

CLAUSTEMP[®]

MODEL HIP

INFRARED PYROMETER



The HIP pyrometer is specifically designed to read the temperature of a Claus thermal reaction furnace. It is useful for calibrating process pyrometers and troubleshooting temperature measurement problems.

Operation

Buttons and Features:



Power – Press the power button to turn pyrometer on. Press again to turn it off. Note: In order to preserve battery life, the pyrometer will turn off automatically after 10 minutes.



°F – Press this button to select measurement in °F. Also, when this button is released, the current measurement will be held on the display for 10 seconds.



°C – press this button to display the measurement in °C. Also, when this button is released, the current measurement will be held on the display for 10 seconds.



Backlight - Press the backlight button to toggle the backlight on and off. Note: in order to preserve battery life, the backlight will turn off automatically after one minute.



Battery Status Indicator – The display shows a battery status indicator in the lower left corner. When the battery is almost drained, the words 'Low Battery' will appear below the temperature. Operating the pyrometer with low batteries could compromise accuracy.



Figure 1

MEASURING THROUGH A SIGHT PORT

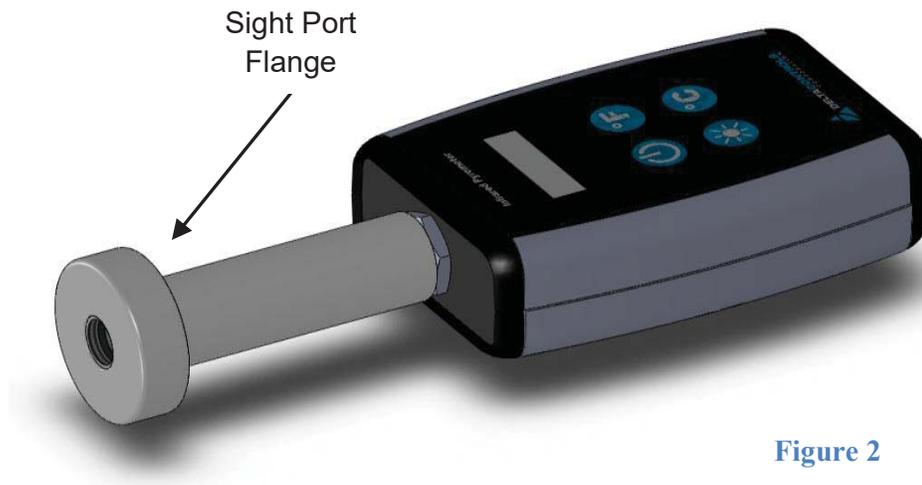


Figure 2

The HIP pyrometer is calibrated to measure temperatures through typical sight ports used by process pyrometers and for viewing into the reaction furnace. The sight port flange is held against the sight port glass to aid in keeping the pyrometer aimed down the bore hole into the furnace. Because some sight port glass may have different optical characteristics than others, there is a possibility that the glass could affect the accuracy of the measurement. However, experience to date has shown as long as the glass is clean and not discolored, results are generally very good.

Measuring an HIR Port

The Sight Port Flange (see figure 2) can be unscrewed from the pyrometer and removed. This allows the thinner lens tube to be inserted into the sight port of a CLAUSTEMP HIR Pyrometer for calibration or troubleshooting.

CAUTION – When removing the lens body cover from the HIR, avoid twisting or kinking the fiber optic cable.

Access the HIR optical port as follows: (See [Figure 3](#) and [Figure 4](#))

(**Note:** This will cause a low temperature reading on the HIR output – notify the control room, if needed, before proceeding)

1. Loosen the cable grip on the HIR Lens Body Cover. **This is important** to prevent damage to the fiber optic cable when you unscrew the lens body cover.
2. Unscrew the lens body cover.
3. Slide the lens body cover down the fiber optic cable.

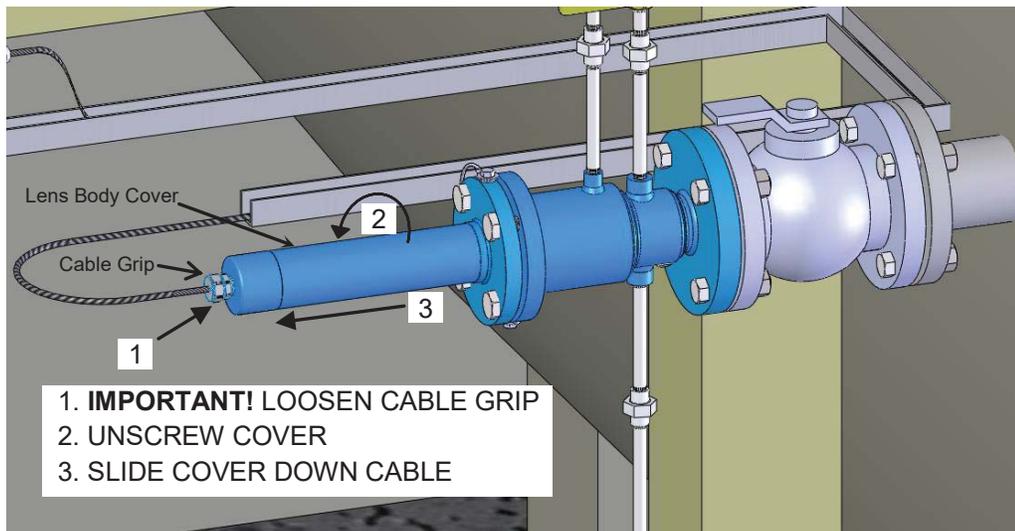


Figure 3

4. Loosen the setscrew in the alignment tube that holds the lens body.
5. Remove the Lens Body.

(Note – find a nearby place to secure the lens body cover. Do not allow it to ‘hang’ by the fiber optic cable)

Look down the alignment tube to inspect the optical path. Make sure there is no material build-up in the optical path that could cause inaccurate measurement, and that the alignment tube is properly aimed down the borehole.

