

Field Instruction

1.0 Application

Applies to installation of factory supplied single and dual thermocouples on all LCI and RTC infrared furnaces.

1.1 Equipment

- Open end hex wrench (9/16").
- Thermocouple height gage or tape measure.
- Thermocouple, single or dual (factory model)
- Permanent marker

1.2 Preparation

Shutoff power to furnace.
On one side of the furnace (rear side if possible), remove top side covers in furnace chamber section.

1.3 Removal

- Locate thermocouple to be replaced.
- Unplug thermocouple connector.
- With a permanent marker, mark thermocouple shaft at point where the shaft enters hex fitting.
- Using open-end wrench, loosen hex nut at chamber port
- Grasp base of thermocouple and pull up to extract thermocouple.
- If reusing fitting nut, cut thermocouple above nut. Remove nut for reuse with new thermocouple.

1.4 Installation

- Mark distance from junction end with permanent marker.
- Add fitting nut and ferrule set (back and front).
- Insert new thermocouple into port opening and lower thermocouple
 - a. until your mark is just above fitting nut; or
 - b. if using height gage, place height gage in position and lower thermocouple until it rests on height gage as shown in figure 1-3 & 1-4; or if using neither of the above, or
 - c. position thermocouple above bend to 2.5 inches (63.5 mm) above chamber top.

Gently tighten tube fitting until snug. Do not over tighten.

