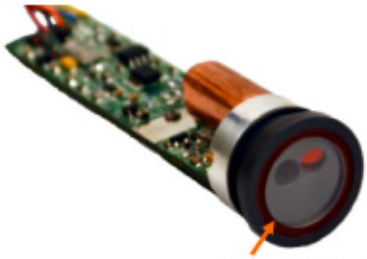
CYCLOPS®
SUBMERSIBLE SENSORS

Technical Note:
Wiring, Functional test, Installation and Sealing Specifications for No Housing Cyclops

The No Housing Cyclops-7 requires installation and sealing which varies from our standard Cyclops instruments. Instructions below cover wiring and testing functionality as well as specifications for mounting. If you have additional questions or would like us to review your design, please contact our Technical Support Department at 408-749-0994, toll-free at 877-316-8049 or support@turnerdesigns.com.



2 different optical faces the No Housing Cyclops-7 (P/N: 2100-000-"Identification Letter"-NH)

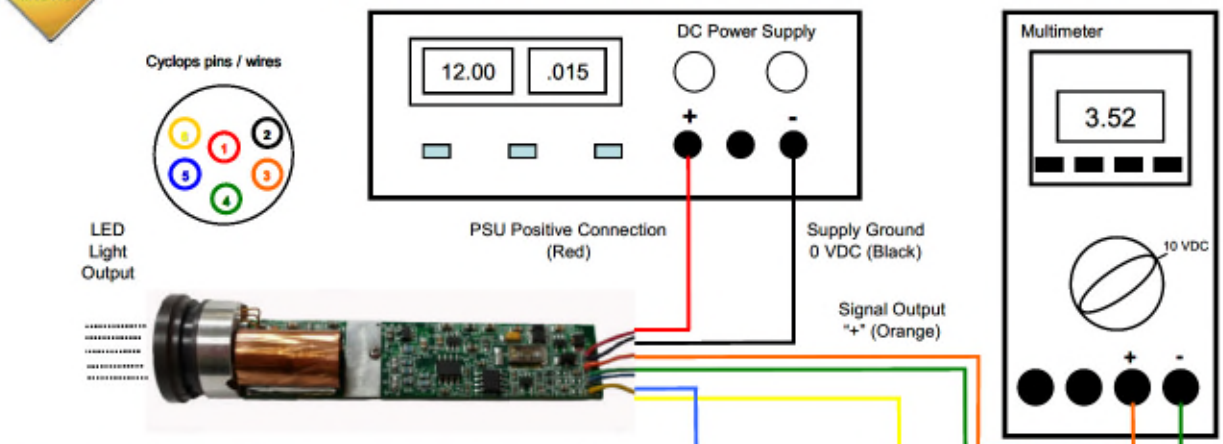
Wiring and Function Check:

To perform a functional check on the Cyclops, connect the Cyclops colored wires to the power supply and multi-meter as shown in Figure 1 below.

Additional Equipment required for functional tests:
DC Power Supply, 3 - 15 VDC, >100 mA
Multi-meter to read 0 – 5 VDC

CAUTION

Note: Supply voltages greater than 15 VDC will damage the sensor.



Pin Connection	Wire Color	Function
1	Red	Supply voltage, 3-15 VDC
2	Black	Supply ground, 0 VDC
3	Orange	Signal output to data logger "+", 0-5 VDC
4	Green	Analog Ground "-", 0
5	Blue	X10 Gain - Medium Sensitivity
6	Yellow	X100 Gain - High Sensitivity

Figure 1.

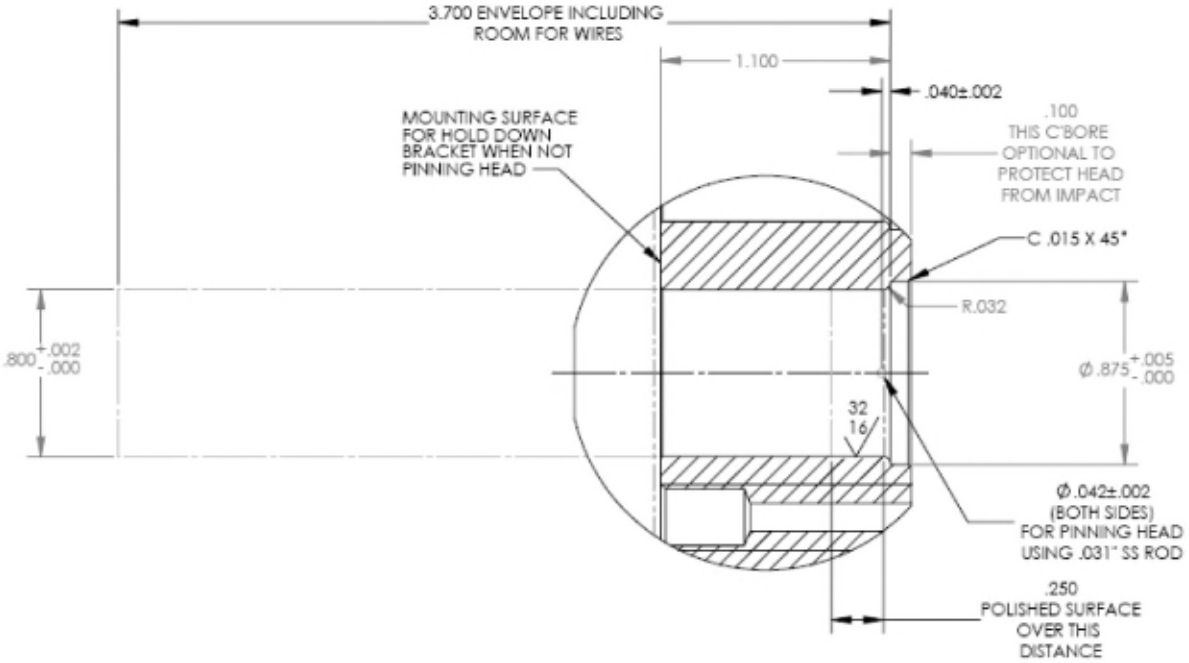
With the Cyclops connected as shown in Figure 1 answer questions 1-3 by making the following functional tests:

