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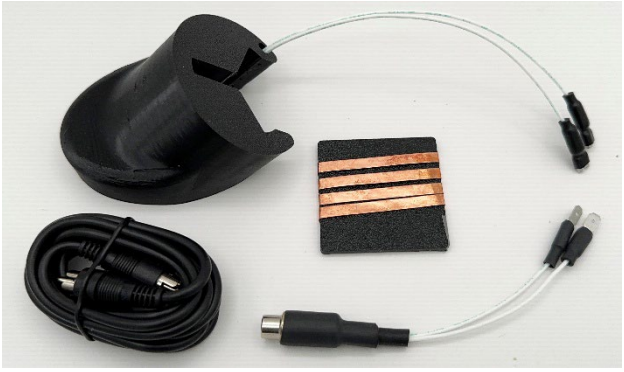
SO-30 / SO-40 / SO-50 / SO-58 / TSO-50 / TSO-60 Secondary Mirror Heater Installation Manual

This manual is for models SO and TSO model series heaters. They are optimized for mirrors with a minor axis not less that 73mm. They can still be used with smaller diameter mirrors but there will be some overhang into the light path.

What is Included:



Included with your TSO heater is:

1 x Flex slip-on heater with housing.

1 x Wire extension (spade connectors to RCA-F).

1 x RCA-M to RCA-M patch cord.

1 x 18”/460mm x 6mm self adhesive copper foil strip.

How does it work?

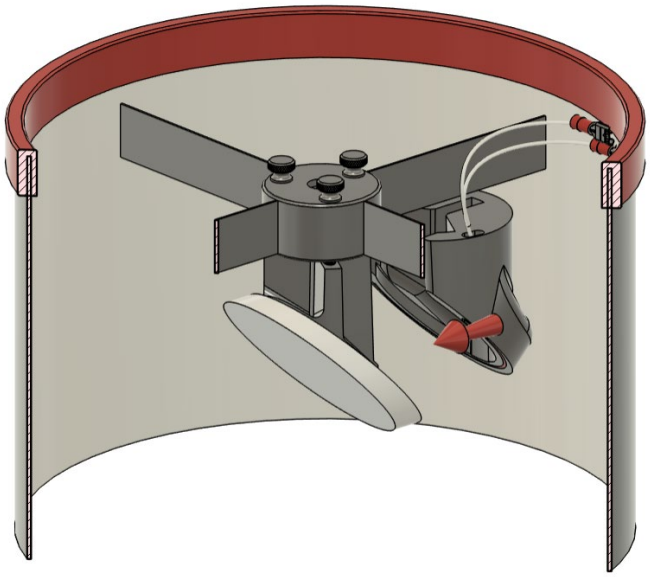
The design intent of this anti-dew heater is that the soft, flexible housing contains a flex heater element that will warm the metal secondary mirror holder on TS-Optics Photon and UNC Newtonians or Newtonians using the Teleskop-Service TSFSH50 or TSFSH60 secondary mirror holders. The heater in combination with the secondary mirror holder will then warm the secondary mirror. This will prevent the formation of dew on your secondary mirror.

Within the heater housing are many air pockets that will insulate against excessive heat loss into the atmosphere and direct the warmth generated by the heater into the metal secondary mirror holder, making it an effective deterrent to the formation of dew.

Installation of your TSO Secondary Mirror Heater

1. Push the black flex heater onto the secondary mirror holder from the backside of the mirror holder (see illustration #1). It will flex and widen and then slip into place onto the mirror holder. It will now hold itself in place (see illustration #2).
2. Route power wires along one of the Spider Vanes. Note: Polarity is NOT important. 2 options:
   a. **EASY METHOD:** Run your wires along one of the spider vanes out to the edge of your telescope tube. Secure the wires in place along the vane. We recommend a black non reflective tape for doing this.
   b. **HARD METHOD:** (see illustration #3) Alternatively, if you want to keep the spider vane profile as thin as possible you can use the included copper tape in place of the white wires. This will involve some careful preparation, wire cutting and soldering. We only recommend this for those with soldering skills. If you choose to use the copper foil method be sure to use some epoxy glue or strong tape at the solder points at both ends of the foil strips to secure the foil permanently. Failure to do so will result in the foil pulling away from the spider vane and/or breaking. **NOTE**: Be aware that as the installation of the copper foil does involve cutting off the heater’s crimp connectors, it will *void the warranty*.
3. Typically, the wire leads coming from the heater should be long enough to bridge the distance of your spider vane to the outside edge of your telescope tube but the included extension will bridge any remaining gap.
4. Even if not required to bridge a gap, the extension cable must be connected to the heaters’ crimp connectors in order the attach the black RCA patch cord.

5. Once your wiring is taken care of, you are pretty much ready to go. Just connect the patch cord to your dew controller. We recommend a low to medium controller setting to start. Adjust for your conditions and environment.



#1.

As shown by the red arrow, push the black flexible heater body onto the metal mirror holder. The heater will flex and wrap around the two front legs of the holder, holding it in place. Be sure it is snugly installed. There should little to no gap between the holder and heater housing. Be sure the heater is in contact with the back surface of the mirror by pushing it lightly downward.

#2.

When properly installed, the heater will look like this *(the spider vanes have been removed for the sake of clarity).*

#3.

The easiest method to wire up this heater is to tape the wires to the spider vane. In this illustration (HARD METHOD) the copper strip has been cut to length and applied to one of the spider vanes. The intention here is to reduce the obstruction profile of the wires across the light path by running the electric current though the copper strips instead of the wires. The wires coming out of the heater as well as the short, white extension cable will need to be cut to remove the crimp connectors, then stripped back about 6mm to expose the bare wires and then soldered to the copper tape. Obviously, the wires coming out of the heater will be soldered at the end closest to the mirror and the extension wires will be soldered to the end at the edge of the telescope tube. Soldering will burn off the adhesive backing of the copper tape. Consequently, the ends of the copper tape will need to be epoxied or taped in place to prevent tearing or pulling away from the