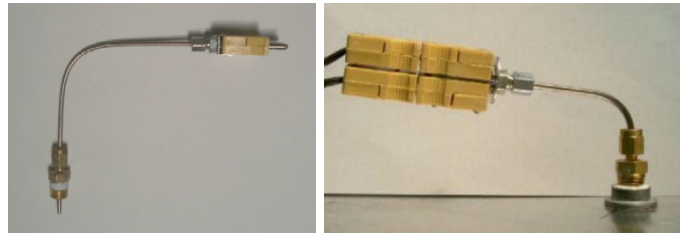


Figure 1-1 Thermocouple, single and dual

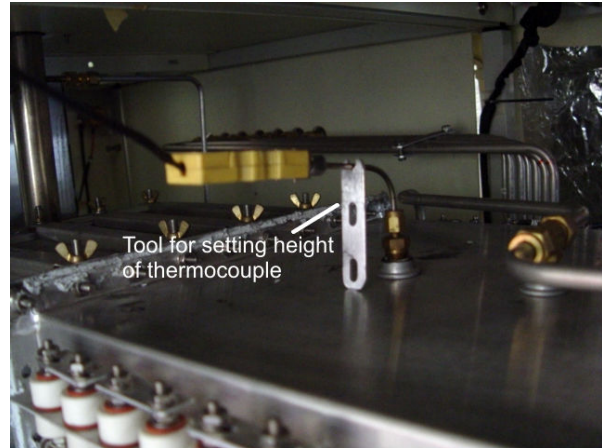


Figure 1-2 Thermocouple in chamber

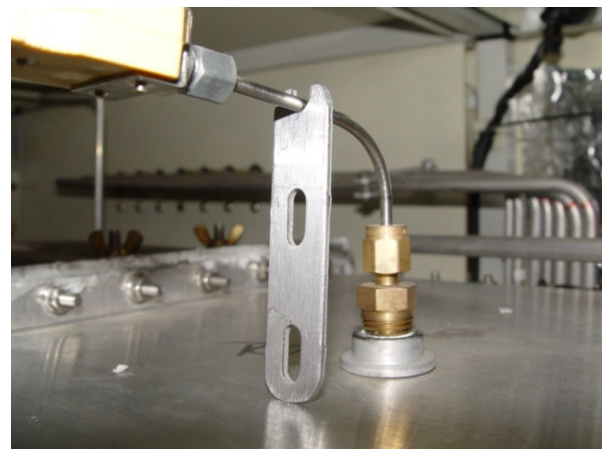


Figure 1-3 Thermocouple Height Gage

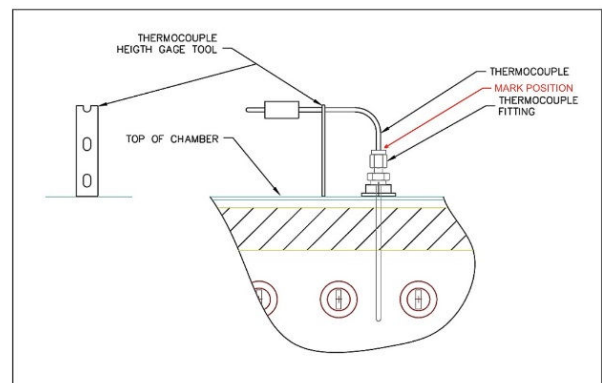
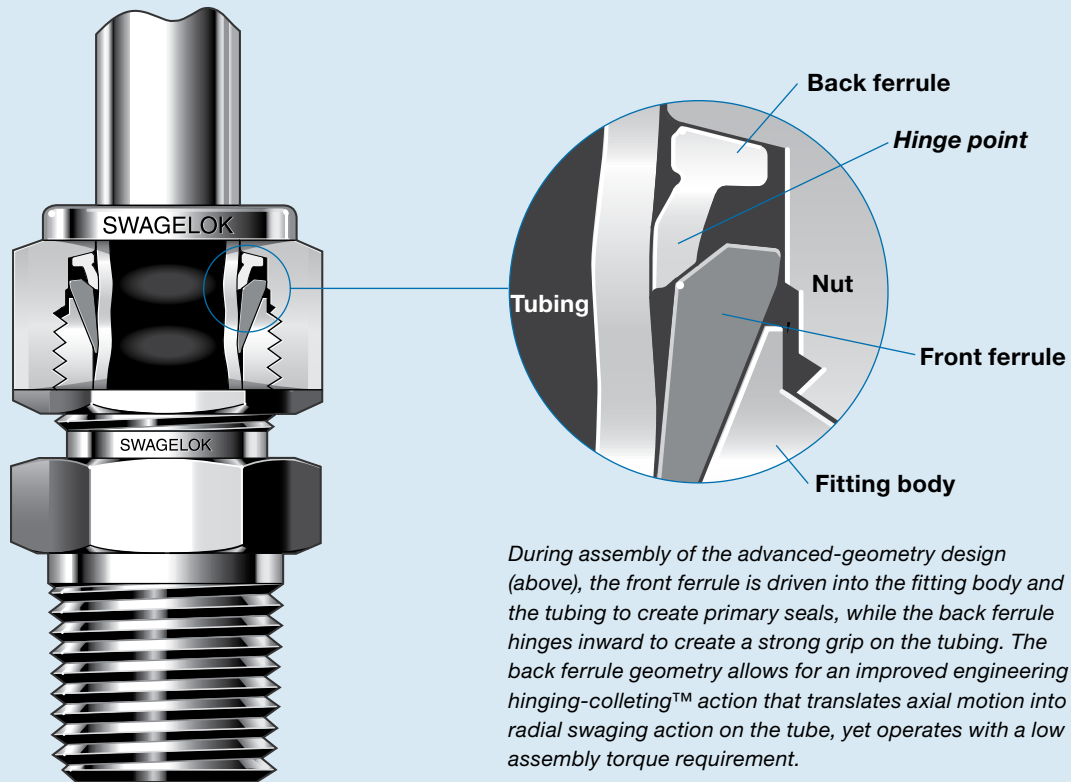


Figure 1-4 Thermocouple Installation

Features

- Live-loaded, two-ferrule design.
- Easy to install.
- No torque is transmitted to tubing during installation.
- Swagelok® gap inspection gauge ensures sufficient pull-up upon initial installation.



During assembly of the advanced-geometry design (above), the front ferrule is driven into the fitting body and the tubing to create primary seals, while the back ferrule hinges inward to create a strong grip on the tubing. The back ferrule geometry allows for an improved engineering hinging-colletting™ action that translates axial motion into radial swaging action on the tube, yet operates with a low assembly torque requirement.

Two-Ferrule, Mechanical Grip Design

The two ferrules separate sealing and tube gripping functions; each ferrule is optimized for its function.

The front ferrule creates a seal:

- against the fitting body
- on the tubing outside diameter.

As the nut is turned, the back ferrule:

- axially advances the front ferrule
- radially applies an effective tube grip.

Advanced-Geometry, Hinging-Colletting Back Ferrule Design

This design is standard on all 1/4 to 1 in. and 6 to 25 mm Swagelok stainless steel tube fittings to help installers make more consistent, leak-tight tube connections.

In these sizes, a patented case hardening process and patented recessed and contoured geometry provide a unique engineered advantage to the Swagelok back ferrule, providing:

- excellent gas-tight sealing and tube-gripping action
- easily achieved proper installation
- consistent remakes
- excellent vibration fatigue resistance and tube support
- full compatibility with original Swagelok stainless steel tube fittings of identical sizes.

Refer to *316 Stainless Steel Swagelok Tube Fittings with Advanced Geometry Back Ferrules* technical report, MS-06-16, for additional information.