

4180 series precision infrared calibrators

FLUKE®

Hart Scientific®



- Fast, portable and easy to use
- Correct target size for most thermometers
- Calibration solutions from -15 °C to 500 °C (5 °F to 932 °F)
- Radiometrically calibrated for traceable and consistent results

Should your thermometer be calibrated by one of these?

Business decisions costing thousands of dollars are based on the results of your measurements, so they had better be right! It can be very expensive to shut down a line for repairs and maintenance, but it might be catastrophic if the shutdown is unplanned. To stand by your measurements with confidence, you should definitely have your thermometers calibrated.

How to get consistent results:

Even those infrared thermometers that cannot be adjusted can benefit from a calibration that demonstrates the consistency and validity of your results. A trusted calibration means less worry, fewer questions and more time being productive. To get more reliable, traceable, and consistent results, buy a precision infrared calibrator from Fluke's Hart Scientific Division.

The 4180 Series of Precision Infrared Calibrators for infrared thermometers is fast, accurate, and easy to use. It comes

Application note, (literature code 3187781):



Infrared Temperature Calibration 101

Infrared temperature calibration is not so hard when you are on the right wave length. View the necessary information for spot on calibration.

Go to www.hartscientific.com/publications for complete information.

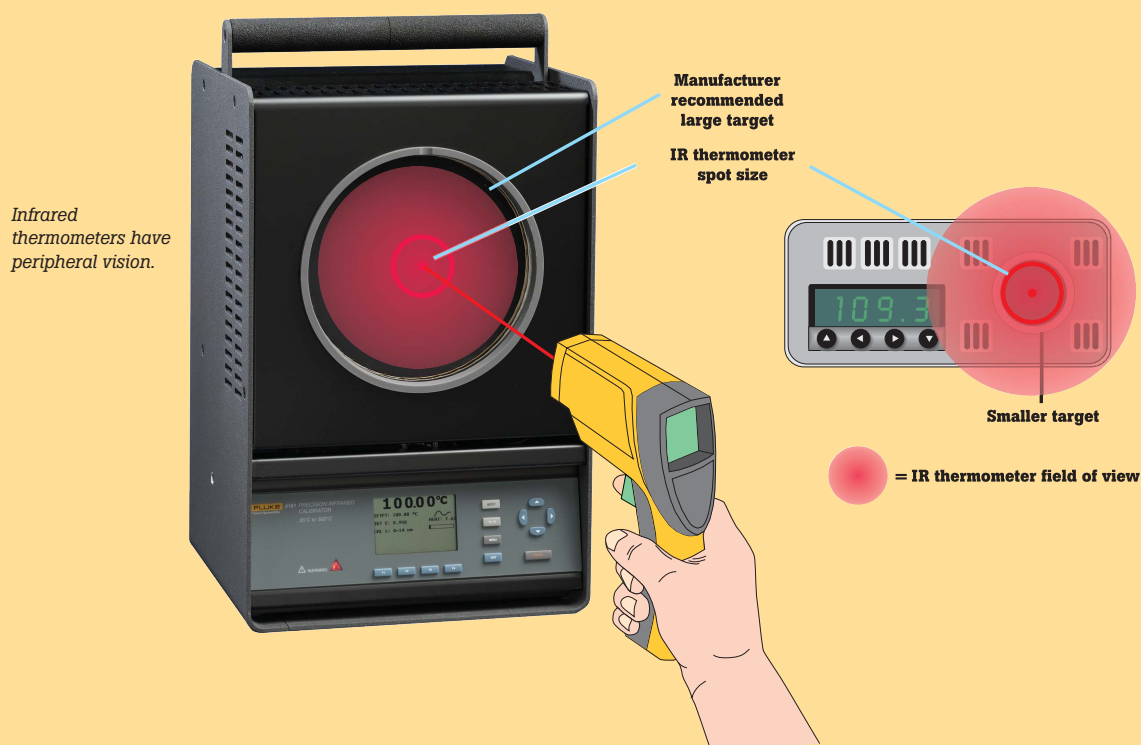
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Common pitfalls in infrared thermometer calibration

- If the target size is too small, the thermometer will not read the right temperature. This problem, called size of source effect, is addressed by the large, 152.4 mm (six in) target of the 4180 series, which was designed to accommodate the field of view and calibration geometry requirements of certain common infrared thermometers used in the field, lab and process control.
- Some people are misled by the accuracy statements on IR calibrators because they are not familiar with the concept of

emissivity. Look for calibrators with a "radiometric calibration" so that accuracy will be straightforward and uncomplicated by emissivity-related errors.