1. Is the LED on?
   Hold a piece of white paper about ½ an inch in-front of the optical head to ensure the LED is on.
   Note: Cannot perform this test for Turbidity sensors because they use IR which is not visible.

2. Is there voltage output?
   The multi-meter should be reading some voltage >0 VDC

3. Does the voltage output change?
   Move the light source closer to your hand or a surface and check if the voltage output increases.

Installation and Sealing Specifications:



16-32 micro-inch RMS on the .875" diameter over the first 1/4"inward from the .032" radius.

Figure 2.

The No Housing Cyclops installs from the outside of whatever housing it goes into. In order to keep the instrument from popping out due to air pressure changes or impacts you will need to either pin it or make a bracket to hold the instrument inside the housing. The drawing in Figure 2 shows details of pin hole size and location as well as the location of the mounting surface to work with our bracket (P/N 130-2380 for the UV head only).

- The Cyclops instrument is installed into the housing by sliding the instrument into the bore from the outboard (water-facing) side of the housing. The housing bore detail drawing shows an optional .875" diameter X .100" deep counter-bored recess to protect the instrument. The recess is recommended whenever possible but may be omitted. When the instrument head stands off of the outboard housing surface, it is more prone to accidental damage.
  Note: A *recess more than .100" deep may cause bubbles to become trapped next to the head, affecting results.*

- The surface on the instrument bore that seats the instrument against water pressure is at the bottom of the optional counter-bore. This surface has a .032" radius fillet which blends tangentially to the .800" diameter inner bore. This fillet provides a smooth inlet to compress the O-rings as the heads are installed. The surface finish on the inner bore within .250" of the fillet needs to be very highly polished to ensure the O-ring(s) will seal at high pressures. Turner Designs recommends a surface finish of 16 to 32 micro-inches RMS in this area.

- Immediately after the instrument is slid into the housing, it is restrained from further inboard movement (due to water pressure, etc.) by the head seating surface but is only held from outboard movement by the friction between the O-rings and the inner bore. This friction is insufficient to restrain the instrument from movement in the outboard direction due to impacts or to positive internal pressure, such as that resulting from high altitudes or temperature fluctuations.

- Suggested methods to retain the instrument in its housing:

  1) Install two .031" diameter stainless steel pins through the .042" diameter holes in the housing and press into mating holes on opposite sides of the instrument head. Details for the exact clearance hole size and location are seen in the drawing, located close to, and slightly inboard of, the head seating surface.

     Note: The above applies to both versions of the optical face.

  2) Install a (custom) bracket that clamps onto the aluminum optics block and is connected to the inside of the housing to restrain the instrument from moving.

     Note: The above applies to the version of the optical face that does <u>not</u> have a red epoxy ring.

  3) Install a (custom) bracket that mates with two #0-80 tapped holes on the aluminum PCB support bracket (part of the instrument) or use Turner Designs P/N 130-2380 bracket.

     Note: The above applies to the version of the optical face that does have a red epoxy ring.

- The supplied desiccant should be installed with the instrument to avoid condensation.

- Should any of the O-rings become damaged or otherwise require replacement, the O-rings may be found in many hardware or industrial supply stores. The size is AS568-017 and the material is 70 durometer Buna-N rubber. New O-rings should be lubricated using silicone-based O-ring lubricant before installation onto the instrument head. It is recommended to replace all O-rings at one time, even if only one appears damaged.

The customer should <u>not</u> rely solely on the preceding advice when developing their custom housing but should test their final design under the intended use conditions to ensure water-tightness and performance criteria are met. Turner Designs is not responsible for damage to any instruments resulting from installation or use in a customer-designed housing.

The No Housing Cyclops optical face has a depth range of 600 meters.