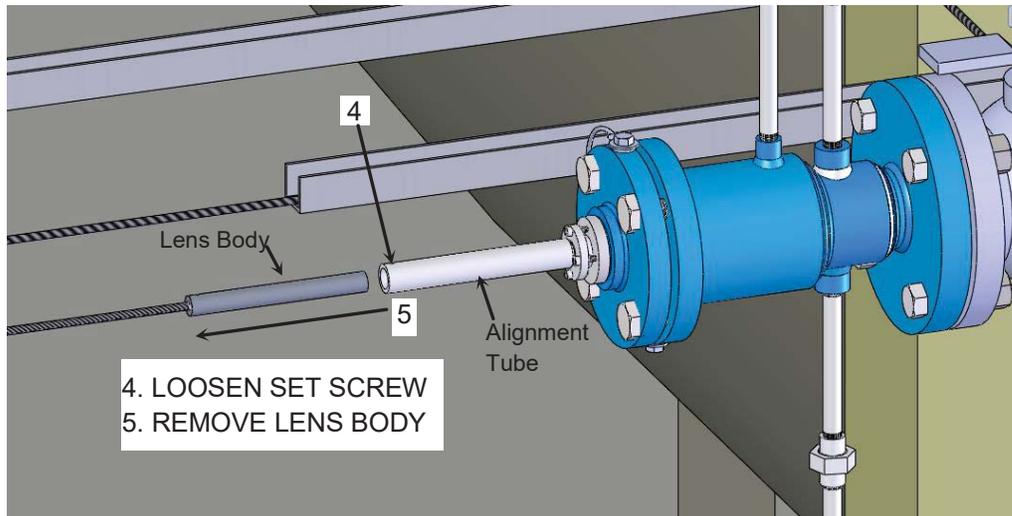


Figure 4

Turn on the handheld pyrometer and select the desired units of

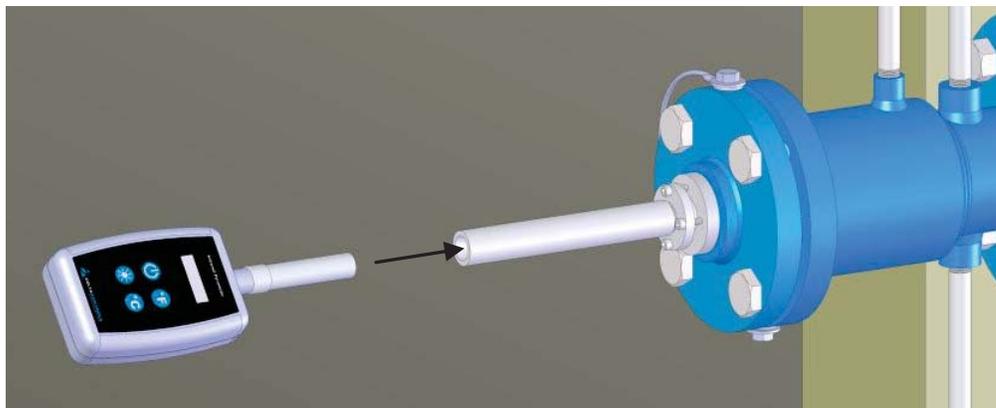


Figure 5

measure. Insert the lens probe all the way into the alignment tube.

Wait 5 seconds for the measurement to stabilize. Read the temperature.

MEASUREMENT HOLD

If the nozzle is located where it is difficult to read the HIP pyrometer, just press the desired °F or °C button for a second or so and then release it. This will cause the HIP to hold the reading on the display for 10 seconds. You may then remove the HIP from the alignment tube and read the measured temperature.

TRANSMISSIVITY MEASUREMENT

Below the temperature indication, in smaller characters, is the indication 'trans=x.xx' where x.xx is usually a number between 0 and 1.00. This value is an indication of the amount of light reaching the sensor relative to a completely unobstructed sight path. A value of .95 and above is considered normal. Values below 0.95 may indicate that some sight path attenuation is occurring, possibly due to material build-up on the window or in the nozzle.

If the transmissivity is below 0.95, it is recommended that you:

1. Investigate the cause of the obstruction. You may need to take corrective action (i.e., improve insulation, align sight tube) or schedule maintenance activities (i.e., clean window, rod out the nozzle).
2. Calibrate the HIR to the value indicated by the HIP.
3. Schedule periodic calibration checks of the HIR in case the obstruction is changing over time.

NOTE: - Above 700°C (1292°F) the HIP uses a two-color ratiometric measurement to determine temperature and measure transmissivity. Using two colors, temperature measurements are accurate even with transmissivities down to 0.05. At lower temperature, the HIP reverts to a single wavelength measurement. In that case, anything other than a completely unobstructed sight path will cause the HIP to read lower than the correct temperature.

Changing the Batteries

To access the batteries for replacement, remove the two screws on the back of the pyrometer. Replace with 3 standard 'AA'-size batteries.

DELTA CONTROLS CORPORATION

585 Fortson Street
Shreveport, La. 71107 – USA
Ph: +1(318) 424-8471
Fax: +1(318) 425-2421
E-mail: sales@deltacnt.com

Web: www.claustemp.com



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