For more information on emissivity, size of source effect and radiometric calibration, see Hart Scientific application note "Infrared Temperature Calibration 101" or choose a calibrator like the 4180 series that you know has already addressed all of these issues.



with an accredited calibration from one of the world's most trusted temperature calibration laboratories, sample calibration procedures for Fluke thermometers built right in and everything you need to get started making high-quality infrared thermometer calibrations. This is the perfect solution for any infrared thermometer within its temperature range.

The 4180 reaches temperatures from -15°C to 120°C and the 4181 has a temperature range from 35°C to 500°C . Uniformity is important at these temperatures because an infrared thermometer will "see" the entire target when placed at the appropriate calibration distance.

In addition, with accuracies as good as $\pm 0.35^{\circ}\text{C}$, the 4180 Series can meet its specifications without additional

emissivity-related corrections, leading to legitimate test uncertainty ratios (TUR) as good as 4:1. (See the sidebar below for information about common pitfalls in infrared calibrator accuracy and have a look at our Guide to Infrared Thermometer Calibration to get started quickly with your new calibrator.

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Specifications	4180	4181
Temperature range (@ 23 °C ambient, 0.95 emissivity) ¹	-15 °C to 120 °C (5 °F to 248 °F)	35 °C to 500 °C (95 °F to 932 °F)
Display accuracy ¹	± 0.40 °C at -15 °C ± 0.40 °C at 0 °C ± 0.50 °C at 50 °C ± 0.50 °C at 100 °C ± 0.55 °C at 120 °C	± 0.35 °C at 35 °C ± 0.50 °C at 100 °C ± 0.70 °C at 200 °C ± 1.20 °C at 350 °C ± 1.60 °C at 500 °C
Stability	± 0.10 °C at -15 °C ± 0.05 °C at 0 °C ± 0.10 °C at 120 °C	± 0.05 °C at 35 °C ± 0.20 °C at 200 °C ± 0.40 °C at 500 °C
Uniformity ² (5.0 in dia of center of target)	± 0.15 °C at -15 °C ± 0.10 °C at 0 °C ± 0.25 °C at 120 °C	± 0.10 °C at 35 °C ± 0.50 °C at 200 °C ± 1.00 °C at 500 °C
Uniformity2 (2.0 in dia of center of target)	± 0.10 °C at -15 °C ± 0.10 °C at 0 °C ± 0.20 °C at 120 °C	± 0.10 °C at 35 °C ± 0.25 °C at 200 °C ± 0.50 °C at 500 °C
Heating time	15 min: -15 °C to 120 °C 14 min: 23 °C to 120 °C	20 min: 35 °C to 500 °C
Cooling time	15 min: 120 °C to 23 °C 20 min: 23 °C to -15 °C	100 min: 500 °C to 35 °C 40 min: 500 °C to 100 °C
Stabilization time	10 minutes	10 minutes
Nominal emissivity ³	0.95	0.95
Thermometer emissivity compensation	0.9 to 1.0	
Target diameter	152.4 mm (6 in)	
Computer interface	RS-232	
Power	115 V ac (± 10%), 6.3 A, 50/60 Hz, 630 W 230 V ac (± 10%), 3.15 A, 50/60 Hz, 630 W	115 V ac (± 10%), 10 A, 50/60 Hz, 1000 W 230 V a (± 10%), 5 A, 50/60 Hz, 1000 W
Fuse(s)	115 V ac 6.3 A, 250 V, slow blow 230 V ac 3.15 A, 250 V, T	115 V ac 10 A, 250 V, fast blow 230 V ac 5 A, 250 V, F
Size (HxWxD)	356 mm x 241 mm x 216 mm (14 in x 9.5 in x 8.5 in)	356 mm x 241 mm x 216 mm (14 in x 9.5 in x 8.5 in)
Weight	9.1 kg (20 lb)	9.5 kg (21 lb)
Safety	EN 61010-1:2001, CAN/CSA C22.2 No. 61010.1-04	

¹For 8 µm to 14 µm spectral band thermometers with emissivity set between 0.9 and 1.0

²The uniformity specification refers to how IR thermometers with different spot sizes both focused at the center of the target will measure the same temperature.

³The target has a nominal emissivity of 0.95, however it is radiometrically calibrated to minimize emissivity related uncertainties.

Ordering information

- 4180** Precision Infrared Calibrator, -15 °C to 120 °C
- 4181** Precision Infrared Calibrator, 35 °C to 500 °C
- 4180-CASE** Carrying Case, 4180 or 4181
- 4180-APRT** 2-in Aperture, 4180 or 4181
- 4180-DCAS** Case, Transportation with wheels, 4180 or 4181

Included accessories

Accredited radiometric calibration report, target cover, User Guide, Getting Started Guide, and 9930 Interface-it software with User Guide