Recommended Installation Procedure for CP-100 Sensors

The following is a recommended procedure for permanent installation of CP-100 wire-wound Platinum sensors.

> **Warning:** Wire-wound Platinum sensors like the CP-100 have pure Platinum leads. These are very brittle, usually following the "you bend twice, you break" rule. All connections to the sensor leads should be made before installation and the connections should be potted with the sensor. Care should be taken during each step of the installation process to minimize bending the leads.

Step 1: Connect the sensor

Make connections to the sensor. Some users connect the cryostat wiring directly to the sensor. Others prefer attaching a small two-pin connector to the sensor.

Connections may be made with standard 60/40 solder.

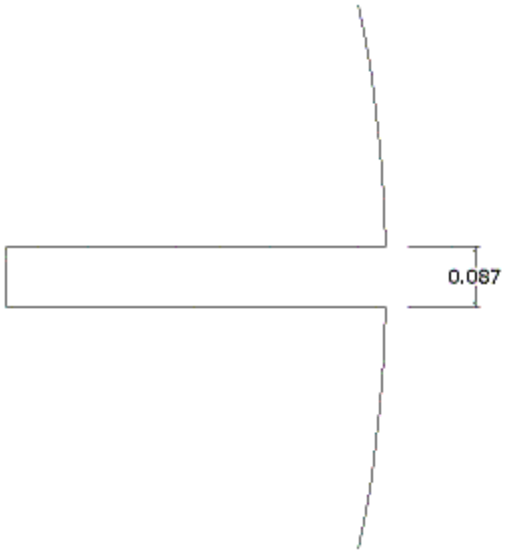
If a connector is used, it should be mounted close enough to the sensor that the entire assembly may be potted, leaving only the connector pins exposed.

A two-piece, two-pin connector[1] kit is supplied with the CP-100. The pin header should be connected to the sensor and the socket header should be connected to the cryostat wiring.

If direct connection to the cryostat wires is desired, the connection should be made close enough to the sensor so that the sensor and all connections can be potted.

Step 2: Drill a hole

Here, we assume that the cold plate where the sensor is to be mounted is made from Oxygen-free Copper and the sensor will be mounted using Stycast[2] epoxy. The thermal expansion of Stycast is very close to that of Copper.



Drill a 0.087" (2.2mm) hole in the cold plate. This will allow enough room to mount the sensor in Stycast.

The hole must be deep enough to accommodate the entire body of the sensor plus enough to allow potting of the leads. This is at least 0.47" (12mm).

Note: In applications below 523K, a non-permanent installation can be made using Apiezon[3] grease instead of Stycast epoxy. However, these sensors have brittle leads, so mounting in grease is not recommended.

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[1] The connector supplied with the CP-100 is a Samtec SMS-102-01-G-S socket and a Samtec TMS-102-02-G-S pin header. Information is available at http://www.samtec.com or by calling 1-800-SAMTEC9.

[2] Stycast epoxy refers to Emerson & Cuming Co. Stycast 2850-FT/Catalyst 9. It is commonly used in cryogenic applications since it has a thermal expansion coefficient very close to that of Oxygen Free Hard Copper. Complete data is available at http://www.emersoncuming.com.

[3] Apiezon grease refers to Apiezon type N or H grease. Complete data is available at http://www.apiezon.com/greasepack.htm

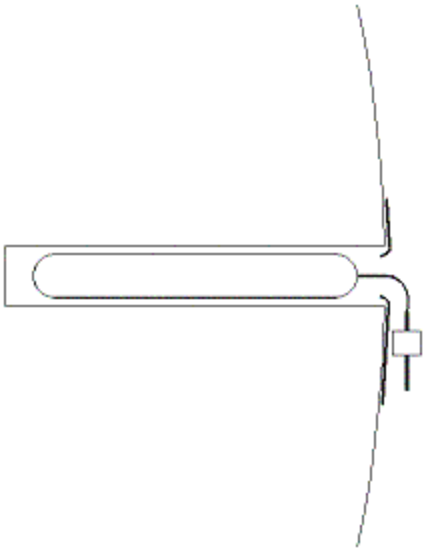
Step 3: Insert the sensor
Fill the hole about ½ full with Stycast epoxy and slowly insert the sensor. Again, be very careful not to bend the sensor leads.

Fill with more epoxy until the hole is just full and the epoxy is flush with the surface of the plate.

Paint a thin layer of epoxy on the cold plate around the area of the hole and then press a layer of Zig-Zag[4] paper over it. The Zig-Zag paper is used as a filler and helps ensure that there is no mechanical or electrical connection between the sensor connections and the cold plate.

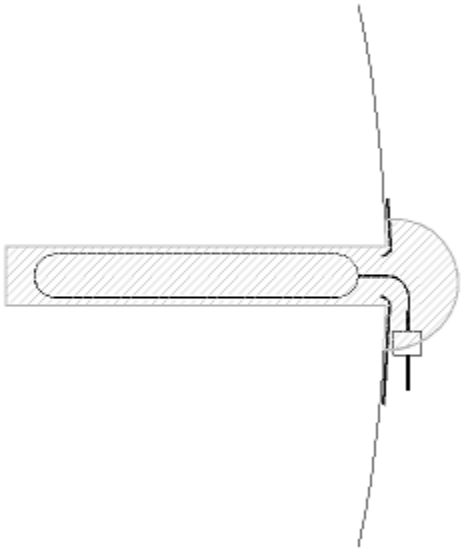
Note that the assembly shown here uses a connector to attach to cryostat wiring.

Allow the epoxy to completely cure before proceeding.



Step 4: Pot the assembly
Pot the assembly, including the sensor connections with Stycast epoxy, covering the sensor connections. Allow the epoxy to cure before use.

Note: If you are using the supplied connector kit, the connection between the socket and the cryostat wiring may also be potted in Stycast for improved mechanical strength.



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[4] Zig-Zag paper refers to Zig-Zag White brand cigarette paper. It is commonly available and is often used as filler for Stycast epoxy. Product information is available at http://www.zigzag.com.