

FL-400 Flame-resistant Fiber Probe Installation and Operation Instructions

Description

The FL-400 Flame-resistant Fiber Probe is a heat-resistant fiber optic probe that couples to Ocean Optics miniature fiber optic spectrometers to measure *in situ* emission spectra of samples such as dissolved metals and high-temperature plasmas.

The FL-400 is a high-temperature 400- μm gold-jacketed UV-VIS optical fiber in an 8" nickel sleeve. The tip of the FL-400 probe functions in environments up to 700 °C.



Parts Included

- FL-400 probe with wire loop for emission measurements of dissolved materials

Parts Needed

- SMA Splice bushing (21-02)
- Optical fiber. We recommend the P400-2-UV-VIS Optical fiber.

Connecting the Probe

► **Procedure**

To connect the FL-400, follow the steps below:

1. Remove the plastic cover from the FL-400 probe.
2. Locate the 21-02 SMA Splice Bushing required to use the probe system.
3. Connect the male end of the FL-400 probe to the splice bushing.
4. Connect a standard optical fiber (sold separately; typically a P400-2-UV/VIS 400 μm optical fiber) to the other end of the splice bushing.
5. Connect the other end of the optical fiber to the SMA 905 connector on the spectrometer.
6. Attach the wire loop to the FL-400 by slipping the FL-400 into the coil spring of the wire loop.

You can now observe flame emission spectra of samples such as sodium, potassium, calcium, and copper.

Operation

After connecting the probe, you can use it to measure salt solutions and solid samples.

Measuring Salt Solutions

► **Procedure**

1. Dip the flame loop into salt solutions such as potassium, copper, sodium, or calcium.
2. Insert the wire loop into a propane torch flame.

Measuring Solid Samples

► **Procedure**

1. Dampen the loop with HCl solution.
2. Dip the loop into a solid sample for flame test.

Care of the Probe

Follow these guidelines to ensure that the probe remains functional for as long as possible:

- Handle the probe with care.
- Do not drop the probe. Dropping the probe may cause permanent damage.
- Clean the probe with distilled water or light detergents. Mild sonication is recommended.
- Do not place probe tip in a cool cleaning solution while tip is hot. This could fracture the silica fiber in the probe. Allow the probe to cool for a minimum of 10 seconds before placing the probe in a cleaning solution.

Probe Specifications

Specification	Value
Fiber core diameter	400 μm
Fiber core/cladding	Fused silica core and doped, fused silica cladding
Fiber jacketing	Gold
Fiber type	1 single-strand, multimode fiber
Wavelengths covered	300 to 800 nm
Probe sleeve (ferrule)	Nickel
Probe dimensions	17.78 cm length, 20 gauge probes with 0.902 mm OD
Temperature range (tip of probe)	-269 °C to 700 °C
Numerical aperture	0.22
Fiber termination	SMA 905

