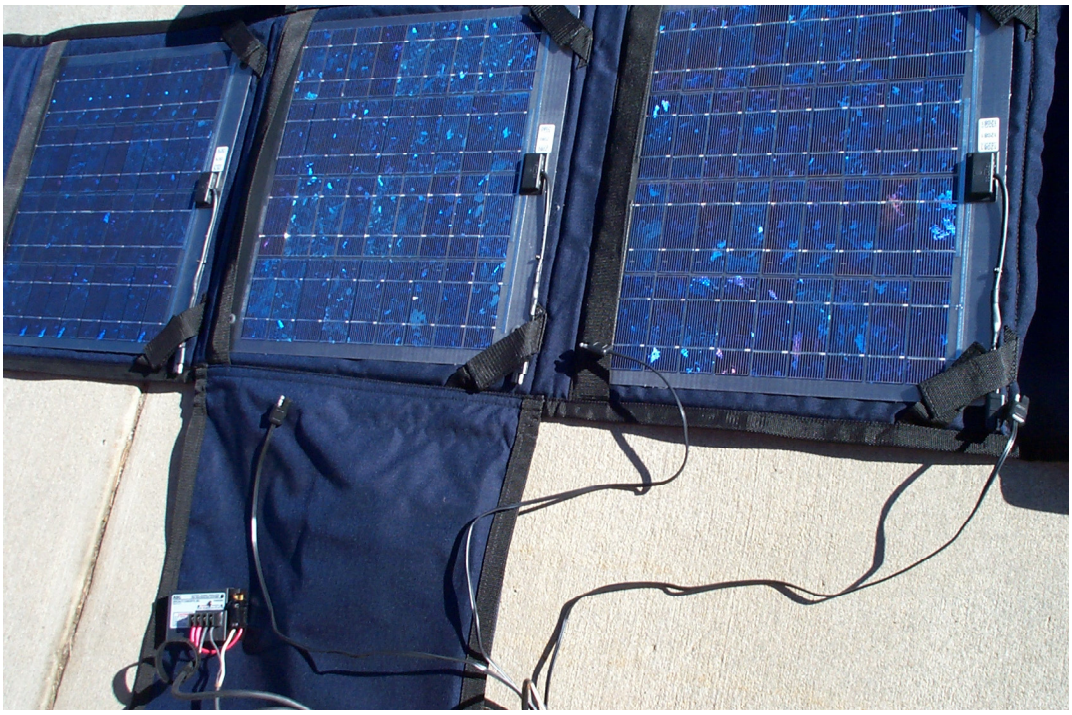
Step 8: Test the system

a. Gather supplies:
    - Solar panel set: Panels in bag and regulator
    - Load resistor (5 Ohm / 20W) (pictured is UNAVCO made)
    - Multimeter (set to DC Voltage)



b. Set-up in a sunny spot
c. Connect regulator clips to load resistor
d. Connect other end of load resistor to multimeter

Note: Resistor can become hot, so caution should be taken



e. Connect one solar panel to a matching (positive w/ positive, negative w/negative) regulator connector
f. Note Multimeter reading (12 –14v w/load)
g. Disconnect panel
h. Connect next solar panel to a matching regulator connector
i. Note Multimeter reading
j. Disconnect panel
k. Connect final solar panel to a matching regulator connector
l. Note Multimeter reading
m. Disconnect panel
n. Compare Multimeter readings: all should be the same
o. Use a wire tie to wrap wires together and then place the regulator in pouch

Basic Diagram: